

# **BDEx - Configuration Guide**

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Basis Technologies

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# Introduction

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The purpose of this document is to provide a comprehensive guide to the configuration of the Business Data Exceptions (BDEx) product. This document contains the in depth, step by step guides for the set-up and configuration of each of the modules within BDEx:

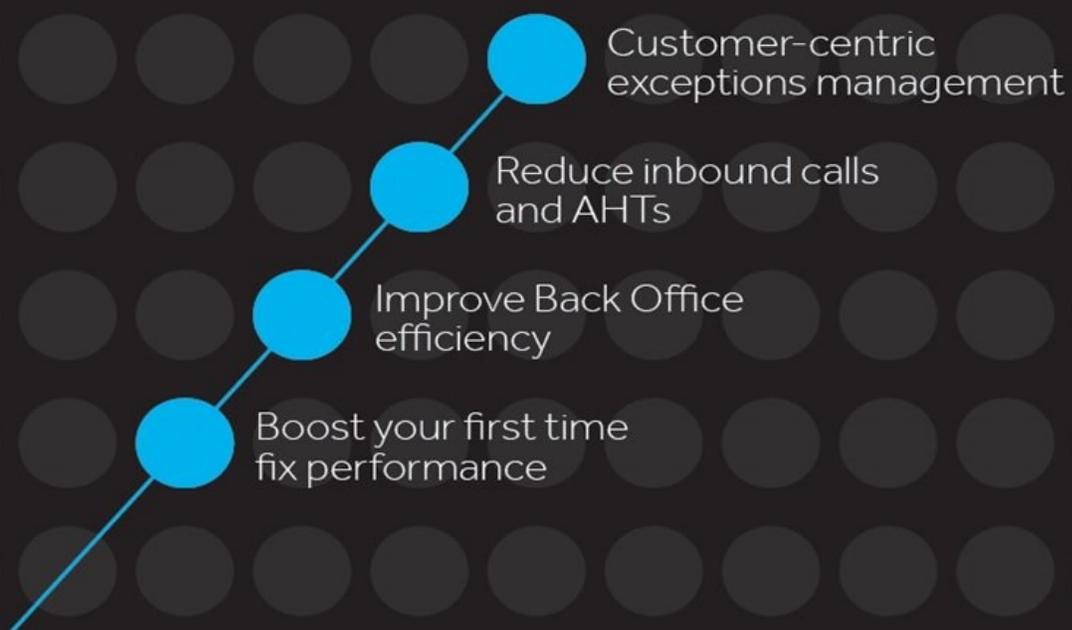
**The Customer Centric Hub**

**BPEM Closure Control**

**The Dynamic Work Center**

This document can be used in conjunction with the BDEx Developers Cookbook, which provides the detailed walkthrough of how to extend the product with custom enhancements.

BDEx is fast becoming  
the must-have add-on  
for utilities running SAP



Customer-centric  
exceptions management

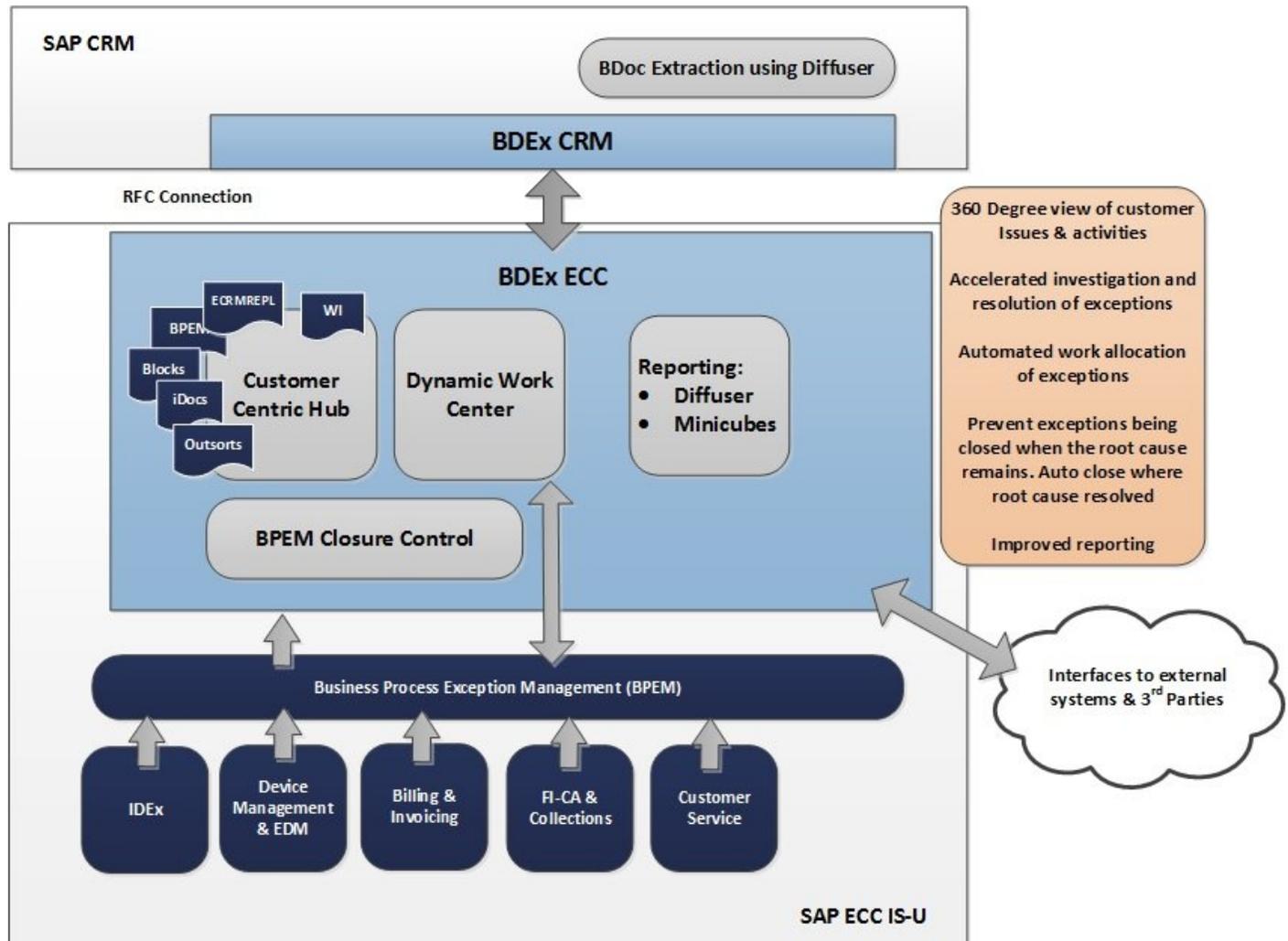
Reduce inbound calls  
and AHTs

Improve Back Office  
efficiency

Boost your first time  
fix performance

# BDEx Overview

BDEx is designed for process optimization for Utilities running SAP CR&B, accelerating the investigation and resolution of Back Office exceptions and significantly improving Front Office call handling. BDEx is a certified add on to SAP for Utilities, designed to integrate with standard SAP BPEM and the Web UI.



BDEx consists of three modules, the Customer Centric Hub, BPEM Closure Control and the Dynamic Work Center.

## BDEx Customer Centric Hub:

Exceptions management in standard SAP is complicated, time consuming and takes multiple transactions and systems to resolve the issues. Typically an agent will need to navigate across multiple transactions and

systems to investigate and fix an exception. The Customer Centric Hub is designed to accelerate this process by providing the user with a complete 360 degree view of the customer, showing all open work and exceptions, past interactions and the history of completed work. The Customer Centric Hub provides the following functionality:

- A customer centric view of all open work and exceptions.
- The summary notes screen that provides easy visibility of all notes across the BPEM Cases, CRM Interaction Records, Business Contacts, Service Orders and Service Notifications.
- A history screen that shows the previously resolved work and exceptions.
- An invoice history screen, which provides the invoicing history for the customer.
- The ability to log each activity that an agent performs, enabling a comprehensive and highly accurate view of the time are taking to resolve exceptions, enabling accurate AHT measurements.
- The root cause analysis screen, showing the interdependencies between exceptions, highlighting which are the symptoms and which issues are the root causes.
- The customer centric hub provides the ability to investigate and resolve exceptions through the provision of right click actions. These are either accessed from a Master Data Object (e.g. Business Partner, Contract or Installation) or a piece of work (e.g. BPEM Case, Service Order, Billing Outsorts) and provide the ability to access all the relevant transactions from within BDEx.

#### **BPEM Closure Control:**

Standard SAP BPEM does not enforce the link between the exception (BPEM) case and the underlying root cause issue. This means that an agent can close a case without having fixed the issue. It also means that the underlying problem, for example an implausible read, can be resolved but the case may remain open.

BPEM Closure Control provides the ability to define the condition of when the case can or cannot be closed. Preventing volumes of exceptions in the system without cases to track and manage these. If the condition is not met the agent will not be able to close the case (it can be 'hard stop' or a warning that the user can override. This is configurable per rule). This prevents agents from closing cases where they haven't fixed the problem or followed all of the resolution steps. If the condition is met the agent is allowed to close the case.

There is a regular (typically nightly) batch job that will automatically close cases where the condition has satisfied, avoiding the need for an agent to manually work the case. This prevents cases 'hanging around' when they have already been fixed or unnecessary manual intervention where a case isn't actually a problem anymore enabling the focus to be clearing issues rather than wasteful exceptions requiring no action, ensuring an agents time is productive.

#### **Dynamic Work Center:**

The Dynamic Work Center is the inbox functionality within BDEx, focusing on delivering the right work, to

the right people, at the right time and in the right sequence. It provides the ability for agents to receive BPEM Cases and Work Items and for manager to view in real time the open work for their team.

# **BDEx Work Request Types**

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Work Requests are the exceptions, errors or other pieces of work that appear in the Customer Centric Hub. A work request maybe an implausible read that has triggered a BPEM exception. It could a technical failure, such as a CRM Replication Failure. Work Requests may be work that a user should actively investigate and resolve, or just an informational item that they need to have visibility of to effectively resolve an exception or customer enquiry.

Currently BDEx supports 38 different type of work requests sub categorised into the following headings:

## **Device Management.**

The Device Management module of SAP IS-U manages objects such as schedule records, meters / devices and meter readings.

## **Billing and Invoicing.**

The Billing and Invoicing functionality within SAP IS-U provides the ability to bill domestic, commercial and industrial customers across a range of divisions (e.g. Electricity, Gas, Water, Waste Water).

## **FI-CA.**

Contracts Accounts Receivable and Payable or FI-CA manages the processes for payment processing, posting and dunning. FI-CA also includes the Enhancement Message Management function more commonly known as EMMA or BPEM (Business Process Exceptions Management).

## **SAP CRM.**

The CRM module of SAP offers complete customer relationship management. It manages a number of objects such as Customers, Accounts / Business Agreements, Sales Orders and Interaction Records.

## **IS-U Customer Service.**

The Customer Service module of SAP IS-U manages a number of objects such as business partners, contract accounts and homemoves.

## **Work Management.**

The Work Management module of SAP IS-U manages work for engineers for replacing, inspecting, and installing meters/devices. It manages objects such as Service Orders and Service Notifications.

## **IDE/IDEX.**

The IDE module of SAP IS-U manages industry market messaging in deregulated environments.

## **Cross Application.**

The cross application exception types are generic to all SAP ERM and CRM systems.

# Device Management

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The Device Management module of SAP IS-U manages objects such as schedule records, meters / devices and meter readings.

## **Implausible Meter Readings**

Meter readings that have been successfully uploaded against the register(s) of a meter but are outside the tolerance limits of the expected meter reading. These readings are not billable and will prevent further billing causing delays to invoicing and payments.

## **Open Meter Reading Orders**

Meter reads can be delayed for a number of reasons, for up to a number of weeks. Lack of a meter read can cause billing to be delayed.

## **Installation Locks**

Installation locks prevent meter reading orders from being created for the installation. If no meter reading orders can be created, then any contracts moved in for the installation will not be billed.

## **Disconnection Documents**

Disconnection documents represent the fact that a particular installation has been disconnected. This prevents numerous business processes from executing for the given object(s) including meter reading download/upload and billing.

## **No Device**

A work request has been added to display if a device is not allocated to the installation, which is connected to an active contract. Delays in flow processing can prevent devices from being installed meaning unbilled consumption leading to potential lost revenue. This feature will highlight these issues immediately to the agent in order for this to be fixed contributing to an effective meter to cash flow journey.

## **Smart Meter Communication (AMI Inbound / Outbound)**

As metering technology improves and direct device communication becomes possible the need to keep an eye on error messages in this area becomes more important. The consequences of these messages not delivering their payload could impact the Customer in many ways ranging for device installation failures, meter read upload delays and tariff change faults.

# Billing and Invoicing

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The Billing and Invoicing functionality within SAP IS-U provides the ability to bill domestic, commercial and industrial customers across a range of divisions (e.g. Electricity, Gas, Water, Waste Water).

## Open Billing Orders

Also known as billing triggers, billing orders represent the fact that a contract/installation needs to be billed. They are created at the time of meter reading order creation (if billing relevant) in a status of “not billable”. Once a valid meter reading is entered (plausible) against the meter reading order, the billing order is updated to billable. All billable billing orders are billed during the billing batch. The presence of a billable billing order implies an issue is present during the billing process.

## Billing Out-sorts

The output of the billing process is a billing document. Once produced, various checks can be performed upon this billing document to ensure validity. This includes tolerance limits for monetary values (e.g. if it exceeds a certain monetary amount). This ensures that very high bills are not sent out to customers incorrectly or zero bills. Billing out-sorts must be resolved in order for invoicing to proceed.

## Billing Check Failures

A billing check is performed to ensure that a given contract along with its associated billing required data is present. If anything is wrong with either the billing master data or configuration, this is flagged up appropriately.

## Contract Billing Blocks

Contract billing blocks can be placed upon the contract to prevent billing from occurring. This can be done for various reasons which are configurable such as customer complaints or during investigations.

## Invoicing Out-sorts

This is similar to billing out-sorts except the entire invoice amount is considered as a part of the validation. Invoicing out-sorts prevent large monetary values from being sent to residential customers. They stop the billing/invoicing process and therefore have a material impact on customers and cash-flow.

## Invoicing Triggers

Invoicing triggers are created after a billing order has been billed and a billing document produced. The invoicing process runs off the presence of an invoicing trigger. The presence of an invoicing trigger indicates that there is a potential problem in the invoicing process which is preventing the invoice from being generated.

**Late Bill**

If a bill order has not yet generated a billing/invoicing document past its due date the customer has become late billed. Late billing is a main cause of lost/delayed revenue and also customer complaints. Visibility in SAP is difficult particularly if the agent is resolving another work area. BDEx identifies these issues and display them as a Late Bill work request. This enables agents to see periods of unbilled consumption and ensure the customer is billed in timely a manner.

**Invoice Print Document**

The invoice document generated in IS-U. Includes open, posted and reversed invoice documents. This work request details the payment status for the invoice indicating whether the invoice amount has been paid in full, partially paid or is open and due.

# FICA

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Contracts Accounts Receivable and Payable or FI-CA manages the processes for payment processing, posting and dunning. FI-CA also includes the Enhancement Message Management function more commonly known as EMMA or BPEM (Business Process Exceptions Management).

## **BPEM/EMMA Cases**

Business Process Exception Management Cases (BPEM). The analysis of message from the application log and the generation of BPEM Cases for agents to work the underlying exceptions. BPEM Cases can be created from the messages in the application log or manually in IS-U or CRM. These exception cases typically form the majority of Back Office processing in SAP for Utilities.

## **Contract Account Locks**

Locks can be placed upon a Contract Account for various reasons. These locks can have validity periods and also be deactivated (but the history of them retained). Common locks include preventing outbound or inbound payments being applied to the account. Invoicing locks can be applied to avoid invoicing being produced. Also dunning locks can be placed. The presence of a lock can immediately indicate to the user why a given issue exists.

## **Collection Agency Items**

After dunning has attempted to collect outstanding debt, the debt can be handed over to external collection agencies. This exception type highlights any collection items that have been transferred to collection agencies and are currently outstanding.

## **Collection Work-Items**

Collection work-items can be generated as standard SAP workflow work-items to be routed to agents to perform collection activities. These collection work-items are displayed as exceptions if they are currently outstanding and awaiting either allocation or completion.

## **Instalment Plans**

Instalment plans ensure the receivables are not included in the dunning run. Instead, dunning activities are implemented for the due instalments that have fallen into arrears. This work request type provides the instalment plan information for all active instalment plans on the contract account.

## **Failed Dunning Proposals**

A dunning activity step sometimes fails i.e. one of the activities have tried to run but something has gone wrong and it cannot execute, which then halts any further dunning activities from being triggered. This might happen, for example, if there is a problem with posting a late payment charge, or a connection to CRM or

another system has failed. This means the customer would not receive any future dunning reminder letter or communications having a significant impact on the customer and potential lost/revenue to the business. This exception allows agents to see the failed activities and dunning history for the customer. Enabling the agent to fix the issue and continue the dunning process. This will ensure lost/delayed revenue is prevented.

# SAP CRM

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The CRM module of SAP offers complete customer relationship management. It manages a number of objects such as Customers, Accounts / Business Agreements, Sales Orders and Interaction Records.

## **CRM Replication Failures (ECRMREPL)**

When replicating contracts from CRM to IS-U, replication errors can occur. This exception type highlights these failed replications and the reason for their failure. CRM replication failures cause inconsistencies between data in the CRM and IS-U systems, which in turn cause downstream validation failures, exceptions and other process interruptions.

## **Failed BDocs (Inbound & Outbound)**

BDoc processing can error for numerous reasons and is one of the most common issues in the CRM Middleware communication. This can prevent customer details from being updated such as name changes and address details leading to customer impact. ISU BDocs are also displayed when failed.

## **Interaction Records / Business Activities**

An interaction record is created for every customer interaction in CRM. An interaction typically starts with an inbound or outbound contact and completes when the agent ends the interaction. Interaction Records can also be generated by background processes, such as the sending of a piece of correspondence.

## **Marketing Leads**

Any marketing leads that are currently outstanding can be displayed as an exception type. This indicates that an opportunity is currently under way for the given customer/account.

# IS-U Customer Service

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The Customer Service module of SAP IS-U manages a number of objects such as business partners, contract accounts and homemoves.

## **Parked Move-In Documents**

Parked Move-In documents are effectively documents for storing the information relating to a Move-In. Parked Move-In documents can then be “executed” (e.g. at a later date). The presence of a parked Move-In document can help an agent support issues relating to why a customer yet to be moved out and receive their first bill.

## **Parked Move-out Documents**

Parked Move-Out documents are effectively documents for storing the information relating to a Move-Out. Parked Move-Out documents can then be “executed” (e.g. at a later date). The presence of a parked Move-Out document can help an agent support issues relating to why a customer yet to be moved out and receive their final bill.

## **Business Contact**

Customer contacts provide visibility to agent’s activities previously undertaken and outstanding tasks. Important information can be obtained from a customer’s call such as meter readings, device details or complaints. In SAP CR&B, Business Contacts are typically replicated up to become Interaction Records in CRM.

## **Correspondences**

Correspondence records that have not yet been printed could be of relevance to the Customer; their handling could be crucial to the Customer relationship. Manifesting these as items for the user to be aware of and if need be take direct action upon can be a very useful way of bringing them out into the light and not remain buried in technical back-end tables.

# Work Management

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The Work Management module of SAP IS-U manages work for engineers for replacing, inspecting, and installing meters/devices. It manages objects such as Service Orders and Service Notifications.

## **Service Orders**

Service orders represent a piece of work that must be carried out. Via the service order itself, the process of initiation through to implementation can be tracked. An open service order or one in an error state can highlight to the user that some task has yet to be carried out.

## **Service Notifications**

The Service notification is for planned or unplanned work. From a service notification a service order can be generated. An open service notification or one in an error state can highlight to the user that some piece of planned/unplanned work has yet to be carried out.

# IDE/IDEX

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The IDE module of SAP IS-U manages industry market messaging in deregulated environments.

## **Switch/Process Documents**

Switch or Process documents manage the industry processes in the deregulated environment, in particular the switching of a customer from one utility supplier/retailer to another. All industry communication are logged against the switch document as data exchange tasks. Activities are also recorded to transcribe the events that take place during the switch process. An in process or in error switch document indicates that a deregulation process requires investigation. In the latest version of IDE (IDEX), switch documents have been renamed “process documents” and manage more deregulation processes that just switching from one supplier to another.

## **Data Exchange Tasks**

Industry messages are related to the Switch Document via IDE Data Exchange Tasks. These have their own status which can be either in an error state or an on-hold/pending state. Messages in IDE can be put on hold in the case where it is waiting for another message (or event) to occur but the industry message (IDoc) must be processed.

# Cross Application

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The cross application exception types are generic to all SAP ERM and CRM systems.

## **SAP Workflow**

Workflows are used to model business processes within SAP. Triggered by events in the system, they combine automated processes with the manual allocation of work items, deadline monitoring and escalations. Workflows can range from simple refund approvals to highly complex end to end industry processes.

## **Work Items**

Work Items are the activity steps within a workflow, that are either executed by a user to carry out a business or technical function manually, or a background process to perform an automated action. These can range from Approve Refund, to Trigger Industry flow or Perform Device Installation.

## **iDocs (Inbound & Outbound)**

IDoc's (Intermediate Documents) which have failed to process successfully. An IDoc is an interface into the IS-U/ERP system, typically used for the Meter Read upload or the sending and receiving of industry flows.

