PUBLIC
SAP Asset Manager
Document Version: 4.0 1911 – 2019-12-04

Getting Started with SAP Asset Manager

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Content

Document History

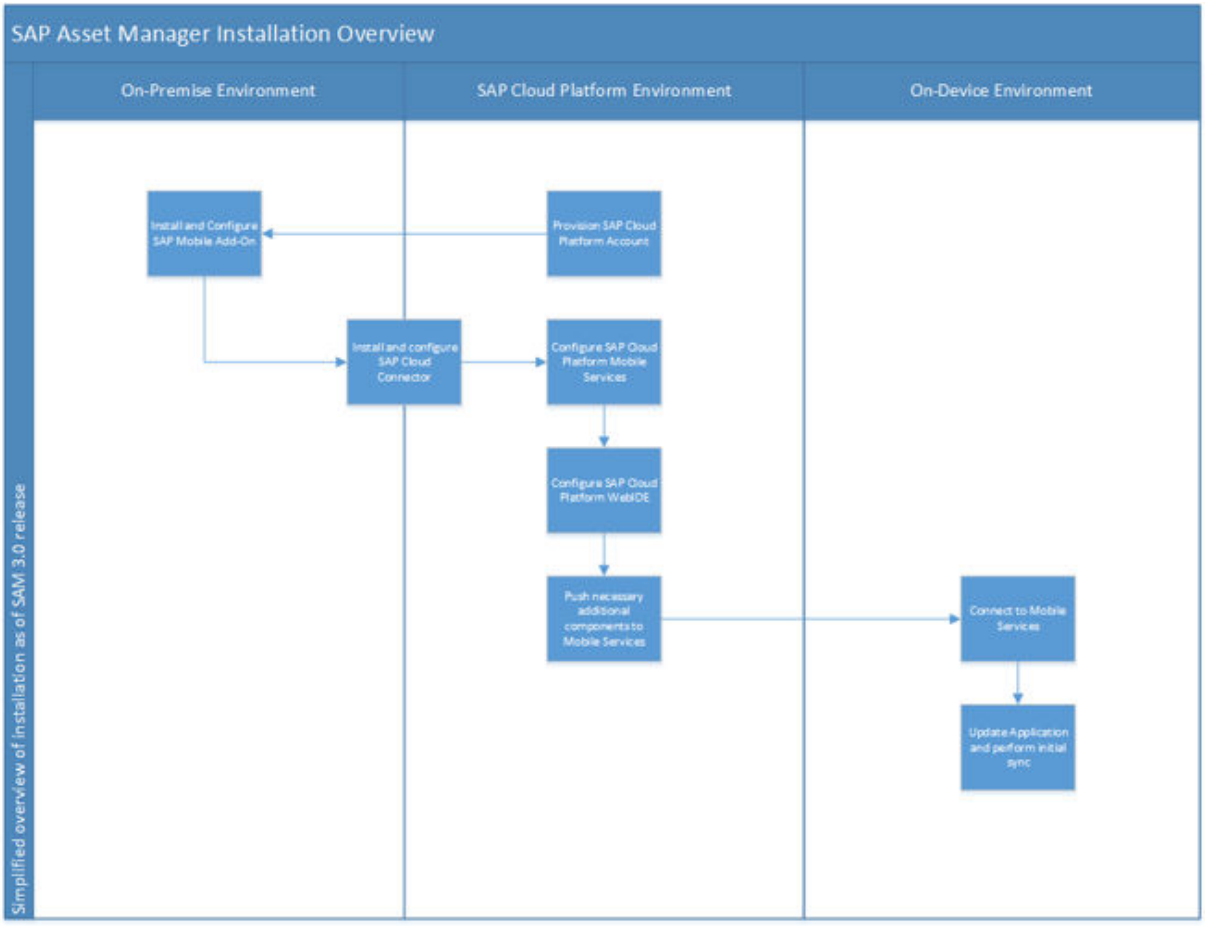
Before you begin reading this guide, be sure that you have the latest version. Find the latest version at https://help.sap.com/viewer/product/SAP_ASSET_MANAGER/p/en-US.

The following table provides an overview of the most important document changes.

Version	Date	Description
1911	NOV 2019	Original release

1 Getting Started with SAP Asset Manager - Overview

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



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- https://help.sap.com/viewer/DRAFT/d2e76ee96b6141c9bfc3afae96b7aa71/4.0SP01/en-US/858f2776bd6d459692a49be9f1cb3499.html [https://help.sap.com/viewer/DRAFT/d2e76ee96b6141c9bfc3afae96b7aa71/4.0SP01/en-US/858f2776bd6d459692a49be9f1cb3499.html]
- https://help.sap.com/viewer/977416d43cd74bdc958289038749100e/Latest/en-US/4b6dd4a0d07d4ed2ad04e6cffae25d17.html [https://help.sap.com/viewer/977416d43cd74bdc958289038749100e/Latest/en-US/4b6dd4a0d07d4ed2ad04e6cffae25d17.html]
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The SAP Asset Manager requires a compatible environment to operate in. Requisite components include:

- From the SAP Cloud Platform:
  - An SAP Cloud Platform account provisioned with the following services:
    - SAP Cloud Platform Mobile 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 SAP On-Premise Environment [page 15] topic.
  - A Cloud Connector to connect your SAP on-premise back-end system to the SAP Cloud Platform
- A mobile device capable of running a version of the Mobile Development Kit compatible with the SAP Asset Manager application.
  - All requisite components for the SAP Asset Manager are installed upon completion of the SAP Asset Manager installation process.

1.1 SAP Asset Manager Application

SAP Asset Manager leverages the digital core with SAP S/4HANA as well as the SAP Cloud Platform as an IoT platform.

SAP 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 Asset Manager. Users can easily customize SAP Asset Manager by adding and editing actions, business logic, screens, and styling.

1.2 Mobile Development Kit

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

> **i 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.

The Mobile Development Kit lets you customize, deploy, and manage SAP 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 Cloud Platform using the Mobile Development Kit client.

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

1.3 SAP Cloud Platform Overview

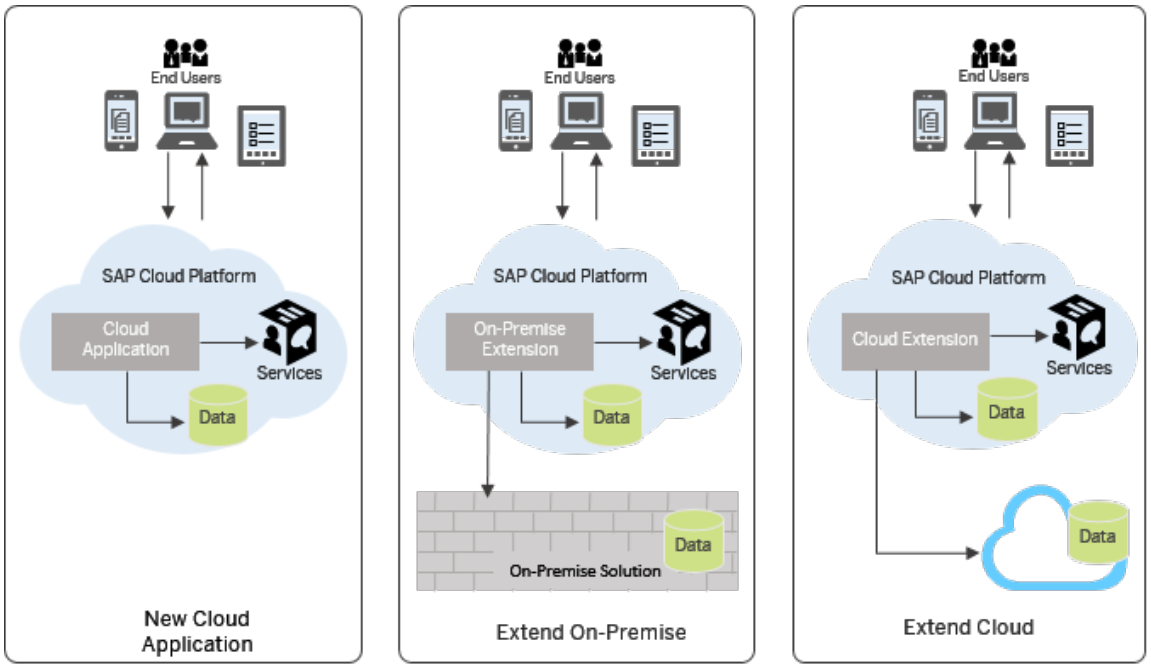
SAP Cloud Platform enables customers and partners to rapidly build, deploy, and manage cloud-based enterprise applications that complement and extend your SAP or non-SAP solutions, either on-premise or on-demand.

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

SAP Cloud 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 Cloud 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 Cloud 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 Cloud 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 Cloud 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 Cloud Platform according to the technology you prefer and the use cases of your scenarios.

Integration with SAP and non-SAP software

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

Secure data

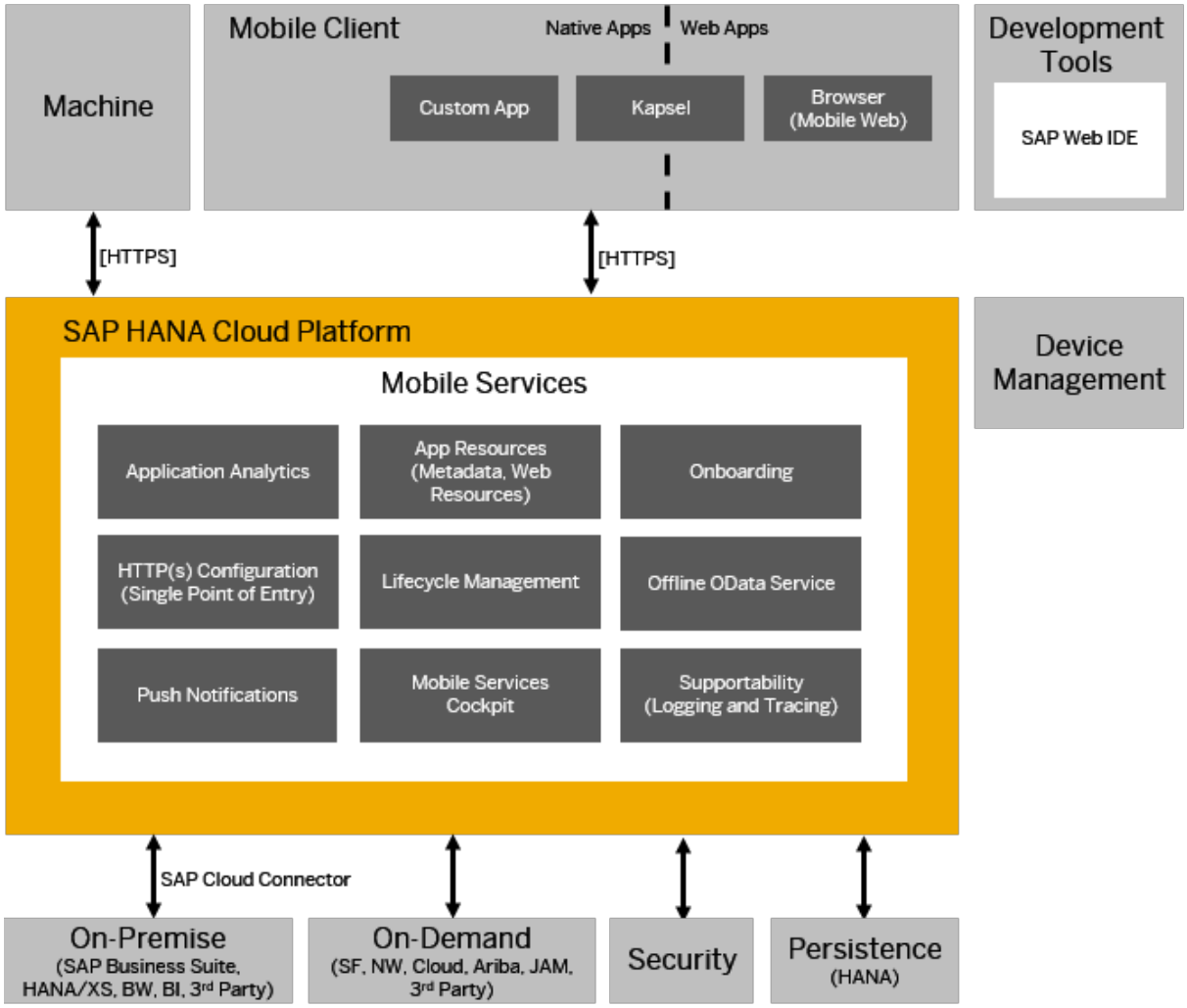
Comprehensive, multilevel security measures have been built into SAP Cloud Platform. This security is engineered to protect your mission critical business data and assets and to provide the necessary industry standard compliance certifications.

