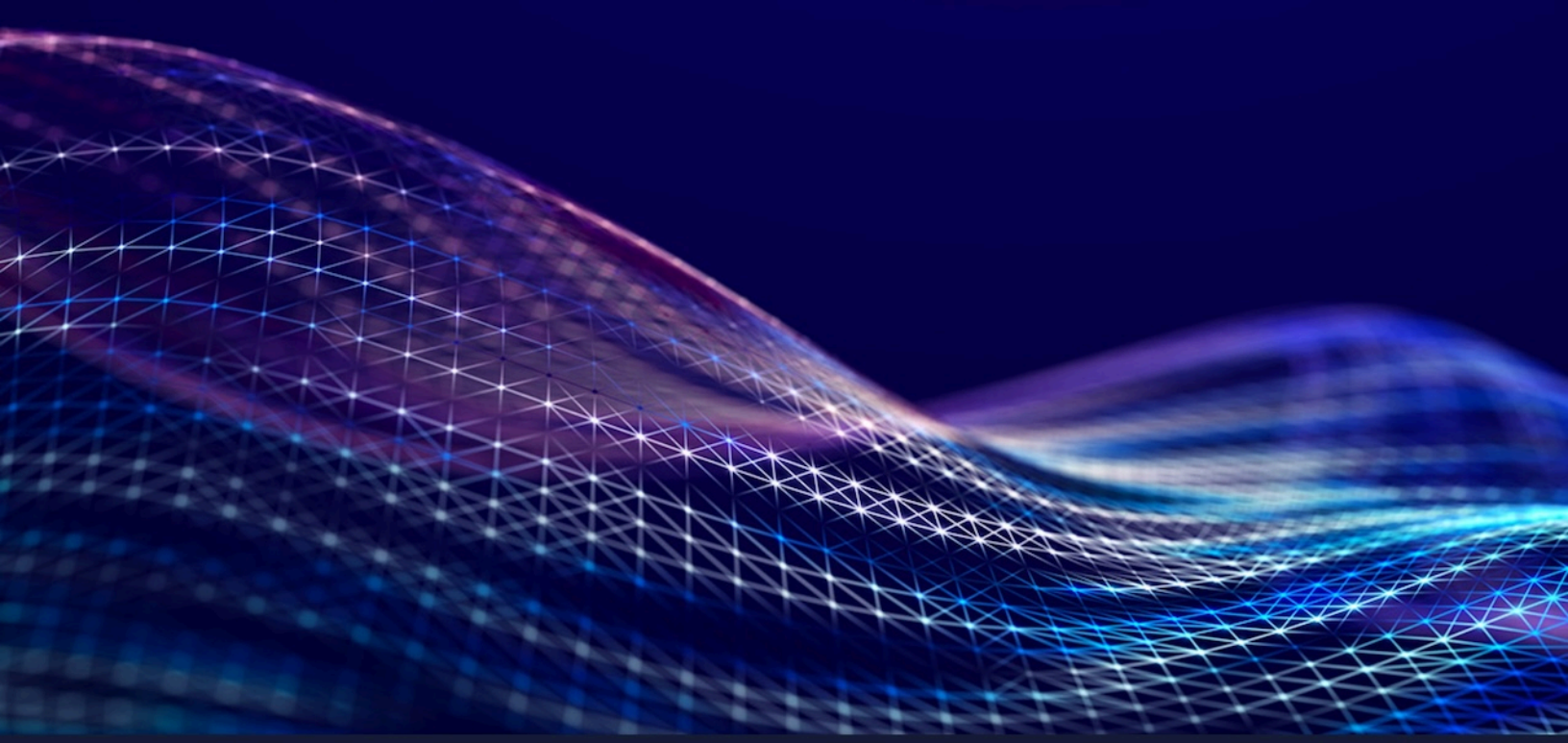


Tungsten Mobile
Installation and Configuration Guide

Version: 3.0.0

Date: 2024-10-25

TUNGSTEN AUTOMATION

Table of Contents

Preface

The Tungsten Mobile™ App interfaces with Tungsten Process Director™ and Tungsten Process Director Accounts Payable™. Using their Apple iOS or Google Android mobile device, the App supports users of Tungsten Automation business applications for SAP in their Accounts Payable and other financial processes, allowing them to approve their financial documents.

The App can be used to manage the workload, review, approve or reject urgent workflows, view scanned image attachments, as well as add notes to documents. The App is directly connected to the SAP ERP back-end system, which means the data is immediately available.

The App can be configured to meet individual customer requirements. This guide describes a typical installation, and therefore, the descriptions may not exactly match your installation. Some features may not be available.

About this guide

This guide explains how to install and configure Tungsten Mobile to enable workflow approvals and the review of Process Director documents in the Worklist.

Related documentation

In addition to this guide, Tungsten Mobile includes the following documentation:

- *Tungsten Mobile Help* which explains the basic tasks that users can perform using the App, such as viewing document details and adding notes to a document.

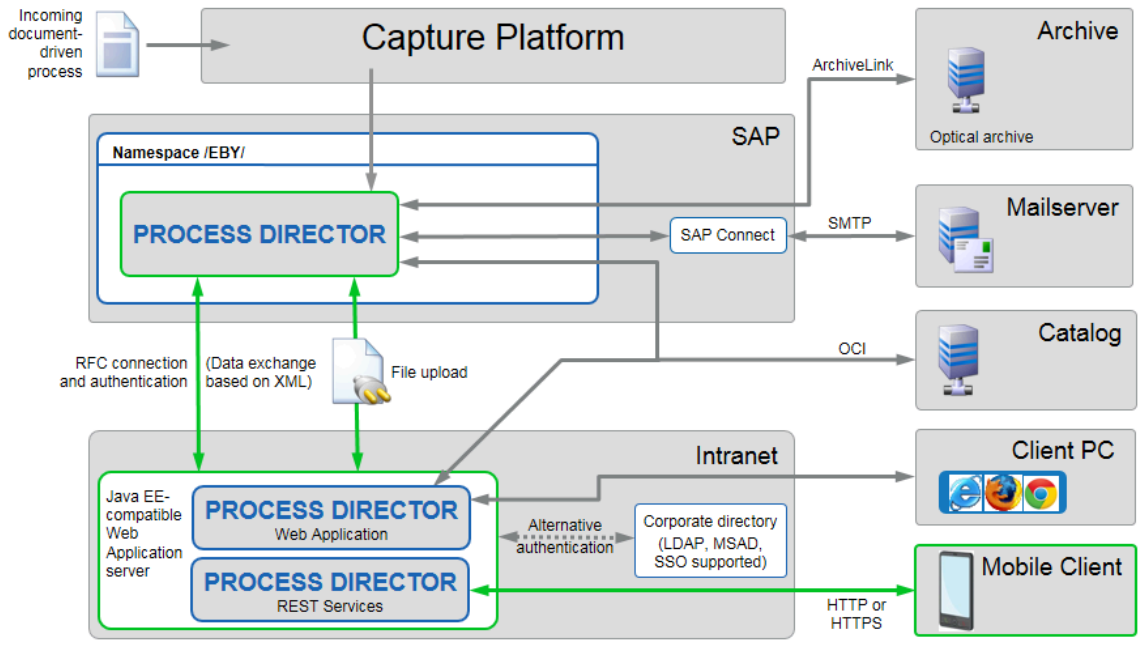
Chapter 1

Architecture

The App interfaces with Tungsten Process Director and Tungsten Process Director Accounts Payable. Currently it can be used primarily for Tungsten Work Cycle workflow approvals and review of documents in the Worklist.

