SAP Dynamic Edge Processing
Edge Business Services - Configuration Guide
Version 2.0 FP01
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ABOUT THIS DOCUMENT
This configuration guide provides a central starting point for the technical implementation and
configuration of SAP Dynamic Edge Processing. It describes all activities necessary for implementation
and configuration. It is not an installation document. Refer to the appropriate installation notes for instructions about installing the underlying components.

This document is intended for the following target audiences:
- Consultants
- Partners
- Customers

**Glossary**

<table>
<thead>
<tr>
<th>Term</th>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agentry</td>
<td></td>
<td>The installation components SMERP 600_700 and SMFND 600_700 are the Agentry SAP Framework ERP Add-On and Integration Foundation and are part of the SAP Dynamic Edge Processing product download.</td>
</tr>
<tr>
<td>Bill of Material</td>
<td>BOM</td>
<td>A list of parts grouped together for one piece of equipment, configured in SAP ERP.</td>
</tr>
<tr>
<td>Complex Table</td>
<td>CT</td>
<td>Master data staging table; data in these tables is common to all edge or remote locations.</td>
</tr>
<tr>
<td>Component</td>
<td></td>
<td>The raw material, part, or subassembly that goes into a higher-level assembly. Example: A part is entered as a component.</td>
</tr>
<tr>
<td>Edge Server Plant</td>
<td></td>
<td>A local representation of unique SAP ECC plant. This edge server plant is operated locally and synchronized with the ECC back-end.</td>
</tr>
<tr>
<td>Equipment Master</td>
<td></td>
<td>Master data that describes an individual piece of equipment.</td>
</tr>
<tr>
<td>Goods Issue</td>
<td>GI</td>
<td>A withdrawal from warehouse stock, such as in the issue of materials to a work order.</td>
</tr>
<tr>
<td>Goods Receipt</td>
<td>GR</td>
<td>An addition to warehouse stock, such as goods received from external vendors or from in-plant production.</td>
</tr>
<tr>
<td>Hypertext Markup Language</td>
<td>HTML</td>
<td>HTML is the language your browser understands. It's a standardized system for tagging text files to achieve font, color, graphic, and hyperlink effects on World Wide Web pages.</td>
</tr>
<tr>
<td>Inter-Plant Transfer</td>
<td></td>
<td>The transfer of materials from one plant or remote location to another and the resulting goods movement.</td>
</tr>
<tr>
<td>Lightweight Directory Access Protocol</td>
<td>LDAP</td>
<td>A software protocol for enabling anyone to locate organizations, individuals, and other resources such as files and devices in a network.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Local Area Network</td>
<td>Computer network that interconnects computers within a limited area.</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Goods that are manufactured or purchased, such as a repair part. They are identified by their unique Material Number.</td>
<td></td>
</tr>
<tr>
<td>Material Document</td>
<td>Evidence of one or more material movements, providing information for downstream applications. A material document contains one or more items and can be printed as a slip to accompany physical goods movements (GR/GI slip).</td>
<td></td>
</tr>
<tr>
<td>Measuring Point</td>
<td>A physical or logical place from where a status is collected. Example: Runtime hours of a piece of equipment. The status is described using measurement readings. Measuring points are stored in the SAP ERP as master data.</td>
<td></td>
</tr>
<tr>
<td>MobiLink</td>
<td>MobiLink synchronization is a component of SAP SQL Anywhere that allows two-way synchronizations.</td>
<td></td>
</tr>
<tr>
<td>Notification</td>
<td>In SAP Dynamic Edge Processing, maintenance notifications are created for maintenance processing in the event of a malfunction or other situation requiring attention. They document maintenance tasks and can be used for planning and execution of tasks or later analysis. They are created in tandem with work orders.</td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td>A task that instructs the user doing the work order. Example: Inspect exhaust system.</td>
<td></td>
</tr>
<tr>
<td>Physical Inventory</td>
<td>Counting material at a specific point in time. The counted quantity of a material for each storage location is contained in a physical inventory document.</td>
<td></td>
</tr>
<tr>
<td>Plant Maintenance</td>
<td>The measures taken to keep a facility operating efficiently. Also, the module of SAP ERP that manages these measures.</td>
<td></td>
</tr>
<tr>
<td>Purchase Order</td>
<td>A request from a buyer to a seller to deliver a specified quantity of material, or perform a specified service, at a specified price within a specified time.</td>
<td></td>
</tr>
<tr>
<td>Purchase Requisition</td>
<td>A document which defines the needs for a good or service and contains details of the purchase to be made.</td>
<td></td>
</tr>
<tr>
<td>SAP SQL Anywhere</td>
<td>A proprietary relational database management system (RDBMS) product from SAP. It includes the MobiLink client and web server.</td>
<td></td>
</tr>
</tbody>
</table>
The components SMERP and SMFND are the ABAP add-ons from SAP Work Manager that are used in this solution.

An invoice for services provided by a third party. Example: Purchase service such as sanding or welding.

Goods or merchandise in inventory.

The entity containing the work to be done for maintenance and repair of equipment.

You can find related information in the following resources:

<table>
<thead>
<tr>
<th>Resource</th>
<th>Quick Link</th>
</tr>
</thead>
</table>

### Important SAP Notes

**Recommendation**

Read the SAP Notes below before you start implementing the software. The SAP Notes contain the latest information about the installation as well as corrections to the installation information. Also make sure that you have the most current version of each SAP Note, which is available on SAP Support Portal at [http://support.sap.com/notes](http://support.sap.com/notes).

<table>
<thead>
<tr>
<th>SAP Note Number</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2330671</td>
<td>Release strategy for ABAP add-ons of SAP Dynamic Edge Processing</td>
<td>Plan the installation and upgrades of the ABAP add-on for SAP Dynamic Edge Processing</td>
</tr>
<tr>
<td>2209481</td>
<td>Release strategy for SAAP_Services 100 HANA instantiation of RCS Transaction Availability for Remote Sites</td>
<td>Plan the installation of SAAP_Services 100 HANA instantiation of the non-ABAP add-on for SAP Dynamic Edge Processing</td>
</tr>
<tr>
<td>2068253</td>
<td>xChange EFI for Physical Inventory Document /SYCLO/MM_EFI_IBLRN_EX_INCL is always disabled</td>
<td>Enable fix that enables the exchange table and also supports the xChange for physical inventory count (MI04) and difference posting (MI07) using the same exchange EFI</td>
</tr>
<tr>
<td>2215310</td>
<td>Purchase Order Exchange - Does not trigger if only Purchase Order Header is updated.</td>
<td>A fix that triggers the exchange table of purchase order /syclo/ebehn_ex when there is only a purchase order header change.</td>
</tr>
</tbody>
</table>
Note
It is recommended that you search for SAP Notes that are valid for the installed *SAP Dynamic Edge Processing* support package and apply the relevant notes as per the instructions. You can search the SAP Support Portal at [http://support.sap.com/notes](http://support.sap.com/notes).
Use software component ‘HAN-DEP’ as a restriction.
SOLUTION OVERVIEW

*SAP Dynamic Edge Processing* provides uninterrupted SAP functionality anywhere, anytime. It is always available, and provides LAN-based speed whether it’s connected or disconnected. Now the distributed locations of a company can run 24x7 and are continuously synchronized, regardless of connectivity.

*SAP Dynamic Edge Processing* consists of the following components:

- SAP ERP integration
- MobiLink server
- Client database and web server

The architecture consists of SAP SQL Anywhere 17.0 running on the remote site as a distributed data store (remote database). Through staging tables in a consolidated database, functionality is extended in the areas of:

- Plant Maintenance (PM)
- Inventory Management (IM)
- Materials Management (MM)

ABAP programs execute in regularly scheduled jobs to populate the exchange or staging tables. The staging tables in SAP ERP are synchronized with the staging tables at the remote location using MobiLink server. The user at the remote location can use a UI that leverages the TARS API that has been implemented to work with data in the local SAP SQL Anywhere database.

### MobiLink Synchronization

Synchronization is initiated by the edge database, which is also known as the MobiLink client. Changes are uploaded to the MobiLink synchronization server through the network layer. Conflicts that result from the upload are resolved at the central SAP ERP database. Changes in SAP ERP data are then downloaded from the consolidated database (the SAP ERP database with the Exchange staging tables) to the local MobiLink database.

The MobiLink synchronization server can operate in a single or multi-tiered distributed architecture. The synchronization system of the MobiLink server uses internal system tables to keep track of the synchronization progress of users. This information is kept both at the edge database and the consolidated SAP ERP database.

The MobiLink synchronization server client keeps track of the transaction log progress and the last successful synchronization timestamp to ensure that the next synchronization of a user is in step.
During upload processing, the MobiLink synchronization server ensures all or nothing updates at the consolidated database. In other words, the MobiLink synchronization server rolls back all transactions for the current upload if anything fails during the upload process. During the download, the MobiLink client operates in the same fashion to ensure all or nothing updates at the client. The MobiLink client guarantees transaction integrity by synchronizing only committed transactions. The MobiLink client picks up committed transactions by scanning the transaction log. If solution data is not properly scoped under database transactions, MobiLink server synchronization can leave the consolidated database in an inconsistent state.
System and Application Landscape

Recommendation
For performance, scalability, high availability, and security reasons, we strongly recommend that you do not use a minimal system landscape as your productive landscape. For more information about creating productive system landscapes, see SAP Service Marketplace at https://service.sap.com.
The system landscape consists of local PCs connecting to the SAP SQL Anywhere 17.0 database server that resides on a LAN at the remote location. The SAP SQL Anywhere 17.0 server also functions as a web server and has a MobiLink connector agent.

Landscape Components
The following form the basis of SAP Dynamic Edge Processing:
- SAP ERP
  - The MobiLink server uploads the data from the edge site database and places the data in the transaction tables of the SAAP staging tables.
  - The synchronization framework processes the uploaded transactions from the transaction tables, then updates SAP ERP data, subsequently updating the object tables, via the delta BAPI wrappers.
- Headquarters
  - The technical user (for example, mlsyncuser) must have full access rights to the SAP\RIGS folder to read and write attachments and reports.
- Network
  - TCP port 5555 must be open between the application server and the MobiLink server.