Free trial

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

1.3.1 SAP Cloud Platform mobile services Overview

SAP Cloud Platform mobile 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 Mobile Services 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
- **Mobile Services Cockpit:** Deploys, manages, and monitors applications
- **Supportability:** Logs for monitoring system health and troubleshooting

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

SAP Cloud Platform mobile 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.

1.3.2 SAP Cloud Platform SDK Overview

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

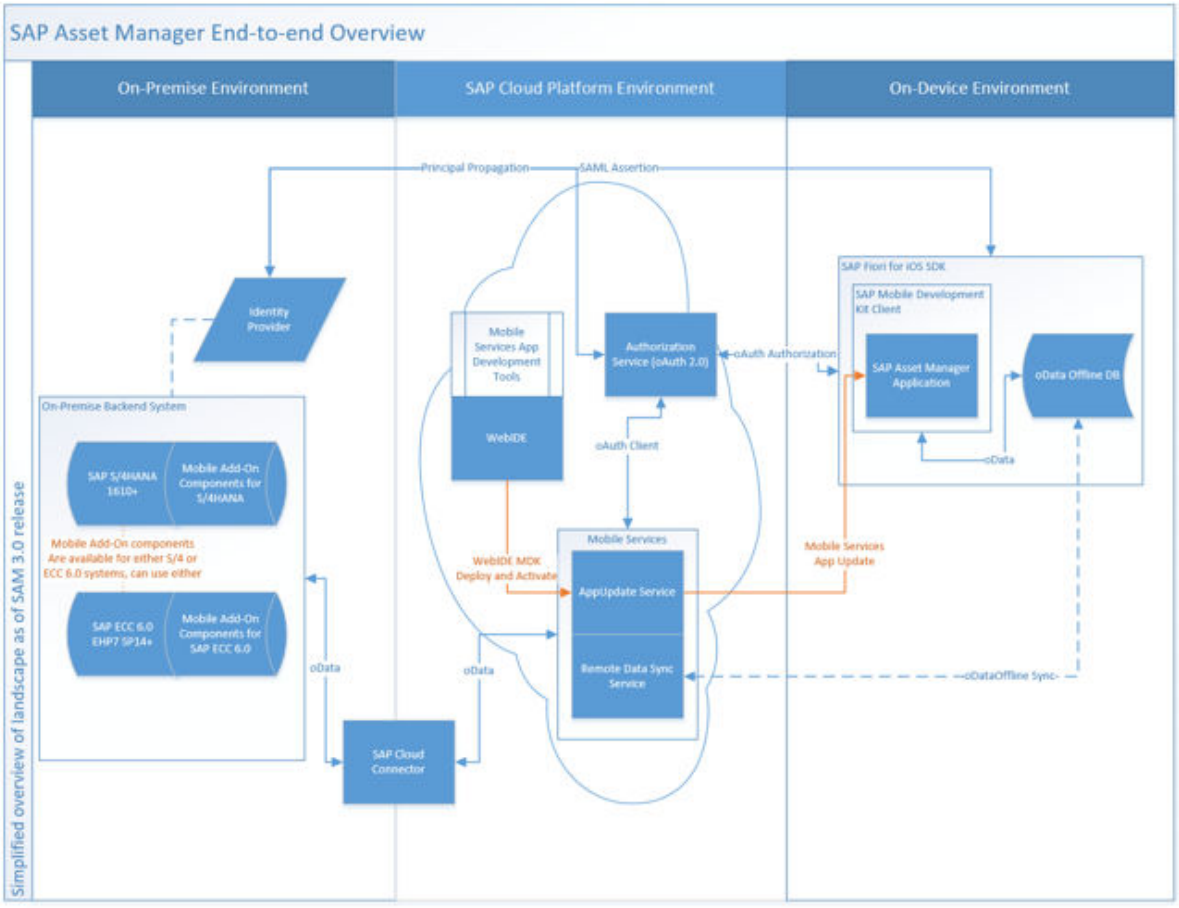
- End-to-end integrated security
- Support for offline applications
- Enterprise grade logging and monitoring support
- Access to core SAP ERP or SAP S/4HANA data and business processes, as well as access to third-party data sources
- Access to SAP Cloud Platform capabilities and services

For more information about the SAP Cloud Platform SDK see the following topics, depending on your mobile client platform:

- SAP Cloud Platform SDK for iOS
- SAP Cloud Platform SDK for Android

2 How SAP Asset Manager Works in a Neo Environment

> **i Note**
>
> The following information details setting up subaccounts on Neo environments for use with SAP Asset Manager. For informaion on how to set up subaccounts Cloud Foundry with SAP Asset Manager, see the topic How SAP Asset Manager Works in a Cloud Foundry Environment [page 13].



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

1. The SAP Asset Manager application requests authorization from the SAP Cloud Platform to authenticate against an identity provider defined by the SAP Cloud Platform using an oAuth2.0 Service.
2. SAP 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 Cloud Platform using the retrieved authentication.

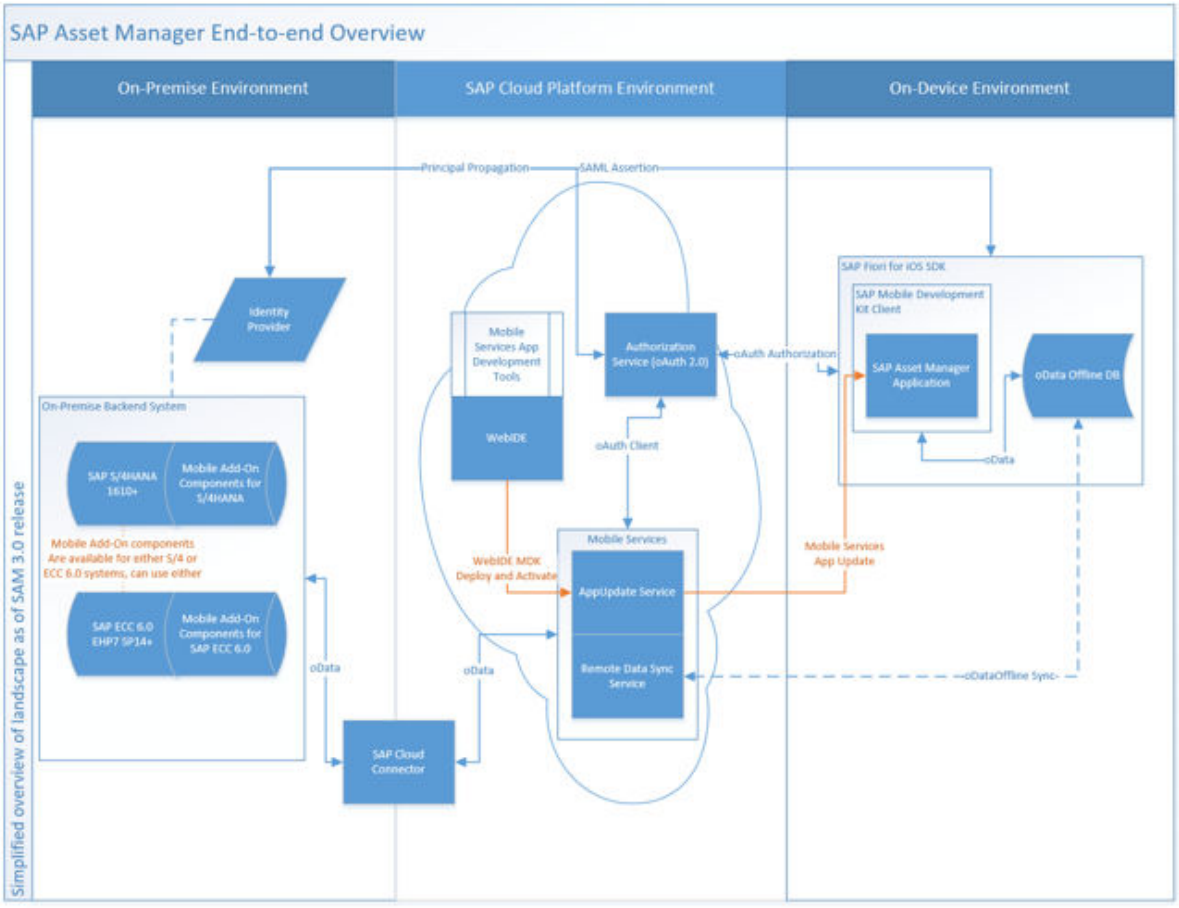
3. The remote data sync feature forwards data synchronization requests from the SAP Asset Manager application to the Cloud Connector as OData requests, along with the requisite authentication via principal propagation.
4. The Cloud Connector brings the OData requests into the secured on-premise environment, 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 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 Cloud Platform uses the SAP Cloud Platform mobile services development tools plug-in to update the SAP 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 Asset Manager to the AppUpdate feature from SAP Cloud Platform mobile services.
3. SAP Asset Manager periodically checks the AppUpdate feature for new definitions of SAP Asset Manager, and retrieves the updates on demand.

3 How SAP Asset Manager Works in a Cloud Foundry Environment

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



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3. The remote data sync feature forwards data synchronization requests from the SAP 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.

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3. SAP Asset Manager periodically checks the AppUpdate feature for new definitions of SAP Asset Manager, and retrieves the updates on demand.

4 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 Cloud Platform via the Cloud Connector. You can find more information on the Cloud Connector in the SAP Cloud Platform Connectivity manual.

4.1 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 Asset Manager.

Depending on the version of SAP Asset Manager, the following versions of the SAP Mobile Add-On are available for compatible SAP ECC 6.0 EHP7 SP14 systems and newer:

Add-On Component	SAM 2.0	SAM 3.0	SAM 4.0	SAM 1911
SMFND 630_740 SP01 SMERP 630_740 SP01 SMISU 630_740 SP01	Supported	Not supported	Not supported	Not supported
SMFND 630_740 SP02 SMERP 630_740 SP02 SMISU 630_740 SP02	Supported	Supported	Not supported	Not supported
SM3ND 630_740 SP02 SMERP 630_740 SP03 SMISU 630_740 SP03	Supported	Supported	Supported	Not supported

Ensure that the corresponding SAP Mobile Add-On and service packs are installed for the SAP 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 master 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 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 Asset Manager version appears in the transaction /SYCLO/CONFIGPANEL under *Mobile Application Parameters*.
3. Ensure that the OData service for the desired SAP 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 Asset Manager.
    3. Ensure that the idempotency jobs are set up from the SPRO configuration of the SAP gateway system, as SAP 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.

4.2 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 Asset Manager.

The following versions of Mobile Add-On for SAP S/4HANA are available for compatible SAP S/4HANA 1610 FPS01 systems and newer:

Add-On Component	SAM 1.0	SAM 1.1	SAM 2.0	SAM 3.0	SAM 4.0	SAM 1911
S4MFND 100 S4MERP 100	Supported	Not supported	Not supported	Not supported	Not supported	Not supported
S4MFND 100 SP01 S4MERP 100 SP01	Not supported	Supported	Not supported	Not supported	Not supported	Not supported
S4MFND 100 SP02 S4MERP 100 SP02 S4MISU 100	Not supported	Supported	Supported	Not supported	Not supported	Not supported
S4MFND 100 SP03 S4MERP 100 SP03 S4MISU 100 SP01	Not supported	Supported	Supported	Supported	Not supported	Not supported
S4MFND 100 SP04 S4MERP 100 SP04 S4MISU 100 SP02	Not supported	Supported	Supported	Supported	Supported	Not supported

Ensure that the corresponding SAP Mobile Add-On and service packs are installed for the SAP 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 master 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 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 Asset Manager version appears in the transaction /SYCLO/CONFIGPANEL under *Mobile Application Parameters*.
3. Ensure that the OData service for the desired SAP 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.
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    3. Ensure that the idempotency jobs are set up from the SPRO configuration of the SAP gateway system, as SAP 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.

5 SAP Cloud Platform Environment

The SAP Cloud Platform is an essential component of the end-to-end landscape for the SAP Asset Manager application. You can manage all of the separate components and features used by the SAP Asset Manager from the SAP Cloud 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 Cloud Platform, contact your SAP account representative.

Before continuing, ensure that you have access to an SAP Cloud 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 Cloud Platform support representative to determine how to request these features.