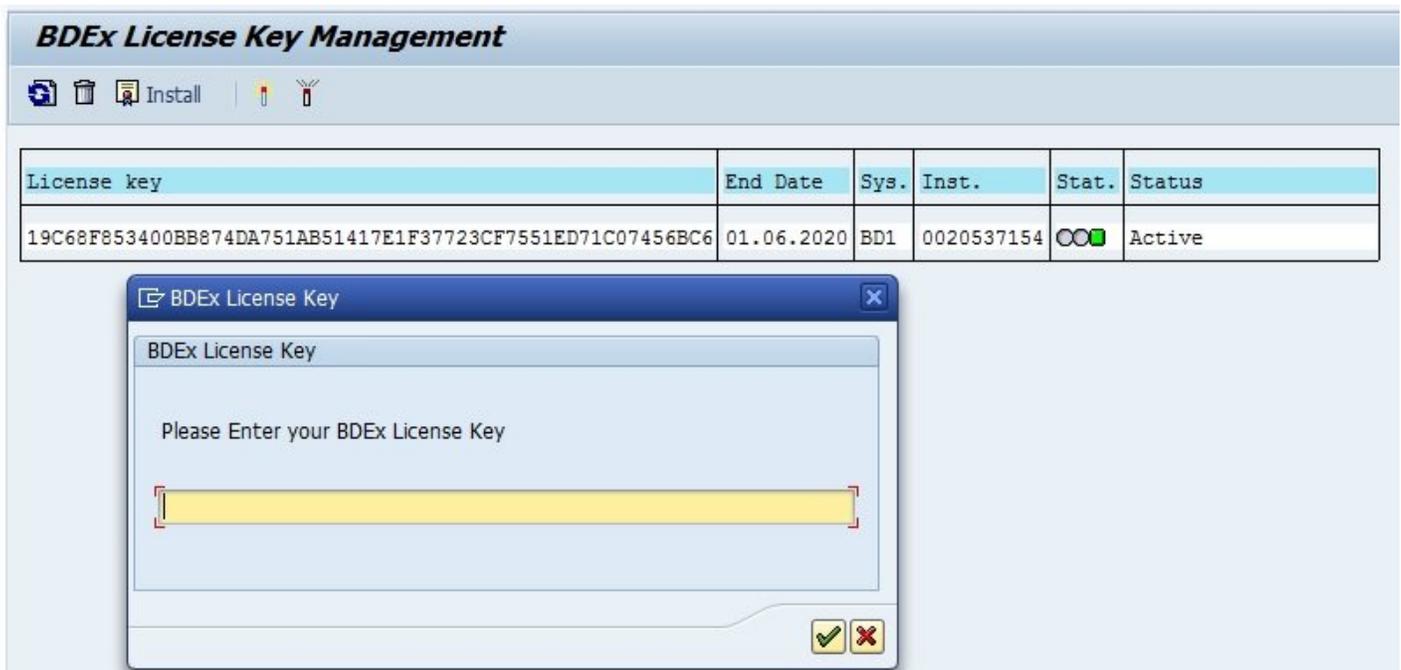
# Installation and Activation

The first step to install BDEx is to import the transport files provided by Basis Technologies into the relevant systems. Depending on your architecture this may be a single set of transports to be applied to all environments, or multiple e.g. one set of transports for ECC and one set of transports for CRM.

Once the BDEx software has been installed on the required system in the SAP landscape, you will need to install the license key to begin use of the product.

This is performed in transaction /BTI/MDELICENSE.

Within the transaction, click on install and paste in the Basis Technologies supplied Licence Key.



Please contact Basis Technologies Support ([support@basistechnologies.com](mailto:support@basistechnologies.com)) to request a license key for the given system(s) into which you are installing BDEx. You need to provide the following information:

SAP System ID: 3 character system SAP system ID (e.g. SD1)

SAP Installation Number: 10 character installation number

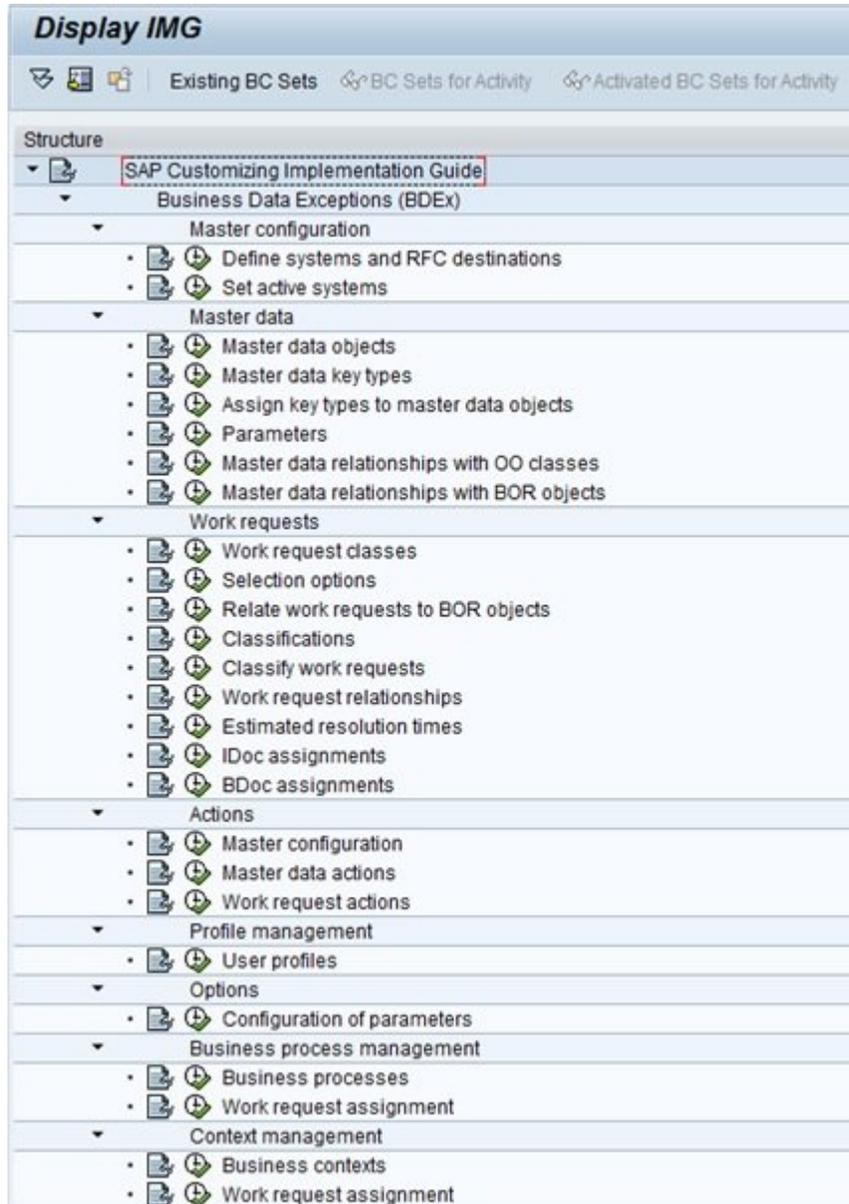
BDEx uses the Mass Data Runtime (MDR) framework for reporting purposes and for the extraction of some work request types (iDocs and BDocs).

The software for MDR will be applied to the SAP system as part of the BDEx install. As with BDEx, MDR will then need to be activated via a supplied licence key. Open transaction /BTR/MDRLICENSE and click on install to apply the supplied license key.

# Configuration Options and the IMG

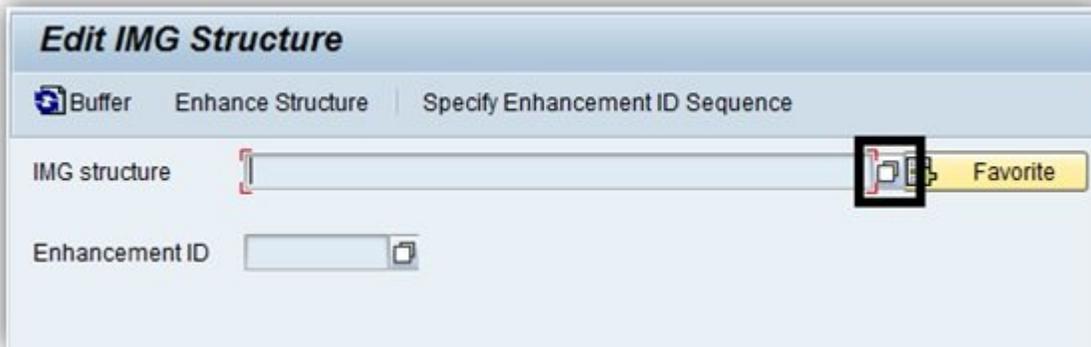
The configuration for the BDEx family of apps is maintained using the standard SAP customizing transaction SPRO. If exceptions are to be retrieved from external systems, then certain configuration is required within these external systems also.

The following steps can be applied to add the BDEx IMG structure to the standard configuration menu:

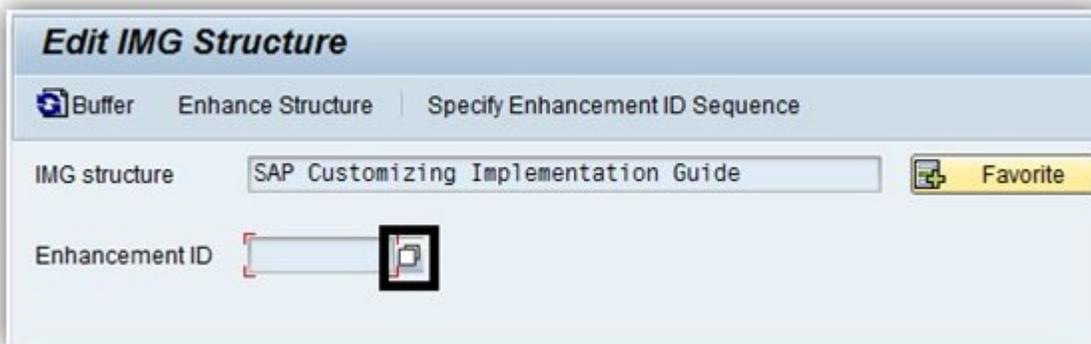


BDEx is configured using a series of customizing tables. In order to provide access to these tables via the standard SAP configuration transaction SPRO, the BDEx node must be added as an enhancement to the SAP IMG.

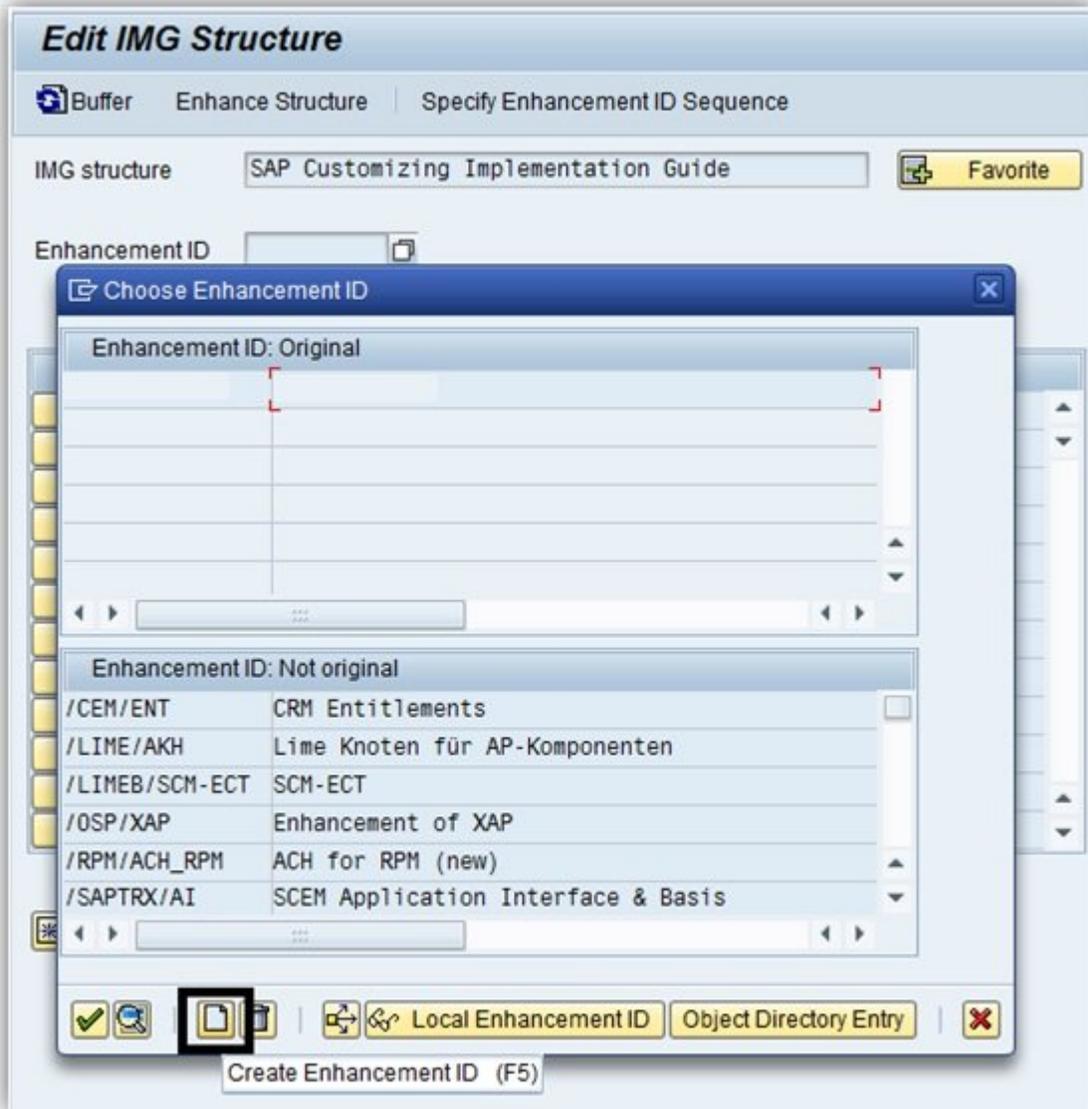
1. Go to transaction S\_IMG\_EXTENSION
2. Use the search help function to find "SAP Customizing Implementation guide".



3. Use the search help function to select a new Enhancement ID.



4. Create a new enhancement ID.



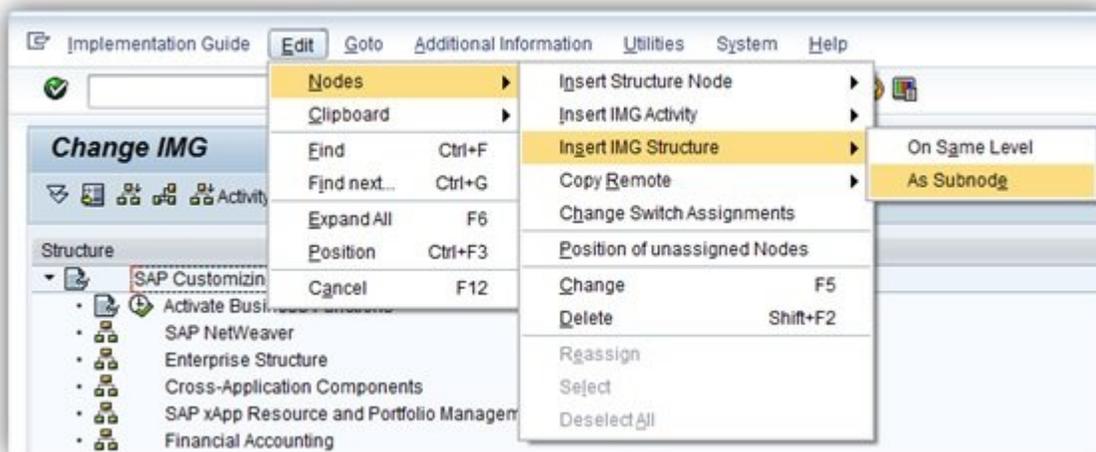
5. Give the enhancement a name in the customer namespace (e.g. ZBDEX) and add it to a relevant customer package. This enhancement must be included on a transport request so that it can be transported to other environments.



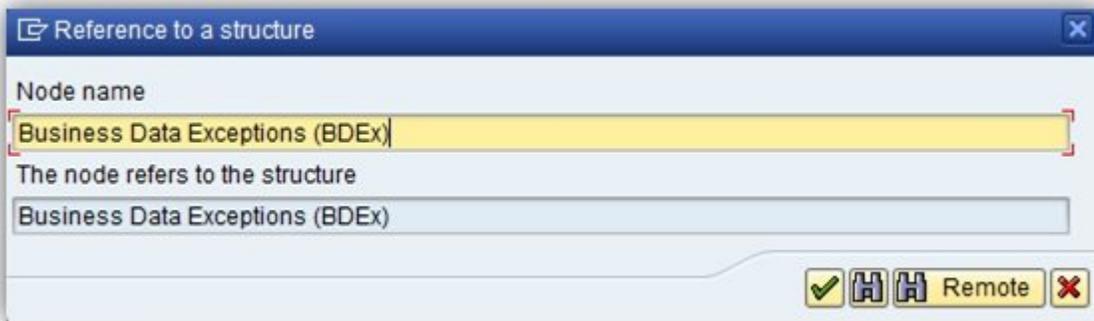
6. Once the enhancement has been created, select it from the list, and then press Enhance Structure.



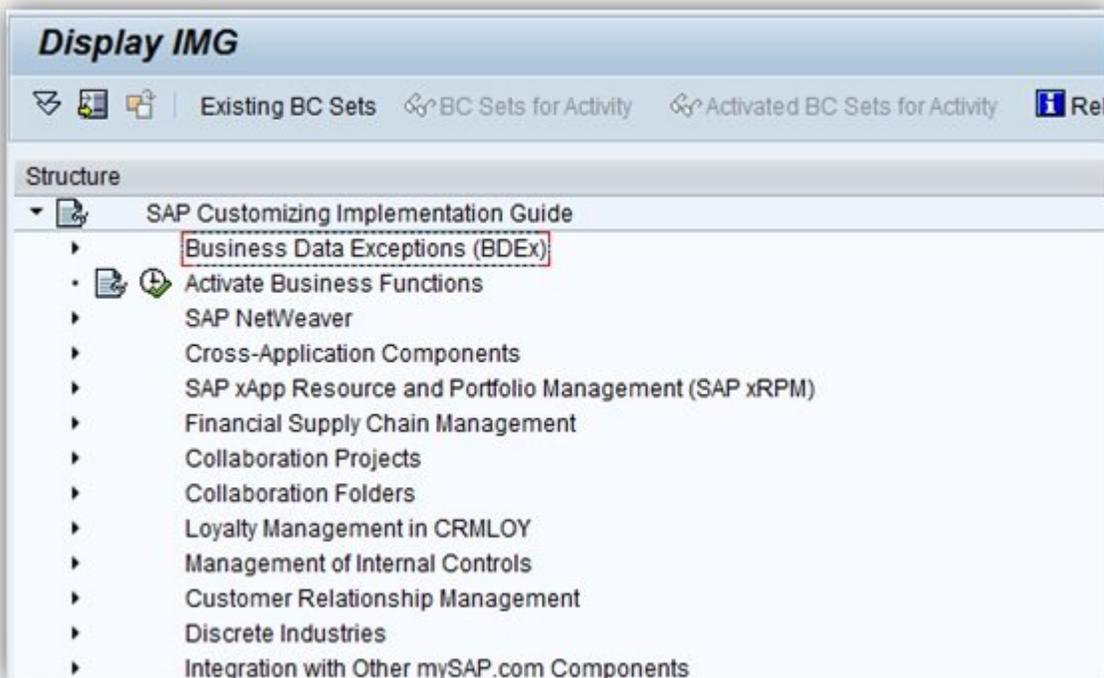
7. Select the top line item “SAP Customizing Implementation Guide” then select Edit -> Nodes -> Insert IMG Structure -> As Subnode



8. Use the search function to select “Business Data Exceptions (BDEx)” IMG structure, and name it accordingly.



9. The node is now available in the SAP customizing menu.



10. Repeat this process for all external systems (e.g. CRM) and transport the changes as required.

# **Customer Centric Hub Configuration**

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## System Configuration and Connectivity

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In order for BDEx to run correctly, collating work and exceptions from across the SAP landscape, it is necessary to configure the various systems and the connectivity between them.

### Define systems and RFC destinations

This configuration option manages the list of systems in the landscape, and how these are to be reached. Every client that will be using BDEx must be entered into this table, so include all development, QA, training, pre-production and production clients where applicable. This can be maintained in SPRO or via configuration table /BTI/MDE\_C\_SYST.

Field	Description
System ID	The BDEx system ID
SAP System ID	The SAP system ID
Client	The client number
System Name	A descriptive name for the system
Application	The application class ID
Appl class	The BDEx application class name
Destination	The RFC destination to the source system
Source System	Whether this system is the primary BDEx system
Source sys ID	The source system ID for this system
Source client	The source client number for this system
Icon	The icon to display for this system
Active	No longer used
WF used	Whether inform when resolved should use workflow or email notification

For example, the following configuration would be appropriate for an ISU system EP1 client 100 and a CRM system CP1 client 100:

Field	Example value
System ID	0001
SAP System ID	EP1
Client	100

System name	ECC production client 100
Application	IS-Utilities
Appl class	/BTI/MDE_CL_MD_APPL_ISU
Destination	
Source system	X
Source sys ID	
Source client	
Icon	
Active	
WF used	

Field	Example value
System ID	0002
SAP System ID	CP1
Client	100
System name	CRM production client 100
Application	
Appl class	
Destination	EP1CLNT100
Source system	
Source sys ID	EP1
Source client	100
Icon	
Active	
WF used	

# Master Data Configuration

---

Master Data Objects are at the core of BDEx. They represent the link between the hierarchies of master data through to the exceptions which are generally transactional data.

Master data objects

/BTI/MDE\_C\_MDOBJ

This table contains all of the master data objects stored at application level. However, this table should mostly be left as supplied as it is required for BDEx to run correctly. The main scenario where this table can be modified is to suppress certain master data objects from being shown by using the 'No display' flag. This is the correct way to hide master data objects from the end-user (e.g. for POD in a regulated environment). Entries should never be removed from this table, and only added in order to extend to additional or custom master data objects.

# Work Request Configuration

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Work requests represent the data that is to be retrieved, analyzed and presented to either users or reports for numerous purposes. A work request can either be a “technical” issue or a “functional/business” issue. Typical work requests include failed IDoc errors, BDoc errors and either in process or failed workflows or work-items.

