



# ReadSoft PROCESS DIRECTOR Web Application Configuration Guide

Version: 7.7

Date: 2021-12-22

# Legal Notice

© 2018 Kofax. All rights reserved.

Kofax is a trademark of Kofax, Inc., registered in the U.S. and/or other countries. All other trademarks are the property of their respective owners. No part of this publication may be reproduced, stored, or transmitted in any form without the prior written permission of Kofax.

# Table of Contents

<b>About this guide.....</b>	<b>12</b>
Related documentation.....	12
Architecture overview.....	13
Deploy the Web Application.....	14
Installation files.....	14
Rename the Web Application.....	15
Deploy to Apache Tomcat.....	15
Deploy to SAP NetWeaver Application Server JAVA >= 7.1.....	15
Deploy multiple applications.....	16
Rename the applications.....	16
Deploy the first application.....	16
Deploy the second application.....	16
Adjust the memory pool for Java.....	17
Increase the number of connections.....	17
SAP parameters.....	18
Configuration files.....	19
Overview.....	19
Specify the location of pdweb-app.properties.....	19
Reduce memory consumption.....	21
Upgrade to a new version.....	21
Upgrading from version 7.1 and later.....	21
Upgrading from version 3.2 and earlier.....	22
Connect to SAP systems.....	24
Connection method.....	24
Configuration file.....	24
Parameters.....	24
Location.....	24
Connect to an SAP application server.....	24
Secure passwords.....	25
Connect to multiple application servers.....	25
Connect to an SAP message server.....	26
Connect to multiple servers in one Worklist.....	26
Configuration file.....	26
Parameters.....	26

Provide multiple Worklist configurations.....	27
SSO and external authentication.....	29
Single Sign-On (SSO).....	29
MySAP SSO2 ticket.....	30
Windows NT LAN Manager.....	33
HTTP header or HTTP cookie value.....	35
X.509 Client Certificate.....	36
OpenSSO.....	37
Create a keystore for an SSL certificate.....	38
SAML 2.0.....	39
SNC mapping for SSO ID.....	46
SSO scenarios.....	46
SSL scenarios.....	49
External authentication services.....	50
Novell Authentication Service.....	51
Microsoft Active Directory.....	52
General LDAP Authentication.....	53
Common configuration tasks.....	57
Set the display language.....	57
Parameters.....	58
Enable users to edit profiles.....	59
Configure user settings.....	60
Prerequisites.....	60
Use Messages.properties keys.....	61
Examples.....	61
Enable workflow recall for AP.....	64
Create invoices for MM or FI documents.....	64
Create custom buttons.....	64
Create a custom button.....	65
Example.....	65
Use custom user searches (PD AP only).....	67
Customize user searches.....	67
Interface to search Email users.....	68
Use another search function.....	68
Configure icons for follow-up flags (PD AP only).....	69
Add a help link.....	69
ReadSoft PROCESS DIRECTOR appearance.....	71
Themes.....	71

CSS.....	72
Print CSS.....	72
Logos.....	72
Other images.....	72
GUI texts.....	72
Change GUI texts.....	73
Attachments.....	73
Node counters.....	73
Number of rows displayed in tables.....	74
File format conversion.....	74
Requirements.....	74
Parameters.....	74
Administration tools and logs.....	75
Log files.....	75
Administrator mode.....	76
Initial configuration.....	77
Configuration files.....	78
Parameter syntax and path notation.....	79
pdweb-app.properties.....	79
accounting.copy.FIELD (PD AP only).....	79
accounting.modifycount (PD AP only).....	79
accounting.preset (PD AP only).....	80
accounting.preset.STEPID (PD AP only).....	80
addlanguages.....	80
administratorN.....	80
autodetailmode (PD AP only).....	81
browserlocale.....	81
createtaxes (PD AP only).....	82
csvDownloadList.....	82
editmasterdata.....	83
editpassword.....	83
editpersonalsettings.....	83
editprofile.....	84
editprofilesap.....	84
editsubstitutes.....	84
editusercontentfields (PD AP only).....	84
extsearch.default.....	84
extsearch.STEPID.....	85