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

5.1 SAP Cloud Platform Mobile Services

Establish an SAP Cloud Platform account with the requisite services.

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

Connecting the SAP Cloud Platform to SAP Cloud Platform Mobile Services

To connect to SAP Cloud Platform Mobile Services:

1. Navigate to the *Services* tab of the SAP Cloud 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 Asset Manager application and the requisite components that it uses on the SAP Cloud Platform.

Configuring Preset Templates in SAP Cloud Platform Mobile Services

For more information on setting up the SAP Asset Manager application with the SAP Cloud Platform, see the official installation documentation for the SAP Cloud Platform Mobile Services.

To quickly get connected in SAP Cloud Platform Mobile Services, some preset templates are provided for apps built on the Mobile Development Kit, including SAP Asset Manager:

1. In SAP Cloud Platform Mobile 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 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 Asset Manager application.
    2. The SAP 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 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 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 Cloud 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 Cloud 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 Cloud 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 Cloud Platform Mobile Services.
    1. To view logs, check the *Analytics* section of the *Logs* tab.
    2. Event logs show events occurring on the SAP Cloud Platform Mobile 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

5.2 Cloud Connector

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

Find more information on the Cloud Connector in the SAP Cloud 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 Cloud 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 Cloud 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.

5.3 SAP Web IDE

If the extension or installation of additional components onto SAP Asset Manager is required, then the SAP Web IDE is a required deployment.

Find more information at the documentation for the SAP Web IDE Full-Stack.

To deploy an application from the SAP Web IDE to the SAP Cloud Platform Mobile Services instance:

1. Ensure that the *mobileservices* destination in the SAP Cloud 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 Web IDE.
3. Download the SAP Asset Manager metadata from the SAP Marketplace. Import the application into the SAP Web IDE.
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 Web IDE 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 Asset Manager installed.
7. Connect to the mobile app, sign in, and update the mobile application when prompted.

6 SAP Asset Manager Application Environment

You can find more information regarding the installation of SAP Asset Manager in the SAP Asset Manager Installation Guide.

You can find more information regarding the configuration of SAP Asset Manager in the SAP Asset Manager Configuration Guide.

7 Troubleshooting

7.1 Using Logs in SAP 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 Asset Manager installation and performance after installation:

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

7.1.1 SAP OData Service Traces

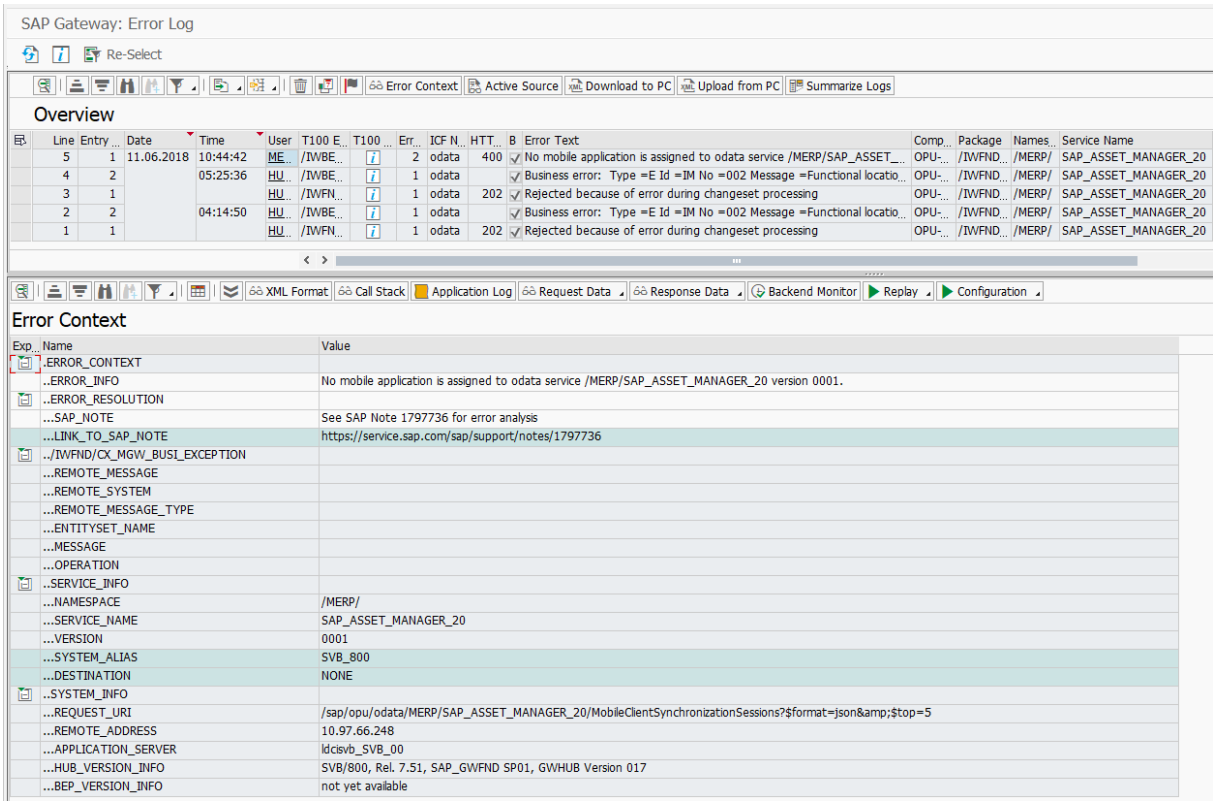
7.1.1.1 SAP Gateway Error Logs

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*.

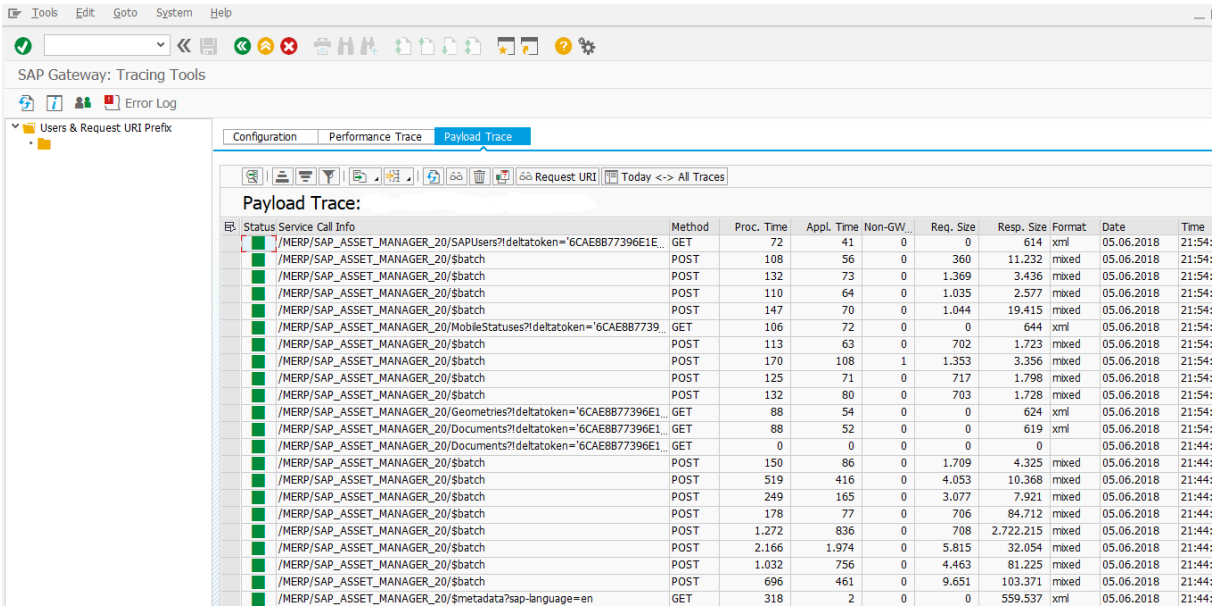
In addition, use the *Application Log Viewer* to display more technical error details by using transaction */IWFND/APPS_LOG*.

7.1.1.2 SAP Gateway Tracing Tools

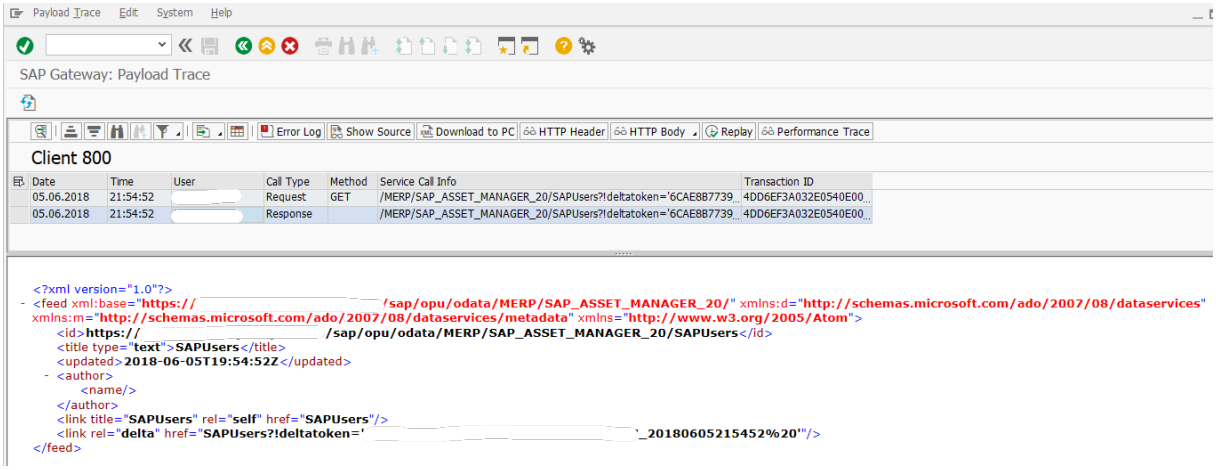
The SAP Gateway provides tracing tools (transaction code: `/IWFND/TRACES`) to trace on a particular user for both performance and payload.

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.



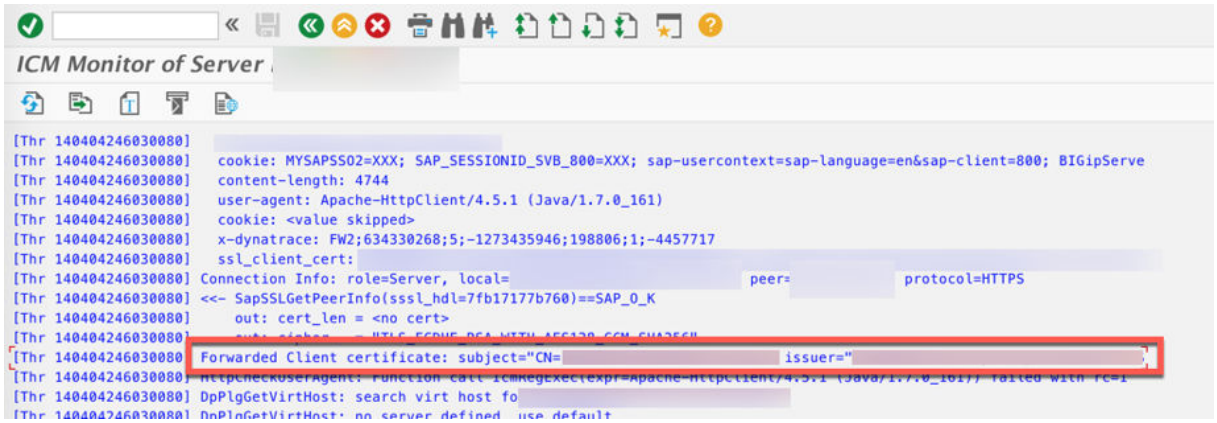
For information about how to configure and activate the payload trace tool, see Tracing Tools: Configuration in the *SAP Gateway Technical Operations Guide*.