The App connects to a REST Service API, which is provided by the Java-based Web Application. This Web Application can reuse the existing Java EE-compatible Web Application server of the normal Tungsten Process Director Web Application, or it can be deployed on a dedicated server.

Tungsten Mobile is different from Tungsten Email-based Approval™ (formerly MOBILE APPROVAL), which allows users to approve, reject or add a note to a document via email. For more information, see the *Tungsten Email-based Approval Configuration Guide*.



Chapter 2

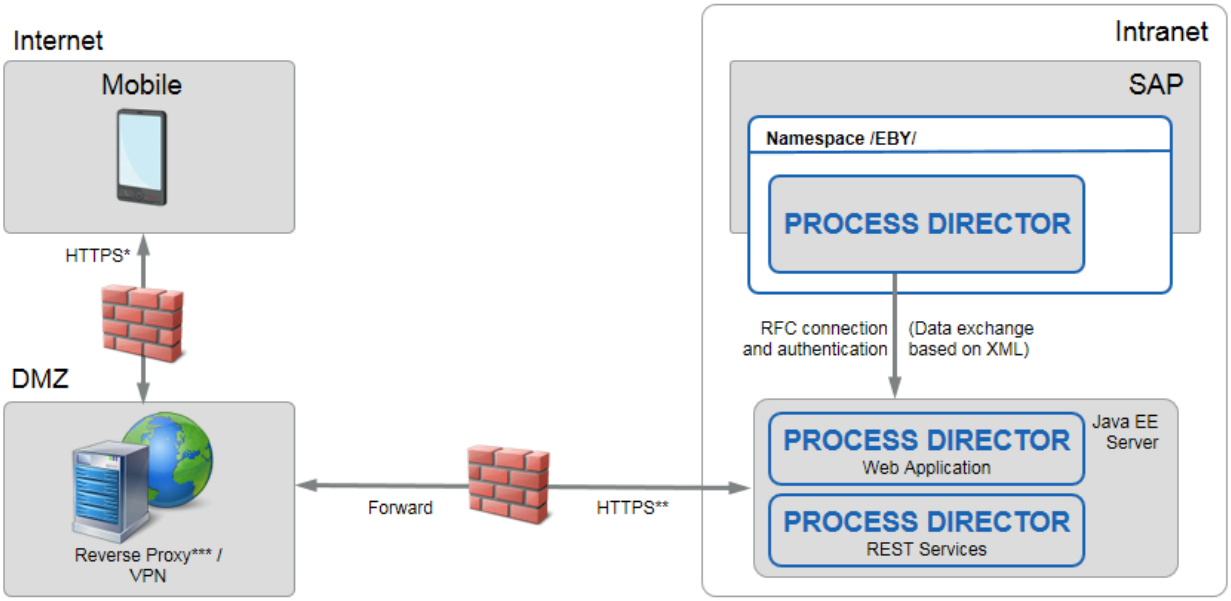
Connection scenarios

The connection scenario depends on each customer's IT infrastructure.

The App utilizes the existing network infrastructure to establish a secure connection to the back-end system. The data is encrypted when it leaves the internal network and is decrypted on the mobile device; no data is stored on the mobile device itself.

The REST Service API must be fully exposed to the mobile client. We do not recommend to expose the Apache Tomcat server directly to the internet. Instead, a reverse proxy or similar server can be used to forward the client requests to the internal network, where the REST Service API is deployed on an Apache Tomcat server.

Using a virtual private network (VPN) is also a valid connection scenario, if the VPN extends the network segment to the REST Service API.



* Not acceptable without encryption; a root certificate is needed.

** A self-signed certificate is acceptable.

*** The reverse proxy infrastructure needs to be configured by the customer; we do not make any specific recommendations.

Session persistence must be supported. It has to be possible to direct a client's requests to the same Apache Tomcat server for the duration of the session, or for the time it takes to complete a task or transaction. The time-out value is fixed and set to 30 seconds.

Configure the reverse proxy mapping

You need to configure the reverse proxy mapping to expose only the REST Service API. Configure the mapping as shown in the following example.

Any customer-specific port is supported; for example, 8443 instead of 443.

External URL	Internal URL
https://approval.customer.com/	https://internal.tomcat:8443/pdweb-wsa/rest

The start page of the App displays the external URL only.

Configure the connection parameters

To support you in the configuration and distribution of the back-end connection parameters, the App provides a QR code generator for Android and Apple mobile devices. You can generate a QR code that users can scan to import the connection parameters to the App.

1. To start the Generator for QR code, go to: https://mobile.readsoftdev.com/config/generator/qr/
2. Enter the connection parameters.
   a. **Server URL (with HTTPS)**: The URL of the server to which the App should connect. **Example:** `https://invoice.customer.com/pdweb-wsa/rest`
   b. **Parameter (optional)**: The SAP ERP system, as defined in the *saplogon.properties* file of the Process Director Web Application, that the server should connect to. This value is handed over to the Process Director web server as a part of the URL.
   c. **Description (optional)**: The description of the connection settings, for example, Production.
3. If you have defined more than one system in the `saplogon.properties` file, you have to define one default system that the App should connect to. If this system should be the default system, select the **Use as default** check box.
4. Click **Generate Code**.
5. Copy the QR code, as instructed, and click **Send E-Mail** to send it to the user via an email.

   Users who have the App installed can then scan the QR code by using the App's QR code scanner. The scanner opens automatically when users tap the QR code symbol on the start page. After verifying the displayed data, they can start the import of the server connection parameters.

Chapter 3

Requirements

SAP requirements

To use Tungsten Mobile with Process Director Accounts Payable or any Process Director business process type, it is required to have the Process Director platform transport installed. You can use Tungsten Mobile for any Tungsten Process Director business process type without having Process Director Accounts Payable installed.

SAP System minimum configuration	
Tungsten Process Director	7.10
Tungsten Process Director Accounts Payable	7.10

It is recommended to always use the latest support pack.

Other requirements

The App connects to a web service version of the Process Director Web Application. This Web Application can be deployed on the same server as the normal Process Director Web Application. Currently, the web service version of the Process Director Web Application can be shipped for only JEE-compatible servers.

Web Server minimum configuration	
Apache Tomcat	9.0 (with JRE 8) 8.5 (with JRE 7 or 8)
Web Application	`pdweb-wsa.war` - 3.02
Official SSL certificate	For example, from RapidSSL

For Apache Tomcat and Web Application deployment and configuration, see the *Tungsten Process Director Web Application Configuration Guide*.

