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UI Technology Guide for SAP S/4HANA 1909

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Content

1 SAP S/4HANA UI Technology. 7

2 Getting Started. 8

2.1 SAP Fiori UX. 8

2.2 App Types. 9

2.3 Implementation Planning. 9

2.4 Required Documentation. 11

3 Setup of SAP Fiori System Landscape. 13

3.1 Deployment Options. 13

3.2 Pre-Installation. 15

3.3 Required Product Versions. 17

Downloading Product Versions. 18

3.4 Installation of a New Front-End Server. 18

Specify Language Settings. 19

Installation of Release Information Notes. 20

Setup of Clients. 20

3.5 Embedded Deployment (Recommended). 21

Rapid Activation of SAP Fiori via Task Lists. 21

Additional Task Lists for Configuration. 25

Communication Channels. 28

3.6 Hub Deployment. 40

Configuration Using Task Lists. 42

Communication Channels. 46

4 Configuration of SAP Fiori Infrastructure. 64

4.1 Setup of SAP Fiori Launchpad. 64

4.2 Configuration of the SAP Fiori Launchpad. 64

4.3 User Assistance Settings. 65

Enable Context-Sensitive User Assistance and Back-End Help Links. 66

4.4 SAP CoPilot. 73

4.5 SAP Fiori Search. 73

Setup of SAP Fiori Search. 74

Enable SAP Fiori Search for Multiple Systems. 75

4.6 Integrating SAP Jam (Optional). 75

4.7 Extended Material Number in SAP Fiori Apps. 76

4.8 Running Apps in Standalone Mode. 76

4.9 Setup of SAPUI5 Application Index. 77

5 App Implementation. 78
5.1 User Management and Authorization. 79
UI Content and Authorization Concept. 79
Recommendations for Organizing SAP Fiori UI Entities and Authorizations. 83
General Authorizations Required for SAP Fiori. 84
Users in ABAP Front-End System. 86
Users in ABAP Back-End System. 86
5.2 UI-Specific Implementation Tasks. 87
SAP Fiori Apps. 87
Configuration Steps for SAP GUI for HTML Transactions, Web Dynpro Applications, and WebClient UI Applications. 92
Make Settings for Design Studio Apps. 99
Make Settings for Smart Business Apps. 100
Maintain Business Catalogs and Business Groups. 100
Create PFCG Role for UI Components and Assign Launchpad Catalogs and Groups. 108
Assign Roles to Users. 109
5.3 Implementation Tasks on Back-End Components (App Implementation). 110
Configuration Steps for SAP GUI for HTML Transactions, Web Dynpro Applications, and WebClient UI Applications. 110
Assign RFC Authorization to User. 116
Create PFCG Role for Application Components. 116
Assign Roles to Users. 118
Create Search Connectors for Object Pages on Back-End Server. 119
5.4 Creating Custom Analytical Apps Using a KPI Tile. 119
Modeling KPIs. 119
Configuring Navigation in SAP Smart Business. 121

6 Troubleshooting for SAP Fiori Apps. 123
6.1 Tools For Error Analysis. 123
6.2 General Problems and Solutions. 125
Caching Problems. 125
SAP Fiori App Cannot Be Opened. 125
Error “Service Failed” in App. 127
Web Dynpro ABAP / SAP GUI for HTML App Cannot Be Started. 128
New App in Catalog Does Not Appear on the SAP Fiori Launchpad. 128
SAP Fiori Content Doesn't Get Deleted Correctly. 130
Chip Instance Not Found. 131
No Or Too Little Data Is Shown in the App. 131
OData Service of Factsheets Cannot Be Activated. 132
How to Find Out which SAP GUI Transactions Can Be Used on the SAP Fiori Launchpad. 133
How to Improve Ticket Processing Time. 133
Apps For Job Scheduling or Application Log Display Cannot Be Opened. 135

Apps Are Not Working Anymore After Upgrade. 136
System Error When Accessing Knowledge Provider. 136

7 Extensibility. 138
7.1 Adapting the User Interface. 138
7.2 Creating Custom Fields and Custom Business Logic. 138
7.3 Adding Custom Views. 139
7.4 Adapting Database Extensions to SAP S/4HANA. 140

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1 SAP S/4HANA UI Technology

With SAP S/4HANA, all new functions, features, and innovations are accessible in the SAP Fiori launchpad. Using the launchpad, you can call up all apps for which you have been granted access. These can be SAP Fiori apps, as well as apps based on Web Dynpro, SAP GUI for HTML technology, and WebClient UI.

This guide explains how to setup a front-end server including the SAP Fiori launchpad, and how to implement the individual apps.

The guide is intended for system administrators and technical consultants.

2 Getting Started

2.1 SAP Fiori UX

Use

SAP Fiori is the new user experience (UX) for SAP software that applies modern design principles. SAP solutions, such as SAP S/4HANA, are using the SAP Fiori UX to provide a personalized, responsive, and simple user experience.

SAP Fiori UX speaks a **consistent design language** and makes use of a **common technical infrastructure**. By blurring traditional computing boundaries and by using interactive and attractive UI elements, SAP Fiori UX provides a **consistent end-to-end user experience** and can be used across all device types (for example, desktop, tablet, and mobile).

Organized by user roles, the SAP Fiori launchpad is the central entry hub to all SAP Fiori apps, where users access apps via tiles. Within the launchpad, there are services for navigation, personalization, single sign-on, and search. The launchpad and the tiles are flexible and can be adapted to your needs.

You can use the search in the SAP Fiori launchpad to search for business objects and for apps. For more information, see SAP Fiori Search.

Apps applying the SAP Fiori UX focus on the most critical and common activities and are designed around how people work:

- **Role-based:** Designed for you, your needs and how you work
- **Responsive:** Supports how and where you work, at any time
- **Simple:** Focuses on the important
- **Coherent:** Provides one fluid, seamless experience
- **Delightful:** Makes an emotional connection

All UIs are built using state-of-the-art technology such as HTML5 and SAPUI5. SAP Fiori apps allow you to access the most recent version of your back end data via OData services. Using previously defined roles and authorizations, you can specify which apps and which data a user is allowed to access.

More Information

For more information about the SAP Fiori launchpad, see Setup of SAP Fiori Launchpad.

2.2 App Types

In SAP S/4HANA, you can use the following SAP Fiori app types:

- Apps that are launched by using an app launcher tile
  For these apps, what information is displayed and how it is displayed is defined as part of the provided app-specific content. You cannot adapt or configure the information displayed by these apps. However, in the SAP Fiori launchpad, you can control what each user sees by grouping these apps into catalogs and groups and assigning them to roles.
  Apps that are launched by using an app launcher tile can be:
  - Transactional apps
    These apps let you perform transactional tasks, such as creating a leave request for an employee. They represent simplified views and interaction with existing business processes and solutions.
- Object Pages that are launched using SAP Fiori Search or through navigation from other apps
  These apps display contextual information and key facts about central objects used in your business operations.
- Analytical apps that are launched by using a KPI tile
  Analytical apps provide insight into the real-time operations of your business by collecting and displaying analytic information and indicators, such as KPIs, directly in your browser. To do this, the analytical apps combine the data and analytical power of SAP HANA with the integration and interface components of SAP Fiori.
  You can easily create custom analytical apps that are launched by using a KPI tile by using the SAP Smart Business Modeler apps: You can use or adapt the predefined KPIs or model your own KPIs. To determine which KPIs are displayed for each user in the SAP Fiori launchpad, you can group these KPIs and assign them to roles. A generic drill-down application included in the SAP Smart Business foundation component provides access to detail views for each tile. You can use predefined templates of the drill-down application or configure this drill-down application according to your requirements.

These SAP Fiori apps are using SAPUI5 as the UI technology. In addition to that, SAP S/4HANA contains further classic applications using a SAP Fiori theme. These apps can be called from the SAP Fiori launchpad and need a specific configuration. These are the following app types:

- Web Dynpro apps
  Some analytical or transactional apps use the well-established Web Dynpro UI technology. This UI technology offers floorplan patterns, which are ideal for analytical or planning purposes.
- SAP GUI for HTML apps
- WebClient UI apps
  Some apps use WebClient UI technology.

2.3 Implementation Planning

From the range of SAP Fiori apps, SAP supports you to choose the apps that are most relevant for your business and guides you through the implementation. This section provides an overview of tools that you can use for planning the implementation.

Discover SAP Fiori Apps with Innovation Discovery

To simplify your search for SAP Fiori apps, SAP offers a self-service providing you with innovations tailored to your business as well as comprehensive business and technical information.

Innovation discovery is a self-service tool that simplifies your search for new functionality SAP has delivered (as enhancement packages, support packages, add-ons, or improvement notes). SAP thereby bridges the gap between business needs on the one hand and technical information regarding innovations on the other. An innovation corresponds to one or several product features.

If Maintenance Planner information is available for an SAP Fiori app, you can access it from innovation discovery.

You access innovation discovery at https://apps.support.sap.com/innovation-discovery/.

For more information, see the innovation discovery help that is available from innovation discovery.

Plan the System Landscape with Maintenance Planner

Maintenance Planner is a graphical tool on SAP Support Portal to plan and prepare the maintenance of systems in your landscape. Using Maintenance Planner, you can do, for example, the following:

- Select and install new systems for SAP Fiori apps
- Choose the target version for the installation
- Understand the impact of planned changes in a system landscape
- Download the consolidated stack XML and push all the required archives to the download basket

Maintenance Planner relates to the SAP Fiori apps reference library, if available, as follows:

- Navigate to Maintenance Planner to get detailed landscape planning information.

You access Maintenance Planner at https://apps.support.sap.com/sap/support/mp.

For more information, see SAP Help Portal at http://help.sap.com/maintenanceplanner.

Find Detailed Information about SAP Fiori Apps with the SAP Fiori Apps Reference Library

With the SAP Fiori apps reference library, you explore, plan, and support implementing SAP Fiori apps. For example, you can do the following:

- Discover all the SAP Fiori apps that are available, including previous versions
- Display key information for each app, including documentation and the technical data that you need to install and configure the app
- Navigate to related tools
- Download the aggregated installation and configuration data for a selection of apps

The SAP Fiori apps reference library relates to the other tools, if available, as follows:

- Navigate to innovation discovery to get more information about the app
- Navigate to Maintenance Planner to get detailed landscape planning information
- Navigate to the product availability matrix
- Download data (consolidated list of launchpad catalogs, ICF nodes, OData services, and search connectors) for use in task lists for automatic configuration

You access the SAP Fiori apps reference library at http://www.sap.com/fiori-apps-library.

2.4 Required Documentation

In the following table you will find the most important documentation you require to implement your SAP Fiori System Landscape and the apps. Further documents and SAP Notes are referenced in the sections of this guide where needed.

Document	Available at
SAP FIORI FOR SAP S/4HANA 1909: Release Information Note	SAP Note 2805572
App-specific implementation documentation	https://help.sap.com/s4hana_op_1909 under *Product Assistance* Under each area, you can find the respective apps and their app-specific implementation information.
Maintenance Planner User Guide	http://help.sap.com/maintenanceplanner
SAP Fiori Launchpad	Go to https://help.sap.com/s4hana_op_1909, enter *SAP Fiori Launchpad* into the search bar, press `Enter` and open the search result with that title.
SAP Gateway Foundation	Go to https://help.sap.com/s4hana_op_1909, enter *SAP Gateway Foundation (SAP_GWFND)* into the search bar, press `Enter` and open the search result with that title.
ABAP Platform Security Guide	Go to https://help.sap.com/s4hana_op_1909, enter *ABAP Platform Security Guide* into the search bar, press `Enter` and open the search result with that title.
Installation of SAP Systems Based on the Application Server ABAP	http://support.sap.com/sltoolset *System Provisioning* > *Install a System using Software Provisioning Manager* > *Installation Guides - Application Server Systems*
SAP Fiori Client User Guide	http://help.sap.com/fiori-client

Document	Available at
SAP Web Dispatcher	Go to https://help.sap.com/s4hana_op_1909, enter *SAP Web Dispatcher* into the search bar, press `Enter` and open the search result with that title.
Enterprise Search	https://help.sap.com/s4hana_op_1909 under *Product Assistance* > *Enterprise Technology* > *ABAP Platform* > *Administrating the ABAP Platform* > *Enterprise Search*
Analytics	https://help.sap.com/s4hana_op_1909 under *Product Assistance* > *Cross Components* > *Analytics*
Latest UI5 Patch	Go to https://launchpad.support.sap.com/#/softwarecenter, search for *SAPUI5 CLIENT RUNTIME 1.00* and navigate to *Support Package Patches* > *[Latest Patch]* > *Related Info* > *Content Info*

3 Setup of SAP Fiori System Landscape

Use

This system landscape applies to the intranet deployment scenario. When accessing SAP Fiori apps over the Internet, that is, from outside the corporate network, make sure the access is secure. For more information, see Deployment Options [page 13].

Set up the system landscape to enable SAP Fiori before you start to implement an app.

The apps require front-end components (providing the user interface and the connection to the back end) and back-end components (providing the data). The front-end components and the back-end components are delivered in separate products and have to be installed in a system landscape that is enabled for SAP Fiori.

> ⓘ Note
>
> We highly recommend automating the activation of SAP Fiori content using the process described in Rapid Activation of SAP Fiori via Task Lists [page 21].
>
> The task lists used in this process serve as a quick-start to experience SAP Fiori for SAP S/4HANA in sandbox or development systems based on SAP-delivered template roles and provides a basis for the definition of customer-specific roles and catalogs.

3.1 Deployment Options

Deployment of SAP Fiori Front-End Server

SAP Fiori front-end server is an add-on product for Application Server ABAP and delivers the technology software components for the front end that are required to run SAP Fiori apps with the required stack definition.

Before implementing SAP Fiori front-end server, you have to decide how the main components of this product will be deployed in your system landscape. SAP Fiori front-end server allows various deployment options, which result in different system landscape architectures.

You have two options to set up SAP Fiori front-end server in an SAP system landscape.

- Embedded deployment (recommended)
  SAP Fiori front-end server is deployed into the AS ABAP of a back-end system.
- Hub deployment for single back-end systems
  A dedicated AS ABAP front-end server with SAP Fiori front-end server is deployed in a standalone system in front of the back-end system, either behind or in front of the firewall.

> ⓘ Note
>
> The general recommendation for SAP S/4HANA systems is an embedded SAP Front-end server deployment instead of a hub deployment. Nevertheless, dependent on the existing system landscape and usage scenario a hub deployment in some cases might be an option.

There are also specific deployment options and each supported option has advantages and potential drawbacks in terms of lifecycle, operations, and sizing.

> ⓘ Note
>
> For more information, see:
>
> - SAP Note 2590653 (*SAP Fiori front-end server deployment for SAP S/4HANA*)
> - Whitepaper "SAP Fiori Deployment Options and System Landscape Recommendations"
> - SAP Community wiki page "SAP Fiori Front-end Server"

> ⓘ Note
>
> SAP Fiori apps for SAP S/4HANA may have additional requirements for system landscape setup. For more information, see the SAP Fiori apps reference library and the release-specific SAP Notes for the apps you want to deploy.

Intranet Deployment

You can deploy SAP Fiori apps in the intranet, that is, inside your corporate network.

The SAP Fiori documentation focuses on the intranet deployment scenario.

When accessing SAP Fiori apps over the Internet, that is, from outside the corporate network, you have to perform additional tasks. For more information, see the following section *Internet-Facing Deployment*.

Internet-Facing Deployment

> → Recommendation
>
> When setting up SAP Fiori apps for consumption from outside the corporate network, we recommend that you deploy SAP Web Dispatcher in the demilitarized zone (DMZ).

> → Recommendation
>
> In addition, we highly recommend using Web Application Firewall capabilities in SAP Web Dispatcher or using an additional Web Application Firewall as first line of defense, especially when consuming SAP Fiori analytical apps or search capabilities over the Internet.

SAP Web Dispatcher should only forward requests to services in the internet communication manager that are necessary to run SAP Fiori apps.

There are services to run the SAP Fiori launchpad and services to run the specific apps:

- For the services to run the SAP Fiori launchpad, go to https://help.sap.com/s4hana_op_1909, enter *Initial Setup of the Launchpad* into the search bar, press `Enter`, open the search result with that title, and navigate to *Configuring ICF Nodes*.
- For the services to run the specific apps, see the app-specific documentation.
  For information about how to activate the specific services, see Activate ICF Services of SAPUI5 Application [page 90].

For an internet-facing deployment of mobile devices, you can use the SAP Cloud Platform Mobile Services. The Mobile Services, together with the SAP Cloud Platform, can guarantee secure access of your mobile applications to intranet resources. In addition, you can benefit from mobile specific features like push notifications and enhanced mobile usage once you add Mobile Services to your SAP Fiori system landscape.

More Information

For more information about SAP Mobile Platform Server, see *Integration of SAP Mobile Platform into SAP Fiori Landscape* at https://help.sap.com/s4hana_op_1909 under *Additional Information*.

For more information about Gateway deployment options, go to https://help.sap.com/s4hana_op_1909, enter *SAP Gateway Foundation Master Guide* into the search bar, press `Enter`, open the search result with that title, and navigate to *Deployment Options*.

For more information about using multiple network zones, go to https://help.sap.com/s4hana_op_1909, enter *Using Multiple Network Zones* into the search bar, press `Enter`, and open the search result with that title.

3.2 Pre-Installation

Before you begin to install the system landscape for SAP Fiori, make sure you have planned the following:

Network Architecture

You have to decide in which network zones the components of the SAP Fiori system landscape reside.

For example, should the clients be able to access the SAP Fiori apps over the Internet, or only within the company's intranet? Is there a demilitarized zone (DMZ) and is the SAP Web Dispatcher deployed there? Depending on your network architecture, make sure you have the right security measures in place, such as a secure firewall configuration.

Certificates for Single Sign-On

For single sign-on (SSO) using logon tickets, you require an SSL server certificate for each of the components between which you want to use SSO.

Components can be, depending on your system landscape:

- SAP Web Dispatcher
- Gateway on front-end server
- ABAP back-end server

> **Note**
>
> Depending on from where you obtain the certificates, it can take several days to get them.

For more information, see section *SAP HANA Authentication and Single Sign-On* in the SAP HANA Security Guide at http://help.sap.com/hana_platform *Security*.

Browser Prerequisites

SAP Fiori apps require a web browser that can display files in HTML5 format.

For more information, see Setup of Clients.

Roles and Authorizations

You have to decide how to set up the roles and authorizations for the SAP Fiori users. This includes, for example, which user group uses which apps.

For more information, see User Management and Authorization.

Operating System Access for SAP HANA Database

To configure HTTPS and SSO in the SAP HANA database, the administrator requires access to SAP HANA on the operating system level.

For more information, see *Operating System User <sid>adm* in the SAP HANA Administration Guide at http://help.sap.com/hana_platform *System Administration*.

3.3 Required Product Versions

Database

- ABAP front-end server:
  The underlying database for the ABAP front-end server must be one of the following databases with the following product versions:
  - SAP HANA database (`SAP HANA DATABASE 1.0` or `SAP HANA DATABASE 2.0`)
  - SAP MaxDB 7.9 64-BIT (`MAXDB 7.9 64-BIT`)
  - Sybase ASE (`SYBASE ASE 15.7 FOR BUS. SUITE`) or SAP ASE (`SAP ASE 16.0 FOR BUS. SUITE`)
- ABAP back-end server:
  The underlying database for the ABAP back-end server must be SAP HANA database (SAP HANA DATABASE 2.0).

SAP FIORI FRONT-END SERVER

You require SAP Fiori front-end server 6.0 (front-end server: NW 7.51 SP06 or higher). It contains the following components with the respective versions:

- SAP Gateway Foundation (software component version `SAP Gateway FOUNDATION 7.51 SP06` or higher)
- User Interface Technology (software component version `USER INTERFACE TECHNOLOGY 7.54`)
- UI for Basis Applications (software component version `UI FOR BASIS APPLICATIONS 500`) - containing SAP NetWeaver Fiori Apps

For more information about the setup and configuration of SAP Fiori, go to https://help.sap.com/s4hana_op_1909, enter *SAP Fiori: Setup and Configuration* into the search bar, press `Enter`, and open the search result with that title.

SAP Fiori for SAP S/4HANA

The SAP Fiori apps for SAP S/4HANA are delivered with the product SAP Fiori for SAP S/4HANA (`SAP FIORI FOR SAP S/4HANA 1909`).

3.3.1 Downloading Product Versions

Context

You use the Maintenance Planner to download the required product versions. Maintenance Planner calculates the required software components, enables the download of archives, and creates a stack configuration file. Create a common stack configuration file for SAP Fiori for S/4HANA and SAP Fiori front-end server 6.0 to install the products in a common installation procedure.

> **Note**
>
> In the embedded deployment scenario, you can create a common stack configuration file with a single Maintenance Planner run.
>
> In the hub deployment scenario, you have do this separately on the frontend and on the backend. You will receive two stack configuration files: one for the frontend, and one for the backend.

Procedure

1. You can launch Maintenance Planner as follows:
   - From the SAP Fiori apps reference library at http://www.sap.com/fiori-apps-library, if available for the required apps.
   - On SAP Support Portal at https://apps.support.sap.com/sap/support/mp.
2. Proceed as described in the *Maintenance Planner User Guide* at the SAP Help Portal at http://help.sap.com/maintenanceplanner

3.4 Installation of a New Front-End Server

Use

This document covers the general steps to take when installing SAP Fiori apps.

For more information, see the chapter *Installation of SAP Fiori* in the *Installation Guide for SAP S/4HANA*.

Prerequisites

Pre-Installation

You have performed specific pre-installation tasks (see Pre-Installation).

Procedure

Perform the following installation tasks:

1. Download the product versions via the maintenance planner (see Required Product Versions [page 17] and Downloading Product Versions).
2. Install SAP Web Dispatcher 7.5 as the reverse proxy.
   For more information, go to https://help.sap.com/s4hana_op_1909, enter *Operating SAP Web Dispatcher* into the search bar, press `Enter`, open the search result with that title and navigate to the section *Installing SAP Web Dispatcher*.
3. Setup of Front-End Server
   Perform the following installation tasks on the front-end server:
   1. Install SAP Fiori Front-End Server and SAP Fiori for SAP S/4HANA. For the installation, follow the instructions in the installation guide available at
      http://support.sap.com/sltoolset under *System Provisioning* > *Installation Option of Software Provisioning Manager* > *Installation Guides - Application Server Systems*.
   2. Specify the default language and the logon language.
      For more information, see Specify Language Settings.
4. Install the required SAP Notes for front-end and back-end server (see Installation of SAP Notes).
5. Setup the required clients (see Setup of Clients).

3.4.1 Specify Language Settings

Use

You must specify the settings for supported languages in the Gateway system. Settings include default and logon languages.

For more information, go to https://help.sap.com/s4hana_op_1909, enter *Language Settings* into the search bar, press `Enter`, and open the search result with that title.

Prerequisites

You have installed the same language packages for SAP Fiori in the Gateway system and the back-end system.

Activities

Default Languages

Ensure that the default language of the Gateway system is the same as the default language of the back-end system, for example, English. If this is not the case, ensure that the Gateway system contains a subset of the languages of the back-end system.

Logon Languages

The logon language for the ABAP application server is set according to the following process:

1. If the *Mandatory Logon Data* indicator has been activated for a service in transaction **SICF**, the system uses the language that was entered there.
2. If this is not the case, but the HTTP request contains the language in the HTTP header (as a header or a form field), you log on to the system using this language.
3. The browser settings of the calling client are then used. The system selects as the logon language the first language from the list that is maintained in the browser, and which is also installed in the SAP system. The language list is specified using the HTTP header field *accept-language*.

   > **Note**
   >
   > With Internet Explorer, you can for example set the language you require by choosing *Tools* > *Internet Options* > *Languages*.

4. If no language is defined by this process, the classic SAP system mechanisms are used. The logon language is based on the user settings (in transaction **SU01**) and if nothing is entered here, the default language of the SAP system is used automatically.

3.4.2 Installation of Release Information Notes

The SAP Note 2805572 provides important overview information and links to further SAP Notes that you need to implement.

3.4.3 Setup of Clients

SAP Fiori apps are designed for both desktop and mobile device and can be used with an HTML5-capable web browser. For more information about supported combinations of device, browser and operating system, see SAP Note 1935915.

SAP created the SAP Fiori Client available for Android, iOS and Windows Phone 8.1 to provide the following assets to SAP Fiori apps running inside SAP Fiori Client:

- Additional native capabilities (such as Camera, Barcode Scanner) on top of what a typical browser provides.
- Management of the local web cache better when new versions of the application are released by the Fiori server.
- Additional security to protect the application from unauthorized access.
- Provisioning the user certificate through Mobile Secure and SAP Mobile Platform.

For more information about SAP Fiori Client, see SAP Help Portal at http://help.sap.com/fiori-client > *SAP Fiori Client User Guide*.

3.5 Embedded Deployment (Recommended)

The SAP Fiori frontend server can be installed along with a SAP S/4HANA backend server (embedded deployment). While installing the SAP S/4HANA system, you can add additional front end components when you plan the installation/upgrade in the SAP Maintenance Planner.

> ⓘ Note
>
> The general recommendation for SAP S/4HANA systems is an embedded SAP Front-end server deployment instead of a hub deployment. Nevertheless, dependent on the existing system landscape and usage scenario a hub deployment in some cases might be an option.

3.5.1 Rapid Activation of SAP Fiori via Task Lists

The rapid activation of SAP Fiori serves as a quick-start to experience SAP Fiori for SAP S/4HANA in sandbox or development systems based on SAP-delivered template roles. It provides a basis for definition of customer-specific roles and catalogs.

To automate the activation of SAP Fiori for selected business roles, you can use the task lists `SAP_FIORI_FOUNDATION_S4` and `SAP_FIORI_CONTENT_ACTIVATION`. These task lists automate the following processes:

1. Setup of the SAP Fiori launchpad (task list `SAP_FIORI_FOUNDATION_S4`)
2. Generation of frontend roles and activation of SAP Fiori apps based on business roles delivered with SAP S/4HANA as templates, including the option to generate test users (task list `SAP_FIORI_CONTENT_ACTIVATION`)

Use your project scope to select the business roles you need to activate depending on the intended system use and configuration.

> ⓘ Note
>
> Do not activate all roles by default.
>
> The SAP Fiori apps reference library helps you identify the relevant roles.

Prerequisites

- Embedded deployment (as per official architecture recommendation), system name LOCAL is recommended. Hub deployment is not supported.
- The following product versions are installed:
  - SAP FIORI FRONT-END SERVER 6.0 SP00 or higher
  - SAP FIORI FOR SAP S/4HANA 1909 SP00 or higher

For a detailed list of prerequisites, see SAP Note 2902673.

Solution

Run the task lists SAP_FIORI_FOUNDATION_S4 [page 22] and SAP_FIORI_CONTENT_ACTIVATION [page 23].

3.5.1.1 Task List SAP_FIORI_FOUNDATION_S4

Purpose

- Activates ICF Nodes and OData services required for SAP GUI for HTML and other generic SAP Fiori launchpad features
- Initializes classic UI technologies (SAP GUI for HTML & WebDynpro ABAP applications)
- Generates working SAP Fiori launchpad user & admin roles including composite roles

Prerequisites

The task list `SAP_GW_FIORI_ERP_ONE_CLNT_SETUP` has been run. For more information, see SAP Note 2902673.

How to Use

1. Run transaction `STC01`, select the task list `SAP_FIORI_FOUNDATION_S4`, press F8 (*Generate Task List Run*)
2. Specify a workbench request.
3. Specify <PREFIX> for role creation e.g. Z.

Post-Activation Steps

The task list may require post-activation steps. For more information, see SAP Note 2902673.

Result

After the task list run, SAP Fiori launchpad can be accessed via transaction `/UI2/FLP` or directly via url **`<HTTP/HTTPS>://<SERVER>:<PORT>/sap/bc/ui5_ui5/ui2/ushell/shells/abap/FioriLaunchpad.html`**.

> **Note**
>
> If you encounter issues during the task list run or need more information on required post-activation steps or testing, see SAP Note 2902673.

3.5.1.2 Task List SAP_FIORI_CONTENT_ACTIVATION

Purpose

- Activates all SAP Fiori apps (including ODATA services and ICF nodes) based on selected SAP Fiori business roles
- Generates working template roles including authorization profiles
- Optional: Generates test users (one user per role)

As a result, the majority of the content works out of the box

Prerequisites

The task list `SAP_FIORI_FOUNDATION_S4` has been run.

How to Use

- Run transaction `STC01`, specify task list `SAP_FIORI_CONTENT_ACTIVATION`, press F8 (*Generate Task List Run*)
- Select one or more business roles.

  > **Note**
  >
  > If you select larger numbers of business roles, please start the task list in background mode.
  >
  > Please do not select more than 100 business roles in one task list run.

> ### Note
>
> Certain business roles have special prerequisites which could lead to task list dumps, especially if the business functionality needs to be activated by a business function switch. Select only those roles where the prerequisites are met and which fit to the intended usage/scoping of the SAP S/4HANA system.

> ### Note
>
> Certain roles cannot be activated due to technical restrictions or require additional activities.

- Choose Deployment Mode (Embedded Deployment => Co-Deployed (Default))
- Specify <PREFIX> for role creation, e.g. Z
- Optional: Create test users
  In the parameters
  - Specify Settings such as user <PREFIX>
  - *Self-Register ON* ensures that the password is set to productive (no need to change the initial password)
  - Specify *Add. Role Assignment*: Choose `<PREFIX>_FIORI_FOUNDATION_USER` (derived from previous task list `SAP_FIORI_FOUNDATION_S4`)
  - The generated users will follow a certain naming convention `<PREFIX><COUNTER>_<ROLE_ABBREVIATION>`, for example `T1_AAAC` (based on role `SAP_BR_AA_ACCOUNTANT`)

Post-Activation Steps

The task list may require post-activation steps. For more information, see SAP Note 2902673.

Result

Access SAP Fiori launchpad via transaction `/UI2/FLP` or directly via url `<HTTP/HTTPS>://<SERVER>:<PORT>/sap/bc/ui5_ui5/ui2/ushell/shells/abap/FioriLaunchpad.html`

Assign any of the previously generated roles including role `<PREFIX>_FIORI_FOUNDATION_USER` to your desired user or simply login with one of the optionally generated users

After a short initialization time, you should have access to the various groups and apps, as listed per each role in the SAP Fiori apps reference library.