Functional issues are generally specific to the module(s) of SAP that is in use. These might include in process sales orders, in process or failed service orders (or service notifications), plus numerous others that represent either the business process starting point or a failure that might have happened within a business process.

Work request classes

/BTI/MDE\_C\_WRCLS

BDEx comes with 40 different exception types available for use. The work request classes table provides the basic configuration for these. The main configuration activity for this table will be to set the “Inactive” flag for work request classes that are not required.

Note that custom exception types or third-party exception types can be added to this table; for further information on developing your own exception types within the BDEx framework, please refer to the [BDEx Developers Guide](#)

Selection options

/BTI/MDE\_C\_WRSEL

This table contains the selection options for each work request class and subclass. This is primarily where the project-specific status values can be configured (e.g. for process/switch documents).

Relate work requests to BOR objects

/BTI/MDE\_C\_WRBOR

This creates the link between work request classes and related BOR objects. By default BDEx comes preloaded with a standard list of BOR object mappings, this table should be updated with any custom or additional BOR objects used. It is very important that all relevant BOR objects used are maintained in this table, as missing entries will cause unexpected behavior in BDEx.

## Classifications

### /BTI/MDE\_C\_WRTYP

This provides a list of classifications available for work requests. BDEx comes pre-configured with two classifications, “Information” and “Problem”.

Other configurations are possible, for example some customers classify their work into “Active process”, “Exception”, and “Outstanding work”.

## Work Requests relating to BOR objects

### /BTI/MDE\_C\_WRBOR

In this table the BOR objects are mapped to the work request types. All the standard objects are configured out of the box however any Z or custom BOR objects need to be added to this table to enable the Customer Centric Hub to pick them up.

## Work Request estimated resolution times

### /BTI/MDE\_C\_WRRES

The estimated resolution times can be added to this table. This information is displayed in the Customer Centric Hub and assists in coordinating data for the Productivity Report BDi App. In this table you can enter the time period the work request is anticipated to take to resolve and the unit type can be selected. The data in this table displays not only the estimated resolution times for the work requests but also the elapsed time is calculated using these values.

## Work Request Primary Object Priorities

### /BTI/MDE\_C\_WRPRI

This table enables the primary objects to be defined. If left blank the objects will be sourced from the work request type. However, in the case where there are multiple objects this can be used to prioritize and list them against the work request. This cannot be used for all object types only the work requests that can use different object types i.e. BPEM cases.

# Actions

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Actions are the resolution steps that can be executed in BDEx in order to either investigate or resolve exceptions. The purpose of actions is to stream-line the navigation of the user from the BDEx framework into the appropriate transaction within the underlying system where the exception resides (e.g. SAP ECC, SAP CRM, XI/PI etc.). Note that this might also include a non-SAP system.

Further more, they may instead call standard BAPI's or other internal function modules rather than navigating to the standard transaction(s) in order to perform the required function.

## Action Header Configuration

Actions are configured within the table /BTI/MDE\_C\_ACT. This represents the header information of the action.

Field	Description
Action ID	Unique reference to the action
Function Code	The function code of the action
Reference Class	The action's executing class
Reference Method	The action's executing method
Icon	Not longer supported
Refresh	A flag to indicate that the list of work requests should be refreshed after the action has executed
Inactive	Deactivates the action

Custom actions not delivered in the standard product should have their "Action ID" within the customer name space (i.e. starting with Z or Y).

Refer to the BDEx developers guide.

## Master Data Actions

Master data actions are those actions that can be executed upon the master data objects within the hierarchy. This table provides the link between a master data object and the relevant action, plus the order the actions will appear in the relevant context menu.

Field	Description
Master Data Object ID	The ID of the master data

Action ID	The ID of the action
Sequence number	Determines the order in which master data actions will appear

### Work request actions

Work request actions are those actions that are executable upon the work requests themselves. These take the user into the appropriate underlying transaction for the exception itself in order to resolve the issue. As mentioned earlier, however, this may actually just call a BAPI or perform some underlying functionality without navigating to a separate screen.

Field	Description
Work request class	The work request class ID
Work request subclass	The work request subclass ID
Status	The work request status ID
Action ID	The action ID
Action sequence	The order this action should appear in the context menu
Work request history relevance	Whether this action is available for work requests in the historical view

Similarly to the master data actions, exception actions are linked from the action header to the work request via this table.

# Root Cause Analysis

---

## Work Request root cause analysis

/BTI/MDE\_C\_WRRCA

Root cause analysis shows the interdependencies between exceptions and identifies which are the symptoms and which are the root causes. BDEx provides different relationship types which can be configured. Depending upon the relationship type a relationship method must also be configured. Each type is explained along with the appropriate methods.

### Relationship Types:

**Symptom** – A primary work request is listed along with a secondary work request. This is used to signify a hierarchical relationship between the exceptions for example a meter exchange work item is the primary root cause and an implausible reading and a BPEM case for the reading are symptoms of the meter exchange work items.

**Created by** – This should be used to identify an exception breeder whereby 100% of the time a work request triggers another work request to be created.

**Dependent** – This displays the interdependencies between the work request types in the Customer Centric Hub.

**Duplicated** – This displays duplicated items. This can be used if there are multiple exceptions for the same object that should have a unique key or for cases which occur on the same date.

**Linkage** – This indicates a one to one relationship between two work request types. Whereby the secondary object should not exist if the primary object is not present. This relationship type creates a link within BDEx and if the primary object is closed this triggers a information box requesting to close the secondary object.

### Relationship methods:

**MATCH\_ALL\_SEC\_OBJECTS**

**Match all secondary objects** – This method checks all of the secondary objects on the case and if all the objects on the primary work request type are a match will show the objects have a relationship.

**MATCH\_SEC\_WR\_KEY**

Match secondary work request key – This method checks the primary work request objects contain the secondary objects key. This could be relevant if both work requests share the same object keys such as a bill block and the BPEM created for the bill block.

**MATCH\_ANY\_OBJECT**

Match any object – This checks the work requests share any objects.

**MATCH\_DUPLICATES**

Match duplicates – Checks the primary work request is the same as the secondary.

**MATCH\_DUPLICATES\_COMP\_TIME**

Match duplicates by completion time – Compares the creation times of the work requests to search for a match.

**MATCH\_ON\_MAIN\_DATE**

Match on main date – Checks the work requests share the same main date.

**MATCH\_ALL\_PRI\_OBJECTS**

Match all primary objects – Checks all the primary objects match to the secondary objects.

**MATCH\_PRI\_WR\_KEY**

Match primary work request key – Checks if a primary object work request key is contained in the secondary objects.

**MATCH\_CREATED\_BY**

Match created by – This checks the created by ID for both the work request items and if there is a match shows there is a relationship between the two.

## BDoc and IDoc configuration

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Note: The following sections only apply to Client implementations where BDoc and/or IDoc Work Requests require extraction and treatment in BDEx.

### BDoc Configuration

Table /BTI/MDE\_C\_BDOC is provided and pre-loaded with configuration settings for many of the standard CRM BDoc Types that would normally qualify for consideration either in their 'Classic' or 'Extended' Payloads or sometimes both. New entries may be necessary to support additional BDoc Types for the specific Client implementation. Alternatively the active flag settings for these entries may need adjustment from time to time depending on the desire to need to continue analysing specific BDoc Types going forward.

Each record in this table should indicate:

1. BDoc Type For example 'BUPA\_MAIN'
2. Payload Type Which payload the data is located in: C – classic data or E – extended data
3. Component name 1 The first-level structure to inspect
4. Component name 2 The second-level structure to inspect
5. Component name 3 The third-level structure to inspect
6. Field name The field name of the master data key
7. Component field 0 name "Field name" where-clause field name
8. Component field 0 value "Field name" where-clause field value
9. Component field 1 name "Component name 1" where-clause field name
10. Component field 1 value "Component name 1" where-clause field value
11. Component field 2 name "Component name 2" where-clause field name
12. Component field 2 value "Component name 2" where-clause field value
13. Component field 3 name "Component name 3" where-clause field name
14. Component field 3 value "Component name 3" where-clause field value
15. Master Data Object ID The BDEx object ID of the master data key, e.g. ISU0009 ('Device')
16. Master Data Key Type The BDEx key type of the master data key, e.g. 100 ('Manufacturer serial number')
17. Active Whether this configuration should be active.

The name of the field containing the relevant key should be recorded in the "Field name" field. If this field is located within another structure, define the structure name in the "component name" field. For example, in the BUAG\_MAIN BDoc the business partner number is located in the field partner, inside the

CRMT\_BUAGS\_MW\_HEAD. For BDocs with multiple line items, where-clauses may be required for each of the parameters.

For example, a SI\_POD BDoc contains the point of delivery number in the 'OBJKEY' field, but only on the line where the value 'BAPI\_EUI' is found in the 'TABNAME' field. This configuration entries required would thus be:

- Field name 'OBJKEY'
- Component field 0 name 'TABNAME'
- Component field 0 value 'BAPI\_EUI'

These settings influence the behaviour of the BDoc Analysis Report (/BTI/MDE\_REP\_BDOC\_ANALYSE\_MDR) which should be scheduled in the front-end CRM environment to run as frequently as required to maintain the necessary table entries in the Additional Work Requests Table (/BTI/MDE\_ADD\_WR) that are interrogated by the BDEx Transaction.

The screenshot displays the SAP configuration interface for 'MDE: Analyse existing and new BDoc work requests (MDR version)'. The window title is 'MDE: Analyse existing and new BDoc work requests (MDR version)'. The interface includes a menu bar (Program, Edit, Goto, System, Help) and a toolbar. The main content area is divided into several sections:

- Technical Settings:** A label to identify this variant is shown with a yellow input field.
- Selection Options:** Fields for 'BDoc Message ID' and 'BDoc Type', each with a range selector (to) and a search icon.
- BDoc Analysis Mode:** Three radio button options:
  - Check for new BDoc errors: Minimum age (minutes) is set to 60.
  - Check for interm. BDoc errors: Interm. Period (hours) is set to 24.
  - Check for old BDocs now fixed.
- Test Settings:**
  - Test mode
  - Run as though last run was on:
    - Date: [ ]
    - Time: 00:00:00
- Additional settings:** Commit Work Block Count is set to 1000.

The SAP logo is visible at the bottom center, and the status bar at the bottom right shows 'BD1 (1) 100 | BTI3204 | INS'.

The BDoc Analysis Report can be run in 3 different modes: New Errors, Interim Errors and Old Errors. The former and latter modes are always required if BDocs require analysis. The second mode is entirely optional and depends on Client preferences about whether BDocs in an intermediate state for an extended period of time are to be considered as errors.

Typically the BDoc Analysis Report will be scheduled to run in the background as a periodic batch job (composed of up to 3 steps, one for each mode) with appropriate (system) variants to control the BDoc Types to be analysed.

## IDoc Configuration

An IDoc Configuration generator program (/BTI/MDE\_REP\_IDOCCONFIG) is provided as standard. This report can be executed with the following runtime criteria:

1. IDoc Message Type
2. IDoc Basic Type
3. Segment Type
4. Field Name

When executed the output generated will allow for the selection and maintenance of settings stored in configuration table /BTI/MDE\_C\_IDOC and allow IDoc fields to be related to a Master Data Object.

For example, a Meter Read IDoc might provide via the Manufacturer's Serial Number of the device. To configure this link, enter the desired IDoc type (and optionally segment type) for a list of the fields available. Use the dropdowns provided to select the correct master data object and key type, and press the save button to update the configuration:

SAP							
Exception	Message Type	Description	BasicType	Segment type	Field Name	Description	Key Type
	ISU_MR_UPLOAD	Upload meter reading results	ISU_MR_UPLOAD01	E1BPEABLU	MATERIAL		
	ISU_MR_UPLOAD	Upload meter reading results	ISU_MR_UPLOAD01	E1BPEABLU	SERIALNO	Device	Meter serial number
	ISU_MR_UPLOAD	Upload meter reading results	ISU_MR_UPLOAD01	E1BPEABLU	REGISTER		
	ISU_MR_UPLOAD	Upload meter reading results	ISU_MR_UPLOAD01	E1BPEABLU	MRREASON		
	ISU_MR_UPLOAD	Upload meter reading results	ISU_MR_UPLOAD01	E1BPEABLU	MRIDNUMBER		
	ISU_MR_UPLOAD	Upload meter reading results	ISU_MR_UPLOAD01	E1BPEABLU	READINGRESULT		
	ISU_MR_UPLOAD	Upload meter reading results	ISU_MR_UPLOAD01	E1BPEABLU	METERREADINGNOTE		
	ISU_MR_UPLOAD	Upload meter reading results	ISU_MR_UPLOAD01	E1BPEABLU	ACTUALCUSTOMERMRTYPE		
	ISU_MR_UPLOAD	Upload meter reading results	ISU_MR_UPLOAD01	E1BPEABLU	METERREADER		
	ISU_MR_UPLOAD	Upload meter reading results	ISU_MR_UPLOAD01	E1BPEABLU	MRDATEFORBILLING		
	ISU_MR_UPLOAD	Upload meter reading results	ISU_MR_UPLOAD01	E1BPEABLU	MRTIMEFORBILLING		

These settings influence the behaviour of the IDoc Analysis Report (/BTI/MDE\_REP\_IDOC\_ANALYSE\_MDR) which should be scheduled the appropriate environment(s) and run as frequently as required to maintain the necessary table entries in the Additional Work Requests Table (/BTI/MDE\_ADD\_WR) that are interrogated by the BDEx Transaction.

The screenshot shows the SAP MDE configuration interface for IDoc analysis. The window title is "MDE: Analyse existing and new IDoc work requests". The interface is divided into several sections:

- Technical Settings:** A label to identify this variant is shown as a yellow box.
- Selection Options:** A table with columns for field name, value, and range. The fields are: IDoc number, Message type, IDoc type, Status (value: 51), Creation Date, and Create Time (value: 00:00:00). Each field has a "to" field and a selection icon.
- IDoc Analysis Mode:** Two radio buttons: "Check for new IDoc errors" (selected) and "Check for old IDoc error fixes". A "Minimum age in minutes" field is set to 60.
- Test Settings:** A checkbox for "Test mode" and a checkbox for "Run as though last run was on:". Below these are "Date" and "Time" (value: 00:00:00) fields.
- Additional settings:** A "Commit Work Block Count" field is set to 1000.

The SAP logo is visible at the bottom center, and the status bar at the bottom right shows "BD1 (1) 100", "8TI3204", and "INS".

The IDoc Analysis Report should be run in both modes: New Errors and Old Errors.

Typically the IDoc Analysis Report will be scheduled to run in the background as a periodic batch job composed of at least 2 steps (one for each mode) with appropriate (system) variants to control the IDoc Types to be analysed.

# Profile Management

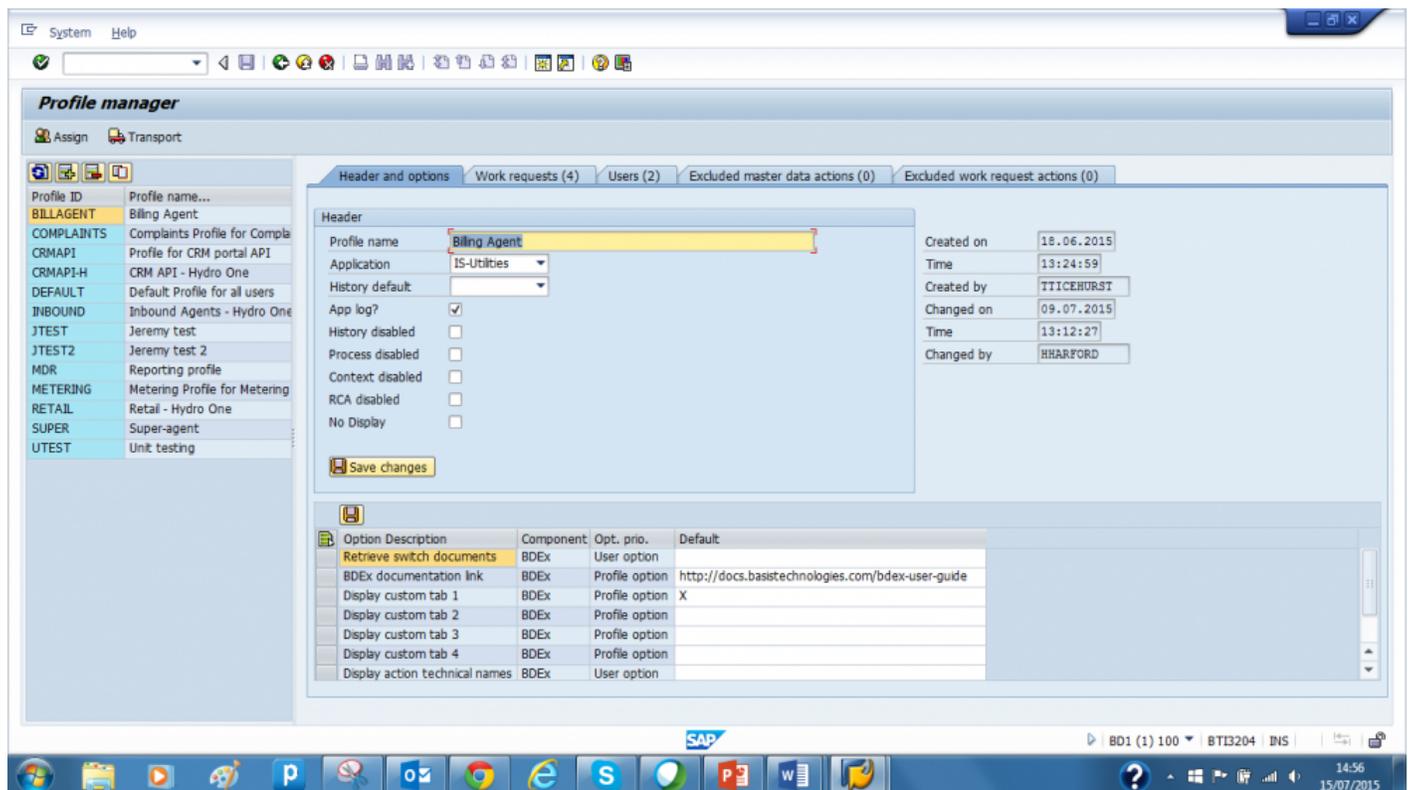
All users who use BDEx can be linked to a “Profile” which controls a number of aspects of the behavior of BDEx including which work request classes are displayed, the actions that are available, and the defaults for certain BDEx options. Managing the list of profiles and their related options is done via the Profile Manager, which is accessed via SPRO or transaction /BTI/MDE\_PROF\_MGR.

The Profile Manager transaction allows an administrator to add, remove and customize profiles as required.

The BDEx profiles provide the ability to define distinct views for different teams or business units. It allows the view in the BDEx Customer Centric Hub to be configured to reflect the different operational needs of the business teams.

## Profile Header

This section defines the profile name and enables customizing of filters and defaults available for the tabs within the Customer Centric Hub.



The screenshot displays the SAP Profile Manager interface. The left sidebar lists various profiles, with 'BILLAGENT' (Billing Agent) selected. The main area shows the 'Header and options' tab for the 'Billing Agent' profile. The profile name is 'Billing Agent', the application is 'IS-Utilities', and the history default is set to 'Default Profile for all users'. The 'App log?' checkbox is checked. The 'Header' section includes fields for 'Created on' (18.06.2015), 'Time' (13:24:59), 'Created by' (TTICEHORST), 'Changed on' (09.07.2015), 'Time' (13:12:27), and 'Changed by' (HHRFORD). Below the header is a table of options:

Option Description	Component	Opt. prio.	Default
Retrieve switch documents	BDEx	User option	
BDEx documentation link	BDEx	Profile option	http://docs.basistechnologies.com/bdex-user-guide
Display custom tab 1	BDEx	Profile option	X
Display custom tab 2	BDEx	Profile option	
Display custom tab 3	BDEx	Profile option	
Display custom tab 4	BDEx	Profile option	
Display action technical names	BDEx	User option	

Tab views:

**Enable Action Logging** – This feature enables all actions and activities carried out by a user to be tracked in the Action Log. This is a useful audit trail to assist with quality control and productivity reporting.

**History disabled** – This feature hides the work request history items. These are all the work requests which have been resolved (if the work request type has been configured to display in the history tab) within the Customer Centric Hub.

**Process disabled** – This feature is the Business Process arrange by option. Within the Work Request tab of the Customer Centric Hub you can sort/filter the items in here by Business Process. If this option is selected this filter will be removed from the CCH.

**Context disabled** – This feature is the Customer Context arrange by option. Similar to the Business Process filters you can also filter/sort by customer context. Again if this option is selected this filter will be removed from the CCH.

**Root cause analysis disabled** – This function enables work requests to be linked together and highlights the interdependencies between the exceptions. This can be disabled within the profile and therefore any users assigned to this profile would not have this option available.

Class	Class text	Link	Status text	Main Date	Est. Time	Unit	Etp
Collection It	Root cause	for submission to collection agencies	Receivable released for submission		7.00	Minute	
Invoice	Interim Billing (02)		Open and due	15.11.2010	0.00		1,6
Invoicing Trigger	Interim Billing (02)		Billing document that is used normally for invoicing	01.12.2010	8.00	Minute	1,2
Invoicing Trigger	Periodic Billing (01)		Billing document that is used normally for invoicing	01.04.2011	8.00	Minute	1,6
Late Bill	Billing Outsort		Overdue	02.04.2011	5.00	Minute	1
BPEM Case	Impausible read - Tolerance lmts (relative)		In Process	27.10.2011	6.00	Minute	1,1
Invoicing Trigger	Interim Billing (02)		Billing document that is used normally for invoicing		8.00	Minute	1
Billing Order	Periodic Billing (01)		Bilable	01.01.2012	6.00	Minute	7
CRM Replication Error	EC70: Create Move-Out for Accelerated Entry		Dependent entry exists	18.06.2012	0.00		1,1
Workitem	Meter Exchange Failure		Reserved	20.06.2012	10.00	Minute	1,1
Workitem	Meter Exchange Failure		Reserved	05.06.2013	10.00	Minute	7
Workitem	Meter Exchange Failure		Reserved		10.00	Minute	7
Billing Order	Periodic Billing (01)		Not bilable	01.10.2014	6.00	Minute	2
Impausible Read	Zero consumption		Automatically Locked		10.00	Minute	2
Billing Outsort	Min. amt receivable		Outsorted	11.02.2015	5.00	Minute	1
BPEM Case	Multiple BQ Required for Price Change Exception WI		In Process	10.03.2015	3.00	Minute	1
Contract Billing Block	Customer complaint		Active	15.07.2015	5.00	Minute	1,6

History view default filter – The default can be set to define the history time period for the work requests which will be displayed in the history tab. The default date periods available are today/week/two weeks/month/two months/year/two years. Usually the recommended default is six months.