Determine web service version

To determine the Process Director Web Application web service version, one of the following resource identifiers can be used.

- `/misc/buildinfo`

  The `APIVersion` parameter contains the web service version, the `Level` parameter contains the patch level.

```
<Version>
   <Version>7.5</Version>
   <APIVersion>3.00</APIVersion>
   <BuildNo>2016-11-08_11-59</BuildNo>
   <BuildDate>2016-11-08 10:58</BuildDate>
   <Level>2</Level>
</Version>
```

- `/misc/version`

  The `Version` parameter contains the web service version.

```
<Version>
   <Version>3.00</Version>
</Version>
```

The web service version is not the same as the Tungsten Mobile release version.

Chapter 4

Configure Process Director

The following guideline assumes that you are already familiar with the Tungsten Process Director Configuration Guide and the Tungsten Process Director Web Application Configuration Guide.

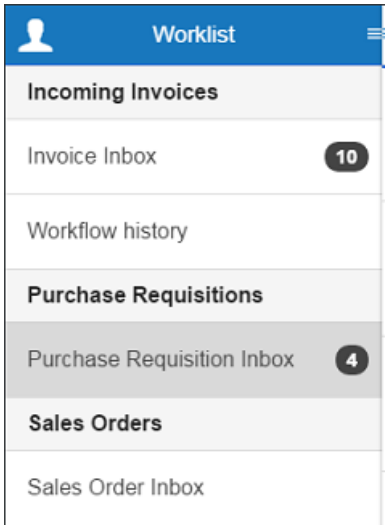
It only covers App-specific settings and does not explain the customizing screens in detail.

- Configure the Worklist
- Configure fields and layout
- Set up action restrictions
- Configure the process parameters
- Enable image attachment upload

Configure the Worklist

The Worklist is a navigation area that allows you to quickly get an overview of business documents. The documents are grouped in logical categories and subcategories, according to the business processes they belong to.

The following image shows the recommended minimum configuration for the Worklist.

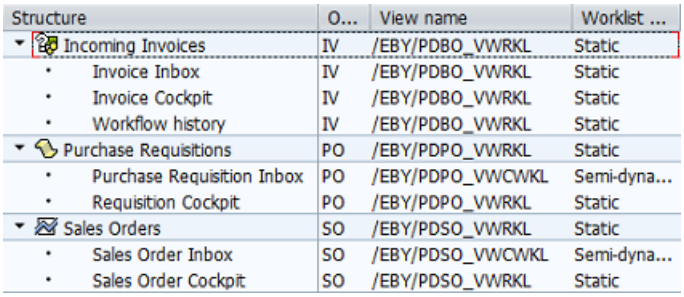


You can configure additional sub-categories to also display the history of the purchase requisitions and the sales orders business process types.

To configure the Worklist, complete the following steps (the Invoice Inbox is used as an example).

1. Create the **Invoice Inbox** node or reuse an existing one.

   All sub-categories you create for the Mobile App have to be on the first sublevel below the main node of the corresponding business process type. Sub-categories on lower levels are not supported.



Structure	O...	View name	Worklist ...
Incoming Invoices	IV	/EBY/PDBO_VWRKL	Static
Invoice Inbox	IV	/EBY/PDBO_VWRKL	Static
Invoice Cockpit	IV	/EBY/PDBO_VWRKL	Static
Workflow history	IV	/EBY/PDBO_VWRKL	Static
Purchase Requisitions	PO	/EBY/PDPO_VWRKL	Static
Purchase Requisition Inbox	PO	/EBY/PDPO_VWCWKL	Semi-dyna...
Requisition Cockpit	PO	/EBY/PDPO_VWRKL	Static
Sales Orders	SO	/EBY/PDSO_VWRKL	Static
Sales Order Inbox	SO	/EBY/PDSO_VWCWKL	Semi-dyna...
Sales Order Cockpit	SO	/EBY/PDSO_VWRKL	Static

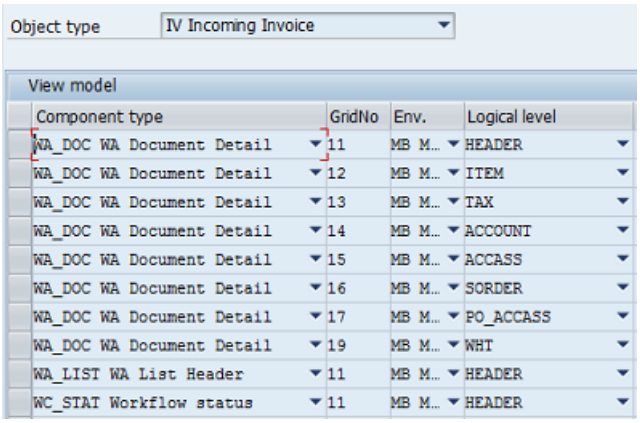
2. In the **Change basic data** popup, under **Not visible in**, clear the **Mobile Application** check box.

   Complete this step for the main business process type and for the **Invoice Inbox** node.

Configure fields and layout

Tungsten Mobile reuses the Process Director view model configuration to define available fields and the layout in which they are presented in the Tungsten Mobile App. For general information on the Process Director view model, see the *Tungsten Process Director Configuration Guide*.

For the App, the view model configuration provides dedicated Component type/GridNo combinations, which let you define a layout. You can identify them by the MB Environment.



Object type: IV Incoming Invoice

View model

Component type	GridNo	Env.	Logical level
WA_DOC WA Document Detail	11	MB M...	HEADER
WA_DOC WA Document Detail	12	MB M...	ITEM
WA_DOC WA Document Detail	13	MB M...	TAX
WA_DOC WA Document Detail	14	MB M...	ACCOUNT
WA_DOC WA Document Detail	15	MB M...	ACCASS
WA_DOC WA Document Detail	16	MB M...	SORDER
WA_DOC WA Document Detail	17	MB M...	PO_ACCASS
WA_DOC WA Document Detail	19	MB M...	WHT
WA_LIST WA List Header	11	MB M...	HEADER
WC_STAT Workflow status	11	MB M...	HEADER

You can configure fields and their layout for the following objects.

- Document overview list

  The document overview list is a flexible list that displays the configured overview fields in a two- or four- column layout, depending on the screen size of the user device. For details about the configuration, see Configure the document overview list.
- Document detail view

  The document detail view displays the details of the document that was selected from the document overview list. For details about the configuration, see Configure the document detail view.

Configure the document overview list

Before you can add the Process Director Accounts Payable fields to the view model, you need to configure them in the `/COCKPIT/WI11` transaction. The number of fields is not limited, but it is recommended to configure an even number of fields (best 4, 6 or 8).