Prerequisites
The software prerequisites for using SAP Dynamic Edge Processing include:

<table>
<thead>
<tr>
<th>Software</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP ERP 6.0</td>
<td>EHP4 or above</td>
</tr>
<tr>
<td>SAP Work Manager components</td>
<td>SMERP 600_700, Support package SAPK-60003INSMERP; SMFND 600_700, Support package SAPK-60003INSMFND;</td>
</tr>
<tr>
<td>(included in the SAP Dynamic Edge Processing download)</td>
<td></td>
</tr>
<tr>
<td>SQL Anywhere with MobiLink client</td>
<td>17.0.0.1062 or above</td>
</tr>
<tr>
<td>MobiLink server (part of SQL Anywhere package)</td>
<td>17.0.0.1062 or above</td>
</tr>
</tbody>
</table>

One of the following database options is also required:

<table>
<thead>
<tr>
<th>Database Option</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft SQL Server</td>
<td>Server 2008 or above</td>
</tr>
<tr>
<td>Oracle Database</td>
<td>11g or above (also requires Oracle JDK 1.6 or above)</td>
</tr>
<tr>
<td>HANA</td>
<td>1.95 or above (also requires HANA Client and HANA Real-Time Replication)</td>
</tr>
</tbody>
</table>
Implementation and Configuration – Basic Settings
This configuration guide contains the information necessary to configure the SAP system to meet customer requirements. The SAP ERP configuration is done in the implementation guide (IMG; transaction SPRO). It covers all steps of the implementation process as well as the SAP standard (factory) customizing settings and the system configuration activities. The customizing activities and their documentation are structured from a functional perspective.

The following is a high-level overview:
• Install SAP add-ons (SMFND and SMERP) on SAP ERP, and activate permissions
  – And Service Pack 4 (K-60004INSMERP.SAR and K-60004INSMFND.SAR)
• Install SAP Dynamic Edge Processing on SAP ERP (K-100AGINSAAP.SAR)
  – And Service Packs 1, 2, and 3 (K-10001INSAAP.SAR, K-10002INSAAP.SAR, K10003INSAAP.SAR)
• Install MobiLink software (SAP SQL Anywhere, advanced edition 17.0) on the synchronization server
• Install MobiLink server scripts and configuration
  – For SAP ERP using SAP HANA: SAAPSERVICE02_0-80001007.ZIP
  – For SAP ERP using Microsoft SQL Server: SAAPSERVICE02_0-70000176.ZIP
  – For SAP ERP using Oracle db: SAAPSERVICE02_0-70000177.ZIP
• Install SAP SQL Anywhere, advanced edition 17.0 server on each edge site server
• Install MobiLink client at each edge site
• Install SAP Dynamic Edge Processing client package on each edge site server (SAAPSQL04_0-70000652.ZIP)

SAP SQL Anywhere Database
The SAP SQL Anywhere database is also known as the MobiLink client database. There are a number of technical components in the SAP SQL Anywhere relational database:
• The schema that extends from the staging tables of SAP ERP via MobiLink synchronization. It holds the data to be used by the client application.
• The relational database, which is running as a Windows service
• SAP SQL Anywhere 17.0 is configured and run as a standard database connectivity and HTTP service, which acts as a web server

Relational database objects used:
• Stored procedures that extend the data as retrieval API
• Stored procedures that accept data and store the data into the relational database
• Web Service to extend the stored procedures
• Events to process background actions such as file transfers
• Synchronization running as a service
For more information about SAP SQL Anywhere 17.0 and MobiLink synchronization, see the following:

Many installation and configuration possibilities are supported, and we strongly recommend that you perform a proper analysis of the best options before beginning your installation.

**Setting Up the Database File and Application**
Configure the deployment environment to fit your system by modifying the following parameters in your setlocalenv.cmd (setlocalenv.sh for Linux) file. Change the default settings to correspond with your deployment environment.

<table>
<thead>
<tr>
<th>Configuration Setting</th>
<th>Configuration Variable</th>
<th>Default Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDAP URL setting</td>
<td>ldap_url</td>
<td>ldap://%rem_ldap_hostname%.com.sap:389</td>
</tr>
<tr>
<td>LDAP domain setting</td>
<td>ldap_domain_component</td>
<td>OU=Users,OU=%rem_ldap_ou %,OU=People,DC=example,DC=com;</td>
</tr>
<tr>
<td>LDAP match for query</td>
<td>ldap_match_attribute</td>
<td>uid</td>
</tr>
<tr>
<td>MobiLink sync user name</td>
<td>ml_syncUser</td>
<td>%syncUser%</td>
</tr>
<tr>
<td>MobiLink protocol</td>
<td>ml_transport</td>
<td>tcpip</td>
</tr>
<tr>
<td>MobiLink Host value</td>
<td>ml_host</td>
<td>xxx.xxx.com</td>
</tr>
<tr>
<td>MobiLink port</td>
<td>ml_port</td>
<td>5555</td>
</tr>
<tr>
<td>Application root directory</td>
<td>rem_root_dir</td>
<td>C:\SAP\SAAP</td>
</tr>
<tr>
<td>SQL Anywhere port</td>
<td>rem_db_port_https</td>
<td>8443</td>
</tr>
<tr>
<td>SQL Anywhere max request size</td>
<td>rem_db_maxrequestssize_http</td>
<td>10M</td>
</tr>
<tr>
<td>Web report directory</td>
<td>rem_saap_report_dir</td>
<td>%rem_root_dir%\reports</td>
</tr>
<tr>
<td>Web file transfer log</td>
<td>rem_saap_file_transfile_log</td>
<td>%rem_root_dir%\file_transfer.log</td>
</tr>
<tr>
<td>Web root directory</td>
<td>rem_saap_web_dir</td>
<td>%rem_root_dir%\web</td>
</tr>
<tr>
<td>SQL Anywhere install directory</td>
<td>sqlany_bin_dir</td>
<td>%SQLANY17%BIN64</td>
</tr>
<tr>
<td>Sync log size</td>
<td>dbmlsync_log_size</td>
<td>4M</td>
</tr>
<tr>
<td>Sync schedule in seconds</td>
<td>dbmlsync_schedule</td>
<td>EVERY:00:05</td>
</tr>
<tr>
<td>Transaction log size</td>
<td>dbmlsync_trans_log_size</td>
<td>4M</td>
</tr>
<tr>
<td>Path to malware scanning script for new attachments</td>
<td>rem_saapscanner_script</td>
<td></td>
</tr>
</tbody>
</table>
Setting Up MobiLink Server

Generating MobiLink System Objects
The MobiLink system objects are provided with your SAP SQL Anywhere installation in the folder `<SQL Anywhere installation>\MobiLink\Setup`. The files `synxxxx.sql` are required for the SAP ERP database to set up MobiLink.

<table>
<thead>
<tr>
<th>Relation Database Management System (RDBMS) used as SAP ERP database (consolidated database)</th>
<th>File in setup folder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft SQL Server</td>
<td>Syncmss.sql</td>
</tr>
<tr>
<td>Oracle</td>
<td>Syncora.sql</td>
</tr>
<tr>
<td>HANA</td>
<td>Synchana.sql</td>
</tr>
</tbody>
</table>

MobiLink synchronization uses:
- Synchronization scripts, which are called by synchronization events
- Synchronization stored procedures, which are invoked by synchronization scripts to process the uploads and downloads between remote sites and SAP ERP
- File share mounted by MobiLink synchronization, which handles uploading and downloading non-relational objects such as reports and attachments. The file share is also used as a deployment database file transfer.

Synchronizing MobiLink Step-by-Step

Prerequisites
- Install Java JDK 1.6 or higher
- Install Apache ANT 1.9 or higher
- For MobiLink synchronization, you must download `SAP Dynamic Edge Processing` zip file (always make sure to download the latest package from SAP Support Portal Software Download Center):
  - For Oracle, use `SAAPSERVICE02_0-70000177.ZIP`
  - For MSSQL, use `SAAPSERVICE02_0-70000176.ZIP`
  - For SAP HANA, use `SAAPSERVICE02_0-80001007.ZIP`
- For the edge, use `SAAPSQL02P_5-70000652.ZIP` (always make sure to download the latest package from SAP Support Portal Software Download Center).

Setting up MobiLink Server
If using HANA, ensure the “Real-Time Replication” option has been installed. If using Oracle or MSSQL Server, install MobiLink server software (SAP SQL Anywhere 17.0) on the synchronization server and install the latest service pack of MobiLink server software (build 1062 or higher).

Set up the ODBC (Open Database Connectivity) connection for MobiLink:
- Microsoft SQL (MSSQL) ODBC - set the ODBC data source using MSSQL Native client (install the MSSQL client first).
- Oracle ODBC - set the ODBC data source using the SQL Anywhere Oracle driver (install the Oracle Admin client first).
- HANA ODBC - set the ODBC data source using HDBODBC version 1.00.09.00 or higher from HANA client (install the HANA client first).

Establish proper credentials for the SAP ERP database to be used by MobiLink.

HANA requirements include the following:
- a) Create user ML_SYSTEM. Any user with USER ADMIN privileges can create the ML_SYSTEM user.
ML_SYSTEM must have the SELECT, UPDATE, INSERT, DELETE privileges for all the objects within the namespace /SAAP/*.

**MSSQL requirements include the following:**

a) Create a schema from the MobiLink system. This is where the MobiLink system object resides:
   - CREATE SCHEMA ML_SYSTEM

b) Create a technical user to start MobiLink.
   - CREATE LOGIN <technical user> WITH PASSWORD = '<password>', DEFAULT_DATABASE = <database instance>
   - CREATE USER <technical user> FOR LOGIN <technical user>
   - GRANT VIEW SERVER STATE TO <technical user>
   - ALTER USER <technical user> WITH DEFAULT_SCHEMA = ML_SYSTEM

**Oracle requirements include the following:**

a) Create two technical users to serve as schema (ML_SYSTEM as acts as a technical user that starts MobiLink).
   - ML_SYSTEM - schema contains all the MobiLink system objects that come with the standard MobiLink product
   - ML_R1 - schema contains all the MobiLink synchronization logics that are related to SAP Dynamic Edge Processing

b) Assign proper privileges to the technical users:
   - GRANT SELECT ON V_$TRANSACTION TO ML_SYSTEM;
   - GRANT SELECT ON V_$SESSION TO ML_SYSTEM;
   - GRANT SELECT ON GV_$TRANSACTION TO ML_SYSTEM (for Oracle grid computing);
   - GRANT SELECT ON GV_$SESSION TO ML_SYSTEM (for Oracle grid computing);
   - GRANT SELECT ON V_$TRANSACTION TO ML_R1;
   - GRANT SELECT ON V_$SESSION TO ML_R1;
   - GRANT SELECT ON GV_$TRANSACTION TO ML_R1 (for Oracle grid computing);
   - GRANT SELECT ON GV_$SESSION TO ML_R1 (for Oracle grid computing);
   - GRANT RESOURCE TO ML_SYSTEM;
   - GRANT CREATE VIEW TO ML_SYSTEM;
   - GRANT CREATE SYNONYM TO ML_SYSTEM;
   - GRANT RESOURCE TO ML_R1;
   - GRANT CREATE VIEW TO ML_R1;
   - GRANT CREATE SYNONYM TO ML_R1

c) Grant all /SAAP/ table objects (individually) to ML_SYSTEM and ML_R1 the SQL script in the zip
   $ML_FOLDER$\cons\sql\grant\application_table_grant.sql.

Download the SAP Dynamic Edge Processing zip file for MobiLink/RDSync synchronization (as in the prerequisites section).