#### Options:

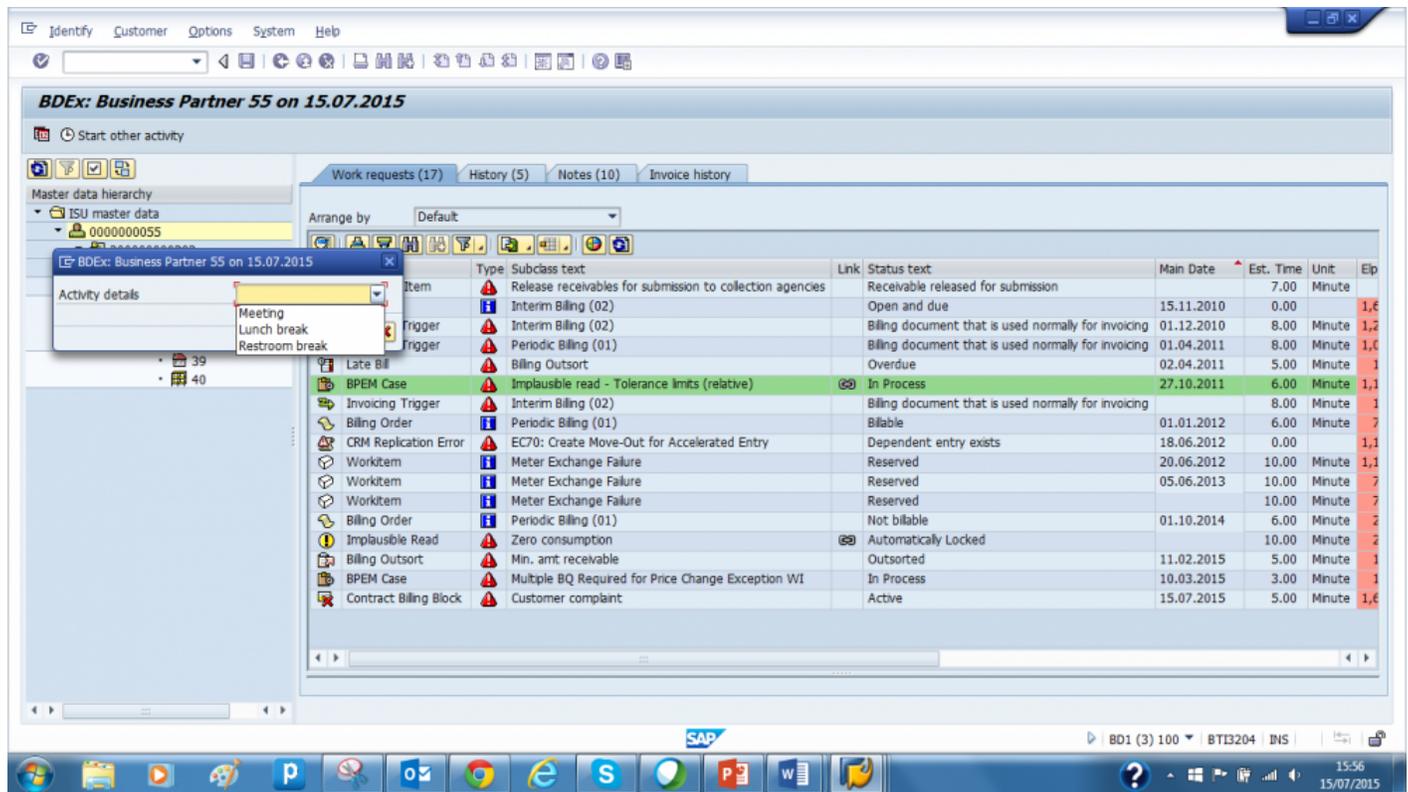
Retrieve switch documents – Switch documents can be deactivated at the profile level, you may wish to deactivate for non metering users.

BDEX Documentation link – Here you can specify a link to the BDEX documentation to enable the users to access the BDEX user guide directly within the CCH.

Display custom tab 1 – This is the Invoice history tab which can be disabled at each profile level by removing the 'X' from this field.

Display action technical names – Within BDEX we have right click actions which can be accessed against each master data object, work request types including historical items and the invoice history items. The right click actions have a description and also a technical name. If the preference is to display the technical name as well as the description this field can be populated to do this for each profile e.g. action name – Display Contract Account, technical name – CAA3.

Enable pause button – Offline activities can be recorded within BDEX to track an agents time when carrying out activities outside of the Customer Centric Hub. For example an agent can record if carrying out an offline activity i.e. 'Meeting' to do this they will select the pause button and pick the activity type from the drop down list. This button can be enabled or switched off using this option.



## Work requests

This tab defines which work requests are retrieved when using this profile, and which ones are retrieved as part of a historical view. Work request subclass and status can also be specified to further tune which requests are visible to profile users.

In most cases, all active work request classes should be added to each profile, so that agents working an account can see all possible issues, even if they are not likely to work them.

An 'Add all' button has been provided to quickly add all active work requests to the profile. This adds each active class, unrestricted by subclass or status. If more granular additions are needed, these need to be done one by one.

## Users

In order to use a profile, a user must be assigned to it. This tab gives the list of assigned users, plus settings for whether or not their actions should be logged, whether they should have their user-level settings locked to the profile defaults, and whether this profile is their default.

## Excluded master data and work request actions

These tabs provide the ability to restrict master data and work request actions by profile. For example, the "Full device removal" might not be desired on a billing agent profile, and can be disabled via this tab.

# Options

---

There are a number of options available for BDEX, such as whether to default to a grid or tree based structure, whether to display inactive contracts, etc. Some options are set at a system-wide level, while others can be set at a profile or user level. The configuration of parameters table contains the master configuration for the options in the system, plus system-wide defaults for more specific options. This means:

- System-level options must be set in this table.
- Profile-level options should be set in the relevant profile (see Profile Management earlier for details). Any entries in this table serve as defaults if the profile isn't configured.
- User should be set by the user from within BDEX. Profile defaults can be set (and optionally locked) in Profile Management. Entries in this table serve as defaults if neither the profile nor the user has specified a value.

The list of options available is provided by Basis Technologies and should not be modified, beyond setting the VALUE field in this table.

# Business Process and Context Configuration

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## Business Process

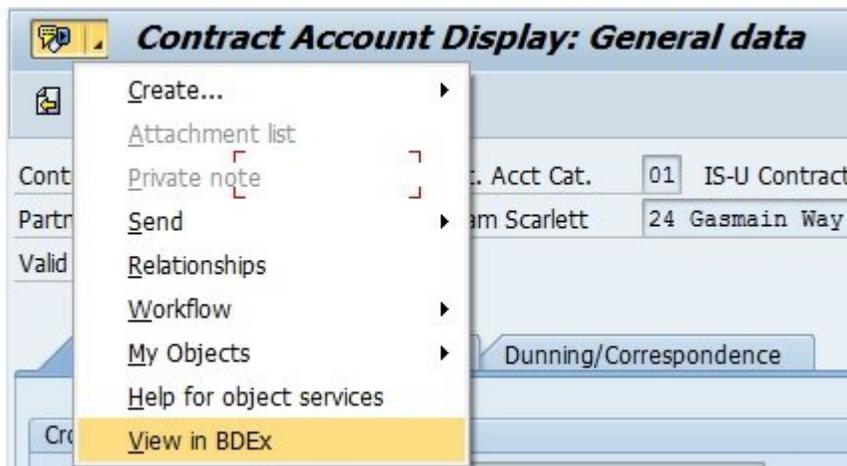
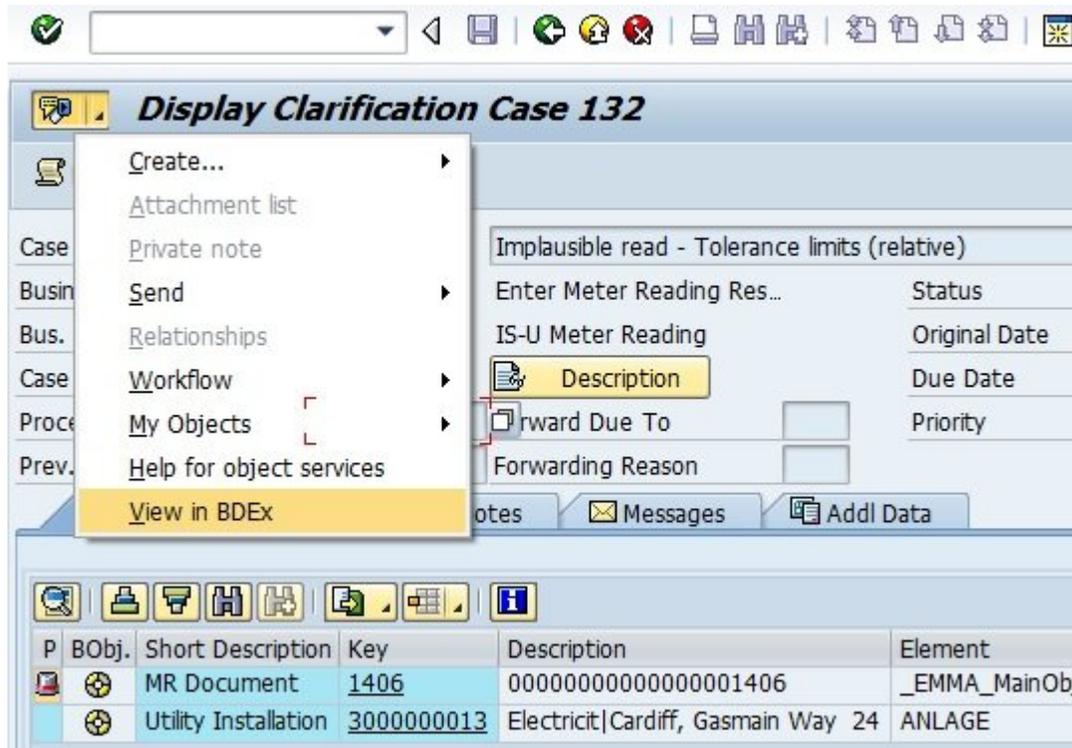
Most work requests can be categorized into business processes along functional lines. For example, a utility company may loosely categorize work as being billing, metering or finance related. This configuration allows these groupings to be reflected within the Business process tab in BDEx.

## Context Management

Business contexts provide a different way of grouping work requests. Whereas business processes are for categorizing work down functional lines, contexts can provide a very different view of the work requests. For example, a business context could be “high bill complaint” or “late billing”, with work requests that may cause these issues assigned accordingly.

# Generic Object Services Configuration

With a minor amount of configuration, it is possible to allow user's access to BDEx from any exception case or master data object via the standard SAP generic objects services (GOS). This means that when a user is within an exception case or displaying a master data object (e.g. a business partner) related transaction; they are then able to launch BDEx from the GOS menu available in the title-bar.



Once selected from the menu path, the user will be taken into the BDEx transaction passing through the context of the case, or master data object they were in.

To make this function available, add the following entry to standard SAP table SGOSATTR:

Name of service	/BTI/MDE
<b>SGOS: Attribute of Generic Services</b>	
Description	View in BDEx
Quick info	View in BDEx
Class f.Gen.Service	/BTI/MDE_CL_GOS
Service Type	Single Service
Icon	ICON_EXECUTE_OBJECT
Next service	
Subservice	
<input type="checkbox"/> Control	
<input type="checkbox"/> Commit required	

Once this is done, a reference to the new service must be added in the “Next service” field of the last item in the existing generic object services menu. This will be an entry with a blank “Next service” field currently, usually ESJI\_GW\_SUB in an unmodified system.

ESJI_GW_SUB	ICON_SUBSCRIPTION	/BTI/MDE	ESJI_FOLLOW	<input type="checkbox"/>
-------------	-------------------	----------	-------------	--------------------------

The generic object services linkage code is largely based on the BOR object bindings to master data and work requests (see the relevant chapters in this guide). If selecting the GOS menu item causes a “Linkage not found” error, this is likely due to missing configuration in these tables.

## Inform When Resolved

---

BDEx is able to send notifications to individuals when issues are resolved. This is also known as the “Inform when resolved” functionality of BDEx. A common use of this functionality is when an agent is unable to work a particular exception (or customer/object) because further information is waiting to be received (for example, a service order/notification is waiting to be completed). The intention is to provide proactive notifications, to avoid agents having to regularly perform manual searches, to find out if issues have been fixed.

Notifications are done via SAP Connect, which must be set up using transaction SCOT.

To receive inform when resolved messages as emails, in the BDEx system configuration, within table /BTI/MDE\_C\_SYST, the USE\_WORKFLOW field should be set to blank. Otherwise BDEx will send the notifications as SAP workflow work items.

### Scheduling the Notifications

Schedule report /BTI/MDE\_REP\_PROCESS\_WR\_WATCH for BDEx to regularly monitor completed items.

This job would normally be scheduled to run on a regular basis, e.g. hourly or daily.

Schedule the notification SAP Connect report RSCONN01 to generate the email alerts.

### Configuring Recipient Email Addresses

Notifications are sent from the “central” system upon which BDEx is running, typically the IS-U ECC system. The recipients email address is taken from the user master record in this system. In order to have these notifications delivered as emails, then the user master record must have an email address maintained. If it does not, then the notification will be sent as a document to the users SAP Business Workplace.

### Maintain Users



User

Changed By   00:00:00 Status

**Address** Logon Data SNC Defaults Parameters Roles Profiles Groups

#### Person

Title  

Last name

First name

Academic Title

Complete name

Language

#### Work Center

Function

Department

Room Number  Floor  Building code

#### Communication

Telephone  Extension  

Mobile Phone  

Fax  Extension  

E-Mail Address  

# Closure Control

---

## Purpose of closure control

Closure Control determines the rules when a BPEM Case can or cannot be closed. When an agent attempts to close the case, the rule will be assessed to determine if the case can be closed.

If the condition has not been met, the case cannot be closed and the user will be prompted with an error message. If the condition has been satisfied, the case will close as expected.

A batch job will be made available for the business to process as per their requirements. This uses the same rules and checks the BPEM cases. Again determining if the condition has not been met, no changes will be made to the cases. If the condition is satisfied, the cases will be mass completed. The results of the job can be viewed in a report providing full visibility of what has been mass closed or untouched.

The rules can be enforced either as a warning or an error. Check with a warning means the the user will receive a pop up message and this can be overridden. However, check with error is a hard stop and will prevent the case from being closed.

For example you may wish to use a check with error if under no circumstances should a case be closed if the condition is not met i.e. if a user is attempting to complete a BPEM case for an implausible reading the rule to be enforced is if an implausible reading has not been reversed or released prevent the closure of the case. However, you may want a user to check if a bill block has been removed. In this instance you can use the check with warning to prompt the user to check for a bill block.

# Configuration

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This topic will demonstrate how to configure a closure control condition and provide an example.

Closure controls can be configured for any rules whereby the rule relates to the objects within the BPEM/EMMA case category and where the object in the case has a one to one relationship with the attributes used for the rules e.g. If a billing outsort BPEM/EMMA case contains multiple billing document objects and the rule checks the status of the billing doc, standard configuration is not suitable for this rule. One BPEM/EMMA case must be created each billing document to enable standard configuration.

However, for unrelated rules or scenarios whereby you have multiple objects of the same type to be checked a BAdI is available to enable these rules to be set up.

Please see the Developers Cookbook for more information on the Closure Control BAdI:

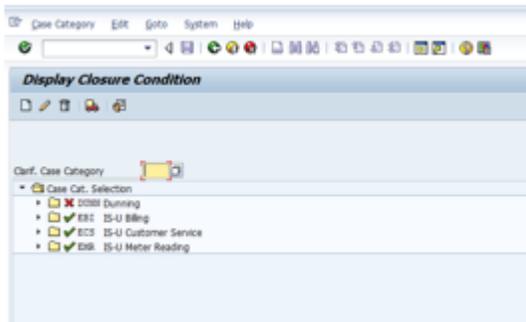
[Developers Cookbook](#)

## Set up

---

Closure control configuration is accessed using transaction /BTI/MDE\_BPEMCOND

This loads the closure condition screen



From this screen the case category to be set up can be selected and you can create a closure condition.

There are three options to be completed in this screen:

### Completion Type:

This is selecting the completion type for the BPEM/EMMA case. The recommended approach would be to use 'Complete' however 'Cancel' is also an option depending upon the business process that is being applied.

### Foreground check type:

#### Check with error

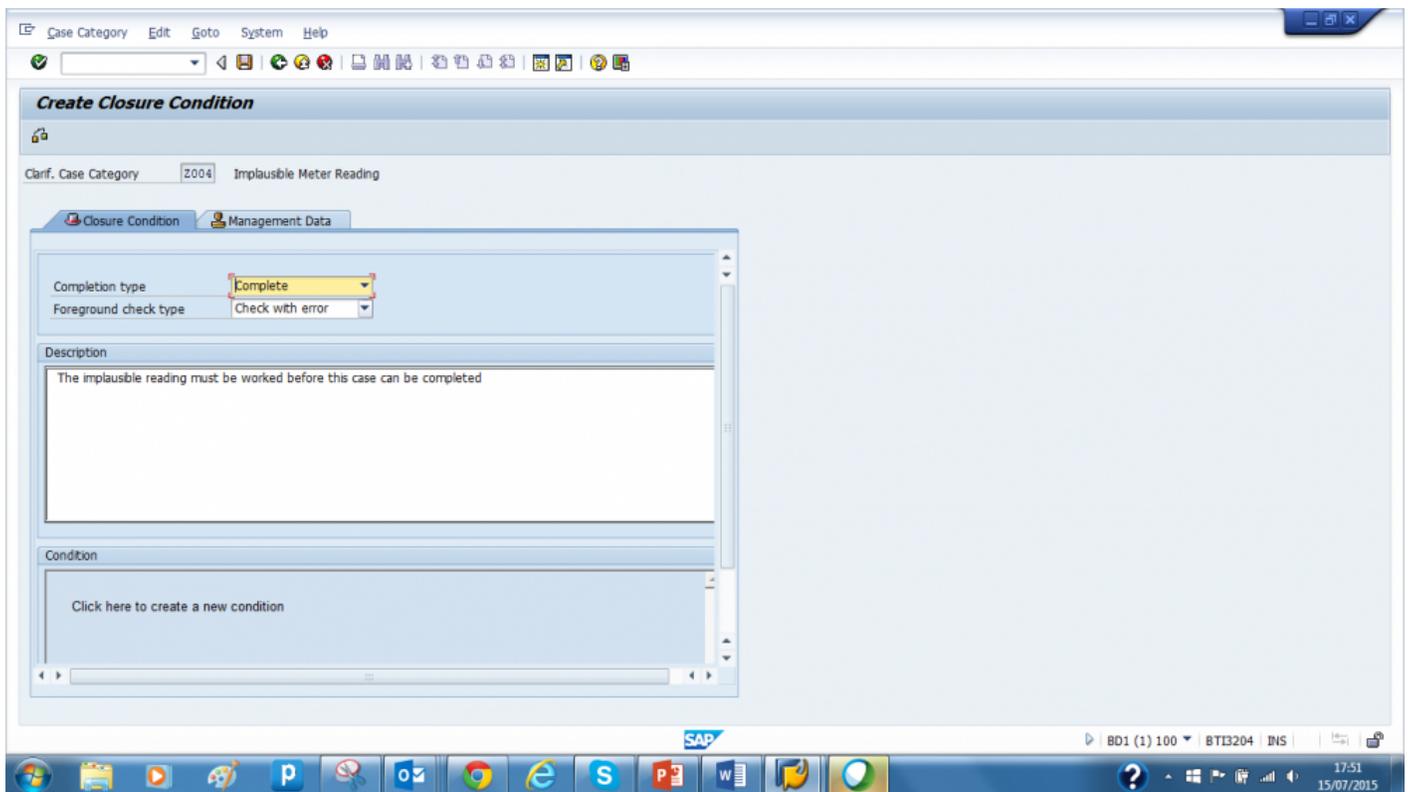
- This is a hard stop and will prevent the case from being closed.

#### Check with warning

- This is a soft option and allows the user to complete the case but provides a prompt in the form of a pop-up box to ensure certain processes have been followed e.g. have you removed all billing blocks could be a message to be displayed though the case is unrelated to this. Therefore, you do not want a hard stop but a reminder message instead.

Description – In this field the message to be displayed to the user if they have attempted to complete a BPEM case without fulfilling the rule.