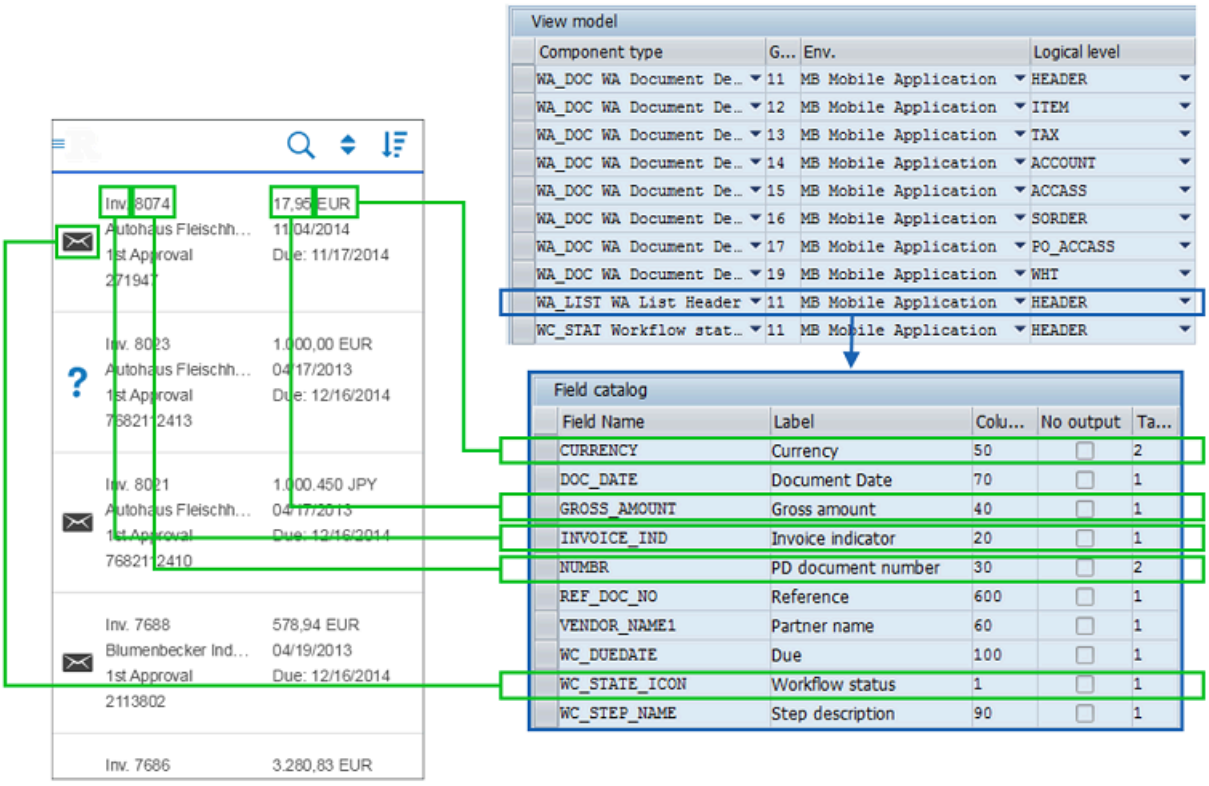
View model settings

Component type	WA_LIST
GridNo	11
Environment	MB
Logical level	HEADER

You can configure the document overview list as follows.

- Use the **Column number** field to set the order in which the fields are displayed, processed, and rendered.
  - The first field in the view model field configuration, based on the column number, is displayed at the top-left section of the screen.
  - The fields are processed and rendered in the UI in the order in which they arrive according to the column number.
- To display two fields side-by-side, use the **Tab column** property.
- To hide a field label, use the **Suppress label** option.
- To display one icon in the document overview list, use the **WC_STATE_ICON** or **STATE_ICON** options.

  The icon must be configured in the first **Column number**.

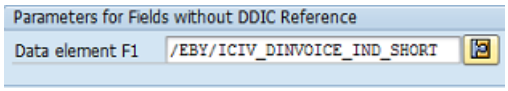


Overview functions

Function	Description
	Filter
	Sort by field
	Change sort order (ascending / descending)

Set field labels and key/value pairs

To overwrite field labels and key/value pairs by using the view model, enter the text for the field or enter a custom **Data element**.



In the default settings, this is used to exchange the normal Invoice indicator value (which would be X or empty) with proper text. This can be achieved by using a custom domain in the customer data element, with a proper value range.

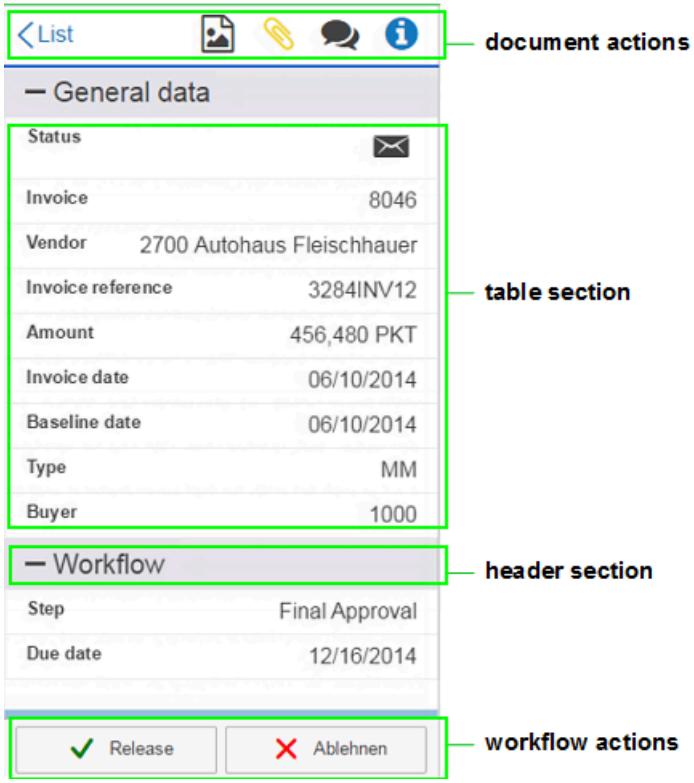
	Fix.val.	Short text
	X	Inv.
=		Cred.

Configure the document detail view

The configuration of the layout of the document detail view is controlled by the Process Director view model customization and offers some additional settings like arranging fields in tabs that can be minimized by the user.

For the best user experience, we recommend that you keep the number of fields low, connect key value fields with their descriptions, for example, Vendor Number and Name, and not mix too many layout options in one section.

The following figure shows the main areas of the document detail view.