> ### Note
>
> For a list of required post-activation steps and limitations, see SAP Note 2902673.

3.5.2 Additional Task Lists for Configuration

Use

You can perform ABAP system configuration tasks in an automated way by using predefined task lists.

For SAP Fiori, task lists support you in setting up and configuring the communication channels between the client, the front-end, and the back-end servers.

Prerequisites

- You are assigned the necessary roles to execute task lists.
  For more information, go to https://help.sap.com/s4hana_op_1909, enter *Configuration using ABAP Task Manager for Lifecycle Management Automation* into the search bar, press `Enter`, open the search result with that title and navigate to *Standard Roles and Permissions*.

Features

The following table lists the predefined task lists that are available for SAP Fiori. When you execute a task list, the system guides you through the configuration of the tasks that are included in the task list. In addition, the task list contains documentation that describes the tasks in the task list in more detail. After executing a task list, you do not have to execute the corresponding tasks manually.

Task	Task List	Description	Related Information
On one server in same client: • SAP Gateway – Basic Configuration • SAP Fiori Launchpad Initial Setup • Schedule job to update caching of OData metadata • SAP Gateway – Activate OData Services • SAP Basis – Activate HTTP Services (SICF)	`SAP_GW_FIORI_ERP_ONE_CLNT_SETUP`	Only for embedded deployment scenario: You use this task list to configure SAP Gateway and SAP Fiori on the same client where the ERP system is located. The task list consists of tasks that are available with the following task lists: • `SAP_GATEWAY_BASIC_CONFIG` • `SAP_FIORI_LAUNCHPAD_INIT_SETUP` • `/UI5/SCHEDULE_JOB_UPDATE_CACHE` • `SAP_GATEWAY_ACTIVATE_ODATA_SERV` • `SAP_BASIS_ACTIVATE_ICF_NODES`	Go to https://help.sap.com/s4hana_op_1909, enter *Set up and Configure SAP Fiori* into the search bar, press `Enter`, and open the search result with that title. Then search for the following titles: • *Activating SAP Gateway* • *Setup of SAP Fiori Launchpad* • *Scheduling Update of OData Metadata Caching* • *Activating OData Services for Several SAP Fiori Apps* • *Activating ICF Services of SAPUI5 Application*
Enable Embedded Search	`SAP_ESH_INITIAL_SETUP_WRK_CLIENT`	You use this task list for the automatic initial setup of Embedded Search in the working client. This task list executes the obligatory preparation steps for the implementation of Embedded Search. This can take a very long time, so start the task list in the background.	Setup of SAP Fiori Search [page 74]
Schedule the layered repository for flexibility services	`/UIF/SCHEDULE_LREP_JOB`	You use this task list on the front-end server to schedule a job in every client that periodically checks and regenerates the load in the layered repository on an SAP Gateway system (front end). SAPUI5 flexibility services use the layered repository to allow you to extend your apps based on your requirements, for example, by creating your own variants or adapting the user interface at runtime.	Go to https://help.sap.com/s4hana_op_1909, enter *SAPUI5: UI Development Toolkit for HTML5* into the search bar, press `Enter`, and open the search result with that title. Then navigate to the section *Essentials*.

Task	Task List	Description	Related Information
SAP Fiori launchpad content activation for customer and SAP-delivered business roles	`SAP_FIORI_FCM_CONTENT_ACTIVATION`	You use this task list to specify one or more customer or SAP-delivered business roles (in the scope definition step), and then, automatically activate OData Services and ICF Services of these roles. The task list automatically assigns the Odata services and business roles to a transport request. As a result, you achieve automatic activation of the SAP Fiori Launchpad content and Apps.	SAP Note 2813396

Procedure

1. Decide which task list you want to execute. Refer to the table above.
2. Execute the task lists with the ABAP Task Manager for Lifecycle Management Automation, transaction `STC01`.
3. Display the documentation that is available in the selected task list.

More Information

For more information about working with task lists in general and the required authorizations, see the Technical Configuration Automation ABAP configuration guide at http://support.sap.com/sltoolset under *System Provisioning* > *Install a System using Software Provisioning Manager* > *Configuration Guides - Automated Initial Setup* >.

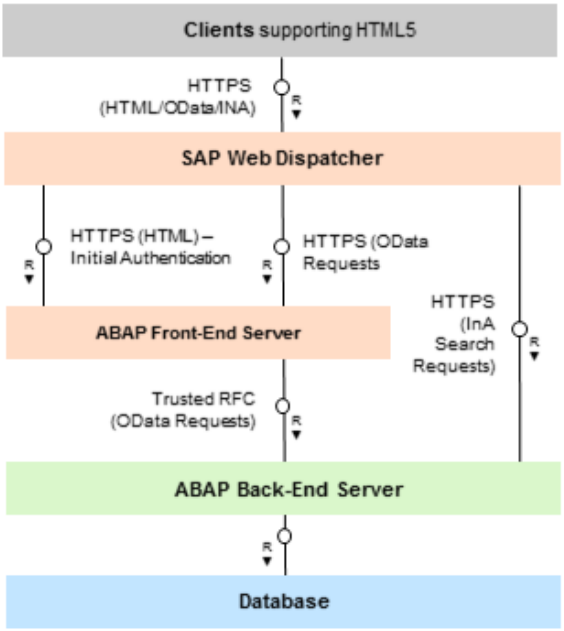
For more information about task lists, go to https://help.sap.com/s4hana_op_1909, enter *Configuration Using Task Lists* into the search bar, press `Enter`, and open the search result with that title.

For more information about task lists for setting up Enterprise Search, go to https://help.sap.com/s4hana_op_1909, enter *Executing Task Manager Task Lists* into the search bar, press `Enter`, and open the search result with that title.

3.5.3 Communication Channels

Use

To transfer application data and security credentials within your SAP Fiori system landscape, communication between the client, the front end, and the back end is established by using different communication channels and protocols:



System Landscape with SAP HANA Database: Communication Channels

Communication Between Client and SAP Web Dispatcher

The client can issue the following types of requests:

- HTML requests
- OData requests
- InA search requests

SAP Web Dispatcher forwards these requests to the ABAP front-end server or to the relevant back-end server (ABAP or SAP HANA). For communication between SAP Web Dispatcher and the client, an HTTPS connection is established.

Communication Between SAP Web Dispatcher and ABAP Servers

For SAP Fiori search and transactional apps, SAP Web Dispatcher forwards the following types of requests to the ABAP front-end server and the ABAP back-end server:

- ABAP front-end server:
  - HTML requests
  - OData requests
- ABAP back-end server:
  - InA search requests (SAP Fiori search only)

For communication between SAP Web Dispatcher and the ABAP servers, HTTPS connections are established.

Communication Between ABAP Front-End and ABAP Back-End Server

Data and services from the ABAP back-end server are provided for all apps to the ABAP front-end server by using OData services.

For communication between the ABAP front-end server and the ABAP back-end server, a trusted RFC connection is established.

More Information

For information about setting up communication encryption, go to https://help.sap.com/s4hana_op_1909, enter *ABAP Platform Security Guide* into the search bar, press Enter, open the search result with that title and navigate to the section *Network and Communication Security* > *Transport Layer Security*.

For information about setting up communication encryption for SAP HANA, see SAP Help Portal at http://help.sap.com/viewer/p/SAP_HANA_PLATFORM under *Security* > *SAP HANA Security Guide* > *SAP HANA Network and Communication Security* > *Securing Data Communication*.

3.5.3.1 ABAP Servers: Setup of Communication

Activities

To set up the connections between **SAP Web Dispatcher** and the **ABAP servers**, you must make the following settings:

- Configure HTTP security session management for the ABAP front-end server and for the ABAP back-end server.
- Configure the ABAP front-end server and the ABAP back-end server to support SSL.
- For object pages, configure SAP Fiori Search. For more information, see Setup of SAP Fiori Search [page 74].

To set up the connection between SAP Gateway on your **ABAP front-end server** and the application system on your **ABAP back-end server**, you must make the following settings:

- Define a trust relationship between the application system on the back-end server and the SAP Gateway system on the front-end server.

- Create an RFC destination in the SAP Gateway system to the application system.
- Activate SAP Gateway on the ABAP front-end server.
- Create system aliases for applications.

> → Recommendation
>
> To ensure confidentiality and integrity of data, we recommend protecting HTTP connections by using Transport Layer Security (TLS) or Secure Sockets Layer (SSL).
>
> For information about setting up communication encryption, go to https://help.sap.com/s4hana_op_1909, enter *ABAP Platform Security Guide* into the search bar, press `Enter`, open the search result with that title and navigate to *Network and Communication Security* > *Transport Layer Security*.

3.5.3.1.1 Configuring ABAP Server Session Security

Use

For the ABAP front-end server and the ABAP back-end server running Enterprise Search, you must activate HTTP security session management by using the transaction `SICF_SESSIONS`. When you activate HTTP security session management, we recommend that you activate the following extra protection for security-related cookies:

- `HttpOnly`
  This attribute instructs the browser to deny access to the cookie through client side script. As a result, even if a cross-site scripting (XSS) flaw exists and a user accidentally accesses a link that exploits this flaw, the browser will not reveal the cookie to a third party.
- `Secure`
  This attribute instructs the browser to send the cookie only if the request is being sent over a secure channel such as HTTPS. This helps protect the cookie from being passed over unencrypted requests.

> ⓘ Note
>
> A token-based protection against cross-site request forgery (CSRF) is active by default in SAP Gateway SAP Fiori OData services. It protects all modifying requests.

In addition, we recommend configuring HTTP session expiration with a reasonable timeout. To configure this, you use the profile parameter `http/security_session_timeout`.

Logout from Multiple Systems

SAP Fiori apps only support logout with the ABAP front-end server. If additional Gateway systems are deployed, the corresponding HTTP sessions are not closed when the user logs out. In this case, it is important to have session expiration configured.

More Information

For more information about activating HTTP security session management, go to https://help.sap.com/s4hana_op_1909, enter *Activating HTTP Security Session Management on AS ABAP* into the search bar, press Enter, and open the search result with that title.

For more information about session security protection for Gateway, go to https://help.sap.com/s4hana_op_1909, enter *SAP Gateway Foundation Security Guide* into the search bar, press Enter, open the search result with that title and navigate to the section *Session Security Protection*.

3.5.3.1.2 Configuring the AS ABAP to Support SSL

All communication between the client, SAP Web Dispatcher, and the ABAP servers is handled by using HTTPS connections. To secure these HTTPS connections, you must configure all ABAP servers to support the Secure Sockets Layer (SSL) protocol.

For more information about the steps that are required to enable SSL on the ABAP servers, go to https://help.sap.com/s4hana_op_1909, enter *Configuring AS ABAP to Support SSL* into the search bar, press Enter, and open the search result with that title.

> **Note**
>
> For secure communication between SAP Web Dispatcher and the ABAP servers, SSL must also be enabled for SAP Web Dispatcher. For more information about setting up SSL for SAP Web Dispatcher, see Configuring Communication Channel between Clients and SAP Web Dispatcher [page 32].

3.5.3.2 SAP Web Dispatcher: Setup of Communication

We recommend using the latest SAP Web Dispatcher version. For more information, see SAP Note 908097.

Activities

To set up the connection between the **client** and **SAP Web Dispatcher**, you must make the following settings:

- Configure SAP Web Dispatcher to support SSL.
- Configure the SAP Web Dispatcher server port.

To set up the connections between **SAP Web Dispatcher** and the **ABAP servers**, you must make the following settings:

- Define routing rules for SAP Web Dispatcher.
- If you use X.509 client certificates for authentication at the ABAP servers, configure a trust relationship between SAP Web Dispatcher and the ICM of the ABAP servers.

→ Recommendation

To ensure confidentiality and integrity of data, we recommend protecting HTTP connections by using Transport Layer Security (TLS) or Secure Sockets Layer (SSL).

For information about setting up communication encryption, go to https://help.sap.com/s4hana_op_1909, enter *ABAP Platform Security Guide* into the search bar, press Enter, open the search result with that title, and navigate to *Network and Communication Security* > *Transport Layer Security*.

3.5.3.2.1 Configuring Communication Channel between Clients and SAP Web Dispatcher

Use

To facilitate communication between the browser and the different systems in the SAP Fiori system landscape, you use SAP Web Dispatcher as a reverse proxy to ensure queries from the browser are correctly directed to the appropriate system.

As SAP Fiori apps access multiple back-end systems but JavaScript code is constrained by the Same Origin Policy, all systems are exposed to the browser through the reverse proxy, which brings them into a common origin (combination of protocol, host name, and port).

ⓘ Note

You can configure SAP Web Dispatcher to be able to handle a high load of incoming requests.

For more information, go to https://help.sap.com/s4hana_op_1909, enter *Configuring SAP Web Dispatcher for High System Load Due to Inbound Requests* into the search bar, press Enter, and open the search result with that title.

Prerequisites

You have implemented SAP Web Dispatcher.

Procedure

Configure SAP Web Dispatcher to Support SSL

All communication to back-end systems should be handled using HTTPS requests and SAP Web Dispatcher itself should be called using only HTTPS.

1. Open the Web Dispatcher profile.

2. To configure HTTPS settings, you can copy the following source code and adapt it to your business requirements:

```
ssl/ssl_lib = <sapcrypto dll>
ssl/server_pse = <pse>
icm/HTTPS/verify_client = 0
ssl/client_pse = <pse>
wdisp/ssl_encrypt = 1
wdisp/ssl_auth = 2
wdisp/ssl_cred = <pse>
icm/HTTPS/forward_ccert_as_header = true
```

   For more information about the parameters, go to https://help.sap.com/s4hana_op_1909, enter *Configure SAP Web Dispatcher to Support SSL* into the search bar, press `Enter`, and open the search result with that title.

Configure SAP Web Dispatcher Server Port

In order to satisfy the requirement of the Same Origin Policy, all systems in an SAP Fiori app landscape have to be served by a single Web server access point. Therefore, you configure a single `icm/server_port` in SAP Web Dispatcher to serve all back-end systems of an SAP Fiori scenario.

1. Open the Web Dispatcher profile.
2. To configure the ports, you can copy the following source code and adapt it to your business requirements:

```
icm/server_port_0 = PROT=HTTPS,PORT=443,TIMEOUT=120
```

   Additional parameters needed by SAP Fiori for correct request routing:

```
wdisp/system_conflict_resolution = FIRST_MATCH
wdisp/handle_webdisp_ap_header = SET
wdisp/add_xforwardedfor_header = true
```

For more information about the parameters, go to https://help.sap.com/s4hana_op_1909, enter *Configuration of the Web Dispatcher Server Port* into the search bar, press `Enter`, and open the search result with that title.

3.5.3.2.2 Defining Routing Rules for SAP Web Dispatcher and ABAP Front End

Use

For object pages, a connection is established between the ABAP front-end server (Gateway) and SAP Web Dispatcher. You define the routing rules to the required target system to ensure that requests are directed to the correct server.

For the connection between ABAP front-end server and SAP Web Dispatcher, you need the following routing rules:

URL Prefix	Target System
`/sap/bc`	Gateway

URL Prefix	Target System
`/sap/public`	Gateway
`/sap/opu`	Gateway

Prerequisites

For more information about the prerequisites, see Configuring Communication Channel between Clients and SAP Web Dispatcher.

Procedure

> → Recommendation
>
> SAP recommends that only those requests corresponding to the services required for the applications that you want to use should be routed to the application servers.

1. Open the Web Dispatcher profile.
2. Configure SAP Web Dispatcher for the Gateway server.
   To configure the SAP Web Dispatcher for the Gateway server, you can copy the following source code and adapt it to your business requirements.

```
wdisp/system_0 = SID=<SID of the Gateway system>, MSHOST=<host name of
Gateway system's message server>, MSPORT=<HTTP port of the Gateway system's
message server>, SRCSRV=*:443, SRCURL=/sap/opu;/sap/bc;/sap/public
```

> ⓘ Note
>
> The `SRCSRV` and the `CLIENT` parameter are optional. For more information about the parameters, go to https://help.sap.com/s4hana_op_1909, enter *wdisp/system_<xx>* into the search bar, press `Enter`, and open the search result with that title.
>
> If you configure multiple `wdisp/system_xx` parameters, make sure you use different indexes.

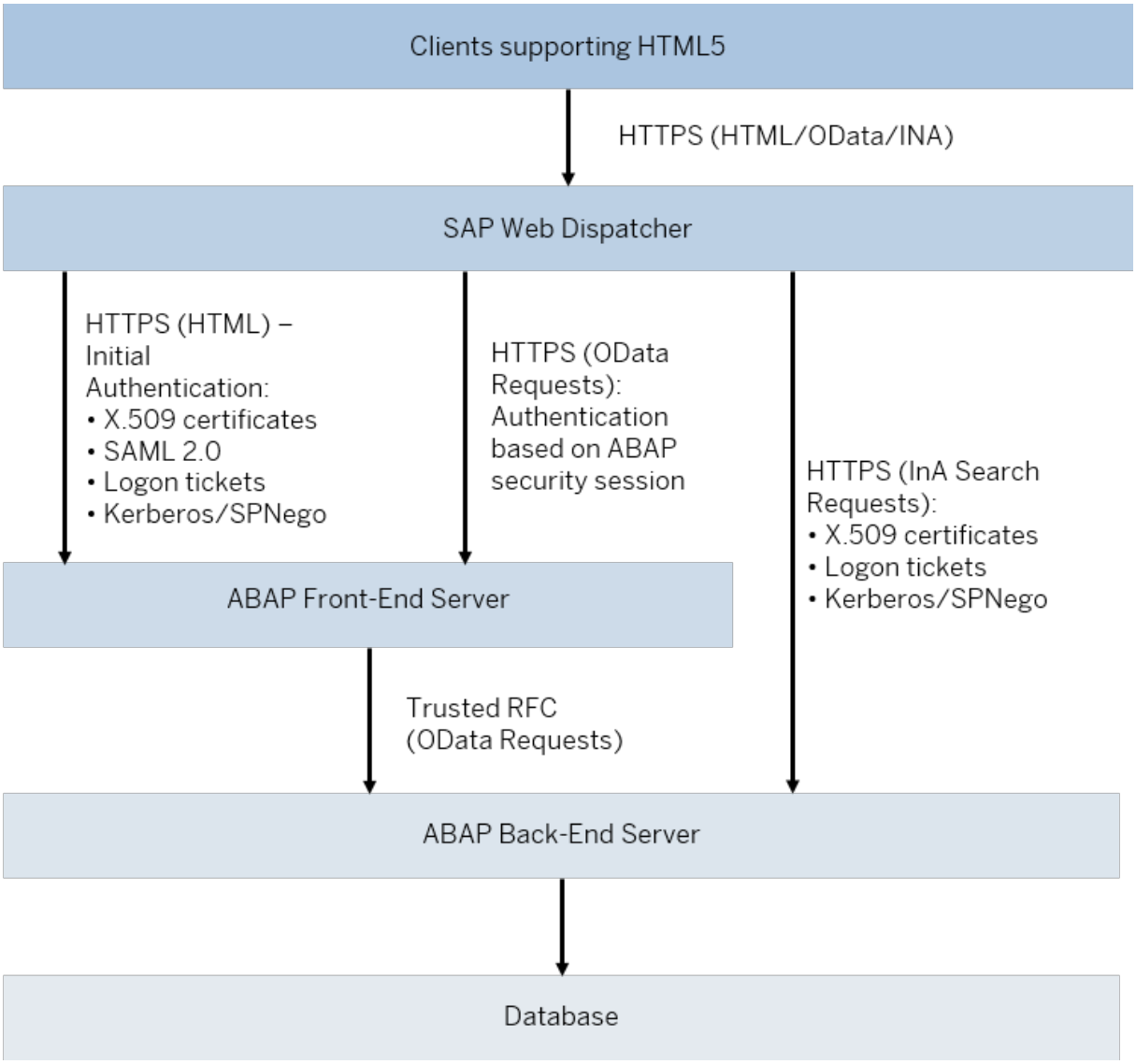
3.5.3.2.3 Configuring Trust Between SAP Web Dispatcher and ABAP Servers

For initial authentication at the ABAP front-end server and authentication for search requests at the ABAP back-end server (object pages), you can use different authentication methods, including X.509 certificates. If you want to use X.509 certificates, you must set up a trusted relationship between SAP Web Dispatcher and the Internet Communication Manager (ICM) of the relevant ABAP servers.

For more information about the steps that are required to configure the trusted relationship, go to https://help.sap.com/s4hana_op_1909, enter *Configuring SAP Web Dispatcher and ABAP Servers for X.509-Based Logon (Optional)* into the search bar, press Enter, and open the search result with that title.

3.5.3.3 User Authentication and Single Sign-On (SSO)

Use



System Landscape: User Authentication and Single Sign-On

Overview

The authentication concept for SAP Fiori apps comprises initial user authentication on the ABAP front-end server, followed by authentication of all requests to back-end systems.

Initial Authentication

When a user launches an SAP Fiori app, the launch request is sent from the client to the ABAP front-end server by the SAP Fiori launchpad. During launch, the ABAP front-end server authenticates the user by using one of the supported authentication and single sign-on (SSO) mechanisms. We recommend setting up SSO, thereby enabling users to start SAP Fiori apps using their single, existing credentials. As a fallback option, initial authentication can be based on the users' passwords on the ABAP front-end server. SAP provides a dedicated logon handler for form-based logon. After initial authentication on the ABAP front-end server, a security session is established between the client and the ABAP front-end server.

Authentication for Requests in the Back-End Systems

After initial authentication on the ABAP front-end server, the SAP Fiori apps and the SAP Fiori launchpad can send requests to the ABAP back-end server. For these requests to back-end servers, additional configuration of SSO mechanisms for authentication may be required.

Requests to the ABAP back-end server

Apps send OData requests through the ABAP front-end server towards the ABAP back-end server. After initial authentication, a security session is established between the client and the ABAP front-end server. OData requests towards the ABAP back-end server are then communicated securely by trusted RFC.

For search in SAP Fiori launchpad, applications send InA search requests from the client to the SAP HANA database. These requests can be authenticated with Kerberos/SPNego, X.509 certificates, or logon tickets. You can configure the ABAP front-end server to issue logon tickets after initial authentication, or you can use your existing portal to do so.

3.5.3.3.1 Setting Up SSO for SAP Fiori and SAP S/4HANA

Use

For SAP Fiori landscapes with SAP S/4HANA, you must configure an single sign-on (SSO) mechanism for initial authentication on the ABAP front-end server. After initial authentication, any requests to back-end ABAP systems are communicated securely by trusted RFC.

Procedure

To set up single sign-on for a system landscape with SAP S/4HANA, proceed as follows:

1. Configure initial authentication on the ABAP front-end server.
2. Configure authentication for requests to the ABAP back-end server:
   - Configure a trusted RFC connection between the ABAP front-end server and the ABAP back-end server.
   - For search in the SAP Fiori launchpad, configure authentication in the back-end server, which processes the search requests. These requests can be authenticated with Kerberos/SPNego, X.509 certificates, or logon tickets. You can configure the ABAP front-end server to issue logon tickets after initial authentication, or you can use your existing portal to do so.

> **Note**
>
> You can perform setup tasks for SAP Fiori by using task lists that SAP delivers. A task list groups configuration tasks logically and guides you through the necessary tasks.
>
> For an overview of all task lists and tasks for SAP Fiori, go to https://help.sap.com/s4hana_op_1909, enter *Configuration Using Task Lists* into the search bar, press `Enter`, and open the search result with that title.

The following task list applies for this step:

- `SAP_SAP2GATEWAY_TRUSTED_CONFIG`

More Information

- For more information about specific SSO mechanisms for authentication, see SSO Mechanisms for SAP Fiori Apps.
- For more information about how to set up a trusted RFC, go to https://help.sap.com/s4hana_op_1909, enter *RFC Scenarios* into the search bar, press `Enter`, and open the search result with that title.
- For more information about configuring SAP Fiori search, see Setup of SAP Fiori Search [page 74].

3.5.3.3.2 SSO Mechanisms for SAP Fiori Apps

The following authentication and single sign-on (SSO) mechanisms are supported for SAP Fiori apps:

- Kerberos/SPNego
- X.509 Certificates
- SAML 2.0
- Logon Tickets

3.5.3.3.2.1 Kerberos/SPNego

Use

If you access SAP Fiori apps from within your corporate network, you can enable Kerberos/SPNego authentication for the ABAP front-end server. This authentication is especially recommended, if you already have a Kerberos/SPNego infrastructure in place, for example, if you use *Microsoft Active Directory*.

Kerberos/SPNego authentication provides the following advantages:

- It simplifies the logon process by reusing credentials that have already been provided, for example, during logon to the Microsoft Windows workstation. A separate logon to the ABAP front-end server is not required.
- It is also supported for logon to the SAP GUI. Using Kerberos for both SAP GUI and HTTP access simplifies the Single Sign-On setup within your system landscape.

- It is supported by a growing number of mobile device vendors.

During logon, Kerberos/SPNego authentication requires access to an issuing system (for example, *Microsoft Active Directory*). As this system is typically located within the corporate network, Kerberos/SPNego **cannot** be used for most internet-facing deployment scenarios. To enable Single Sign-On with Kerberos/SPNego authentication from outside your corporate network, you might have to set up a VPN connection.

Kerberos/SPNego is available with the SAP Single Sign-On product, which also provides additional authentication mechanisms, such as X.509 certificates or an SAML Identity Provider.

For an overview of SAP Single Sign-On, see http://www.sap.com/pc/tech/security/software/single-sign-on/index.html.

Configuration

For more information about the configuration that is required for Kerberos/SPNego, see the Secure Login for SAP Single Sign-On Implementation Guide on SAP Help Portal at http://help.sap.com/sapsso.

3.5.3.3.2.2 X.509 Certificates

Use

If you have implemented a public-key infrastructure (PKI) for user authentication in your organization, you can use X.509 certificates by configuring the required back-end systems (ABAP or SAP HANA) to accept X.509 certificates.

Authentication with X.509 certificates provides the following advantages:

- It does not require an issuing system during logon, which means that it works well in internet-facing scenarios.
- It is also supported for logon to the SAP GUI. Using X.509 certificates for both SAP GUI and HTTP access simplifies the Single Sign-On setup within your system landscape.

X.509 certificates must be distributed to the workstations and devices that are used to access SAP Fiori apps. For mobile devices, this distribution can be performed centrally by a mobile device management software, for example SAP Afaria.

> → Recommendation
>
> As X.509 certificates remain valid for a relatively long time, we recommend that you minimize the security risk by implementing a method to revoke the certificates, for example if a mobile device is lost.

Configuration

For information about the configuration that is required for X.509 certificates, go to https://help.sap.com/s4hana_op_1909, enter *Configuring the AS ABAP to Use X.509 Client Certificates* into the search bar, press Enter, and open the search result with that title.

3.5.3.3.2.3 SAML 2.0

Use

If you have implemented the security assertion markup language (SAML) version 2.0 as the method of single sign-on (SSO) within your organization, you can configure the ABAP front-end server for use with SAML 2.0.

This authentication method provides the following advantages:

- It includes extensive federation capabilities, which means that it works well in scenarios with federated user domains, where trust configuration can be complicated.
- It includes extensive user mapping capabilities that enable you to map SAP users based on identity attributes, such as the SAP user name attribute or a user's e-mail address. This means that SAML 2.0 works well for scenarios with multiple user domains.

During logon, SAML 2.0 authentication requires access to an issuing system (Identity Provider). To enable single sign-on with SAML 2.0 in internet-facing deployment scenarios that leverage its federation capabilities, you must ensure that the SAML Identity Provider is securely accessible from outside your corporate network.

> ⓘ Note
>
> In the SAP Fiori system landscape, SAML 2.0 is supported only for communication with the ABAP front-end server.

Configuration

For information about the configuration that is required for using SAML 2.0, go to https://help.sap.com/s4hana_op_1909, enter *Configuring AS ABAP as a Service Provider* into the search bar, press Enter, and open the search result with that title.

3.5.3.3.2.4 Logon Tickets

Use

For logon tickets, you must configure the ABAP front-end server to issue logon tickets. Alternatively, you can use an existing system, such as a portal, in your landscape that already issues logon tickets. In addition, you

must configure the required back-end systems (ABAP or SAP HANA) to accept logon tickets. You must also ensure that users in the ABAP system have the same user names as the database users in SAP HANA; user mapping is not supported.

As logon tickets are transferred as browser cookies, you can only use this authentication mechanism if all systems in your system landscape are located within the same DNS domain.

> → Recommendation
>
> The new standardized authentication methods Kerberos/SPNego, X.509 certificates, and SAML 2.0 provide additional security and flexibility features compared to proprietary logon tickets. For example, you can define user mappings and shorten token validity periods or session lifetimes on the server. Therefore, we recommend using Kerberos/SPNego, X.509 certificates, or SAML 2.0 where technically possible.

> ⓘ Note
>
> You can perform setup tasks for SAP Fiori by using task lists that SAP delivers. A task list groups configuration tasks logically and guides you through the necessary tasks.
>
> For an overview of all task lists and tasks for SAP Fiori, go to https://help.sap.com/s4hana_op_1909, enter *Configuration Using Task Lists* into the search bar, press `Enter`, and open the search result with that title.

The following task list includes a task for importing the system certificate from a remote system and adding the remote system to the Access Control List (ACL) according to transaction STRUSTSSO2:

- `SAP_SAP2GATEWAY_TRUSTED_CONFIG`

Configuration

For information about the configuration that is required for using logon tickets, go to https://help.sap.com/s4hana_op_1909, enter *Configuring AS ABAP to Accept Logon Tickets* into the search bar, press `Enter`, and open the search result with that title.

3.6 Hub Deployment

Concept

You can use an existing front-end server (hub) for the SAP Fiori for SAP S/4HANA installation. Existing apps continue to run against the old back-end systems while the newly installed applications of SAP Fiori for SAP S/4HANA need to be configured to run against the SAP S/4HANA system. As a prerequisite, you have to migrate the database of the central hub system and upgrade the system.

