

PUBLIC
SAP Service and Asset Manager
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SAP Service and Asset Manager Application Product Overview - Windows

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THE BEST RUN SAP

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1 Submitting Improvement Requests

You can submit your improvement request for SAP Service and Asset Manager to the SAP Customer Influence site, a central place for all product improvement requests.

You can browse all improvement requests, submit improvement requests, comment, vote, receive updates, and see who has voted at the SAP Customer Influence site.

> **Note**
>
> Before you submit your improvement, check if a similar improvement hasn't already been submitted. If a similar improvement is already in the system, vote for it instead of submitting a new improvement request.

Procedure

1. Access the SAP Customer Influence site from the following link:https://influence.sap.com/sap/ino/#/campaign/2665
2. Log in with your S-user ID.
3. Choose *Improvement Request* on the left panel.
4. Enter the details for your improvement request:

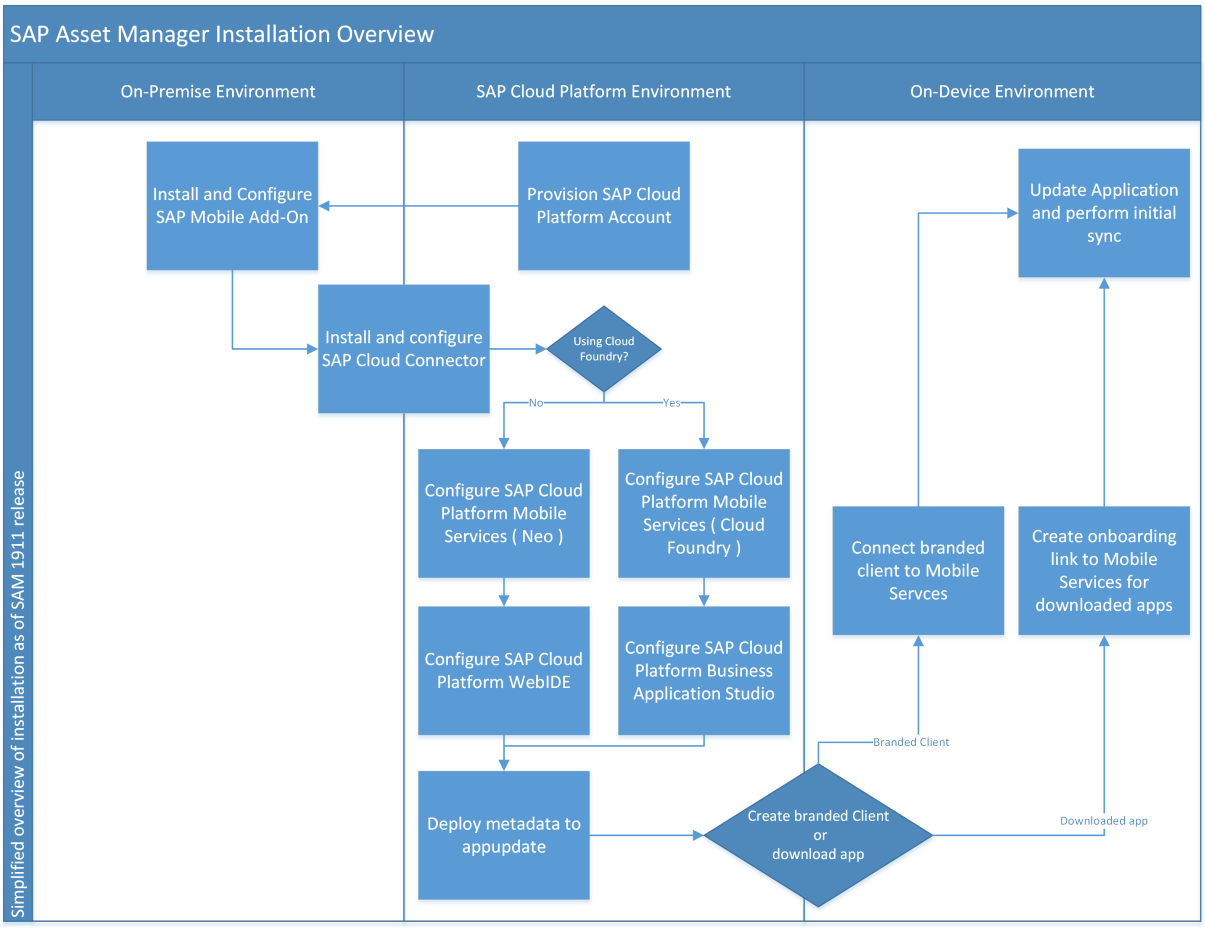
Field	Notes
Project	Prepopulated with SAP Service and Asset Manager. Don't change.
Title	Enter a title that clearly states your request and area of improvement.
Category	Select the category that best fits your request.
Description	Follow the template to enter details about your suggestion. Provide as much detail as possible.
Tags	(Optional) Add tags that can help others find your request.

   You can also provide links, attachments, or add co-authors.

5. Click *Submit* when you're ready to submit your improvement request.

2 Getting Started with SAP Service and Asset Manager - Overview

You can find a complete high-level installation process overview in the *SAP Service and Asset Manager Installation Guide*.



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- https://help.sap.com/viewer/DRAFT/fb9ae24b2b77468ba00e10df21c5cf24/latest/en-US/62a78f4ee72a4b0c80101be9ca6e400a.html [https://help.sap.com/viewer/DRAFT/fb9ae24b2b77468ba00e10df21c5cf24/latest/en-US/62a78f4ee72a4b0c80101be9ca6e400a.html]
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- https://help.sap.com/viewer/DRAFT/d2e76ee96b6141c9bfc3afae96b7aa71/latest/en-US/50d2c45ad08b4231b1c3fcc0c096f95f.html [https://help.sap.com/viewer/DRAFT/d2e76ee96b6141c9bfc3afae96b7aa71/latest/en-US/50d2c45ad08b4231b1c3fcc0c096f95f.html]
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The SAP Service and Asset Manager requires a compatible environment to operate in. Requisite components include:

- From the SAP Business Technology Platform:
  - An SAP Business Technology Platform account provisioned with the following services:
    - SAP BTP services for development and operations
    - SAP Web IDE full stack
- From the on-premise environment:
  - An SAP on-premise back-end system compatible with your SAP S/4HANA or SAP ERP mobile add-on. For more information, see the topic.
  - A Cloud Connector to connect your SAP on-premise back-end system to the SAP Business Technology Platform
- A mobile device capable of running a version of the Mobile Development Kit compatible with the SAP Service and Asset Manager application.
  - All requisite components for the SAP Service and Asset Manager are installed upon completion of the SAP Service and Asset Manager installation process.

2.1 SAP Service and Asset Manager Application

SAP Service and Asset Manager leverages the digital core with SAP S/4HANA as well as the SAP Business Technology Platform as an IoT platform.

SAP Service and Asset Manager manages work orders, notifications, condition monitoring, material consumption, time management, and failure analysis.

The Mobile Development Kit provides a runtime and full customization framework for SAP Service and Asset Manager. Users can easily customize SAP Service and Asset Manager by adding and editing actions, business logic, screens, and styling.

2.1.1 Supported Languages

The SAP Service and Asset Manager application supports the following languages:

- zh_hans - Simplified Chinese
- zh_hant - Traditional Chinese
- csCZ - Czech Republic
- daDK - Danish
- nlBE - Dutch
- elGR - Greek
- enUS - English
- frFR - French
- deDE - German
- hrHR - Croatian
- huHU - Hungarian
- itIT - Italian
- jaJP - Japanese
- koKR - Korean
- nbNO - Norwegian
- plPL - Polish
- ptBR - Portugese
- roRO - Romanian
- RuRU - Russian
- srSP - Serbian
- skSK - Slovak
- slSL - Slovenian
- esES - Spanish
- svSE - Swedish
- thTH - Thai
- trTR - Turkish

2.2 Mobile Development Kit

The Mobile Development Kit is a metadata based application development platform.

> **Note**
>
> See the following topics and guides for detailed information on the Mobile Development Kit and the SAP Web IDE:
>
> - SAP Web IDE: See the Getting Started chapter of the SAP Web IDE Full-Stack guide.
> - Mobile Development Kit: See the Using SAP Cloud Platform Mobile Services, mobile development kit guide.
> - If a custom SAP Service and Asset Manager build is needed for Cloud Foundry, see the Creating a Build Job for Customized MDK Clients procedure.

The Mobile Development Kit lets you customize, deploy, and manage SAP Service and Asset Manager in the cloud. The Mobile Development Kit editor lets you edit your various aspects of your application using the Mobile Development Kit editor. It also provides native client support and consumes mobile services such as onboarding, offline OData, life cycle management, and supportability through the SAP Business Technology Platform using the Mobile Development Kit client.

The Mobile Development Kit allows business process experts to customize SAP Service and Asset Manager in a cloud-based editor using SAP Web IDE, and developers to code directly in the metadata files.

3 SAP Business Technology Platform Overview

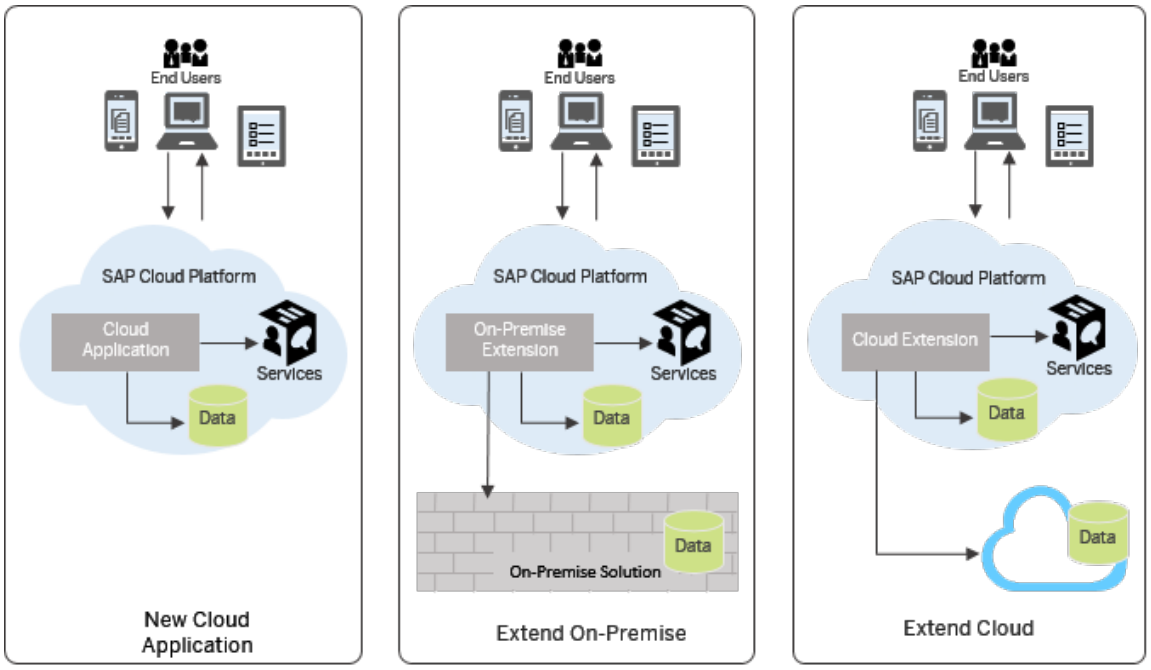
SAP Business Technology Platform enables customers and partners to rapidly build, deploy, and manage cloud-based enterprise applications that complement and extend your SAP or non-SAP solutions, either on-premise or on-demand.

> **Note**
>
> For more information on prerequisites and procedures for setting up customer accounts on SAP Business Technology Platform, see the topic Getting Started with a Customer Account: Workflow in the Neo and Cloud Foundry environment.

SAP Business Technology Platform is an in-memory cloud platform based on open standards. It provides access to a feature-rich, easy-to-use development environment in the cloud. The platform includes a comprehensive set of services for integration, enterprise mobility, collaboration, and analytics.

As a Platform-as-a-Service operated by SAP, our product frees your administrators from any infrastructure and IT costs and offers state-of-the art quality of service.

Scenarios



- Develop new cloud applications

This scenario is suitable for companies that need to start developing new applications from scratch. You can create brand new cloud applications and reach your end customers easily, with a low learning curve and small capital investment in software and hardware.

- Develop on-premise extensions
  This scenario is suitable for companies that have already invested a lot in on-premise IT infrastructure. You can create the new extensions to the system on the cloud, and integrate seamlessly with the on-premise components using Connectivity Service and Cloud Connector.
- Develop cloud extensions
  At SAP Business Technology Platform, you can also develop extensions to other cloud products, such as SuccessFactors.

Application development

You can use the following programming models to build highly scalable applications:

- Java - SAP Business Technology Platform is Java EE 6 Web Profile certified. You can develop Java applications just like for any application server. You can also easily run your existing Java applications on the platform.
- SAP HANA - you can use the SAP HANA development tools to create comprehensive analytical models and build applications with SAP HANA programmatic interfaces and integrated development environment.
- HTML5 - you can easily develop and run lightweight HTML5 applications in a cloud environment.
- SAPUI5 - use the UI Development Toolkit for HTML5 (SAPUI5) for developing rich user interfaces for modern Web business applications.

Solutions

In the context of SAP Business Technology Platform, a solution is comprised of various application types and configurations created with different technologies, and is designed to implement a certain scenario or task flow. You can deploy solutions by using the Change and Transport System (CTS+) tool, the console client, or by using the cockpit, where you can also monitor your solutions. To describe and technically realize the solutions, SAP Introduces the multi-target application (MTA) model. It encompasses and describes application modules, dependencies, and interfaces in an approach that facilitates validation, orchestration, maintenance, and automation of the application throughout its lifecycle.

Runtime container for applications

Applications developed on SAP Business Technology Platform run in a modular and lightweight runtime container. The platform provides a secure, scalable runtime environment with reusable platform services.

Virtual Machines

Virtual machines allow you to install and maintain your own applications in scenarios not covered by the platform. A virtual machine is the virtualized hardware resource (CPU, RAM, disk space, installed OS) that blends the line between Platform-as-a-Service and Infrastructure-as-a-Service.

Services

You can consume a set of services provided by SAP Business Technology Platform according to the technology you prefer and the use cases of your scenarios.

Integration with SAP and non-SAP software

SAP Business Technology Platform facilitates secure integration with on-premise systems running software from SAP and other vendors. Using the platform services, such as the connectivity service, applications can establish secure connections to on-premise solutions, enabling integration scenarios with your cloud based applications.

In-memory persistence

SAP Business Technology Platform includes persistence powered by SAP HANA, taking full advantage of its real-time, in-memory computing technology and built-in analytics.