Document actions

Action	Description
List	Unlock the document and go back to the overview

Action	Description
	Show invoice image Only for Process Director Accounts Payable documents and if the invoice image is available.
	Show and add image attachments The attachment list is filtered according to the file types, PNG and JPG. The icon is yellow if attachments are available.
	Show and add document notes Chat bubbles are black if notes are available.
	Show workflow status data

Workflow actions

Action	Description
✓	Approve/Send response
×	Reject
	Forward Available only if it is enabled for the workflow step
	Send query Available only if it is enabled for the workflow step

Header section

View model settings

Component type	WA_DOC
GridNo	11
Environment	MB
Logical level	HEADER

Configure the header section

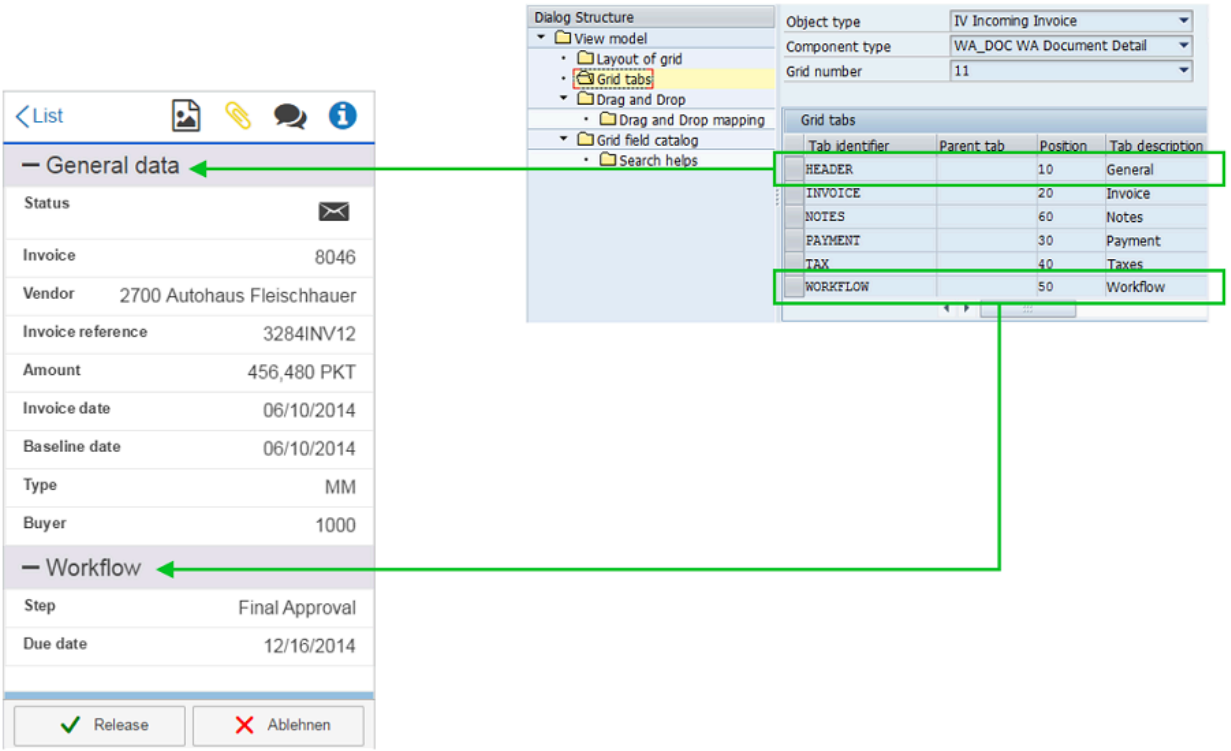
You can arrange the header section of a detail document in tabs that can be minimized by the user. You can add your own tabs with descriptions in the view model settings, or you can use existing tabs from the default settings.

You can set up the tab display for the header section as follows.

- To make a field that you added to the view model header section visible in the App, assign it to a **Tab identifier**.
- To remove a default tab, hide or reassign all the fields in that tab.
- To control the order of fields in a tab, use the **Tab row parameter**.

- If suitable for the layout, you can display two fields in one row, for example the amount and the currency. To do so, you have to assign both the fields to the same **Tab row** and use the **Tab column** parameter to display both fields side-by-side.

  As of now, the App is limited to displaying only two fields in one row. The **Suppress label** flag can be used to hide labels. The fields in the second **Tab column** will never show the field labels.



Configuration example

In the following example, the first four rows in the General tab are configured.

Field Name	Tab ID	Tab row	Tab column	Suppress label
WC_STATE_ICON	HEADER	1	1	
INVOICE_IND	HEADER	10		X
DOCNO	HEADER	10	2	
VENDOR_NO	HEADER	20		
VENDOR_NAME1	HEADER	20	2	
REF_DOC_NO	HEADER	30		

Table section

View model settings

Component type	WA_DOC
Environment	MB
Logical level	*

Configure the table section

The table section configuration is similar to the header section configuration, but without the possibility to assign fields to tabs. Due to the screen size limitation on mobile phones, the tables do not show up as classical tables, but are displayed similar to the document overview list, with fields displayed one below the other.

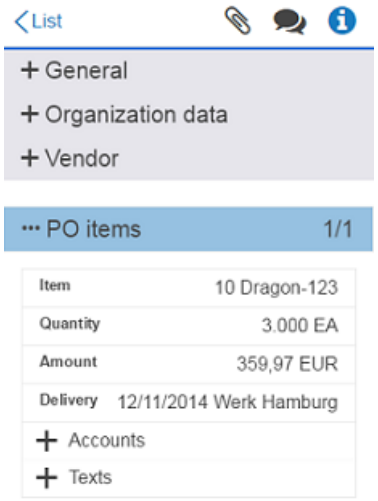
- The order in which the fields are displayed is controlled by the **Column number** field in the view model.
- Use the **Tab column** parameter to display two fields side-by-side, as in the header section.

  Sub-table buttons appear automatically when the sub-tables are configured. They use the same layout settings as the normal tables.

Configuration examples

Example 1

This example shows a possible setup for the display of purchase order items.

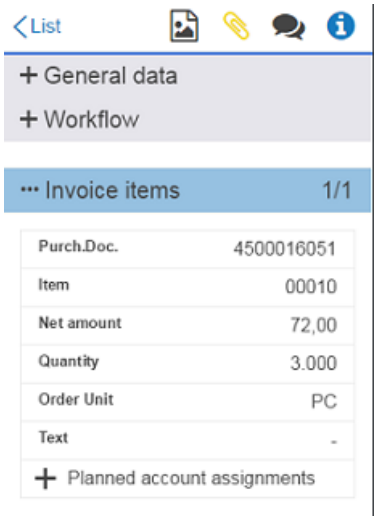


Field name	Column number	Tab column	Suppress label
PO_ITEM	10		
SHORT_TEXT	20	2	

Field name	Column number	Tab column	Suppress label
QUANTITY	30		
PO_UNIT	40	2	
NET_PRICE_SUM	50		
CURRENCY	60	2	
DELIVERY_DATE	70		
PLANT_NAME	80	2	

Example 2

This example shows a possible setup for the display of invoice items.