7.1.1.3 Internet Communications Trace

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

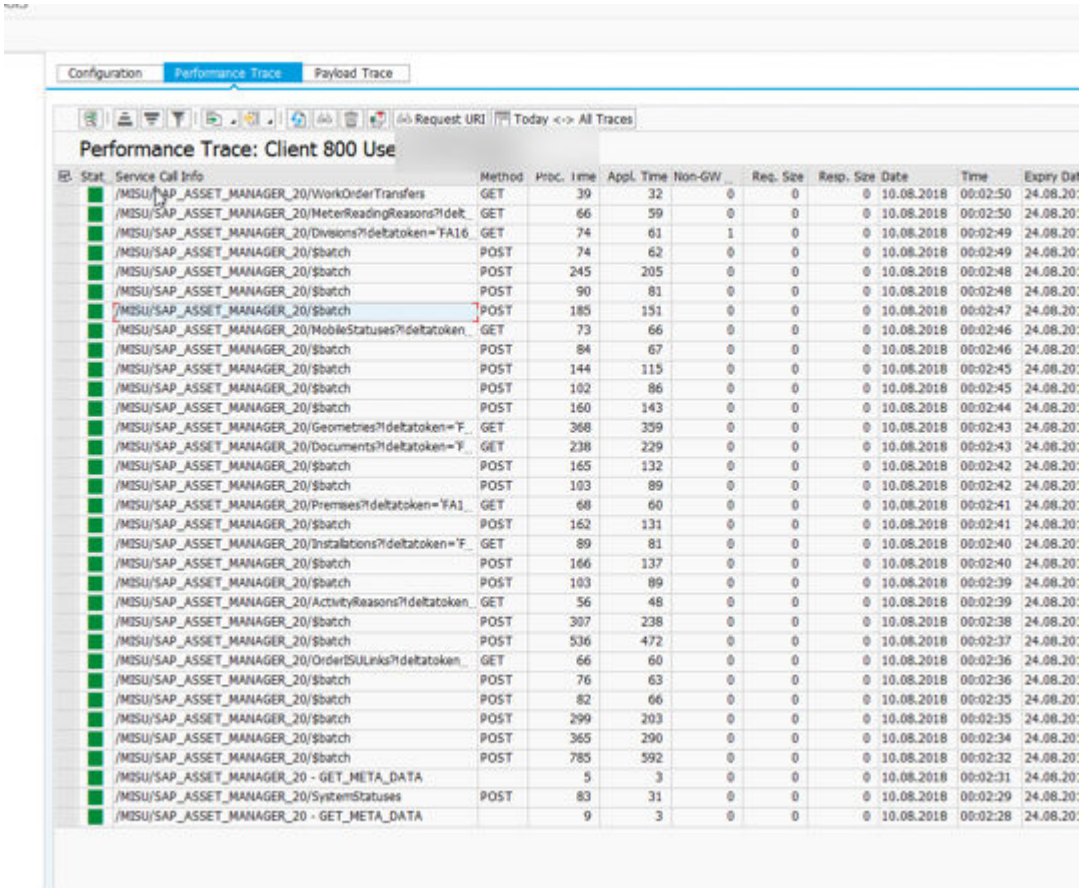
An internet communications trace can reveal issues with principal propagation. You can use the incoming forwarded client certificate to determine if certificate-mapping rules are properly established.

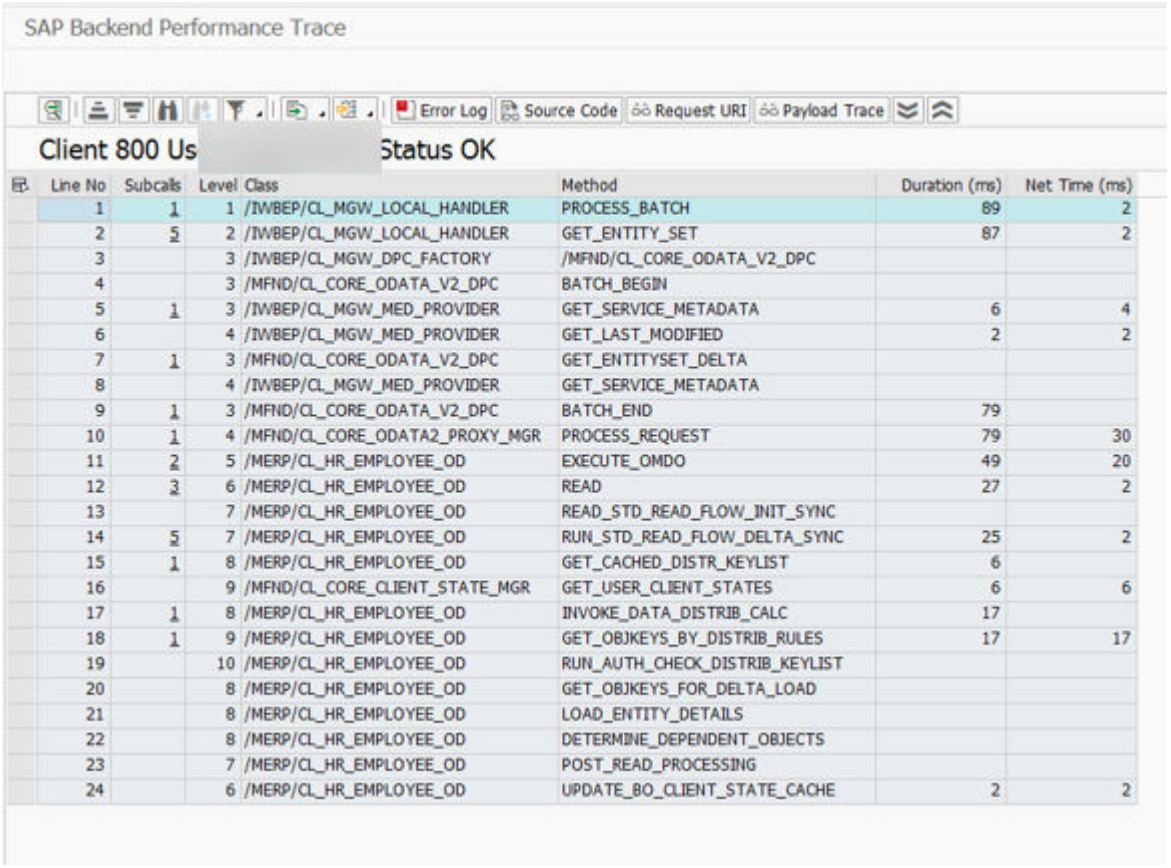
Trace levels are set through an administration menu. You can also restart the ICM using `SMICM`.



7.1.1.4 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.





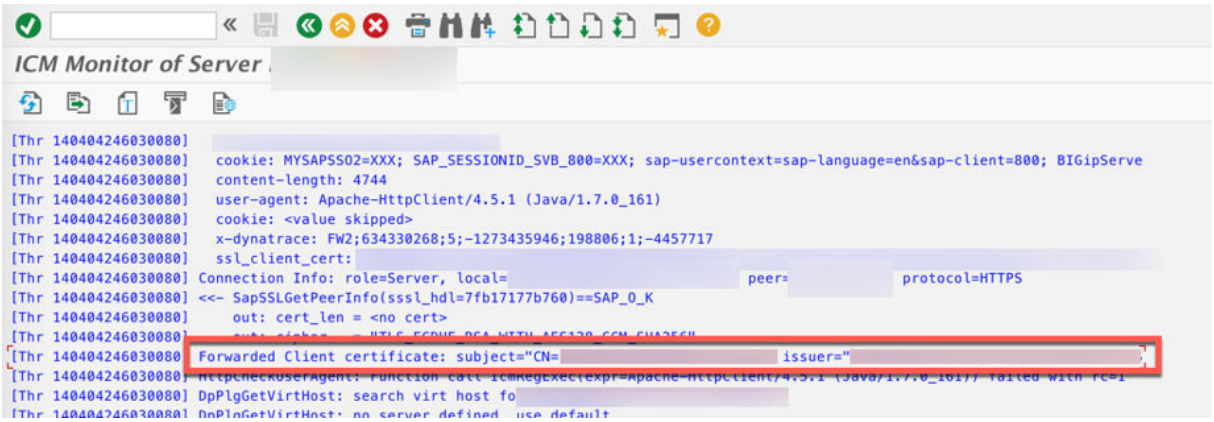
Line No	Subcalls	Level	Class	Method	Duration (ms)	Net Time (ms)
1	1	1	/IWBEP/CL_MGW_LOCAL_HANDLER	PROCESS_BATCH	89	2
2	5	2	/IWBEP/CL_MGW_LOCAL_HANDLER	GET_ENTITY_SET	87	2
3		3	/IWBEP/CL_MGW_DPC_FACTORY	/MFND/CL_CORE_ODATA_V2_DPC		
4		3	/MFND/CL_CORE_ODATA_V2_DPC	BATCH_BEGIN		
5	1	3	/IWBEP/CL_MGW_MED_PROVIDER	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

7.1.1.5 Internet Communications Trace

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

Trace files can reveal potential issues with principal propagation. Use the incoming forwarded client certificate to determine if your certificate-mapping rules are properly established.

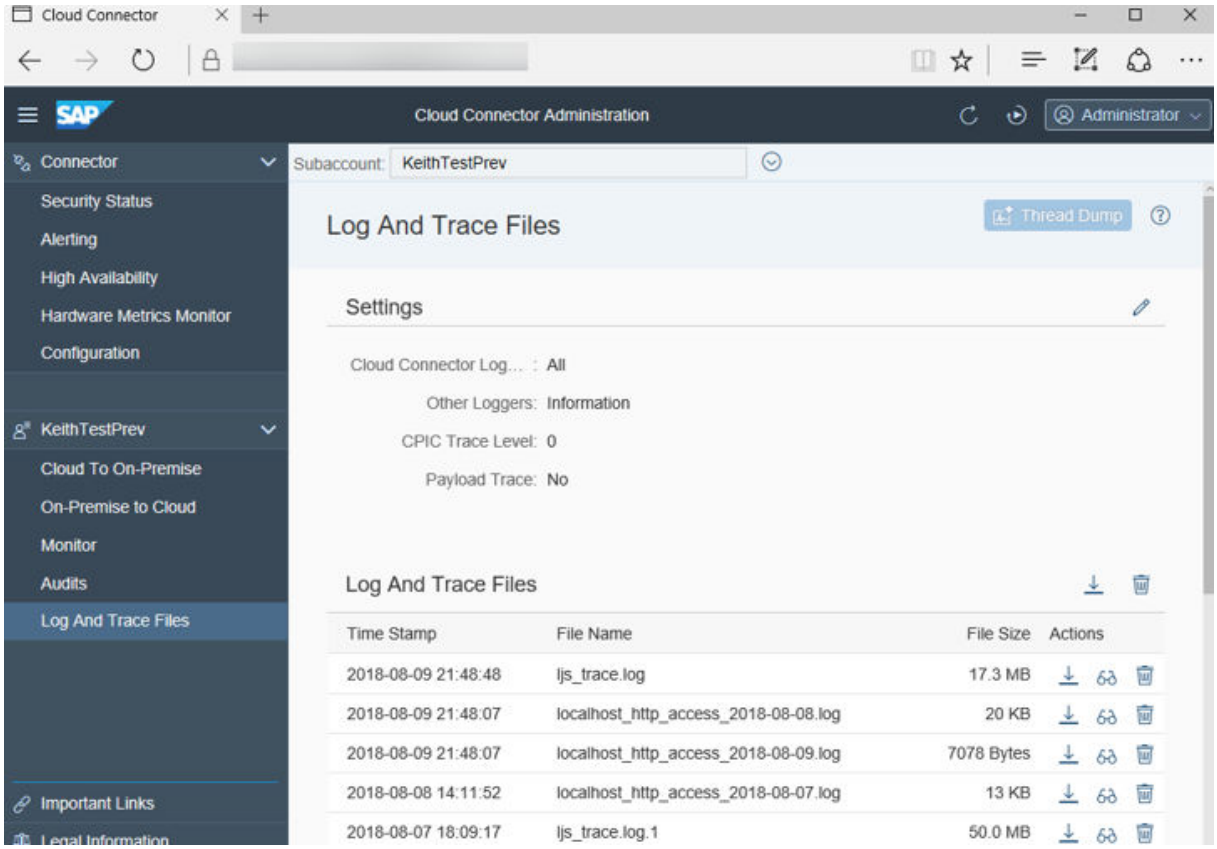
Set trace levels through the *Administration* menu. You can also restart the ICM through transaction `SMICM`.



7.1.2 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.