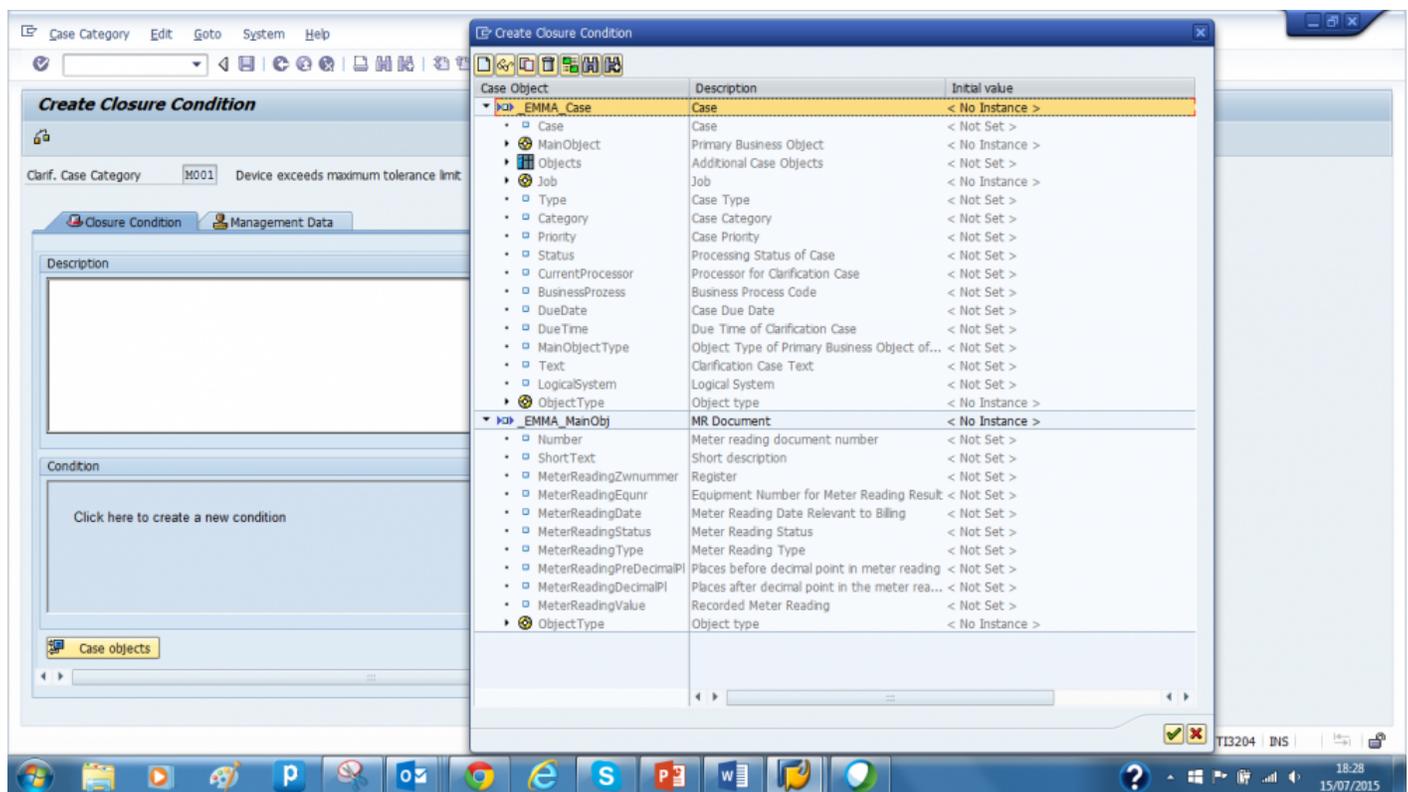
This is a free text box and the message should explain to the user why they cannot complete the BPEM case.



## Case Objects

Case objects are usually master data or work request keys assigned to the BPEM/EMMA case to provide a data reference for the case. The Business Object Repository (BOR) is the object-oriented repository in the R/3 System. It contains the SAP business object types and SAP interface types as well as their components, such as methods, attributes and events. BOR types are added to the case container within the BPEM/EMMA configurations to reference the key and pull through attributes for the case.

Case objects are used in closure control to define the conditions. The conditions will use the attributes from the object to enable the rules to be set up.



The editor allows new attributes to be added to the case container for the purposes of closure control. For example if you are configuring closure control for an implausible reading you may need to add a rule to check the meter reading is active. In the standard BOR MR Document the meter reading active field is not an attribute on this object. However, using the condition editor you can add this field from the table as an attribute to enable rules to be defined for this.

Any new attributes added must have the binding added to ensure the attribute is linked to the case object.

The screenshot displays a software interface for configuring case objects. The main window is titled "Change Binding Case Objects -> mr\_active Keys". It features two primary tables:

Case Objects	Description
System Fields	
Container	
EMMA_Case	Case
EMMA_MainObj	MR Document
mr_active	Meter reading active

mr_active Keys	P	Description
MANDT		Client
ABLBELNR		Internal MR Doc. ID

Below these tables is a toolbar with various icons. At the bottom, a "Data Flow Case Objects -> mr\_active Keys" section shows a mapping:

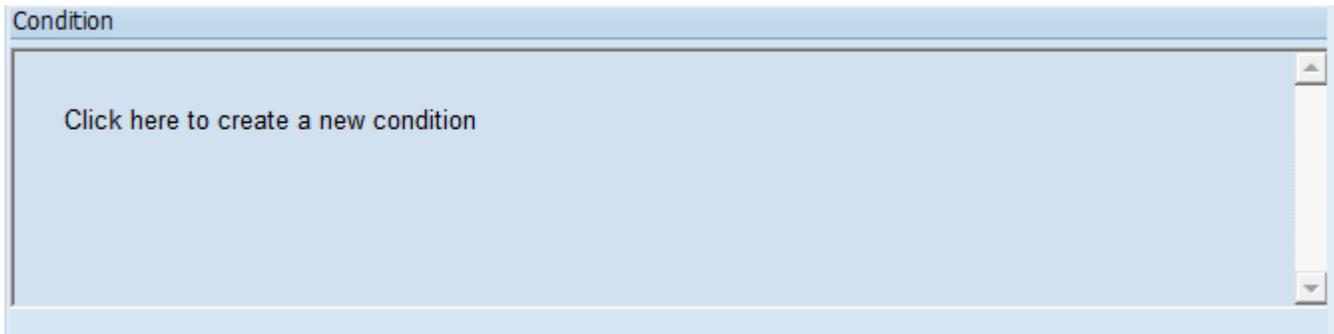
Case Objects	mr_active Keys
&MR_ACTIVE&	&ABLBELNR&

Once the attributes have been linked to the case objects the rules can now be configured.

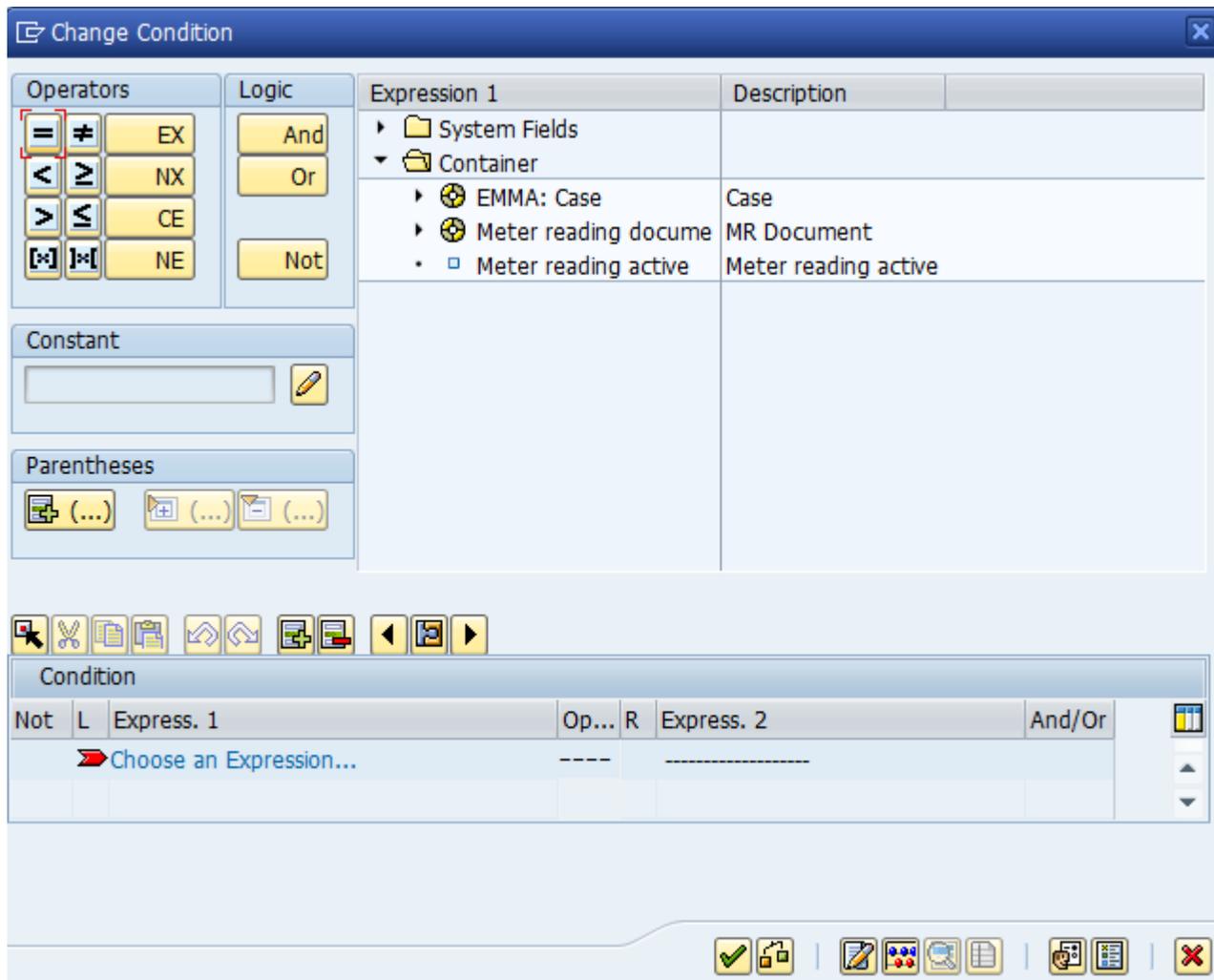
## Condition Rules

---

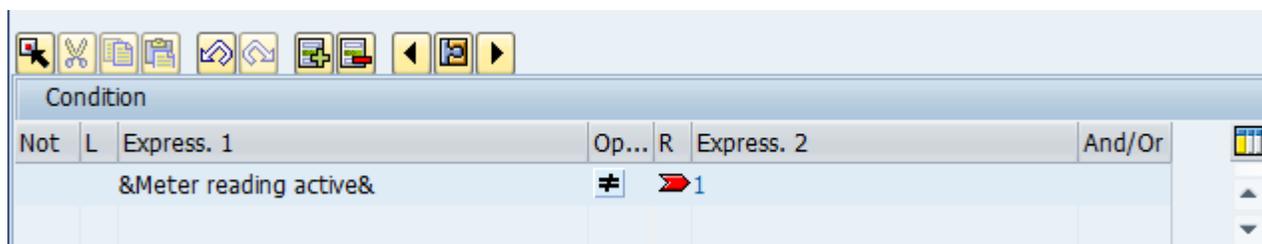
Clicking the link in the Condition box launches the rule editor to enable the conditions to be configured.



The change condition screen allows the closure control expressions to be set up which is the pivotal part of configuring the rules.



The container attribute should be added to the expression and the operators to manage the rule i.e. Meter reading active – NE (not equal) 1



This rule is saying for this BPEM/EMMA case type if the meter reading document has an active reading the case cannot be closed. If the case is inactive then it can be closed.

Multiple rules can be defined in here and there is a test function to enable you to ensure the rules are correct which is explained in the next topic.

## Testing the conditions

---

In the condition editor there is a test function to ensure the rule is defined correctly and is working as design.



Firstly test data can be added by selecting:



Once the test data has been added the rule can be checked by selecting:



If the result returned is 'True' this means the case would be completed and the rule has been met.

If the result has returned 'False' the case cannot be completed and the rule has not been met.

## Example

---

### Example Closure Condition

Exception Type:

BPEM/EMMA Case Category: XXXX

Case description: Contract is blocked from billing

Error closure condition type will be applied will the following rule(s):

Closure condition is false and the case cannot be closed if:

- A bill block exists on the contract associated to the XXXX BPEM case.

Closure condition is true and the case can be closed if:

- There is no bill block type on the contract associated to the XXXX BPEM case.

### Configuration Details

BPEM Case Category: XXXX

BPEM Case Object: Meter Reading Document

Attribute required Active field from EABL table

Table Name: EABL

Field: AKTIV

Completion Type: Complete

Foreground Check Type: Check with Error

Message to be displayed if condition is false and the case cannot be closed:

This implausible read must be released, reversed, or marked as inactive.

# Background Processing

---

Technical\_settings\_guide control rules can also be ran in the background to check the BPEM/EMMA cases are still valid and even re-open any cases which may have been completed in error prior to the condition being applied.

Program name: /BTI/MDE\_BPEM\_CLOSURE\_MDR

This program is designed within our Node 5 framework and the technical settings need to be defined.

You can find the instructions on setting up the technical settings here:

[Technical settings guide](#)

This program can be executed on-line or in the batch run.

Once the program has been executed the selection screen as follows will be displayed:

Program Edit Goto System Help

MDR:Process Pack for Automatic Closure of BPEM Cases

Technical Settings

Main Selection

Case Number  to

Additional selections

Case Type	<input type="text"/>	to	<input type="text"/>	<input type="button" value="↔"/>
Status	<input type="text"/>	to	<input type="text"/>	<input type="button" value="↔"/>
Case Category	<input type="text"/>	to	<input type="text"/>	<input type="button" value="↔"/>
Main Object Type	<input type="text"/>	to	<input type="text"/>	<input type="button" value="↔"/>
Main Object Key	<input type="text"/>	to	<input type="text"/>	<input type="button" value="↔"/>
Case Text	<input type="text"/>	to	<input type="text"/>	<input type="button" value="↔"/>

Audit selections

Creation Date	<input type="text"/>	to	<input type="text"/>	<input type="button" value="↔"/>
Creation Time	<input type="text" value="00:00:00"/>	to	<input type="text" value="00:00:00"/>	<input type="button" value="↔"/>
Creation User	<input type="text"/>	to	<input type="text"/>	<input type="button" value="↔"/>
Last Change Date	<input type="text"/>	to	<input type="text"/>	<input type="button" value="↔"/>
Last Change Time	<input type="text" value="00:00:00"/>	to	<input type="text" value="00:00:00"/>	<input type="button" value="↔"/>
Last Changed By User	<input type="text"/>	to	<input type="text"/>	<input type="button" value="↔"/>

Case Closure conditions

Complete BPEM Cases  
 Cancel BPEM Cases

Cancellation Reason

Cancellation/Completion User

Advanced Options

Test mode

Options available:

Case Category – Specific category types can be entered here if the program should only be run for certain case categories. If this field is left blank all categories that have been configured will be checked.

Completion date – The completion date of the BPEM/EMMA cases can be entered to restrict the data to be checked and only run the rules against cases completed on a particular date or date range.

Check box options:

Complete cases – If this is selected any cases checked whereby the rules are met will be mass completed

by the program.

Reopen cases – If this is selected any cases that have been completed already however the rules are not met will be re-opened.

Confirm completed cases – Cases in status completed will be set to confirmed (this enables the status changes to be completed in bulk).

Test mode – If this option is selected the cases will be checked however no changes will be applied in the system.

## Displaying the Output

The results are displayed in a report.

Program name: /BTI/MDE\_BPEM\_CLOSURE\_TRANS

There are two options available to sort the results

***BPEM closure transformation***



Output style

Result summary

Detail view

Result Summary – This provides an aggregated view by case category of the total volume unchanged (these cases have been determined to be valid and still required to be worked), reopened, completed, confirmed, errors, invalid, total.

***BPEM closure transformation***



Case Cat.	Unchanged	Reopened	Completed	Confirmed	Errors	Invalid	Total
BI02 	8	0	1	0	0	0	9
Z005	3	0	1	0	0	0	4
Z006	35	3	8	0	0	0	46
M001	1	0	1	0	0	1	2
Z007	7	0	0	0	0	0	7
BI01	4	0	25	0	0	0	29
BQR1	1	0	0	0	0	0	1

Detail view – This provides the full list of BPEM cases with their case numbers.

<b><i>BPEM closure transformation</i></b>		
Case	Case Cat.	Result
31	BI02	Unchanged
33	BI02	Unchanged
34	BI02	Unchanged
25	Z005	Unchanged
26	Z005	Unchanged
32	Z005	Unchanged
102	BI02	Unchanged
122	BI02	Unchanged
132	Z006	Unchanged
154	Z006	Unchanged
155	Z006	Unchanged
173	BI02	Unchanged
157	M001	Unchanged
161	Z006	Unchanged
180	Z006	Unchanged
204	Z006	Unchanged
205	Z006	Unchanged
212	Z007	Unchanged

# The Dynamic Work Center

---

In a SAP Utilities environment back office work can come from many different sources, like work items, BPEM cases and front office activities.

With limited time and resources it's important to prioritize these efficiently, this can prove to be difficult using spreadsheets or searching case lists manually.

Work is prioritized based on pre-determined rules, and then allocated to the correct agent's single inbox automatically without requiring lots of manual steps.

The Dynamic Work Center streamlines the process of allocating back office work in an SAP Utilities environment, enabling greater efficiency, reducing cherry picking of work and enabling back office managers to gain complete visibility and control of their teams' workload.

Activating a work request in Dynamic Work Center requires the relevant SAP code to be enhanced, enabling the DWC architecture to be updated in line with the underlying data. This document contains instructions and sample code for each supported work request to be enabled if required.

All of the complex logic resides within the /BTI/MDE\_CL\_BWC\_DB class; the enhancements need merely call the relevant methods and passing all available parameters. All work retrieval and routing is performed using the standard SAP PFAC infrastructure and the SAP Organisational Structure, so these must be fully configured for all work types that require specific routing.

## Configuration settings:

There are two BDEx Profile Option settings (/BTI/MDE\_C\_OPT) that are relevant to the DWC that are **not** maintainable using the BDEx Profile Manager (Transaction /BTI/MDE\_PROF\_MGR) and so must be maintained at the Configuration level (either via the IMG or using Transaction SM30):

- Option 10 – Max results when searching => defaulted to 50
- Option 11 – Get work button size limit => defaulted to 5

# Housekeeping

---

Additional Work Requests (Database Table /BTI/MDE\_ADD\_WR)

IDocs

Configuration settings: /BTI/MDE\_C\_IDOC

Report: /BTI/MDE\_REP\_IDOC\_ANALYSE\_MDR

Schedule the Report as frequently as desired to identify IDocs as Work Requests for BDEx consideration according to the Configuration settings defined.

Note that the report must be executed in both modes (New and Old) by means of separate runtime variants. This can be achieved as consecutive steps in the same batch job to simply scheduling.

BDocs (CRM Installations only)

Configuration settings: /BTI/MDE\_C\_BDOC

Report /BTI/MDE\_REP\_BDOC\_ANALYSE\_MDR

Schedule the Report as frequently as desired to identify BDocs as Work Requests for BDEx consideration according to the Configuration settings defined.

Note that the report must be executed in all 3 modes (New, Intermediate and Old) by means of separate runtime variants. This can be achieved as consecutive steps in the same batch job to simply scheduling.

## Archiving

The following Archiving Objects are provided as standard:

Dynamic Work Center: **/BTI/MDEBW** => Database Tables /BTI/MDE\_BWC\_HDR, /BTI/MDE\_BWC\_ASN and /BTI/MDE\_BWC\_FWD.

BDEx Action Log: **/BTI/MDELG** => Database Table /BTI/MDE\_ACTLOG

BDEx Additional Work Requests: **/BTI/MDEAD** => Database Table /BTI/MDE\_ADD\_WR

As with all Archiving Objects these can be managed using SAP Transaction SARA, with following actions supported:

- > Write – Allows for Archive File creation using Variant settings
- > Delete – Executes DB Table deletion according to Archive File content
- > Read – Displays Archive File content
- > Management – Allows for Administration of Archive Files

How these Archiving Objects are used will depend entirely on the growth rate of the underlying Database Tables and the data retention requirements for the individual client implementation.

For the Dynamic Work Center DB Tables an additional consideration will be the data retention of the Parent work request object, e.g. the BPEM Case itself.

For the Additional Work Requests a similar consideration will be the data retention of the Parent work request object, e.g. the BDoc or the IDoc.

# BDEx Connect – OData Service (SAP Gateway)

---

Inspired by the SAP 'Multichannel' Foundation for Utilities and Public Sector, BDEx Connect exposes the functionality of our Customer-Centric Hub as an OData Service.

This means that regardless of technology, platform or application, BDEx Connect provides answers to questions about Customers (or Technical Locations) using the universally-accepted and browser-friendly language of HTTP without the need for complex interfaces, file formats or even operational scheduling.

With BDEx Connect, common questions such as:

**Q.** 'What open work needs to be resolved for this Customer?'

become simple HTTP requests instead:

**Q.** *GET: BusinessPartnerSet('[BP Number']/ToWorkRequests?*

BDEx Connect possesses an Entity Model replete with technical objects designed to expose the capabilities of BDEx functionality as well as more Business-oriented objects that encapsulate common functions and services normally expected of SAP Utilities implementations.

In this way we provide access to features such as full Master Data Context building from a single Master Data Object reference, whilst at the same time being able to answer specific Business questions, such as 'What the was the value of the last Bill we sent to the Customer?'

Similarly, we can provide a set of Customer-related Note texts from a range of sources from deep within the entire SAP Estate (e.g. SAP IS-U and SAP CRM) and at the same time answer the simple question 'What's the current Balance of the Customer's Account?'

How this OData Service is exposed in the Client's System Landscape is also entirely flexible, thus allowing for various degrees of data security to be met without compromise.

SAP Gateway provides an open, REST-based interface that implements simple access to SAP systems via the Open Data Protocol (OData) released under the Microsoft Open Specification Promise (OSP) for querying and updating data.