Field name	Column number	Tab column	Suppress label
PO_NUMBER	10	1	
PO_ITEM	20	1	
ITEM_AMOUNT	30	1	
QUANTITY	40	1	
PO_UNIT	50	1	
ITEM_TEXT	60	1	

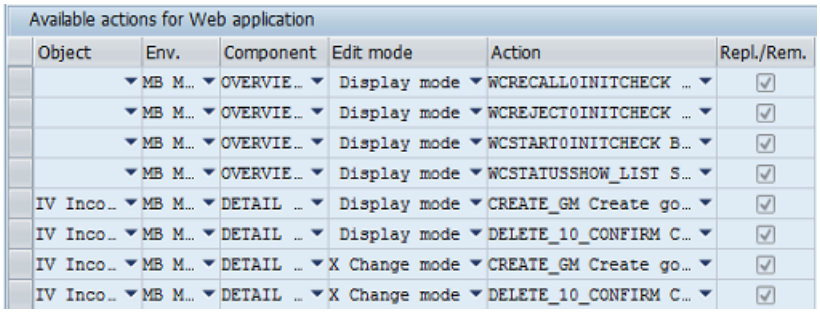
Set up action restrictions

As the App supports only a limited number of Process Director actions, it is not required to reduce the number of available actions for the App.

However, to reduce the data sent between the server and the client, it is recommended to review the available actions that are configured for the Web Application, and remove all the unnecessary action configuration

1. Go to the `/EBY/PDWA_VACT` transaction.

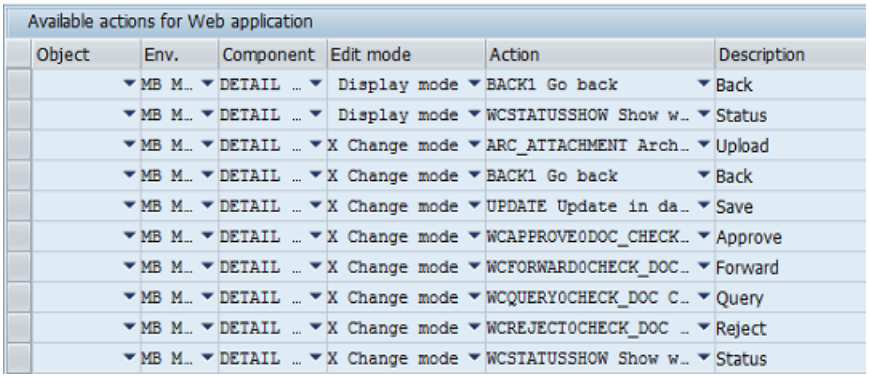
   Use the **Environment** field to distinguish between the normal Web Application (**WA**) and the Mobile Application (**MB**).
2. Remove unnecessary actions by adding them to the Change settings in the `/EBY/PDWA_VACTC` transaction.


Available actions for Web application

Object	Env.	Component	Edit mode	Action	Repl./Rem.
	MB M…	OVERVIE…	Display mode	WCRECALL0INITCHECK …	☑
	MB M…	OVERVIE…	Display mode	WCREJECT0INITCHECK …	☑
	MB M…	OVERVIE…	Display mode	WCSTART0INITCHECK B…	☑
	MB M…	OVERVIE…	Display mode	WCSTATUSSHOW_LIST S…	☑
IV Inco…	MB M…	DETAIL …	Display mode	CREATE_GM Create go…	☑
IV Inco…	MB M…	DETAIL …	Display mode	DELETE_10_CONFIRM C…	☑
IV Inco…	MB M…	DETAIL …	X Change mode	CREATE_GM Create go…	☑
IV Inco…	MB M…	DETAIL …	X Change mode	DELETE_10_CONFIRM C…	☑

3. Set up the action restrictions, as required.

   The App supports the following actions for all business process types.


Available actions for Web application

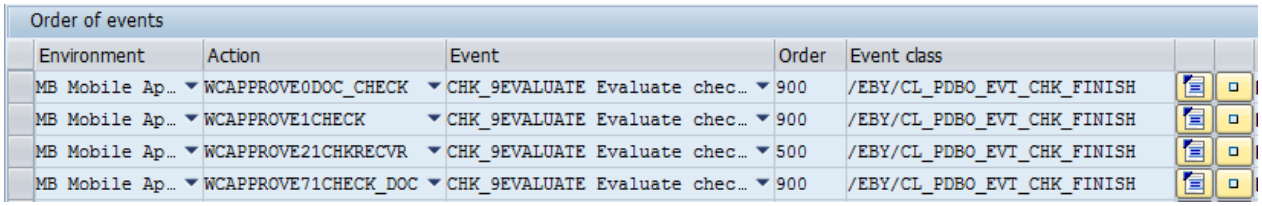
Object	Env.	Component	Edit mode	Action	Description
	MB M…	DETAIL …	Display mode	BACK1 Go back	Back
	MB M…	DETAIL …	Display mode	WCSTATUSSHOW Show w…	Status
	MB M…	DETAIL …	X Change mode	ARC_ATTACHMENT Arch…	Upload
	MB M…	DETAIL …	X Change mode	BACK1 Go back	Back
	MB M…	DETAIL …	X Change mode	UPDATE Update in da…	Save
	MB M…	DETAIL …	X Change mode	WCAPPROVE0DOC_CHECK…	Approve
	MB M…	DETAIL …	X Change mode	WCFORWARD0CHECK_DOC…	Forward
	MB M…	DETAIL …	X Change mode	WCQUERY0CHECK_DOC C…	Query
	MB M…	DETAIL …	X Change mode	WCREJECT0CHECK_DOC …	Reject
	MB M…	DETAIL …	X Change mode	WCSTATUSSHOW Show w…	Status

- Entries with an empty **Environment** are used for the Web Application and the Mobile App.
- The **BACK1** and **WCSTATUSSHOW** actions are mandatory for the display and change edit modes.
- The **ARC_ATTACHMENT** action is optional and allows mobile users to upload picture data, either by using the camera or from the picture library. For information on how to make it work, see Enable image attachment upload.

Configure the process parameters

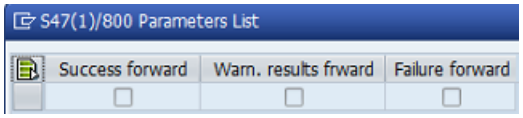
As of now, the App cannot handle Process Director action chain forwards (popups). Due to this reason, you can use process configuration to activate an App-specific execution of Process Director actions.

The most common case is the CHK_9EVALUATE event in the approve process. This event is used to evaluate the check results, and by default, it uses a forward to display warning messages to the user.


Order of events

Environment	Action	Event	Order	Event class
MB Mobile Ap…	WCAPPROVE0DOC_CHECK	CHK_9EVALUATE Evaluate chec…	900	/EBY/CL_PDBO_EVT_CHK_FINISH
MB Mobile Ap…	WCAPPROVE1CHECK	CHK_9EVALUATE Evaluate chec…	900	/EBY/CL_PDBO_EVT_CHK_FINISH
MB Mobile Ap…	WCAPPROVE21CHKRECVR	CHK_9EVALUATE Evaluate chec…	500	/EBY/CL_PDBO_EVT_CHK_FINISH
MB Mobile Ap…	WCAPPROVE71CHECK_DOC	CHK_9EVALUATE Evaluate chec…	900	/EBY/CL_PDBO_EVT_CHK_FINISH

For the App, you need to overwrite these events and change the process parameters to not use a forward.