Unzip the file to a temporary folder. Don’t nest the folder too deep. For example, your folder structure may look like the following. For this example, the unzipped folder is named “$ML_FOLDER$”.

- For HANA: $ML_FOLDER$ represents C:\SAAP_ML_HANA-1.2.0->mobilink_hana
  - Instructions below that refer to MobiLink server also apply to RDSync when using HANA
- For MSSQL: $ML_FOLDER$ represents C:\SAAP_ML-1.2.0\mobilink_mssql
- For Oracle: $ML_FOLDER$ represents C:\SAAP_ML_ORACLE-1.2.0->mobilink_oracle

Configure the build script to point to the SAP ERP database. Change the consolidated host/port/uid/pwd in the build.xml file to point at the SAP ERP server.

- HANA
  - cons.host (localhost)
  - cons.port
  - cons.uid = ML_SYSTEM
  - cons.pwd = <ML_SYSTEM password>
  - Note: Replace all “a0a” with your SAP ERP system ID, such as “PRD”.
- MSSQL:
- cons.host
- cons.port
- cons.uid = <technical user>
- cons.pwd = <technical user password>

  Oracle:
  - cons.host
  - cons.port
  - cons.ml.uid = ML_SYSTEM
  - cons.ml.pwd = <ML_SYSTEM password>
  - cons.ml.sync.uid = ML_SYSTEM
  - cons.ml.sync.pwd = <ML_SYSTEM password>
  - cons.ml.code.uid = ML_R1
  - cons.ml.code.pwd = <ML_R1 password>

Note: You can obtain the host and port number for the system ID from the tnsnames.ora file on the MobiLink server.

Install MobiLink system tables in the SAP ERP database using the technical user you set up in the previous steps.

- Use Apache Ant to run the target install_consolidated_ml. It is in the same folder as the build.xml file.

Set up a file share to be used by the MobiLink server for file upload and download. This file share is used by MobiLink to transfer files between the client and MobiLink, and between MobiLink and SAP ERP. The file share is also used by SAP ERP for files and reports to be synchronized to the remote site.

- Create the file share as part of the ABAP setup.
- Create the necessary file shares on the share drive. The file share defined on the SAP ERP server must be mounted as a share by MobiLink server, and must be at least two levels deep, for example, C:\MobiLink_fileshare. The attachment folder must be created in C:\MobiLink_fileshare. MobiLink must mount C:\MobiLink_fileshare\XXX as its upload and download folder. A read/write permission should be extended to the MobiLink service.
- For the attachment folders (ATTS_BUS2007, ATTS_BUS2012, ATTS_BUS2091, ATTS_BUS2105)
- For the report folder
- For the template database folder

Create the MobiLink Server service by modifying and running the ExampleCreateMLService.bat file, which is located in $ML_FOLDER$\cons\bin. Make sure you have the correct DSN (data source name), synchronization user ID, password, port, MobiLink installation folder, and so on. The port number should be the port that the MobiLink server is listening on (usually 5555). The file share in the service should reflect the mounted share above.

To start the MobiLink service, add command dbsvc -u SAPML to the command file.

Generate MobiLink synchronization logic.

a) Generate the reference database
   - Download SAAPSQL04_0-70000652.ZIP and unzip into a temporary folder. For example, the folder may look like C:\SAAP_SQL-1.4.377-> sqlanywhere. For this example, the unzipped folder is named 'SQL FOLDERS'.
   - Run ant -DsyncUser=ref from the command line under the directory path $SQL_FOLDERS$.

b) Configure SyncObjectGenerator file under folder $ML_FOLDER$.
   - Under the folder $ML_FOLDER$util\SyncObjectGenerator modify build.xml:
     - Modify the target "generate" to change the -C switch for the SAP client number, for example:
       - <arg value="-C"/>
     - <arg value="200"/>
     - Modify the -S switch to specify the schema for the SAP ERP tables, for example:
       - <arg value="SAPERP"/>

   c) Generate synchronization logic by running ANT from the command line in $ML_FOLDER$util\SyncObjectGenerator (this runs the default target).

Install MobiLink support tables by running the following under directory $ML_FOLDER$:
o ANT install_sync_support_schema
Install synchronization logic under directory $ML_FOLDER$:
  o ANT build_sync_logic
Generate a template database:
  a) Set up a template user mapping in the SYNC_USER_MAPPING table in the consolidated or SAP ERP database.
  o Connect to the database and add the following SQL:
    - INSERT INTO SYNC_USER_MAPPING VALUES;
  o Within $SQL_FOLDER$, modify the following variables in the file build.xml
    - <property name="ml.host" value="${ml.host.z0v}" />
    - <property name="ml.port" value="${ml.tcpip.port}" />
  o Location of the file share to store the transfer file, for example:
    - <property name="ml.ftr_share" value="\myfileshare\SAP\RIGS" />
Generate a template database to be downloaded to the folder RIG_XXXX for each RIG under the folder $SQL_FOLDER$ by doing the following:
  o Generate an empty remote database.
  o Make sure the following is correct: <property name="rem.db.rootDir" value="${ml.ftr_share}" />
  o Populate the remote database by performing an initial sync:
    - Go to the $SQL_FOLDER\bin folder and modify the scheduled_template_sync.cmd (scheduled_template_sync_linux.sh for linux deployments) command file to point to the proper plant template database. For example, if the plant number is 0101:
      - REM template 0101
      - dbmlsync -c "dsn=SAAP_RCS_rem_RIG_0101;uid=saap;pwd=sql" -x -qc -os 4M -o "c:\MobiLink\logs\dbmlsync_log_RIG_0101"
      - dbstop -c "dsn=SAAP_RCS_rem_RIG_0101;uid=saap;pwd=sql"
    - In the same file change the ml_ftr_share property to point to the proper fileshare location, the line should look like the following:
      - SET ml_ftr_share=\server555.sap.corp\MobiLink_Fileshare\TARS\RIG_1000\ 
    - In the same file set the rem_host_name to the host name of the remote site and set rem_root_dir to the file path of the root directory being used
    - Run the batch and pass in the sync user as the only argument to the batch script
      - e.g. scheduled_template_sync.cmd 1000

Setting Up Remote SQL Anywhere 17.0 Database Server Step-by-Step

Prerequisites

- LDAP server
- Organizational Unit (OU) within LDAP, where the user resides
- On Linux systems the environment variable $SQLANY17 needs to be set to the root of the SQL Anywhere installation directory

Setting Up MobiLink Client (Remote)

Install SAP SQL Anywhere Database Server (SAP SQL Anywhere 17.0.0.1062 or higher).
1) On the remote server, create a deployment folder structure. For this example, we will use C:\SAP\SAAP for the variable $REMOTE_FOLDER$.
2) Unzip $AAPSQL04_0-70000652.ZIP$ to a temporary folder on the remote server. Don’t nest the folder too deep, as doing so may cause installation errors. The folder may look like the following.
   o C:\SAAP_SQL-1.4.377\sqlanywhere – in this example, the folder is named $SQL_FOLDER$.
3) Modify the environment variables in setlocalenv.cmd (setlocalenv.sh on linux), which is located in $SQL_FOLDER$\sqlanywhere\bin:
   o Location of MobiLink server, for example:
- SET ml_host=XXX.XXX.com
- SET ml_port=5555 (default)
- SET rem_db_port_http=8080 (default)
- SET rem_db_port_https=8443 (default)
- The location of a script (if one exists) to scan attachments for malware, for example:
  - SET rem_saap_scanner_script=$SQL_FOLDER$\sqlanywhere\scanner\script.cmd
- See the Scanning Attachments for Malware section for more information
- The UI location (if one exists), and the database location at the remote server, for example:
  - SET rem_root_dir=C:\\SAP\\SAAP ($REMOTE_FOLDER$)
- Modify deploy_template_db.cmd, located in $SQL_FOLDER$\\sqlanywhere\\bin, to prepend the following two lines with "REM":
  - Lines change from:
    ECHO mlfiletransfer -u RIG_%ml_syncUser% -p RIG_%ml_syncUser% -v %ml_scriptVersion% -lp %rem_db_dir%\\ml_syncUser% -g -x %ml_transport%{host=%ml_host%;port=%ml_port%;compression=zlib} %rem_web_app%
    mlfiletransfer -u RIG_%ml_syncUser% -p RIG_%ml_syncUser% -v %ml_scriptVersion% -lp %rem_db_dir%\\ml_syncUser% -g -x %ml_transport%{host=%ml_host%;port=%ml_port%;compression=zlib} %rem_web_app%
  - To:
    REM ECHO mlfiletransfer -u RIG_%ml_syncUser% -p RIG_%ml_syncUser% -v %ml_scriptVersion% -lp %rem_db_dir%\\ml_syncUser% -g -x %ml_transport%{host=%ml_host%;port=%ml_port%;compression=zlib} %rem_web_app%
    REM mlfiletransfer -u RIG_%ml_syncUser% -p RIG_%ml_syncUser% -v %ml_scriptVersion% -lp %rem_db_dir%\\ml_syncUser% -g -x %ml_transport%{host=%ml_host%;port=%ml_port%;compression=zlib} %rem_web_app%

4) Run deploy_template_db.cmd (deploy_template_db.sh on linux) with the following parameters:
- Rig number XXX
- LDAP OU where the users are located
- LDAP server name
  - Example: Deploy_template_db.cmd 1000 USER myldapserver.sap.com

Revisiting the Database Server and MobiLink Client on Linux

It is recommended to configure all SAP DEP processes to run as background processes that are autostarted when the Linux instance boots up. There are multiple ways of accomplishing this in Linux. This documentation will focus on using Systemd Linux services. Systemd is the new standard for Linux that is being adopted by most major Linux distributions. It allows configuring restarting processes if they fail, easy definition of dependencies between services, easier configuration. This section is not meant as an in-depth tutorial on Systemd but covers creating systemd services for SAP DEP, deploying and configuring them for auto-start. Please refer to systemd documentation for details on specific parameters and how systemd works in general.

Systemd services are defined by creating "unit" files in /lib/systemd/system directory. On some Linux distributions such as Suse Enterprise Linux 12, /lib/systemd directory does not exist. In this case use /etc/systemd/system directory. When both directories exist /lib/systemd/system and /etc/systemd/system are present use /lib/systemd/system directory. The unit files specify how to start or stop services, any dependencies, what action to take if the process fails and if this service will be auto-started during Linux bootup at what point in the bootup process it should be started.