Implementation Considerations

SAP Fiori for SAP S/4HANA includes all apps which can be used with the corresponding SAP S/4HANA back-end system. For some areas, it updates the existing app versions on the front-end server as well. Take the following known dependencies into account when you plan the installation.

- When using one of the following UI products on the front-end server, ensure that you meet the minimum Support Package Stack level in the back-end systems of your existing landscape. As an alternative, you can also deselect these components when you plan the upgrade in the SAP Maintenance Planner.

Product	Minimum Product Version and SPS level in Back-End System
Master Data Governance (SAP FIORI FOR SAP MDG 2.0)	SAP ERP 6.0 EHP 8 SPS 07
Information Lifecycle Management (SAP FIORI FOR SAP ILM 1.0)	SAP NetWeaver 7.40 SPS 08
Human Capital Management (SAP FIORI FOR SAP ERP HCM 1.0)	SAP ERP 6.0 EHP 7 SPS 09 and SAP Fiori for SAP ERP HCM 1.0 SPS 02

- Not all SAP Fiori product versions installed on the front-end server are released for the new version SAP Fiori front-end server 5.0 (front-end server: NW 7.52) to which you need to upgrade. You need to uninstall any app which is not released to be able to upgrade the front-end server. For more information, see SAP Note 2618605.
- For customers running SAP Simple Finance 2.0 or lower on their front-end server, it is not possible to install the SAP Fiori for SAP S/4HANA 1610 on the same instance.
- It's mandatory to upgrade My Inbox 100 (UIX01CA1) to My Inbox 200 (Approve Request UI 2.0).

Activities

1. Migrate your database to one of the supported database systems.
   The front-end server for SAP S/4HANA is supported on SAP HANA, SAP MaxDB, or SAP ASE as database management system. Migrate you database, if necessary.
2. If necessary, uninstall not released SAP Fiori apps. For more information, see SAP Notes 2034588 and 2011192.
3. Upgrade the front-end server to SAP Fiori front-end server 5.0 (front-end server: NW 7.52).
   You can combine the upgrade of the front-end server and installation of SAP Fiori for SAP S/4HANA in one step. When you plan this upgrade in the SAP Maintenance Planner, the Maintenance Planner will create a common stack configuration file for all installed components.
   Proceed as described in the *Upgrade and Update Guides*.
4. Configure the apps as described in this document and in the app-specific implementation information.

> **Note**
>
> You do not have to configure the apps of the UI products listed in the table above.

> **Note**
>
> If you move from SAP Suite on SAP HANA to SAP S/4HANA and want to make modifications you had made to the SAP HANA database visible on the UIs again, you have to carry out manual steps in different content layers. For more information, see Adapting Database Extensions to SAP S/4HANA [page 140]

3.6.1 Configuration Using Task Lists

Use

You can perform ABAP system configuration tasks in an automated way by using predefined task lists.

For SAP Fiori, task lists support you in setting up and configuring the communication channels between the client, the front-end, and the back-end servers.

Prerequisites

- You are assigned the necessary roles to execute task lists.
  For more information, go to https://help.sap.com/s4hana_op_1909, enter *Configuration using ABAP Task Manager for Lifecycle Management Automation* into the search bar, press `Enter`, open the search result with that title and navigate to *Standard Roles and Permissions*.

Features

The following table lists the predefined task lists that are available for SAP Fiori. When you execute a task list, the system guides you through the configuration of the tasks that are included in the task list. In addition, the task list contains documentation that describes the tasks in the task list in more detail. After executing a task list, you do not have to execute the corresponding tasks manually.

Task	Task List	Description	Related Information
Gateway – Basic Configuration	`SAP_GATEWAY_BASIC_CONFIG`	You use this task list on the front-end server to perform basic configuration steps for Gateway.	Activating Gateway [page 51]
SAP Fiori Launchpad Initial Setup	`SAP_FIORI_LAUNCHPAD_INIT_SETUP`	You use this task list on the front-end server to activate launchpad OData and HTTP services on an Gateway system (front end).	Setup of SAP Fiori Launchpad [page 64]

Task	Task List	Description	Related Information
Schedule job to update caching of OData metadata	`/UI5/SCHEDULE_JOB_UPDATE_CACHE`	You use this task list on the front-end server to schedule the update of OData metadata caching as a background job. You need to execute this task list in every client that users log on to the SAP Fiori launchpad. This task list is client-dependent.	Go to https://help.sap.com/s4hana_op_1909, enter *Scheduling Update of OData Metadata Caching* into the search bar, press `Enter`, and open the search result with that title. Then navigate to the section *Essentials*.
Schedule the layered repository for flexibility services	`/UIF/SCHEDULE_LREP_JOB`	You use this task list on the front-end server to schedule a job in every client that periodically checks and regenerates the load in the layered repository on an SAP Gateway system (front end). SAPUI5 flexibility services use the layered repository to allow you to extend your apps based on your requirements, for example, by creating your own variants or adapting the user interface at runtime.	Go to https://help.sap.com/s4hana_op_1909, enter *SAPUI5: UI Development Toolkit for HTML5* into the search bar, press `Enter`, and open the search result with that title. Then navigate to the section *Essentials*.
Create Trusted Connection from SAP System to Gateway	`SAP_SAP2GATEWAY_TRUSTED_CONFIG`	You use this task list on the back-end server to create a trusted connection from an SAP system to Gateway. **Note** You have to execute this task list in dialog.	Connect Gateway to Back-End System (Trusted RFC) [page 49] Logon Tickets [page 39] ABAP Servers: Setup of Communication [page 29] Setting Up SSO for SAP Fiori and SAP S/4HANA [page 36]
Enable Embedded Search	`SAP_ESH_INITIAL_SETUP_WRK_CLIENT`	You use this task list for the automatic initial setup of Embedded Search in the working client. This task list executes the obligatory preparation steps for the implementation of Embedded Search. This can take a very long time, so start the task list in the background.	Setup of SAP Fiori Search [page 74]

Task	Task List	Description	Related Information
Gateway – Add Backend System	`SAP_GATEWAY_ADD_SYSTEM`	You use this task list on the front-end server to connect an SAP system (back end) to an Gateway system (front end). The task list creates or uses an existing trusted remote function call (RFC) destination, checks the single sign-on (SSO) profile parameters, configures the SSO ticket and creates a system alias. Changes are recorded on a customizing request that you have to create or select at the beginning of the task list. **Note** The task list uses a trusted RFC destination with the current user. Maintain the authorization object `S_RFCACL` in the back-end system and assign the corresponding role or profile to the current user.	Creating System Alias for Applications [page 51]
Gateway – Maintain System Alias	`SAP_GATEWAY_ADD_SYSTEM_ALIAS`	You use this task list on the front-end server to create a system alias for an existing remote function call destination. Configure the remote function call destination as trusted. Changes are recorded on a customizing request that you have to create or select at the beginning of the task list.	Creating System Alias for Applications [page 51]
Gateway – Activate OData Services	`SAP_GATEWAY_ACTIVATE_ODATA_SERV`	You use this task list on the front-end server to activate OData services for the SAP Fiori apps. OData services provide information about the app tiles to be displayed.	Activate OData Services for Several SAP Fiori Apps [page 88]
SAP Basis – Activate HTTP Services (SICF)	`SAP_BASIS_ACTIVATE_ICF_NODES`	You use this task list on the front-end server to activate HTTP services (SICF) according to transaction SICF. ICF nodes provide access to web resources.	Activate ICF Services of SAPUI5 Application [page 90]

Task	Task List	Description	Related Information
Enable Embedded Search on work clients	`SAP_ESH_INITIAL_SETUP_WRK_CLIENT`	You use this task list for the automatic initial setup of Embedded Search in work clients. This can take a very long time, so start the task list in the background.	Setup of SAP Fiori Search [page 74]

Procedure

1. Decide which task list you want to execute. Refer to the table above.
2. Execute the task lists with the ABAP Task Manager for Lifecycle Management Automation, transaction `STC01`.
3. Display the documentation that is available in the selected task list.

More Information

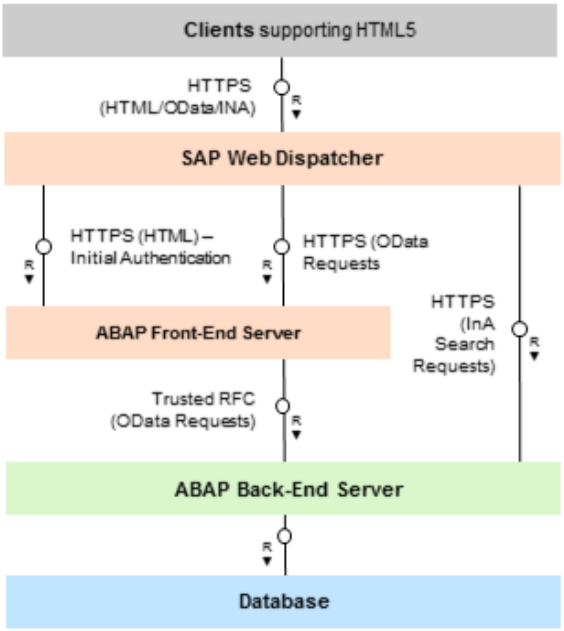
For more information about working with task lists in general and the required authorizations, see the Technical Configuration Automation ABAP configuration guide at http://support.sap.com/sltoolset under *System Provisioning* > *Install a System using Software Provisioning Manager* > *Configuration Guides - Automated Initial Setup* >.

For more information about task lists for setting up Enterprise Search, go to https://help.sap.com/s4hana_op_1909, enter *Executing Task Manager Task Lists* into the search bar, press `Enter`, and open the search result with that title.

3.6.2 Communication Channels

Use

To transfer application data and security credentials within your SAP Fiori system landscape, communication between the client, the front end, and the back end is established by using different communication channels and protocols:



System Landscape with SAP HANA Database: Communication Channels

Communication Between Client and SAP Web Dispatcher

The client can issue the following types of requests:

- HTML requests
- OData requests
- InA search requests

SAP Web Dispatcher forwards these requests to the ABAP front-end server or to the relevant back-end server (ABAP or SAP HANA). For communication between SAP Web Dispatcher and the client, an HTTPS connection is established.

Communication Between SAP Web Dispatcher and ABAP Servers

For SAP Fiori search and transactional apps, SAP Web Dispatcher forwards the following types of requests to the ABAP front-end server and the ABAP back-end server:

- ABAP front-end server:
  - HTML requests
  - OData requests
- ABAP back-end server:
  - InA search requests (SAP Fiori search only)

For communication between SAP Web Dispatcher and the ABAP servers, HTTPS connections are established.

Communication Between ABAP Front-End and ABAP Back-End Server

Data and services from the ABAP back-end server are provided for all apps to the ABAP front-end server by using OData services.

For communication between the ABAP front-end server and the ABAP back-end server, a trusted RFC connection is established.

More Information

For information about setting up communication encryption, go to https://help.sap.com/s4hana_op_1909, enter *ABAP Platform Security Guide* into the search bar, press Enter, open the search result with that title and navigate to the section *Network and Communication Security* > *Transport Layer Security*.

For information about setting up communication encryption for SAP HANA, see SAP Help Portal at http://help.sap.com/viewer/p/SAP_HANA_PLATFORM under *Security* > *SAP HANA Security Guide* > *SAP HANA Network and Communication Security* > *Securing Data Communication*.

3.6.2.1 ABAP Servers: Setup of Communication

Activities

To set up the connections between **SAP Web Dispatcher** and the **ABAP servers**, you must make the following settings:

- Configure HTTP security session management for the ABAP front-end server and for the ABAP back-end server.
- Configure the ABAP front-end server and the ABAP back-end server to support SSL.
- For object pages, configure SAP Fiori Search. For more information, see Setup of SAP Fiori Search [page 74].

To set up the connection between SAP Gateway on your **ABAP front-end server** and the application system on your **ABAP back-end server**, you must make the following settings:

- Define a trust relationship between the application system on the back-end server and the SAP Gateway system on the front-end server.

- Create an RFC destination in the SAP Gateway system to the application system.
- Activate SAP Gateway on the ABAP front-end server.
- Create system aliases for applications.

→ Recommendation

To ensure confidentiality and integrity of data, we recommend protecting HTTP connections by using Transport Layer Security (TLS) or Secure Sockets Layer (SSL).

For information about setting up communication encryption, go to https://help.sap.com/s4hana_op_1909, enter *ABAP Platform Security Guide* into the search bar, press `Enter`, open the search result with that title and navigate to *Network and Communication Security* > *Transport Layer Security*.

3.6.2.1.1 Configuring ABAP Server Session Security

Use

For the ABAP front-end server and the ABAP back-end server running Enterprise Search, you must activate HTTP security session management by using the transaction `SICF_SESSIONS`. When you activate HTTP security session management, we recommend that you activate the following extra protection for security-related cookies:

- `HttpOnly`
  This attribute instructs the browser to deny access to the cookie through client side script. As a result, even if a cross-site scripting (XSS) flaw exists and a user accidentally accesses a link that exploits this flaw, the browser will not reveal the cookie to a third party.
- `Secure`
  This attribute instructs the browser to send the cookie only if the request is being sent over a secure channel such as HTTPS. This helps protect the cookie from being passed over unencrypted requests.

ⓘ Note

A token-based protection against cross-site request forgery (CSRF) is active by default in SAP Gateway SAP Fiori OData services. It protects all modifying requests.

In addition, we recommend configuring HTTP session expiration with a reasonable timeout. To configure this, you use the profile parameter `http/security_session_timeout`.

Logout from Multiple Systems

SAP Fiori apps only support logout with the ABAP front-end server. If additional Gateway systems are deployed, the corresponding HTTP sessions are not closed when the user logs out. In this case, it is important to have session expiration configured.

More Information

For more information about activating HTTP security session management, go to https://help.sap.com/s4hana_op_1909, enter *Activating HTTP Security Session Management on AS ABAP* into the search bar, press Enter, and open the search result with that title.

For more information about session security protection for Gateway, go to https://help.sap.com/s4hana_op_1909, enter *SAP Gateway Foundation Security Guide* into the search bar, press Enter, open the search result with that title and navigate to the section *Session Security Protection*.

3.6.2.1.2 Configuring the AS ABAP to Support SSL

All communication between the client, SAP Web Dispatcher, and the ABAP servers is handled by using HTTPS connections. To secure these HTTPS connections, you must configure all ABAP servers to support the Secure Sockets Layer (SSL) protocol.

For more information about the steps that are required to enable SSL on the ABAP servers, go to https://help.sap.com/s4hana_op_1909, enter *Configuring AS ABAP to Support SSL* into the search bar, press Enter, and open the search result with that title.

> ⓘ Note
>
> For secure communication between SAP Web Dispatcher and the ABAP servers, SSL must also be enabled for SAP Web Dispatcher. For more information about setting up SSL for SAP Web Dispatcher, see Configuring Communication Channel between Clients and SAP Web Dispatcher [page 32].

3.6.2.1.3 Connect Gateway to Back-End System (Trusted RFC)

Use

In the back-end system, you must create an RFC destination to the Gateway system on your front-end server and define the trust relationship between the back-end system (to be the trusting system) and the Gateway system (to be the trusted system).

> ⓘ Note
>
> You can perform setup tasks for SAP Fiori by using task lists that SAP delivers. A task list groups configuration tasks logically and guides you through the necessary tasks.
>
> For an overview of all task lists and tasks for SAP Fiori, go to https://help.sap.com/s4hana_op_1909, enter *Configuration Using Task Lists* into the search bar, press Enter, and open the search result with that title.

The following task list applies for this step:

- `SAP_SAP2GATEWAY_TRUSTED_CONFIG`

For more information about how to maintain the trust relationship, go to https://help.sap.com/s4hana_op_1909, enter *Defining Trust for SAP Systems* into the search bar, press `Enter`, and open the search result with that title.

> **Note**
>
> Ensure that the RFC connection is securely configured.
>
> For information about the required security settings, go to https://help.sap.com/s4hana_op_1909, enter *RFC Communication Between SAP Systems* into the search bar, press `Enter`, open the search result with that title and navigate to the section *Network Security and Communication*.

3.6.2.1.4 Managing RFC Destinations

Use

You define remote function call (RFC) destinations from the ABAP front-end server to the ABAP back-end system(s). Additionally, define an RFC destination that has the front-end server itself as target for local RFC calls.

Prerequisites

You have created the trusted relationship because the back-end servers must already trust the front-end server. For more information, see Connect Gateway to Back-End System (Trusted RFC).

Procedure

1. In Customizing for SAP NetWeaver, choose *UI Technologies* > *SAP Fiori* > *Initial Setup* > *Connection Settings (Front-End Server to ABAP Back-End Server)* > *Manage RFC Destinations*.
2. Define the required RFC destinations.

For more information about the settings, go to https://help.sap.com/s4hana_op_1909, enter *Creating an RFC Destination for SAP Gateway Hub to SAP System* into the search bar, press `Enter` and open the search result with that title.

3.6.2.1.5 Activating Gateway

Use

Before you can use Gateway functionality, you have to activate it globally in your system. You can activate and deactivate Gateway. When you deactivate it, all Gateway services stop running, no consumer servers can communicate with it, and an error message is sent to any system that calls for the services.

> **Note**
>
> You can perform setup tasks for SAP Fiori by using task lists that SAP delivers. A task list groups configuration tasks logically and guides you through the necessary tasks.
>
> For an overview of all task lists and tasks for SAP Fiori, go to https://help.sap.com/s4hana_op_1909, enter *Configuration Using Task Lists* into the search bar, press `Enter`, and open the search result with that title.

You can use the following task list to perform this step:

- `SAP_GATEWAY_BASIC_CONFIG`

Prerequisites

Ensure that you have installed and configured the consumer server.

You have completed the installation and post-installation configuration for Gateway. For more information, see Connect Gateway to Back-End System (Trusted RFC) and Managing RFC Destinations.

Procedure

1. In Customizing for SAP NetWeaver, choose *UI Technologies* > *SAP Fiori* > *Initial Setup* > *Connection Settings (Front-End Server to ABAP Back-End Server)* > *Activate SAP Gateway*.
   A message displays.
2. Choose *Activate*.
   A message displays informing you of the current status.

3.6.2.1.6 Creating System Alias for Applications

Use

An SAP system alias is needed as the logical name of a system connection, that is, you specify where the SAP system alias should point to. Depending on the Gateway content scenario and your system landscape you thus set up the system alias. The system alias is the result of the routing for an inbound request on Gateway. It can

be a remote or a local system. If that system alias is flagged as a *Local GW* (Local Gateway) instance, it means that the system that is responsible for processing (managing and storing) the data of an inbound request is the local Gateway instance itself.

For the SAP Fiori system landscape, you need one system alias pointing to the front-end server with the indicator *Local GW* selected. For each back-end system that you want to use, you need at least one system alias with the software version *Default*. If you use approvals in a back-end system, you need an additional system alias for task processing within the workflows used in this back-end system.

> **Note**
>
> You can perform setup tasks for SAP Fiori by using task lists that SAP delivers. A task list groups configuration tasks logically and guides you through the necessary tasks.
>
> For an overview of all task lists and tasks for SAP Fiori, go to https://help.sap.com/s4hana_op_1909, enter *Configuration Using Task Lists* into the search bar, press `Enter`, and open the search result with that title.

The following task lists apply to this step:

- `SAP_GATEWAY_ADD_SYSTEM`
- `SAP_GATEWAY_ADD_SYSTEM_ALIAS`

Prerequisites

You have defined remote function call (RFC) destinations from the ABAP front-end server to all back-end servers. For more information, see Managing RFC Destinations [page 50].

Procedure

1. In Customizing for SAP NetWeaver, choose *UI Technologies* > *SAP Fiori* > *Initial Setup* > *Connection Settings (Front-End Server to ABAP Back-End Server)* > *Define SAP System Alias*.
2. Choose *New Entries*.
3. Create the following SAP system aliases:
   - For the front-end server: One SAP system alias with the *Local GW* indicator selected.
   - For each back-end system: One SAP system alias with the corresponding RFC destination assigned and the software version *Default*.
   - For each back-end system for which you use approval apps: One additional SAP system alias for task processing with the following parameters:
     - *Local GW*: Not selected
     - *For Local App*: Selected
     - *Software Version*: Select the relevant data provider, such as `/IWPGW/BWF`.

   For more information about further settings, go to https://help.sap.com/s4hana_op_1909, enter *Creating an SAP System Alias* into the search bar, press `Enter`, and open the search result with that title.

4. For proper functioning of remote SAP GUI and Web Dynpro ABAP applications integrated into SAP Fiori launchpad, you need to repeat the configuration of system aliases for remote systems in the launchpad configuration tables as well. For each connected back-end system, perform the following:
   - Establish connections between front-end server and back-end systems (you can reuse RFC destination of connection type 3 created for SAP Gateway).
   - Register the back-end server location as safe host in the HTTP_WHITELIST table.
     For more information, go to https://help.sap.com/s4hana_op_1909, enter *Using a Whitelist for Clickjacking Framing Protection* into the search bar, press `Enter`, and open the search result with that title.
   - Map the connections to system aliases.

For more information, go to https://help.sap.com/s4hana_op_1909, enter *Integrating Remote Content* into the search bar, press `Enter`, and open the search result with that title.

3.6.2.2 SAP Web Dispatcher: Setup of Communication

We recommend using the latest SAP Web Dispatcher version. For more information, see SAP Note 908097.

Activities

To set up the connection between the **client** and **SAP Web Dispatcher**, you must make the following settings:

- Configure SAP Web Dispatcher to support SSL.
- Configure the SAP Web Dispatcher server port.

To set up the connections between **SAP Web Dispatcher** and the **ABAP servers**, you must make the following settings:

- Define routing rules for SAP Web Dispatcher.
- If you use X.509 client certificates for authentication at the ABAP servers, configure a trust relationship between SAP Web Dispatcher and the ICM of the ABAP servers.

> → Recommendation
>
> To ensure confidentiality and integrity of data, we recommend protecting HTTP connections by using Transport Layer Security (TLS) or Secure Sockets Layer (SSL).
>
> For information about setting up communication encryption, go to https://help.sap.com/s4hana_op_1909, enter *ABAP Platform Security Guide* into the search bar, press `Enter`, open the search result with that title, and navigate to *Network and Communication Security* > *Transport Layer Security*.

3.6.2.2.1 Configuring Communication Channel between Clients and SAP Web Dispatcher

Use

To facilitate communication between the browser and the different systems in the SAP Fiori system landscape, you use SAP Web Dispatcher as a reverse proxy to ensure queries from the browser are correctly directed to the appropriate system.

As SAP Fiori apps access multiple back-end systems but JavaScript code is constrained by the Same Origin Policy, all systems are exposed to the browser through the reverse proxy, which brings them into a common origin (combination of protocol, host name, and port).

> ⓘ Note
>
> You can configure SAP Web Dispatcher to be able to handle a high load of incoming requests.
>
> For more information, go to https://help.sap.com/s4hana_op_1909, enter *Configuring SAP Web Dispatcher for High System Load Due to Inbound Requests* into the search bar, press `Enter`, and open the search result with that title.

Prerequisites

You have implemented SAP Web Dispatcher.

Procedure

Configure SAP Web Dispatcher to Support SSL

All communication to back-end systems should be handled using HTTPS requests and SAP Web Dispatcher itself should be called using only HTTPS.

1. Open the Web Dispatcher profile.
2. To configure HTTPS settings, you can copy the following source code and adapt it to your business requirements:

```
ssl/ssl_lib = <sapcrypto dll>
ssl/server_pse = <pse>
icm/HTTPS/verify_client = 0
ssl/client_pse = <pse>
wdisp/ssl_encrypt = 1
wdisp/ssl_auth = 2
wdisp/ssl_cred = <pse>
icm/HTTPS/forward_ccert_as_header = true
```

   For more information about the parameters, go to https://help.sap.com/s4hana_op_1909, enter *Configure SAP Web Dispatcher to Support SSL* into the search bar, press `Enter`, and open the search result with that title.

Configure SAP Web Dispatcher Server Port

In order to satisfy the requirement of the Same Origin Policy, all systems in an SAP Fiori app landscape have to be served by a single Web server access point. Therefore, you configure a single `icm/server_port` in SAP Web Dispatcher to serve all back-end systems of an SAP Fiori scenario.

1. Open the Web Dispatcher profile.
2. To configure the ports, you can copy the following source code and adapt it to your business requirements:

```
icm/server_port_0 = PROT=HTTPS,PORT=443,TIMEOUT=120
```

   Additional parameters needed by SAP Fiori for correct request routing:

```
wdisp/system_conflict_resolution = FIRST_MATCH
wdisp/handle_webdisp_ap_header = SET
wdisp/add_xforwardedfor_header = true
```

For more information about the parameters, go to https://help.sap.com/s4hana_op_1909, enter *Configuration of the Web Dispatcher Server Port* into the search bar, press `Enter`, and open the search result with that title.

3.6.2.2.2 Defining Routing Rules for SAP Web Dispatcher and ABAP Front End

Use

For object pages, a connection is established between the ABAP front-end server (Gateway) and SAP Web Dispatcher. You define the routing rules to the required target system to ensure that requests are directed to the correct server.

For the connection between ABAP front-end server and SAP Web Dispatcher, you need the following routing rules:

URL Prefix	Target System
`/sap/bc`	Gateway
`/sap/public`	Gateway
`/sap/opu`	Gateway

Prerequisites

For more information about the prerequisites, see Configuring Communication Channel between Clients and SAP Web Dispatcher.

Procedure

→ Recommendation

SAP recommends that only those requests corresponding to the services required for the applications that you want to use should be routed to the application servers.

1. Open the Web Dispatcher profile.
2. Configure SAP Web Dispatcher for the Gateway server.
   To configure the SAP Web Dispatcher for the Gateway server, you can copy the following source code and adapt it to your business requirements.

```
wdisp/system_0 = SID=<SID of the Gateway system>, MSHOST=<host name of
Gateway system's message server>, MSPORT=<HTTP port of the Gateway system's
message server>, SRCSRV=*:443, SRCURL=/sap/opu;/sap/bc;/sap/public
```

Note

The `SRCSRV` and the `CLIENT` parameter are optional. For more information about the parameters, go to https://help.sap.com/s4hana_op_1909, enter *wdisp/system_<xx>* into the search bar, press `Enter`, and open the search result with that title.

If you configure multiple `wdisp/system_xx` parameters, make sure you use different indexes.

3.6.2.2.3 Defining Routing Rules for SAP Web Dispatcher and ABAP Back End

Use

For object pages, a connection is established between the ABAP back-end server and SAP Web Dispatcher. You define the routing rules to the required target system to ensure that requests are directed to the correct server.

For the connection between ABAP back-end server and SAP Web Dispatcher, you need the following routing rules:

URL Prefix	Target System
`/sap/es/ina`	Back-end server where Enterprise Search is installed

Prerequisites

For more information about the prerequisites, see Configuring Communication Channel between Clients and SAP Web Dispatcher.

Procedure

→ Recommendation

SAP recommends that only those requests corresponding to the services required for the applications that you want to use should be routed to the application servers.

ⓘ Note

The backend systems provide the following two different types of service:

- Classic applications (Web Dynpro ABAP, SAP GUI for HTML) started by the SAP Fiori launchpad but running in the backend system
  Classic applications run inside an iFrame. They have to be configured on a **separate** virtual host. One virtual host has to be used for each backend system.
  A virtual host is the combination of hostname and port number in the URL. The following are three different virtual hosts:
  `https://erp.acme.com:443`
  `https://erp.acme.com:44301/`
  `https://scm.acme.com:443`
- Services used inside the SAP Fiori launchpad page retrieving data from the backend system, such as Enterprise Search (https://<fes virtual host>/sap/es/ina)
  They are consumed with XMLHttpRequest using JavaScript and have to be configured in the same virtual host as the frontend server.

1. Open the Web Dispatcher profile.
2. Configure SAP Web Dispatcher for the back-end server where the Enterprise Search is installed. To configure the SAP Web Dispatcher for the back-end server where the Enterprise Search is installed, you can copy the following source code and adapt it to your business requirements:

```
wdisp/system_1 = SID=<SID of the back-end server>, MSHOST=<host name of back-end server system's message server>, MSPORT=<HTTP port of the back-end server system's message server>, SRCSRV=*:443, SRCURL=/sap/es/, CLIENT=200
```

ⓘ Note

The `SRCSRV` is optional. For more information about the `CLIENT` parameter, see SAP Note 1963456.

For more information about the parameters, go to https://help.sap.com/s4hana_op_1909, enter *wdisp/system_<xx>* into the search bar, press `Enter`, and open the search result with that title.

If you configure multiple `wdisp/system_xx` parameters, make sure you use different indexes.