Secure data

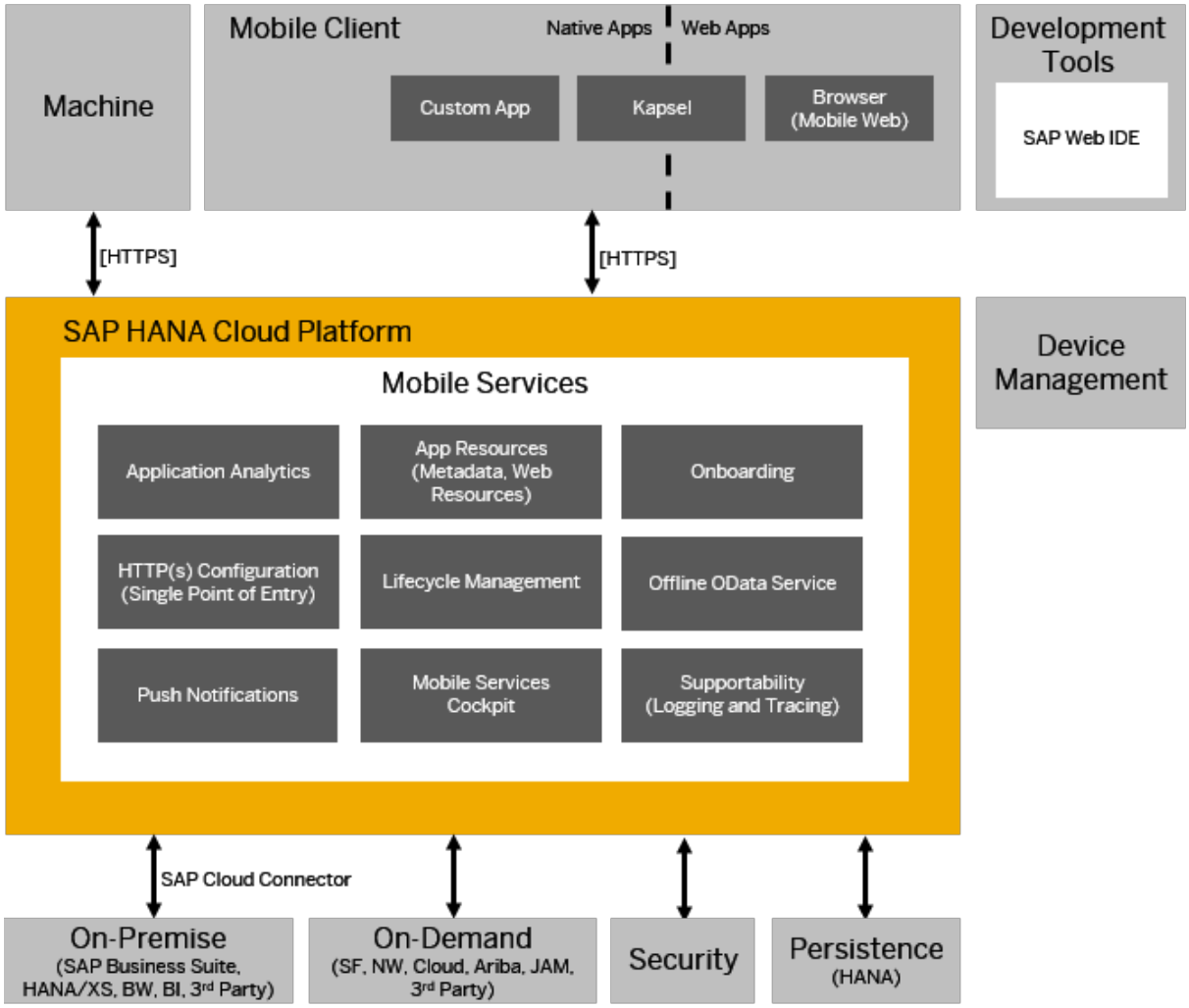
Comprehensive, multilevel security measures have been built into SAP Business Technology Platform. This security is engineered to protect your mission critical business data and assets and to provide the necessary industry standard compliance certifications.

Free trial

You can start by getting a free SAP Business Technology Platform developer license on SAP Business Technology Platform Developer Center that also gives you access to our community and all the free technical resources, tutorials, blogs, support you need.

3.1 SAP Business Technology Platform Mobile Services Overview

SAP Business Technology Platform Mobile Services, or SAP BTP services, provides services to mobile applications, such as application analytics, app resources, onboarding, and HTTP/HTTPS configuration.



Mobile application services consist of the following:

- **Application analytics:** Usage statistics that are displayed graphically in the SAP BTP cockpit
- **App resources:** Containers of dynamic configurations, styles, or content that are downloaded by native applications
- **Onboarding:** Authentication of users who are registering through SAP Mobile Place
- **HTTP/HTTPS configuration:** Open standards for client communications
- **Life cycle management:** Managing and deploying multiple versions of an application
- **Offline oData service:** Optimizes data transport between the back end and the client offline store
- **Push notifications:** Native notifications sent from back-end systems to the server, which forwards them on to the clients

- **SAP BTP cockpit:** Deploys, manages, and monitors applications
- **Supportability:** Logs for monitoring system health and troubleshooting

SAP BTP services can expose on-premise back end services through Cloud Connector, and on-demand back end services directly.

SAP BTP services security enables you to use an on-premise identity management system for on-demand applications. You can use basic authentication using LDAP, or form-based application authentication using SAML.

All configuration and runtime data is persisted in an SAP S/4HANA database.

3.2 SAP Business Technology Platform SDK Overview

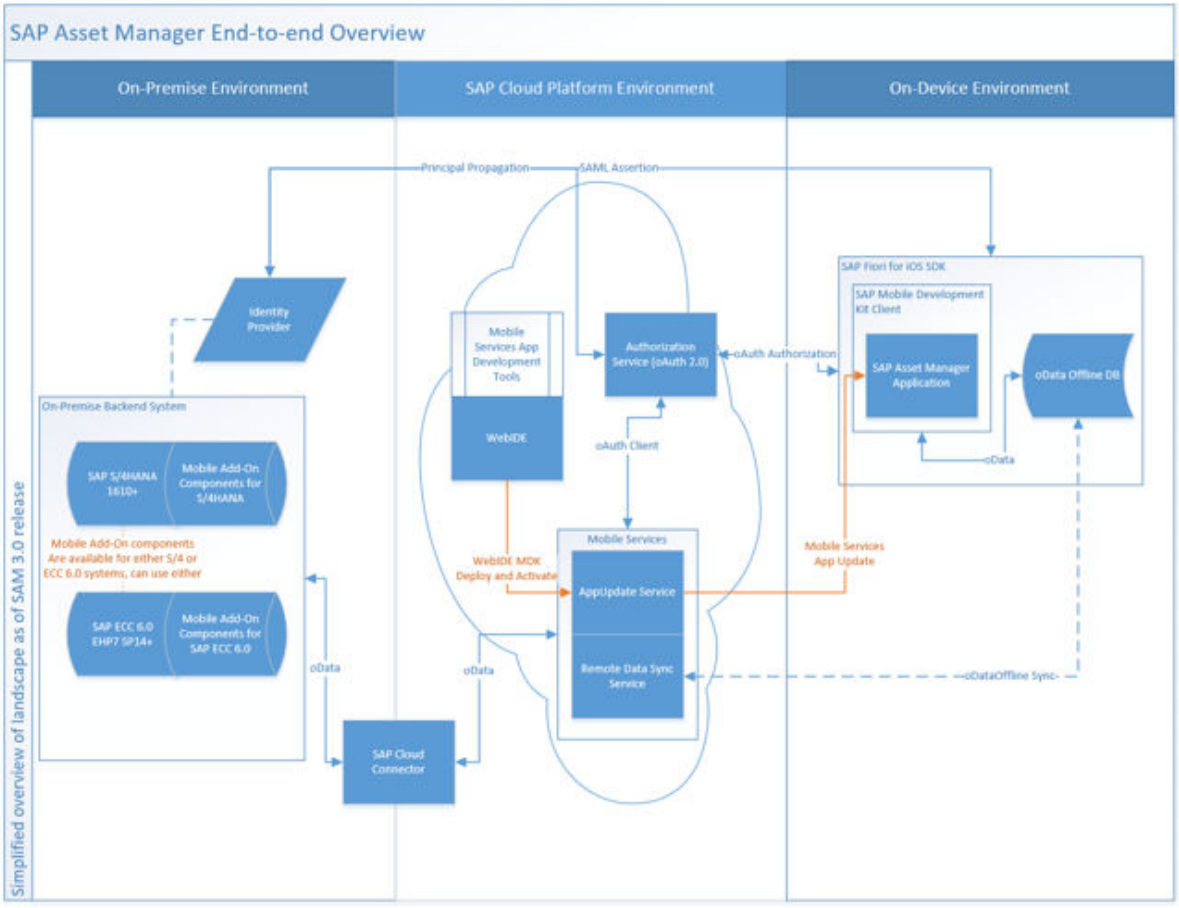
The SAP Business Technology Platform SDK includes well defined layers (SDK frameworks, components, and platform services) that simplify development of enterprise-ready mobile native apps that take full advantage of the mobile platform features.

The SAP Business Technology Platform SDK is tightly integrated with the SAP Business Technology Platform Mobile Services Cockpit to provide the following:

- End-to-end integrated security
- Support for offline applications
- Enterprise grade logging and monitoring support
- Access to core SAP ERP or SAP S/4HANA data and business processes, as well as access to third-party data sources
- Access to SAP Business Technology Platform capabilities and services.

4 How SAP Service and Asset Manager Works in a Neo Environment

> **Note**
>
> The following information details setting up subaccounts on Neo environments for use with SAP Service and Asset Manager. For informaion on how to set up Cloud Foundry subaccounts with SAP Service and Asset Manager, see the topic .



These components work in concert to continuously synchronize data from the back end SAP on-premise database onto the SAP Service and Asset Manager application on mobile devices through the following flow:

1. The SAP Service and Asset Manager application requests authorization from the SAP Business Technology Platform to authenticate against an identity provider defined by the SAP Business Technology Platform using an oAuth2.0 Service.
2. SAP Service and Asset Manager uses the authorization grant from the oAuth 2.0 service to access the remote data sync feature on the mobile service of the SAP Business Technology Platform using the retrieved authentication.

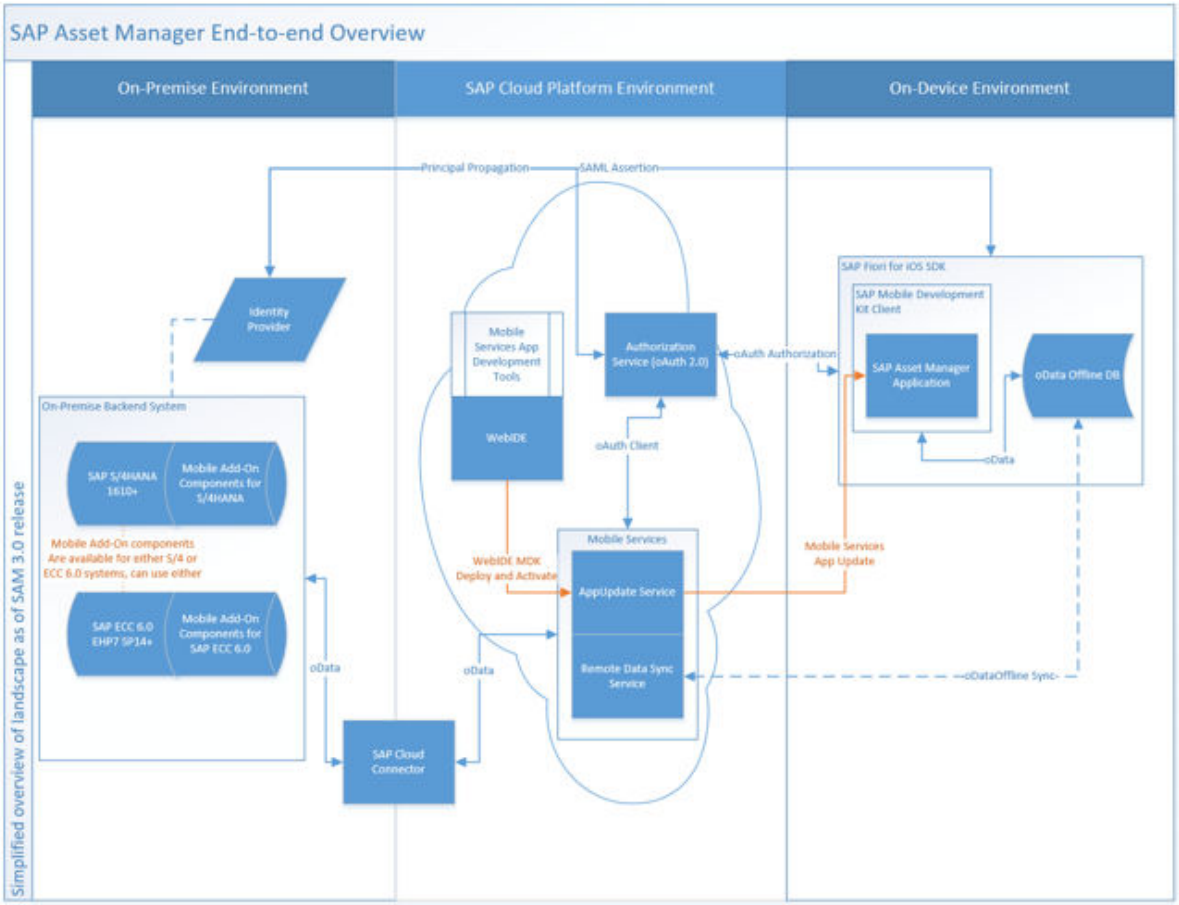
3. The remote data sync feature forwards data synchronization requests from the SAP Service and Asset Manager application to the Cloud Connector as OData requests, along with the requisite authentication via principal propagation.
4. The Cloud Connector brings the OData requests into the secured on-premise environment, and forwards it to the SAP Mobile Add-On installed on the on-premise NetWeaver Gateway of the SAP system.
5. The SAP Mobile Add-On then generates the requisite responses and sends the OData response to the Cloud Connector to be returned to the remote data sync feature on mobile services.
6. The remote data sync feature synchronizes the offline data store on the device with the OData response returned from the SAP Mobile Add-On.

Additionally, another set of components work in concert to ensure that the SAP Service and Asset Manager application itself is up-to-date and behaves as intended through the following flow:

1. Users can use the SAP Web IDE on the SAP Business Technology Platform uses the SAP Business Technology Platform Mobile Services development tools plug-in to update the SAP Service and Asset Manager application or install additional components onto the application.
2. The SAP Web IDE can perform an *MDK Deploy and Activate* of the updated application definitions for SAP Service and Asset Manager to the AppUpdate feature from SAP Business Technology Platform Mobile Services.
3. SAP Service and Asset Manager periodically checks the AppUpdate feature for new definitions of SAP Service and Asset Manager, and retrieves the updates on demand.