Once the unit file is in the required location, you will need to execute the following command to get systemd to pick-up the new service definition. You will need to rerun this command any time you edit any unit file.

```
systemctl daemon-reload
```
Below are standard system commands to start and stop services

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>systemctl status &lt;servicename&gt;</td>
<td>Display the current status of the service</td>
</tr>
<tr>
<td>systemctl start &lt;servicename&gt;</td>
<td>Start the service manually</td>
</tr>
<tr>
<td>systemctl stop &lt;servicename&gt;</td>
<td>Stop the service manually</td>
</tr>
<tr>
<td>systemctl enable &lt;servicename&gt;</td>
<td>Configure the service to auto-start on Linux bootup</td>
</tr>
<tr>
<td>systemctl disable &lt;servicename&gt;</td>
<td>Configure the service to no-longer auto-start on Linux bootup</td>
</tr>
</tbody>
</table>

For each service systemctl start <servicename> and systemctl enable <servicename> need to be run. Before starting the services the currently running database server and synchronization process may need to be stopped manually.

Below is the unit file for SQL Anywhere used by SAP DEP. It should be called dep.service and placed in /lib/systemd/system.

```
[Unit]
Description=DEP
[Service]
Type=simple
ExecStart=/bin/bash -c 'source /opt/sqlanywhere17/bin64/sa_config.sh && dbsrv17 @/home/SAP/SAAP/dep_db_start.conf'
ExecStop=/bin/bash -c 'source /opt/sqlanywhere17/bin64/sa_config.sh && dbstop @/home/SAP/SAAP/dep_db_stop.conf && sleep 5'
Restart=always
RestartSec=15
[Install]
WantedBy=multi-user.target
```

Below are the configuration files relavent to starting the database server and should match the name specified in the unit file above. dep_db_start.conf specifies the parameters needed to start the database server and dep_db_stop.conf specifies the parameters needed to stop the database server.

dep_db_start.conf configuration file:

```
-n
SAAPDB_RCS_SERVERNAME_1000
/home/SAP/SAAP/db/1000/DEP.db
-n
SAAP_RCS_rem_1000
-o
/home/SAP/SAAP/db/logs/eng_log_1000
-on
4M
-x
shmem
-x
tcpip(port=5657)
-x
```
http(port=8080;dbn=SAAP_RCS_rem_1000;MaxRequestSize=10M;log=/home/SAP/SAAP/db/logs/web_log_1000.txt)
-gd
ALL

dep_db_stop.conf configuration file:

-y
-c
"dsn=SAAP_RCS_rem_1000"

Below is the unit file for Mobilink used by SAP DEP. It should be called dep_nodejs.service and placed in /lib/systemd/system directory.

[Unit]
Description=sync
BindsTo= dep.service
After= dep.service
[Service]
Type=simple
ExecStart=/bin/bash -c 'source /opt/sqlanywhere17/bin64/sa_config.sh && dbmlsync @/home/SAP/SAAP/mlsync.conf'
ExecStop=/bin/bash -c 'pkill -P $MAINPID && sleep 10'
Restart=always
RestartSec=30
[Install]
WantedBy=multi-user.target

The "After" parameter specifies that this service should be started after the "dep" service has started. The "BindsTo" service specifies that if the "dep_sqlany" service stops then the streaminglite service should also be stopped. This "After" and "BindsTo" parameters specific service dependency. All the commands specified for dep_sqlany will also apply to this service.

Below is the configuration file for starting the Mobilink client and should match the name specified in the unit file above in this example mlsync.conf.

-c
"dsn=SAAP_RCS_rem_0293"
-os
4M
-o
/home/SAP/SAAP/db/logs/SAAP_RCS_dbmlsync_0293
-e
"sch=EVERY:00:02"
-x
4M
-sc
SAP ERP CONFIGURATION

Project Administration

SAP Dynamic Edge Processing implementation can either be documented in a separate project or embedded in an existing implementation project. The language must be English. Documents to be uploaded into SAP Solution Manager must use a common readable format (PDF is recommended).

SAP Add-On Configuration

Overview

SAP Dynamic Edge Processing implementation requires some customer-specific configuration in SAP ERP.

Install SMFND and SMERP components on the SAP ERP system. SAP Dynamic Edge Processing utilizes these two components from SAP Work Manager and SAP Inventory Manager. There are configuration tables that are specific to SAP Dynamic Edge Processing: /SAAP/CONF_SYNC, /SAAP/CONF_SYNCP, /SAAP/CONF_SYNCM, /SAAP/LOCALUSER, /SAAP/S_ROLES and /SAAP/A_DEF. Maintain these tables using transaction SM30. You must also configure the file transfer that occurs for attachments, both to and from remote sites. Finally, define background jobs to control the synchronization process using transaction SM36.

Configuration Details

Activate BCSET

The BCSET /SAAP/WORK_MANAGER_53 contains the SAP Work Manager configuration for SAP Dynamic Edge Processing. Activate BCSET through transaction SCPR20.

1. Type SCPR20 into the transaction dropdown.
2. Double-click BCSET, then search for and select /SAAP/WORK_MANAGER_53.
3. On the menu bar, click Activate BCSET.
4. Accept the confirmation message to activate BCSET.

Create PMBATCH User for Agentry and SAP ERP

Create PMBATCH User in Agentry

For data synchronization to operate, create the PMBATCH user in the Agentry system for both the SAP Work Manager and SAP Inventory Manager solutions. Use the transaction /SYCLO/ADMIN. The following SAP ERP authorizations are required to create users in Agentry:

<table>
<thead>
<tr>
<th>Authorization Object</th>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>S_ICF</td>
<td>ICF_FIELD</td>
<td>SERVICE</td>
</tr>
<tr>
<td>S_ICF</td>
<td>ICF_VALUE</td>
<td>SYCLOADM</td>
</tr>
<tr>
<td>S_TCODE</td>
<td>TCD</td>
<td>/SAAP/*</td>
</tr>
<tr>
<td>S_TCODE</td>
<td>TCD</td>
<td>/SYCLO/*</td>
</tr>
</tbody>
</table>

The first user you need to set up in Agentry is the batch user PMBATCH, which runs batch jobs in SAP ERP.

1) Type /n/syclo/admin into the transaction dropdown.
2) In the System Administration & Monitoring Portal select Administration → User Management.
3) In **Mobile Application**, select **SAAP Work Manager 5.3.0**, and click **Search**.

4) Select **PMBATCH** and click **Create**.

5) Enter **PMBATCH** in the **User Name** and **Device User ID** fields; in the **Middleware License No** field type **SAP_Work Manager_53**.

6) Click **Save**.

7) Repeat steps 3-7 for **SAP Inventory Manager 3.2.0**.
*Create PMBATCH user in SAP ERP*

Create users in SAP ERP via transaction SU01. Create user PMBATCH as a communication user who has authorization to execute batch jobs.

Make sure to create users with roles according to their responsibilities so that business transactions submitted by each user are processed correctly in the batch jobs. For example, users who submit edits to work orders should have roles that allow them to edit work orders for the appropriate plant and work order types.

**Configure the Agentry System Technical Settings**

Next, maintain the technical settings in the Agentry configuration panel.

1) Enter /n/syclo/configpanel into the transaction dropdown.
2) In Agentry SAP Framework Configuration, go to Technical Settings.
3) The Technical Settings Detail screen should already be populated; if it is not, click Add, then save the screen with the information that appears in the fields.

**Configure Attachment File Transfer Settings**

Use the table /SAAP/A_DEF to maintain the directory for attachment file transfers. This table identifies the directory and subdirectory locations for the folder used to transfer attachments between SAP ERP and remote sites. Maintain the table using transaction /SAAP/DEF. To complete this task, complete the following steps:

Type SM30 into the transaction dropdown.

**Type /saap/a_def into the Table/View lookup, and click Display.**

Make sure the configuration table has entries for each of the following business objects that use attachments:

- BUS2007 - Work Order attachments
- BUS2012 - Purchase Order attachments
- BUS2091 - Service Entry attachments
- BUS2105 - Purchase Requisition attachments

<table>
<thead>
<tr>
<th>CLASSTYPE</th>
<th>BO</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASSNAME</td>
<td>BUS2007</td>
</tr>
<tr>
<td>DIRPATH</td>
<td>&lt;the directory path from AL11&gt;</td>
</tr>
<tr>
<td>SUBDIR</td>
<td>Concatenate any subdirectory assigned with the business object, for example, RIGS/ATTS_BUS2007</td>
</tr>
<tr>
<td>RIGDEP</td>
<td>’N’ (this is important - if ‘Y’, the program will look for another subdirectory)</td>
</tr>
</tbody>
</table>
Configure Reports Management Settings

Configuring reports management settings requires two tasks. First, configure intervals for the number range object /SAAP/REPO for use of the reports, then maintain a file share folder. You must create intervals in each system for this number range object using the transaction SNRO:

1) Enter SNRO into the transaction dropdown.
2) Enter the object /SAAP/REPO.
3) Choose Create intervals.
4) Enter the number range from 0000000001 to 1000000000.
   Note: Your final number range interval should look like the following:

5) Then, you must maintain a file share folder:
   a) Enter /n/SAAP/manage_reps into the transaction dropdown.
   b) Create a folder for each remote site (for example, RPT_1000) so each has its own file share.

Create Initial Load

Run the initial load for the following background jobs listed in Error! Reference source not found.:  
- /SAAP/GET_DT - Get Data Tables
- /SAAP/GET_CT - Get Complex Tables
- /SAAP/GET_OBJ - Get Object Tables
- /SAAP/ATTACHMENTS_DOWN - Download Attachments from SAP ERP Business Objects to Remote Sites

Once the initial loads are complete, schedule your regular background jobs as per Documentation of Background Jobs.

Configuration Tables

There are a number of configuration tables. Some tables have existing entries; others require customer-specific modifications. Access these tables through transaction SM30 or through a customer-specific transaction.

- Maintain remote plant synchronization master (/SAAP/CONF_SYNC) - this table should already be set up with all the valid settings for SAP Dynamic Edge Processing. If you do need to modify it, or view its entries, use transaction /SAAP/CONF_SYNC.
- Maintain remote plant synchronization - BAPI Wrapper Parameters (/SAAP/CONF_SYNCP) - this table should already be set up with all the valid settings for SAP Dynamic Edge Processing. If you do need to modify it, or view its entries, use transaction /SAAP/CONF_SYNCP.
- Maintain remote plant synchronization of parameter mapping (/SAAP/CONF_SYNCM) - you should need to modify this table only for a few default values, as specified in this document. Do not modify
any other values, as they are the valid settings for *SAP Dynamic Edge Processing*. To view the entries, use transaction `/SAAP/CONF_SYNCM`.

- **Maintain roles and security (/SAAP/S_ROLES)** - this table specifies the system functionality that can be performed by each customer-defined role or work center. (Note work centers for the client functionality are not the same as SAP ERP work centers). Typically, a role will perform only portions of a business process. For example, an electrician role or work center may not have the ability to create work orders and add components. A specific implementation can utilize this table to govern access to certain features in a user interface. Maintain the table using transaction `/SAAP/ROLES`.

- **Maintain Remote Site Users (/SAAP/LOCALUSER)** - this table has a link between front-end user names and back-end user names. It also has a link to the role assigned to the user (see table `/SAAP/S_ROLES`). Maintain the table using transaction `/SAAP/LOCALUSER`.