3.6.2.2.4 Configuring Trust Between SAP Web Dispatcher and ABAP Servers

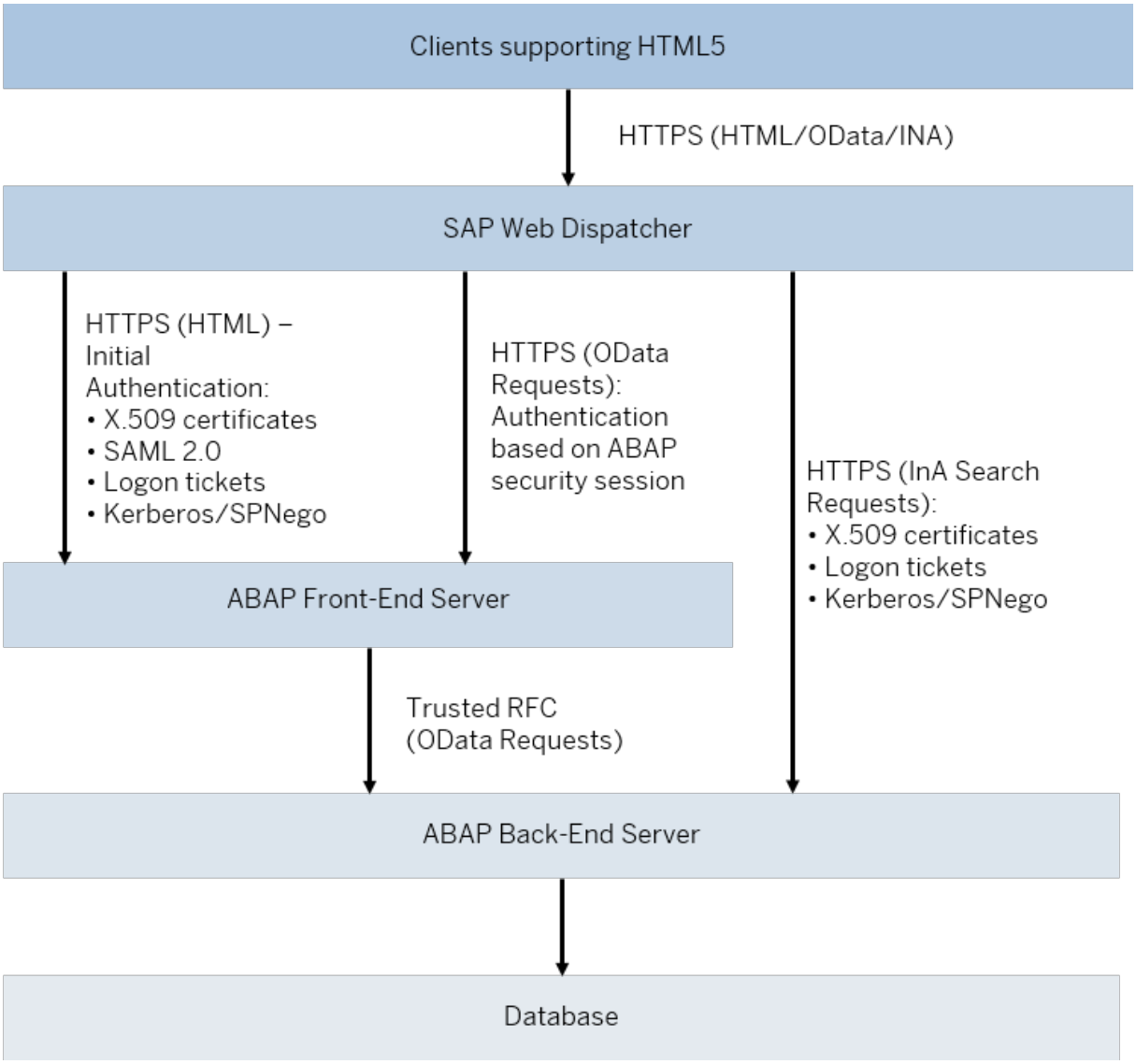
For initial authentication at the ABAP front-end server and authentication for search requests at the ABAP back-end server (object pages), you can use different authentication methods, including X.509 certificates. If

you want to use X.509 certificates, you must set up a trusted relationship between SAP Web Dispatcher and the Internet Communication Manager (ICM) of the relevant ABAP servers.

For more information about the steps that are required to configure the trusted relationship, go to https://help.sap.com/s4hana_op_1909, enter *Configuring SAP Web Dispatcher and ABAP Servers for X.509-Based Logon (Optional)* into the search bar, press Enter, and open the search result with that title.

3.6.2.3 User Authentication and Single Sign-On (SSO)

Use



System Landscape: User Authentication and Single Sign-On

Overview

The authentication concept for SAP Fiori apps comprises initial user authentication on the ABAP front-end server, followed by authentication of all requests to back-end systems.

Initial Authentication

When a user launches an SAP Fiori app, the launch request is sent from the client to the ABAP front-end server by the SAP Fiori launchpad. During launch, the ABAP front-end server authenticates the user by using one of the supported authentication and single sign-on (SSO) mechanisms. We recommend setting up SSO, thereby enabling users to start SAP Fiori apps using their single, existing credentials. As a fallback option, initial authentication can be based on the users' passwords on the ABAP front-end server. SAP provides a dedicated logon handler for form-based logon. After initial authentication on the ABAP front-end server, a security session is established between the client and the ABAP front-end server.

Authentication for Requests in the Back-End Systems

After initial authentication on the ABAP front-end server, the SAP Fiori apps and the SAP Fiori launchpad can send requests to the ABAP back-end server. For these requests to back-end servers, additional configuration of SSO mechanisms for authentication may be required.

Requests to the ABAP back-end server

Apps send OData requests through the ABAP front-end server towards the ABAP back-end server. After initial authentication, a security session is established between the client and the ABAP front-end server. OData requests towards the ABAP back-end server are then communicated securely by trusted RFC.

For search in SAP Fiori launchpad, applications send InA search requests from the client to the SAP HANA database. These requests can be authenticated with Kerberos/SPNego, X.509 certificates, or logon tickets. You can configure the ABAP front-end server to issue logon tickets after initial authentication, or you can use your existing portal to do so.

3.6.2.3.1 Setting Up SSO for SAP Fiori and SAP S/4HANA

Use

For SAP Fiori landscapes with SAP S/4HANA, you must configure an single sign-on (SSO) mechanism for initial authentication on the ABAP front-end server. After initial authentication, any requests to back-end ABAP systems are communicated securely by trusted RFC.

Procedure

To set up single sign-on for a system landscape with SAP S/4HANA, proceed as follows:

1. Configure initial authentication on the ABAP front-end server.
2. Configure authentication for requests to the ABAP back-end server:
    - Configure a trusted RFC connection between the ABAP front-end server and the ABAP back-end server.

- For search in the SAP Fiori launchpad, configure authentication in the back-end server, which processes the search requests. These requests can be authenticated with Kerberos/SPNego, X.509 certificates, or logon tickets. You can configure the ABAP front-end server to issue logon tickets after initial authentication, or you can use your existing portal to do so.

> **Note**
>
> You can perform setup tasks for SAP Fiori by using task lists that SAP delivers. A task list groups configuration tasks logically and guides you through the necessary tasks.
>
> For an overview of all task lists and tasks for SAP Fiori, go to https://help.sap.com/s4hana_op_1909, enter *Configuration Using Task Lists* into the search bar, press `Enter`, and open the search result with that title.

The following task list applies for this step:

- `SAP_SAP2GATEWAY_TRUSTED_CONFIG`

More Information

- For more information about specific SSO mechanisms for authentication, see SSO Mechanisms for SAP Fiori Apps.
- For more information about how to set up a trusted RFC, go to https://help.sap.com/s4hana_op_1909, enter *RFC Scenarios* into the search bar, press `Enter`, and open the search result with that title.
- For more information about configuring SAP Fiori search, see Setup of SAP Fiori Search [page 74].

3.6.2.3.2 SSO Mechanisms for SAP Fiori Apps

The following authentication and single sign-on (SSO) mechanisms are supported for SAP Fiori apps:

- Kerberos/SPNego
- X.509 Certificates
- SAML 2.0
- Logon Tickets

3.6.2.3.2.1 Kerberos/SPNego

Use

If you access SAP Fiori apps from within your corporate network, you can enable Kerberos/SPNego authentication for the ABAP front-end server. This authentication is especially recommended, if you already have a Kerberos/SPNego infrastructure in place, for example, if you use *Microsoft Active Directory*.

Kerberos/SPNego authentication provides the following advantages:

- It simplifies the logon process by reusing credentials that have already been provided, for example, during logon to the Microsoft Windows workstation. A separate logon to the ABAP front-end server is not required.
- It is also supported for logon to the SAP GUI. Using Kerberos for both SAP GUI and HTTP access simplifies the Single Sign-On setup within your system landscape.
- It is supported by a growing number of mobile device vendors.

During logon, Kerberos/SPNego authentication requires access to an issuing system (for example, *Microsoft Active Directory*). As this system is typically located within the corporate network, Kerberos/SPNego **cannot** be used for most internet-facing deployment scenarios. To enable Single Sign-On with Kerberos/SPNego authentication from outside your corporate network, you might have to set up a VPN connection.

Kerberos/SPNego is available with the SAP Single Sign-On product, which also provides additional authentication mechanisms, such as X.509 certificates or an SAML Identity Provider.

For an overview of SAP Single Sign-On, see http://www.sap.com/pc/tech/security/software/single-sign-on/index.html.

Configuration

For more information about the configuration that is required for Kerberos/SPNego, see the Secure Login for SAP Single Sign-On Implementation Guide on SAP Help Portal at http://help.sap.com/sapsso.

3.6.2.3.2.2 X.509 Certificates

Use

If you have implemented a public-key infrastructure (PKI) for user authentication in your organization, you can use X.509 certificates by configuring the required back-end systems (ABAP or SAP HANA) to accept X.509 certificates.

Authentication with X.509 certificates provides the following advantages:

- It does not require an issuing system during logon, which means that it works well in internet-facing scenarios.
- It is also supported for logon to the SAP GUI. Using X.509 certificates for both SAP GUI and HTTP access simplifies the Single Sign-On setup within your system landscape.

X.509 certificates must be distributed to the workstations and devices that are used to access SAP Fiori apps. For mobile devices, this distribution can be performed centrally by a mobile device management software, for example SAP Afaria.

> → Recommendation
>
> As X.509 certificates remain valid for a relatively long time, we recommend that you minimize the security risk by implementing a method to revoke the certificates, for example if a mobile device is lost.

Configuration

For information about the configuration that is required for X.509 certificates, go to https://help.sap.com/s4hana_op_1909, enter *Configuring the AS ABAP to Use X.509 Client Certificates* into the search bar, press Enter, and open the search result with that title.

3.6.2.3.2.3 SAML 2.0

Use

If you have implemented the security assertion markup language (SAML) version 2.0 as the method of single sign-on (SSO) within your organization, you can configure the ABAP front-end server for use with SAML 2.0.

This authentication method provides the following advantages:

- It includes extensive federation capabilities, which means that it works well in scenarios with federated user domains, where trust configuration can be complicated.
- It includes extensive user mapping capabilities that enable you to map SAP users based on identity attributes, such as the SAP user name attribute or a user's e-mail address. This means that SAML 2.0 works well for scenarios with multiple user domains.

During logon, SAML 2.0 authentication requires access to an issuing system (Identity Provider). To enable single sign-on with SAML 2.0 in internet-facing deployment scenarios that leverage its federation capabilities, you must ensure that the SAML Identity Provider is securely accessible from outside your corporate network.

> ⓘ Note
>
> In the SAP Fiori system landscape, SAML 2.0 is supported only for communication with the ABAP front-end server.

Configuration

For information about the configuration that is required for using SAML 2.0, go to https://help.sap.com/s4hana_op_1909, enter *Configuring AS ABAP as a Service Provider* into the search bar, press Enter, and open the search result with that title.

3.6.2.3.2.4 Logon Tickets

Use

For logon tickets, you must configure the ABAP front-end server to issue logon tickets. Alternatively, you can use an existing system, such as a portal, in your landscape that already issues logon tickets. In addition, you

must configure the required back-end systems (ABAP or SAP HANA) to accept logon tickets. You must also ensure that users in the ABAP system have the same user names as the database users in SAP HANA; user mapping is not supported.

As logon tickets are transferred as browser cookies, you can only use this authentication mechanism if all systems in your system landscape are located within the same DNS domain.

> → Recommendation
>
> The new standardized authentication methods Kerberos/SPNego, X.509 certificates, and SAML 2.0 provide additional security and flexibility features compared to proprietary logon tickets. For example, you can define user mappings and shorten token validity periods or session lifetimes on the server. Therefore, we recommend using Kerberos/SPNego, X.509 certificates, or SAML 2.0 where technically possible.

> ⓘ Note
>
> You can perform setup tasks for SAP Fiori by using task lists that SAP delivers. A task list groups configuration tasks logically and guides you through the necessary tasks.
>
> For an overview of all task lists and tasks for SAP Fiori, go to https://help.sap.com/s4hana_op_1909, enter *Configuration Using Task Lists* into the search bar, press `Enter`, and open the search result with that title.

The following task list includes a task for importing the system certificate from a remote system and adding the remote system to the Access Control List (ACL) according to transaction STRUSTSSO2:

- `SAP_SAP2GATEWAY_TRUSTED_CONFIG`

Configuration

For information about the configuration that is required for using logon tickets, go to https://help.sap.com/s4hana_op_1909, enter *Configuring AS ABAP to Accept Logon Tickets* into the search bar, press `Enter`, and open the search result with that title.

4 Configuration of SAP Fiori Infrastructure

In this section, you set up the central SAP Fiori infrastructure before installing individual apps in your SAP Fiori system landscape.

4.1 Setup of SAP Fiori Launchpad

> ⓘ Note
>
> This section is only relevant for the hub deployment scenario.

Use

The SAP Fiori launchpad is the entry point to the apps, from desktop and mobile devices. You need to configure the SAP Fiori launchpad so that users can access those apps that have been assigned to their respective role.

For information about the configuration tasks for the SAP Fiori launchpad, go to https://help.sap.com/s4hana_op_1909, enter *Initial Setup of the Launchpad* into the search bar, press `Enter`, open the search result with that title and navigate to *Activating SAP Gateway OData Services* and *Configuring ICF Nodes*.

> ⓘ Note
>
> You can perform setup tasks for SAP Fiori by using task lists that SAP delivers. A task list groups configuration tasks logically and guides you through the necessary tasks.
>
> For an overview of all task lists and tasks for SAP Fiori, see Configuration Using Task Lists [page 42].

The following task list applies to this step:

- `SAP_FIORI_LAUNCHPAD_INIT_SETUP`

4.2 Configuration of the SAP Fiori Launchpad

SAP offers several options to adapt the SAP Fiori launchpad to your needs, allowing you to make use of additional features and change the visual appearance of the launchpad.

We recommend evaluating the available options and configuring or activating those that fit to your needs. For an overview of the available options, go to https://help.sap.com/s4hana_op_1909, enter *SAP Fiori Launchpad*

into the search bar, press Enter, open the search result with that title, and navigate to *Administration Guide* > *Configuring the Launchpad*.

We especially recommend activating the following features:

1. Notifications in the Launchpad
   For details, go to https://help.sap.com/s4hana_op_1909, enter *Enabling Notifications in the Launchpad* into the search bar, press Enter, and open the search result with that title.
2. In-Place Navigation for Classic UIs
   For details, go to https://help.sap.com/s4hana_op_1909, enter *Configuring In-Place Navigation for Classic UIs* into the search bar, press Enter, and open the search result with that title.
3. Improved performance for launching SAP GUI for HTML apps
   For details, go to https://help.sap.com/s4hana_op_1909, enter *Improving Navigation Performance for SAP GUI Applications* into the search bar, press Enter, and open the search result with that title.

> **Note**
>
> The following product versions are required for the features **In-Place Navigation for Classic UIs** and **Improved performance for launching SAP GUI for HTML apps**:
>
> - On the front-end server: SAPUI5 Version 1.56.x (which is contained in SAP Fiori Front-End Server 5.0)
> - On the back-end: SAP Kernel 773 (which is part of the software stack of SAP S/4HANA 1809)
>
> Note that in case of a mixed backend scenario in which other backend products with a lower kernel version are connected to your front-end server, the features are not supported.

4.3 User Assistance Settings

The following sections describe how to enable context-sensitive user assistance and back-end help links for SAP S/4HANA.

Once you have correctly configured the help settings and SAP Web Dispatcher, the context-sensitive user assistance will be available on the SAP Fiori launchpad and back-end help links to the product assistance will work.

To test whether you have correctly configured the context-sensitive user assistance, choose the question mark icon on the SAP Fiori launchpad homepage.

If content is displayed, everything is correctly configured and all available content, such as static help or guided tours, will be visible in all apps.

4.3.1 Enable Context-Sensitive User Assistance and Back-End Help Links

To make context-sensitive user assistance available in the SAP Fiori launchpad and to enable back-end help links, proceed as follows:

SAP S/4HANA 1909 FPS02 and higher

1. Run transaction `HELP_CONFIG` (*Configure Help Settings*).
2. Select *Embedded Deployment* or *Hub Deployment*.
   Depending on what you select, the sections *General Settings*, *Front-End Settings*, and *Back-End Settings* are displayed with prefilled fields.

   > **Note**
   >
   > In the hub deployment scenario, it's currently not possible to configure the front-end settings using transaction `HELP_CONFIG`. To configure the front-end settings in the hub deployment, you must configure the help plugin in transaction `/UI2/FLP_CUS_CONF` in the relevant front-end systems, see Set Up the User Assistance Plugin in the Front-End System (Hub Deployment) [page 72].

3. Modify the values if required.
   We recommend filling the *Version* field with the "latest" version for the relevant release (for example `1909.latest`).

   > **Note**
   >
   > If you wish to link to user assistance for a **specific** release (for example to the version for SAP S/4HANA 1909 FPS02), please see SAP Note 2874229. We recommend, however, to link to the latest version as this ensures that you receive the most up-to-date documentation.

4. Execute the report.

Result

Depending on your deployment scenario, the settings in transactions `/UI2/FLP_CUS_CONF` (for the context-sensitive user assistance) and/or `SR13` (for the back-end help links) are configured with the values maintained in the report.

Technical Details

The following additional settings are maintained by default in transaction `/UI2/FLP_CUS_CONF` when executing the report:

FLP Configuration

FLP Property ID	Property Value	Description
ENABLE_HELP	true	This setting is a prerequisite for the context-sensitive help to work with the SAP Fiori launchpad.

WEB_ASSISTANT_HELP_PLUGIN

FLP Property ID	Property Value	Description
BUTTON_LOCATION	head	The help button is displayed in the SAP Fiori launchpad header.
NO_HELP_MODE	carousel	The help button and panel are always displayed, even if no content is available.
USE_GLOBAL_HELP	true	In SAP GUI for HTML and WebDynpro apps, instructions about how to access help content are displayed.

SAP S/4HANA 1909 FPS01 and lower

Context-Sensitive User Assistance (Front-End System)(

1. In the front-end system, execute transaction */UI2/FLP_CUS_CONF*.
2. Under *FLP Configuration*, click on *Change → Display* and then on *New Entries*.
3. In the field *FLP Property ID*, select or enter `ENABLE_HELP`.
4. Enter the property value `true`.
5. Click on *Save*.
6. Double-click on *FLP Plugins*.
7. Click on *Change → Display* and then on *New Entries*.
8. In the field *FLP Plugin ID*, select or enter `WEB_ASSISTANT_HELP_PLUGIN` and in the field *Activity State*, choose *Active*.
9. Highlight the entry `WEB_ASSISTANT_HELP_PLUGIN` and double-click on *Configuration*.
10. Click on *New Entries*.
11. Enter the following values:

FLP Property ID	Property Value
DATA_URL_UACP	`https://help.sap.com/webassistant`

FLP Property ID	Property Value
EDITOR	false
LA_COMMUNITY_URL	`https://community.sap.com/`
LEARNING_APP_BACKEND_URL	`https://education.hana.ondemand.com/education/`
LEARNING_APP_WORKSPACE	s4
NO_HELP_MODE	carousel
PRODUCT	SAP_S4HANA_ON-PREMISE
SHOW_WHATS_NEW	no
USE_GLOBAL_HELP	true
VERSION	1909.latest

12. Click on *Save*.

Back-End Help Links (Back-End System)

You need to do these settings in the back-end system which you use to create your system configuration setting. After you have done the settings, you save them, create a transport for them and transport them to your productive system(s).

Proceed as follows:

1. Open transaction `SR13`.
2. Select the tab *PlainHtmlHttp*.
3. Choose *New Entries*.
   You have to create new entries for both documentation and XML documentation areas. To create entries for the **documentation** area, enter the following values:

Name	Value to be entered
Variant	Enter a name for the variant (any name).
Platform	Select the platform relevant for your implementation, for example, `WN32`.
Area	Select `Documentation`. This will display as `IWBHELP` in the table.
Server Names	**`https://help.sap.com/http.svc/ahp2`**
Path	**`SAP_S4HANA_ON-PREMISE/1909.latest`**

Name	Value to be entered
Language	Select the language you need.

To create entries for the **XML documentation** area, enter the following values:

Name	Value to be entered
Variant	Enter a name for the variant (any name).
Platform	Select the platform relevant for your implementation, for example, `WN32`.
Area	Select `XML Documentation`. This will display as `XML_DOCU` in the table.
Server Names	**`https://help.sap.com/http.svc/ahp2`**
Path	**`SAP_S4HANA_ON-PREMISE/1909.latest`**
Language	Select the language you need.

> **Note**
>
> The table above describes how to set up context-sensitive user assistance to link to the **latest** published user assistance of the release. If you wish to link to user assistance for a **specific** release (for example to the version for SAP S/4HANA 1909 FPS02), please see SAP Note 2874229. We recommend, however, to link to the latest version as this ensures that you receive the most up-to-date documentation.

4. Repeat step 3 for each relevant platform and language.
5. Select **one** entry as default per platform.
6. Save your changes and create a transport.

Enable Product-Specific User Assistance

After you have done the settings in transaction `sr13` described above, you need to enable the product-specific User Assistance with the program `rsiwbh04` in transaction `se38`:

1. Open transaction `se38`.
2. Enter the program name **`rsiwbh04`** in the *Program* field and open the program.
3. Under *Product-Specific SAP Library* enter the ID **`2c0e7c571fbeb576e10000000a4450e5`** in the *Structure/DITA Map ID* field.
   - Class must be `XDP_STRUCT`.
   - The radio button *Change* must be selected.
4. Run the program.

4.3.1.1 Configure the SAP Web Dispatcher

Use

If you want to make context-sensitive user assistance available in the SAP Fiori launchpad, you must configure SAP Web Dispatcher.

Prerequisites

You have installed SAP Web Dispatcher 7.5 as the reverse proxy. For more information, go to https://help.sap.com/s4hana_op_1909, enter *Operating SAP Web Dispatcher* into the search bar, press `Enter`, open the search result with that title and navigate to the section *Installing SAP Web Dispatcher*.

Activities

1. Adjust the SAP Web Dispatcher profile file.
   In the `sapwebdisp_pf.txt` file, add the following parameters:
   - For the User Assistance Content Platform
     `wdisp/system_<number> = SID=<SID1>, EXTSRV=https://cp.hana.ondemand.com, SRCURL=/sap/dfa/help/, SRCSRV=*:*, PROXY=<your proxy>:<your proxy port>, STANDARD_COOKIE_FILTER=OFF`
   - For the script server in your production system
     `wdisp/system_<number> = SID=<SID2>, EXTSRV=https://xray.hana.ondemand.com, SRCURL=/resources/sap/dfa/help/, SRCSRV=*:*, PROXY=<your proxy>:<your proxy port>, STANDARD_COOKIE_FILTER=OFF`

   > **Note**
   > - Make sure that the numbers following `wdisp/system_` are smaller than the numbers that you use for all your application server. The rules for the context-sensitive user assistance need to come before the rules for the application servers.
   > - Make sure that the SIDs are not the same as your system IDs.

2. Activate the usage of the modification handler:
   `icm/HTTP/mod_0 = PREFIX=/, FILE=$(DIR_PROFILE)/redirect.txt`
   For more information, go to https://help.sap.com/s4hana_op_1909, enter *SAP Web Dispatcher Parameter References* into the search bar, press `Enter`, open the search result with that title and navigate to the section *icm/HTTP/mod_<xx>*.
3. Adjust the SAP Web Dispatcher redirect file.
   In the `redirect.txt` file, add the following parameters:

```
# User Assistance Content Platform - rewrite rule
if %{SID} = <SID1>
begin
SetHeader HOST cp.hana.ondemand.com
```

```
RegRewriteRawUrl  ^/sap/dfa/help/(.*) /dps/$1
end
# Script Server - rewrite rule
if %{SID} = <SID2>
begin
SetHeader HOST xray.hana.ondemand.com
RegRewriteRawUrl  ^/resources/sap/dfa/help/(.*) /xRayControls/
resources/sap/dfa/help/$1
end
```

> **Note**
>
> Make sure that the SIDs in the `redirect.txt` file are the same as in the `sapwebdisp_cf.txt` file.

4. You can check if the content platform is working properly through the proxy connection by accessing: `https://<your server>:<your port>/sap/dfa/help/odata.svc/?$format=json`

> **Example**
>
> If the content platform is connected correctly, you can see on your screen the following output, for example:
>
> ```
> {"d":{"EntitySets":
> ["Transport","DeliverableForReplication","Tile","Project","Deliverable","Tran
> sportHistory","TourIssue","ReplicationTourIssue","Hotspot","Product","Context
> "]}}
> ```

5. You can check if the help script server is working properly through the proxy connection by accessing: `https://<yourserver>:<yourport>/resources/sap/dfa/help/utils/adapters/fiori/Component.js`

> **Example**
>
> If the help script server is connected correctly, you can see on your screen the following output, for example:

```
{
    "description":"This configuration registers the Xray bootstrap plug-in",
    "modulePaths":{
        "sap.dfa.help":"/resources/sap/dfa/help/~201509221536~"
    },
    "bootstrapPlugins":{
        "BootstrapXrayPlugin":{

"module":"sap.dfa.help.utils.adapters.fiori.BootstrapXrayHelpPlugin"
        }
    }
}
```

Result

You can access SAP Fiori launchpad with context-sensitive user assistance.

4.3.1.2 Set Up the User Assistance Plugin in the Front-End System (Hub Deployment)

To make context-sensitive user assistance available in the SAP Fiori Launchpad, you set up the user assistance plugin in the relevant frontend systems in the following way:

1. Execute transaction */UI2/FLP_CUS_CONF*.
2. Under *FLP Configuration*, click on *Change* → *Display* and then on *New Entries*.
3. In the field *FLP Property ID*, select or enter `ENABLE_HELP`.
4. Enter the property value `true`.
5. Click on *Save*.
6. Double-click on *FLP Plugins*.
7. Click on *Change* → *Display* and then on *New Entries*.
8. In the field *FLP Plugin ID*, select or enter `WEB_ASSISTANT_HELP_PLUGIN` and in the field *Activity State*, choose *Active*.
9. Highlight the entry `WEB_ASSISTANT_HELP_PLUGIN` and double-click on *Configuration*.
10. Click on *New Entries*.
11. Enter the following values:

FLP Property ID	Property Value
DATA_URL_UACP	https://help.sap.com/webassistant
EDITOR	false
LA_COMMUNITY_URL	https://community.sap.com/
LEARNING_APP_BACKEND_URL	https://education.hana.ondemand.com/education/
LEARNING_APP_WORKSPACE	s4
NO_HELP_MODE	carousel
PRODUCT	SAP_S4HANA_ON-PREMISE
USE_GLOBAL_HELP	true
VERSION	1909.latest

> **Note**
>
> The table above describes how to set up context-sensitive user assistance to link to the **latest** published user assistance of the release. If you wish to link to user assistance for a **specific** release (for example to the version for SAP S/4HANA 1909 FPS01), please see SAP Note 2874229. We recommend, however, to link to the latest version as this ensures that you receive the most up-to-date documentation.

12. Click on *Save*.

After you have made these settings, the user assistance icon is available for the SAP Fiori launchpad.

For more information, go to https://help.sap.com/s4hana_op_1909, enter *Setting Parameters in SAP Fiori Customizing* into the search bar, press Enter, and open the search result with that title.

4.4 SAP CoPilot

SAP CoPilot enables a humanized user experience for your SAP applications and is an optional addition to your SAP S/4HANA system. It is a digital assistant that allows you to accomplish tasks without having to navigate away from the context of your screen. You can add and create objects and notes on-the-go through conversation in the app. You can use SAP CoPilot on your phone, desktop, or through an external channel.

To use SAP CoPilot skills and the digital assistant capabilities for SAP S/4HANA, a separate purchase may be required.

For more information about SAP CoPilot, see https://help.sap.com/viewer/p/SAP_COPILOT.

4.5 SAP Fiori Search

Use

SAP Fiori search enables users to search for business objects across the SAP S/4HANA system and to search for apps in the SAP Fiori Launchpad.

It uses the *SAP Enterprise Search on HANA*. With SAP HANA as a basis, the search directly accesses transactional database tables.

SAP HANA-enabled search models are available for important business objects. They have a simple, table-based structure, which enables a high performance in the determination of search results.

You can call up object pages from the results of the SAP Fiori search to display details about the objects found and to navigate to their related object, to transactional apps. You can also access back-end transactions through object pages (from desktop devices only).

More Information

Setup of SAP Fiori Search [page 74]

4.5.1 Setup of SAP Fiori Search

Use

You can use the SAP Fiori Search to find apps and central business objects. The search for business objects is enabled through corresponding search models.

SAP Fiori Search and Object Pages

The object page app does not require search models to work. However, if you want to start the app from search, you must activate the underlying search connectors.

> ⓘ Note
>
> The setup of SAP Fiori search is a prerequisite for the use of object pages.

SAP Fiori object pages for business objects provide information on top of what is displayed in the search results. Furthermore, they enable you to navigate to object pages of related business objects and to transactional apps, or to access back-end transactions, and you can drill down into a business object's details.

> ⓘ Note
>
> You can perform setup tasks for SAP Fiori by using task lists that SAP delivers. A task list groups configuration tasks logically and guides you through the necessary tasks.
>
> For an overview of all task lists and tasks for SAP Fiori, go to https://help.sap.com/s4hana_op_1909, enter *Configuration Using Task Lists* into the search bar, press `Enter`, and open the search result with that title.

The following task lists apply for this step:

- `SAP_ESH_INITIAL_SETUP_WRK_CLIENT`

Activities

For information on how to set up SAP Fiori Search, go to https://help.sap.com/s4hana_op_1909, enter *Automated Setup of Enterprise Search* into the search bar, press `Enter`, and open the search result with that title.

More Information

Enable SAP Fiori Search for Multiple Systems [page 75]

4.5.2 Enable SAP Fiori Search for Multiple Systems

Use

> ⓘ Note
>
> This activity is optional.

In the SAP Fiori landscape, you can connect multiple ABAP back-end servers to have the installed systems browsed by SAP Fiori search. Each back-end server must run on an SAP HANA database and must have SAP Fiori search installed and configured.

One back-end server acts as a proxy to which the other back-end servers are connected.

The connected back-end servers act as clients. Their content can be browsed using the SAP Fiori search on the proxy.

Activities

To enable SAP Fiori search for multiple systems, proceed as follows:

1. Set up SAP Fiori search on each of the back-end servers. For more information, see Setup of SAP Fiori Search [page 74].
2. Connect the search systems on the different back-end servers. For more information, go to https://help.sap.com/s4hana_op_1909, enter *Optional: Establishing Connection to Back-End Systems* into the search bar, press `Enter`, and open the search result with that title.