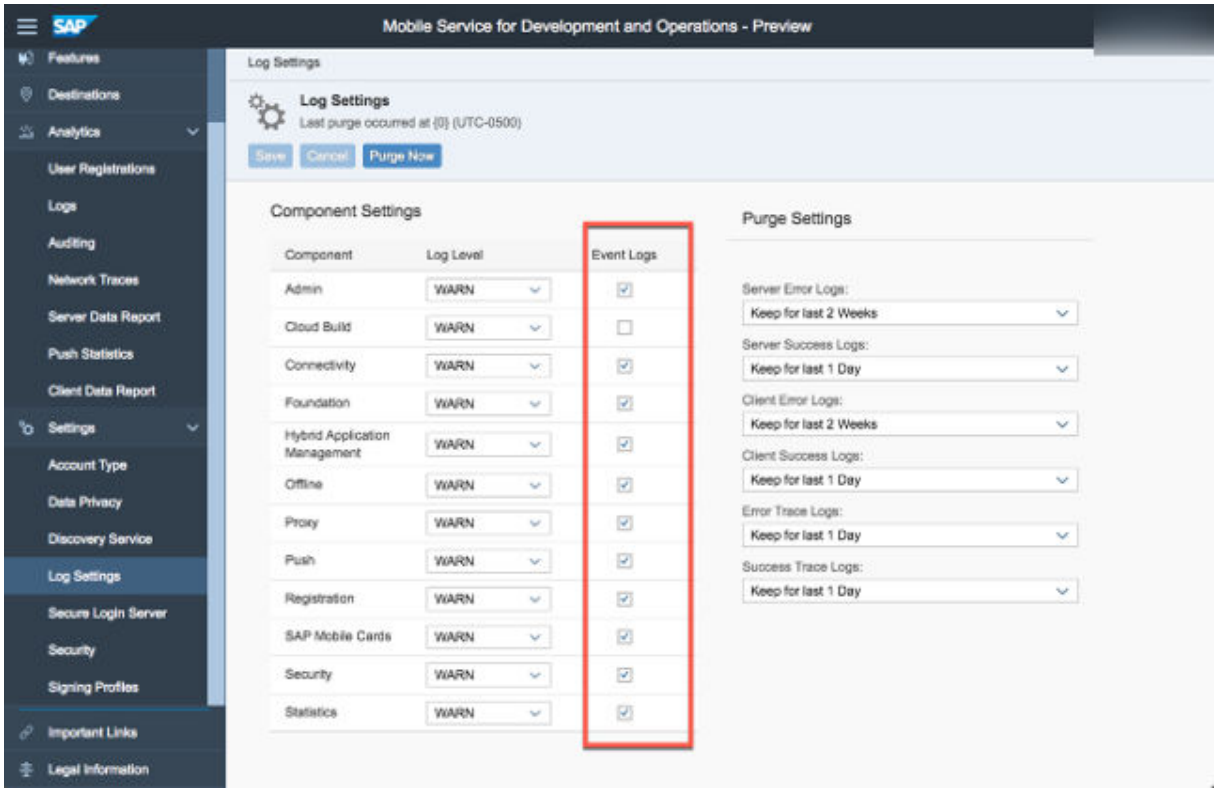
7.1.3 SAP Cloud Platform mobile services Logs and Traces

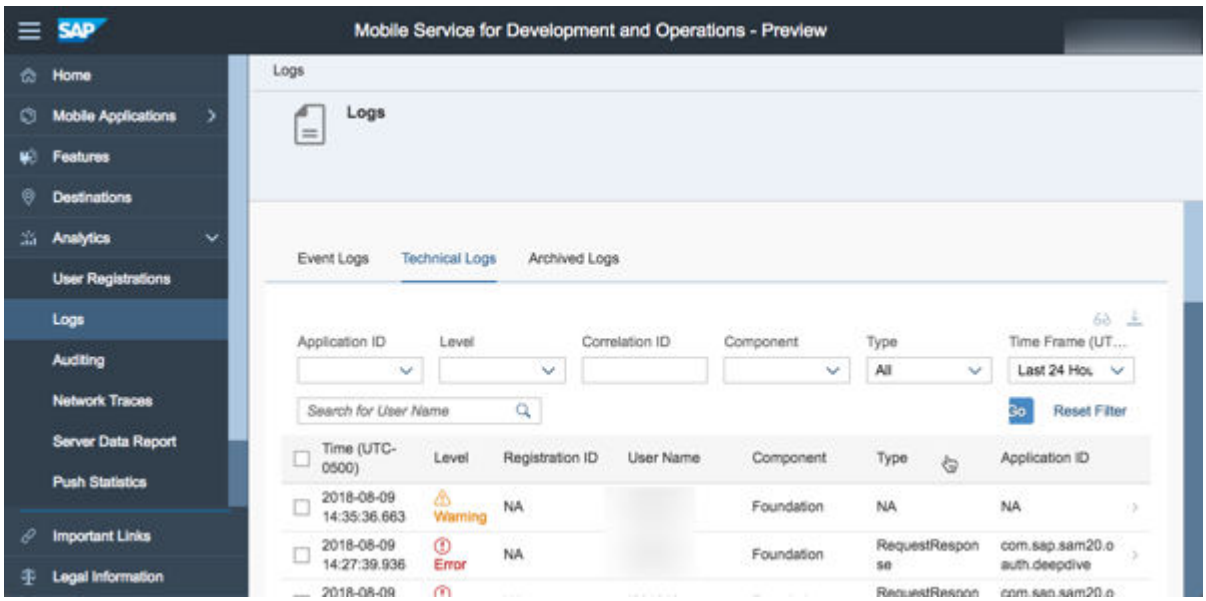
7.1.3.1 SAP Cloud Platform mobile services Logs

SAP Cloud Platform mobile services technical logs contain grouped logs by correlation ID for easier readability of log data.

The SAP Cloud 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 Cloud Platform mobile services through the log settings. You can also set the consistency of log purging through the settings.


Mobile Service for Development and Operations - Preview
Features
Destinations
Analytics
User Registrations
Logs
Auditing
Network Traces
Server Data Report
Push Statistics
Client Data Report
Settings
Account Type
Data Privacy
Discovery Service
Log Settings
Secure Login Server
Security
Signing Profiles
Important Links
Legal Information
Log Settings
Log Settings
Last purge occurred at {0} (UTC-0500)
Save
Cancel
Purge Now
Component Settings
Component
Log Level
Event Logs
Admin
Cloud Build
Connectivity
Foundation
Hybrid Application Management
Offline
Proxy
Push
Registration
SAP Mobile Cards
Security
Statistics
WARN
Purge Settings
Server Error Logs:
Keep for last 2 Weeks
Server Success Logs:
Keep for last 1 Day
Client Error Logs:
Keep for last 2 Weeks
Client Success Logs:
Keep for last 1 Day
Error Trace Logs:
Keep for last 1 Day
Success Trace Logs:
Keep for last 1 Day


Mobile Service for Development and Operations - Preview
Home
Mobile Applications
Features
Destinations
Analytics
User Registrations
Logs
Auditing
Network Traces
Server Data Report
Push Statistics
Important Links
Legal Information
Logs
Logs
Event Logs
Technical Logs
Archived Logs
Application ID
Level
Correlation ID
Component
Type
All
Time Frame (UT...
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
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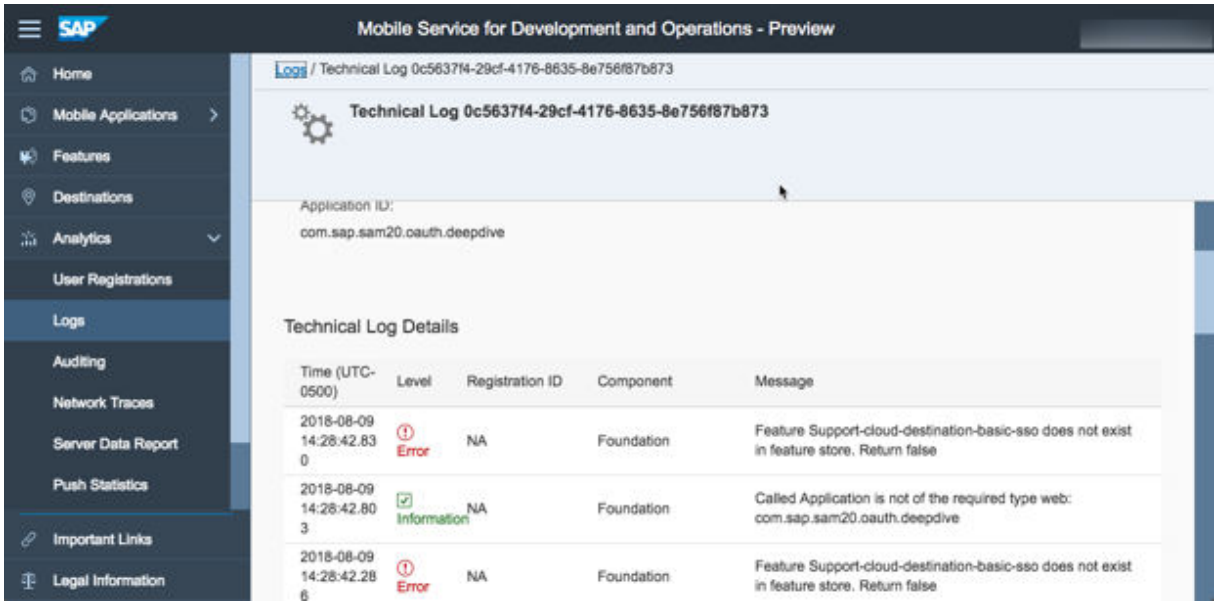
Foundation
RequestResponse
com.sap.sam20.oauth.deepdive

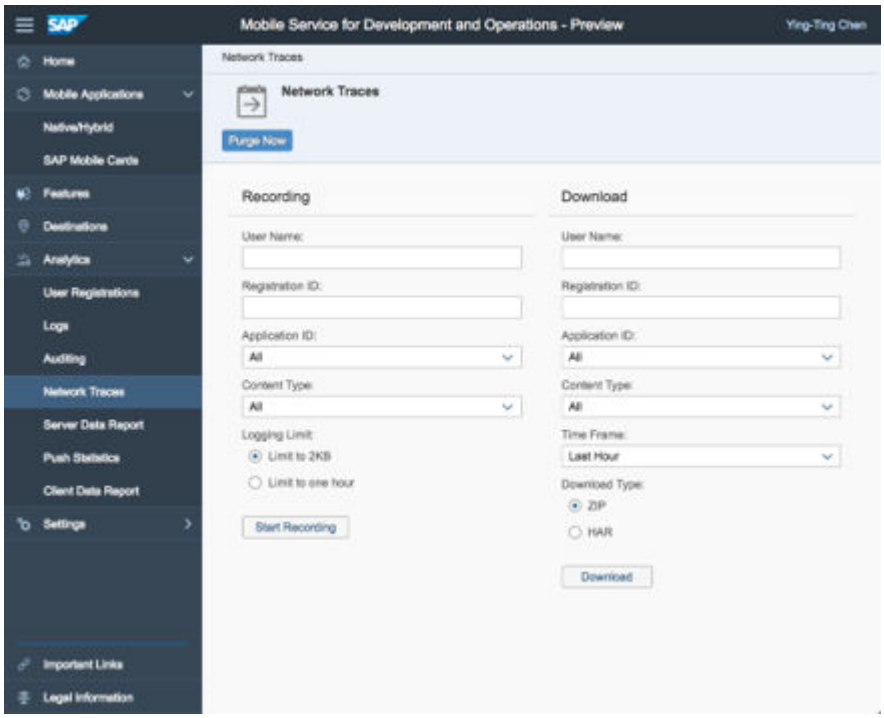


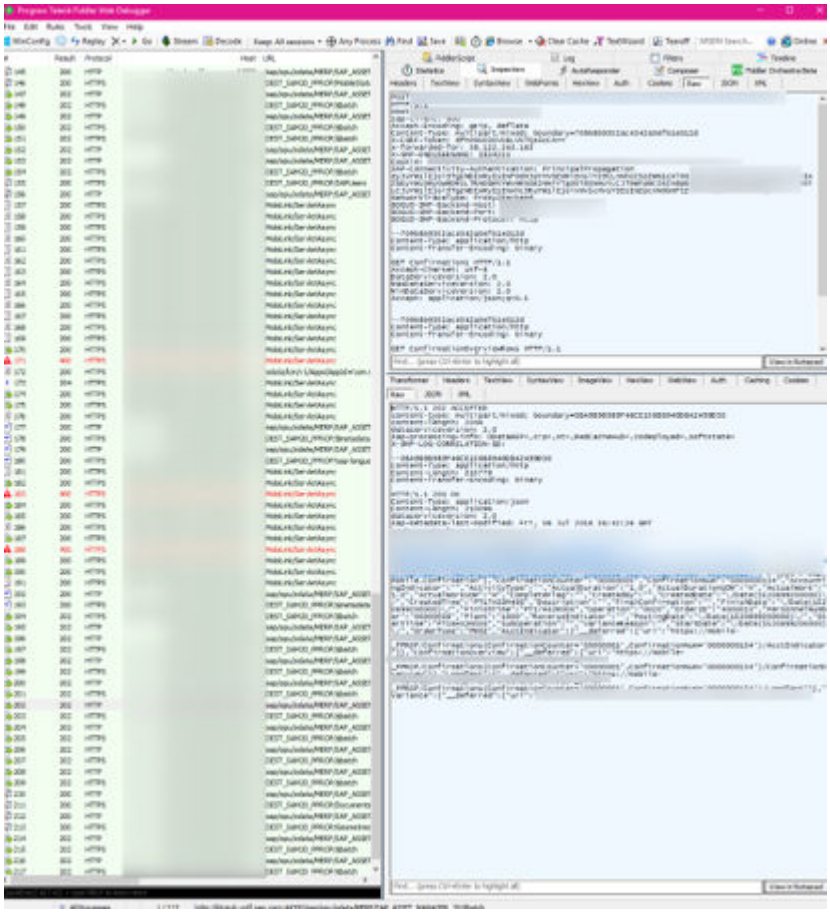
7.1.3.2 SAP Cloud Platform mobile services Network Traces

SAP Cloud 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 Cloud 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.