5 How SAP Service and Asset Manager Works in a Cloud Foundry Environment

> **Note**
>
> The following information details setting up subaccounts on Cloud Foundry environments for use with SAP Service and Asset Manager. For informaion on how to set up Neo subaccounts with SAP Service and Asset Manager, see the topic .



These components work in concert to continuously synchronize data from the back end SAP on-premise database onto the SAP Service and Asset Manager application on mobile devices through the following flow:

1. The SAP Service and Asset Manager application requests authorization from the SAP Business Technology Platform to authenticate against an identity provider defined by the SAP Business Technology Platform using an oAuth2.0 Service.
2. SAP Service and Asset Manager uses the authorization grant from the oAuth 2.0 service to access the remote data sync feature on the mobile service of the SAP Business Technology Platform using the retrieved authentication.

3. The remote data sync feature forwards data synchronization requests from the SAP Service and Asset Manager application to the Cloud Connector as OData requests, along with the requisite authentication via principal propagation.
4. The Cloud Connector brings the OData requests into the secured on-premise environment, and forwards it to the SAP Mobile Add-On installed on the on-premise NetWeaver Gateway of the SAP system.
5. The SAP Mobile Add-On then generates the requisite responses and sends the OData response to the Cloud Connector to be returned to the remote data sync feature on mobile services.
6. The remote data sync feature synchronizes the offline data store on the device with the OData response returned from the SAP Mobile Add-On.

Additionally, another set of components work in concert to ensure that the SAP Service and Asset Manager application itself is up-to-date and behaves as intended through the following flow:

1. Users can use the SAP Web IDE on the SAP Business Technology Platform uses the SAP Business Technology Platform Mobile Services development tools plug-in to update the SAP Service and Asset Manager application or install additional components onto the application.
2. The SAP Web IDE can perform an *MDK Deploy and Activate* of the updated application definitions for SAP Service and Asset Manager to the AppUpdate feature from SAP Business Technology Platform Mobile Services.
3. SAP Service and Asset Manager periodically checks the AppUpdate feature for new definitions of SAP Service and Asset Manager, and retrieves the updates on demand.

6 SAP On-Premise Environment

In order to connect to an SAP back end, a compatible on-premise environment with the SAP Mobile Add-On must be available.

The SAP back end communicates with the SAP Business Technology Platform via the Cloud Connector. You can find more information on the Cloud Connector in the SAP Business Technology Platform Connectivity manual.

6.1 SAP Mobile Add-On for ERP

Add the SAP Mobile Add-On for SAP ERP systems alongside the requisite service packs in order to provide the required OData services for specific versions of SAP Service and Asset Manager.

Ensure that the corresponding SAP Mobile Add-On and service packs are installed for the SAP Service and Asset Manager application you wish to run. For detailed information and instructions regarding the installation of the SAP Mobile Add-On for ECC 6.0 Systems, see the Mobile Add-On for ERP Installation Guide, or check primary note 2577248.

After downloading the files for the SAP Mobile Add-On desired support packages from the SAP Software Download Center, load the mobile add-on onto your system through the add-on manager, using the transaction code `SAINT`. Once the add-on is installed, load the support packages into your system through the Support Package Manager (accessed through transaction code `SPAM`).

Once the SAP Mobile Add-On and requisite support packages have been installed, follow the Post Installation - Required topic to fully configure the SAP Mobile Add-On for ERP. Ensure that the OData Service is assigned in `/IWFND/MAINT_SERVICE` and the B/C set is activated for the given version of SAP Service and Asset Manager. After following the topic, use thefollowing checklist to ensure that the mobile application integration framework is properly installed and configured:

1. Ensure that the requisite Web Dynpro that controls the behavior of the SAP Mobile Add-On are properly activated.
    1. Transactions `/SYCLO/CONFIGPANEL` and `/SYCLO/ADMIN` open the Mobile Application Integration Framework Configuration Panel and Administration Panel for the desired back end SAP ERP system.
2. Ensure that the requisite B/C sets related to the desired version of the SAP Mobile Add-On are installed and activated.
    1. If these B/C sets have been properly activated, application configuration for the desired SAP Service and Asset Manager version appears in the transaction `/SYCLO/CONFIGPANEL` under *Mobile Application Parameters*.
3. Ensure that the OData service for the desired SAP Service and Asset Manager application is activated and assigned to the *Mobile Application OData Service Assignment*.
    1. The requisite OData service appears in the *Mobile Application OData Service Assignment* in the transaction `/SYCLO/CONFIGPANEL` and is assigned to the mobile application.
    2. The requisite OData service will also appear in the listing of OData services provided by the SAP Gateway system, found in transaction `/IWFND/MAINT_SERVICE`.

1. Configure the alias assignment in the `/IWFND/MAINT_SERVICE` transaction. By selecting the desired OData service, the bottom-right panel informs administrators which back end connection alias is used for the connection to the backend SAP Mobile Add-On services.
2. Perform a quick test of the OData service to ensure the proper OData service document is being returned by the service:
   After selecting the OData service, the bottom-right panel includes a link to an internal test using the gateway client. By using the internal gateway client tool with the HTTPS connection option, system administrators can ensure that their connections are properly reaching the correct back-end system from the SAP gateway and retrieving data for the proper data service providers for SAP Service and Asset Manager.

3. Ensure that the idempotency jobs are set up from the SPRO configuration of the SAP gateway system, as SAP Service and Asset Manager relies on idempotency in HTTP OData services to ensure data integrity.

4. Ensure that the SAP back-end system is set up to allow authentication of HTTPS calls from the Cloud Connector via principal propagation.

When the SAP Mobile Add-On has been set up correctly, the OData service starts returning data in the SAP Gateway client, accessible from transaction `/IWFND/GW_CLIENT`.

6.2 Mobile Add-On for SAP S/4HANA

Add the SAP Mobile Add-On for SAP S/4HANA systems alongside the requisite service packs in order to provide the required OData services for specific versions of SAP Service and Asset Manager.

Ensure that the corresponding SAP Mobile Add-On and service packs are installed for the SAP Service and Asset Manager application you wish to run. For detailed information and instructions regarding the installation of the SAP Mobile Add-On for 1610 FPS01 systems, see the Mobile Add-On for S/4HANA Installation Guide, or check primary note 2493602.

After downloading the files for the SAP Mobile Add-On desired support packages from the SAP Software Download Center, load the mobile add-on onto your system through the add-on manager, using the transaction code `SAINT`. Once the add-on is installed, load the support packages into your system through the Support Package Manager (accessed through transaction code `SPAM`).

Once the SAP Mobile Add-On and requisite support packages have been installed, follow the Post Installation - Required topic to fully configure the Mobile Add-On for SAP S/4HANA. Ensure that the OData Service is assigned in `/IWFND/MAINT_SERVICE` and the B/C set is activated for the given version of SAP Service and Asset Manager. After following the topic, use thefollowing checklist to ensure that the mobile application integration framework is properly installed and configured:

1. Ensure that the requisite Web Dynpro that controls the behavior of the SAP Mobile Add-On are properly activated.
   1. Transactions `/SYCLO/CONFIGPANEL` and `/SYCLO/ADMIN` open the Mobile Application Integration Framework Configuration Panel and Administration Panel for the desired back end SAP S/4HANA system.
2. Ensure that the requisite B/C sets related to the desired version of the SAP Mobile Add-On are installed and activated.

1. If these B/C sets have been properly activated, application configuration for the desired SAP Service and Asset Manager version appears in the transaction `/SYCLO/CONFIGPANEL` under *Mobile Application Parameters*.

3. Ensure that the OData service for the desired SAP Service and Asset Manager application is activated and assigned to the *Mobile Application OData Service Assignment*.
    1. The requisite OData service appears in the *Mobile Application OData Service Assignment* in the transaction `/SYCLO/CONFIGPANEL` and is assigned to the mobile application.
    2. The requisite OData service will also appear in the listing of OData services provided by the SAP Gateway system, found in transaction `/IWFND/MAINT_SERVICE`.
        1. Configure the alias assignment in the `/IWFND/MAINT_SERVICE` transaction. By selecting the desired OData service, the bottom-right panel informs administrators which back end connection alias is used for the connection to the backend SAP Mobile Add-On services.
        2. Perform a quick test of the OData service to ensure the proper OData service document is being returned by the service:
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    3. Ensure that the idempotency jobs are set up from the SPRO configuration of the SAP gateway system, as SAP Service and Asset Manager relies on idempotency in HTTP OData services to ensure data integrity.
4. Ensure that the SAP back-end system is set up to allow authentication of HTTPS calls from the Cloud Connector via principal propagation.

When the SAP Mobile Add-On has been set up correctly, the OData service starts returning data in the SAP Gateway client, accessible from transaction `/IWFND/GW_CLIENT`.

7 SAP Business Technology Platform Environment

The SAP Business Technology Platform is an essential component of the end-to-end landscape for the SAP Service and Asset Manager application. You can manage all of the separate components and features used by the SAP Service and Asset Manager from the SAP Business Technology Platform. These components and features are easily configured, including offline OData services, APNs or GCP push services, SAP on-premise OData connections, Mobile Development Kit customization and deployment options, and others.

For more details regarding purchasing access licenses to the SAP Business Technology Platform, contact your SAP account representative.

Before continuing, ensure that you have access to an SAP Business Technology Platform global account, as well as licenses and access for SAP Mobile Services, the Mobile Development Kit, and the SAP Web IDE full stack edition. Once you obtain the licenses and access for these items, create a subaccount on the region of your choice under the *NEO* environment. Check to ensure that all of these services are provisioned to the subaccount. If you're unable to establish a connection to Mobile Services or the SAP Web IDE with the Mobile Development Kit plug-in, contact your SAP Business Technology Platform support representative to determine how to request these features.

For more information, see the SAP Business Technology Platform portal page at SAP Cloud Platform.

7.1 SAP Business Technology Platform Mobile Services Overview

Your SAP Service and Asset Manager installation needs either a Cloud Foundry or a Neo SAP Business Technology Platform Mobile Services (SAP BTP services) installation and configuration.

For more information regarding what services are required for your Cloud Foundry setup, see the official installation documentation for the SAP BTP services.

7.1.1 SAP BTP services - Setting Up a Neo Environment

Establish an SAP Business Technology Platform Neo account with the requisite services.

Connecting the SAP Business Technology Platform to SAP BTP services Neo

To connect to SAP BTP services Neo:

1. Navigate to the *Services* tab of the SAP Business Technology Platform subaccount with *Mobile Services* provisioned on it.
2. Enter the configuration for mobile services by selecting the *Mobile Services, Users* service. Ensure that the status is set to *Enabled*.
3. Once the service is enabled, select the *Configure Mobile Servies, Users* option. Navigate to the *Roles* tab in the configuration.
4. Add users that need access to the connection settings of the mobile application to the *Administrator* role to allow them to manage the connection between the SAP Service and Asset Manager application and the requisite components that it uses on the SAP Business Technology Platform.

Configuring Preset Templates in SAP BTP services

For more information on setting up the SAP Service and Asset Manager application with the SAP Business Technology Platform, see the official documentation for the SAP BTP Neo Environment.

To quickly get connected in SAP BTP services, some preset templates are provided for apps built on the Mobile Development Kit, including SAP Service and Asset Manager:

1. In SAP BTP services, create a destination that utilizes the Cloud Connector to create a connection to the SAP on-premise environment.
    1. In the default metadata that is shipped with SAP Service and Asset Manager, the destination names that the mobile application is looking for are *DEST_SAM<version number>_PPROP*. Therefore, use this naming convention for destinations used with standard installations of the SAP Service and Asset Manager application.
    2. The SAP Service and Asset Manager application currently only supports connections to on-premise environments. Ensure that the Cloud Connector is properly configured by creating the connection based on the virtualhost information in the Cloud Connector.
    3. The SAP Service and Asset Manager application has different performance and timing requirements depending on the on-premise system being used:
        1. For SAP ERP back ends and landscapes using the Gateway hub environment, set the timeout settings for the connection to at least 20 minutes.
        2. For SAP S/4HANA back ends with embedded SAP Gateways, set the timeout settings for the connection to 10 minutes at a minimum.
    4. In the custom header section, include the header `sap-client = <on-premise gateway client #>` to prevent potential issues from a misconfigured default client configuration.
    5. Manually configure URL rewriting only if the Cloud Connector is set with a virtualhost that differs from the internal host. To manually configure URL rewriting, set the inbound and outbound rewrite rules to

replace outbound internal host links with virtual host links, and replace inbound virtual host links with internal host links.

6. For the Authentication method, the SAP Service and Asset Manager application currently only supports authentication via principal propagation. Ensure that the principal propagation mapping is set up on your Cloud Connector and SAP on-premise environment. Also ensure that the user names mapped in the back end matches the usernames of the IDP assigned to the SAP Business Technology Platform.

2. Once the destination is created, create a mobile application definition under the section *Applications* in the tab *Native/hybrid*:
    1. When creating a mobile application definition, create it using the Mobile Development Kit template.
    2. Give the app a meaningful name and an easy to identify AppID. Make note of the AppID.
    3. In the app definitions, select the *connections* feature. Add the destination that was created in the previous step to establish the connection.
       Check the validity of the connection using the icon to the left of the *ping* button. If the connection is properly configured, it returns the service document from the SAP on-premise environment.
    4. In the app definitions, select the *offline* feature. Upload the OData offline configuration that matches your mobile app version and on-premise landscape. This is required for proper calculation of data objects sent to the device.
        1. If you don't already have a configuration, there's one included in the branding metadata available for download through instructions found in the Building the SAP Asset Manager Client topic.
        2. To make changes to this configuration, find more information regarding the behavior of the OData offline component in the topic Defining Offline Settings for Applications.
        3. In the app definitions, select the *security* feature. Ensure that there is an oAuth client established. Note the oAuth client ID, redirect URL, Token URL, and Authorization URL. These are used to connect your device to the app definitions of the SAP Business Technology Platform.
        4. In the app definitions, check the *APIs* tab to retrieve the server URL. Note of this URL, as it's used to connect your device to the app definitions of the SAP Business Technology Platform.
3. After configuring the application and destination, enable logging for the app as it isn't enabled by default. Navigate to the *Settings* section. Then go to the *Log Settings* tab, and enable the event logs for all the components for SAP BTP services.
    1. To view logs, check the *Analytics* section of the *Logs* tab.
    2. Event logs show events occurring on the SAP BTP services instance based on the log levels that were activated in the settings section. You can find common errors with configuration by analyzing these logs

7.1.2 SAP Business Technology Platform Mobile Services - Setting Up a Cloud Foundry Environment, Single Instance

Establish an SAP Business Technology Platform Cloud Foundry account with the requisite individual services.