4.6 Integrating SAP Jam (Optional)

Use

Some SAP Fiori apps contain features based on an integration with SAP Jam. SAP Jam is a collaborative environment that brings together people, information, applications, and processes to solve business-critical problems and drive rapid results.

SAP Jam is part of the ABAP social media integration (SMI), which allows you to integrate the SAP Jam social collaboration platform across SAP technologies such as SAPUI5.

You can configure ABAP SMI to allow the SAP Fiori launchpad and apps to use the ABAP SMI functions developed for SAP Fiori.

More Information

For information about integrating SAP Jam with SAP Fiori and the prerequisites, go to https://help.sap.com/s4hana_op_1909, enter *Configuring ABAP SMI for SAP Fiori Apps* into the search bar, press `Enter`, and open the search result with that title.

4.7 Extended Material Number in SAP Fiori Apps

Use

In SAP S/4HANA you can use the extended material number with a maximum length of 40 characters. As a default, the standard material number which allows a maximum length of 18 characters is activated. You can activate the extended material number in the back-end system. The SAP Fiori apps then automatically display the extended material number.

Activities

If you want to use the extended material number, you have to make the following settings:

1. Activate the extended material number in the IMG under *Cross-Application Components* > *General Application Functions* > *Field length Extension* > *Activate extended fields*
   The standard setting is that the checkbox is not selected: The system uses the short version of the material number field, for example MATNR, for all external communication.
2. Define the material number field length in the IMG under *Logistics General* > *Material Master* > *Basic Settings* > *Define Output Format of Material Number*

4.8 Running Apps in Standalone Mode

Use

Several SAP Fiori apps support standalone mode. If you implement this feature, users can directly access an app without the SAP Fiori launchpad being visible to them either by calling a URL or by launching the app in the SAP Enterprise Portal content area.

You typically use one of these options to give users direct access to selected apps that do not require contextual navigation.

More Information

Go to https://help.sap.com/s4hana_op_1909, enter *Running Standalone Applications* into the search bar, press Enter, and open the search result with that title.

4.9 Setup of SAPUI5 Application Index

Use

The SAPUI5 application index provides an indexing and caching mechanism for information related to SAPUI5 applications, components, and libraries that are contained in SAPUI5 repositories on the Application Server ABAP.

Activities

The SAPUI5 application index is used by several different services (such as SAP Fiori launchpad and cache buster), which means you have to define the execution of its calculation report /UI5/APP_INDEX_CALCULATE as a background job (transaction SM36).

More Information

For more information, go to https://help.sap.com/s4hana_op_1909, enter *SAPUI5 Application Index* into the search bar, press Enter, and open the search result with that title.

5 App Implementation

Use

This section contains the background information and the tasks that you need to perform to implement apps into the system landscape that you have set up and configured. The implementation tasks slightly differ according to the type of app that you want to use.

Prerequisites

- You have installed and configured the system landscape.
  For more information about the system landscape, see Setup of SAP Fiori System Landscape.
- You have done the initial configuration of Gateway. For more information, go to https://help.sap.com/s4hana_op_1909, enter *SAP Gateway Foundation Configuration Guide* into the search bar, press `Enter`, open the search result with that title and navigate to the section *General Configuration Settings*.
- You have set up the SAP Fiori infrastructure. For more information, see Configuration of SAP Fiori Infrastructure [page 64].

Process

> **Note**
>
> For the following implementation tasks, you need information from the **app-specific implementation documentation**, such as technical names of services, roles, and so on. Access this documentation at https://help.sap.com/s4hana_op_1909 ▶ *Product Assistance* ▶. Under each area, you can find the respective apps and app-specific implementation information.
>
> You can also find technical information about the apps in the **SAP Fiori apps reference library** at http://fioriappslibrary.hana.ondemand.com/sap/fix/externalViewer/.
>
> Some important technical information is not included in the **SAP Fiori apps reference library**. These settings are explained in *Additional Implementation Activities for All Finance Apps*. We highly recommend that you also read this document when you implement apps outside of Finance. Some of the settings are also relevant for other application areas, in particular, the activation of the **Central Simple Finance Fiori Reuse Library**. To view the document, go to https://help.sap.com/s4hana_op_1909, enter *Additional Implementation Activities for All Finance Apps* into the search bar, press `Enter` and open the search result with that title.

1. Make yourself familiar with the user management and authorization concepts for the SAP Fiori launchpad.
2. You enable the apps to retrieve data from the back-end server.

- For SAP Fiori apps, you need to activate OData services and ICF Services on the front-end server.
- For Web Dynpro apps, you need to create RFC connections to the backend on the front-end server. On the back-end server, you need to activate ICF services of Web Dynpro Apps and activate ICF services for transactions displayed in SAP GUI for HTML [page 111].

3. You need to set up users on the front-end server and back-end server.
4. You need to define what apps your users are allowed to access from the SAP Fiori launchpad on the front-end server. To do so, you do the following:
   1. You create catalogs and groups [page 100] to which you add apps.
   2. You create PFCG roles, add catalogs to these roles, and determine the authorization defaults for the apps.
   3. You assign the roles to your users.
5. On the back-end server, users need the start authorizations for the Odata service or the application and the business authorizations for accessing business data displayed in the app. You therefore need to create PFCG roles on the back-end server and assign them to your users.

> **Note**
>
> You can also perform several app implementation tasks automatically. See the task descriptions and Activate OData Services for Several SAP Fiori Apps [page 88].
>
> - Activate OData Services for Several SAP Fiori Apps

5.1 User Management and Authorization

SAP Fiori apps adopt the user management and authorization concepts provided by AS ABAP. Therefore, the security recommendations and guidelines for user and role administration and authorization as described in the Application Server ABAP Security Guide also apply to the SAP Fiori apps.

For more information, go to https://help.sap.com/s4hana_op_1909, enter *ABAP Platform Security Guide* into the search bar, press `Enter`, and open the search result with that title.

This section contains information about user and role administration and the authorization concept that specifically applies to SAP Fiori apps.

5.1.1 UI Content and Authorization Concept

SAP Fiori launchpad is the access point to apps on mobile or desktop devices. To use SAP Fiori apps, users need the following types of entities:

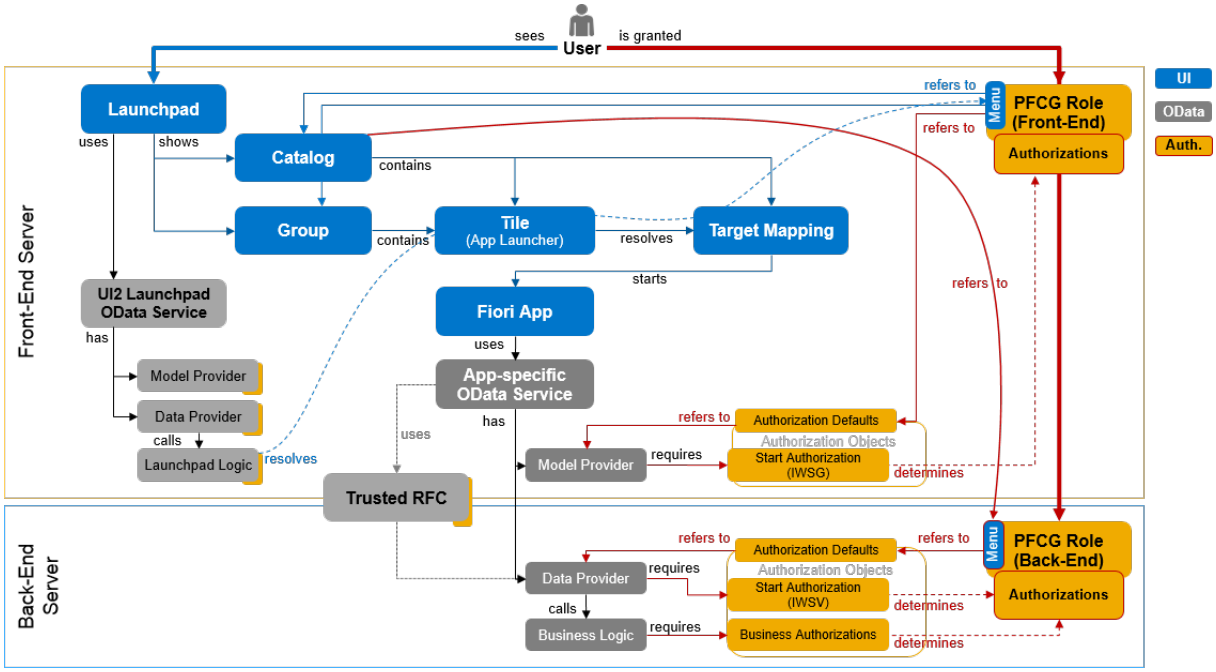
- UI: The SAP Fiori UI entities that define which SAP Fiori apps are displayed to the user. The apps are organized through catalogs and groups.
- Authorizations: The authorizations that are required to use Fiori launchpad, to start SAP Fiori apps, and to use the business logic and data of the SAP Fiori apps.

SAP Fiori UI entities and authorizations are assigned to users by means of PFCG roles. This section presents the app-specific SAP Fiori UI entities and authorizations. For general authorizations that are required for using the SAP Fiori launchpad, see General Authorizations Required for SAP Fiori [page 84].

Dependencies between SAP Fiori UI Entities, OData Services, and Authorizations

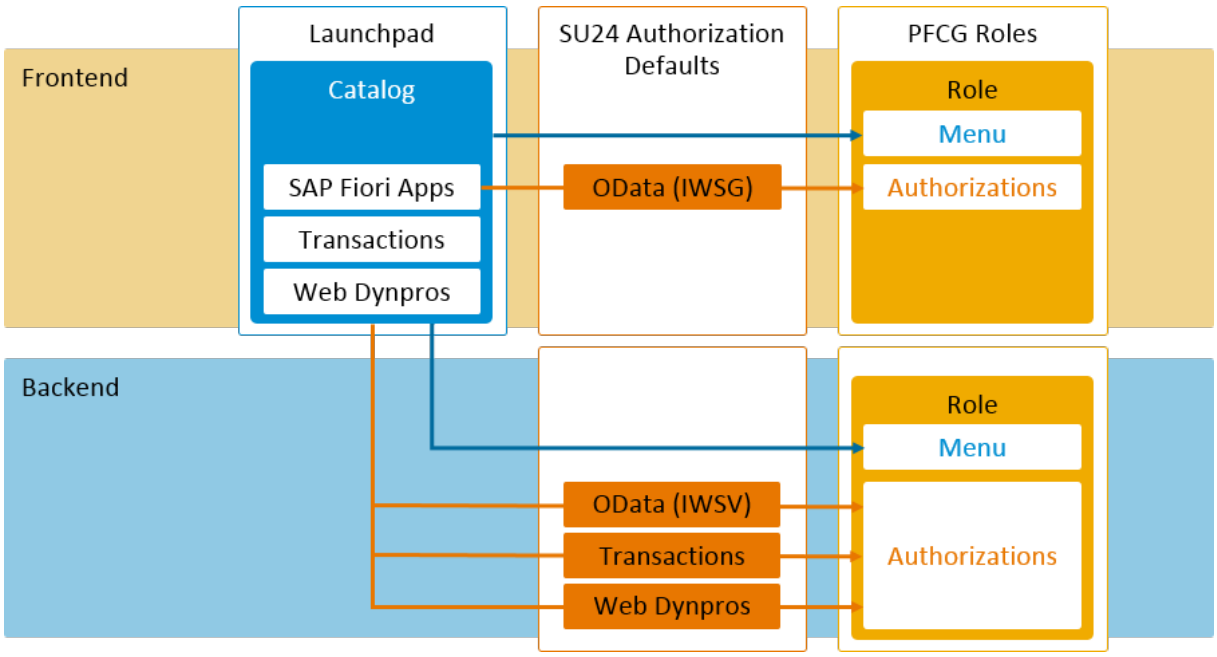
The following figure shows the dependencies between the entities:

- The SAP Fiori UI entities that define which SAP Fiori apps are displayed to the user.
- The OData services that retrieve the dynamic data to be displayed from the business logic for the SAP Fiori apps.
- The authorizations required to start and to use the business logic of the SAP Fiori apps. These authorizations are defined by the OData services.



Dependencies Between UI Entities and Authorizations for SAP Fiori Apps

> **Note**
>
> For apps using Web Dynpro or SAP GUI for HTML technology, the picture looks slightly different. These apps do not use app-specific OData services. Instead, the access to the back-end server requires an HTTP connection. Authorizations are defined by the application itself.



Overview of PFCG integration of SAP Fiori tile catalogs for different UI technologies used in SAP Fiori

UI Entities

The apps that are displayed to the users are organized using the following SAP Fiori UI entities:

- Catalogs
  A catalog is a set of apps that you want to make available and authorize for your users. The users can browse through the catalog, choose apps from the catalog, and add them to the entry page of their SAP Fiori launchpad.
  Technically, apps are represented by the following:
  - KPI tiles to launch analytical apps
  - App launcher tiles to launch all other types of apps

    > **Note**
    >
    > Only the apps that can be accessed directly from the entry page of the SAP Fiori launchpad have an app launcher tile. Object pages, for example, do not have any app launchers. They are started by navigating from other applications or by using the search.

  - Target mappings referencing the actual navigation targets

    > **Note**
    >
    > For launching apps either using a tile or using navigation, users require a target mapping. We recommend that you add the tiles and corresponding target mappings to the same catalog.

- Groups
  Groups define the SAP Fiori launchpad entry page. The apps in the group are a subset of apps that are assigned to one or several catalogs. Which tiles are displayed on a user's entry page depends on the catalogs and groups assigned to the user's roles. If a group contains apps that are not assigned to the user by catalogs, the app is not displayed on the user's entry page. In addition, if configured, the user can personalize the entry page by adding or removing apps to pre-delivered groups or self-defined group.

You maintain catalogs and groups in the launchpad designer. SAP delivers technical catalogs which contain apps per application area. In addition, SAP delivers business catalogs and business groups as sample collection of apps relevant for a business role.

As an administrator, you can use the technical catalogs as repository to create your own role-specific business catalogs and groups. For more information, see Maintain Business Catalogs and Business Groups.

PFCG Roles

You use PFCG roles to assign the UI entities and authorizations to the users:

- PFCG roles on front-end server
  By adding the catalogs to the role menu, you include the apps in the catalog that is available to the users. By adding groups, you define the SAP Fiori launchpad entry page. To start the apps, users require the start authorizations for the model provider of the activated OData services (IWSG). To get these start authorizations, you need to add the OData services to the PFCG role menu. For the OData services the SAP Fiori app use, see the SAP Fiori app implementation documentation in the SAP Fiori apps reference library. When you add a catalog to the role menu, the system will determine the OData services used in a catalog and automatically include the start authorizations.
  For more information, see:
  - Create PFCG Role for UI Components and Assign Launchpad Catalogs and Groups [page 108]
  - Go to https://help.sap.com/s4hana_op_1909, enter *Configuring Roles with Launchpad Start Authorizations* into the search bar, press `Enter`, and open the search result with that title.
- PFCG roles on the back-end server
  On the back-end server, the OData services that the SAP Fiori apps use are implemented. Therefore, the users need to have start authorization for the OData service's data provider (IWSV), and all the business authorizations for accessing business data displayed in the app.
  For object pages, the authorization defaults also include the authorizations for the Enterprise Search connectors. For Web Dynpro or SAP GUI for HTML apps, users need authorizations for the Web Dynpro applications and transactions. The OData services, Web Dynpro applications and transactions carry the authorization defaults for the business authorizations as proposed by SAP.
  To get the authorizations, you add the OData services, Web Dynpro applications and transactions for SAPGUI for HTML apps to the PFCG role menu. This adds the start authorizations and the authorization defaults for the business authorizations of the applications to the role. We recommend adding the catalog to the role menu to automatically determine the OData services, Web Dynpro applications and transactions included in the catalog. With that, you can organize the update of authorizations when the catalog changes. In the graphic above, the red arrow pointing from the menu of the PFCG role on the back-end to the catalog on the front-end depicts this recommendation.
  For more information, see:
  - Create PFCG Role for Application Components [page 116]
  - Go to https://help.sap.com/s4hana_op_1909, enter *Configuring Roles for Tile Catalogs and Groups* into the search bar, press `Enter`, and open the search result with that title.
- Business Roles
  Business roles in SAP S/4HANA represent the central object used to structure users' access on the frontend server.
  SAP delivers business role templates that follow the naming convention `SAP_BR*`. The business role templates delivered are designed to cover typical activities of business users with a certain job profile. So, for example, the business role template `SAP_BR_AR_ACCOUNTANT` delivered is designed for accounts receivable accountants.
  Each role contains business catalogs that cover the typical tasks of a user. So, for example, the `SAP_BR_AR_ACCOUNTANT` role covers the typical tasks of an accounts receivable accountant.

Each business catalog contains one or more applications and is designed to support segregation of duties. Country-specific requirements are covered by separate business roles that complement the respective base role. Their technical name consists of the technical name of the base role enhanced by the ISO code of the country the role covers, for example, `SAP_BR_AR_ACCOUNTANT_CN` as a role including business catalogs for accounts receivable accountants in China.

Sequence When Starting an SAP Fiori App

- When the user starts the SAP Fiori launchpad, the launchpad displays the app tiles that are assigned to users via catalogs and organized in groups.
  A launchpad-specific OData service resolves the catalogs and groups a user is assigned to: This service resolves the user's catalog and group assignments. It uses the PFCG roles which the user belongs to on the front-end server by collecting the corresponding catalog and group entries in the PFCG role menu.
- To start an SAP Fiori app, the user chooses a tile. The tile resolves the technical SAP Fiori app implementation to be started using a target mapping.
- The tiles and target mappings of a catalog or group, which then determine the technical SAP Fiori app implementation, are maintained in the SAP Fiori launchpad designer.
- When a user's browser loads an SAP Fiori app, the app retrieves its dynamic data from the HTTP endpoint of the app-specific OData service on the front-end server. Gateway translates the HTTP request to a trusted RFC call to the Gateway enablement of the back-end server, which then retrieves the data by calling the relevant business logic.
- The user requires authorizations for the app-specific OData service, that is, the start authorizations for the service on the front-end server and in the back-end system and the business authorizations required by the business logic.

5.1.2 Recommendations for Organizing SAP Fiori UI Entities and Authorizations

Users can start all SAP Fiori apps assigned to them from catalogs. Therefore, we recommend organizing SAP Fiori UI entities and authorizations for the catalogs.

- Define the catalogs as the smallest entities that are assigned and authorized for your users.
- Derive groups from or across catalogs where required. Groups define the initial UI content on the SAP Fiori launchpad. The users can then personalize the SAP Fiori launchpad by displaying and hiding apps.
- In the PFCG roles on the front-end server and on the back-end server, keep the catalogs and the authorizations required by the apps included in the catalog together in the same roles.
- With the help of the PFCG integration of SAP Fiori tile catalogs, you can you can determine the authorizations required for the apps in the catalog on the front-end and on the back-end server in the Role Maintenance (PFCG). For more information, go to https://help.sap.com/s4hana_op_1909, enter *Assign Tile Catalogs to Roles* into the search bar, press `Enter`, and open the search result with that title.
  - On the front-end server, make sure to choose the *Include Applications* checkbox when adding a catalog to your PFCG roles. The start authorizations for the catalog are then included in the role menu as subnodes below the catalog entry.

- On the back-end system, also add the catalog to your existing or new PFCG role and make sure to choose the *Include Applications* checkbox. The authorization defaults for the catalog for the OData service data providers, Web Dynpro applications, and transactions for apps using SAP GUI for HTML technology, are included in the role menu as subnodes below the catalog entry. In addition, the authorization defaults delivered by SAP for these services and applications are added to the role.

> **Note**
>
> It is now possible to transfer the role menu of a SAP Fiori front-end business role (PFCG) to the role menu of an existing or new back-end role (see SAP Note 2533007).

- When a catalog is changed in the launchpad designer, for example, an app is added or removed, you must update authorizations in the PFCG roles which include this catalog. If you have add the catalogs with the determination of authorizations as described above (checkbox *Include Applications* chosen), you can determine the roles that must be adapted by using the PRGN_COMPARE_ROLE_MENU report.
  In Role Maintenance (PFCG), you then compare and update the roles to reflect the authorization changes as given in the current definition of the catalog.
  However, the comparison (both using the report or comparing in PFCG) does not include applications or services that you added manually to the role menu. For more information, go to https://help.sap.com/s4hana_op_1909, enter *Update Authorization Defaults for Tile Catalogs* into the search bar, press `Enter`, and open the search result with that title.
- If a catalog contains apps that address several back-end servers , you need to create a PFCG role per back-end server. Consider splitting up the catalog.
- Instead of creating new PFCG roles, you can also extend existing roles that fit to the scope of the catalog. You might want to extend roles already used in the back-end server. If you add the catalog and its applications and services to an existing role, the authorization proposals have to be merged with the authorization values already defined in the role. You can consider using existing roles if the following applies:
  - The same users assigned to the role shall get access to all apps in the catalog.
  - The business authorizations already defined in the role and those that you define for the apps in the catalog do not contradict.

5.1.3 General Authorizations Required for SAP Fiori

To run SAP Fiori launchpad and trigger the OData services required for SAP Fiori, users need certain general authorizations in addition to the app-specific authorizations on the front-end and the back-end server.

Front-End Server

Assign the following once on the SAP Fiori front-end server:

- Launchpad authorizations
  End users need authorizations to run the SAP Fiori launchpad; administrators need additional authorizations to run the SAP Fiori launchpad designer.
  SAP delivers template roles for launchpad access.

For more information, go to https://help.sap.com/s4hana_op_1909, enter *Configuring Roles with Launchpad Start Authorizations* into the search bar, press Enter, and open the search result with that title.

- General OData authorizations
  The authorizations required to use the Gateway runtime.
  SAP delivers authorization templates for accessing the Gateway runtime.
  For more information, go to https://help.sap.com/s4hana_op_1909, enter *User, Developer, and Administrator Roles* into the search bar, press Enter, and open the search result with that title.
- Trusted RFC back-end connectivity authorizations
  S_RFC and S_RFCACL authorizations are required for each back-end server to access the back-end server over a trusted RFC connection.
- For analytical apps that are launched by using a KPI tile:
  End users need authorizations for the OData service /SSB/SMART_BUSINESS_DESIGNTIME_SRV. On the front-end server, the start authorization for the model provider of the activated OData service is required. While the authorization is required only once per user, we recommend to organize it by adding a reference to the target mapping with the action analyzeSBKPIDetailsS4HANA from the technical catalog SAP_TC_CA_SSB_COMMON to your business catalogs which contain analytical apps. By defining the roles for the catalogs as described in Create PFCG Role on Front-End and Assign Launchpad Catalogs and Groups, the relevant users will get the authorization.
  For modeling KPIs, users need to be assigned to the SAP Smart Business modeler apps. The business role SAP_BR_ANALYTICS_SPECIALIST contains the catalog and group provided by SAP. To run these apps, users need the authorizations for the OData service /SSB/SMART_BUSINESS_DESIGNTIME_SRV. We recommend that you define a role using the SAP delivered catalog and group as described in Create PFCG Role on Front-End and Assign Launchpad Catalogs and Groups.
- For analytical apps that are built using Analysis Path Framework (APF):
  - End users and key users:
    End users and key users need authorizations for all OData services used in the configuration, including those used for the step configuration, the filter resolution, the value help request, and so on, and for the service for path persistence BSANLY_APF_RUNTIME_SRV.
  - End users:
    For access to the layered repository of the SAPUI5 flexibility services, assign the authorization object /UIF/LREP to the end user's PFCG role and select APFUSER as value for field */UIF/ROLE*.
  - Key users:
    For using the APF Configuration Modeler design time app, users need to be assigned the business role SAP_BR_ANALYTICS_SPECIALIST. For access to the layered repository of the SAPUI5 flexibility services, assign the authorization object /UIF/LREP to the key user's PFCG role and select APFADMIN as value for field */UIF/ROLE*.

Back-End Server

Assign the following once for each back-end server:

- Back-end connectivity authorizations
  The S_RFC and S_RFCACL authorizations are required to access the trusted RFC on each back-end server.
  For more information, see Assign RFC Authorization to User.
- For analytical apps that are launched by using a KPI tile:
  End users need the authorizations for the OData service SMART_BUSINESS_RUNTIME_SRV.
  Users who model KPIs in addition need the authorization for the OData service

SMART_BUSINESS_DESIGNTIME_SRV. We recommend that you define the roles corresponding to those on the front-end server as described in Create PFCG Role on Back-End.

- For analytical apps that are built using Analysis Path Framework (APF):
  - End users and key users:
    End users and key users need authorizations for all OData services used in the configuration, including those used for the step configuration, the filter resolution, the value help request, and so on, and for the service for path persistence `BSANLY_APF_RUNTIME_SRV`.
- For transactional apps:
  For more information about authorizations and roles for transactional apps, go to http://help.sap.com, enter *Authorizations and Roles for Transactional Apps* into the search bar, press `Enter`, and open the search result with that title.

5.1.4 Users in ABAP Front-End System

Use

The ABAP front-end server contains the central and app-specific SAP Fiori UI components including SAP Fiori launchpad and Gateway. To launch SAP Fiori apps using SAP Fiori launchpad, users are required on the front-end server.

> ⓘ Note
>
> Users must have the same user names and passwords on the ABAP front-end server and the ABAP back-end server. User mapping is not supported. For this purpose, you can use Central User Administration (CUA) or identity management systems.

To access SAP Fiori apps, users on the front-end server require UI content and authorizations. The corresponding PFCG roles need to be assigned to the user.

More Information

For information about the required UI content and authorizations for users on the front-end server, see UI Content and Authorization Concept.

5.1.5 Users in ABAP Back-End System

Use

The ABAP back-end system implements the business logic and provides the data for the SAP Fiori apps, Web Dynpro applications and transactions. For apps launched by users from the SAP Fiori Launchpad on the front-end server, users with the same user names are required on the ABAP back-end system. You can use

your existing users in the ABAP back-end system as long as these users have the same user names in all ABAP back-end systems which implement apps you want to make available in SAP Fiori Launchpad.

Users in the ABAP back-end system require PFCG roles with certain general authorizations as well as authorizations for OData services, WebDynpro applications, and transactions.

More Information

For information about the required authorizations for users on the back-end system, see UI Content and Authorization Concept.

5.2 UI-Specific Implementation Tasks

This section contains the UI-specific tasks you perform to implement SAP Fiori apps.

5.2.1 SAP Fiori Apps

5.2.1.1 Activate OData Services

Prerequisites

Before you start activating other OData Services, you need to activate the OData service `/IWFND/CATALOGSERVICE` (version 2).

Use

There are several ways to activate the relevant OData services:

- You can activate the OData services for each app individually. For more information, see Activate OData Services for Individual Apps [page 88].
- You can activate OData services for several apps at once, by using a task list. For more information, see Activate OData Services for Several SAP Fiori Apps [page 88].

5.2.1.1.1 Activate OData Services for Individual Apps

Procedure

1. Run transaction *Activate and maintain services* (`/IWFND/MAINT_SERVICE`) on the front-end server.
2. Choose *Add Service*.
3. Enter the system alias of your back-end system.
4. In the *External Service Name* field, enter the technical name of the OData service for your app without the version number.
   For more information on the OData service per app, see the app-specific documentation.
5. In the *Version* field, enter the version number.
6. Choose *Get Services*.
7. Choose *Add Selected Services*.
8. Enter a technical name for the service in your customer namespace.
9. Assign a package or choose *Local Object*.
10. Choose *Execute* to save the service.
11. On the *Activate and maintain services* screen, check if the system alias is maintained correctly. If not, delete the alias and add the correct one.
12. Call the OData service once.

Determining the OData service names for your apps

- For apps delivered by SAP, see the SAP Fiori App Reference Library and the app-specific documentation.
- For analytical apps launched using a KPI tile that your company created, ask the responsible developer.
- If you want to determine the OData service name by yourself:
  - In the SAP Smart Business KPI Modeler apps, use the *KPI Workspace* app to look for the relevant KPI. The names of the KPI tile and the KPI name might differ slightly.
  - In the KPI, look for the evaluation. The evaluation contains the URL of the OData service, such as `/sap/opu/…<service>`.

5.2.1.1.2 Activate OData Services for Several SAP Fiori Apps

Use

Instead of manually activating OData services individually for each app, you can activate the OData services for several apps at once, by using a task list.

Prerequisites

- If you want to download OData services from SAP Fiori apps reference library: SAP Fiori apps reference library is available.
  For more information, go to https://help.sap.com/s4hana_op_1909, enter *SAP Fiori App Reference Library* into the search bar, press `Enter`, and open the search result with that title.
- Task lists for configuring SAP Fiori Apps are available

> **Note**
>
> You can perform setup tasks for SAP Fiori by using task lists that SAP delivers. A task list groups configuration tasks logically and guides you through the necessary tasks.
>
> For an overview of all task lists and tasks for SAP Fiori,
>
> go to https://help.sap.com/s4hana_op_1909, enter *Configuration Using Task Lists* into the search bar, press `Enter`, and open the search result with that title.

The following task list applies to this step:

- `SAP_GATEWAY_ACTIVATE_ODATA_SERV`

Activities

1. Collect the names and version numbers of the OData services you want to activate.
   You can download this information from the SAP Fiori apps reference library or paste it from the app-specific implementation information.
2. Start task list `SAP_GATEWAY_ACTIVATE_ODATA_SERV`.
3. In the *Define OData Services for Activation* task, enter the OData services you want to activate:
   1. Enter the external service name or the technical service name.
   2. To use a version other than 1: Behind the service name, enter a blank and then the version number.
4. In the *Select System Alias for Activation* task, enter the system alias.
5. In the *Select OData Services for Activation* task, make sure that all services are selected that you want to activate. You can exclude some services that you do not want to activate.
6. Choose *Generate Task List Run*.
   The system creates the OData service, assigns the system alias to the OData service, and activates the related ICF nodes.

More Information

For more information about SAP Fiori apps reference library, see Implementation Planning [page 9].

For more information about working with task lists, see Configuration Using Task Lists [page 42].