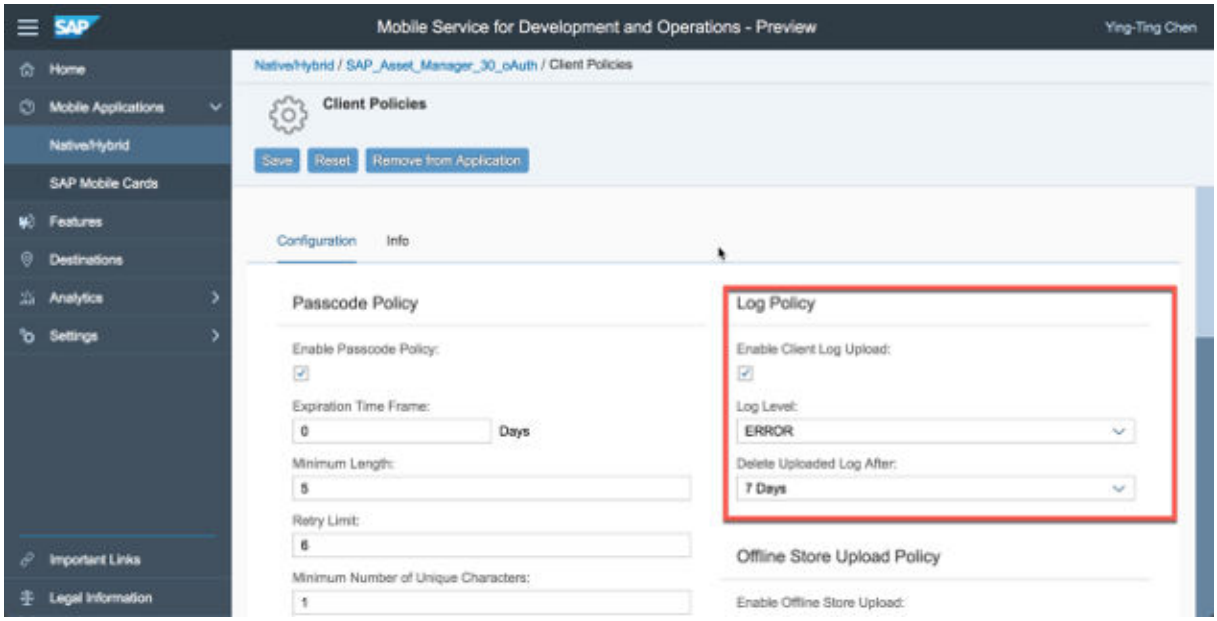




7.1.4 Mobile Development Kit Log Uploads

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

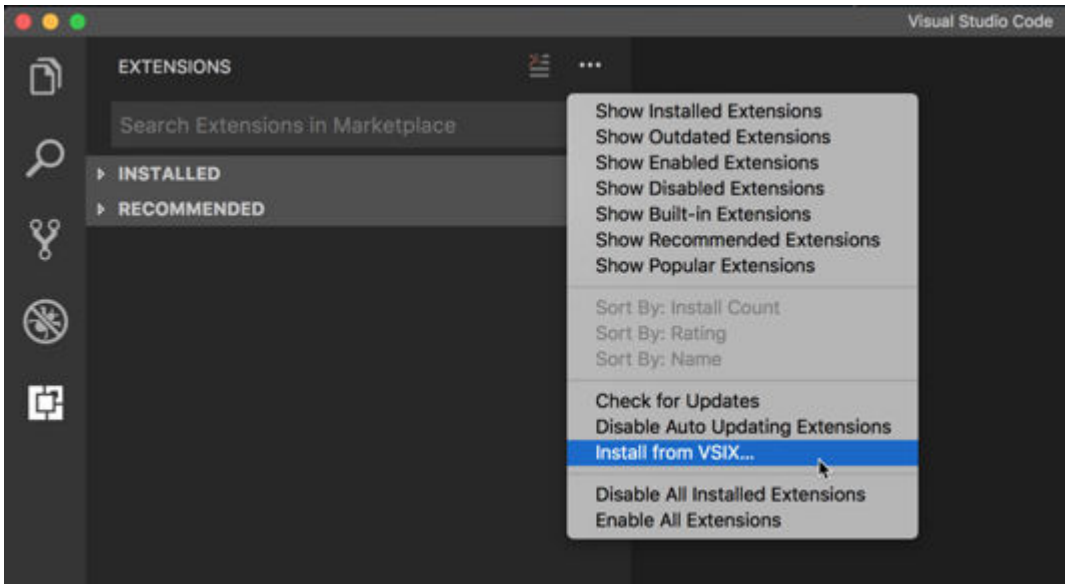
You can set the log level from the *Client Policies* screen in the SAP Cloud Platform mobile services. Log levels are brought into the logging page through the *Analytics* section of SAP Cloud Platform mobile services.



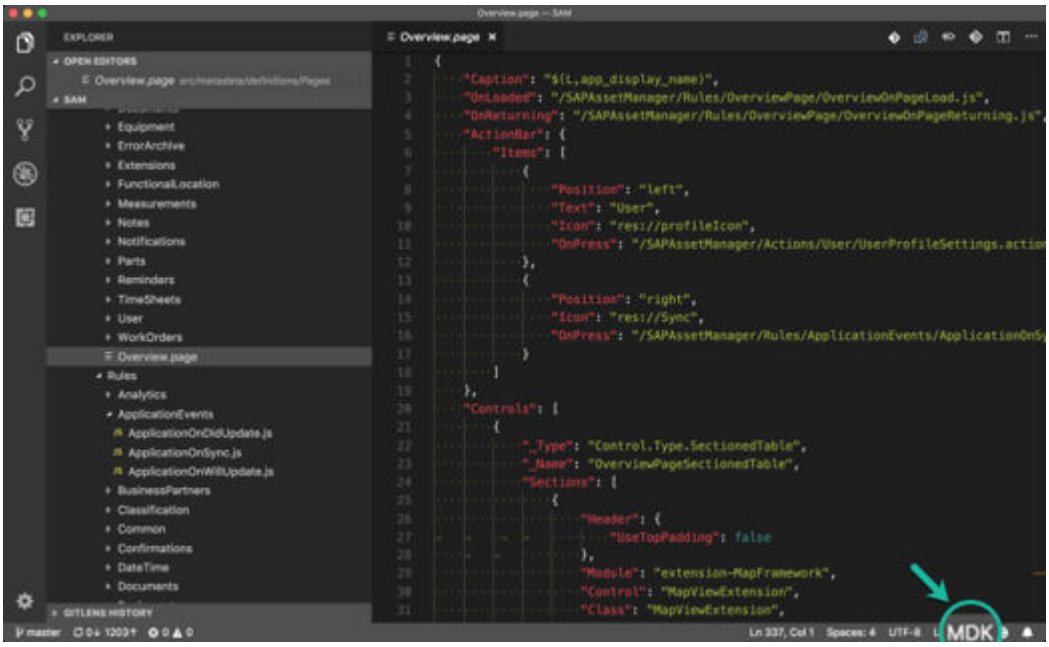
7.2 Debugging the Mobile Development Kit Using VS Code

Procedure

1. Install the Mobile Development Kit VS Code extension via the menu item of *VS Code Extensions Viewer* > *Install from VSIX*.

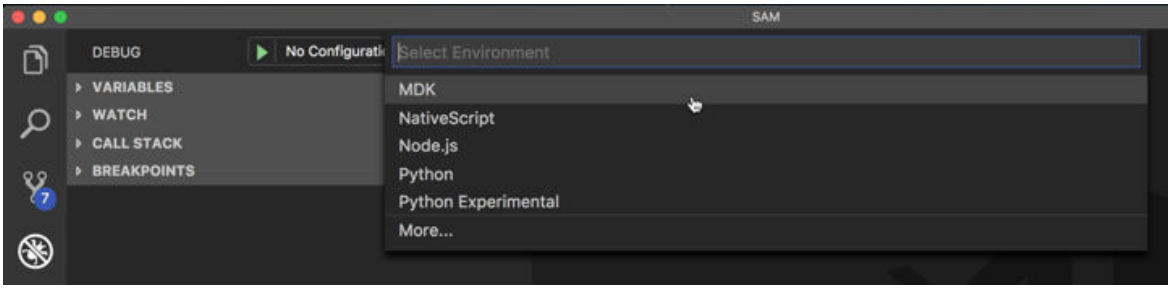


2. Reload VS Code to enable the Mobile Development Kit extension.

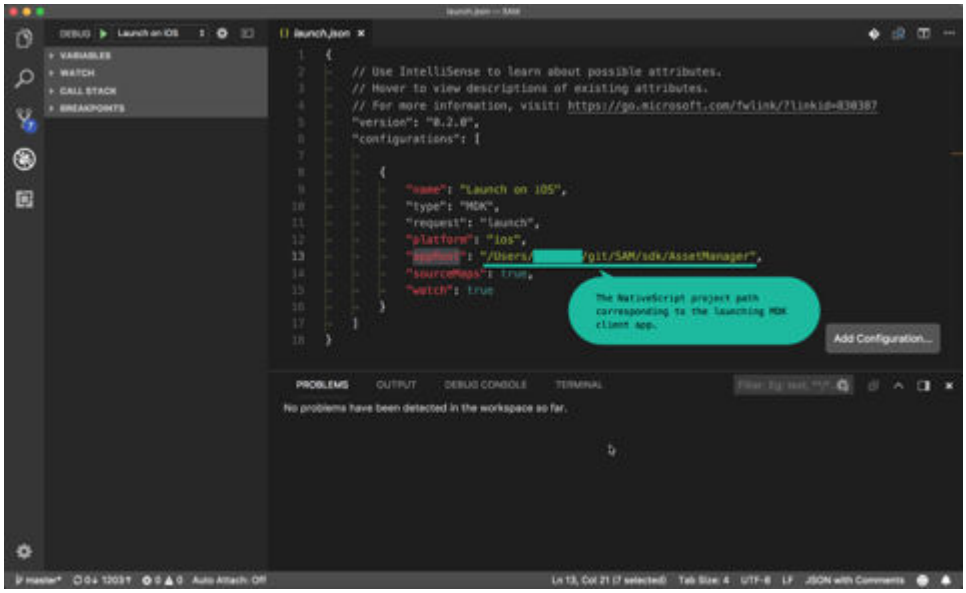


A new language mode, *MDK*, is attached to any opened Mobile Development Kit metadata file.