- **Maintain Directory for Attachment File Transfer (/SAAP/A_DEF)** - this table includes the directory and subdirectory locations for the folder used to transfer attachments between SAP ERP and remote sites. Maintain the table using transaction `/SAAP/DEF`.

- **Maintain Syclod GUID (/syclo/mdw00)** for back-end batch user (such as PMBATCH) - this table provides a GUID for each back-end user, which is used for remote site users (/SAAP/LOCALUSER). The GUID is required for some transactions, such as approvals, to run correctly. In addition, before you set up batch jobs, you must also generate a valid GUID for the batch user ID PMBATCH. Maintain this table using transaction `/syclo/admin` and selecting User Management.

*Configure Background RFC Queue*

For synchronization jobs to execute properly, you must configure the following components.

**Assign the SAP ERP instance to an RFC Server Group**

1. Assign the SAP ERP instance to a new RFC Server group using transaction `RZ12`. Consider the following:
   - The logon group can be named based on company preferences.
   - The instance name is typically the concatenation of the server name, system ID, and instance number (for example, USCHI3100_PRD_00).
   - Make sure the status indicator is green.

2. Assign the SAP ERP instance to a server group.

**Create an RFC (Logical) Destination**

1. Define a logical destination using transaction `SM59`.

2. Verify whether the `SAAP_LOCAL` connection has already created by expanding the *Logical Connections* section. If it has not yet been created, choose the *Create* icon and create `SAAP_LOCAL`.
3. On the **Logon & Security** tab, define the logon information for the logical destination.

![Logon & Security Tab]

4. On the **Special Options** tab, set the **Transfer Protocol** to **Classic with bgRFC**.

### Create an RFC Inbound Destination

You must create the background RFC inbound destination in each system to run the synchronization batch job.

1. Navigate to transaction **SBGRFCCONF**.
2. Select the **Define Inbound Dest.** tab.
3. Click the **Create** icon.
4. Define the **Inb. Dest. Name** as **/SAAP/SYNC_INB_TRANS**.
5. Define the **Logon/server group** as the RFC server group created in transaction **RZ12** above.

![Define Inbound Dest. Tab]

6. In the **Add Queue Prefix** field, enter **/SAAP/SYNC** , then click **Add**. 
7. Click **Save**, then click **Save** again on the **bgRFC Configuration** screen.
The background RFC destination should look like this:

![bgRFC Configuration](image)

**Create Supervisor Destination**

Define **SAAP_LOCAL** as a supervisor destination.
1. Define a supervisor destination using transaction **SBGRFCCONF**.
2. Select the **Define Supervisor Dest.** tab.
3. Click the **Create** icon and set the **Destination** to the appropriate RFC connection.
4. Click **Save**.
Plant-Related Configuration

Overview
SAP Dynamic Edge Processing groups work by maintenance plant, which must also be the same Plant ID as the materials management plant and the maintenance planning plant. An edge site is considered a single plant. The functional locations and equipment used at the edge site must be linked or extended to the edge plant.
Define filters for the respective plant and order types that will be used:
1. Go to transaction /syclo/configpanel.
2. Select Mobile Integration Settings → Mobile Data Object Configuration.
3. Expand CT – Complex Table, choose SAAP Work Manager 5.3.0, and complete the following:
   a) Select the object in the Data Object Navigation Tree.
   b) Choose the Data Filter tab.
   c) Expand Defined Filters and select the standard filter Planning Plant.
   d) Define the filter rule so that orders relevant to the planning plant being implemented are retrieved from SAP ERP. Select the Active flag.
   e) Repeat steps c and d for the Order Type filter, and make sure that orders that are relevant to work order types PM01, PM02, and ZM01 are retrieved from SAP ERP.
   Note: Make sure that the data filters do not exclude plants of interest. For example, if you are implementing maintenance for plant 1000, ensure the data filters are set to include data for maintenance plant 1000. You can learn about defining filters in the SAP Work Manager documentation. SAP Dynamic Edge Processing does not currently use parameters, so you can set to inactive any filters using parameters.

Configuring for Work Orders

Overview
SAP Dynamic Edge Processing must be able to create work orders that are external to SAP ERP, and upload and integrate them with plant maintenance. This requires a custom work order type that uses external numbering. The work orders are generally either for maintenance or for external services. There are also requirements for user status profile. The following list is an overview of the steps to be completed; you must complete the first two items first.

- Create Plant Maintenance (PM) order type ZM01 (copy of PM01)
- Assign order type ZM01 to maintenance plants
- Create and assign external numbering (vZzzz0000001 through vZzzzz9999999)
- Maintain user status profile
- Create control keys EXT2 (copy of PM03) and ZINT (copy of PM01)
- Maintain default control key for order type ZM01
- Create activity type for SAAP orders
- Assign maintenance activity types to order type ZM01
- Maintain default activity type for order type ZM01
- Define control parameters for completion confirmations for order type ZM01

Technical System Landscape
The setup for work orders is done primarily by customizing the ECC application (transaction SPRO). You may also need to enter or change some Agentry parameters.

Configuration Details

Create PM Order Type ZM01
Configure order types in transaction O10A or using the IMG (transaction SPRO) under Plant Maintenance and Customer Service → Maintenance and Service Processing → Maintenance and Service Orders → Functions and Settings for Order Types → Configure Order Types.
Select the order type PM01 and from the menu bar, select Edit → Copy As. Overwrite the Order Type PM01 with ZM01 and add a description that differentiates it from the PM01, for example, SAAP Maintenance Order. Save the new order type.

Assign Order Type ZM01 to SAAP MTCE Plants
Assign order types in transaction OIOD or via the IMG (transaction SPRO) under Plant Maintenance and Customer Service → Maintenance and Service Processing → Functions and Settings for Order Types → Assign Order Types to Maintenance Plants.
Select New Entries and add one entry with Order Type ZM01 for each plant that is implementing SAP Dynamic Edge Processing.

Create External Number Range - Add to Group
Create number ranges in transaction OION or via the IMG (transaction SPRO) under Plant Maintenance and Customer Service → Maintenance and Service Processing → Functions and Settings for Order Types → Configure Number Ranges.
From the menu bar, choose Group → Maintain. If there is no group for external numbering, create one, for example, External A → ZZZZZZZZZZ. Assign Order Type ZM01 to a group that supports numbers between VZZZZZZZZZZ and VZZZZZZZZZZ. Save the assignment.

Maintain User Status Profile
Maintain user status profiles in transaction OIBS or via the IMG (transaction SPRO) under Plant Maintenance and Customer Service → Maintenance and Service Processing → Functions and Settings for Order Types → User Status for Orders → Define Status Profile.
Create a user status profile, for example, SAAP_WO, that starts as a copy of the one used for order type PM01. Next, assign this new user status to both PM01 and ZM01 order types.

Create Control Keys EXT2 and ZINT
You can make customized settings in the IMG (transaction SPRO) under Plant Maintenance and Customer Service → Maintenance and Service Processing → Functions and Settings for Order Types → Control Key → Maintain Control Keys.
Select the control key PM01 and from the menu bar, choose Edit → Copy As. Overwrite the Control Key PM01 with ZINT and add a description that differentiates it from the PM01, for example, SAAP Plant Maintenance - Internal. Save the new control key.
Select the control key PM03 and from the menu bar, choose Edit → Copy As. Overwrite the Control Key PM03 with EXT2 and add a description that differentiates it from the PM03, for example, SAAP Plant Mtce - External (Services). Save the new control key.

Maintain Default Control Key Order Type ZM01
Maintain the default control key in transaction OIO6 or via the IMG (transaction SPRO) under Plant Maintenance and Customer Service → Maintenance and Service Processing → Functions and Settings for Order Types → Control Key → Maintain Default Values for Control Keys for Order Types.
Select each combination of Planning Plant and Order Type ZM01 (one entry for each plant implementing SAAP). Assign control key ZINT to each combination and save.

Create Activity Type for ZM01 Orders
You can create customized settings in SAP Customizing Implementation Guide (transaction SPRO) under Plant Maintenance and Customer Service → Maintenance and Service Processing → Functions and Settings for Order Types → Maintenance Activity Type → Define Maintenance Activity Types.
Select New Entries. Add a new activity type with a description, for example, Maintenance order (SAAP) . Save the new activity type. Do not select the Warranty Case and Insurance Case.
Assign Maintenance Activity Types to Order Type ZM01
Assign activity types in transaction OIO5 or via the IMG (transaction SPRO) under Plant Maintenance and Customer Service → Maintenance and Service Processing → Functions and Settings for Order Types → Maintenance Activity Type → Assign Valid Maintenance Activity Types to Maintenance Order Types.
Assign each activity type that is used for order type PM01 to order type ZM01. Also assign the activity type created in Create Activity Type for ZM01 Orders to order type ZM01. Save the assignments.

Maintain Default Activity Type for Order Type ZM01
Maintain the default activity type in transaction OIO4 or via the IMG (transaction SPRO) under Plant Maintenance and Customer Service → Maintenance and Service Processing → Functions and Settings for Order Types → Default Values for Maintenance Activity Type for Each Order Type.
Assign the activity type created in Create Activity Type for ZM01 Orders to order type ZM01. Save the assignment.

Configure Automatic Notification Creation During Work Order Creation
For SAP Dynamic Edge Processing, a notification must be created automatically during work order creation.
In the IMG, under Plant Maintenance and Customer Service > Maintenance and Service Processing > Maintenance and Service Orders > Functions and Settings for Order Types > Define Notification and Order Integration create an entry for order types ZM01, ZM02 and any other work order type that will be used by SAP Dynamic Edge Processing. Assign the appropriate notification type to the order. Set the indicator for Notification Data on the Order Header and the indicator for Long Text to Active.

Define Control Parameters for Completion Confirmations
Maintain control parameters for completion confirmations for maintenance and service orders. You must do this for each plant and order type combination, that is, you must configure the parameters for the new ZM01 order type and any new combinations.
Maintain the parameters in transaction OIOR or in the IMG under Plant Maintenance and Customer Service > Maintenance and Service Processing > Completion Confirmations > Define Control Parameters for Completion Confirmations. Assign a notification type to the work orders used by SAP Dynamic Edge Processing (for example, ZM01, ZM02).