Connecting the SAP Business Technology Platform to SAP BTP services Cloud Foundry

For detailed information on Cloud Foundry, see the SAP Cloud Platform Mobile Services page.

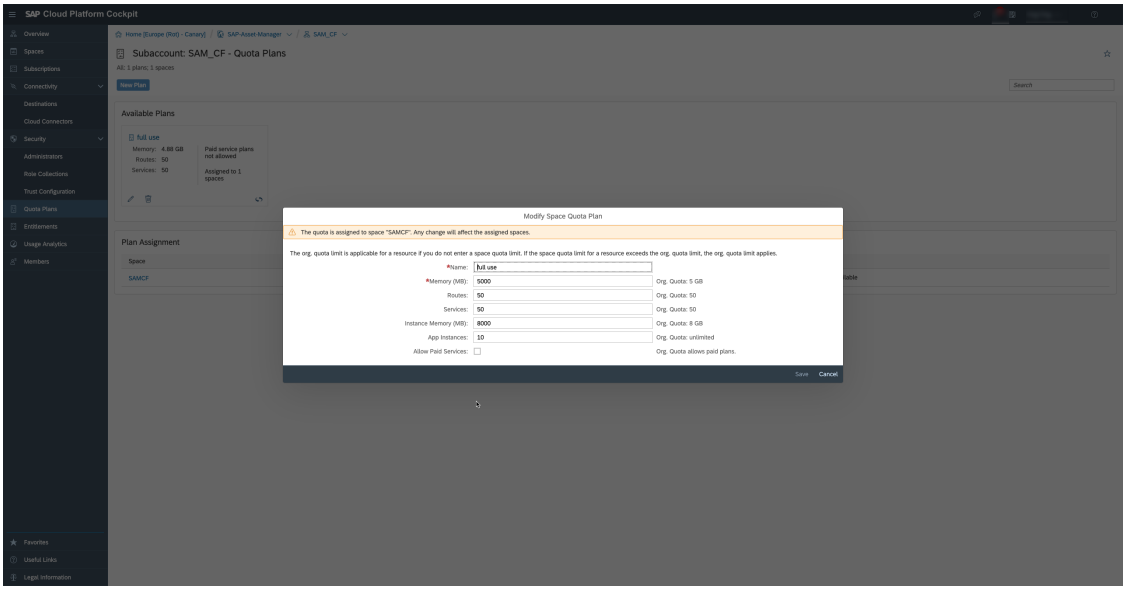
To connect to SAP BTP services Cloud Foundry:

1. Navigate to the SAP Cloud Platform Cockpit portal page. The SAP Business Technology Platform portal page is the home page where you access your listing of global accounts. You must be logged on to access your accounts.
2. Click your desired global account, for example, SAP Service and Asset Manager.
   You're taken to Global Account Cockpit page.
3. Click the *Subaccounts* tab. Your subaccounts appear. If you don't have any subaccounts created, use the following substeps to create a subaccount:
   - Click the *New Subaccount* button.
   - In both the *Display* and the *Subdomain* fields, type a short, meaningful name.
   - In the *Provider* field, select either *AWS* or *Microsoft Azure*. Currently, *Google Cloud Platform* isn't supported.
   - Click *Create*.
     A new subaccount is created.
4. Click the *Subaccounts Assignment* tab.
5. Select your desired subaccount.
6. Click the *Configure Entitlements* button, then click the *Add Service Plant* button.
   The Entitlements window displays.
7. Select *Mobile Services* on the left to bring up the *Mobile Services* panel on the right.
8. Click the *Standard* checkbox to add it to your plan.
9. Click *Application Runtime* on the left. Then check the *MEMORY* checkbox on the right.
   Application Runtime and *Mobile Services* appear at the bottom of the panel.
10. Click the *Add [Number] Service Plans*.
    You're returned to the *Subassignment Accounts* page.

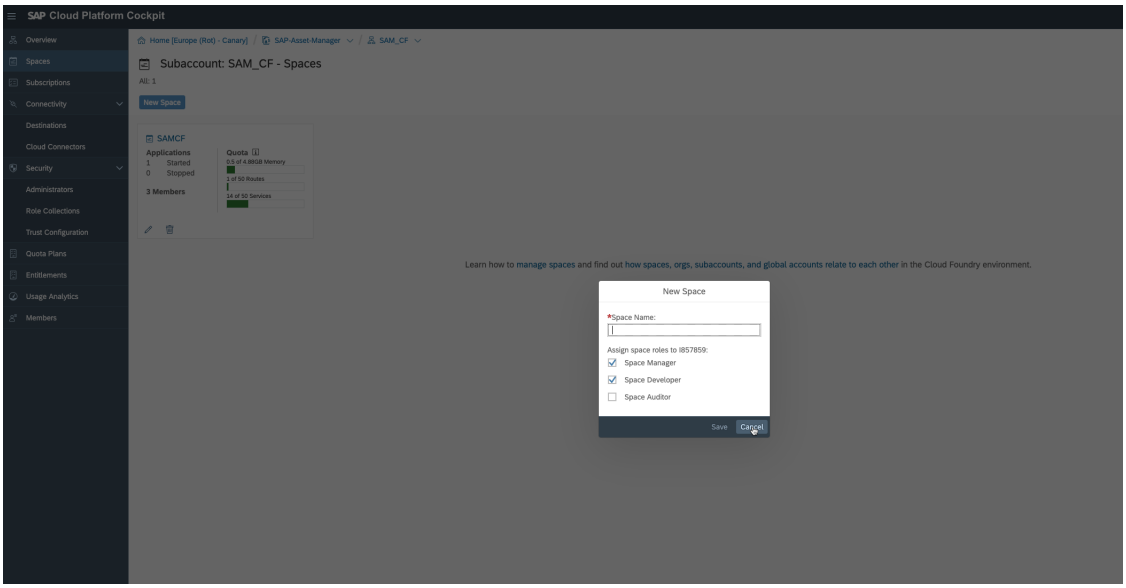
    > **Note**
    >
    > The amount of application runtime memory required is based on the number of applications you're setting up in the subaccount. For every 5 applications, you need at least 1 GiB of quota. For example, 10 mobile applications require 2 GiB of runtime. See the SAP Asset Manager Sizing Guide for detailed information.

11. Click *Save*.
    The subaccount now has the proper allocation of runtime memory and service plans assigned to it.

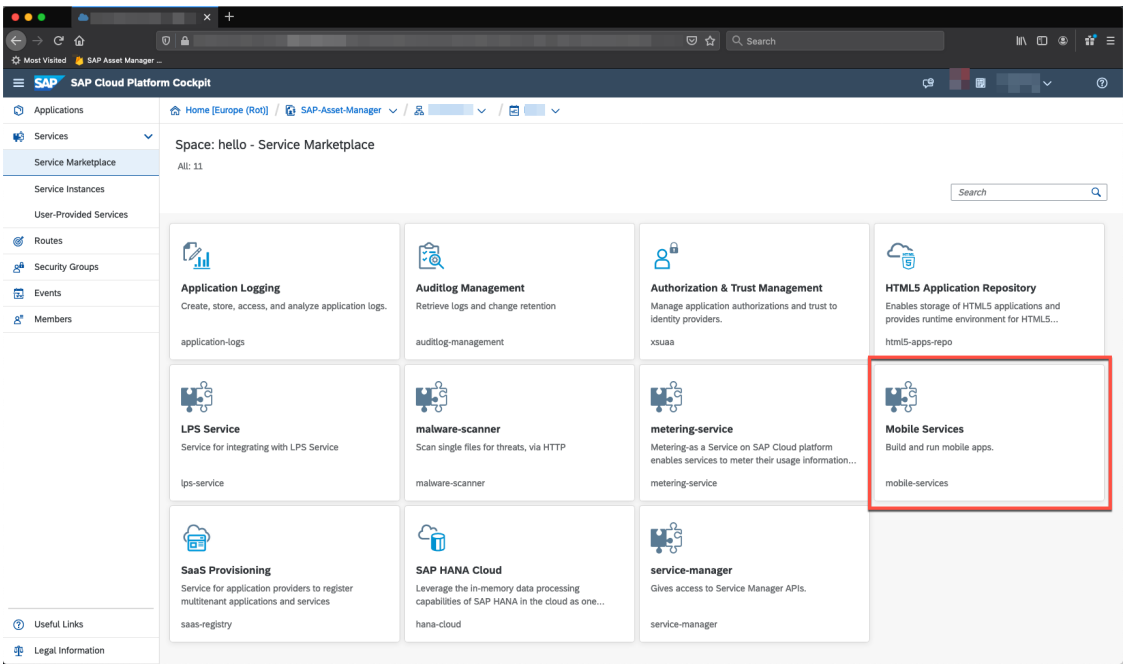
12. Click the *Subaccounts* tab and select the subaccount you're working with. Click the *Enable Cloud Foundry* button.
13. When the *Create Cloud Foundry Organization* window displays, click *Create*.
14. Add users that need access to the Cloud Connector as administrators for security roles. Pick the Cloud Foundry region host on the live environment.
15. The number of routes/services that are allowed from the org quota is based on the memory allotted to the subaccount in the *Application Runtime* quota. Each subaccount is assigned 10 routes/services per gigabyte. Create a new plan with the given entitlements for use with the space.
    The quota plan gives your application space shape, so you can access it externally. For more information, see the topics in the chapter Managing Entitlements and Quotas Using the Cockpit in the *SAP Cloud Platform* guide.
    1. Create a new quota plan with the given entitlements for use with the space. See the Create Space Quota Plans Using the Cloud Foundry Command Line Interface topic in the *SAP Cloud Platform* guide for more information.



    2. Create a space.

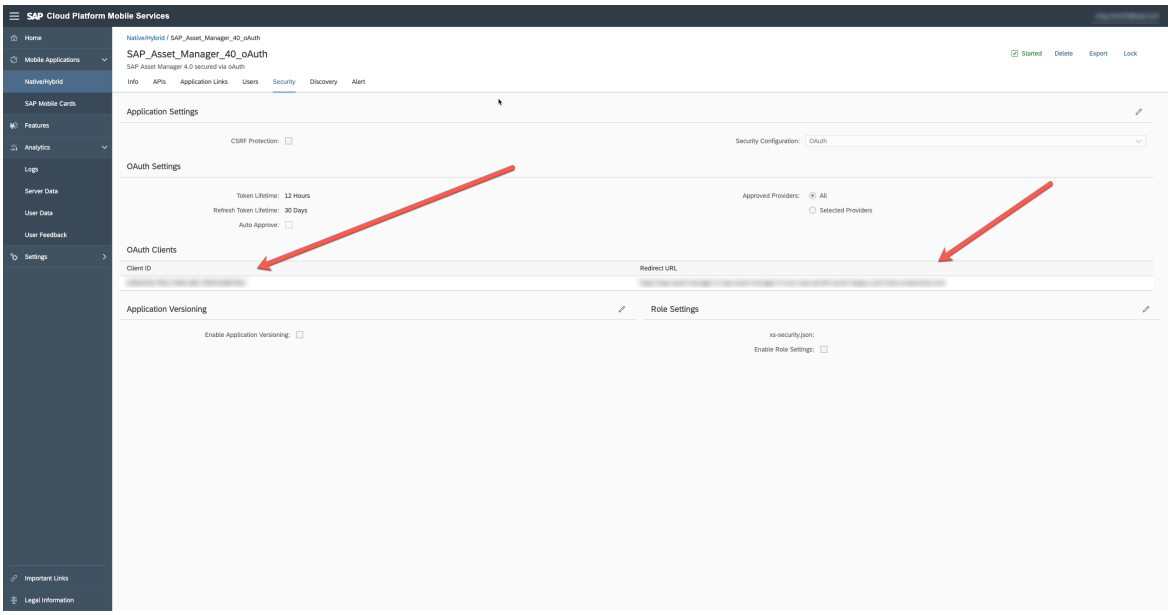


3. Navigate to the *Service Marketplace* in your newly created space and select one of the services related to mobile.



4. Select the *Instances* tab. Create a new instance with a meaningful name and no parameters.
5. Select the instance. Select *Open Dashboard* to open the mobile services. Create an application following the procedure.

16. By default, apps made in SAP BTP services on Cloud Foundry are oAuth secured. To build the onboarding link to connect the application, navigate to the *Security* section and configure the following:
    - *oAuth Token*
    - *Authorization*
    - *Redirect URLs*
    - *Client ID*



17. Add individual features to the application as needed. You need the following features for SAP Service and Asset Manager:
    - *Mobile App Update*
    - *Mobile Client Log Upload*
    - *Mobile Offline Access*
    - *Mobile Connectivity*
    - *Mobile Push Notification*
    - *Mobile Setting Exchange*
    - OPTIONAL: *Mobile Network Trace*. This setting is helpful to debug HTTP pitfalls

    The suggested timeout for each setting is a minimum of 10 minutes for SAP Service and Asset Manager connections.
18. Add a connection to the back-end on-premise system. Add the *Mobile Connectivity* feature and create a new destination.
    See the topic, specifically *Step 1*. However, for authentication in Cloud Foundry, the SSO mechanism is *Cloud Connector SSO*. (In Neo, the equivalent SSO mechanism is *Principal Propagation*.)