3. Add a new launch configuration called *MDK* for the first time launch in *Debug* view.



4. Change the value for *appRoot*.



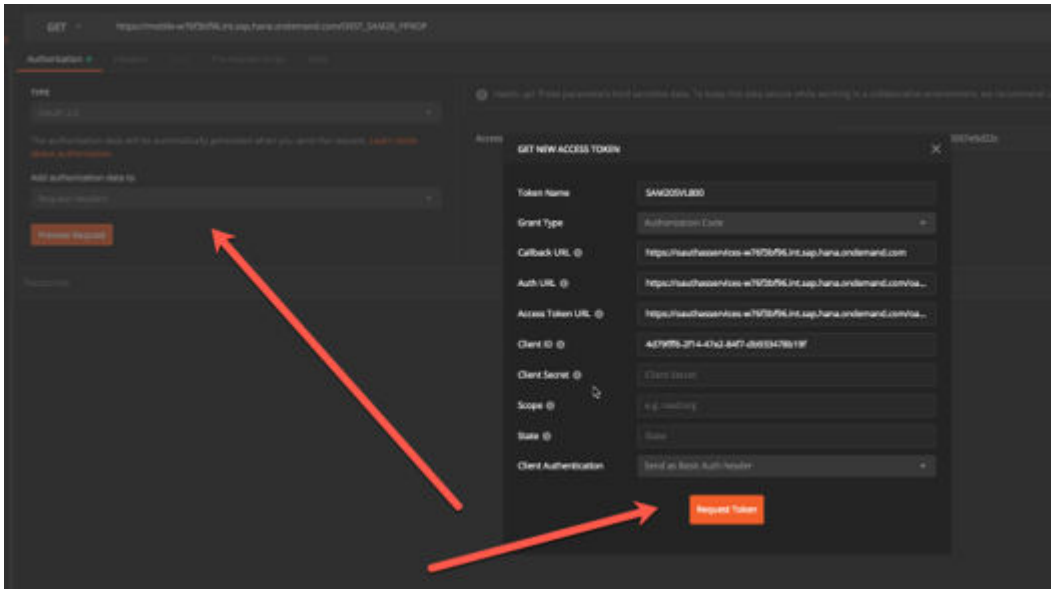
5. Click the menu item *Debug* > *Start Without Debugging*.
6. Launch on iOS or attach on iOS.

7.3 Debugging the OData Model

7.3.1 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

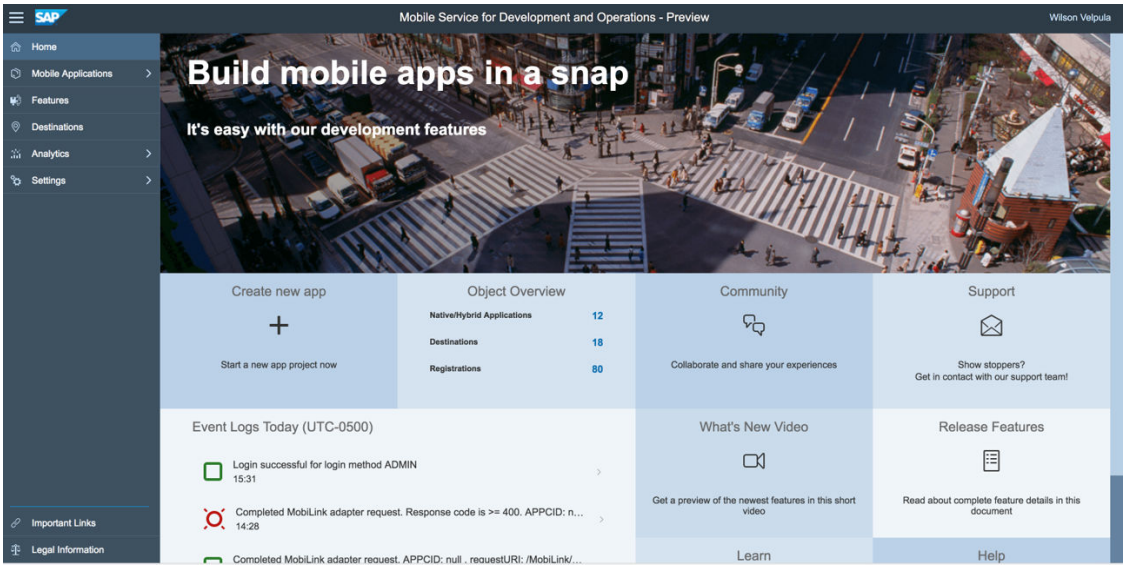
- Doesn't support offline features, including navigation links, expands, and others
- Doesn't retrieve records with dependent objects

7.4 Client Troubleshooting

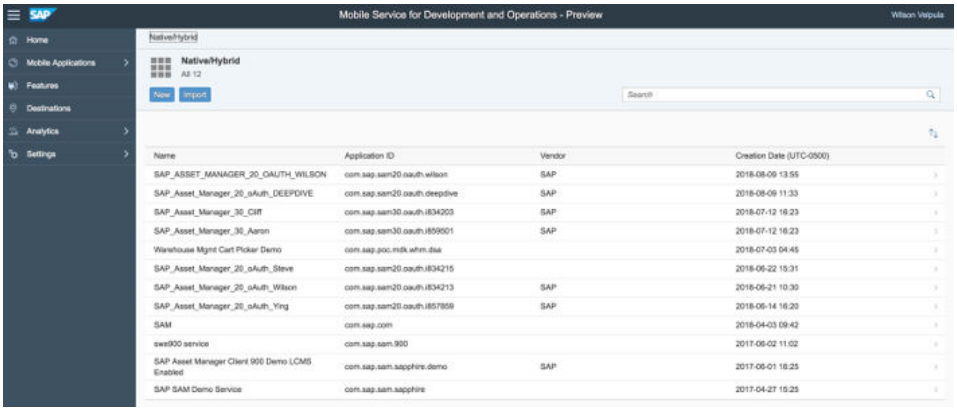
7.4.1 Debugging the SAP Asset Manager Client

Procedure

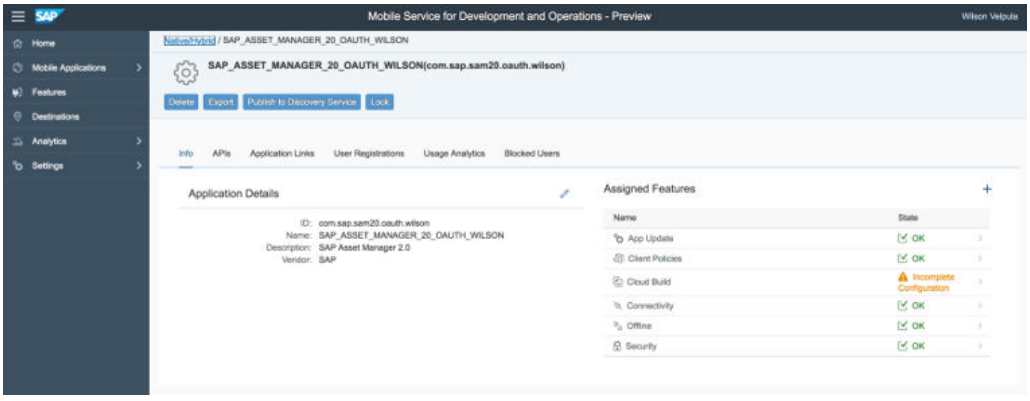
1. **Enable logging on SAP Cloud Platform mobile services:**
   a. Open *Mobile Service for Development and Operations* in the SAP Web IDE.



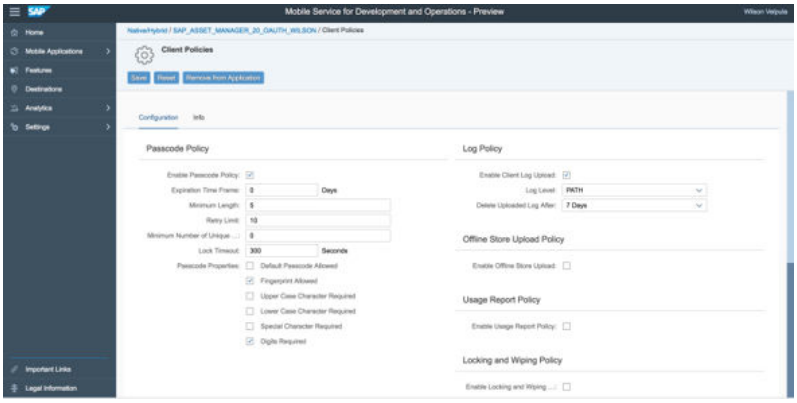
b. Select the native/hybrid application in the *Object Overview*.



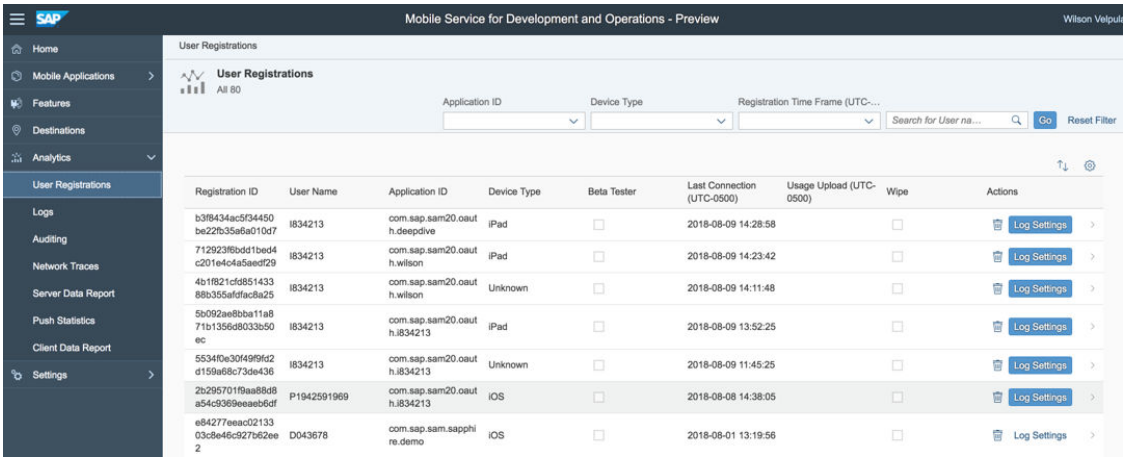
c. Select the *Application*, then select *Client Policies*.



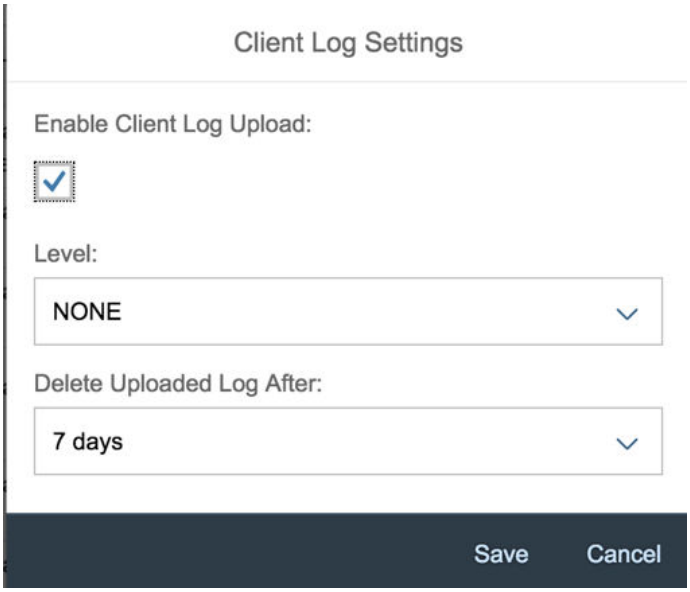
d. Enable the log policy.