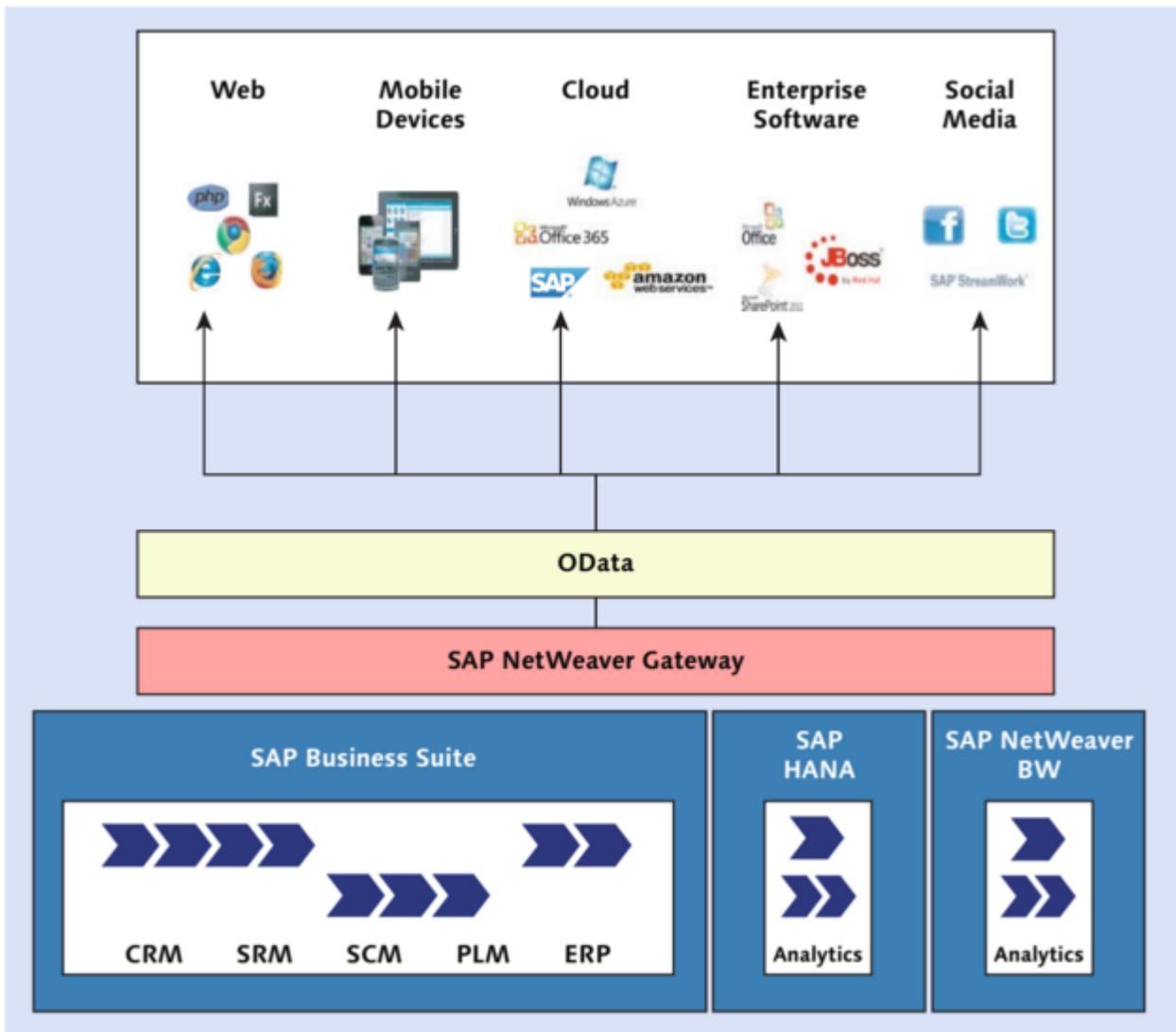
OData builds on broadly known and used industry standards such as Atom Publishing Protocol (AtomPub), XML, and JSON (JavaScript Object Notation), which makes it easier to understand and use.

It's consistent with the way the web works and follows its core principles, allowing for a new level of data integration and interoperability across traditional platform and manufacturer boundaries.

It's easy to understand and extensible, and provides consumers with a predictable interface for accessing a variety of data sources.

In short, OData can be seen as Online Database Connectivity (ODBC) for the web. It opens up the silos of traditional IT and increases the value of data by allowing for easier and broader data access.

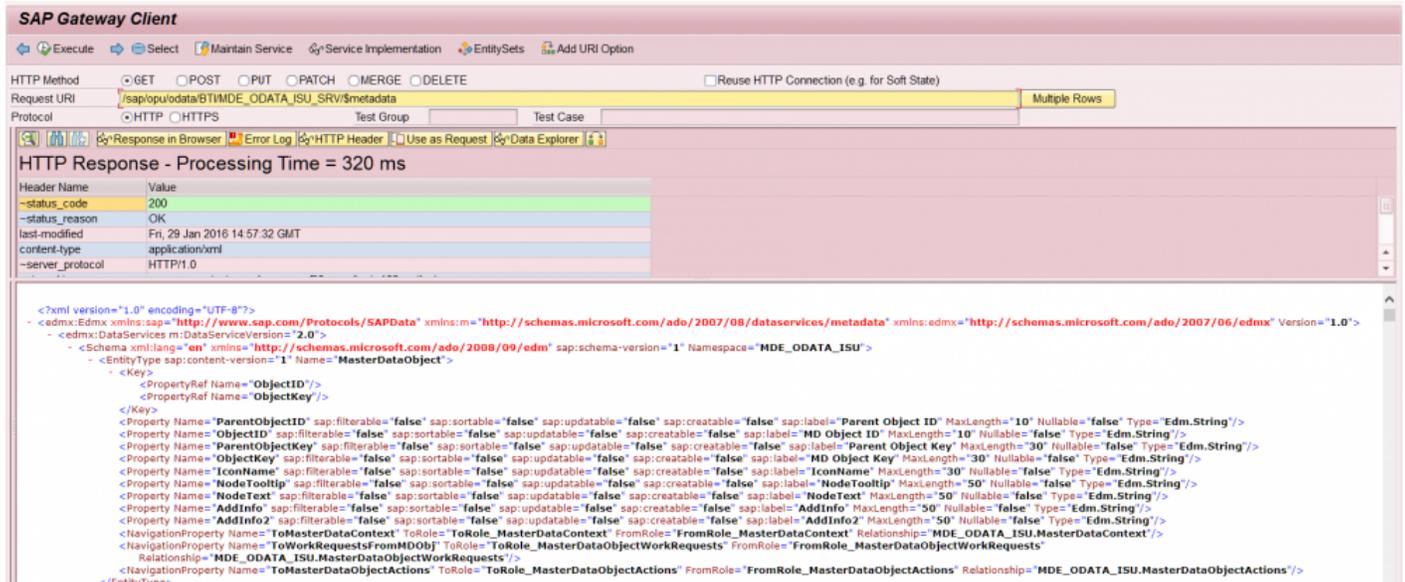
The diagram below shows how SAP Gateway can act as a single solution that replaces all other point-to-point solutions:



# Metadata

When SAP Gateway is active the Metadata for the BDEX Connect OData Service can be found via Transaction SEGW in the back-end system using the following simple HTTP Request:

```
/sap/opu/odata/BT/MDE_ODATA_ISU_SRV/$metadata
```



**SAP Gateway Client**

HTTP Method: GET POST PUT PATCH MERGE DELETE  Reuse HTTP Connection (e.g. for Soft State)

Request URI: /sap/opu/odata/BT/MDE\_ODATA\_ISU\_SRV/\$metadata Multiple Rows

Protocol: HTTP HTTPS Test Group Test Case

HTTP Response - Processing Time = 320 ms

Header Name	Value
-status_code	200
-status_reason	OK
last-modified	Fri, 29 Jan 2016 14:57:32 GMT
content-type	application/xml
-server_protocol	HTTP/1.0

```
<?xml version="1.0" encoding="UTF-8"?>
- <edmx:Edmx xmlns:sap="http://www.sap.com/Protocols/SAPData" xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata" xmlns:edm="http://schemas.microsoft.com/ado/2007/06/edm" Version="1.0">
  - <edmx:DataService m:DataServiceVersion="2.0">
    - <Schema xmlns:lang="en" xmlns="http://schemas.microsoft.com/ado/2008/09/edm" sap:schema-version="1" Namespace="MDE_ODATA_ISU">
      - <EntityType sap:content-version="1" Name="MasterDataObject">
        - <Key>
          - <PropertyRef Name="ObjectID"/>
          - <PropertyRef Name="ObjectKey"/>
        - </Key>
        - <Property Name="ParentObjectID" sap:filterable="false" sap:sortable="false" sap:updatable="false" sap:creatable="false" sap:label="Parent Object ID" MaxLength="10" Nullable="false" Type="Edm.String"/>
        - <Property Name="ObjectID" sap:filterable="false" sap:sortable="false" sap:updatable="false" sap:creatable="false" sap:label="MD Object ID" MaxLength="10" Nullable="false" Type="Edm.String"/>
        - <Property Name="ParentObjectKey" sap:filterable="false" sap:sortable="false" sap:updatable="false" sap:creatable="false" sap:label="Parent Object Key" MaxLength="30" Nullable="false" Type="Edm.String"/>
        - <Property Name="ObjectKey" sap:filterable="false" sap:sortable="false" sap:updatable="false" sap:creatable="false" sap:label="MD Object Key" MaxLength="30" Nullable="false" Type="Edm.String"/>
        - <Property Name="IconName" sap:filterable="false" sap:sortable="false" sap:updatable="false" sap:creatable="false" sap:label="IconName" MaxLength="30" Nullable="false" Type="Edm.String"/>
        - <Property Name="NodeTooltip" sap:filterable="false" sap:sortable="false" sap:updatable="false" sap:creatable="false" sap:label="NodeTooltip" MaxLength="50" Nullable="false" Type="Edm.String"/>
        - <Property Name="NodeText" sap:filterable="false" sap:sortable="false" sap:updatable="false" sap:creatable="false" sap:label="NodeText" MaxLength="50" Nullable="false" Type="Edm.String"/>
        - <Property Name="AddInfo" sap:filterable="false" sap:sortable="false" sap:updatable="false" sap:creatable="false" sap:label="AddInfo" MaxLength="30" Nullable="false" Type="Edm.String"/>
        - <Property Name="AddInfo2" sap:filterable="false" sap:sortable="false" sap:updatable="false" sap:creatable="false" sap:label="AddInfo2" MaxLength="50" Nullable="false" Type="Edm.String"/>
        - <NavigationProperty Name="ToMasterDataContext" ToRole="ToRole_MasterDataContext" FromRole="FromRole_MasterDataContext" Relationship="MDE_ODATA_ISU.MasterDataContext"/>
        - <NavigationProperty Name="ToWorkRequestsFromMDOBJ" ToRole="ToRole_MasterDataObjectWorkRequests" FromRole="FromRole_MasterDataObjectWorkRequests" Relationship="MDE_ODATA_ISU.MasterDataObjectWorkRequests"/>
        - <NavigationProperty Name="ToMasterDataObjectActions" ToRole="ToRole_MasterDataObjectActions" FromRole="FromRole_MasterDataObjectActions" Relationship="MDE_ODATA_ISU.MasterDataObjectActions"/>
      - </EntityType>
    - </Schema>
  - </DataService>
- </Edmx>
```

## Entity Types

---

The following Entity Types are supported within BDEx Connect:

- **Address** (Abstract) – Cannot be queried or read directly. See BusinessPartner, ContractAccount and ConnectionObject below.  
=> Properties:
  - *AddressNumber (key)*
  - *AddressUniqueID*
  - *AddressGroup*
  - *PersonalAddress*
  - *StandardAddress (filterable)*
  - *Alternative*
  - *DateFrom*
  - *DateTo*
  - *Nation*
  - *Title*
  - *Name1*
  - *Name2*
  - *Name3*
  - *Name4*
  - *NameText*
  - *NameCareOf*
  - *Location*
  - *Building*
  - *Floor*
  - *RoomNumber*
  - *HouseNumber1*
  - *HouseNumber2*
  - *HouseNumber3*
  - *Street1*
  - *Street2*
  - *Street3*
  - *Street4*
  - *City1*
  - *City2*
  - *Region*

- *PostCode1*
  - *PostCode2*
  - *PostCode3*
  - *PoBox*
  - *Country*
  - *SearchTerm1*
  - *SearchTerm2*
  - *MDOBJECTID*
  - *MDOBJECTKEY*
- **Balance** (Abstract) – Cannot be queried or read directly. See ContractAccount below.  
=> Properties:
    - *ContractAccount* (key)
    - *Partner*
    - *Details:*
      - *Description*
      - *Amount*
      - *Currency*
  - **BillingDocument** – Can be queried or read directly using Billing Document numbers (BELNR):  
=> Properties:
    - *DocumentNumber* (key)
    - *InvoiceNumber*
    - *Division*
    - *Partner*
    - *ContractAccount*
    - *Contract*
    - *BillingPeriodStart*
    - *BillingPeriodEnd*
    - *CreatedOn*
    - *Estimated*

.

 => Navigation Properties:
    - '/ToEstimatedReadsFromBillDoc' => Fetches the Estimated Meter Reads (note that property 'Estimated' will indicate whether this is likely to be successful).
  - **BudgetBillingPlan** – Can be partially queried with either a Business Partner (PARTNER), a Contract Account (VKONT) or a Contract (VERTRAG) key or read directly using Budget Billing Plan Document numbers (OPBEL). Note: only 'Active' Plans are considered.

=> Properties:

- *DocumentNumber (key)*
- *NextDueDate*
- *ContractAccount*
- *BusinessPartner*
- *Contract*
- *StartBBPeriod*
- *EndBBPeriod*
- *Status*
- *Amount*
- *OpenAmount*
- *Currency*

- **BusinessPartner** – Can be queried or read directly using Business Partner keys (PARTNER):

=> Properties:

- *PartnerNumber (key)*
- *Category*
- *Type*
- *Group*
- *ExternalNumber*
- *AuthorizationGroup*
- *Title*
- *Salutation*
- *LastName*
- *FirstName*
- *OtherLastName*
- *BirthName*
- *MiddleName*
- *GenderMale*
- *GenderFemale*
- *GenderUnknown*
- *CreatedOn*
- *ChangedOn*
- *PartnerGuid*
- *AddressNumber*

.

=> Navigation Properties:

'/ToActiveBBPFromBP' => Fetches all active Budget Billing Plans for the Business Partner;

'/ToAddressesFromBP' => Fetches all Correspondence Address details for the Business Partner;

'/ToBusinessPartnerActions' => Fetches all of the *background* BDEX Master Data Actions for the Business Partner. Note: The Actions returned can be managed using BDEX Profile 'ODATA';

'/ToCommDetailsFromBP' => Fetches the Communication details for the Business Partner;

'/ToLastInvoiceFromBP' => Fetches the most recent *printed* Invoice (Print Document) for the Business Partner;

'/ToMasterDataObject' => Returns the Master Data Object details according to BDEX;

'/ToWorkRequests' => Fetches the open Work Requests by executing BDEX (Master Data Context will be derived at runtime). Note: The Work Requests returned can be managed using BDEX Profile 'ODATA'.

- **CommunicationDetails** – (Abstract) – Cannot be queried or read directly. See BusinessPartner above.

=> Properties:

- *BusinessPartner (key)*
- *CommunicationType (key, filterable)*
- *SequenceNumber (key)*
- *Country*
- *CountryISO*
- *StandardIndicator (filterable)*
- *HomeFlag*
- *TelephoneNumber*
- *TelephoneExtension*
- *TelephoneCombined*
- *CallerNumber*
- *FaxNumber*
- *FaxExtension*
- *FaxCombined*
- *SenderNumber*
- *FaxGroup*
- *EmailAddress*

- **ConnectionObject** – Can be queried or read directly using a Connection Object key (HAUS):

=> Properties:

- *ConnectionObjectNumber (key)*
- *CRMGuid*

.

=> Navigation Properties:

'/ToAddressFromCO' => Fetches the Address details for the Connection Object;

'/ToConnectionObjectActions' => Fetches all of the *background* BDEX Master Data Actions for the

Connection Object. Note: The Actions returned can be managed using BDEX Profile 'ODATA';  
 '/ToMasterDataObjectFromCO' => Returns the Master Data Object details according to BDEX.  
 '/ToWorkRequestsFromCO' => Fetches the open Work Requests by executing BDEX (Master Data Context will be derived at runtime). Note: The Work Requests returned can be managed using BDEX Profile 'ODATA'.

- **Contract** – Can be queried or read directly using a Contract key (VERTRAG):  
 => Properties:
  - *ContractNumber (key)*
  - *CompanyCode*
  - *Division*
  - *JointInvoicing*
  - *BillBlockReason*
  - *BillBlockRelease*
  - *CreatedOn*
  - *AuthorizationGroup*
  - *Installation*
  - *ContractAccount*
  - *MoveInDate*
  - *MoveOutDate*
  - .
 => Navigation Properties:
  - '/ToActiveBBPFromC' => Fetches all active Budget Billing Plans for the Contract;
  - '/ToContractActions' => Fetches all of the *background* BDEX Master Data Actions for the Contract.  
 Note: The Actions returned can be managed using BDEX Profile 'ODATA';
  - '/ToMasterDataObjectFromC' => Returns the Master Data Object details according to BDEX.
  - '/ToWorkRequestsFromC' => Fetches the open Work Requests by executing BDEX (Master Data Context will be derived at runtime). Note: The Work Requests returned can be managed using BDEX Profile 'ODATA'.
  
- **ContractAccount** – Can be queried or read directly using a Contract Account key (VKONT):  
 => Properties:
  - *AccountNumber (key)*
  - *JointInvoicing*
  - *Application*
  - *BudgetBillingPlan*
  - *Category*
  - *Partner*
  - *LegacyNumber*

- *AuthorizationGroup*
- *Name*
- *Currency*
- *Class*
- *BillForm*
- *Language*
- *IncPayMethod*

.

=> Navigation Properties:

'/ToActiveBBPFromCA' => Fetches all active Budget Billing Plans for the Contract Account;

'/ToAddressesFromCA' => Fetches all Correspondence Address details for the Contract Account;

'/ToBalancesFromCA' => Fetches all Contract Account Balances;

'/ToContractAccountActions' => Fetches all of the *background* BDEX Master Data Actions for the Contract Account. Note: The Actions returned can be managed using BDEX Profile 'ODATA';

'/ToLastInvoiceFromCA' => Fetches the most recent *printed* Invoice (Print Document) for the Contract Account;

'/ToMasterDataObjectFromCA' => Returns the Master Data Object details according to BDEX;

'/ToOpenBalanceFromCA' => Fetches only the Open Balance for the Contract Account;

'/ToWorkRequestsFromCA' => Fetches the open Work Requests by executing BDEX (Master Data Context will be derived at runtime). Note: The Work Requests returned can be managed using BDEX Profile 'ODATA'.

- **Device** – Can be queried or read directly using an Equipment number (EQUNR only):

=> Properties:

- *EquipmentNumber (key)*

- *Division*

- *AuthorizationGroup*

- *CreatedOn*

- *ManufacturerSerialNumber*

- *MaterialNumber*

- *SerialNumber*

.

=> Navigation Properties:

'/ToDeviceActions' => Fetches all of the *background* BDEX Master Data Actions for the Device. Note: The Actions returned can be managed using BDEX Profile 'ODATA';

'/ToMasterDataObjectFromD' => Returns the Master Data Object details according to BDEX;

'/ToWorkRequestsFromD' => Fetches the open Work Requests by executing BDEX (Master Data Context will be derived at runtime). Note: The Work Requests returned can be managed using BDEX Profile 'ODATA'.

- **DeviceLocation** – Can be queried or read directly using key (TPLNR):
  - => Properties:
    - *FunctionalLocationNumber (key)*
    - *StructureIndicator*
    - *Category*
    - *CreatedOn*
    - *AuthorizationGroup*
    - .
  - => Navigation Properties:
    - '**/ToDeviceLocationActions**' => Fetches all of the *background* BDEx Master Data Actions for the Device Location. Note: The Actions returned can be managed using BDEx Profile 'ODATA';
    - '**/ToMasterDataObjectFromDL**' => Returns the Master Data Object details according to BDEx;
    - '**/ToWorkRequestsFromDL**' => Fetches the open Work Requests by executing BDEx (Master Data Context will be derived at runtime). Note: The Work Requests returned can be managed using BDEx Profile 'ODATA'.
- **Installation** – Can be queried or read directly using Installation key (ANLAGE):
  - => Properties:
    - *InstallationNumber (key)*
    - *Division*
    - *Premises*
    - *MeterReadBlockRsn*
    - *Type*
    - *CreatedOn*
    - *AuthorizationGroup*
    - .
  - => Navigation Properties:
    - '**/ToInstallationActions**' => Fetches all of the *background* BDEx Master Data Actions for the Installation. Note: The Actions returned can be managed using BDEx Profile 'ODATA';
    - '**/ToMasterDataObjectFromI**' => Returns the Master Data Object details according to BDEx;
    - '**/ToWorkRequestsFromI**' => Fetches the open Work Requests by executing BDEx (Master Data Context will be derived at runtime). Note: The Work Requests returned can be managed using BDEx Profile 'ODATA'.
- **Invoice** – Can be queried or read directly using Invoice key (OPBEL):
  - => Properties:
    - *DocumentNumber (key)*
    - *BillingPeriod*
    - *Estimated*

- *Partner*
- *ContractAccount*
- *TotalAmount*
- *TotalCurrency*
- *CreatedOn*
- *PostingDate*
- *DocumentDate*
- *PrintDate*

.

=> Navigation Properties:

'/ToBillDocsFromInvoice' => Fetches the Billing Documents associated with an Invoice (if available).

'/ToEstimatedReadsFromBillDoc' => Fetches the Estimated Meter Reads (note that Attribute 'Estimated' will indicate whether this is likely to be successful).

- **InvoiceHistory** (Partially Abstract) – Full Invoice History can be generated by using a Master Data Object reference to execute BDEX with or an individual Invoice key (OPBEL) can be specified if known.