7.1.2.1 Using the SAP Business Technology Platform Mobile Services App Creator to Create an Application

Prerequisites

- Ensure you have followed the steps in , up to *Step 15e* before starting the following subprocedure.
- Read and follow 2978807: MAIF to CPms Multi-Virtualhost Support

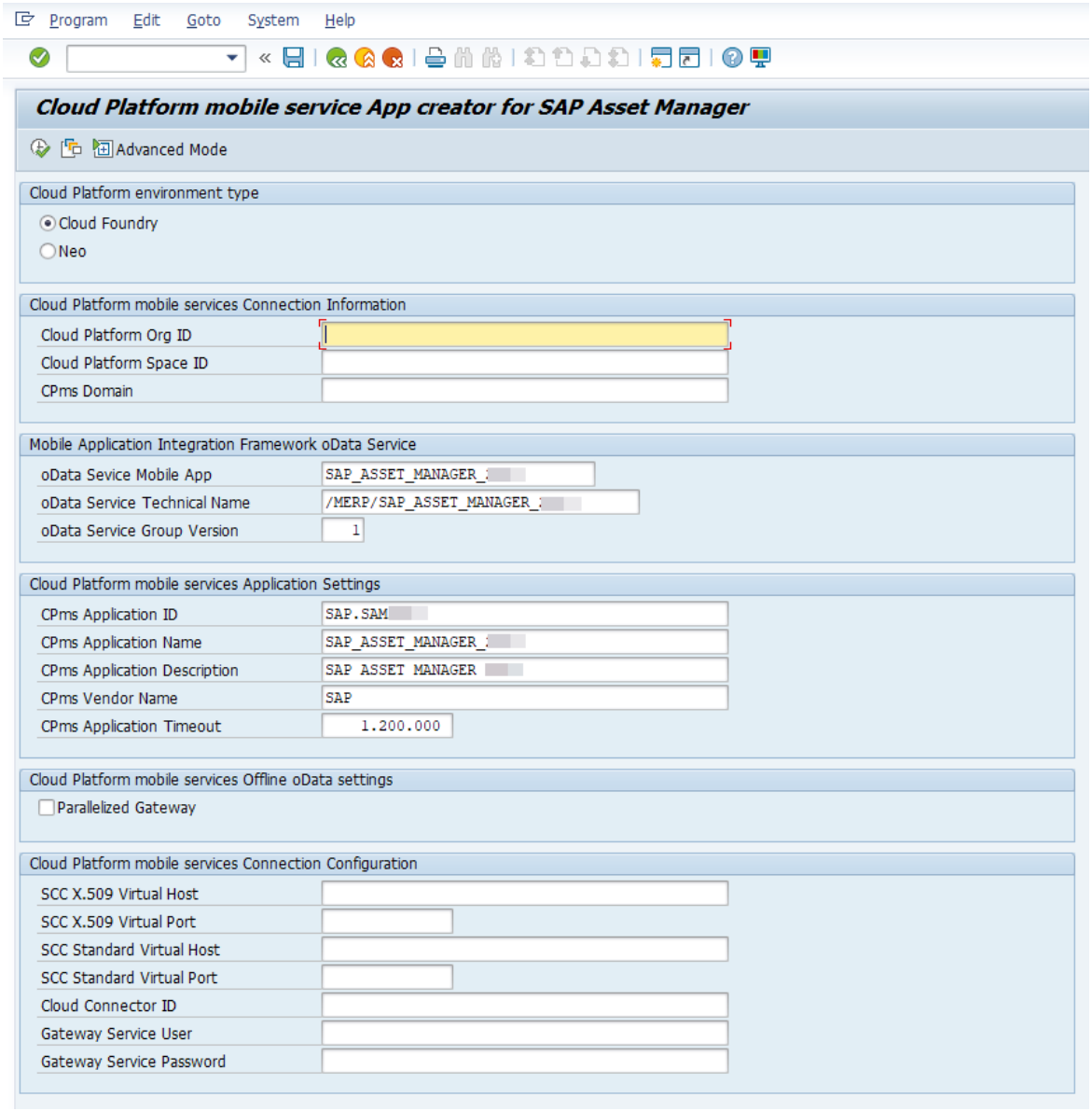
Context

> **Note**
>
> The following procedure is available for Cloud Foundry installations only.

Procedure

1. Using the SAP GUI, enter transaction */MERP/CPMS_APPCREATE*.
2. Tap the *Variant Catalog* icon. Choose *SAP&SAM<version>* from the list.
   The SAP Business Technology Platform Mobile Services App Creator for SAP Service and Asset Manager displays. Some fields are automatically filled in for you. The remaining empty fields are mandatory

3. Fill in the empty fields in all sections. See the following list for details on how to obtain the information required:



- **Cloud Platform environment type**
  - Cloud Foundry: Ensure the Cloud Foundry button is selected
  - Neo: Unavailable
- **SAP Business Technology Platform Mobile Services Connection Information**
  - Cloud Platform Org ID: From the *Home* page in the SAP Business Technology Platform cockpit, navigate to *Applications* > *SAP-Asset-Manager* > *<Subaccount>*. Find your *Org ID* in the *Cloud Foundry* section.
  - Cloud Platform Space ID: From the *Home* page in the SAP Business Technology Platform cockpit, navigate to *Applications* > *SAP-Asset-Manager* > *<Subaccount>* > *Space*. In the URL of the

page, copy the Space ID found at the end of the URL between */space/* and */applications*. For example:
`https://<Region>/cockpit/#/globalaccount/<Account ID>/subaccount/<Subaccount ID>/org/<org ID>/space/<Space ID>/applications`

- CPms Domain: Using the SAP Business Technology Platform cockpit, log into SAP Business Technology Platform Mobile Services through the link in your *Space*. Copy the domain URL, including the `https://`.

- **Mobile Application Integration Framework oData Service**
  - oData Service Mobile App: Automatically filled in
  - oData Service Technical Name: Automatically filled in
  - oData Service Group Version: Automatically filled in
- **SAP Business Technology Platform Mobile Services Application Settings**
  - CPms Application ID: Automatically filled in
  - CPms Application Name: Automatically filled in
  - CPms Application Description: Automatically filled in
  - CPms Vendor Name: Automatically filled in
  - CPms Application Timeout: Automatically filled in
- **SAP Business Technology Platform Mobile Services Offline oData Settings**
  - Parallellized Gateway: If you are using a parallelized gateway, check this box
- **SAP Business Technology Platform Mobile Services Connection Configuration:** The *Offline & Online Destinations* selection is automatically selected
- **SAP Business Technology Platform Mobile Services Offline Configuration Destination**
  - Mobile Destination Name: Automatically filled in
  - Mobile Destination URI: Using the SAP Business Technology Platform cockpit, navigate to your *Mobile Destination*.
    A sample URL is as follows: `http://<cloud connector virtual host>:<cloud connector virtual port> /sap/opu/odata/<mobile add-on component>/<mobile add-on service>`.
  - Cloud Connector ID: Navigate to *Account* > *Subaccount* > *Cloud Connectors*. The Cloud Connector ID is the *Connector ID*.
- **SAP Business Technology Platform Mobile Services Online Configuration Destination**
  - Mobile Destination Name: Automatically filled in
  - Mobile Destination URI: Using the SAP Business Technology Platform cockpit, navigate to your *Mobile Destination*.
    A sample URL is as follows: `http://<cloud connector virtual host>:<cloud connector virtual port> /sap/opu/odata/<mobile add-on component>/<mobile add-on service>`.
  - Cloud Connector ID: Navigate to *Account* > *Subaccount* > *Cloud Connectors*. The Cloud Connector ID is the *Connector ID*.

Result

Your SAP Service and Asset Manager application is automatically created on SAP Business Technology Platform Mobile Services.

Postrequisites

Executing this procedure in a production environment starts an automatic, periodic, transmission of usage metrics to SAP. If the procedure fails to send usage metrics to SAP for longer than a period of 14 days, while connecting to SAP Service and Asset Manager, the Mobile Application Integration Framework will prohibit any further incoming connections.

To ensure that usage metrics are successfully transmitted, use transaction code *SM37* to check the *Job Overview* for a job created running ABAP Program Name */MFND/CORE_CLOUD_METRICS_PROG*.

If you need support, open a support message at https://support.sap.com/incident using the *MOB-APP-MAO* component.

Continue to *Step 6* of the procedure in the *SAP Service and Asset Manager Installation Guide*.

7.2 Cloud Connector

The SAP on-premise landscape communicates with the SAP Business Technology Platform via the Cloud Connector.

Find more information on the Cloud Connector in the SAP Business Technology Platform Connectivity documentation.

During the installation of the Cloud Connector, take the following steps:

1. Ensure that the system certificate is trusted by the back-end SAP Gateway. You can add a certificate via transaction `STRUST`.
2. For principal propagation, ensure that the local CA certificate is set up and the back end accepts the x.509 principal propagation certificate sent from the Cloud Connector. The back-end SAP Gateway needs to allow authentication via principal propagation in order to properly determine data distribution for a given mobile application user. Therefore, define the subject pattern that the x.509 certificates are sent with from the Cloud Connector in the SAP Gateway system, either explicitly though transaction `EXTID_DN` or via a certificate rule through transaction `CERTRULE`.
3. In addition, the subject and issuers of all certificates need to be trusted in the ICM system.
    1. Add the parameter `<icm/HTTPS/trust_client_with_issuer = <Subject of CA Certificate on Cloud Connector>` and `<icm/HTTPS/trust_client_with_subject = <subject pattern of the x.509 certificate from the cloud connector>` into the *System Profile Parameters* using transaction `RZ10`.
    2. Restart the ICM framework using transaction `SMICM` under the option *Administration* > *Hard Shutdown* > *Global*.

Once the on-premise connection to the Cloud Connector is established and configured, establish the connection to the SAP Cloud Platform account.

1. Ensure that the Cloud Connector has its trust configuration and proxy configuration set properly to communicate with the SAP Business Technology Platform region that you would like to connect to.
2. Create a connection to a valid subaccount with the previous checklist in this topic accomplished. Use the subaccount ID and a user account that has been added to that subaccount with the role *Cloud Connector Admin* or *Administrator*.

After connecting the Cloud Connector to both the SAP Business Technology Platform subaccount and the SAP on-premise Gateway system, take the following steps:

1. Add the mapping from the virtual to the internal system of an HTTPS connection to the on-premise Gateway. Ensure that all resources are available for the URL path and all subpaths for `/sap/opu/odata`.
2. Ensure that the trust configuration accepts all *hanamobileprod* based trusts in the *Principal Propagation* tab.

> **Note**
>
> When using the Cloud Connector with SAP BTP services on a Neo subaccount, configure `hanamobileprod:mobilejava` as *Trusted* in the following location: *Sub-account configuration* > *Cloud-to-on-Premise section* > *Principal Propagation tab*.
>
> See 2660862: SAP Cloud Platform Mobile Services (SCPms) Setup Info for SAP Asset Manager with SAP ERP System for detailed information.

7.3 SAP Business Application Studio

If the extension or installation of additional components onto SAP Service and Asset Manager is required, then the SAP Business Application Studio is a required deployment.

To deploy an application from the SAP Business Application Studio to the SAP BTP services instance:

1. Ensure that the *mobileservices* destination in the SAP Business Technology Platform subaccount has the value *mobile* added to the *WebIDEUsage* property.
2. Ensure that the *Mobile Services App Development Tools* is enabled by checking the *Settings* tab in the *Extensions* section in the SAP Business Application Studio .
3. Download the SAP Service and Asset Manager metadata from the SAP Marketplace. Import the application into the SAP Business Application Studio .
4. Once the metadata is imported, load the metadata to the MDK perspective.
   Right-click on the app, and select *MDK Deploy and Activate*. Deploy the app to the mobile application.
5. Once the app is loaded, use the connection link builder in the SAP Business Application Studio to build an onboarding link for the mobile device using the information retrieved from the building of the mobile application.
6. Once the link is built, send the link to the mobile device with SAP Service and Asset Manager installed.
7. Connect to the mobile app, sign in, and update the mobile application when prompted.

8 SAP Service and Asset Manager Application Environment

You can find more information regarding the installation of SAP Service and Asset Manager in the SAP Service and Asset Manager Installation Guide Windows Document History.

You can find more information regarding the configuration of SAP Service and Asset Manager in the SAP Service and Asset Manager Configuration Guide Windows Document History.

9 Troubleshooting

9.1 Using Logs in SAP Service and Asset Manager

Error logs provide detailed context information about errors that have occurred at runtime.

Use the following logs and traces to help diagnose issues with your SAP Service and Asset Manager installation and performance after installation:

- SAP OData service traces
  - IWFND trace
  - IWBEP trace
- Cloud Connector logs
- SAP Business Technology Platform Mobile Services troubleshooting
  - SAP Business Technology Platform Mobile Services network trace
  - SAP Business Technology Platform Mobile Services log analytics
  - SAP Business Technology Platform Mobile Services client log upload
- Mobile Development Kit log uploads

9.1.1 SAP OData Service Traces

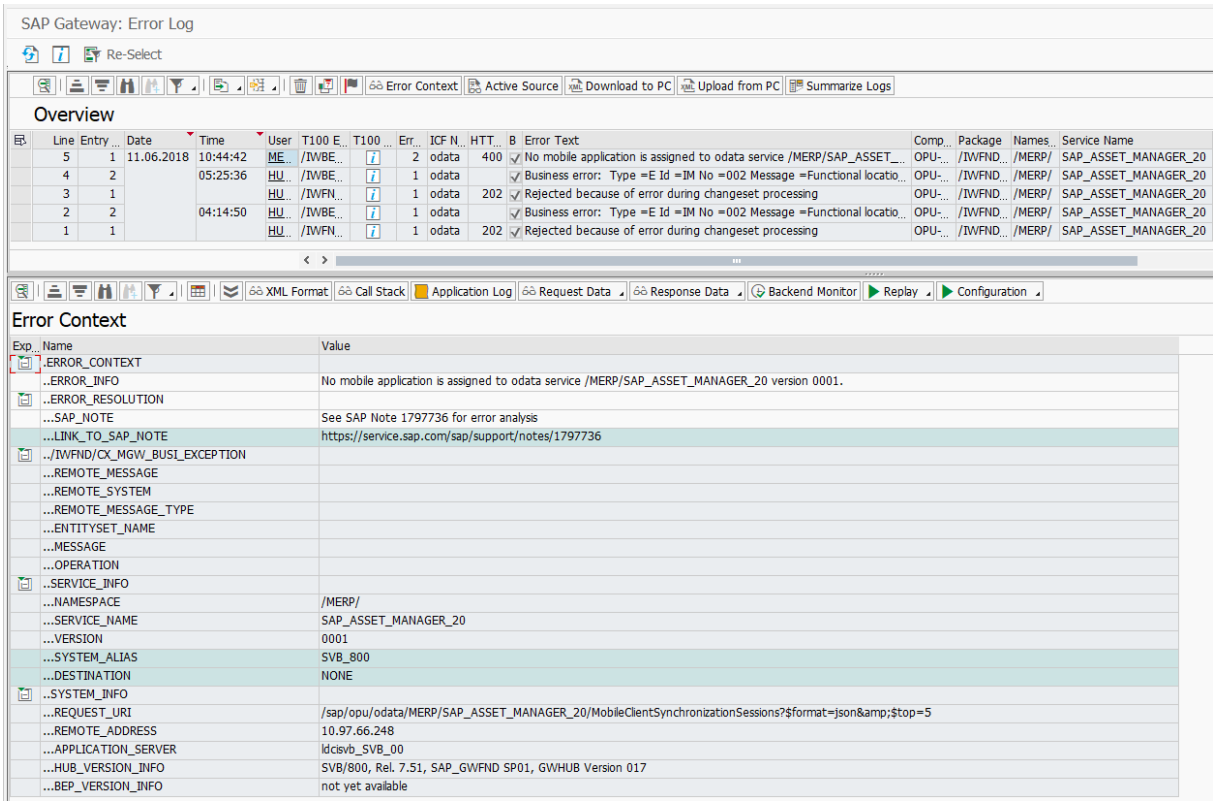
9.1.1.1 SAP Gateway Error Logs

Error logs provide detailed context information about errors that have occurred at runtime, enabling you to perform root cause analysis, as well as reproducing and correcting errors.