5.2.1.2 Activate ICF Services of SAPUI5 Application

Use

In addition to the central services relevant for all SAP Fiori apps, you must also activate the services for the specific apps. This is because, for security reasons, all Internet Communication Framework (ICF) services are made available in an inactive state.

> **Note**
>
> For security reasons, we recommend that you only activate the services for the apps you want to use.

You can activate the ICF services for each app manually, as given below.

Prerequisites

For each app, you find the technical name of the corresponding ICF service in the *App Implementation* documentation under *Implementation Tasks*.

Procedure

To activate an ICF service, proceed as follows:

1. On the front-end server, start transaction *Maintain Services* (SICF).
2. Press F8.
3. Navigate to *default_host* > *sap* > *bc* > *ui5_ui5* > *sap*.
4. In this node, navigate to the SAPUI5 application for your app.
5. To activate the service (SAPUI5 application), choose *Service/Host* > *Activate*.

5.2.1.3 Activate OData and ICF Services for Finance Apps

Make the following settings to ensure that all Finance apps that you implement run correctly.

Activate OData and ICF Services for User Default Parameters

The fin.central.user.defaultparameter application plug-in is called for determining the value for certain user default parameters (for example, company code) from the ABAP back end. The plug-in is called in two situations:

- A Fiori app is started that requires a certain user default parameter.
- The SAP Fiori launchpad maintenance UI for the user default parameter is opened.

You must activate the `FIN_USER_DEFAULTPARAMETER` OData service and `FIN_ACC_USERPAR ICF` ICF service, as given below.

Procedure

1. On your ABAP front-end server, activate the `FIN_USER_DEFAULTPARAMETER` OData service using the **`/IWFND/MAINT_SERVICE`** transaction. Alternatively, you can activate the services in the SAP Customizing Implementation Guide (**`SPRO`** transaction) under *SAP NetWeaver* > *SAP Gateway* > *OData Channel* > *Administration* > *General Settings* > *Activate and Maintain Services*.

   > **Note**
   >
   > If you have multiple ABAP back-end servers, you must activate the `FIN_USER_DEFAULTPARAMETER_SRV` technical services on each ABAP back-end server by listing each system alias.

   The activation on the ABAP front-end server triggers automatically the activation of the `FIN_USER_DEFAULTPARAMETER_SRV` technical service on your ABAP front-end server. You can check this using the **`SICF`** transaction. Check under *defaulthost* > *sap* > *opu* > *odata* > *sap*.
2. On your ABAP front-end server, activate the `FIN_ACC_USERPAR ICF` service . Use the **`SICF`** transaction and check under *defaulthost* > *sap* > *bc* > *ui5_ui5* > *sap*.
3. In the SAP Fiori Launchpad Designer, in all new business catalogs that you create for your Finance apps, create a reference to the target mapping of the `Shell` semantic object with the `plugin` action, which is delivered in the `SAP_TC_FIN_ACC_COMMON` technical catalog. Note: This target mapping is already referenced in the template business catalogs delivered by SAP.

Activate FIN_LIB ICF Service

The activation of the *Central Simple Finance Fiori Reuse Library* (`FIN_LIB` ICF service) provides a collection of central functions used by all Finance Fiori apps.

Procedure

Use the **`SICF`** transaction to ensure that the following two nodes are active:

- *default_host* > *sap* > *bc* > *ui5_ui5* > *sap* > *fin_lib*
- *default_host* > *sap* > *bc* > *bsp* > *sap* > *fin_lib*

If they are not active, activate them.

For more information on the *Central Simple Finance Fiori Reuse Library*, especially for information about other mandatory SAP Notes that must be implemented, see SAP Note2117762.

5.2.2 Configuration Steps for SAP GUI for HTML Transactions, Web Dynpro Applications, and WebClient UI Applications

5.2.2.1 Basic Information

To consume the content of catalogs containing SAP GUI for HTML transactions, Web Dynpro applications, and WebClient UI applications on the SAP Fiori launchpad, some additional configuration steps are required.

The SAP Fiori launchpad content for classic UI apps is delivered through app descriptors in backend catalogs. In order to make this content available on the SAP Fiori launchpad on the frontend server, the content of these backend catalogs needs to be replicated to technical frontend catalogs.

> **Note**
>
> This replication step is also required in an embedded deployment scenario.

This content replication requires some mapping to be defined between frontend catalogs and backend catalogs.

To enable this mapping, SAP delivers two tables with a predefined list of system alias and their mapping to catalogs.

Transaction `SM30`:

1. Table view `/UI2/V_SYSALIAS` – contains the delivered system aliases, for example S4FIN
2. Table view `/UI2/V_ALIASCAT` – contains the delivered mapping between system aliases and backend catalogs

This mapping also defines the name of the technical backend catalog which is created during replication on the frontend or in the same system in the embedded case.

> **Example**

Backend catalog name	`SAP_TC_FIN_ACC_BE_APPS`
System alias	S4FIN
Name of created technical frontend catalog	`SAP_TC_FIN_ACC_BE_APPS:S4FIN`

In a hub deployment scenario, this mapping is also used for link resolution from the frontend to the backend system.

> **Note**
>
> Don't change delivered alias names, because the SAP system alias is part of the technical name of the replicated technical catalogs which is referenced from the business catalogs. If you change the alias, the references will not work.

For customer specific development, the tables `/UI2/VC_SYSALIAS` and `/UI2/VC_ALIASCAT` are available.

The list of system aliases can be found below (also see table view `UI2/V_SYSALIAS`):

Name (System Alias)	Application Area	ACH
NW	SAP NetWeaver	BC
S4CA	Cross Applications	CA
S4CRM	Service	S4CRM
S4CMD	Common Master Data	AP-MD
S4CPA	Commercial Project Management	CA-CPD
S4EAM	Enterprise Asset Management	PM
S4ECCSE	Localization	FI-LOC
S4EHS	Environment, Health and Safety	EHS
S4FIN	Financials	FI
S4FICA	Financials Contract Accounts	FI-CA
S4FICAX	IS Extension Financials Contract Accounts	FI-CAX
S4LO	Logistics	LO
S4MDG	Master Data Governance	CA-MDG
S4PLM	Product Lifecycle Management	PLM
S4PP	Production Planning	PP
S4PPM	Portfolio and Project Management	PPM
S4PRC	Procurement	MM-PUR
S4PS	Project Services	PS
S4PSS	Product Safety & Stewardship	ESH
S4QM	Quality Management	QM
S4SCM	Supply Chain Management	SCM
S4SD	Sales and Distribution	SD

Name (System Alias)	Application Area	ACH
S4SLL	Global Trade Services / Logistics Services	SLL
S4TRV	Travel	FI-TV

> **Note**
>
> The aliases for SAP S/4HANA Industries and SAP S/4HANA Add-Ons are only required if you want to use apps from those areas.

SAP S/4HANA Industries

Name (System Alias)	Application Area	ACH
S4INS	Insurance	FS-CM
S4ISA	IS Automotive	IS-A
S4ISAD	IS Aerospace & Defence	IS-AD
S4ISEC	IS Engineering and Construction	IS-EC
S4ISPSCA	IS Public Sector Contract Accounting	IS-PS-CA
S4ISU	IS Utilities	IS-U
S4OIL	IS Oil & Gas	IS-OIL
S4PSM	Public Sector Management	EA-PS
S4RFM	Retail Fashion Management	LO-RFM

5.2.2.1.1 Embedded Deployment: Maintain System Aliases for Backend Catalogs

SAP delivers a mapping between backend catalogs and system aliases, which is used for the replication of SAP GUI for HTML transactions, Web Dynpro applications, and WebClient UI applications from backend catalogs to technical frontend catalogs.

For the embedded scenario you (only) need to define here which system aliases (and by that which mapped catalogs) shall be used in your system.

To maintain the table, call up transaction `SM30` and open the maintenance view `/UI2/V_ALIASMAP`.

Field Name	Key	Description	Value
MANDT	Yes	Client	< Leave empty >
SYSALIAS_SRC	Yes	Source System Alias	<Select entries from system alias table (`/UI2/V_SYSALIAS`)>
SYSALIAS_TGT		Target System Alias	<Leave empty>

Example

Client	Source System Alias	Target System Alias
<empty>	S4CA	<empty>
<empty>	S4FIN	<empty>
<empty>	...	<empty>

5.2.2.1.2 Hub Deployment: Set Up RFC Connections to a Backend System

SAP delivers a mapping between backend catalogs and system aliases

In a hub scenario this mapping is used for:

1. Replication of GUI / WDA apps from backend catalog to technical frontend catalogs
2. Link resolution in the SAP Fiori launchpad runtime

In a hub scenario you first need to maintain view `/UI2/V_ALIASMAP` and create corresponding RFC and HTTP(S) connections.

Procedure

Map the Connections

The catalogs shipped by SAP contain system aliases which are used to call a SAP GUI for HTML transactions, Web Dynpro applications, and WebClient UI applications in a specific backend system.

In your system landscape several system aliases may point to one or more physical backend systems. For example, system alias S4FIN is assigned to backend system A and S4PRC is assigned to backend system B.

Note

Important: a system alias can only be assigned to one backend system!

To maintain the table, call up transaction `SM30` and open the maintenance view `/UI2/V_ALIASMAP`.

This table is used to map SAP system aliases to logical system aliases, which stand for the physical backend systems connected to the frontend system. The logical system is resolved to a concrete RFC or HTTP(S) connection by adding the suffix _RFC or _HTTP(S).

The table has to be maintained as follows:

Field Name	Key	Description	Value
MANDT	Yes	Client	<Client number>
SYSALIAS_SRC	Yes	Source System Alias	<Select entries from system alias table (`/UI2/V_SYSALIAS`)>
SYSALIAS_TGT		Target System Alias	<RFC / HTTP connection to be used>

Example

Client	Source System Alias	Target System Alias
<Client number>	S4CA	<for example, ABC_500>
<Client number>	S4FIN	<for example, XYZ_001>
<Client number>	S4PRC	<for example, ABC_500>

Create RFC Connections

Configure the following two types of RFC/HTTP(S) connections to the backend system:

- An ABAP connection (type 3) which is used to replicate the content of the backend catalogs (app descriptors) from the backend server to the frontend server.
- An HTTP(s) connection (type H), which is used to start Web Dynpro, WebClient UI apps and transactions using SAP GUI for HTML to retrieve the business data.

Caution

The entered URLs must not use the same virtual host as the SAP Fiori Frontend Server! The connection must point to the URL with which the browser can access the backend system. For example, this can be a virtual host configured for this backend system as described in Defining Routing Rules for SAP Web Dispatcher and ABAP Back End [page 56].

1. In the frontend system, choose *Tools* > *Administration* > *Administration* > *Network* > *RFC Destinations* or start transaction `SM59`.
2. Create an RFC connection of the connection type *3 - ABAP Connection:*
   1. Use the following naming convention: < Target System Alias>_RFC
   2. Tab *Technical Settings*: We recommend using to set *Load Balancing* to *Yes* and entering a target system, message sever and group

3. Tab *Logon & Security*: Mark the checkbox *Current User* and set *Trust Relationship* to *Yes*.

Use the following naming conventions:

- ABAP connection: **<Logical System Alias>_RFC**
- HTTP connection: **<Logical System Alias>_HTTP** or **<Logical System Alias>_HTTPS**

> → Recommendation
>
> We recommend using a HTTPS connection.

System Aliases

Make sure to mark the checkbox *Current User* and set *Trust Relationship* to *Yes*.

> ⓘ Note
>
> The aliases for SAP S/4HANA Industries and SAP S/4HANA Add-Ons are only required if you want to use apps from those areas.

3. Create an HTTP(S) connection of the connection type *H – HTTP Connection to ABAP System*. We recommend using a HTTPS connection:
   1. Use the naming convention: <Target System Alias>_HTTP(S)
   2. Tab *Technical Settings*: Fill in the fields *Target Host* and *Service No.*.
   3. Tab *Logon & Security*: Set *Logon with user* to *SAP RFC logon* and enter the client number; set *Logon with Ticket* to *Send assertion for dedicated target system* and enter a system ID and client number
   4. Recommendation: Set *SSL* to *Active* and *SSL Certificate* to *DFAULT SSL Client (Standard)*.

> ✤ Example
>
> Two backend systems are in use. One system for cross- and procurement applications (ABC, client 500), the other one for financials applications (XYZ, client 001).
>
> Table `/UI2/SYSALIASMAP` has to be maintained as follows:

Client	Source System Alias	Target System Alias
100	S4CA	ABC_500
100	S4FIN	XYZ_001
100	S4PRC	ABC_500

> The following SM59 connections have to be created:
>
> 1. RFC connection: ABC_500_RFC and XYZ_001_RFC
> 2. HTTP connection: ABC_500_HTTPS and XYZ_001_HTTPS

5.2.2.2 Replicate App Descriptors

Use

To enable the access from the SAP Fiori launchpad to applications using Web Dynpro, SAP GUI for HTML and WebClient UI technology, you have to replicate information about these applications from the backend catalogs to the technical frontend catalogs. Each app has an app descriptor which provides this information.

> ⓘ Note
>
> This replication step is also required in an embedded deployment scenario.

You have to execute the replication before you enter the SAP Fiori launchpad designer to create your own catalogs. Only after the replication you will see the apps in the *Technical Catalogs* view.

Procedure

1. Launch the report `/UI2/GET_APP_DESCR_REMOTE_ALL`.
2. Choose a *Replication Mode*:
   - *Delta replication*: The selected catalogs are only replicated if changes were made since the last replication.
   - *Full replication*: All selected catalogs are replicated.
3. Mark the *Build Target Mapping Index* checkbox to trigger the rebuild of the target mapping index.
4. Mark the *Test mode* checkbox and choose *Execute*. The catalogs will not be replicated.
   For catalogs that could not be replicated some error information is displayed in the application log.
5. If the log does not contain any errors, deselect the test mode and run the report.

> → Recommendation
>
> To ensure that you always have up-to-date information in the SAP Fiori launchpad designer, we recommend running the report after the installation of support packages of the following software component versions:
>
> - UIBAS001 400
> - UIAPFI70 600
> - UIS4HOP1 400
>
> You should also run the report after SAP S/4HANA release upgrades.
>
> In case of customer specific development, the report has to be run continuously.

More Information

For more information, go to https://help.sap.com/s4hana_op_1909, enter *Integrating Web Dynpro and SAP GUI Applications Using Mass Maintenance* into the search bar, press `Enter`, and open the search result with that title.

5.2.3 Make Settings for Design Studio Apps

This step is required if you want to make use of Design-Studio-based apps.

If you want to use analytical apps that have Design Studio as their application type in the SAP Fiori apps reference library, you need to create the related system aliases for your SAP Gateway and activate ICF nodes.

Procedure

System Aliases

Create this alias in the SAP Customizing Implementation Guide (transaction SPRO) under *SAP NetWeaver* > *SAP Gateway* > *OData Channel* > *Configuration* > *Connection Settings* > *SAP Gateway to SAP System* > *Manage SAP System Aliases*.

Enter the following mandatory parameters:

Embedded Deployment

Field Name	Value
SAP System Alias	S4FIN (when using design studio apps from Financials) S4SD (when using design studio apps from Sales)
Description	<free text>
RFC Destination	NONE

Mark the checkbox *Local Gateway*.

Hub Deployment

Field Name	Value
SAP System Alias	S4FIN (when using design studio apps from Financials) S4SD (when using design studio apps from Sales)
Description	<free text>
RFC Destination	for example, S4FIN_RFC

> **Note**
>
> If you already created the corresponding RFC destination for the connectivity to the FIN / SD backend apps, you can reuse the same destination here as well.

ICF Nodes

Use the SICF transaction to ensure that the following two nodes are active:

- /sap/bw/ina/GetServerInfo
- /sap/bw/ina/GetResponse

If your front-end and back-end servers are running on different systems, activate these nodes on both the front-end and back-end servers.

5.2.4 Make Settings for Smart Business Apps

This step is required if you want to make use of Smart Business-based apps.

If you want to use analytical apps that have SAP Smart Business as their application type in the SAP Fiori apps reference library, activate the `/SSB/SMART_BUSINESS_RUNTIME_SRV (1)` OData service.

Activate this OData service using the **`/IWFND/MAINT_SERVICE`** transaction.

5.2.5 Maintain Business Catalogs and Business Groups

Prerequisites

You have replicated the app descriptors for apps using Web Dynpro, SAP GUI for HTML, or WebClient UI. For more information, see Replicate App Descriptors [page 98].

Context

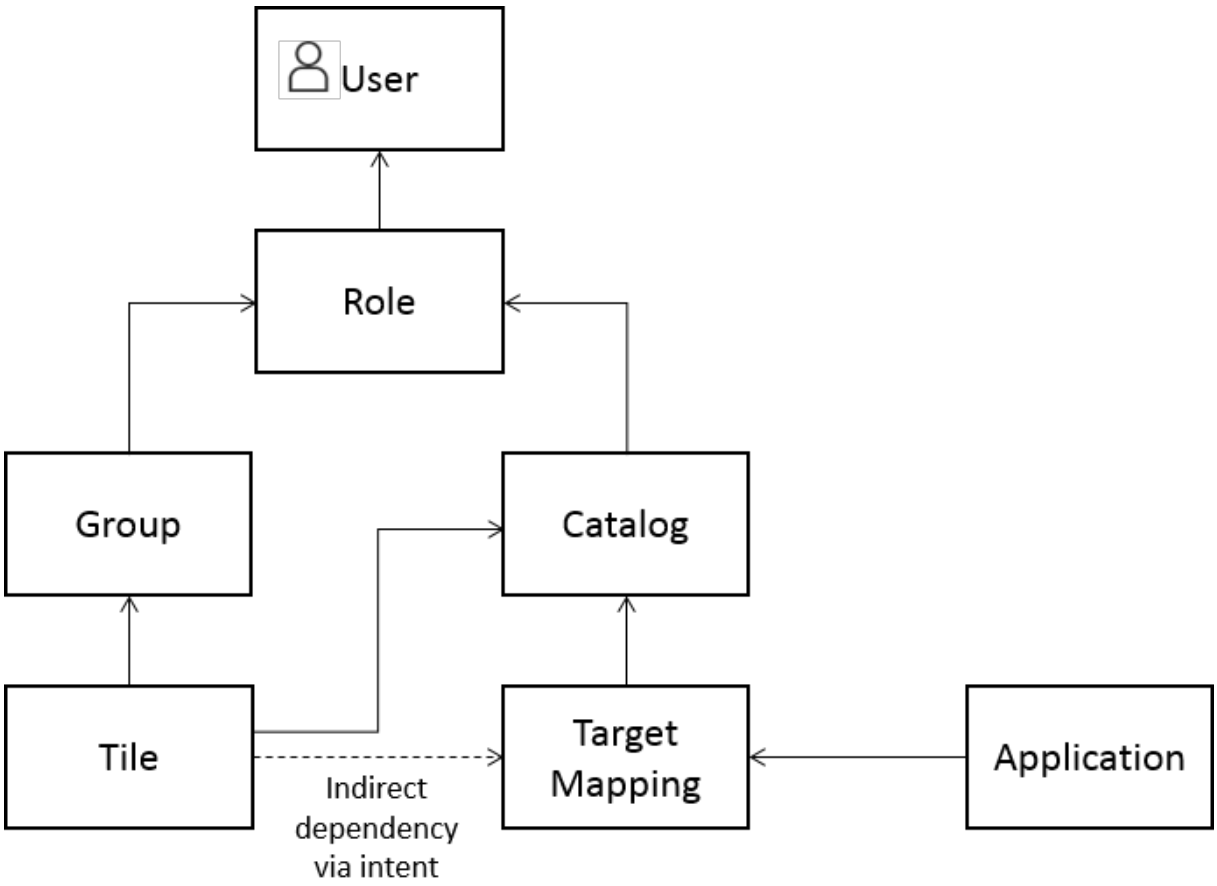
The apps that are displayed to users on the SAP Fiori launchpad are organized by using catalogs and groups.

Catalogs are the smallest entities that define the apps you want to assign to your users for selection and authorization.

Groups define the grouping, sort order, and general appearance (tile or link) of apps that are initially displayed on the SAP Fiori launchpad home page for a user.

The following diagram shows how the different entities required to set up launchpad content relate to one another:

For more information, go to https://help.sap.com/s4hana_op_1909, enter *Setting Up Launchpad Content* into the search bar, press `Enter`, and open the search result with that title.



Procedure

1. Create your own catalogs and add apps to your catalogs.

   For more information, see Maintain Business Catalogs [page 102].
2. Create a group to display specific apps to your users by default on the entry page of the SAP Fiori launchpad. Add apps from your catalogs to the group.

   For more information, see Maintain Business Groups [page 106].
3. Assign groups and catalogs to users' PFCG roles on the front-end server. For more information, see Create PFCG Role for UI Components and Assign Launchpad Catalogs and Groups [page 108].

5.2.5.1 Maintain Business Catalogs

Purpose

Create your own business catalogs to:

- Control which apps are assigned to users
- Control which users are authorized to access related apps (for navigation)
- Refine the appearance of a tile in the home page, for example to change texts and/or icons
- Refine keywords used to find an app, for example when searching for an app in the SAP Fiori Search
- Adjust the parameters passed between related apps

Prerequisites

You have replicated the app descriptors for apps using Web Dynpro, SAP GUI for HTML, or WebClient UI. For more information, see Replicate App Descriptors [page 98].

Context

The apps that are displayed to users on the SAP Fiori launchpad are organized by using catalogs and groups.

Catalogs are the smallest entities that define the apps you want to assign to your users for selection and authorization. A user can use SAP Fiori launchpad features such as App Finder or SAP Fiori Search to find and select any app from any catalog they have been authorized to use. Conversely a security administrator can use catalogs to generate and assign authorizations to a security role that are necessary to access all of the apps in the catalog.

For more information, see UI Content and Authorization Concept [page 79].

Catalogs collect apps regardless of the technology type. For example, a single catalog can contain a mix of SAP Fiori apps, Web Dynpro ABAP applications, SAP GUI transactions, or WebClient applications.

Tiles and Target Mappings

Catalogs contain the following sub-entities:

- Tiles – A visual representation of an app on the launchpad home page
- Target Mappings – Define the app to be launched, including any parameters to be passed

> **Note**
>
> Not all apps require an app launcher tile. A single app may be launched from multiple places, that is it may have more than one source. For example an app may be launched:
>
> - Via an app launcher tile or link on the user's SAP Fiori launchpad home page
> - Via a link, button, or card of a related SAP Fiori app
> - Via SAP Fiori Search or the App Finder
> - Via a List of Links list based on the Semantic Object

The relationship between source and target is logically defined by a Semantic Object and Action using intent-based navigation.

For more information, go to https://help.sap.com/s4hana_op_1909, enter *About Navigation* into the search bar, press `Enter`, and open the search result with that title.

Different targets can be defined for the same source, for example depending on the device type or the business role. For example, if you have a collection of apps that are shared by multiple business roles, for which different parameters need to be passed depending on the business role, you can create:

- a catalog containing a set of shared app launcher tiles
- a separate catalog for each business role with the specific target mappings for each business role

The source and target may be defined in different business catalogs. The user is assigned the sum of all sources and all targets of all of the business catalogs for which they are authorized.

> **Note**
>
> You can use SAP Fiori Launchpad Intent Analysis to check the source to target mappings of a user.
>
> For more information, go to https://help.sap.com/s4hana_op_1909, enter *Analyzing Intents for SAP Fiori Launchpad* into the search bar, press `Enter`, and open the search result with that title.

Technical Catalogs and Business Catalogs

SAP delivers apps (tiles and target mappings) in technical catalogs and business catalogs:

- Technical catalogs, naming convention <...>_TC_<...>
  Technical catalogs serve as a repository of all apps delivered by SAP. They contain all target mappings and app launcher tiles relevant for apps per application area. They contain original tiles and target mappings which can be referenced from business catalogs. Technical catalogs are not intended to be assigned directly to users.
- Business catalogs, naming convention <...>_BC_<...>
  Business catalogs contain a sample collection of target mappings and app launcher tiles relevant for a business role. The content of the business catalog is a subset of the content of the technical catalog. This subset reflects the requirements of a specific business user.

SAP catalogs are always located in the configuration scope. The SAP business catalogs contain references to the tiles and target mappings contained in the technical catalogs. References ensure that any changes to the original tile or target mapping can be made centrally in the technical catalog and are propagated to the business catalog.

> **Note**
>
> Changing the configuration of a reference tile or target mapping breaks the reference to the original, and any subsequent changes must then be managed directly in the business catalog.

Use the SAP Fiori apps reference library to search for relevant apps and find out the corresponding SAP business catalog.

You can reuse the business catalogs delivered by SAP as they are by assigning them directly to roles.

Recommendations for Adapting SAP Catalogs

If you want to adapt the content delivered by SAP, use the SAP business catalogs as a starting point. We recommend the following:

- Do not change SAP catalogs. Instead, copy SAP business catalogs to use them as the starting point for creating your own business catalogs.
  This will ensure to get a consistent set of SAP Fiori apps that supports app-to-app navigation by including the relevant target mappings. This will not necessarily be the case when you select only a set of single apps from the technical catalogs.
  Exception: Some apps (mainly SAP GUI for HTML apps) are not contained in any business catalog and are only delivered as part of technical catalogs. In these cases, you need to select a single app (tile/target mapping) from the technical catalog and add it as a reference to your custom business catalog.
- Create separate catalogs for the provisioning and usage of tiles and target mappings:
  - Technical catalogs: Contain original tiles and target mappings
  - Business catalogs: Contain references to the tiles and target mappings in the technical catalogs

  This facilitates the reuse of catalog content because one original tile/target mapping can be referenced from several catalogs. Any changes to the original tiles and target mappings are automatically reflected in the reference (unless the configuration of the reference tile/target mapping was changed).
- Create and change your catalogs in the following scopes:
  - Technical catalogs: Configuration scope
    This allows you to reuse the tiles and target mappings created in the technical catalogs in all clients.
  - Business catalogs: Customizing scope
    This allows you to manage business catalogs for a selected client.

  Do not change catalogs that were created in the configuration scope while you work in the customizing scope since this could lead to outdated catalogs.
- Use the following tools to create and change your catalogs:
  - Technical catalogs: Launchpad designer or Mass Maintenance tool
  - Business catalogs: Launchpad content manager

  For more information, go to https://help.sap.com/s4hana_op_1909, and enter *Tools for Setting Up Content* into the search bar, press `Enter`, and open the search result with that title.
- A catalog should not contain more than 100 apps (tile/target mapping combinations).
  This helps prevent performance issues at design time (for example, when the catalog is copied).

Procedure

For more information on the recommended steps for adapting catalogs, go to https://help.sap.com/s4hana_op_1909, and enter *Best Practices for Managing Catalogs* into the search bar, press `Enter`, and open the search result with that title.

Next Steps

1. Add apps from your catalogs to groups.
   For more information, see Maintain Business Groups [page 106].
2. Assign groups and catalogs to users' PFCG roles on the front-end server. For more information, see Create PFCG Role for UI Components and Assign Launchpad Catalogs and Groups [page 108].

5.2.5.1.1 Adding SAP GUI for HTML, Web Dynpro Apps, WebClient UI Apps to a Catalog

Context

In principle, all SAP GUI transactions, Web Dynpro applications, and WebClient UI applications can be used on the Fiori launchpad. However, they require a corresponding app descriptor as prerequisite

There are three categories of SAP GUI transactions, Web Dynpro ABAP applications, and WebClient UI applications:

1. Applications for which SAP delivers app descriptors and that are included in both technical catalogs and business catalogs delivered by SAP
2. Applications for which SAP delivers app descriptors and that are included in technical catalogs only
3. Applications for which SAP does not deliver any descriptors / standard content

These categories have been formed based on the most common usage of the SAP GUI transactions, Web Dynpro applications, and WebClient UI applications.

Applications of category 1 can directly be consumed for your launchpad, e.g. by creating a custom business catalog as copy of the SAP delivered business catalogs

To make use of applications in category 2, you need to add the app to your business catalog by creating a reference from the technical catalog of the app (tile/target mapping) to your custom catalog (see description below).

To find out if a certain transaction, Web Dynpro application or WebClient UI application is directly eligible for usage in the SAP Fiori Launchpad, you can search for it in the SAP Fiori apps reference library.

To do so, choose *All apps for SAP S/4HANA* > *All Apps* and enter the transaction code into the search field. If an entry is found, it means that the transaction has been assigned an app descriptor and is eligible directly.

Alternatively, you can call transaction `MM_APP` in the backend system to search for existing app descriptors of transactions.

To integrate applications of category 3 to your SAP Fiori launchpad, you need to perform the following steps:

Procedure

1. Create an app descriptor in the backend and assign them to the technical catalog (using transaction `MM_APP`)
2. Assign a system aliases to the technical catalog
3. Replicate the backend catalog to the frontend
4. Create references from your business catalog to the tiles / target mappings in the replicated catalog to consume the created content

   For more information, go to https://help.sap.com/s4hana_op_1909, enter *Integrating Web Dynpro and SAP GUI Applications Using Mass Maintenance* into the search bar, press `Enter`, and open the search result with that title.

   For more information on the replication, see Replicate App Descriptors [page 98].

5.2.5.2 Maintain Business Groups

Create your own business groups to:

- Define which apps initially appear on a user's SAP Fiori launchpad home page
- Define the grouping and sort order of apps that initially appear on a user's SAP Fiori launchpad home page
- Define whether an app appears as a tile or a link

Context

Business groups define the grouping, sort order, and general appearance (tile or link) of apps that are initially displayed on the SAP Fiori launchpad entry home page for a user. Groups can reference multiple apps from one or more catalogs. Groups do not grant authorizations. If a user is not authorized for an app provided by the group, the unauthorized app will not appear on the user's home page.

Groups contain the optional sub-entities:

- Tiles – the apps that should appear as tiles on the home page, in the order in which they will appear
- Links – the apps that should appear as links on the home page, in the order in which they will appear

> **Note**
>
> On the SAP Fiori launchpad home page, tiles are displayed before the links that belong to the same group.

You maintain groups in the launchpad designer. For more information, go to https://help.sap.com/s4hana_op_1909, enter *Setting Up Content With the Launchpad Designer* into the search bar, press `Enter`, and open the search result with that title.