S47(1)/800 Parameters List

Success forward	Warn. results frward	Failure forward
☐	☐	☐

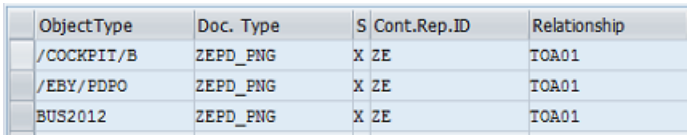
Enable image attachment upload

It is optional to activate the image upload functionality for the App; and by default, it is deactivated. Only JPG and PNG image file types can be uploaded. Both image types are stored as PNG in the connected content repository.

Only images (for example: PNG and JPEG files) can be displayed as attachments. PDF and TIFF files are also converted into images. File formats such as XLS, DOC, and PPT cannot be displayed.

To activate the upload functionality, configure the following settings on the SAP side.

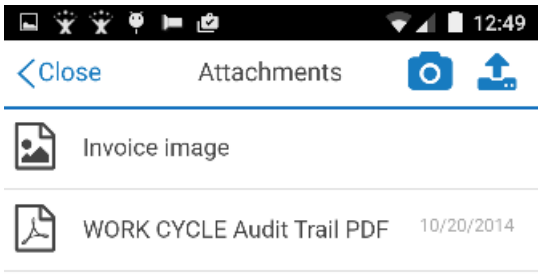
1. Enable the **ARC_ATTACHMENT** action for the **MB Environment**, as described in Set up action restrictions.
2. In the `OAC2` transaction, create a document type for the PNG document class.
3. In the `OAC3` transaction, connect **ObjectType** with **Doc. Type**.



ObjectType	Doc. Type	S	Cont.Rep.ID	Relationship
/COCKPIT/B	ZEPD_PNG	X	ZE	TOA01
/EBY/PDPO	ZEPD_PNG	X	ZE	TOA01
BUS2012	ZEPD_PNG	X	ZE	TOA01

4. In the `OAD2` transaction, ensure that the **PNG** document class is mapped to the **image/png** MIME type.
5. In the `/COCKPIT/WI15` transaction, ensure that the document type associated with the **image/png** MIME type is configured for attachment upload.

When all the requirements are fulfilled, a camera and a file picker icon are available in the attachment list of the App. Users can then add attachments by uploading pictures taken by the built-in camera or by selecting files from their photo gallery.


12:49
Close
Attachments
Invoice image
WORK CYCLE Audit Trail PDF
10/20/2014

Chapter 5

Configure the Web Application

The web service version of the Process Director Web Application uses the same configuration structure as the normal Web Application. This guide covers only the App-specific parameters.

Configuration files

After being deployed, the `wcconfig.war` file of the Process Director Web Application is extracted into three separate folders in the `../webapps/` folder.

- `wcconfig`
- `pdweb-app`
- `pdweb-wsa`

All configuration files are located in the `wcconfig` folder. The App files are kept separately in the `pdweb-wsa` folder. This is so designed to provide an easy way to upgrade the App (which replaces the `pdweb-wsa` folder), without affecting the existing configuration files.

You can configure the App using the following configuration files.

File	Location	Description
`pdweb-wsa.properties`	`../webapps/wcconfig`	Main configuration file.
`saplogon.properties`	`../webapps/wcconfig/pdweb-wsa/WEB-INF/conf`	SAP system information.
`web.xml`	`../webapps/pdweb-wsa/WEB-INF`	Standard Java configuration file.

The App uses the following (default) method to locate the configuration files.

1. It starts with the `..\webapps\pdweb-wsa` folder.
2. It goes up one folder to the `..\webapps` folder.
3. It then locates the `..\webapps\wcconfig` folder.
4. It uses the `pdweb-wsa.properties` file.

pdweb-wsa.properties

The `pdweb-wsa.properties` file is the main configuration file for the App. It contains the following web service-specific parameters. These parameters are set by default when the `wcconfig.war` file is extracted.

Parameter	Value	Description
`history.onlyapprovals`	no	If set to yes, display only approved documents in the workflow history.
`imageconvertpng`	2	Convert PDF documents to a series of PNG images (mandatory).
`imagedimension`	1000x1400	Rescale the image size.
`imagedirect`	0	Retrieve the image via the Web App.
`pd_ignore_att_url`	yes or 1	Attachments are always read using binary data. This must be set if in `/Cockpit/C21`, you did not set Image Transfer to Y.
`pd_extended_search`	yes	"Fuzzy" user search.
`pd_text_search_key_ICIVWC_RECEIVER`	FULL_NAME	Process Director Accounts Payable – user search by full name.
`pd_text_search_key_WC_RECEIVER`	LAST_NAME_SRCH: FULL_NAME	Process Director – user search by full name.

saplogon.properties

The `saplogon.properties` file is used to configure the connection to the SAP system that the App connects to.

In the parameter names, replace `sysid` with the SAP system ID. For example, replace `sysid.activate` with `TR1.activate`.

Parameter	Description
`sapsystem`	Specifies the default SAP system when there is more than one defined in the `saplogon.properties` file.
`sysid.activate`	Determines whether the connection to the system is enabled or not. Valid values: • no: the connection to the SAP system is deactivated. • yes: the connection to the SAP system is activated.

Parameter	Description
`sysid.ashost`	The host name of the application server. For information on how to set the host name, see Set the host name.
`sysid.client`	The three-digit SAP client identifier.
`sysid.ext_auth_svc`	The Java class used to authenticate users.
`sysid.ext_search`	The Java class used to search for email users.
`sysid.group`	The name of the application server group.
`sysid.jcotrace`	The SAP JCo trace level. Possible values are 0 to 10. Higher values result in more detailed logs. The JCo traces are written to the same folder as the logs of the Web Application (specified using the `logDir` setting in the `log.properties` file).
`sysid.maxconnections`	The maximum number of simultaneous connections permitted from the App to the SAP system. The number of connections is allocated from the general pool of connections to the SAP system. ℹ This is not the same as the maximum number of concurrent users, which can be higher than the maximum number of connections. The SAP Java connector (JCo) has a built-in default limit of 100 connections. This means that setting `sysid.maxconnections` to a value higher than 100 will have no immediate effect, because JCo does not allow more than 100 connections. For information on how configure more than 100 connections, see Increase the number of connections.
`sysid.lang`	Not used (deprecated).
`sysid.msghost`	The host name of the message server.
`sysid.passwd`	The SAP system user password. For SAP system releases in which passwords are not case sensitive, do not use lowercase letters in the passwords. The new versions of the RFC library (like in JCO 2.1.7 and above) do not automatically convert the passwords to uppercase. See also, SAP Note 792850. ℹ On request, Tungsten Automation can provide a tool with which you can generate a secure password so that the actual password is not displayed in the `saplogon.properties` file. For more information, see Generate a secure password.
`sysid.sso`	Not supported.
`sysid.ssouser`	Not supported.
`sysid.sysnr`	The SAP system number.