Configuring for Purchase Requisitions

Enhance CI_EBANDB and CI_EBANDBX Structures
Since this is an offline solution and the user can create purchase requisitions at a remote site while disconnected, the request to create a requisition made by the solution interface must assign a temporary unique requisition number. When the requisition created on a remote site synchronizes with SAP ERP, a permanent purchase requisition number is generated by SAP ERP. To maintain the association between the local requisition number created at the remote site and the SAP ERP requisition number, enhance structures CI_EBANDB and CI_EBANDBX with the zzpr_no_local field. The field zzfreight_mode is also added to the structures to support the use of freight modes at the remote site.
- zzpr_no_local TYPE CHAR60 (representing local requisition number)
- zzfreight_mode TYPE CHAR2 (representing the transportation mode used entered via the UI)

Implement BADI /SAAP/BADI/MM_PREQ_NUM_LC
To pass the local assigned requisition number and freight mode from the solution interface to the newly added fields in CI_EBAN, implement the BAdI /SAAP/BADI/MM_PREQ_NUM_LC in your system and follow the sample implementation class /SAAP/CL_BADI_IMPL_SAMPLE.
Once the implementation class is copied, uncomment the code and verify and change the fields in the sample class to match the newly added fields in CI_EBAN.
To implement the BAdI, either go to transaction SE19 or make custom settings in (transaction SPRO) under Agentry SAP Framework Configuration → SAP Dynamic Edge Processing → Business Add-Ins (BAdIs) → BAdI: Process Purchase Requisition Local Numbers, following the instructions in the SAP Customizing Implementation Guide.

**Change Purchase Requisition Order Type**
The default requisition order type in table /SAAP/CONF_SYNCM is NB. This forces all purchase requisitions to be created as type NB.

If you do not want purchase requisitions to be created as requisition type NB, you can change the configuration in the IMG under Agentry SAP Framework Configuration → SAP Dynamic Edge Processing → Backend Configuration → Synchronization Parameter → Maintain Synchronization Parameter Mapping.

- Find entries with the following keys:

  - In **Mapped Field**, change NB to valid purchase requisition order type.
  - Do not change any other value.
The default requisition purchase group in table /SAAP/CONF_SYNCM is 001, which forces all purchase requisitions created in purchasing group to be 001. If you do not want to have 001 as the purchasing group, you can change the (transaction SPRO) under Agentry SAP Framework Configuration → SAP Dynamic Edge Processing → Backend Configuration → Synchronization Parameter → Maintain Synchronization Parameter Mapping, following the instructions in the SAP Customizing Implementation Guide.

- Find entries with the following keys:
In **Mapped Field**, change **001** to a valid purchase group.

- Do not change any other value.

### File Transfer Configuration

**SAP Dynamic Edge Processing** requires a file folder on the underlying server (UNIX/Linux/Windows) for passing attachments files between SAP ERP and remote sites. You may need to request this from your system administrator if one doesn't already exist. The folder must be accessible from SAP ERP and from the MobiLink server. This section shows the setup for SAP ERP. File transfer setup for MobiLink can be found in **Setting Up MobiLink Server**. Note: The directory name should be at the same folder level as the ATTS files.

1) Create the subdirectories on the SAP ERP server:
   a) From Windows Explorer, access the share folder on the SAP ERP server.
   b) Create a subfolder for each business object that will use attachments. To do this, combine the literal **ATTS_** with the business object class name, for example, **ATTS_BUS2007**. The folder structure should look similar to the following:

![Folder Structure Example]

2) Define the directories in SAP ERP:
   a) Enter transaction **AL11** in the transaction dropdown.
b) Click Configure and add the directory name, parameter name, and server name.

<table>
<thead>
<tr>
<th>Name of Directory Parameter</th>
<th>DIR_TARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directory Name</td>
<td>C:\MobLink_Files\TARS</td>
</tr>
<tr>
<td>Valid for Server Name</td>
<td>all</td>
</tr>
</tbody>
</table>

c) Click Save.

3) Add entries to the SAAP configuration table /SAAP/A_DEF for each business object that uses attachments (currently supported: BUS2007, BUS2012, BUS2091, BUS2105):

<table>
<thead>
<tr>
<th>CLASSTYPE</th>
<th>BO</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASSNAME</td>
<td>BUS2007 (for example, this is for business object Work Order)</td>
</tr>
<tr>
<td>DIRPATH</td>
<td>&lt;the directory path from AL11&gt;</td>
</tr>
<tr>
<td>SUBDIR</td>
<td>Concatenate any sub-directory assigned with the business object, for example, RIGS/ATTs_BUS2007</td>
</tr>
<tr>
<td>RIGDEP</td>
<td>N for No (this is important - if this value is Y, the program looks for a different subdirectory)</td>
</tr>
<tr>
<td>CHANGED_TS</td>
<td>Leave this blank</td>
</tr>
</tbody>
</table>

When configured correctly, you can double-click the entry and see the following folders:

**Directory: C:\MobLink_Files\TARS**

<table>
<thead>
<tr>
<th>Useable</th>
<th>Viewed</th>
<th>Changed Length</th>
<th>Owner</th>
<th>Lastchange</th>
<th>Lastchange</th>
<th>File Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Admin</td>
<td>04/05/2016</td>
<td>14:04:55</td>
<td>.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Admin</td>
<td>04/06/2016</td>
<td>14:01:52</td>
<td>ATTS_BUS2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Admin</td>
<td>04/05/2016</td>
<td>14:01:53</td>
<td>ATTS_BUS2012</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Admin</td>
<td>04/06/2016</td>
<td>14:01:53</td>
<td>ATTS_BUS2019</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Admin</td>
<td>04/06/2016</td>
<td>14:01:53</td>
<td>ATTS_BUS2105</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Admin</td>
<td>04/06/2016</td>
<td>14:05:00</td>
<td>RIG_1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Admin</td>
<td>04/06/2016</td>
<td>14:05:00</td>
<td>RIG_3000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Admin</td>
<td>04/05/2016</td>
<td>14:05:00</td>
<td>RPT_1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Admin</td>
<td>04/06/2016</td>
<td>14:05:00</td>
<td>RPT_3000</td>
</tr>
</tbody>
</table>

**Web Dynpro Service Configuration**
This solution uses Web Dynpro to launch your application. Make sure the Web Dynpro service is enabled in each system using the transaction SICF. After configuration, you should have a service called saap under your Web Dynpro runtime service as shown below (make sure you also activate the SYCLO service):
Documentation of Background Jobs

The following background jobs are used for SAP Dynamic Edge Processing. They are defined using transaction SM36. Before you run any batch jobs, make sure that all of the background jobs have been defined.

/SAAP/GET_DT - Get Data Tables

Job Name: /SAAP/GET_DT
Scheduler: Run every 1 minute

<table>
<thead>
<tr>
<th>Job Step Description</th>
<th>Program Value</th>
<th>ABAP Program Name</th>
<th>Variant</th>
<th>Client-Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Get delta updates for data tables</td>
<td>ABAP</td>
<td>/SAAP/P_GET</td>
<td>DT</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Variant DT should be created as shown below (check object table options):

**Mobile Plant: Update Staging Tables for Complex and Data Tables**

<table>
<thead>
<tr>
<th>Table Options</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>User Name</td>
<td>[Input]</td>
</tr>
<tr>
<td>Fill Data Tables</td>
<td>[Check]</td>
</tr>
<tr>
<td>Fill Complex Tables</td>
<td></td>
</tr>
<tr>
<td>Fill Object Tables</td>
<td></td>
</tr>
</tbody>
</table>

*Data Table Options*

- **Standard**
- **Reset**

*Complex Table Options*

- **Standard**
- **Reset - All Data Deleted**

*Reset Options*

- `/SAAP/C_CATPRO`
- `/SAAP/C_CGDRP`
- `/SAAP/C_CTLKEY`
- `/SAAP/C_CSTINST`
- `/SAAP/C_CURREC`
- `/SAAP/C_ELIST`
- `/SAAP/C_ELSTPT`
- `/SAAP/C_EQUI`
- `/SAAP/C_FLOC`
- `/SAAP/C_IORDER`
- `/SAAP/C_MPLANT`
- `/SAAP/C_MSLLOC`
- `/SAAP/C_MATUOM`
- `/SAAP/C_OVRES`

**/SAAP/GET_CT - Get Complex Tables**

- **Job Name:** `/SAAP/GET_CT`
- **Scheduler:** Run every 1 minute

*Job Step Description* | Program Value | ABAP Program Name | Variant | Client-Specific |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Get delta updates for complex tables</td>
<td>ABAP</td>
<td><code>/SAAP/F_GET</code></td>
<td><strong>CT</strong></td>
<td>Yes</td>
</tr>
</tbody>
</table>

Variant CT should be created as shown below.
### Mobile Plant: Update Staging Tables for Complex and Data Tables

#### Table Options
- User Name: PBATCH
- Fill Data Tables
- Fill Complex Tables
- Fill Object Tables

#### Data Table Options
- Standard
- Reset

#### Complex Table Options
- Standard
- Reset - All Data Deleted

#### Job Step Description

<table>
<thead>
<tr>
<th>Job Step Description</th>
<th>Program Value</th>
<th>ABAP Program Name</th>
<th>Variant</th>
<th>Client-Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Get delta updates for object tables</td>
<td>ABAP</td>
<td>/SAAP/P_GET</td>
<td>OBJ</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Variant OBJ should be created as shown below (check complex table options).
Mobile Plant: Update Staging Tables for Complex and Data Tables

Table Options

User Name: PMBATCH
- Fill Data Tables
- Fill Complex Tables
- Fill Object Tables

Data Table Options

- Standard
- Reset

Complex Table Options

- Standard
- Reset - All Data Deleted
- Reset Options
  - /SAAP/C_CATPRO
  - /SAAP/C_CODGRP

Object Table Options

- Standard
- Standard Options
  - Fetch Purchase Orders
  - Fetch Physical Inventory Doc.
  - Fetch Purchase Reqs
  - Fetch Reservations
  - Fetch Material Documents
  - Fetch BOMs
  - Fetch Service Entry Sheets
  - Fetch Workflow Items
  - Fetch Work Orders & Dependents
  - Fetch Material Texts
- Reset - All Data Deleted
- Reset Options
  - Fetch Purchase Orders
  - Fetch Physical Inventory Doc.
/SAAP/TRN - Process Uploaded Transactions

Job Name: /SAAP/TRN
Scheduler: Run every 1 minute

<table>
<thead>
<tr>
<th>Job Step Description</th>
<th>Program Value</th>
<th>ABAP Program Name</th>
<th>Variant</th>
<th>Client-Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process all transactions uploaded from remote sites</td>
<td>ABAP</td>
<td>/SAAP/P_TRN</td>
<td>STANDARD</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Variant Standard should be created with your entries based on the RFC connections and users created for your installation.

/SAAP/HOURLY_REPORTS - Run Hourly Reports in Background and Send to Remote Sites

Job Name: /SAAP/HOURLY_REPORTS
Scheduler: Run once every hour

<table>
<thead>
<tr>
<th>Job Step Description</th>
<th>Program Value</th>
<th>ABAP Program Name</th>
<th>Variant</th>
<th>Client-Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run hourly reports in background and send to remote sites</td>
<td>ABAP</td>
<td>/SAAP/P_JOB_START</td>
<td>/SAAP/HOURLY</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Note the example variant is defined for plant 3000.