SAP delivers the following entities that help you maintaining your own, role-specific groups:

Business group, naming convention <...>_BCG_<...>

Business groups contain a set of applications from a business catalog that are displayed to a user by default on the entry page of the SAP Fiori launchpad. Users can further personalize groups by adding or removing apps from the SAP Fiori launchpad, provided the group is not locked. For example, you can use a locked business group to ensure certain important apps are always displayed to users, and unlocked business groups that users can rearrange to improve their personal productivity.

Recommendations

- Business groups should contain applications which are regularly used, e.g. on a daily or weekly basis. Rarely used applications can be left in the app finder or found via the SAP Fiori search or *Home* button.
- Consider reducing the number of apps shown on the home page. We recommend you to aim for a maximum number of 64 tiles on the home page (which corresponds to 8 groups with 8 tiles each). This helps to prevent performance issues.
- Aim for a good default home page; users can always personalize the home page at any time.
- Avoid overpopulating the home page – scrolling vertically or horizontally can be cumbersome for the user. Consider turning on the tab mode for the group selection bar at the top of the home page so that it only shows one group at a time.
- Take advantage of link lists. Include apps here that are relevant, though maybe not as urgent as others. Link lists help save space on the UI.
- Business roles delivered by SAP contain business groups which represent best practice job tasks. These business groups have generic titles, such as *Sales Contract* or *Data Migration*. We recommend referring to this naming convention and adapting your own business groups accordingly.
- Make sure group and tile names are meaningful to the business users who will use them. Involve end users who will perform the tasks of the relevant business role.
- Consider putting the most frequent and urgent tasks in the first groups towards the top of the home page – they should be the easiest to reach every time you log in.
  The order of SAP Fiori groups can be changed in the PFCG role menu they are assigned to. Note that you can only control the order of groups within a role but not across roles.
- Consider putting apps that trigger actions (insight to action) in a prominent place in your groups, i.e. at the beginning of a group.
- Aim for only adding entry point apps to business groups: These combine activities, such as *Manage Activities*, instead of single apps for *Create Activities* or *Display Activities*. This approach saves space on the UI, avoids redundancies and eases access. Consider that many apps can be reached via forward navigation.

5.2.6 Create PFCG Role for UI Components and Assign Launchpad Catalogs and Groups

Use

You must perform this task and the following authorization- and role-related tasks on the front-end server to equip the user with the UI access to apps and the start authorizations for the activated OData services used by the apps.

We recommend adding the relevant catalog and the start authorizations for the activated OData services used by the apps in the catalog to the role menu of the same PFCG role. . Thereby, you keep the UI access provided with the catalogs together with the needed start authorizations. The system determines the OData services for a catalog and automatically includes the start authorizations when you add the catalog to the role menu.

Adding single OData service authorizations provides additional security, especially if the front-end server is set up as a separate hub. By specifying the services explicitly in the role menu, you control which requests on behalf of a user can pass Gateway.

As an alternative, it is possible to authorize all activated OData services by specifying a wildcard for the start authorization check on the front-end server (`S_SERVICE` = * (asterisk)).

> ⚠ Caution
>
> If you use a wildcard, users can call all activated services. We therefore recommend not using wildcard authorizations in productive environments but adding single OData service authorizations.

Prerequisites

You have activated the OData service and have called it at least once before assigning start authorizations. For more information, see Front-End Server: Activate OData Services.

Procedure

1. Open transaction *Role Maintenance* (`PFCG`).
2. Create a new single role and assign the following in the role menu:
   - Type **`Catalog`**
   - Catalog Provider **`Fiori Launchpad Catalogs`**
   - Catalog ID
   - Optional (if the users should see the tiles in a group already on the SAP Fiori launchpad start page): Type **`Group`**, Group ID

   Alternatively, you can copy the template business role delivered by SAP, which already contains the catalog and group, as sample content to your customer namespace.

3. To automatically enter the OData services, if available:
   - Select the *Local Front-End Server* radio button.
   - Mark the *Include Applications* checkbox.
4. To manually enter the OData services, for example, for analytical apps that are launched by using a KPI tile, do the following:
   1. Add the following in the (new or copied) role menu for each of the OData services:
      - Type **`Authorization Default`**
      - Authorization Default **`TADIR Service`**
      - Object Type **`IWSG - Gateway: Service Groups Metadata`**
   2. Select *TADIR Service* using value help for the object name with `<name of activated service>`.
   3. Enter the name as follows: **`<technical name>_<four-digit version number with leading zeros>`**.
      For more information about how to determine the OData service name for apps , see Front-End Server: Activate OData Services.
5. Save the role menu, and go to the role authorization, change the authorization data, and adopt the generated authorizations accordingly.
6. Generate the authorization profile and save it.

> **Note**
>
> When a catalog is changed in the launchpad designer, for example, an app is added or removed, you must update the start authorizations for the services in the back-end system and the business authorizations for accessing business data that are displayed in the app. If you added the catalogs to the back-end PFCG roles and included the applications, you can determine the roles that must be adapted by using the `PRGN_COMPARE_ROLE_MENU` report. You can call this report directly or by calling up transaction `PFCG` and choosing *Utilities* > *Update of Application Groups in Role Menu*. In the selection screen of the report, select the option *Application Group = SAP Fiori Tile Catalog*.
>
> In Role Maintenance (PFCG), you compare and update the roles to reflect the authorizations changes as given in the current definition of the catalog.
>
> However, the comparison (both using the report or comparing in PFCG) does not include applications or services that you added manually to the role menu.
>
> For more information, go to https://help.sap.com/s4hana_op_1909, enter *Update Authorization Defaults for Tile Catalogs* into the search bar, press `Enter`, and open the search result with that title.

5.2.7 Assign Roles to Users

Use

You have to assign the roles on the front-end server with the catalogs, groups, and OData start authorizations to users.

Procedure

1. In transaction *Role Maintenance* (`PFCG`) on the *User* tab, assign the role containing the catalogs, groups, and OData start authorizations to a user by specifying the user ID.
   Thereby, the user has UI access to the apps in the catalogs and the start authorizations for the respective OData services on the front-end server.

5.3 Implementation Tasks on Back-End Components (App Implementation)

This section contains the tasks you perform on the back-end components to implement SAP Fiori apps.

> ⓘ Note
>
> User names in the ABAP back-end server must be identical to the corresponding user names in the ABAP front-end server. User mapping is not supported. For this purpose, you can use Central User Administration (CUA) or identity management systems.

5.3.1 Configuration Steps for SAP GUI for HTML Transactions, Web Dynpro Applications, and WebClient UI Applications

5.3.1.1 Activate ICF Services of Web Dynpro Apps

Use

To call a Web Dynpro app, you use a dedicated URL, which accesses your back-end system.

A component called the **Internet Communication Framework (ICF)** runs on your back-end system. The URL calls a service in the ICF (**ICF Service**). The ICF service executes one or more ABAP programs to compile the requested data and returns it to the web browser.

Each Web Dynpro app uses its own ICF service. For security reasons, all ICF services initially are inactive and have to be activated first.

> ⓘ Note
>
> We recommend that you only activate the services for the apps you want to use.

Prerequisites

You have collected the following information from the SAP Fiori apps reference library:

- *WebDynpro Component Name*
  This name specifies the **app-specific ICF service**.

Procedure

Activate the ICF services of your Web Dynpro app on your **back-end server**. In the **HTTP Service Hierarchy Maintenance** transaction, you find the ICF service under the path **/default_host/sap/bc/webdynpro/sap/<WebDynpro Component Name>**. Alternatively, you can use the *WebDynpro Component Name* as filter for the *Service Name* to locate it.

To activate an ICF service, proceed as follows:

1. Choose *Tools* > *Administration* > *Network* > *HTTP Service Hierarchy Maintenance* or start transaction **SICF**.
2. You are on the *Maintain Services* screen. The system defaults the *Hierarchy Type* `SERVICE`.
   Choose or press F8.
3. You are on the *Define Services* screen, which offers a filter area called *Filter Details*.
   Enter the name of the ICF service you want to activate in the *ServiceName* field in the *Filter Details* screen area and choose .

   > **Note**
   >
   > If you know the path of the ICF service, you can also navigate to it in the *Virtual Hosts / Services* screen area.

4. The system filters the service hierarchy in the *Virtual Hosts / Services* screen area for the path leading to the filtered ICF service. Highlight the ICF service and choose *Service/Host* > *Activate*.
5. The *Activation of ICF Services* dialog box appears.
   Choose to activate the selected service including all the sub services.

5.3.1.2 Activate ICF Services for SAP GUI for HTML

Context

You have to activate ICF services to enable the start of SAP GUI for HTML. You have to do this once for all SAP GUI for HTML apps.

Procedure

1. Start transaction SICF.
2. Choose .
3. In the Virtual Hosts/Services area, navigate to the following services, and choose *Service/Host* > *Activate* for each:
   - `/sap/bc/gui/sap/its/webgui`
   - `/sap/bc/apc/sap/webgui_services`
4. In the *Activation of ICF Services* dialog box, choose  to activate the selected service including all the sub services.

5.3.1.3 Activate ICF Services of WebClient UI Apps

Use

To call a WebClient UI app, you use a dedicated URL, which accesses your back-end system.

A component called the **Internet Communication Framework (ICF)** runs on your back-end system. The URL calls a service in the ICF (**ICF Service**). The ICF service executes one or more ABAP programs to compile the requested data and returns it to the web browser.

Each WebClient UI app uses its own ICF service. For security reasons, all ICF services initially are inactive and must be activated first.

> ⓘ Note
>
> We recommend that you only activate the services for the apps you want to use.

Prerequisites

Services indicated in SAP Note 2825458 are required for WebClient UI apps.

Procedure

To activate an ICF service, proceed as follows:

1. In the SAP Menu, choose *Tools* > *Administration* > *Network* > *HTTP Service Hierarchy Maintenance* or start transaction **SICF**.

2. You are on the *Define Services* screen. The system defaults the *Hierarchy Type* `SERVICE`.
   Choose or press F8.
3. You are on the *Maintain service* screen, which offers a filter area called *Filter Details*.
   Enter the name of the ICF service you want to activate in the *ServiceName* field in the *Filter Details* screen area and choose .

   > **Note**
   >
   > If you know the path of the ICF service, you can also navigate to it in the *Virtual Hosts / Services* screen area.

4. The system filters the service hierarchy in the *Virtual Hosts / Services* screen area for the path leading to the filtered ICF service. Highlight the ICF service and choose *Service/Host* > *Activate* .
5. The *Activation of ICF Services* dialog box appears.
   Use the context menu to *Activate* the selected service.

5.3.1.4 Optimize the SAP Fiori Launchpad Embedding for SAP GUI for HTML Apps

Prerequisites

You have activated the ICF node `/sap/bc/gui/sap/its/webgui`.

Context

The following settings are recommended for embedding GUI-based functionality in the SAP Fiori launchpad in an optimized way.

Procedure

1. In transaction SICF, create an external alias for `/sap/bc/gui/sap/its/webgui`.
2. Set the following service Parameters:

Parameter	Value	Effect
~SINGLETRANSACTION	**1**	Window session is closed after starting transaction is left. In combination with the below logoff handler, this is used to close the window automatically after a transaction completes. This mode can cause certain transactions to close without showing a success message even though the document was processed successfully. If your scenarios are affected by such cases, consider changing this parameter value to 0.
~WEBGUI_SIMPLE_TOOLBAR	**7918**	Bitmap for customizing the toolbar: • Bit 0 = 0: Standard settings (equals to Bits 1/2/5 set) • Bit 1 = 1: Title Bar shown • Bit 2 = 1: "Cancel" and "Help" buttons shown • Bit 3 = 1: Turns on Tools Buttons (e.g. "Back", "Print") • Bit 4 = 0: Separate system menu • Bit 5 = 1: Application Button bar • Bit 6 = 1: Show the Standard Menu below a button • Bit 7 = 1: Setting this bit turns off the information tab (System, User) in the status bar • it 9 = 1: no System Menu Bit • B 10 = 1: no Help Menu • Bit 11 = 1: no OK Code field • Bit 12 = 1: No F1 Help **Note** Certain transactions may require usage of functions in the system menu, so you may want to consider to leave Bit 9 set to 0 (corresponding to value 7406). For more information, see SAP Note 1010519.
~WEBGUI_ICON_TOOLBAR	**2**	Shows button icons instead of text.

Parameter	Value	Effect
~XSRFCHECK	**1**	Cross Site Request Forgery Check support of WebGUI enabled. For more information, see SAP Note 1481392.
~THEME	**sap_belize**	Default theme is set to Belize (mainly takes effect when run in standalone mode).
~WEBGUI_DLGAREA2	**0**	Do not show the Personas SAPGUI-like menu header, instead use simplified look.
~WEBGUI_DLGAREA2_MBAR	**0**	Do not show the Personas SAPGUI-like menu header, instead use simplified look.
~WEBGUI_CONTEXTMENU	**0**	Disable context menu (does not disable keyboard shortcuts)
~WEBGUI	**1**	
SAP-IE	**edge**	Force Microsoft Internet Explorer to make use of edge mode.
~NO_DOMAIN_RELAXING	**1**	Deactivate domain relaxation

3. In addition, define a logoff handler page to automatically close the window. Under *Error Pages*, choose *Logoff Page* and enter the following:

> **Note**
>
> Make sure you create the texts while logged in with the language that is maintained in profile parameter `zcsa/second_language` in RZ10 in order to avoid language dependency issues.

- Explicit Response Page Header
```
<NO_TRANSLATION>
<HEADER>ITS-Cmd:1</HEADER>
<HEADER>ITS-Cmd-JSON:1</HEADER>
</NO_TRANSLATION>
```
- Explicit Response Page Body
```
{ ITS : { cmd : { Javascript : { name: "Javascript", content:"(function()
{top.close();})()" }}}}
```

5.3.2 Assign RFC Authorization to User

Use

If the OData back-end service is located on a remote back end, users need permission to perform the RFC call on the back-end system.

Prerequisites

You have created a user on the front-end system.

Procedure

1. In the *User Maintenance* transaction (`SU01`) under *Information* > *Information System*, check if the user has the required authorizations `S_RFC` and `S_RFCACL` for trusted RFC.
2. If the user does not have the authorizations, assign a role including the RFC authorization objects `S_RFC` and `S_RFCACL` to the back-end user that corresponds to the front-end user.

5.3.3 Create PFCG Role for Application Components

Use

You must perform this task to equip the user in the back-end system with the authorizations required for the apps launched from SAP Fiori Launchpad. We recommend organizing the roles according to the roles on the front-end server for the catalogs.

The authorizations required for a particular application are provided via the application itself or via the OData service of the application in case of SAP Fiori apps. This includes the start authorizations for the service or the application in the back-end system and the business authorizations for accessing business data displayed in the app. By adding the application or OData service to the menu of back-end PFCG roles, you add the start authorization and the authorization proposals for the business authorizations. You can adjust these according to your needs.

We recommend adding all applications and services required by apps of a certain catalog to the same role. This PFCG integration of SAP Fiori tile catalogs adds the catalog to the role menu to automatically include the OData services, Web Dynpro and SAPGUI for HTML applications. You can create a new role or use an existing role that fits to the scope of the catalog. If you add the applications and services to an existing role, the authorization proposals have to be merged with the authorization values already defined in the role. You can consider using existing roles if the following applies:

- The same users assigned to the role shall get access to all apps in the catalog.

- The business authorizations already defined in the role and those that you define for the apps in the catalog do not contradict.

Procedure

1. Run transaction *Role Maintenance* (`PFCG`) and create a new PFCG role or edit an existing role.
2. To enter the catalog and automatically include the OData services, Web Dynpro and SAPGUI for HTML applications, on the menu tab open the menu of the pushbutton for adding objects and choose *SAP Fiori Tile Catalog*.
   - Select the *Remote Front-End Server* radio button and provide the RFC variable or the RFC destination to establish a connection to the front-end server.
   - Select the *Include Applications* checkbox.
   - Select the catalog for which the authorizations shall be included. The value help lists all catalogs available on the front-end server. The OData services, Web Dynpro applications and SAPGUI for HTML applications are added to the role menu as sub-nodes of the catalog.

   > **Note**
   >
   > To ensure support for automated OData service integration for existing custom analytical apps created based on SAP NetWeaver 7.50 and lower, edit and save the corresponding KPI tile again using KPI Designer.
3. To manually add Web Dynpro apps and SAP GUI for HTML apps, do the following:
   - Web Dynpro: On the *Menu* tab, open the menu of the pushbutton for adding objects (+ pushbutton) and choose the object type *Web Dynpro Application*. Enter the Web Dynpro application.
   - SAP GUI for HTML: On the *Menu* tab, open the menu of the pushbutton for adding objects (+ pushbutton) and choose the object type *Transaction*. Enter the transaction code.
4. Repeat steps 2 to 3 for all applications and services of the catalogs that you want to authorize with the role.
5. On the *Authorization* tab, choose *Change Authorization Data*
6. Maintain the desired authorization values and activities (if the user does not yet have the business authorizations required to use the app).
7. Choose *Save* and then *Generate* to generate the authorization profile for the role.
8. Save the role.

When done with the role creation, you can continue with user assignment to the role.

> **Note**
>
> When a catalog is changed in the launchpad designer, for example, an app is added or removed, you must update the start authorizations for the services in the back-end system and the business authorizations for accessing business data that are displayed in the app. If you added the catalogs to the back-end PFCG roles and included the applications, you can determine the roles that must be adapted by using the `PRGN_COMPARE_ROLE_MENU` report. You can call this report directly or by calling up transaction `PFCG` and choosing *Utilities* > *Update of Application Groups in Role Menu*. In the selection screen of the report, select the option *Application Group = SAP Fiori Tile Catalog*.
>
> Alternatively, in Role Maintenance (PFCG), you can compare and update the roles to reflect the authorizations changes as given in the current definition of the catalog.

However, the comparison (both using the report or comparing in PFCG) does not include applications or services that you added manually to the role menu.

For more information, go to https://help.sap.com/s4hana_op_1909, enter *Update Authorization Defaults for Tile Catalogs* into the search bar, press `Enter`, and open the search result with that title.

Additional Steps for Object Pages

If the catalog contains object pages, the authorization defaults contain the `S_ESH_CONN` (search connector) authorization object.

You must add entries to the authorization object `S_ESH_CONN` in the subtree *Basis: Administration*. Fill the following fields:

- *Request of Search Connector*
- *Search Connector ID*
- *System ID*
- *Client*

For the values, see the app-specific documentation.

More Information

> ⓘ Note
>
> The PFCG integration for WebClient UI apps is provided in SAP Note 2817664.

5.3.4 Assign Roles to Users

Use

You have to assign the roles on the front-end server with the catalogs, groups, and OData start authorizations to users.

Procedure

1. In transaction *Role Maintenance* (`PFCG`) on the *User* tab, assign the role containing the catalogs, groups, and OData start authorizations to a user by specifying the user ID.
   Thereby, the user has UI access to the apps in the catalogs and the start authorizations for the respective OData services on the front-end server.

5.3.5 Create Search Connectors for Object Pages on Back-End Server

Use

To enable the use of a specific object page, the underlying search model(s) must have been activated.

When activating a search model, a search connector is created. A connector is the runtime object corresponding to the search model. It is system-specific and client-specific.

When available, the search models that need to be activated for your app are listed in the app-specific implementation information and are present in the authorization defaults of the OData services, see *Maintain Authorization Default Values (SAP)* (`SU22`). For more information, see the app-specific documentation.

Prerequisites

The SAP Fiori search has been set up. For more information, see Setup of SAP Fiori Search.

Activities

For each app, create the search connectors in transaction `ESH_COCKPIT` in your back-end system. For more information, see Setup of SAP Fiori Search and then *Activities* > *Setup of SAP Fiori Search in the Back End* > *6. Create connectors*.

5.4 Creating Custom Analytical Apps Using a KPI Tile

For the analytical apps that are launched by using a KPI tile, you can create custom apps by performing the following tasks:

1. Modeling KPIs [page 119]
2. Configuring Navigation in SAP Smart Business [page 121]

5.4.1 Modeling KPIs

Use

Analytical apps can be launched by using KPI tiles. You can define new KPIs or adapt predefined KPIs to determine what information is displayed and how it is visualized in the tile.

To enable you to model your own KPIs according to your business needs, SAP provides SAP Smart Business modeler apps and predefined KPIs that you can adapt as required.

For information about whether your app is launched by using a KPI tile, see the app-specific documentation.

Prerequisites

- You have installed the SAP Smart Business modeler apps on the front-end server.
- Your user is assigned to the SAP Smart Business modeler apps. The business role `SAP_BR_ANALYTICS_SPECIALIST` contains the catalog and group provided by SAP. To run these apps, users need the authorizations for the OData service `/SSB/SMART_BUSINESS_RUNTIME_SRV`. We recommend that you define a role on front-end server using the SAP delivered catalog and group as described in Create PFCG Role for UI Components and Assign Launchpad Catalogs and Groups [page 108] and a corresponding role on the back-end server as described in Create PFCG Role for Application Components [page 116].

Activities

Model KPIs according to your requirements.

> **Note**
>
> You can use the entities provided by SAP as templates for your own KPIs.
>
> To do so:
>
> 1. Copy the KPIs to your own namespace by using the *KPI Workspace* app.
> 2. Re-create any evaluations and tiles in your own namespace.
> 3. Adapt the objects according to your needs.

More Information

- For more information about modeling KPIs, see SAP Help Portal at https://help.sap.com/s4hana_op_1909 ▶ *Product Assistance* ▶ *Cross Components* ▶ *Analytics* ▶ *SAP Smart Business Modeler Apps* ▶.
- For more information about drill-down applications for KPIs, see SAP Help Portal at https://help.sap.com/s4hana_op_1909 ▶ *Product Assistance* ▶ *Cross Components* ▶ *Analytics* ▶ *SAP Smart Business Modeler Apps* ▶ *Configure Drill-Down* ▶.
- For information about whether an app uses a KPI tile, see the app-specific documentation for SAP Fiori apps.

5.4.2 Configuring Navigation in SAP Smart Business

SAP Smart Business enables users to navigate from generic drilldown applications to other applications.

This navigation is based on navigation targets that are specified by means of semantic objects and semantic actions that you define in the *Add Evaluation* application.

Creating Navigation Targets

For new evaluations, you maintain the navigation targets in the *Add Evaluation* application under *Data Sources* > *Semantic Object/Action*. You can add one or more semantic objects to an evaluation. Adding actions for semantic objects is optional. If you do not provide an action, all apps for the given semantic objects are shown in the Smart Business drilldown page.

When maintaining semantic objects and actions, note the following:

- Avoid duplicate entries
  When you have already created an semantic object *Supplier* and try to create a second semantic object *Supplier*, the system does not allow you to create the second entry and only keeps the first semantic object.
- Semantic objects and semantic actions are case-sensitive.
- The following characters are invalid and must not be used for semantic objects and actions: question mark (?), ampersand (&), pound sign (#), dash (-), space

Editing Navigation Targets

In the *KPI Workspace* app, you can edit your evaluations and add, change, or delete semantic objects and actions.

> **Note**
>
> If you want to change navigation targets that have been created before SAP S/4HANA Cloud 1608 or SAP S/4HANA 1610 FSP 00, you need to activate the changes that you apply in the *KPI Workspace* app and the KPI to which the respective evaluation belongs needs to be transported.

Evaluation of Navigation Targets at Runtime

The semantic objects and actions that you have maintained in the evaluation are used to populate the list of applications to which the user can navigate from the SAP Smart Business runtime application. For this, the required authorizations are added to the business role which contains the catalog in which the application is available.

- If you want to navigate directly from the chart or table, you have to maintain the dimension as a mandatory parameter. When you navigate to the application, the content of the current selection are passed, for

example, the dimension details. If the parameter is not available or not valid, the application would not be displayed as a possible navigation target.

- If the dimension is **not** specified as a mandatory parameter, you can still navigate to the application by choosing *Open In*. The list of applications that are maintained as navigation targets and not specified as mandatory are displayed and you can navigate to the respective applications.

Example

You have created the *Supplier Evaluation By Time* evaluation and defined the following applications for navigation:

- **Document** - defined as mandatory parameter
- Purchasing Category
- Manage Activities
- Supplier
- Manage Purchase Orders

You can navigate to the *Documents* application directly from the chart or table. Navigation to the other applications is available via *Open In*.

6 Troubleshooting for SAP Fiori Apps

This section provides a central starting point for solving problems related to configuring and running SAP Fiori apps.

For additional troubleshooting information, go to https://help.sap.com/s4hana_op_1909, enter *SAP Fiori Launchpad* into the search bar, press `Enter`, open the search result with that title and navigate to the section *Troubleshooting*.

6.1 Tools For Error Analysis

If the problem is related to customer-defined content that is not working as expected, there are a couple of tools to check the content for consistency.

In the rest of this document, there are references to the following tools:

SAP Fiori Launchpad Intent Resolution Analyzer

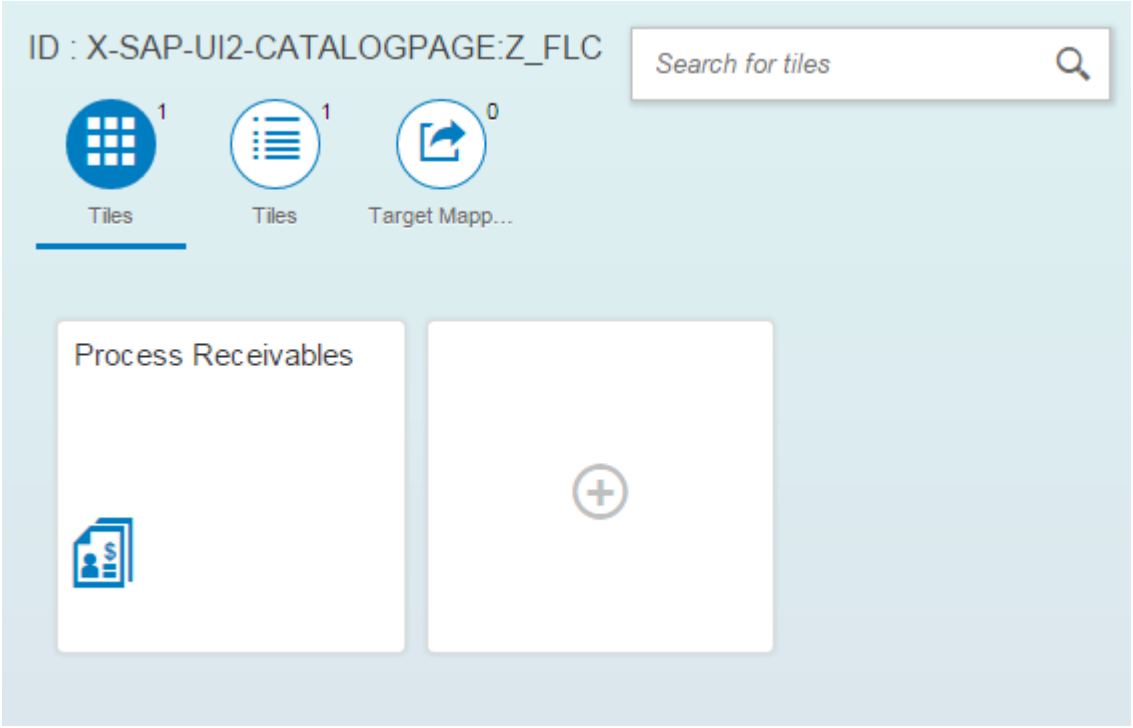
The SAP Fiori Launchpad Intent Resolution Analyzer (FLIA) can help you to find out if an intent (combination of semantic object and action) can be resolved. The FLIA also allows you to check the intent for a dedicated device type for configuration, customizing, and personalization.

The SAP Fiori Intent Analyzer can be started with the transaction code `/UI2/FLIA`.

SAP Fiori Content Check

The SAP Fiori Launchpad Content Check (FLC) helps you to analyze your catalogs for potential issues such as unresolvable intents or tiles without mappings. The FLC can also be restricted to either configuration,

customizing, or personalization. The following example shows the check results for a catalog that contains a tile but no mapping:





The SAP Fiori Launchpad Content Check can be started with the transaction code `/UI2/FLC`.

Catalog Consistency Check in the SAP Fiori Launchpad Designer

The SAP Fiori launchpad designer also provides some consistency checks for catalogs and a where-used list that can help to analyze the catalog during maintenance. In comparison to the FLC (mentioned above), the consistency check in the designer has fewer capabilities.

Performance Aspects

You can add the string **`sap-statistics=true&`** to the URL. Every request to the server will then return statistical data on how much time was spent on the frontend server, on the backend server, and on for the remote function call.

6.2 General Problems and Solutions

6.2.1 Caching Problems

Most issues that occur are related to cached content that should be deleted. That is why it is important for you to regularly delete the cache, especially after the upgrade to a new release and the application of support packages or certain SAPUI5 notes.

Deleting Caches

There are three caches involved where a deletion could solve the problem:

1. Delete the SAP Fiori content caches using the `/UI2/INVALIDATE_GLOBAL_CACHES` report.
2. Delete the browser cache using the respective function in the browser. For example, in Internet Explorer, choose *Internet Options* > *General* > *Browser History* > *Delete*.
3. Delete the Metadata Cache on the Gateway Server (only relevant after import of support packages). To do so, make settings in the *Clear Cache* customizing activity in the IMG (`SPRO` transaction) under *SAP Netweaver* > *Gateway* > *OData Channel* > *Administration* > *Cache Settings* > *Metadata* > *Clear Cache*.

6.2.2 SAP Fiori App Cannot Be Opened

Issue Description

When you click on a tile, the app does not start and a popup with the message "Could not open app. Try again later" is displayed.

Issue Analysis & Resolution

The error described above can have different root causes.