Parameter	Description

`sysid.system`	The SAP system ID, if it is different to `sysid` prefix.
	The SAP system ID is automatically taken using the `sysid` prefix, which is used for all the settings in the `saplogon.properties` file. This parameter is needed only if you want to use the same file to connect to more than one system that have different `client` or `sysnr` parameters.
	Example:
	`DR1-800.client = 800`
	`DR1-800.system = DR1`
	`DR1-0.client = 0`
	`DR1-0.system = DR1`

`sysid.user`	The SAP system user.

Set the host name

You can set the host name in the following ways.

- By using an SAP router string
  Example:

  ```
  D76.ashost =
  /H/saprouter-snc.ebydos.org/S/3298/W/p3e8aejnjg9hb1ry/H/d76.r3.ebydos.local
  ```

- By using the IP address of an SAP server
  Example:

  ```
  D76.ashost = D76.r3.ebydos.local
  ```

Increase the number of connections

The maximum number of simultaneous connections to the SAP system, which is permitted by the App, is controlled by the `sysid.maxconnections` parameter in the `saplogon.properties` file.

In the App, a connection is allocated when users log in, and is released when they log off or close the browser, or when a session timeout occurs. When many users are simultaneously logged in, the default value of the `sysid.maxconnections` parameter may often be exceeded.

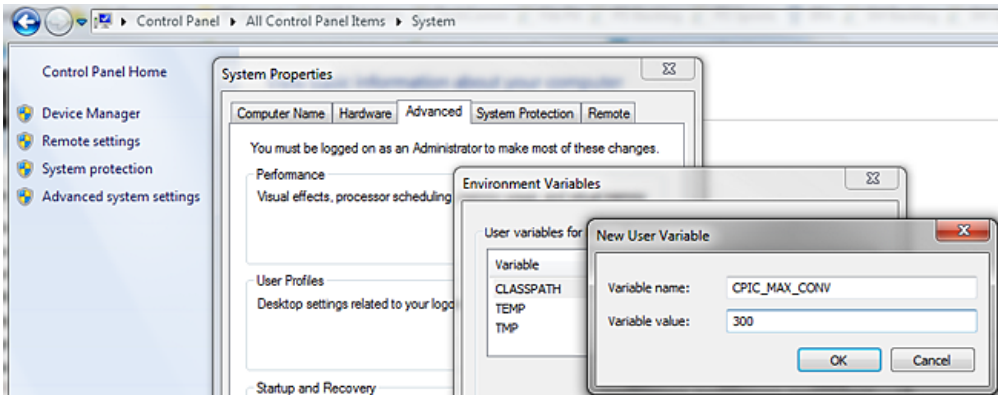
The SAP Java connector (JCo) has a built-in default limit of 100 connections. This means that setting `sysid.maxconnections` to a value higher than 100 will have no immediate effect because JCo does not allow more than 100 connections.

To increase the maximum number of connections, you need to set the `CPIC_MAX_CONV` environment variable on the server where JCo is installed, to the desired value; for example: 300.

To do so, you have the following options.

- The preferable method is to set the variable in the operating system settings. For example, for Windows:
  a. In the Windows Start menu, search for **Advanced System Settings**.
  b. Click **View advanced system settings**.
  The **System Properties** window appears.
  c. On the **Advanced** tab, click **Environment Variables**.

d. Under **User variables**, click **New** and type the variable name and value. Click **OK** to save your changes.



- You can also set this variable in the startup script of the application server by using the following commands:
  - Windows: `set CPIC_MAX_CONV=300`
  - Unix: `export CPIC_MAX_CONV=300`

Generate a secure password

Tungsten Automation can provide a tool with which you can generate a secure password so that the actual password is not displayed in the `saplogon.properties` file. You will receive the file `sec.zip`.

To generate a secure password, complete the following steps.

1. Unzip the `sec.zip` file to any Windows folder.
2. Open a command prompt, type sec <password> and press **Enter**.
   Example: sec abc123
   A secure password is generated and displayed.
3. Enter this secure password in the `saplogon.properties` file.
4. Restart Apache Tomcat.

web.xml

The `web.xml` file is the standard configuration file for Java-based web applications.

By default, the web service version of the Process Director Web Application also provides the desktop Web Application user interface.

To deactivate this, go to the `webapps\pdweb-wsa\WEB-INF` Web Application installation folder and edit the `web.xml` file. Set the `enableUI` parameter to *false*.

```
<context-param>
    <param-name>restURI</param-name>
    <param-value>rest</param-value>
</context-param>
```

```
<context-param>
    <param-name>enableUI</param-name>
    <param-value>false</param-value>
</context-param>
<context-param>
    <param-name>enableRest</param-name>
    <param-value>true</param-value>
</context-param>
```

Differences between Tungsten Mobile and Process Director Web Application

Tungsten Mobile has the following known limitations:

- The initial passwords for both SAP and Work Cycle users cannot be changed from within the Tungsten Mobile application.

  If required, this change needs to be carried out in the Process Director Web Application.
- The entries in the `/COCKPIT/WI3` transaction code for customizing a workflow step need to be set carefully as the recipients nominated for the workflow actions are displayed on the screen in Tungsten Mobile and are automatically defaulted.

  This is different from the functionality in the Process Director Web Application, where the search help must first be executed.

  Example: If the **Pre-assign processor** setting is set to **B (All assigned, any other processor)** for the Forward and Query workflow actions and no underlying User Exit control mechanism (WS2 interface type) is used, all possible users are selected. On the other hand, in the Process Director Web Application, a list of possible users is displayed in a search help window.

Chapter 6

API interface

Currently, third-party applications are not allowed to use the API.

Service URL

```
https://<server>[:port]/<web-app-name>/rest/<service-name>/<uri>
```

It is recommended to use an `https` connection with a valid root certificate. Using an `http` connection is not recommended.

Operations for service name "authentication"

Name	URI	Method
authenticate	/authenticate	POST
logout	/logout	POST

Operations for service name "user"

Name	URI	Method
getDetails	/details	GET
changePassword	/pwchange	POST
getUserDetails	/details/{userName}/{userType}	GET
getUserDetails	/details/{userName}	GET

Operations for service name "worklist"

Name	URI	Method
getTree	/tree	POST
refreshTree	/refresh	GET

Operations for service name "list"

Name	URI	Method
getList	/list/{documentType}/page/{pageNo}	POST
getListView	/listview/{documentType}	GET

Operations for service name "document"

Name	URI	Method
getDocView	/docview/{documentType}	GET
getDetail	/detail/{documentType}/{documentID}/{action}	POST
getAttachment	/attachment/{documentID}/{attachmentID}	GET
getAttachmentData	/attachment/{documentID}/{attachmentID}/page/{pageNo}	GET
documentAction	/action/{documentID}/{actionID}	POST
upload	/upload/{documentID}/{uplaodID}/{actionID}	POST
cancelForward	/cancel/{documentID}	GET
textSearch	/txtsearch/{documentType}/{documentID}	POST

Operations for service name "misc"

Name	URI	Method
getVersion	/misc/version	GET
getBuildInfo	/misc/buildinfo	GET
getPatchHistory	/misc/patchHistory	GET

For details about how to use these identifiers, see Determine the Process Director Web Application web service.