You can launch the error log with transaction */IWFND/ERROR_LOG* in Gateway Hub systems. Launch the error log with transaction */IWBEP/ERROR_LOG* in your back-end system.

The SAP Gateway error logs reveal basic details about errors and show errors from all users for a given client. Business logic errors are often displayed in this error log due to improper business logic. Other errors displayed include the HTTP code to indicate the type of error.

Note that based on the security level setting, advanced details or the replay function may be hidden or disabled. Note also that these error logs will not show generic authorization errors if users fail to properly authenticate.



You can navigate to different sections from the *Error Context* area as shown above. Choose *Replay* to reproduce and correct errors. Choose from the following two replay options:

- SAP Gateway Client
- Web Browser

Use option *SAP Gateway Client* to reproduce runtime situations that led to a particular error without accessing the application from the actual mobile client, and to simulate a service at runtime to identify and resolve potential issues.

For more information about how to configure the error log, see Configuration Settings for the Error Log in the *SAP Gateway Technical Operations Guide*.

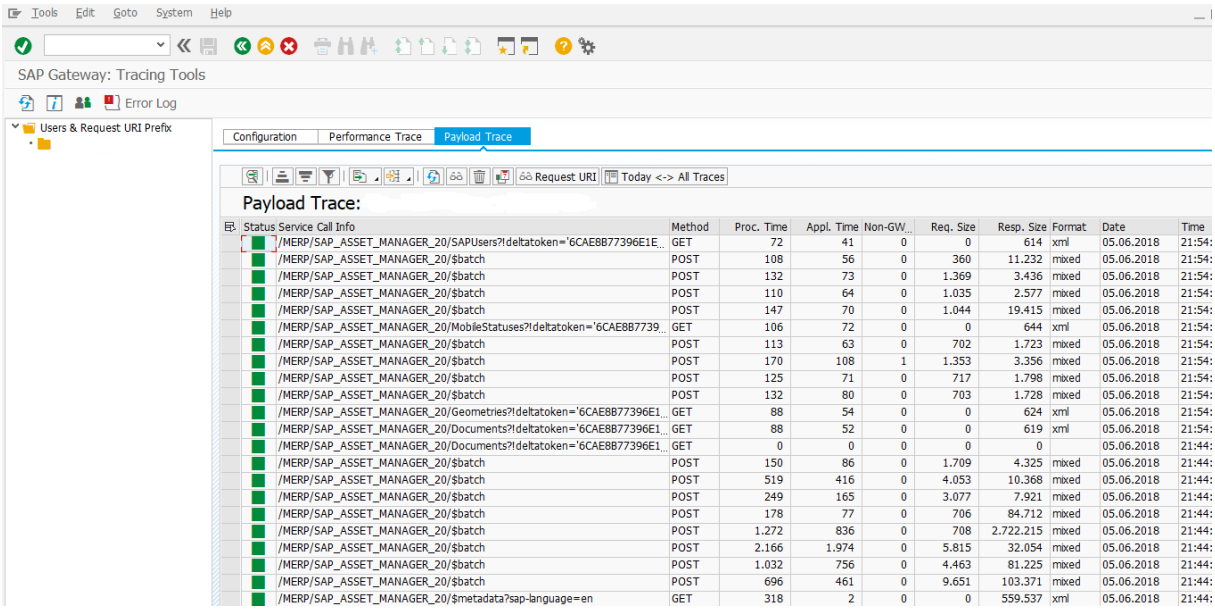
In addition, use the *Application Log Viewer* to display more technical error details by using transaction */IWFND/APPS_LOG*.

9.1.1.2 SAP Gateway Tracing Tools

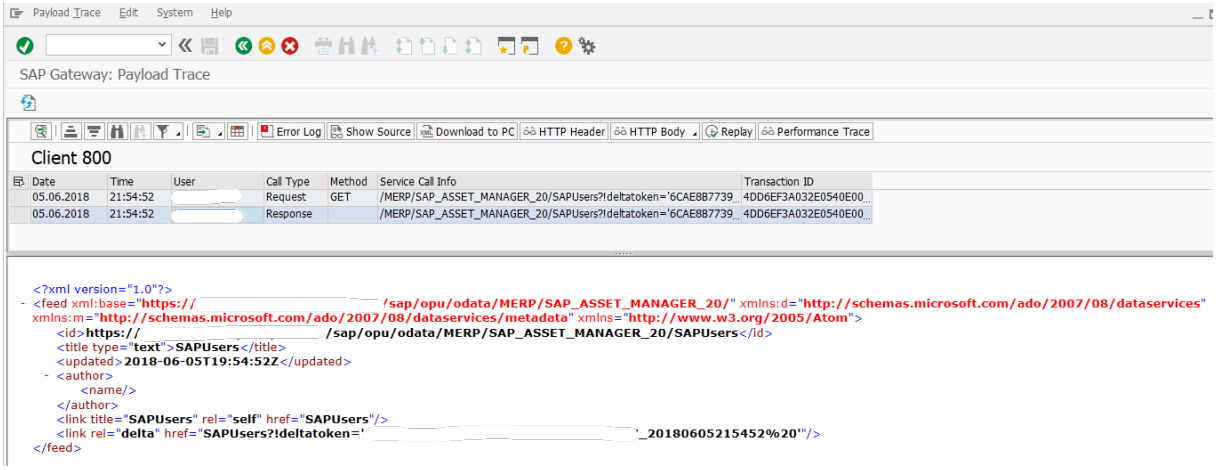
The SAP Gateway provides tracing tools (transaction code: `/IWFND/TRACES`) to trace on a particular user for both performance and payload.

Performance trace enables you to monitor performance at service call level for both the SAP Business Suite and the SAP Gateway. Payload trace enables you to monitor the service calls with request and response data, and to replay and simulate the service calls without accessing the application from the mobile client.

Traces display detailed request and response data coming into the SAP Gateway. Traces are active for only a short time, and are purged on a regular basis.



With this tool, you can verify the exact content of the request header and body that is sent from the mobile device, and also check the response from the SAP Gateway.



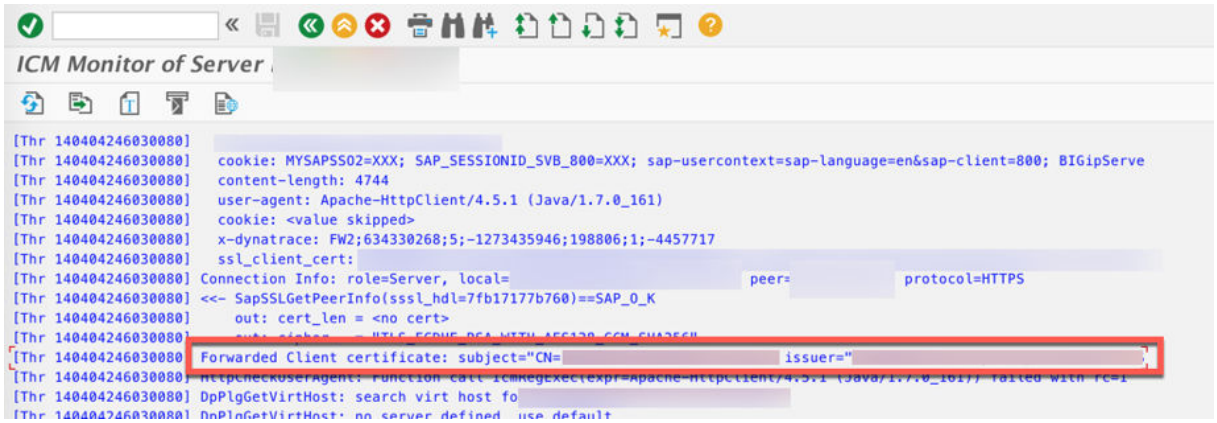
For information about how to configure and activate the payload trace tool, see Tracing Tools: Configuration in the *SAP Gateway Technical Operations Guide*.

9.1.1.3 Internet Communications Trace

Use transaction `SMICM` to reveal client certificates and information sent alongside HTTP requests.

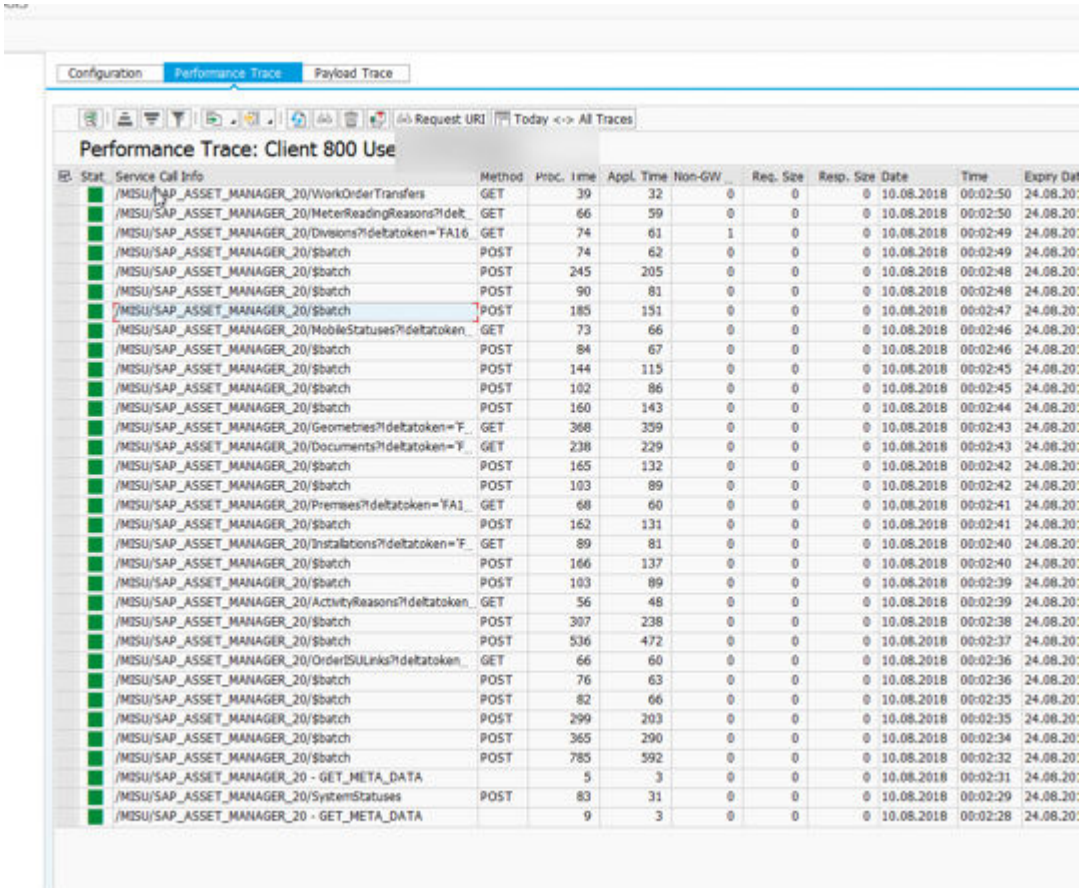
An internet communications trace can reveal issues with principal propagation. You can use the incoming forwarded client certificate to determine if certificate-mapping rules are properly established.

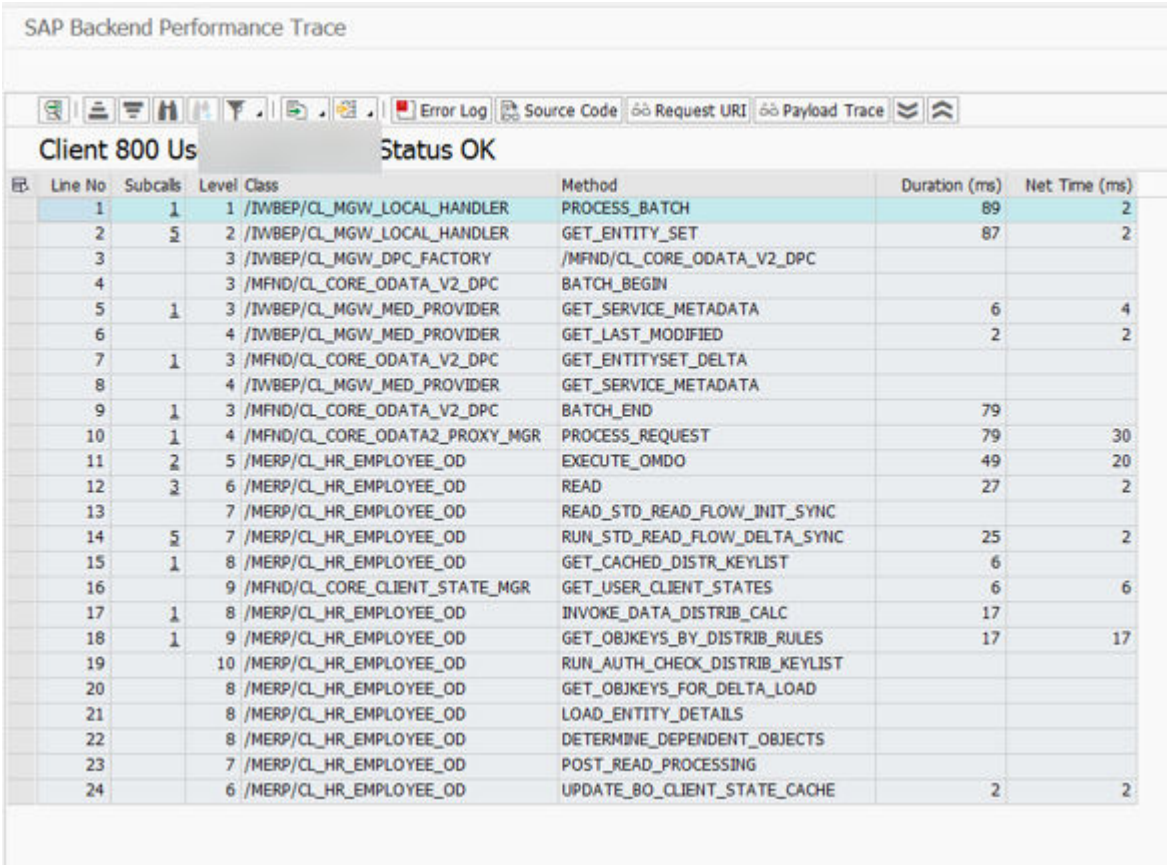
Trace levels are set through an administration menu. You can also restart the ICM using `SMICM`.



9.1.1.4 SAP Back-End Performance Tracing Tools

The SAP back-end performance tracing tools display a trace log of processes that ran as well as detailed performance information regarding those processes.