![Edit Variants: Variant HOURLY REPORTS](image)

/SAAP/DAILY_REPORTS - Run Daily Reports in Background and Send to Remote Sites
Job Name: /SAAP/DAILY_REPORTS
Scheduler: Run once each day

<table>
<thead>
<tr>
<th>Job Step Description</th>
<th>Program Value</th>
<th>ABAP Program Name</th>
<th>Variant</th>
<th>Client-Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run daily reports in background and send to remote sites</td>
<td>ABAP</td>
<td>/SAAP/P_JOB_START</td>
<td>/SAAP/DAILY</td>
<td>Yes</td>
</tr>
</tbody>
</table>
**Edit Variants: Variant DAILY REPORTS**

<table>
<thead>
<tr>
<th>Variant Attributes</th>
<th></th>
</tr>
</thead>
</table>

**Report Selection**

| Rig | 300G to | Transaction Code |  |

**Run Options**

- ALL Directory to download Rep: DIR_TARS
- Sub-directory for report files: TARS_REPORTS
- Use Plant Sub-Directories: Y
- Run Schedule: D

**Parallel Run Options**

- Prefix for Reporting Jobs: /SAAP/RPT_
- Max number of Parallel Jobs: 5

**Archiving Options**

- Delete Now
- Delete All Reports From Log
- Over-write Archive By (days)
- Residence time (days)

******* PDF Conversion Started *******

- Call Foreground for Debug

---

**/SAAP/MONTHLY_REPORTS - Run Monthly Reports in Background and Send to Remote Sites**

**Job Name:** /SAAP/MONTHLY_REPORTS

**Scheduler:** Run once each month

<table>
<thead>
<tr>
<th>Job Step Description</th>
<th>Program Value</th>
<th>ABAP Program Name</th>
<th>Variant</th>
<th>Client-Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run monthly reports in background and send to remote sites</td>
<td>ABAP</td>
<td>/SAAP/P_JOB_START</td>
<td>/SAAP/MONTHLY</td>
<td>Yes</td>
</tr>
</tbody>
</table>
/SAAP/YEARLY_REPORTS - Run Yearly Reports in Background and Send to Remote Sites

Job Name: /SAAP/YEARLY_REPORTS
Scheduler: Run once each year

<table>
<thead>
<tr>
<th>Job Step Description</th>
<th>Program Value</th>
<th>ABAP Program Name</th>
<th>Variant</th>
<th>Client-Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run yearly reports in background and send to remote sites</td>
<td>ABAP</td>
<td>/SAAP/P_JOB_START</td>
<td>/SAAP/YEARLY</td>
<td>Yes</td>
</tr>
</tbody>
</table>
/SAAP/ONDEMAND_REPORTS - Run On-Demand Reports in Background and Send to Remote Sites
Job Name: /SAAP/ONDEMAND_REPORTS
Scheduler: Run on request

<table>
<thead>
<tr>
<th>Job Step Description</th>
<th>Program Value</th>
<th>ABAP Program Name</th>
<th>Variant</th>
<th>Client-Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run on-demand reports in background and send to remote sites</td>
<td>ABAP</td>
<td>/SAAP/P_JOB_START</td>
<td>/SAAP/ONDEMAND</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### /SAAP/ATTACHMENTS_UP - Attach Documents Uploaded from Remote Sites

**Job Name:** /SAAP/ATTACHMENTS_UP  
**Scheduler:** Run every 1 minute

<table>
<thead>
<tr>
<th>Job Step Description</th>
<th>Program Value</th>
<th>ABAP Program Name</th>
<th>Variant</th>
<th>Client-Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attach documents uploaded from remote sites to SAP ERP business objects</td>
<td>ABAP</td>
<td>/SAAP/P_ATTACHMENT_MANAGE</td>
<td>UPLOADATTACH</td>
<td>Yes</td>
</tr>
</tbody>
</table>
**Edit Variants: Variant UPLOAD ATTACH**

<table>
<thead>
<tr>
<th>Variant Attributes</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class name</td>
<td></td>
</tr>
<tr>
<td>Object key</td>
<td></td>
</tr>
<tr>
<td>P_DATE</td>
<td></td>
</tr>
<tr>
<td>P_LOAD</td>
<td>✓</td>
</tr>
<tr>
<td>Test Download</td>
<td>✓</td>
</tr>
<tr>
<td>Test Upload</td>
<td>✓</td>
</tr>
</tbody>
</table>

/SAAP/ATTACHMENTS_DOWN - Download Attachments from ECC Business Objects to Remote Sites

**Job Name:** /SAAP/ATTACHMENTS_DOWN  
**Scheduler:** Run every 1 minute

<table>
<thead>
<tr>
<th>Job Step Description</th>
<th>Program Value</th>
<th>ABAP Program Name</th>
<th>Variant</th>
<th>Client-Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Download attachments from ECC business objects to remote sites</td>
<td>ABAP</td>
<td>/SAAP/P_ATTACHMENT_MANAGE</td>
<td>DOWNLOADATTACH</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Edit Variants: Variant DOWNLOAD ATTAC**

<table>
<thead>
<tr>
<th>Variant Attributes</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class name</td>
<td></td>
</tr>
<tr>
<td>Object key</td>
<td></td>
</tr>
<tr>
<td>P_DATE</td>
<td></td>
</tr>
<tr>
<td>P_LOAD</td>
<td>✓</td>
</tr>
<tr>
<td>Test Download</td>
<td>✓</td>
</tr>
<tr>
<td>Test Upload</td>
<td>✓</td>
</tr>
</tbody>
</table>

/SAAP/GET_MDKE - Download Stock Wanted List to Remote Sites

**Job Name:** /SAAP/GET_MDKE  
**Scheduler:** Run once every hour

<table>
<thead>
<tr>
<th>Job Step Description</th>
<th>Program Value</th>
<th>ABAP Program Name</th>
<th>Variant</th>
<th>Client-Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Download stock wanted list to remote sites</td>
<td>ABAP</td>
<td>/SAAP/P_GET_MDKE</td>
<td>GET_MDKE</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### Edit Variants: Variant GET MDKE

<table>
<thead>
<tr>
<th>Variant Attributes</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>User ID</td>
<td>FNDATCH</td>
</tr>
<tr>
<td>Mobile Application</td>
<td>/SAAF/WORK_MANAGER_53</td>
</tr>
</tbody>
</table>
SECURITY INFORMATION

*SAP Dynamic Edge Processing* is based on SAP ERP 6.0 (EHP 4 through EHP 7) MM, IM, and PM components. Therefore, guides for these components also apply to *SAP Dynamic Edge Processing*. For more information about specific security-related topics, see the following resources on SAP Service Marketplace, SAP Support Portal, or SCN:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Quicklink</th>
</tr>
</thead>
<tbody>
<tr>
<td>Related SAP Notes</td>
<td><a href="http://support.sap.com/notes">http://support.sap.com/notes</a></td>
</tr>
<tr>
<td></td>
<td><a href="http://support.sap.com/securitynotes">http://support.sap.com/securitynotes</a></td>
</tr>
</tbody>
</table>


Authorization Concept

There are two types of authorizations for *SAP Dynamic Edge Processing*: front-end or client-side, and back-end or SAP ERP.

Client side roles or work centers control the functionality accessible by users of the client user interface. When users at the remote location submit work to synchronize in the back-end, standard SAP ERP authorization checks are used during the batch job.

1. **Note**
   
   All client users submitting work to be posted in SAP ERP need authorization to the S_RFC Object for all RFC function calls.

**Roles**

The following table lists the functions that can be assigned to client roles for use by *SAP Dynamic Edge Processing*.

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPROVAL</td>
<td>Purchase Requisition Approval</td>
</tr>
<tr>
<td>BOM_EDIT</td>
<td>Bill of Material Edit</td>
</tr>
<tr>
<td>GITTRANSF</td>
<td>Goods Issue and Transfer</td>
</tr>
<tr>
<td>GIWRKORD</td>
<td>Goods Issue for Work Order</td>
</tr>
<tr>
<td>INVTMNGR</td>
<td>Inventory Manager</td>
</tr>
<tr>
<td>MATEDIT</td>
<td>Material Edit</td>
</tr>
<tr>
<td>MEASPNTS</td>
<td>Measurement Points</td>
</tr>
<tr>
<td>----------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>POGR</td>
<td>Purchase Order and Goods Receipt</td>
</tr>
<tr>
<td>PREDIT</td>
<td>Purchase Requisition Edit</td>
</tr>
<tr>
<td>REPORTIN</td>
<td>Inventory Report</td>
</tr>
<tr>
<td>SERVENTS</td>
<td>Service Entry Sheet</td>
</tr>
<tr>
<td>STATREDY</td>
<td>Status Change to Ready</td>
</tr>
<tr>
<td>STATTECO</td>
<td>Status Change to TECO</td>
</tr>
<tr>
<td>STOCKWNT</td>
<td>Stock Wanted</td>
</tr>
<tr>
<td>WORKMNGR</td>
<td>Work Manager</td>
</tr>
</tbody>
</table>

**Mapping Remote Location Users with Roles**

*Local Users*

In the SAP GUI, go to `/n/saap/roles` and enter the following roles data:

1) Select *New Entries*.

2) Enter the main work center (for example, SOMC, OIM, MS, CRAFT) representing front-end roles.

3) Select functions to be performed by this role/work center. See *Role/Function Assignments*.

4) Enter a timestamp value in the following format:
   - Approximately 5 minutes in the future, so that when you save the record, it will be picked up for synchronization.
   - The format is YYYYMMDDHHMMSS (for example, 20160801134255 – which corresponds to August 1, 2016 at 1:42:55 PM)
   - Select the *Save* icon on the top menu bar.