=> Properties:

- *DocumentNumber (key)*
- *MDObjID*
- *MDObjKey*
- *ContractAccount*
- *BillingPeriodStart*
- *BillingPeriodEnd*
- *BillingPeriod*
- *PostingDate*
- *TotalAmount*
- *TotalCurrency*
- *CreatedBy*
- *NameText*
- *ClearingDate*
- *ClearingDocument*
- *ClearingPostingDate*
- *ClearingReason*
- *ReversalDocument*
- *ReversalReason*
- *ReversalDate*
- *Status*
- *HistoryIndicator*

- **LastInvoice** (Abstract) – Cannot be queried or read directly. See BusinessPartner and ContractAccount above.  
=> Properties:
  - *DocumentNumber (key)*
  - *BillingPeriod*
  - *Estimated*
  - *Partner*
  - *ContractAccount*
  - *TotalAmount*
  - *TotalCurrency*
  - *CreatedOn*
  - *PostingDate*
  - *DocumentDate*
  - *PrintDate*
- **MasterDataAction** (Abstract) – Cannot be queried or read directly. See all Entity Types that represent Master Data Objects.  
=> Properties:
  - *ObjectID (key)*
  - *ObjectKey (key)*
  - *ActionID (key)*
  - *ActionText*
  - *Execute*
- **MasterDataObject** (Abstract) – Cannot be queried or read directly. See all Entity Types that represent Master Data Objects:  
=> Properties:
  - *ObjectID (key)*
  - *ObjectKey (key)*
  - *ParentObjectID*
  - *ParentObjectKey*
  - *IconName*
  - *NodeTooltip*
  - *NodeText*
  - *AddInfo*
  - *AddInfo2*
  - .  
=> Navigation Properties:  
'**/ToInvHistFromMDObj**' => Fetches Invoice History by executing BDEx, deriving the full Master Data

Context at runtime and analysing the Work Requests related to Invoices. Note: The Work Requests returned can be managed using BDEx Profile 'ODATA';

**'/ToMasterDataContext'** => Derives and returns the full Master Data Context that would be used by BDEx if executed;

**'/ToMasterDataObjectActions'** => Fetches all of the *background* BDEx Master Data Actions for the Master Data Object. Note: The Actions returned can be managed using BDEx Profile 'ODATA';

**'/ToNotesFromMDObj'** => Fetches all of the Notes by executing BDEx (Master Data Context will be derived at runtime). Note: The Work Requests returned can be managed using BDEx Profile 'ODATA';

**'/ToWorkRequestsFromD'** => Fetches the open Work Requests by executing BDEx (Master Data Context will be derived at runtime). Note: The Work Requests returned can be managed using BDEx Profile 'ODATA'.

- **MeterReadingResult** – Cannot be queried directly but can be returned using Billing Documents and Invoices via navigation properties. Read directly using Meter Reading Document Number key (ABLBELNR).

=> Properties:

- *DocumentNumber (key)*
- *BillDocNumber*
- *InvoiceNumber*
- *EquipmentNumber*
- *RegisterNumber*
- *ReadingDate*
- *ReadingTime*
- *ResultPredecimal*
- *ResultPostdecimal*
- *Active*
- *ScheduledDate*
- *Status*
- *IndependentValidation*
- *DependentValidation*
- *DocumentType*
- *DocumentCategory*
- *CreatedOn*
- *CreatedBy*
- *ChangedOn*
- *ChangedBy*

- **Note (Abstract)** – Cannot be queried or read directly. See MasterDataObject above.

=> Properties:

- *NoteID (generated key)*
  - *Text*
  - *UserID*
  - *NoteDate*
  - *NoteTime*
  - *UserName*
  - *ClassID*
  - *WrKey*
  - *MDObjID*
  - *MDObjKey*
  - *HistoryIndicator*
- **PointOfDelivery** – Can be queried or read directly using the PoD Internal Unique ID (INT\_UI):
    - => Properties:
      - *InternalID (key)*
      - *Type*
      - *CreatedOn*
      - *AuthorizationGroup*
      - *ExternalIID*
      - .
    - => Navigation Properties:
      - '/ToMasterDataObjectFromPoD' => Returns the Master Data Object details according to BDEx;
      - '/ToPointOfDeliveryActions' => Fetches all of the *background* BDEx Master Data Actions for the Point of Delivery. Note: The Actions returned can be managed using BDEx Profile 'ODATA';
      - '/ToWorkRequestsFromPoD' => Fetches the open Work Requests by executing BDEx (Master Data Context will be derived at runtime). Note: The Work Requests returned can be managed using BDEx Profile 'ODATA'.
- **Premises** – Can be queried or read directly using the Premises key (VSTELLE):
    - => Properties:
      - *PremisesNumber (key)*
      - *ConnectionObject*
      - *Type*
      - *AuthorizationGroup*
      - *CreatedOn*
      - .
    - => Navigation Properties:
      - '/ToMasterDataObjectFromP' => Returns the Master Data Object details according to BDEx;
      - '/ToPremisesActions' => Fetches all of the *\_background* BDEx Master Data Actions for the

Premises. Note: The Actions returned can be managed using BDEX Profile 'ODATA';  
 '/ToWorkRequestsFromP' => Fetches the open Work Requests by executing BDEX (Master Data Context will be derived at runtime). Note: The Work Requests returned can be managed using BDEX Profile 'ODATA'.

- **WorkRequest** (Abstract) – Cannot be queried or read directly. See all Entity Types that have navigation properties relating to Work Requests:

=> Properties:

- *ClassID (key)*
- *WrKey (key)*
- *ObjectID*
- *ObjectKey*
- *Typelcon*
- *TypeID*
- *TypeText*
- *Classlcon*
- *ClassText*
- *SystemId*
- *Systemlcon*
- *SystemName*
- *SubclassID*
- *SubclassText*
- *PrimaryMDObjID*
- *PrimaryMDObjlcon*
- *PrimaryMDObjKey*
- *PrimaryMDObjText*
- *StatusID*
- *StatusText*
- *MainDate*
- *CreationDate*
- *Currproc*
- *CreatedBy*

.

=> Navigation Properties:

'/ToWorkRequestActions' => Fetches all of the *background* BDEX Work Request Actions for the Work Request. Note: The Actions returned can be managed using BDEX Profile 'ODATA'.

- **WorkRequestAction** (Abstract) – Cannot be queried or read directly. See WorkRequest above.

=> Properties: \_

- ClassID (key)
- WrKey (key)
- ActionID
- ActionText
- Execute

## GET Requests (Single Reads and Queries)

---

As with any OData Service, BDEx Connect obeys the OData Standard conventions of supporting HTTP Requests with the following types: Create, Read, Update, Delete and Query.

However while this is theoretically true, at present only Queries, Reads and one very specific Update Request are currently supported.

We fully expect BDEx Connect to expand with new Entities, EntitySets and Navigation properties in future as and when the need arises to do so.

Queries and Single Reads are two forms of GET Requests.

Typically they take the form of specifying an Entity key or providing Select-Option values to be used as part of a 'Filter'.

Here are some notable examples:

- READ – All of the Notes for a specific Master Data Object reference, e.g. a Business Partner:  
*MasterDataObjectSet(ObjectID='ISU0001',ObjectKey='[BP Number])/ToNotesFromMDObj?*
- READ – The Invoice History for a specific Master Data Object reference, e.g. a Business Partner:  
*MasterDataObjectSet(ObjectID='ISU0001',ObjectKey='[BP Number])/ToInvHistFromMDObj?*
- READ – All of the Estimated Meter Readings (Entities) for a given Invoice (where the Estimated property is 'True'):  
*InvoiceSet('[Invoice Document Number])/ToEstimatedReadsFromInvoice?*
- QUERY – All open BPEMs for a specific Business Partner:  
*BusinessPartnerSet('[BP Number])/ToWorkRequests?&\$filter=ClassID eq 'ISU\_BPPEM'*
- QUERY – Find Contract Accounts that have an old Legacy Account reference  
*ContractAccountSet?&\$filter=LegacyNumber eq 'OLDACC101'*
- QUERY – Find Standard Addresses for a specific Business Partner:  
*BusinessPartnerSet('[BP Number])/ToAddressesFromBP?&\$filter=StandardAddress eq true*

- QUERY – Find Standard Telephone Numbers for a specific Business Partner:  
*BusinessPartnerSet('[BP Number']/ToCommDetailsFromBP?&\$filter=CommunicationType eq 'TEL'  
and StandardIndicator eq true*

# PUT Request (Update)

BDEX Connect currently supports a single Update Request designed to support the execution of 'Background' Actions (for Master Data Objects or Work Requests).

As a proof of concept the example illustrated below is supplied as standard which is the background closure of a BPEM Case.

In order to succeed the composition of this type of HTTP Request needs to be precise. To keep things as simple as they can be we've made sure the payload is light, so only the Action Entity itself is needed along with its 'Execute' property set to 'True'. This way BDEX Connect can be certain the Action Entity is being executed.

Once the appropriate Action Entity has been identified, this could be gleaned from a previous GET Request, the submission of the PUT Request requires no additional effort other than the explicit setting of the 'Execute' property.

The screenshot shows the SAP Gateway Client interface. The HTTP Method is set to PUT. The Request URI is `/sap/opu/odata/BI/MDE_ODATA_ISU_SRV/WorkRequestActionSet(ClassID='ISU_BPEM',WrKey='0000000291',ActionID='BPEM0011')`. The Content-Type is `application/xml; charset=utf-8`. The XML payload is as follows:

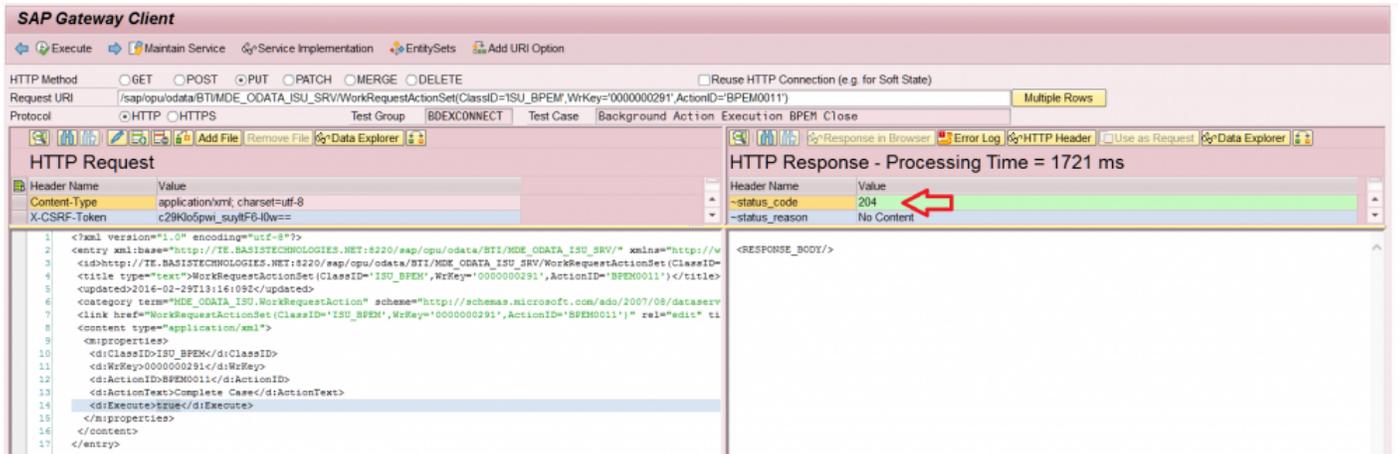
```

1 <?xml version="1.0" encoding="utf-8"?>
2 <entry xmlns="http://www.basis-technologies.net:8220/sap/opu/odata/BI/MDE_ODATA_ISU_SRV/" xmlns:m="http://www.w3.org/2005/Atom" xml:base="http://TE.BASISTECHNOLOGIES.NET:8220/sap/opu/odata/BI/MDE_ODATA_ISU_SRV/WorkRequestActionSet(ClassID='ISU_BPEM',WrKey='0000000291',ActionID='BPEM0011')"/>
3 <id>http://TE.BASISTECHNOLOGIES.NET:8220/sap/opu/odata/BI/MDE_ODATA_ISU_SRV/WorkRequestActionSet(ClassID='ISU_BPEM',WrKey='0000000291',ActionID='BPEM0011')</id>
4 <title type="text">WorkRequestActionSet(ClassID='ISU_BPEM',WrKey='0000000291',ActionID='BPEM0011')</title>
5 <updated>2016-02-29T13:16:09Z</updated>
6 <category term="MDE_ODATA_ISU_WorkRequestAction" scheme="http://schemas.microsoft.com/ado/2007/05/dataservices/schema"/>
7 <link href="WorkRequestActionSet(ClassID='ISU_BPEM',WrKey='0000000291',ActionID='BPEM0011')" rel="edit" title="WorkRequestAction"/>
8 <content type="application/xml">
9 <m:properties>
10 <d:ClassID>ISU_BPEM</d:ClassID>
11 <d:WrKey>0000000291</d:WrKey>
12 <d:ActionID>BPEM0011</d:ActionID>
13 <d:ActionText>Complete Case</d:ActionText>
14 <d:Execute>true</d:Execute>
15 </m:properties>
16 </content>
17 </entry>

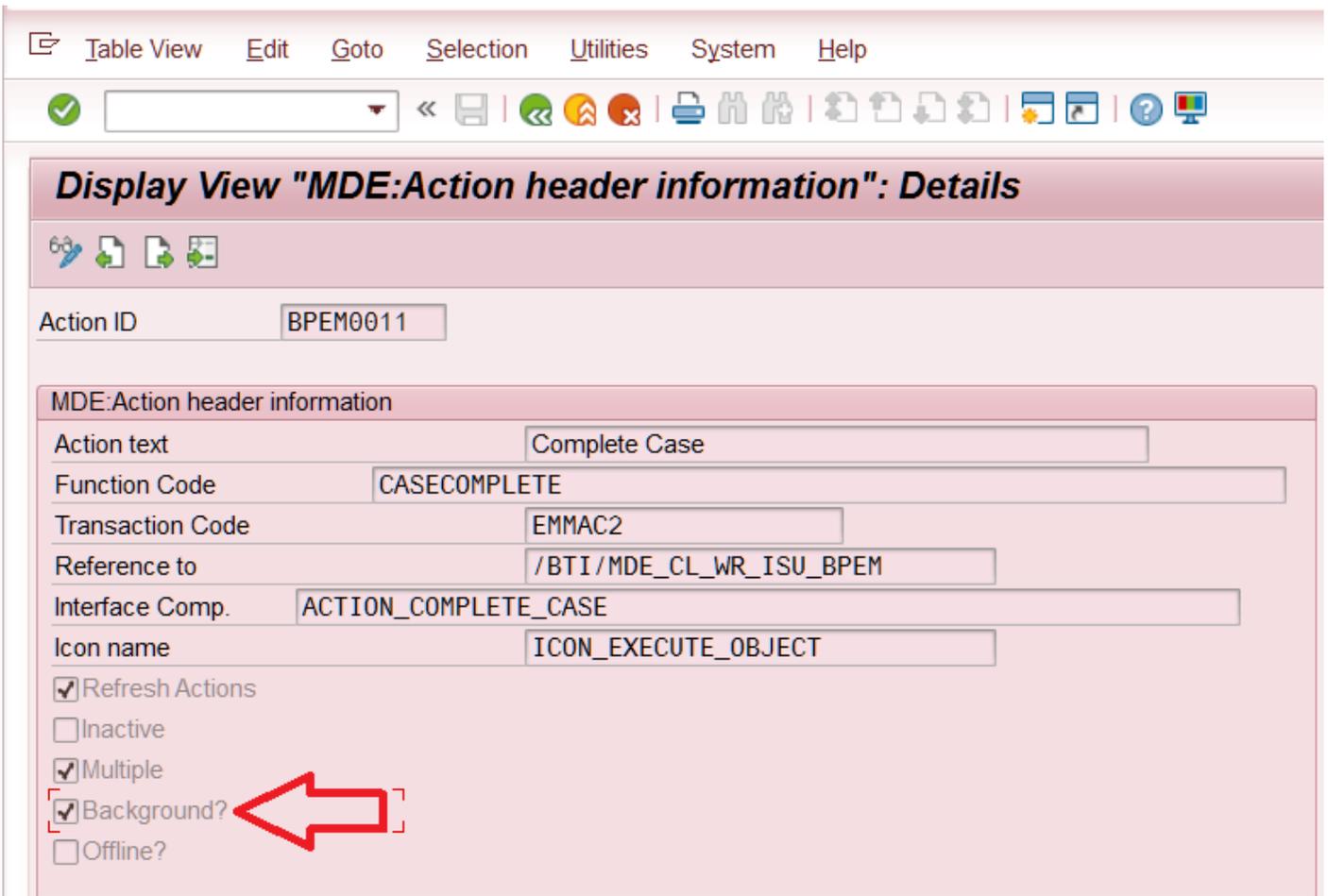
```

Red arrows in the image point to the 'Execute' property in the XML and the 'PUT' method selection.

Note that upon successful execution the HTTP Response will be simply a status of 204 with no actual message content:



Note: The Background Action setting can be found in Configuration Table /BTI/MDE\_C\_ACT



# XML (Default) Format example

BDEX Connect acts in a similar fashion to the Customer Centric Hub in that it can be provided with a single Master Data Object and from that object build a Master Data Context and search for related Work Requests as a response.

In the example below the starting Master Data Object is a Business Partner:

`http://[server]/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/  
BusinessPartnerSet('0000000650')/ToWorkRequests?&format=xml`

The OData Service response in XML might resemble the following:

```
<?xml version='1.0' encoding='utf-8'>
<feed xmlns='http://www.w3.org/2005/Atom' xmlns:d='http://schemas.microsoft.com/ado/2007/08/dataservices/metadata' xmlns:m='http://schemas.microsoft.com/ado/2007/08/dataservices'
xml:base='http://TE.BASISTECHNOLOGIES.NET:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/'>
  <id>
    http://TE.BASISTECHNOLOGIES.NET:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/BusinessPartnerSet('0000000650')/ToWorkRequests
  </id>
  <title type='text'>WorkRequestSet</title>
  <updated>2016-02-12T11:35:20Z</updated>
  <author>
    <name/>
  </author>
  <link href='BusinessPartnerSet('0000000650')/ToWorkRequests' rel='self' title='WorkRequestSet'/>
  <entry>
    <id>
      http://TE.BASISTECHNOLOGIES.NET:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/WorkRequestSet(ClassID='ISU_LATB',urKey='0000001168')
    </id>
    <title type='text'>
      WorkRequestSet(ClassID='ISU_LATB',urKey='0000001168')
    </title>
    <updated>2016-02-12T11:35:20Z</updated>
    <category term='MDE_ODATA_ISU_WorkRequest' scheme='http://schemas.microsoft.com/ado/2007/08/dataservices/scheme'/>
    <link href='WorkRequestSet(ClassID='ISU_LATB',urKey='0000001168')' rel='self' title='WorkRequest'/>
    <link href='WorkRequestSet(ClassID='ISU_LATB',urKey='0000001168')/ToWorkRequestActions' rel='http://schemas.microsoft.com/ado/2007/08/dataservices/related/ToWorkRequestActions' type='application/atom+xml;type=feed' title='ToWorkRequestActions'/>
    <content type='application/xml'>
      <properties xmlns:m='http://schemas.microsoft.com/ado/2007/08/dataservices/metadata' xmlns:d='http://schemas.microsoft.com/ado/2007/08/dataservices'>
        <d:ObjectID>ISU0001</d:ObjectID>
        <d:ObjectKey>0000000650</d:ObjectKey>
        <d:TypeIcon>@SQInformation</d:TypeIcon>
        <d:TypeID>01</d:TypeID>
        <d:TypeText>Information</d:TypeText>
        <d:ClassIcon>@QQuote B11@</d:ClassIcon>
        <d:ClassID>ISU_LATB</d:ClassID>
        <d:ClassText>Late B11</d:ClassText>
        <d:SystemID>@03</d:SystemID>
        <d:SystemIcon/>
        <d:SystemName/>
        <d:SubclassID>@ORD</d:SubclassID>
        <d:SubclassText>Billing Order</d:SubclassText>
        <d:urKey>0000001168</d:urKey>
        <d:PrimaryObjID>ISU0003</d:PrimaryObjID>
        <d:PrimaryObjIcon>@EQContract@</d:PrimaryObjIcon>
        <d:PrimaryObjKey>0000001168</d:PrimaryObjKey>
        <d:PrimaryObjText>Active from 11.05.2012 Div. Electricity</d:PrimaryObjText>
        <d:StatusID></d:StatusID>
        <d:StatusText>Overdue</d:StatusText>
        <d:MainData>2012-05-11T00:00:00</d:MainData>
        <d:CreationDate>2012-05-18T00:00:00</d:CreationDate>
        <d:Curproc/>
        <d:CreatedBy/>
      </properties>
    </content>
  </entry>
  <entry>
    <id>
      http://TE.BASISTECHNOLOGIES.NET:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/WorkRequestSet(ClassID='ISU_BORD',urKey='30000001932012070101')
    </id>
  </entry>
</feed>
```

Note: The addition of the Uniform Resource Identifier (URI) Option '&format=xml' is always assumed as the default by SAP Gateway if not actually specified in the HTTP Request.

# JSON Format example

By the addition of a simple Uniform Resource Identifier (URI) Option the output of BDEx Connect can be switched to JSON.