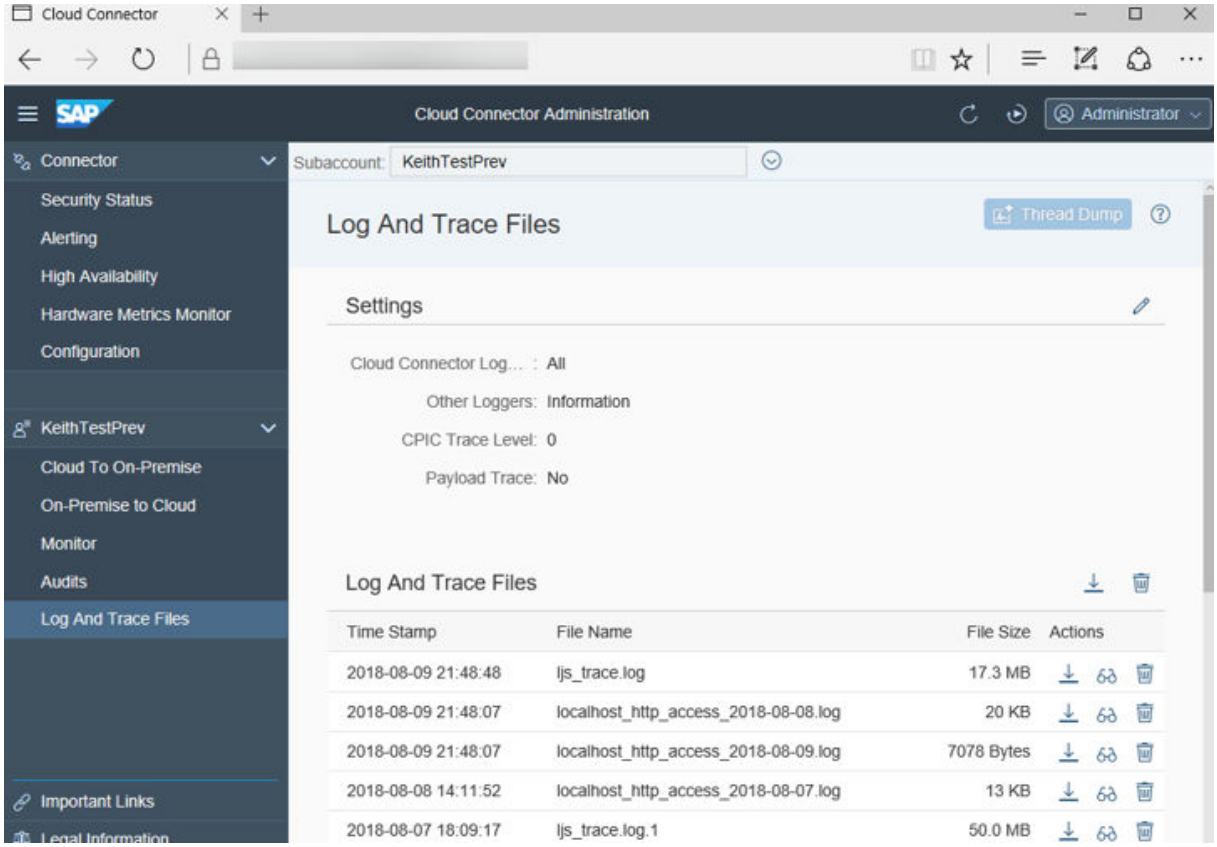


Line No	Subcalls	Level	Class	Method	Duration (ms)	Net Time (ms)
1	1	1	/IWBEP/CL_MGW_LOCAL_HANDLER	PROCESS_BATCH	89	2
2	5	2	/IWBEP/CL_MGW_LOCAL_HANDLER	GET_ENTITY_SET	87	2
3		3	/IWBEP/CL_MGW_DPC_FACTORY	/MFND/CL_CORE_ODATA_V2_DPC		
4		3	/MFND/CL_CORE_ODATA_V2_DPC	BATCH_BEGIN		
5	1	3	/IWBEP/CL_MGW_MED_PROVIDER	GET_SERVICE_METADATA	6	4
6		4	/IWBEP/CL_MGW_MED_PROVIDER	GET_LAST_MODIFIED	2	2
7	1	3	/MFND/CL_CORE_ODATA_V2_DPC	GET_ENTITYSET_DELTA		
8		4	/IWBEP/CL_MGW_MED_PROVIDER	GET_SERVICE_METADATA		
9	1	3	/MFND/CL_CORE_ODATA_V2_DPC	BATCH_END	79	
10	1	4	/MFND/CL_CORE_ODATA2_PROXY_MGR	PROCESS_REQUEST	79	30
11	2	5	/MERP/CL_HR_EMPLOYEE_OD	EXECUTE_OMDO	49	20
12	3	6	/MERP/CL_HR_EMPLOYEE_OD	READ	27	2
13		7	/MERP/CL_HR_EMPLOYEE_OD	READ_STD_READ_FLOW_INIT_SYNC		
14	5	7	/MERP/CL_HR_EMPLOYEE_OD	RUN_STD_READ_FLOW_DELTA_SYNC	25	2
15	1	8	/MERP/CL_HR_EMPLOYEE_OD	GET_CACHED_DISTR_KEYLIST	6	
16		9	/MFND/CL_CORE_CLIENT_STATE_MGR	GET_USER_CLIENT_STATES	6	6
17	1	8	/MERP/CL_HR_EMPLOYEE_OD	INVOKE_DATA_DISTRIB_CALC	17	
18	1	9	/MERP/CL_HR_EMPLOYEE_OD	GET_OBJKEYS_BY_DISTRIB_RULES	17	17
19		10	/MERP/CL_HR_EMPLOYEE_OD	RUN_AUTH_CHECK_DISTRIB_KEYLIST		
20		8	/MERP/CL_HR_EMPLOYEE_OD	GET_OBJKEYS_FOR_DELTA_LOAD		
21		8	/MERP/CL_HR_EMPLOYEE_OD	LOAD_ENTITY_DETAILS		
22		8	/MERP/CL_HR_EMPLOYEE_OD	DETERMINE_DEPENDENT_OBJECTS		
23		7	/MERP/CL_HR_EMPLOYEE_OD	POST_READ_PROCESSING		
24		6	/MERP/CL_HR_EMPLOYEE_OD	UPDATE_BO_CLIENT_STATE_CACHE	2	2

9.1.2 Cloud Connector Log and Trace Files

Cloud Connector logs show all traffic that passes through your Cloud Connector.

You can set your Cloud Connector settings with or without payload information.



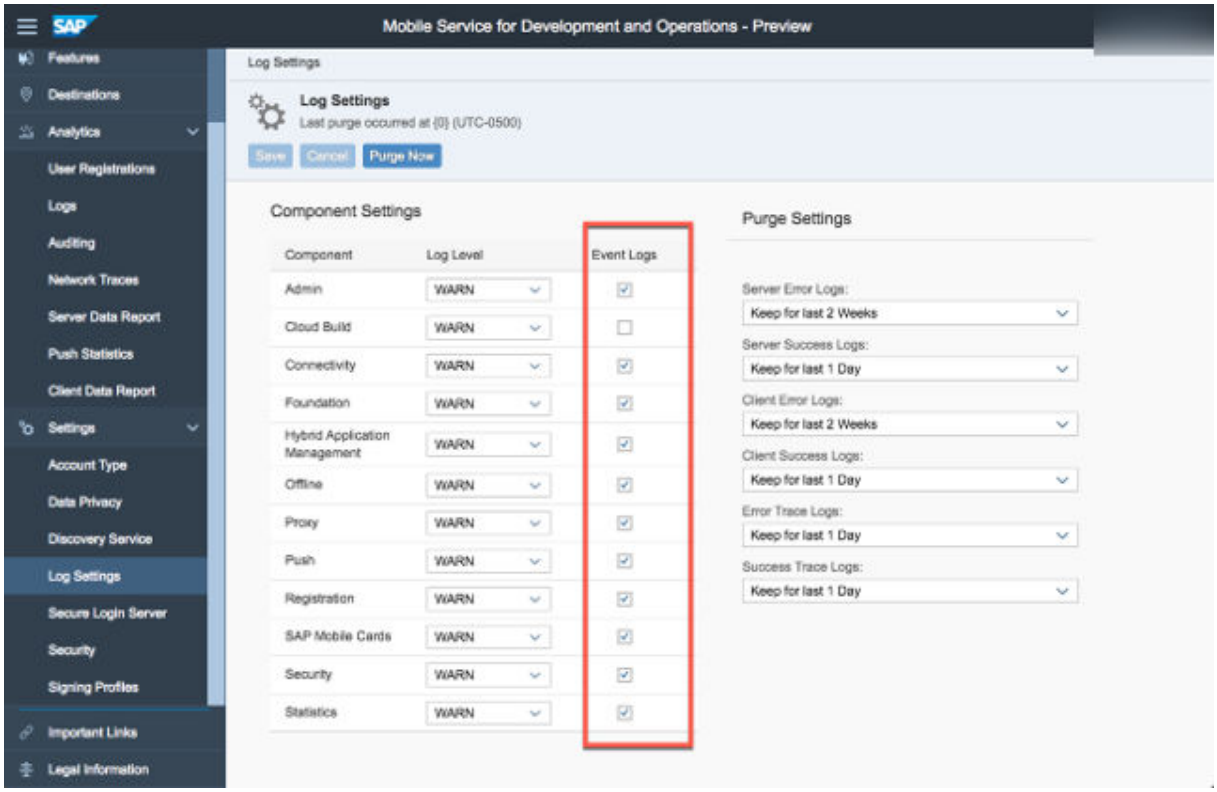
9.1.3 SAP Cloud Platform mobile services Logs and Traces

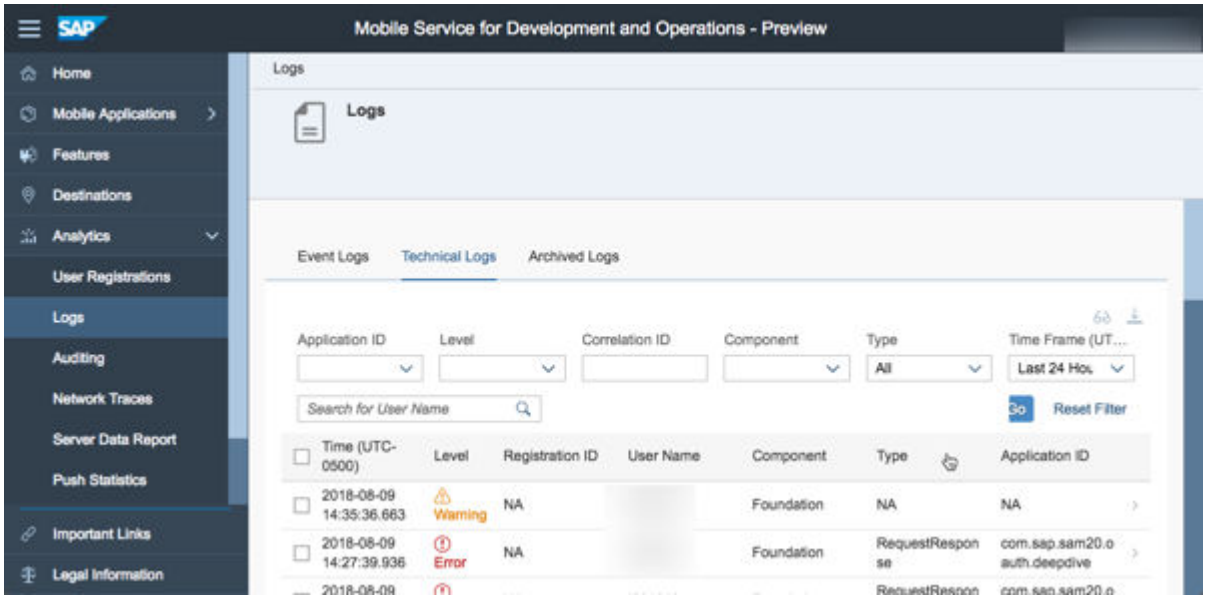
9.1.3.1 SAP Business Technology Platform Mobile Services Logs

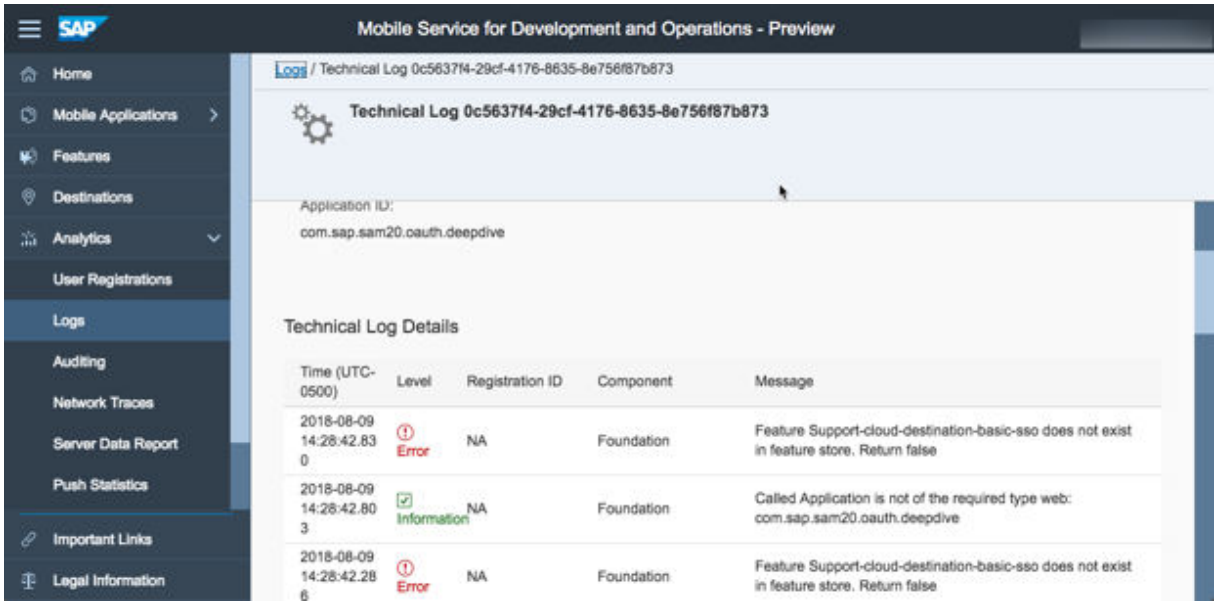
SAP Business Technology Platform Mobile Services technical logs contain grouped logs by correlation ID for easier readability of log data.

The SAP Business Technology Platform Mobile Services aren't enabled by default. Enable the logs using *Log Settings*.

You can set the individual log levels for each component of SAP Business Technology Platform Mobile Services through the log settings. You can also set the consistency of log purging through the settings.