5) Repeat steps 1-4 for the remaining roles/functions.
Role/Function Assignments

Corresponding Function Dropdown Values

<table>
<thead>
<tr>
<th>Function Value</th>
<th>Permission Granted</th>
<th>Permission Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approvals</td>
<td>Control access to approvals data</td>
<td>APPROVAL</td>
</tr>
<tr>
<td>Bill of Material edit</td>
<td>Control access for editing BOM items from equipment BOM</td>
<td>BOM_EDIT</td>
</tr>
<tr>
<td>Goods Issue and Transfer</td>
<td>Control access to transfer out goods from a specified remote plant destined for another remote plant</td>
<td>GITTRANSF</td>
</tr>
<tr>
<td>Goods Issue for Work Order</td>
<td>Control access for the issuing of materials to work orders</td>
<td>GIWRKORD</td>
</tr>
<tr>
<td>Inventory Manager</td>
<td>Control access to viewing Inventory and Materials management capabilities</td>
<td>INVTMNGR</td>
</tr>
<tr>
<td>Material edit</td>
<td>Control access to editing materials</td>
<td>MAEDIT</td>
</tr>
<tr>
<td>Material Documents Reverse</td>
<td>Control access to perform material document reversals</td>
<td>MATDOCRV</td>
</tr>
<tr>
<td>Service Category</td>
<td>Description</td>
<td>Access Code</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Physical Inventory Edit</td>
<td>Control access for creating Physical Inventory Documents and performing counts of materials in inventory</td>
<td>PIEDIT</td>
</tr>
<tr>
<td>Physical Inventory</td>
<td>Control access to post differences for a Physical Inventory Document count</td>
<td>PIPSTDIF</td>
</tr>
<tr>
<td>Purchase Order and Goods Receipt</td>
<td>Control access for retrieving goods for a Purchase Order</td>
<td>POGR</td>
</tr>
<tr>
<td>Purchase Requisition Edit</td>
<td>Control access to edit of Purchase Requisitions</td>
<td>PREDIT</td>
</tr>
<tr>
<td>Inventory Report</td>
<td>Control access to reporting data</td>
<td>REPORTIN</td>
</tr>
<tr>
<td>Service Entry Sheet</td>
<td>Control access to service entry sheet data</td>
<td>SERVENTS</td>
</tr>
<tr>
<td>Status change to REDY</td>
<td>Ability to change user status of a work order to REDY</td>
<td>STATREDY</td>
</tr>
<tr>
<td>Status change to TECO</td>
<td>Ability to change user status of a work order to TECO</td>
<td>STATTECO</td>
</tr>
<tr>
<td>Stock Wanted</td>
<td>Control access to Stock Wanted data for creating Purchase Requisitions</td>
<td>STOCKWNT</td>
</tr>
<tr>
<td>Work Manager</td>
<td>Control access to the Maintenance capabilities</td>
<td>WORKMNGR</td>
</tr>
</tbody>
</table>

**Local User Setup**

1) In the SAP GUI, go to transaction `/n/saap/localuser`:

![Local User Setup](image)

2) Select *New Entries*.

![New Entries](image)

3) Add the plant user.
   - Example: SOMC 0102

4) Add the plant (remote site #) in the next column.
   - Example: 0102

5) Press tab, then enter the back-end SAP ERP user name that has been set up for the SOMC 0102 user.

6) Add the main workctr (that is, SOMC, OIM, MS, CRAFT, and so on; the ones set up in the Roles table above).

7) Set the active user flag to *True*.  


8) Set the create time stamp value using YYYYMMDDHHMSS format, then click Save on the top menu.
9) Repeat steps 1-8 for the remaining users at the remote location.

Privacy and Data Protection
*SAP Dynamic Edge Processing* does not store any personal information.

Security-Relevant Logging and Tracing
Security-related logging uses standard logging for all actions in SAP ERP. This logging relates to the back-end user ID that is linked to the front-end user ID in table /SAAP/LOCALUSER. Front-end security logging is handled through an LDAP server.

LDAP Setup
LDAP (Lightweight Directory Access Protocol) is an open and vendor-neutral, industry-standard application protocol for querying and modifying items in directory services. In *SAP Dynamic Edge Processing*, LDAP verifies the credentials of a user at the remote site. There are three parts to authentication of credentials:

- Remote site authentication
- Synchronization transport
- SAP ERP transaction processing authorization

Remote site authentication is processed via LDAP. Synchronization transport happens via the technical RDBMS user for the staging area (MobiLink user) within the SAP ERP database. Finally, processing of the transaction into SAP ERP occurs via the SAP ERP user.
At the remote site, the edge server/application authenticates against LDAP protocol. If Active Directory is being used (such as Windows environment), Active Directory needs to be exposed as LDAP protocol.
To set up LDAP, complete the following steps:
1) Set up the back-end system (see Local User Setup)
2) Set up the remote configuration. We will be using only the search and compare feature of LDAP; we must first set up the following items in the remote server database (SYNC_OPTIONS):
   - LDAP URL – a client starts an LDAP session by connecting to an LDAP server (DSA). This is exposed as an URI with the default port as 389.
   - LDAP DOMAIN COMPONENT – a tree view organization in which the user can be located as a DOMAIN COMPONENT (DC). Multiple tree views can be shown; the more concise the tree view, the quicker the lookup for pass or failure
   - LDAP AUTHENTICATION TYPE – simple is currently the only authentication type that has been tested within TARS. Other methods may require unsupported LDAP attributes. Do not change the “simple” setting.
   - LDAP MATCH ATTRIBUTE – attribute that forms a distinguished name (DN). LDAP uses a unique DN to look up the directory. The uniqueness is constructed with this attribute as its DC. For example: if the matching attribute is UID and the domain component is “OU=people,DC=employee,DC=SAPGLOBAL,DC=com; ” looking up john.smith in LDAP would be the following “UID=john.smith,OU=people,DC=employee,DC=SAPGLOBAL,DC=com;”

```
<table>
<thead>
<tr>
<th>SQL Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SELECT OPTION_NAME, OPTION_NAME FROM DEF_SYNC_OPTIONS WHERE OPTION_NAME LIKE 'LDAP'</td>
</tr>
</tbody>
</table>
```

<table>
<thead>
<tr>
<th>Results</th>
<th>OPTION_NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LDAP AUTHENTICATION TYPE simple</td>
</tr>
<tr>
<td>2</td>
<td>LDAP DOMAIN COMPONENT OU=people</td>
</tr>
<tr>
<td>3</td>
<td>LDAP MATCH ATTRIBUTE uid</td>
</tr>
<tr>
<td>4</td>
<td>LDAP URL</td>
</tr>
<tr>
<td>5</td>
<td>def:///v</td>
</tr>
</tbody>
</table>
APPLYING SQL PATCH TO SAP DYNAMIC EDGE PROCESSING

Because *SAP Dynamic Edge Processing* contains SQL components, applying a patch differs from applying SAP notes for ABAP.

1) Find the SQL patches, which are usually delivered through the SAP Support Portal Software Download Center.
2) Download any applicable patches to a temporary folder.
3) Unzip the patches and copy them to your remote server where you installed your SQL database as described in *Remote SQL Anywhere 17.0 Database Server Setup Step-by-Step*.

4) Go to the destination in the new SQL folder where you copied the patch and edit the `setlocalenv.cmd` file.
5) Change the highlighted sections below to match the local settings.

```plaintext
SET ml_host=localhost
SET ml_port=8555
SET ml_scriptVersion=ML_R1
REM – SET your install root directory here –
SET rem_root_dir=D:\SAP\SAAP
SET rem_db_dir=%rem_root_dir%db
SET rem_db=SAAP\RCS.db
SET rem_web_app=web_build_%rem_app_build_num%.zip
SET rem_dns=SAAP\RCS_rem_%ml_syncUser%.
SET rem_eng=SAAPDB_RCS_%COMPUTERNAME%_%ml_syncUser%
SET rem_dbn=%rem_dns%
SET rem_db=%rem_db_dir%_%ml_syncUser%\%rem_db%
SET rem_uid=saap
SET rem_pwd=sql
SET rem_dba_uid=dba
SET rem_dba_pwd=sql
SET rem_db_port=5057
SET rem_db_port_https=8443
SET rem_db_maxrequestsize_http=10M
SET rem_service_name=%rem_eng%
SET rem_dbimsync_arv_name=SAAPMLSync_%ml_syncUser%
SET rem_saap_report_dir=%rem_root_dir%reports
SET rem_saap_file_transfile_log=%rem_saap_report_dir%\file_transfer.log
SET rem_saap_web_dir=%rem_root_dir%web
SET sql_rem_subscription=.\.sql\subscription.sql
SET sql_rem_lkdap_server=.\.sql\ldap_server.sql
SET sql_rem_lkdap_user=.\.sql\ldap_user.sql
SET sql_java_lkdap_auth=.\.sql\app_java.sql
SET java_dir=.\java
SET java_pkgs_dir=com/sap/SAAP
SET java_pkgs_pak=com sap saap
SET java_class_lkdap_auth=LdapAuth
SET sqlany_bin_dir=%SQLANY16\%BIN64
SET sqlany_db_engine=dbsvr16.exe
SET dbimsync_debugLevel=5
SET dbimsync_log=%rem_root_dir%\logs\SAAP\RCS\dbimsync_%ml_syncUser%
SET dbimsync_log_size=4M
SET dbimsync_schedule=EVERY 00:02
SET dbimsync_trana_log_size=4M
REM – SET your LDAP Parameters here –
SET ldap_domain_component=OU=%rem_lkdap_ou%,DC=example,DC=com
```

6) Open the `update.cmd` file and modify the highlighted section of the file to match the remote site (0425 is used in this example), DC (xxxx), user, and LDAP server.

```plaintext
@REM update database
CALL setlocale.cmd 0425 xxxx <please-change-user> <please-change-ldapserv>
@REM synchronization framework stored procedures
dbisql -onerror exit 0 "dsn=%rem_dns%,uid=%rem_dba_uid%,pwd=%rem_dba_pwd%" READ .\sql\drop_event_connection.sql
if NOT %errorlevel% EQ 0 goto ERROR
dbisql -onerror exit 0 "dsn=%rem_dns%,uid=%rem_dba_uid%,pwd=%rem_dba_pwd%" CALL sp_drop_event_connections();
if NOT %errorlevel% EQ 0 goto ERROR
```

7) Fix the path (in the same `update.cmd`) and copy the `java` folder into the `bin` directory.
8) Disable the SAAP service in **Web Services**.
9) Once all `setenvlocal.cmd` and `update.cmd` files are modified, run the `update.cmd` in a command line.

10) Monitor the screen to make sure no errors are reported. You should see the following results:

11) Reenable SAAP Web Services.
MULTI-LANGUAGE SUPPORT
Due to technical limitations with the latest Support Packs (SAAP_100 SP3, SAAP_UI100 SP2, SAAP_SQL100 SP2, SAAP_Service100 SP1), *SAP Dynamic Edge Processing* currently supports only English. This means that you can configure back-end processing for only English, and data is retrieved in that language. All back-end batch jobs must run in English.

SCANNING ATTACHMENTS FOR MALWARE
This section only applies if the remote system’s antivirus software does not watch the file system to scan files as they are saved. The DEP SQL Anywhere database can execute a command line script to instruct the antivirus software to check an attachment file for malicious content.

Without any configuration, the default behavior is to rely on existing antivirus software and take no action against new attachments. In this situation the value of `rem_saap_scanner_script` in `setlocalenv.cmd` should be empty.

If a script does need to be used to scan attachments, the value of `rem_saap_scanner_script` should be the path to the script. The script should be based on (or a modified version of) the sample at `$SQL_FOLDER$\sqlanywhere\scanner\script.cmd`.

Of note is line 12, which is the actual command to run the scanner against the new attachment file. This will vary based on the antivirus software installed. Depending on how your antivirus software handles success or failure, line 15 may also need to be modified. A successful scan on a clean file should output a value of 0. Any other value will be seen as either an error or malicious content. Some antivirus software will simply return an error code if a malicious file is detected, others may have different behavior.

Refer to your antivirus software’s documentation for information about scanning a target file from the command line, and how it provides return codes upon execution.