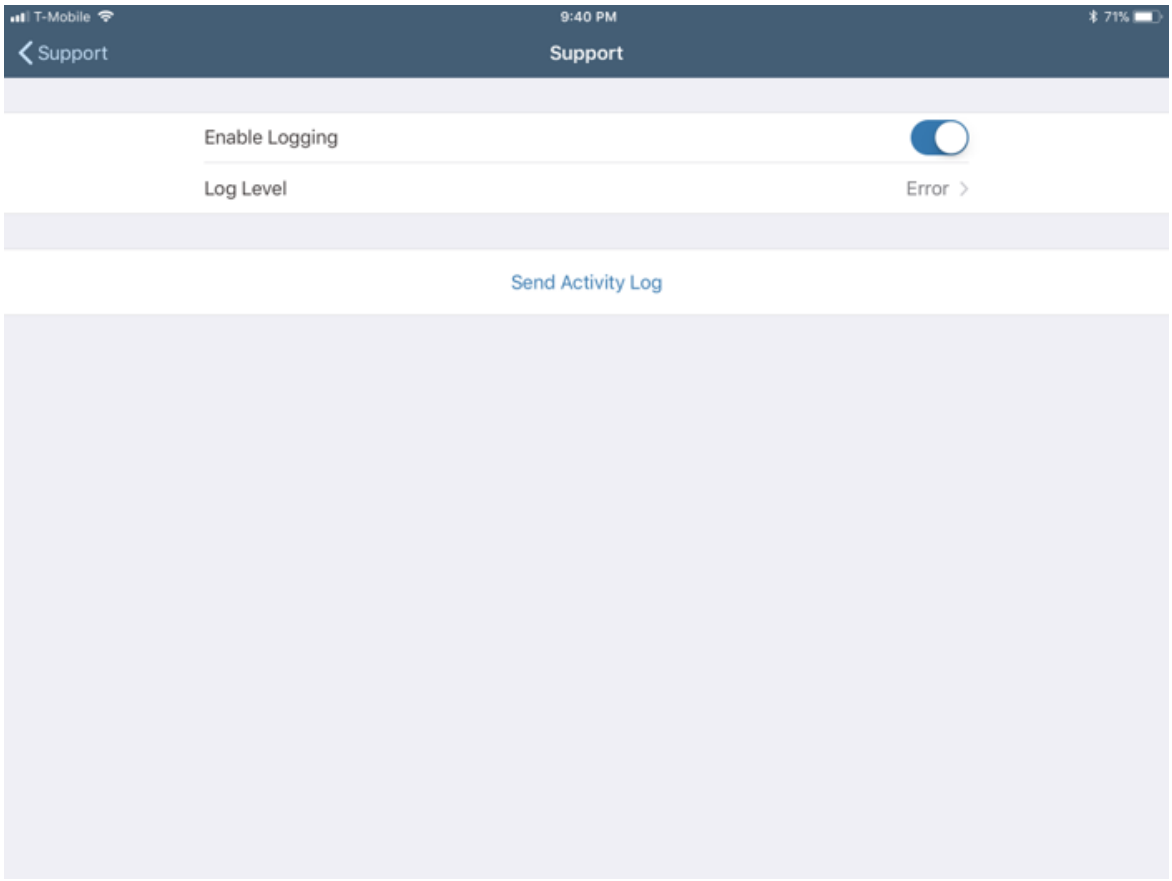
2. **Enable logging per user on SAP Cloud Platform mobile services:**
   a. Open *Mobile Service for Development and Operations* in the SAP Web IDE if it's not already open.
   b. Expand *Analytics* and select *User Registrations*.
   c. Select the log settings of your desired user, then select *Client Policies*.

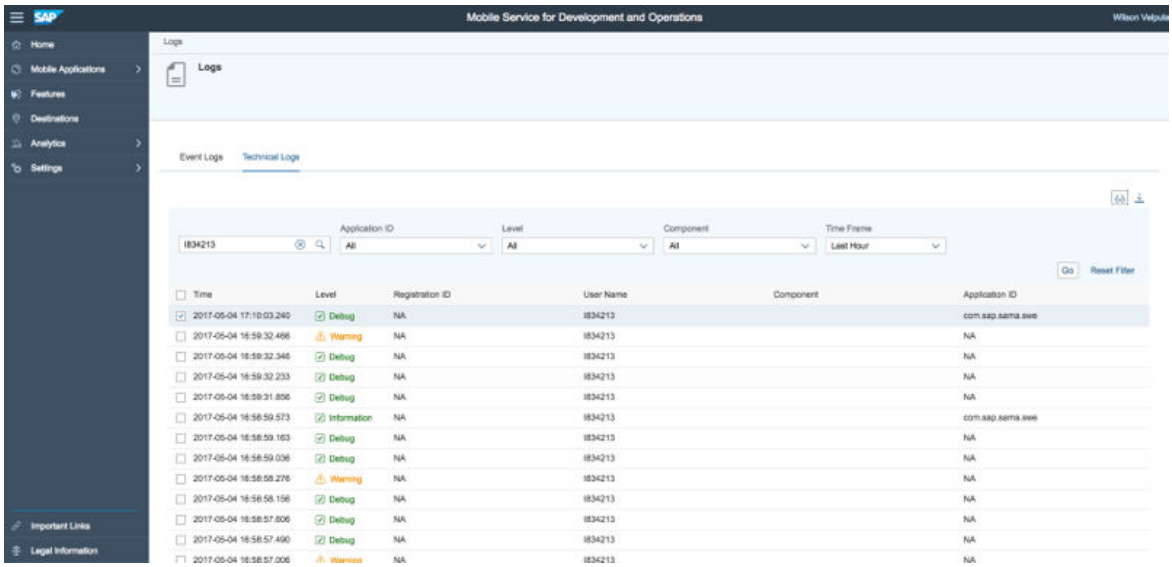


   d. Enable the *Log Policy*.



3. Upload the client logs to SAP Cloud Platform mobile services.





4. Use the Gateway trace logs found on your back-end system. See SAP Gateway Tracing Tools [page 25] for more information.

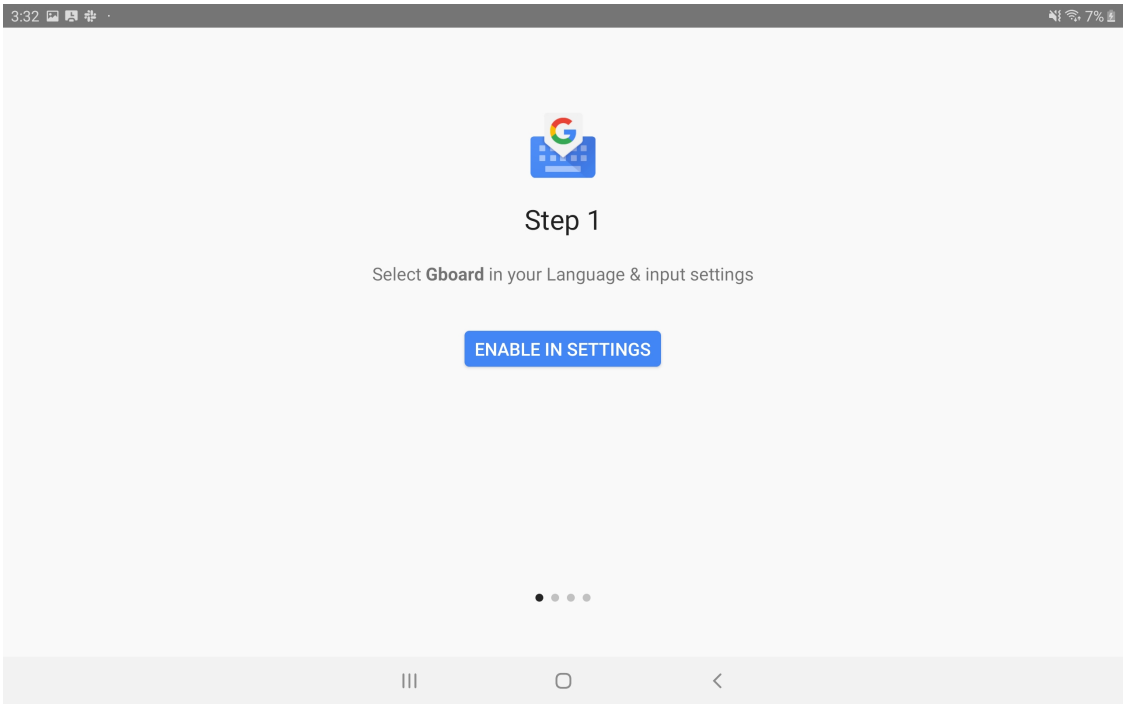
7.4.2 Numeric Input on Android Devices

If your Android device uses an OEM-specific (non-Google) software keyboard, it may prevent you from entering decimals and negative numbers in fields where you're entering a reading value, such as measuring point screens.

If you or your mobile device users are unable to enter decimal points and negative values on their Android devices, take the following steps to install Gboard on your Android device:

Installing the Gboard App onto Your Mobile Device

1. Search for and install the *Gboard* app from the *Google Play* store onto Android mobile devices running SAP Asset Manager (https://play.google.com/store/apps/details?id=com.google.android.inputmethod.latin). Gboard is the default, Google-provided, Android keyboard.
2. Enable *Gboard* as the default keyboard input. See the following substeps and screenshots for examples of how to install Gboard. Note that your Android screens may not look exactly like the screenshots due to manufacturer differences in design.
    1. Open the *Gboard* app after you've installed it. Gboard displays a message requesting you to enable your language and input settings. Tap the *Enable in Settings* button to continue.



    A pop-up window displays, allowing you to select which keyboard you wish to enable.

> **i Note**
>
> If a pop-up window doesn't display during the Gboard set up wizard, continue to the *Manually Setting Gboard Defaults* subsection in this topic to manually apply the Gboard settings.

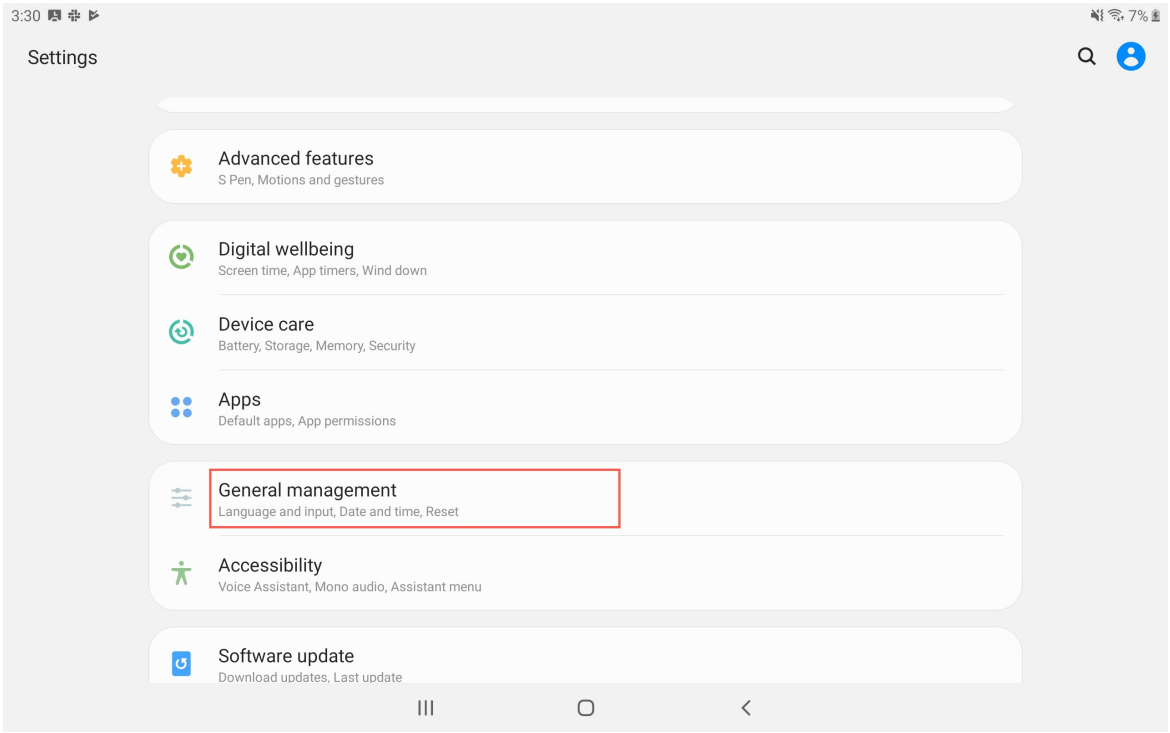
    2. Select the *Gboard* option.

The Step 2 screen appears in the Gboard set up wizard, prompting you to select the default input method.

3. Tap the *Select Input Method* button.
   A pop-up window displays, allowing you to select which keyboard you wish to enable.
4. Select the *Gboard* option.
5. The other set-up options in the Gboard set up wizard are optional. You can set them or skip.
6. After performing these steps on your Android device that you use for the SAP Asset Manager application, ensure that you can enter measuring point or reading values that include decimal points and a negative number value.

Manually Setting Gboard Defaults

1. Tap on *Settings* from your app choices listed on your phone.
   The *Settings* feature opens.
2. Tap the *General Management* option.



3. Tap the *Language and input* selection on the *General Management* screen. Select *Gboard* as the default keyboard.
4. Tap the *Default keyboard* selection on the *Language and input* screen. Select *Gboard* as the default keyboard.
5. After performing these steps on your Android device that you use for the SAP Asset Manager application, ensure that you can enter measuring point or reading values that include decimal points and a negative number value.

7.4.3 Errors When Deploying and Activating the Mobile Development Kit

You can get the following error when activating and deploying the Mobile Development Kit:

```
Build failed

Please follow the relevant troubleshooting tips below:

ERROR: "Unable to find local grunt"

- Right-click the project folder, select "Clean npm Folder", and build again.

ERROR: "npm ERR! code EINTERGITY"

- Delete the "package-lock.json" file from the project and build again..
```

To resolve the error, right-click the `MDKWebpackFactory` folder and select *Clean npm Folder*. If cleaning the npm folder doesn't resolve the issue, delete the `MDKWebpackFactory` folder and redeploy your project.

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