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Log Settings
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Cancel
Purge Now
Component Settings
Component
Log Level
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Keep for last 2 Weeks
Server Success Logs:
Keep for last 1 Day
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Client Success Logs:
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Keep for last 1 Day
Success Trace Logs:
Keep for last 1 Day


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Technical Logs
Archived Logs
Application ID
Level
Correlation ID
Component
Type
Time Frame (UT...
All
Last 24 Hou
Search for User Name
Go
Reset Filter
Time (UTC-0500)
Level
Registration ID
User Name
Component
Type
Application ID
2018-08-09 14:35:36.663
Warning
NA
Foundation
NA
NA
2018-08-09 14:27:39.936
Error
NA
Foundation
RequestResponse
com.sap.sam20.oauth.deepdive

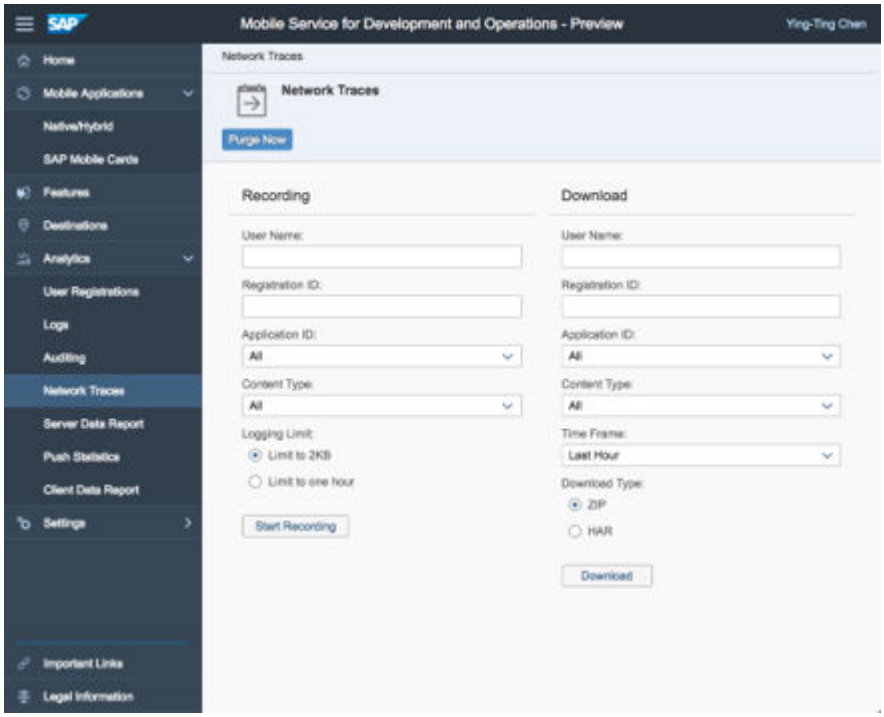


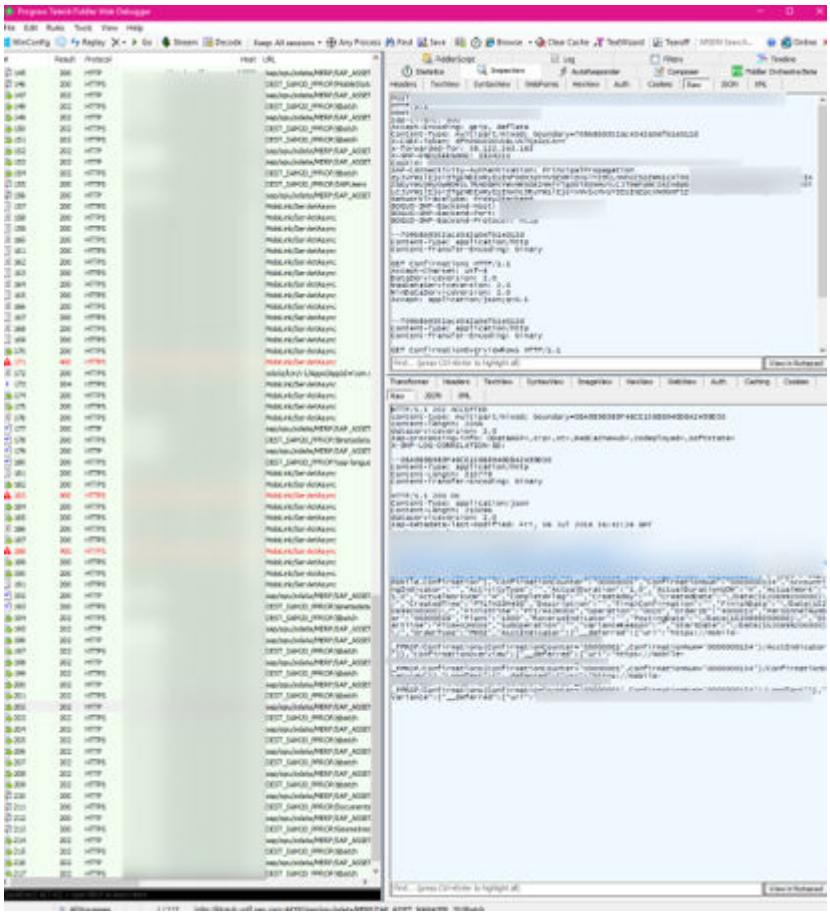
9.1.3.2 SAP Business Technology Platform Mobile Services Network Traces

SAP Business Technology Platform Mobile Services network traces trace calls that route through mobile services.

Download network trace files in either ZIP or HAR format. Note that SAP Business Technology Platform Mobile Services are best read in HAR format by programs like Fiddler or Charles.

You can also set the consistency of log purging on the *Network Traces* screen.

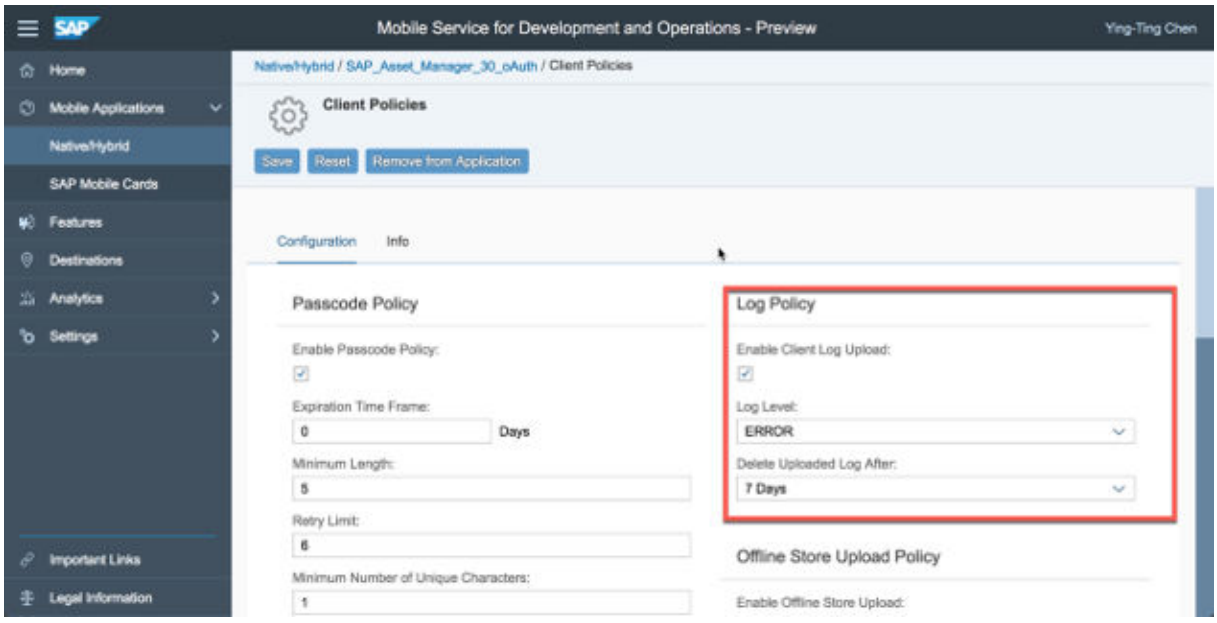

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User Name:
Registration ID:
Application ID:
All
Content Type:
All
Logging Limit:
Limit to 2KB
Limit to one hour
Start Recording
Download
User Name:
Registration ID:
Application ID:
All
Content Type:
All
Time Frame:
Last Hour
Download Type:
ZIP
HAR
Download



9.1.4 Mobile Development Kit Log Uploads

Use the built-in logger of the Mobile Development Kit client so that it turns on when it connects to the SAP Business Technology Platform Mobile Services application based upon the log policy set on the *Client Policies* screen.

You can set the log level from the *Client Policies* screen in the SAP Business Technology Platform Mobile Services. Log levels are brought into the logging page through the *Analytics* section of SAP Business Technology Platform Mobile Services.



9.2 Debugging the Mobile Development Kit Using VS Code

The MDK-Win Packager is used in conjunction with the MDK-Win Client Debugger to allow MDK app developers the ability to debug metadata definitions with the Flipper . Please refer to the Mobile Development Kit to understand the MDK and its definitions.

Prerequisites

Supported Devices

- All Windows 11 devices
- Windows 10 devices with Windows version: 10.0.19044 (aka 21H2, aka November 2021 Update) or higher (some features may not work on all versions).

Software

The following software must be installed on a supported Windows device to run the Packager software:

- Node.js LTS
- Yarn
- chocolatey
- Flipper
- OpenSSL that is already added to the Windows Path, see Flipper Installation . It is recommended to install using choco with the `choco install openssl`.

Staging the MDK Bundle

This packager project will automatically look for `src/app/mbundle.js` and load it for flexible testing. The VSCode Extension mobile development kit extension can generate a local `bundle.js` file, which you can rename and copy accordingly.

> **Note**
>
> This is the only bundle debugging that the packager supports.

Successfully Staged Indicators

1. One of the first log entries in the packager's powershell must point to `register (src/app/mbundle.js) with a valid module`. This indicates that the bundle has been successfully located.
2. One of the last log entries in the packager's powershell must point to `loadBundle()`: `Loading bundle src/app/mbundle.js internal bundle`. This indicates that the active set of definitions in memory is `mbundle.js`.

Executing the Bundle

1. Before proceeding, make sure you have a published BTPms app with either the `OnWillUpdate` undo action defined (the recommended approach) or the app is published without a `Mobile App Update` feature. Otherwise, the app update procedure may unload `src/app/mbundle.js`.
2. Connect Flipper (see directions below).
3. Run the MDK Development Client and accept the EULA.
4. Onboard the client with the Scan QR button, using a saved image of the QR code from the relevant BTPms app.
5. After authentication, remember to cancel the application update if the previous option from step 1 is used.

Packager Configuration and Launch

Once the dependencies mentioned above are installed on the Windows device, this NPM project must be configured by installing the project dependencies and a few modifications specific to UWP.

1. Open a new Windows Powershell terminal.
2. Ensure OpenSSL is installed
   - `openssl` version
   - if it is not installed, run choco: `choco install openssl`.
3. Execute `yarn install` in this directory, this will install the NPM dependencies needed for hosting a React Native packager.

> **Note**
>
> If this command does not work, please ensure the required software above has been installed.

4. Create the directory of `src/app` and stage test MDK Bundle for `src/app/mbundle.js`. This is an optional step. For more information see the Staging MDK Bundle procedure.
5. Execute `yarn start --reset-cache` to start the packager.

MDK-Win Client Debugger Installation

1. Download and install (but do not run) the MDK-Win Client Debugger.
2. Open a new Windows Powershell terminal.
3. Execute `checknetisolation loopbackexempt -a -n="$((Get-AppxPackage -Name SAP*.MDK.Development).PackageFamilyName)"` to enable communication between the MDK-Win Debugger and Packager.
4. Ensure the Packager is running.

> **Note**
>
> If the BTPMS application and `src/app/mbundle.js` have matching OData configurations, they can initialise correctly.

Debugging with Flipper

Once the MDK bundle has been placed, the packager has started and the MDK-Win client debugger is running, you can launch the Flipper.

If everything is set up and working properly, the Hermes Debugger (RN) software will appear under the Device and/or React Native Plugins section in the App Inspect pull-down menu.

Use the Ctrl + P shortcut to find and display the `mbundle.js` file. Once the file is displayed, you can set breakpoints on the target functions as desired.

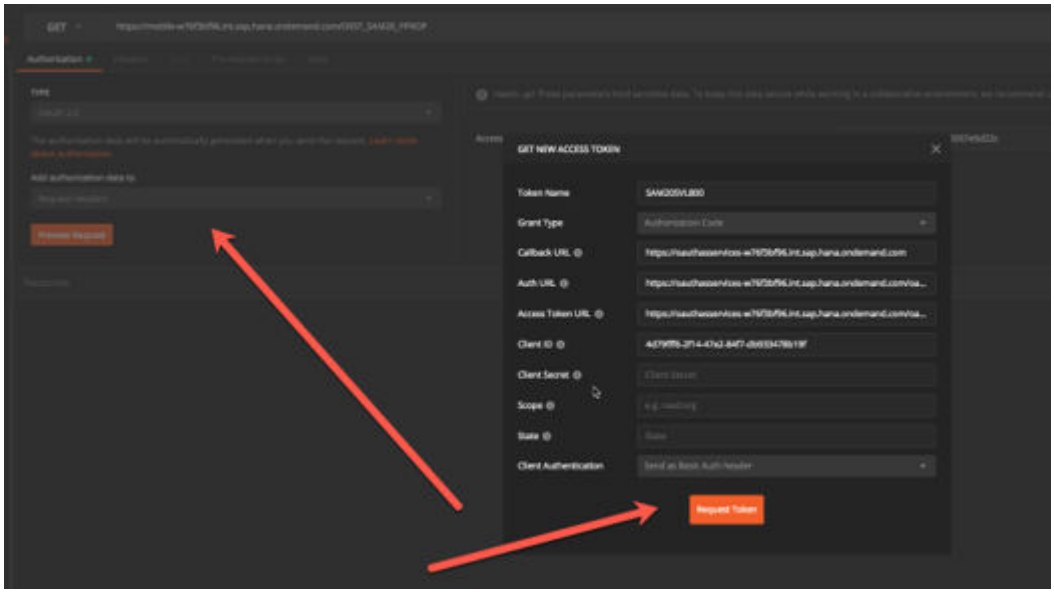
9.3 Debugging the OData Model

9.3.1 Accessing OData Services Through Postman

Use Postman to access the following OData services:

- OData URIs, including
  - EntitySets (compatible headers)

    - Metadata calls
- Authenticating to OData services: basic vs oAuth





Postman Limitations

- Doesn't support offline features, including navigation links, expands, and others
- Doesn't retrieve records with dependent objects

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