A. Missing Software Component

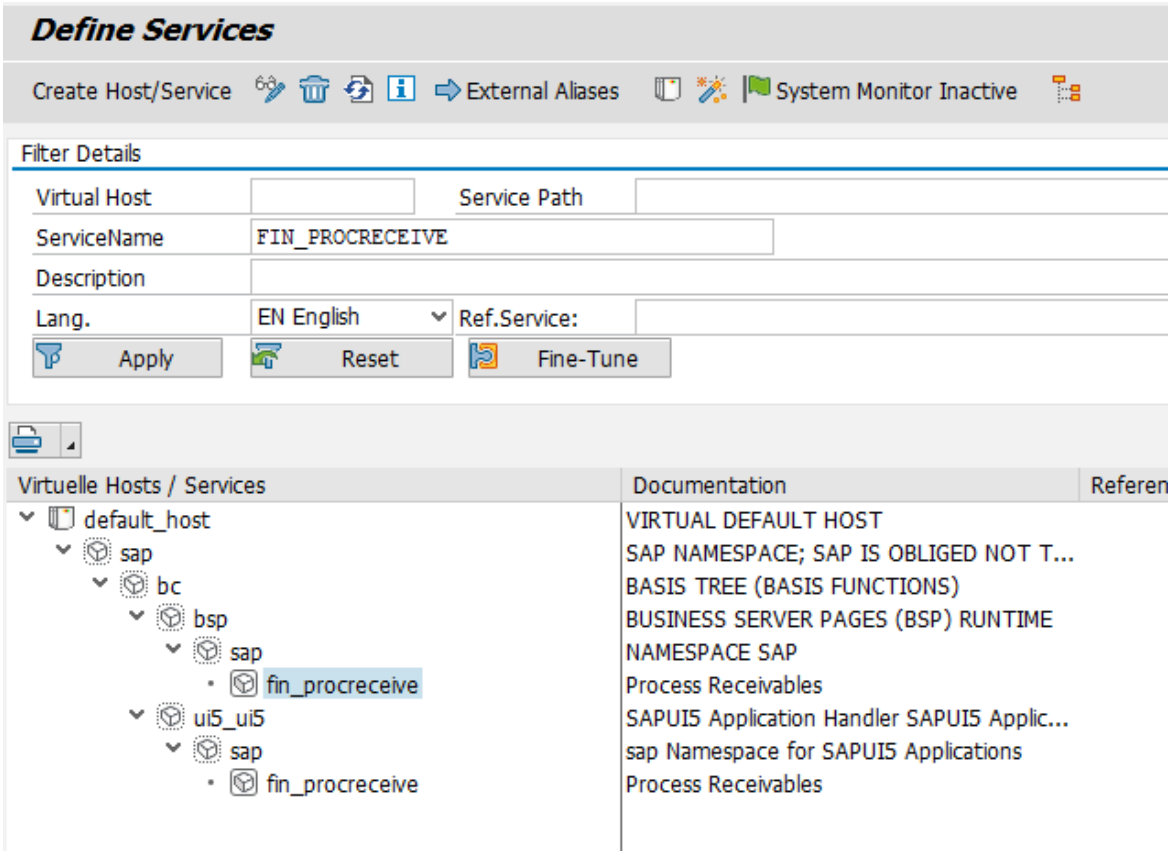
If this issue occurs for job scheduling apps or apps displaying application logs, please check if the software component `UIBAS001` is installed.

B. Inactive ICF nodes

1. Call the SAP Fiori launchpad and clear your browser cache on your computer and try to reproduce the problem.
2. If you receive the same popup, call the browser's console (for example, by pressing `F12` in Google Chrome).
3. Clear the console.
4. Click on the tile again and check the console.
   If you get an error stating with “Error: found in negative cache”, the app probably cannot start because of a deactivated ICF node.

   > → Tip
   >
   > Each app has two ICF app nodes and both must be active to start the app.

   Activate the ICF nodes.
5. Call the transaction `SICF` on the frontend server and search for the BSP name of the app.
   You can find the BSP name of the app by using the SAP Fiori apps reference library.
   The BSP name occurs twice. Both occurrences must be activated.



6. Clear the cache.
   Run the `/UI2/INVALIDATE_GLOBAL_CACHES` report to clear the SAP Fiori launchpad caches.

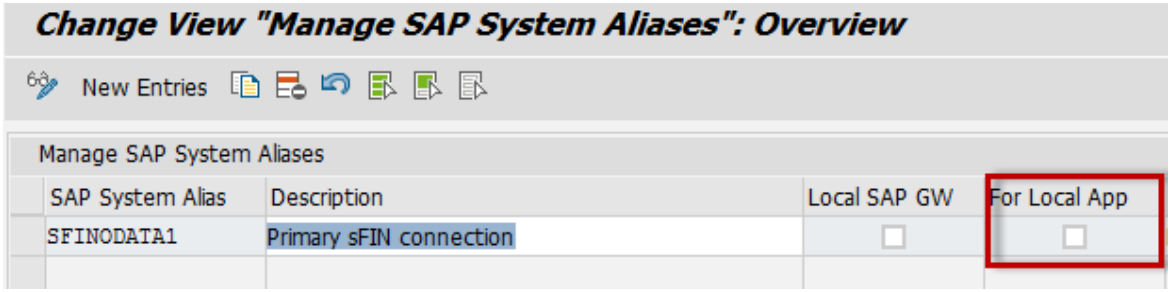
C. New UI sources

Check if your gateway system has the report `/UI5/APP_INDEX_CALCULATE` scheduled.

For details. go to https://help.sap.com/s4hana_op_1909, enter *SAPUI5 Application Index* into the search bar, press `Enter`, and open the search result with that title.

D. Misconfiguration of the system alias

1. Get the system alias for your app.
   Call the transaction `/IWFND/MAINT_SERVICE` and search for the OData service of your app.
   The system alias is displayed in the lower right corner.
2. Check the system alias configuration in the IMG.
   To do so, make settings in the *Manage SAP System Aliases* customizing activity in the IMG (transaction SPRO) under *SAP NetWeaver* > *Gateway* > *Configuration* > *Connection Settings* > *SAP Gateway to SAP System* > *Manage SAP System Aliases*.
3. Check that the *For Local App* flag is not selected.



6.2.3 Error “Service Failed” in App

Issue Description

When users start the app, a popup is displayed saying that the service failed.

Issue Analysis & Resolution

This error is raised when the OData service is not active. Call the transaction `/IWFND/MAINT_SERVICE` and activate the service. The corresponding ICF node must be active too.

6.2.4 Web Dynpro ABAP / SAP GUI for HTML App Cannot Be Started

Issue Description

Users want to start a Web Dynpro ABAP or an SAP GUI for HTML app but they get an error message instead. Below is an example of the error message for the *Set Controlling Area* app.



Issue Analysis & Resolution

This error message is an indicator that a connection is not properly established between the frontend server and the backend server, where the Web Dynpro ABAP or SAP GUI for HTML app is located.

One possible cause for this can be a missing RFC connection for a specific system alias. For more information, see Configuration Steps for SAP GUI for HTML Transactions, Web Dynpro Applications, and WebClient UI Applications [page 92].

6.2.5 New App in Catalog Does Not Appear on the SAP Fiori Launchpad

Issue Description

You have added a new app to an existing catalog and transported the catalog to a target system but it does not show up on the end users' SAP Fiori launchpad.

Possible Root Causes

For this problem, there are several possible root causes:

- Root cause 1: Caches have not been cleared.
- Root cause 2: App is not released for the device type.
- Root cause 3: Target mapping is not part of a catalog included in the users' role.
- Root cause 4: Customizing layer is overwriting the configuration layer.

Issue Analysis and Resolution

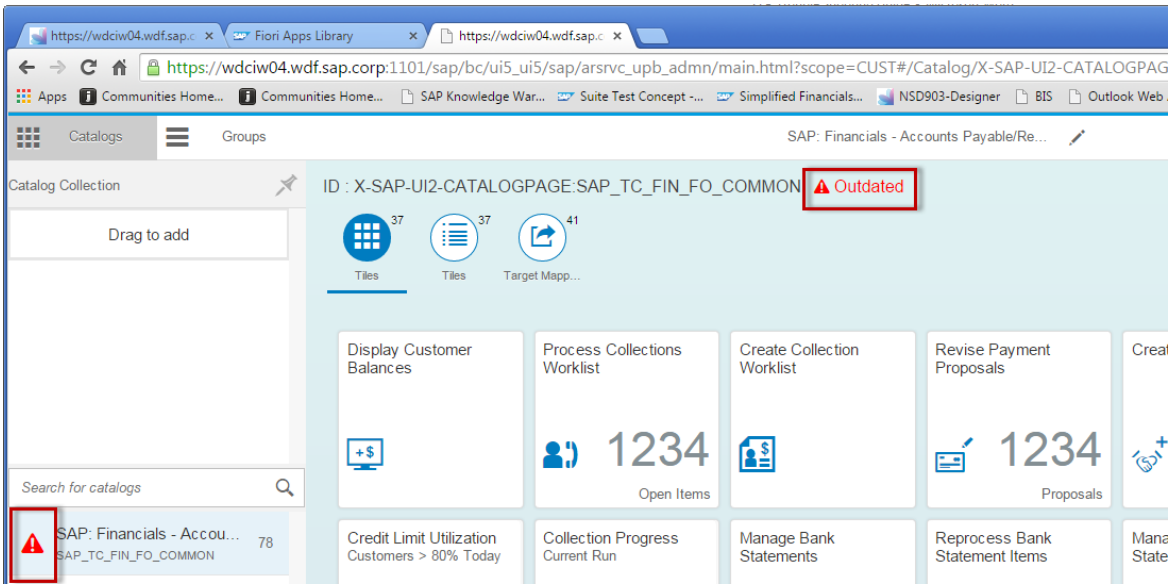
- Root cause 1
  Delete the caches.
  The users should delete the browser cache.
  The admin should delete the SAP Fiori launchpad caches by starting the `/UI2/INVALIDATE_GLOBAL_CACHES` report.
- Root cause 2
  Check the target mapping.
  If the issue occurs only on certain device types, the target mapping was not released for the device type and thus the tile is automatically hidden.

Semantic Object	Action	Navigation type	Information	Desktop	Tablet	Phone	Re
Customer	manageLineItems	SAPUI5-based		✓	✕	✕	
Customer	displayBalance	SAPUI5-based		✓	✕	✕	
CustomerAccountingDocument	displayFactSheet	SAPUI5-based		✓	✓	✓	

- Root cause 3
  Check if the user has a role assigned that points to the catalog that includes the target mapping.

  > **Note**
  >
  > It is important to understand that if a role points to groups with apps coming from different catalogs, all relevant catalogs have to be in that role. If one catalog is missing, all apps coming from the missing catalog are automatically hidden.

- Root cause 4
  Check if there is a customizing layer for the catalog.
  If the catalog was changed in the designer in CUST mode (customizing mode), a layer is created that hides new apps coming into the catalog in CONF mode (configuration mode).
  To check if such a layer exists, use the SAP Fiori launchpad content check (transaction `/UI2/FLC`). Use the report first with the setting for *Configuration*. If the report does not display any error for the app that causes the problems, run it for *Customizing*.
  Call the SAP Fiori launchpad designer in CUST mode (URL extension `scope=CUST`). Catalogs that differ between the customizing and configuration layers are marked with a red icon.



To delete the customizing layer, while you are in the customizing mode (!), drag the catalog to the trash bin area. Then refresh the browser.

→ Tip

You can easily identify which mode you are in by checking the upper right corner. If you can see *Client: ALL*, you are in configuration mode, and if a specific client is displayed, you are in customizing mode.

Configuration Mode:



Customizing Mode:



6.2.6 SAP Fiori Content Doesn't Get Deleted Correctly

Issue Description

You quickly delete a series of tiles/mappings. The objects disappear from the designer but, after a refresh of the browser, some of the deleted objects appear again.

Issue Resolution

When deleting objects from the SAP Fiori launchpad designer, wait until you get the toast message that the object was successfully deleted before trying to delete the next object.

6.2.7 Chip Instance Not Found

Issue Description

You are creating, for example, new tiles in a catalog. When you try to save the configuration details, you receive an error message stating that a chip instance was not found and after refreshing the browser, none or only parts of your data was saved.

Issue Resolution

This effect can occur when more than one application server is used. When a tile or mapping is created, the OData service is redirected to one server to retrieve the GUID of the tile/mapping, but when you enter the details and save again, the request might be redirected to a different server. If the time between the save actions is very short, the servers might not be in sync. Then, the SAP Fiori launchpad designer raises an error because the second request wants to save data for a tile/mapping that does not exist yet on the other server.

If you have a multi-server setup, follow the instructions in SAP Note 2057804.

6.2.8 No Or Too Little Data Is Shown in the App

Issue Description

Users call an app and see either no data or too little data, even when the app is configured properly.

Issue Analysis and Resolution

The most probable reason is an authorization issue:

1. Check if any authorization violations are shown in the transaction SU53.
2. If transaction SU53 shows no violations, the issue could be the following:
   Some apps make use of the Service Adaption Definition Language (SADL). This API offers the possibility to pass ABAP authorization objects. If this is used, an SQL statement is generated that excludes all data the user is not allowed to see by evaluating the handed-over authorization objects.
   This technique leads to the issue that a valid SQL statement without any authorization violations is always generated. This means transaction SU53 cannot pick up any issues and the app will not raise an error message indicating that there is a lack of authorizations.
   For more information, please read SAP Note 2147808.
   Similar cases are when apps directly make use of CDS views where authorizations are modeled in DCLs. In that case all authorizations traces only show positive results even if due to missing authorizations the returned dataset was reduced.

If no data is shown, there could be a second reason. In very rare cases, it can happen that the artifacts of Data Control Language (DCL) on the ABAP server are not synchronized with the database. In this case, an initial load can be triggered with the SACM transaction. Be aware that this initial load takes some time and should not be done during production use.

The component for problems related to DCL issues is BC-SEC-AUT-DCL.

6.2.9 OData Service of Factsheets Cannot Be Activated

Issue Description

You are not able to activate a Factsheet-specific OData service. The following message is displayed: "Metadata not loaded - See /IWEP/ERROR_LOG...".

Issue Resolution

1. Log on to the backend and start the transaction ESH_TEST_SEARCH.
2. Enter the corresponding connector (for example, DBOM1_H) as object type and run the report (F8) or check the connector.
3. In case of an error stating that there are no search connectors for selected scope, activate the corresponding search connector in the backend.

6.2.10 How to Find Out which SAP GUI Transactions Can Be Used on the SAP Fiori Launchpad

To find out if a certain transaction, Web Dynpro ABAP application, or WebClient UI application can be used on the SAP Fiori launchpad, you can search for it in the SAP Fiori apps reference library. To do so, choose *All apps for SAP S/4HANA* > *All Apps* and enter the transaction code into the search field. If an entry is found, it means that the transaction has been assigned an app descriptor and is eligible for usage in the SAP Fiori launchpad.

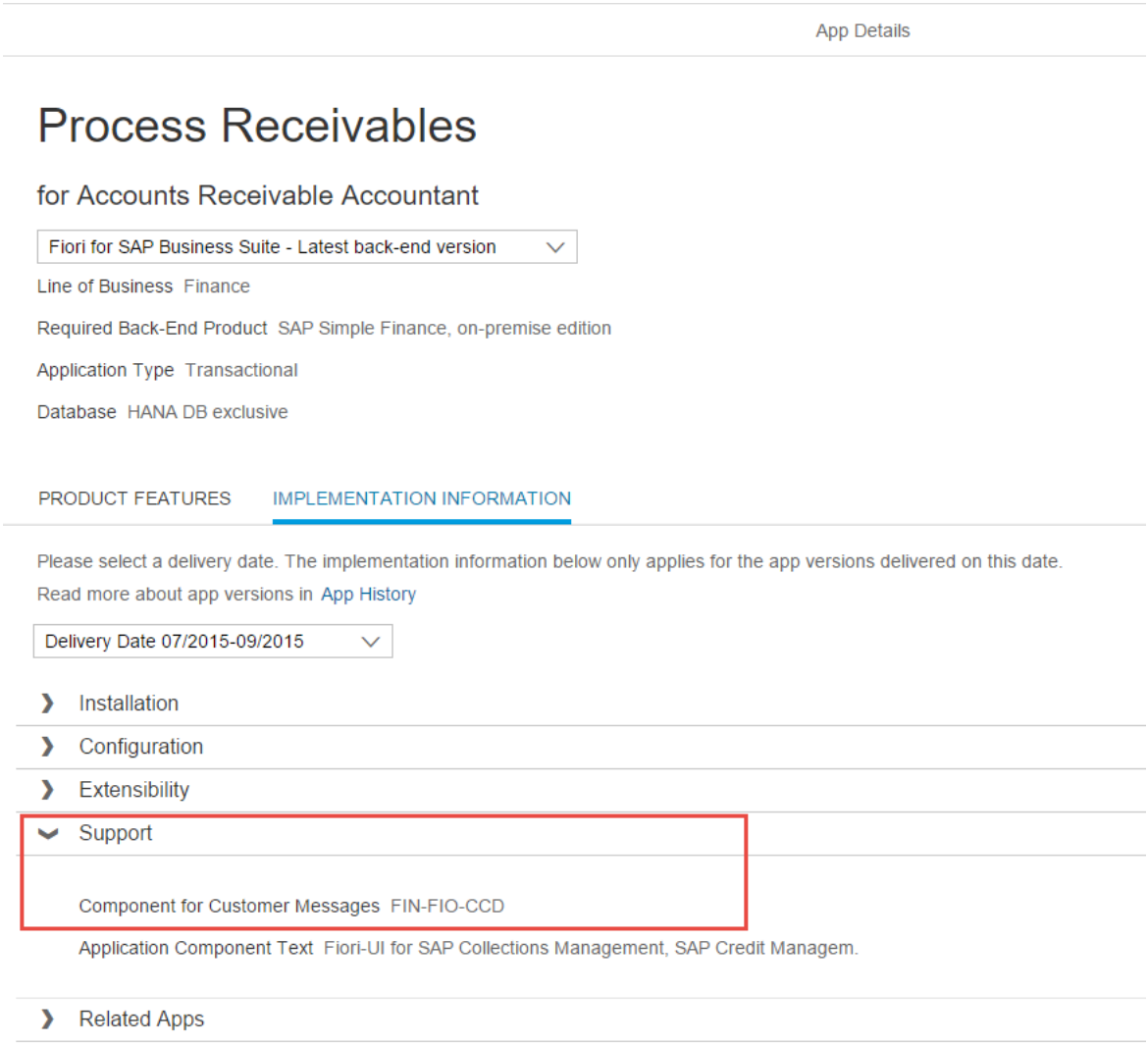
Alternatively, you can call transaction `MM_APP` in the backend system to search for existing app descriptors of transactions. You can also use `MM_APP` to create app descriptors for your own transactions, Web Dynpro ABAP applications, or WebClient UI applications.

6.2.11 How to Improve Ticket Processing Time

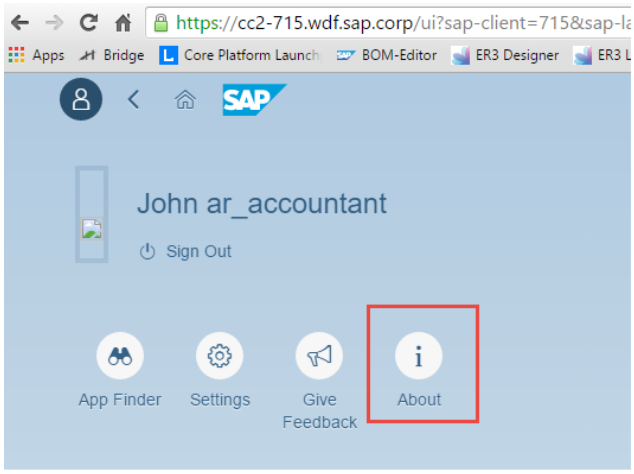
To speed up the processing time of tickets, try these quick fixes:

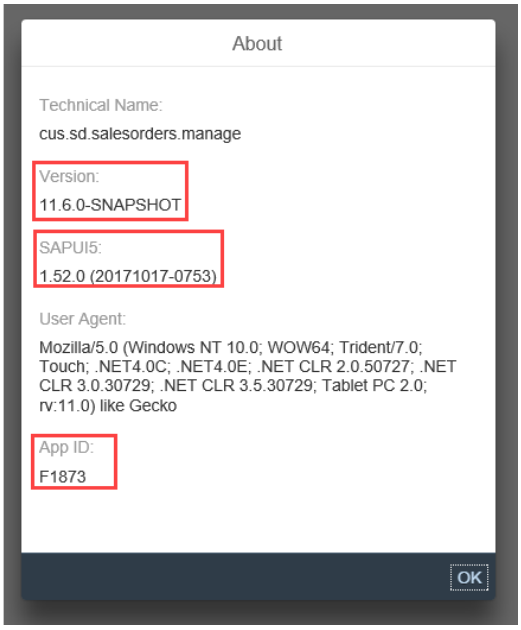
- Use the correct component.

To find the correct component for creating tickets, please check the app information in the SAP Fiori apps reference library. Here is an example:

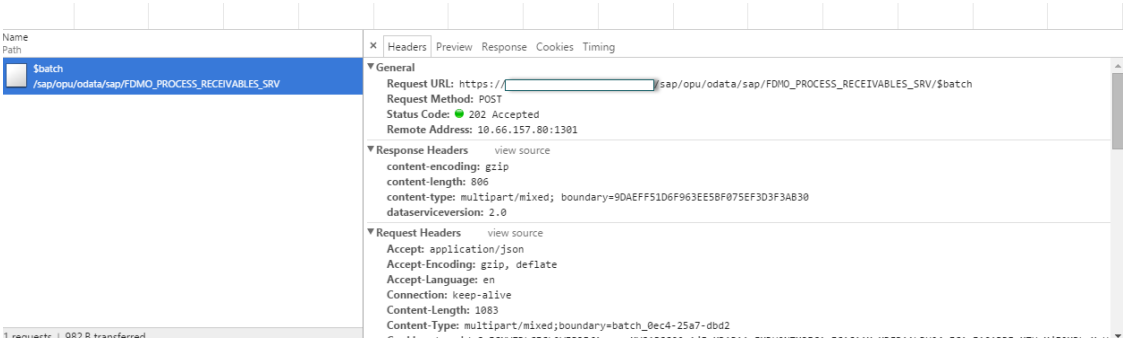


- Always provide the backend system information and gateway system (if a local gateway is not used).
- Provide the app version, SAP UI5 version, and SAP Fiori app ID in the ticket.
  To retrieve this information, call the *About* dialog of the app.





- Try to find out if the problem is a backend or frontend issue:
  - Perform all actions until you are one step ahead of the action causing the issue.
  - Open the developer tools of your browser (F12), clear the shown network, and console entries.
  - Perform the action that causes the issue and retrieve the proper network request:



  - Check if the request works without any issues or timeouts.
  - Provide this information and the retrieved request in the ticket to accelerate processing time.

6.2.12 Apps For Job Scheduling or Application Log Display Cannot Be Opened

Issue Description

Applications that are using the job scheduling or application log framework are not starting and showing error message "Error – Could not open app".

Issue Resolution

If this issue occurs for applications that are of type *Transactional (Generic UI5 Job Scheduling Framework)* according to the SAP Fiori apps reference library, please check if the software component `UIBAS001` is installed on the frontend server.

Those applications use generic services and UIs from ABAP Platform and only provide app-specific configurations that are part of the application frontend software component like `UIAPFI70`. So both UI software components are required to get the apps running.

6.2.13 Apps Are Not Working Anymore After Upgrade

Issue Description

After an upgrade, certain apps that worked before can no longer be opened.

Issue Analysis & Resolution

Some SAP Fiori apps make use of the user default settings that users can enter on the SAP Fiori launchpad under *Settings* > *Default Settings*.

Such applications require the activation of the service `FIN_USER_DEFAULTPARAMETER_SRV` on the frontend server. In addition, the business catalogs containing SAP Fiori apps that require this service must have the target mapping with the intent `shell~plugin`.

If certain apps no longer work after an upgrade, check whether the service and the mapping are configured correctly.

For more information, go to https://help.sap.com/s4hana_op_1909, enter *Additional Implementation Activities for All Finance Apps* into the search bar, press `Enter`, and open the search result with that title.

6.2.14 System Error When Accessing Knowledge Provider

Issue Description

When uploading a file or an attachment in an SAP Fiori app that sends the call to the SAPOffice API, the error message `System error when accessing Knowledge Provider` is displayed and the action is canceled.

Issue Resolution

In transaction SLG1, check logs for object SCMS and SDOK (for user uploading the document) and look for erroneous entries. Common problems include:

- The content repository is not set up (or not set up correctly) – see transaction OAC0.
- Antivirus rejects the entry.
- Inconsistency in table SDOKPROF.

7 Extensibility

SAP S/4HANA natively embodies key user in-app extensibility tools, offering the means to change and adapt the UI layout and context, create custom fields, create and extend analytical reports and forms, and change the business logic. With SAP S/4HANA, you can implement in-app extensions satisfying all extensibility qualities. In particular, end-to-end tools enable business experts to apply changes without risk, as the technical complexity is reduced to a level that corresponds to the business purpose and is stable and fault tolerant. Thanks to a strict tool-based approach, these extensions are loosely coupled with core business processes and contribute to a pace-layered IT.

In addition, the UI development toolkit for HTML5 (SAPUI5) offers you a broad range of means for adapting SAP Fiori apps to your specific requirements.

7.1 Adapting the User Interface

Use

Key users can adapt the user interface (UI) of their apps at runtime in a modification-free way, for example, by adding, removing, or moving fields and groups. Runtime adaptation is supported for apps that use SmartForm controls with stable IDs. Note that you can only add fields which have been made available for this app. If you need additional fields, you have to create them as described under Creating Custom Fields and Custom Business Logic.

More Information

For more information, go to https://help.sap.com/s4hana_op_1909, enter *Adapting SAP Fiori UIs at Runtime - Key User Adaptation* into the search bar, press `Enter`, and open the search result with that title.

7.2 Creating Custom Fields and Custom Business Logic

Use

Field extensibility refers to the capability to add customer-specific fields (custom fields) to a business context of an application (for example, a sales order item or a customer address) in a one-to-one relation. After the field has been defined, all necessary software artifacts are generated by the extensibility tool: SAP database tables and application structures are enhanced by using the “DDIC extension include” concept. Assigned SAP

core data service (CDS) views, SAP Fiori search, and OData services are extended as well. As the applications are prepared for this kind of extensibility, they do consider these extension fields in their business logic, so the generated fields can be used directly.

Business logic extensibility refers to the enhancement of the behavior of applications and processes. You can enhance a modifiable application at a designated point to implement your custom logic.

You use the *Customer Fields and Logic* app to implement these extensions.

More Information

For more information, see https://help.sap.com/s4hana_op_1909 under *Product Assistance* > *Enterprise Technology* > *ABAP Platform* > *General Functions for Key Users* > *Extensibility Information*.

7.3 Adding Custom Views

Use

To extend views, you use extension points. These constitute anchor points for extensions. To activate an extension point, you insert the SAPUI5 control `< core:ExtensionPoint / >` into an SAP-shipped HTML5 application based on an XML-type view. Extension points are documented and kept stable. This means that any extensions plugging in are more robust across application updates.

More Information

For more information, go to https://help.sap.com/s4hana_op_1909, enter *SAPUI5: UI Development Toolkit for HTML5* into the search bar, press `Enter`, open the search result with that title, and navigate to the following sections:

- *Extending Apps* > *Using Component Configuration* > *View Extension*
- *Essentials* > *Model View Controller (MVC)* > *Views* > *XML View*

7.4 Adapting Database Extensions to SAP S/4HANA

Context

When you convert your system from SAP Suite on HANA to SAP S/4HANA, modifications to the SAP HANA database remain unchanged. However, to make your modifications visible on the UI, manual steps can be required in different content layers.

Procedure

1. If required for your modifications, adapt the relevant Core Data Service (CDS) views in the SAP Business Suite layer. You can extend CDS views by using ABAP development tools. For more information, see https://help.sap.com/s4hana_op_1909 ▶ *Use* ▶ *Product Assistance* ▶ *English* ▶ *Enterprise Technology* ▶ *ABAP Platform* ▶ *Developing on the ABAP Platform* ▶ *Development Concepts and Tools* ▶ *Application Development on AS ABAP* ▶ *ABAP Development Tools - Eclipse* ▶ *SAP - ABAP CDS Development User Guide* ▶ *Tasks* ▶ *Extending Data Models* ▶.
2. If required for your modifications, adapt the OData services for your CDS views in the SAP Gateway layer:
   - For OData services that are included in a CDS view definition as an annotation, the relevant artifacts are generated automatically. No modifications are required in the SAP Gateway layer. For more information, see https://help.sap.com/s4hana_op_1909 under ▶ *Use* ▶ *Product Assistance* ▶ *English* ▶ *Enterprise Technology* ▶ *ABAP Platform* ▶ *Developing on the ABAP Platform* ▶ *Development Concepts and Tools* ▶ *Application Development on AS ABAP* ▶ *SAP (On-Premise) - ABAP Programming Model for SAP Fiori* ▶ *Get Started* ▶ *Developing a Simple List Reporting App* ▶ *Generating OData Service With Auto-Exposure* ▶.
   - OData services that are not included in a CDS view definition must be redefined in Service Builder. For more information, see https://help.sap.com/s4hana_op_1909 under ▶ *Use* ▶ *Product Assistance* ▶ *English* ▶ *Enterprise Technology* ▶ *ABAP Platform* ▶ *Developing on the ABAP Platform* ▶ *Development Concepts and Tools* ▶ *SAP Gateway Foundation (SAP_GWFND)* ▶ *SAP Gateway Foundation Developer Guide* ▶ *SAP Gateway Service Builder* ▶ *Data Modeling Basics* ▶ *Data Modeling Options* ▶ *Redefining Services* ▶.
3. If available for your app, you can use runtime adaptation to add, move, or remove view fields in the UI layer. For more information, see Adapting the User Interface [page 138]. As an alternative, you can extend views by using SAP UI5 extension points. For more information, see https://help.sap.com/s4hana_op_1909 under ▶ *Use* ▶ *Product Assistance* ▶ *English* ▶ *Enterprise Technology* ▶ *ABAP Platform* ▶ *UI Technologies* ▶ *SAPUI5: UI Development Toolkit for HTML5* ▶ *Extending Apps* ▶ *Using SAPUI5 Flexibility* ▶.

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