[http://\[server\]/sap/opu/odata/BTI/MDE\\_ODATA\\_ISU\\_SRV/BusinessPartnerSet\('0000000650'\)/ToWorkRequests?&\\$format=json](http://[server]/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/BusinessPartnerSet('0000000650')/ToWorkRequests?&$format=json)

```

{"@odata.context": "http://te.basistechnologies.net:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/BusinessPartnerSet('0000000650')/ToWorkRequests?$format=json", "value": [{"@odata.type": "#MDE_ODATA_ISU_SRV.WorkRequestSet", "id": "http://te.basistechnologies.net:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/WorkRequestSet(ClassID='ISU_LATB', WKey='0000001168')", "type": "MDE_ODATA_ISU.WorkRequest", "ObjectID": "ISU0001", "ObjectKey": "0000000650", "TypeIcon": "805\\QInformation", "TypeID": "01", "TypeText": "Information", "ClassIcon": "805\\QLate Billing", "ClassID": "ISU_LATB", "ClassText": "Late Billing", "SystemID": "0001", "SystemName": "", "SystemIcon": "", "SubclassID": "BORD", "SubclassText": "Billing Order", "WKey": "0000001168", "PrimaryDocIcon": "ISU0008", "PrimaryDocJText": "ISU0008", "PrimaryDocObjKey": "0000001168", "PrimaryDocJText": "Active from 11.05.2018 Div. Electricity", "StatusID": "X", "StatusText": "Overdue", "MainDate": "\/Date(1336094400000)\/", "CreationDate": "\/Date(1372992000000)\/", "Currproc": "", "CreatedBy": "", "CreatedBy": "", "ToWorkRequestActions": {"__deferred": {"uri": "http://te.basistechnologies.net:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/WorkRequestSet(ClassID='ISU_LATB', WKey='0000001168')/ToWorkRequestActions"}; "type": "MDE_ODATA_ISU_SRV.WorkRequestSet", "id": "http://te.basistechnologies.net:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/WorkRequestSet(ClassID='ISU_BORD', WKey='30000001932012070101')", "type": "MDE_ODATA_ISU.WorkRequest", "ObjectID": "ISU0001", "ObjectKey": "0000000650", "TypeIcon": "805\\QInformation", "TypeID": "01", "TypeText": "Information", "ClassIcon": "802\\QBilling Order", "ClassID": "ISU_BORD", "ClassText": "Billing Order", "SystemID": "0001", "SystemIcon": "", "SystemName": "", "SubclassID": "01", "SubclassText": "Periodic Billing", "WKey": "30000001932012070101", "PrimaryDocIcon": "ISU0006", "PrimaryDocJText": "ISU0006", "PrimaryDocObjKey": "30000001932012070101", "PrimaryDocJText": "Electricit(Donaghadee, West Lane 10", "StatusID": "1", "StatusText": "Billable", "MainDate": "\/Date(1341008000000)\/", "CreationDate": "\/Date(1337299200000)\/", "Currproc": "HARFORD", "CreatedBy": "IS2R1HACZ", "ToWorkRequestActions": {"__deferred": {"uri": "http://te.basistechnologies.net:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/WorkRequestSet(ClassID='ISU_BORD', WKey='30000001932012070101')/ToWorkRequestActions"}; "type": "MDE_ODATA_ISU_SRV.WorkRequestSet", "id": "http://te.basistechnologies.net:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/WorkRequestSet(ClassID='ISU_BORD', WKey='30000001932012100101')", "type": "MDE_ODATA_ISU.WorkRequest", "ObjectID": "ISU0001", "ObjectKey": "0000000650", "TypeIcon": "805\\QInformation", "TypeID": "01", "TypeText": "Information", "ClassIcon": "802\\QBilling Order", "ClassID": "ISU_BORD", "ClassText": "Billing Order", "SystemID": "0001", "SystemIcon": "", "SystemName": "", "SubclassID": "01", "SubclassText": "Periodic Billing", "WKey": "30000001932012100101", "PrimaryDocIcon": "ISU0006", "PrimaryDocJText": "ISU0006", "PrimaryDocObjKey": "30000001932012100101", "PrimaryDocJText": "Electricit(Donaghadee, West Lane 10", "StatusID": "1", "StatusText": "Not billable", "MainDate": "\/Date(1340400000000)\/", "CreationDate": "\/Date(1361404000000)\/", "Currproc": "", "CreatedBy": "IS2R1HACZ", "ToWorkRequestActions": {"__deferred": {"uri": "http://te.basistechnologies.net:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/WorkRequestSet(ClassID='ISU_BORD', WKey='30000001932012100101')/ToWorkRequestActions"}; "type": "MDE_ODATA_ISU_SRV.WorkRequestSet", "id": "http://te.basistechnologies.net:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/WorkRequestSet(ClassID='ISU_HTR0', WKey='0000000000000001768')", "type": "MDE_ODATA_ISU.WorkRequest", "ObjectID": "ISU0001", "ObjectKey": "0000000650", "TypeIcon": "805\\QInformation", "TypeID": "01", "TypeText": "Information", "ClassIcon": "80N\\QMeter Reading", "ClassID": "ISU_HTR0", "ClassText": "Meter Reading Order", "SystemID": "0001", "SystemIcon": "", "SystemName": "", "SubclassID": "01", "SubclassText": "Periodic Meter Reading", "WKey": "0000000000000001768", "PrimaryDocIcon": "ISU0009", "PrimaryDocJText": "ISU0009", "PrimaryDocObjKey": "0000000000000001768", "PrimaryDocJText": "Installed on 01.01.2018", "StatusID": "0", "StatusText": "Meter reading order created", "MainDate": "\/Date(1340400000000)\/", "CreationDate": "\/Date(1361404000000)\/", "Currproc": "", "CreatedBy": "IS2R1HACZ", "ToWorkRequestActions": {"__deferred": {"uri": "http://te.basistechnologies.net:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/WorkRequestSet(ClassID='ISU_HTR0', WKey='0000000000000001768')/ToWorkRequestActions"}; "type": "MDE_ODATA_ISU.WorkRequestSet", "id": "http://te.basistechnologies.net:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/WorkRequestSet(ClassID='ISU_WFL0', WKey='0000000000000001768')", "type": "MDE_ODATA_ISU.WorkRequest", "ObjectID": "ISU0001", "ObjectKey": "0000000650", "TypeIcon": "805\\QInformation", "TypeID": "01", "TypeText": "Information", "ClassIcon": "87N\\QWorkflow", "ClassID": "ISU_WFL0", "ClassText": "Workflow", "SystemID": "001", "SystemIcon": "", "SystemName": "", "SubclassID": "IS00039001", "SubclassText": "Work Request Resolved", "WKey": "000000022001", "PrimaryDocIcon": "ISU0009", "PrimaryDocJText": "ISU0009", "PrimaryDocObjKey": "0000000000000001768", "PrimaryDocJText": "Installed on 01.01.2018", "StatusID": "1", "StatusText": "In Process", "MainDate": "\/Date(1452124800000)\/", "CreationDate": "\/Date(1452124800000)\/", "Currproc": "WF-BATCH", "CreatedBy": "HARFORD", "ToWorkRequestActions": {"__deferred": {"uri": "http://te.basistechnologies.net:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/WorkRequestSet(ClassID='ISU_WFL0', WKey='000000022001')/ToWorkRequestActions"}; "type": "MDE_ODATA_ISU.WorkRequestSet", "id": "http://te.basistechnologies.net:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/WorkRequestSet(ClassID='ISU_WIT0', WKey='000000022002')", "type": "MDE_ODATA_ISU.WorkRequest", "ObjectID": "ISU0001", "ObjectKey": "0000000650", "TypeIcon": "805\\QInformation", "TypeID": "01", "TypeText": "Information", "ClassIcon": "8CS\\QWorkitem", "ClassID": "ISU_WIT0", "ClassText": "Workitem", "SystemID": "001", "SystemIcon": "", "SystemName": "", "SubclassID": "IS00039006", "SubclassText": "BPEH Case 0000000237 has been resolved", "WKey": "000000022002", "PrimaryDocIcon": "ISU0009", "PrimaryDocJText": "ISU0009", "PrimaryDocObjKey": "0000000000000001768", "PrimaryDocJText": "Installed on 01.01.2018", "StatusID": "READY", "StatusText": "Ready", "MainDate": "\/Date(1452124800000)\/", "CreationDate": "\/Date(1452124800000)\/", "Currproc": "", "CreatedBy": "WF-BATCH", "ToWorkRequestActions": {"__deferred": {"uri": "http://te.basistechnologies.net:8220/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/WorkRequestSet(ClassID='ISU_WIT0', WKey='000000022002')/ToWorkRequestActions"}; "type": "MDE_ODATA_ISU_SRV.WorkRequestSet"}]}]}

```

# XLSX Format example

By the addition of a simple Uniform Resource Identifier (URI) Option the output of BDEX Connect can be switched to XLSX and displayed in a Browser session.

[http://\[server\]/sap/opu/odata/BTI/MDE\\_ODATA\\_ISU\\_SRV/BusinessPartnerSet\('0000000650'\)/ToWorkRequests?&\\$format=xlsx](http://[server]/sap/opu/odata/BTI/MDE_ODATA_ISU_SRV/BusinessPartnerSet('0000000650')/ToWorkRequests?&$format=xlsx)

Class ID	NWR Key	MD Object ID	MD Object Key	Type Icon	Type ID	Type Text	Class Icon	Class Text	System ID	System Icon	System Name	Subclass ID	Subclass Text	MD Object ID
ISU_LATB	'0000001168	ISU0001	'0000000650	@05QInformation@	'1	Information	@6QQLate Bill@	Late Bill	'0001			BORD	Billing Order	ISU0003
ISU_BORD	'00000001932012070101	ISU0001	'0000000650	@05QInformation@	'1	Information	@9ZQBilling Order@	Billing Order	'0001			01	Periodic Billing (01)	ISU0006
ISU_BORD	'00000001932012100101	ISU0001	'0000000650	@05QInformation@	'1	Information	@9ZQBilling Order@	Billing Order	'0001			01	Periodic Billing (01)	ISU0006
ISU_MITRO	'00000000000000001768	ISU0001	'0000000650	@05QInformation@	'1	Information	@CNQMeter Reading Order@	Meter Reading Order	'0001			01	Periodic Meter Reading	ISU0009
ISU_WFLE	'000000022201	ISU0001	'0000000650	@05QInformation@	'1	Information	@7NMQWorkflow@	Workflow	'0001			WS00370601	Work Request Resolved	ISU0009
ISU_WITE	'000000022202	ISU0001	'0000000650	@05QInformation@	'1	Information	@CSQWorkitem@	Workitem	'0001			TS00370606	BPPEM Case 0000000237 has been resolved	ISU0009

# Appendices

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## Out of the Box Actions

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Out of the Box BDEX Actions:

BDEX provides 295 out of the box right click actions available in the Customer Centric Hub. These actions are:

Action ID	SAP Transaction Code	Action Description	Master Data Object or Work Request
AC0001	CAA2	Display contract account	Contract Account
AC0002	CAA3	Change contract account	Contract Account
AC0003	EASIBI	Invoicing	Contract Account
AC0004	FPM3	Display dunning history	Contract Account
AC0005	FPR3	Display installment plans	Contract Account
AC0006	FPPHN	Display prenotification history	Contract Account
AC0007	ECENV_BP	Data environment	Contract Account
AC0008	CORRHIST	Display correspondence history	Contract Account
AC0009	FPL9	Display account balance	Contract Account
AC0010	EA40	Display print documents	Contract Account
AC0011	FPR1	Create installment plans	Contract Account
AC0012	FPR2	Change installment plans	Contract Account
AC0013	EABICO	Billing correction	Contract Account
AC0014	FPE1	Post Document	Contract Account
AC0015	FPE3	Display Document	Contract Account
AC0016	FPE2	Change Document	Contract Account
AC0017	FP08	Reverse Document	Contract Account
AC0018	EA13	Full Reversal	Contract Account
AC0019		Change move-in document	Contract Account
AC0020	EASIBI	Bill and Invoice	Contract Account
AC0021	EA19	Create or Simulate Invoice	Contract Account
AC0022	CAA1	Create Contract Account	Contract Account

AC0023	FPSEC3	Display Security Deposit	Contract Account
AC0024	FPSEC2	Change Security Deposit	Contract Account
AC0025	FP04	Write off History	Contract Account
AC0026	FP40	Transfer Items	Contract Account
AC0027	FP07	Reset Cleared Items	Contract Account
ACTI0001		Display activity	Interaction Record
ACTI0002		Change activity	Interaction Record
ALCK0001	CAA2	Maintain contract account lock	Account Lock
ALCK0002	CAA2	Remove contract account lock	Account Lock
ALCK0003	CAA2	Change contract account lock	Account Lock
ALCK0004	CAA3	Display contract account lock	Account Lock
ALCK0005	FPL9	Display account balance	Account Lock
ALCK0006	FPM3	Display dunning history	Account Lock
ALCK0007		Display Invoice Lock	Account Lock
ALCK0008	ES22	Display contract	Account Lock
ALCK0009	ES21	Change contract	Account Lock
ALCK0010		Display document	Account Lock
ALCK0011		Change document	Account Lock
ALCK0012		Display line item	Account Lock
ALCK0013		Change line item	Account Lock
BCHK0001	ES32	Display installation	Billing Check Failure
BCHK0002	ES31	Change installation	Billing Check Failure
BCHK0003	ES22	Display contract	Billing Check Failure
BCHK0004	ES21	Change contract	Billing Check Failure
BCHK0005	CAA2	Change contract account	Billing Check Failure
BCHK0006	EG71	Display rate	Billing Check Failure
BCHK0007	EASICH	Re-run billing check	Billing Check Failure
BDCI0001		Display BDoc	BDoc (IS-U)
BDCO0001		Display BDoc	BDoc (IS-U)
BDOCDISCL		Display classic BDoc message	BDoc (CRM)
BDOCDISEXL		Display extended BDoc message	BDoc (CRM)

BDOCDISP		Display BDoc	BDoc (CRM)
BDOCOL		Display object links	BDoc (CRM)
BDOCREP		Reprocess BDoc	BDoc (CRM)
BORD0001	EASIBI	Bill billing order	Billing Order
BORD0002		Display billing order	Billing Order
BORD0003	ES22	Display contract	Billing Order
BORD0004	ES32	Display installation	Billing Order
BORD0005	EASIBI	Perform billing	Billing Order
BORD0006		Display billing order trigger	Billing Order
BORD0007	EL37	Reverse Meter Readings	Billing Order
BOUT0001	EA05	Display billing outsort	Billing Outsort
BOUT0002	EA05	Release billing outsort	Billing Outsort
BOUT0003	EA22	Display billing document	Billing Outsort
BOUT0004	EA20	Reverse billing document	Billing Outsort
BOUT0005		Display log	Billing Outsort
BOUT0006	FPL9	Display account balance	Billing Outsort
BOUT0007	EA21	Adjustment Reversal	Billing Outsort
BOUT0008	EA24	Delete Adjustment Reversal Doc. Number	Billing Outsort
BP0001	BP	Display business partner	Business Partner
BP0002	BP	Change business partner	Business Partner
BP0003	BCT2	Display most recent contact	Business Partner
BP0004	CORRHIST	Display correspondence history	Business Partner
BP0005	FPL9	Display account balance	Business Partner
BP0006	ECENV_BP	Data environment	Business Partner
BP0007	FPM3	Display dunning history	Business Partner
BP0008	ECVBP02	Customer data	Business Partner
BP0009	EA40	Display invoice/print documents	Business Partner
BP0010	ESWTMON01	Display related switch documents	Business Partner
BP0012	EC50E	Create move-in	Business Partner
BP0013	EC52E	Display move-in documents	Business Partner

BP0014	BCT0	Create contact	Business Partner
BP0015	BCT2	Display contacts	Business Partner
BP0016	FPCR1	Display credit worthiness	Business Partner
BP0017	ES51	Create owner allocation	Business Partner
BP0018	ES53	Display owner allocation	Business Partner
BP0019	ES54	Reverse owner allocation	Business Partner
BP0020	INVMON	Inbound bill monitoring	Business Partner
BPEM0001	EMMAC3	Display case	BPEM Case
BPEM0002	EMMAC2	Change case	BPEM Case
BPEM0003		Close case	BPEM Case
BPEM0004	EMMACL	Display case list	BPEM Case
BPEM0005		Assign case	BPEM Case
BPEM0006		Accept case	BPEM Case
BPEM0007		Forward case	BPEM Case
BPEM0008		Cancel case	BPEM Case
BPEM0009		Reopen case	BPEM Case
BPEM0010		Put case back in queue	BPEM Case
BPEM0011		Complete case	BPEM Case
BPEM0012		Change case note	BPEM Case
BPEM0013		Reassign case	BPEM Case
BPEM0014		Complete case (with note)	BPEM Case
BPEM0015		Confirm Case	BPEM Case
BPEM0016		Complete and confirm (with note)	BPEM Case
CBLK0001	ES22	Display contract	Contract Bill Block
CBLK0002	ES21	Change contract	Contract Bill Block
CBLK0003	ES21	Remove block	Contract Bill Block
CBLK0004	FPM3	Display dunning history	Contract Bill Block
CBLK0005	CAA3	Display contract account	Contract Bill Block
CBLK0006	CAA2	Change contract account	Contract Bill Block
CBLK0007	FPL9	Display account balance	Contract Bill Block
CIWI0001	FP03H	Display collection history	Collection Work Item

CIWI0002	FPM3	Display dunning history	Collection Work Item
CIWI0003	FPR3	Display installment plan overview	Collection Work Item
CIWI0004	CORRHIST	Display collection item history	Collection Work Item
CIWI0005	FPL9	Display account balance	Collection Work Item
CO0001	ES57	Display connection object	Connection Object
CO0002	ES56	Change connection object	Connection Object
CO0003	ECENV_CO	Data environment	Connection Object
CO0004	IW51	Create Service Notification	Connection Object
COLI0001	CORRHIST	Display collection history	Collection Item
COLI0002	FPM3	Display dunning history	Collection Item
COLI0003	FPR3	Display installment plan overview	Collection Item
COLI0004	FP03H	Display collection item history	Collection Item
COLI0005	FPL9	Display account balance	Collection Item
CONT0001	BCT2	Display contact	Business Contact
CT001	ES22	Display contract	Contract
CT002	ES21	Change contract	Contract
CT003	CAA3	Display contract account	Contract
IN0015	EG71	Display Rate Data	Installation
IN0016	EA05	Perform Billing	Installation
IN0017		Reverse bill order	Installation
IN0018	Display Installation Facts	Installation	
IN0019	EL29	Correct Plausible Meter Reads	Installation
INVO0001	EA05	Display invoice outsort	Invoice Outsor
INVO0002		Change invoice document	Invoice Outsor
INVO0003		Release invoice document Invoice Outsor	
INVO0004	EA13	Reverse invoice document	Invoice Outsor
INVO0005		Invoice overview	Invoice Outsor
INVO0007		Display log	Invoice Outsor
INVO0008	EA22	Display billing document	Invoice Outsor
INVO0009	FPL9	Display account balance	Invoice Outsor

INVO0010	EA21	Adjustment Reversal	Invoice Outsort
INVO0011	EABICO	Billing Correction	Invoice Outsort
INVT0001	EA22	Display billing document	Invoice Trigger
INVT0002	FPL9	Display account balance	Invoice Trigger
INVT0003	CAA3	Display contract account	Invoice Trigger
INVT0004	BP	Display business partner	Invoice Trigger
INVT0005	EA22	Reverse billing document	Invoice Trigger
INVT0006	EASIBI	Perform invoicing	Invoice Trigger
INVT0007	EASISI	Simulate invoicing	Invoice Trigger
INVT0008	EASICH	Overall billing check	Invoice Trigger
INVT0010	CAA2	Change contract account	Invoice Trigger
INVT0011		Display invoice trigger	Invoice Trigger
INVT0012	EA21	Adjustment Reversal	Invoice Trigger
INVT0013	EA24	Delete Adjustment Reversal Doc. Number	Invoice Trigger
INVT0014		Display Installation Facts	Invoice Trigger
IPLN0001	FPR3	Display Installment Plan	Installment Plan
IPLN0002		View history	Installment Plan
IPLN0003	FPR2	Deactivate installment plan	Installment Plan
LEAD0001		Display lead	CRM Marketing Lead
MOVI0001		Display parked documents	Parked Move In Document
MOVI0002		Change parked documents	Parked Move In Document
MOVO0001		Display parked documents	Parked Move Out Document
MOVO0002		Change parked documents	Parked Move Out Document
MTRO0001	EL37	Reverse meter reading order	Meter Reading Order
MTRO0002	EL28	Enter meter reading	Meter Reading Order
MTRO0004	ES32	Display installation	Meter Reading Order
MTRO0005	IQ03	Display device	Meter Reading Order
MTRO0006	EL01	Create meter reading order	Meter Reading Order
NODV0001		Full device installation	No Device Installed (for active Contract)

NODV0002		Billing-related installation	No Device Installed (for active Contract)
PO0001	EEDM11	Display point of delivery	Point of Delivery
PO0002	EEDM10	Change point of delivery	Point of Delivery
PO0003	ESWTMON01	Display related switch documents	Point of Delivery
PO0004	EEDMIDESERVPROV03	Display service providers	Point of Delivery
PO0005	EDATEXMON01	Data exchange monitoring	Point of Delivery
PR0001	ES62	Display premise	Premise
PR0002	ES61	Change premise	Premise
PR0003	ECENV	Data environment	Premise
PRDC0001		Display invoice	Invoice Print Document
PRDC0002		Correct invoice	Invoice Print Document
PRDC0003		Display account balance	Invoice Print Document
PRDC0004		Preview invoice	Invoice Print Document
PRDC0005		Reverse Invoice	Invoice Print Document
REPL0001	ECRMREPL	Display replication error	CRM Replication Failure (ECRMREPL)
REPL0002	ECRMREPL	Display replication queue	CRM Replication Failure (ECRMREPL)
SNTF0001	IW53	Display service notification	Service Notification
SNTF0002	IW52	Change service notification	Service Notification
SORD0001	IW33	Display service order	Service Order
SORD0002	IW32	Change service order	Service Order
SWDC0001	ESWTMON01	Display switch document	Switch/Process Document
SWDC0002	ESWTMON01	Switch document overview	Switch/Process Document
SWDC0003	EEDM11	Display related point of delivery	Switch/Process Document
SWDC0004	BP	Display related business partner	Switch/Process Document
SWDC0005	EDATEXMON01	Data exchange monitoring	Switch/Process Document
SWDC0006	EEDMIDESERVPROV03	Display related service providers	Switch/Process Document
WFLW0001		Display workflow	Workflow
WFLW0003		Restart workflow	Workflow
WITM0001		Execute work item	Work Item

WITM0002		Display work item	Work Item
WITM0003		Forward work item	Work Item
WITM0004		Replace work item	Work Item
WITM0005		Display parent workflow	Work Item
WITM0006		Reserve work item	Work Item