formspath (PD AP only).....	85
helpconfig.....	85
history.attachfile (PD AP only).....	85
history.onlyapprovals (PD AP only).....	86
history.stateselection (PD AP only).....	86
ignorefieldstateinlist (PD AP only).....	86
imageattach (PD AP only).....	87
imageattach.STEPID (PD AP only).....	87
imageconvertjpg.....	87
imageconvertpdf.....	88
imageconvertpdf.permissions.....	88
imageconvertpng.....	89
imageinlist (PD AP only).....	89
invoice.createatonce (PD AP only).....	89
languages.....	89
languageselection.....	90
lineitems.editable (PD AP only).....	90
lineitems.modifycount (PD AP only).....	90
logconfig.....	91
loginheader.....	91
logo.....	92
logoff_redirect_url.....	92
logoheight.....	92
maxresult.search.....	93
messageconfig.....	93
multiaccounting.check.....	94
multiaccounting.check.STEPID.....	94
multiprocessing.approve.....	94
multiprocessing.approve.checksteps.....	94
multiprocessing.forward.....	95
multiprocessing.forward.checksteps.....	95
multiprocessing.reject.....	95
multiprocessing.reject.checksteps.....	96
multiprocessing.substitution.....	96
normaltimeout.....	96
ntlmauthenticate.....	96
ntlmauthenticate.error.....	98
ntlmauthenticate_remove_domain.....	98

pd_attachment_list_minimized.....	98
pd_bg_search_def.....	98
pd_client_download_url.....	100
pd_date_format.....	100
pd_doc_navigate.....	101
pd_extended_search.....	101
pd_field_help_delay.....	102
pd_filter_list.....	103
pd_formats_from_sap.....	103
pd_group_message.....	104
pd_header_display_mode.....	104
pd_help_icon_pos.....	105
pd_ics_only_quickstart (PD AP only).....	105
pd_ignore_att_url (Web Service only).....	106
pd_imagedocking_width.....	106
pd_initialsplit.....	106
pd_mime_detection.....	106
pd_node_counters.....	107
pd_notes_in_detail.....	107
pd_number_format.....	107
pd_page_size_list.....	108
pd_page_size_hdr_table.....	108
pd_page_size_search.....	108
pd_page_size_table.....	109
pd_print_full_text.....	110
pd_print_page.....	110
pd_search_auto_select.....	110
pd_search_on_change.....	111
pd_search_on_change_DOCTYPE_FIELDID.....	111
pd_searchhelpkey.....	112
pd_select_last_node.....	112
pd_select_mode.....	113
pd_show_last_note.....	114
pd_show_old_messages.....	114
pd_show_tif_embedded.....	115
pd_skip_selection_screen.....	115
pd_subtable_first.....	115
pd_suggest_mode.....	116

pd_text_search_key.....	117
pd_user_profile_as_node.....	118
pd_user_settings.....	118
pd_value_summary.IV (PD AP only).....	118
pd_visual_timeout.....	119
pd_warning_new_version.....	120
pd_wfsteps_in_header.....	120
pdap_auto_image (AP only).....	120
pdap_goto_next_doc_approve.....	121
pdap_mark_unread (AP only).....	121
pdap_show_maa_table (AP only).....	122
pdap_show_po_history.....	122
pdap_show_processed.....	122
pdap_show_userid_in_search (AP only).....	123
pdap_use_pd_field_names (PD AP only).....	123
pluginconfig.....	123
portalmode.....	124
profile.department.editable.....	124
profile.phone.editable.....	124
saplogconfig.....	125
saplogging.....	125
saplogonconfig.....	125
showimagebutton.....	125
showlastlogin.....	126
showlinks.....	126
showtaxes (PD AP only).....	126
sso-cookiename.....	126
template.createfrom (PD AP only).....	127
template.save (PD AP only).....	127
theme.procdir.....	127
undo (PD AP only).....	128
upload.html.pdfconverter.....	128
userformat.profile.....	128
userformat.superior.....	128
userformat.superior.tooltip.....	129
userformat.workflow.status (PD AP only).....	129
userpriority.....	129
wb_create (PD AP only).....	130

wallowsapsbst.....	130
wintitle.....	130
xss_security_header.n.....	130
saplogon.properties.....	131
sapsystem.....	131
sysid.activate.....	131
sysid.ashost.....	131
sysid.client.....	131
sysid.ext_auth_svc.....	132
sysid.ext_search.....	132
sysid.group.....	132
sysid.jcotrace.....	132
sysid.lang.....	132
sysid.maxconnections.....	132
sysid.msgghost.....	132
sysid.passwd.....	133
sysid.sso.....	133
sysid.ssouser.....	133
sysid.sysnr.....	133
sysid.system.....	133
sysid.user.....	134
log.properties.....	134
Sample log entry.....	134
appName.....	134
dailyFile.....	134
dateFormat.....	135
host.....	135
level.....	135
logDir.....	135
logName.....	136
separator.....	136
showDate.....	136
timeFormat.....	136
log4sap.properties.....	136
plugin_configuration.properties.....	137
PDDataProvider.....	137
OtherPool_1.....	137
OtherPool_16.....	137

icon_mapping.properties.....	137
mimetypes.properties.....	137
Messages.properties.....	138
Create a language-specific Messages.properties file.....	138
customer_buttons.properties.....	139
help_configuration.properties.....	141
user_settings.xml.....	142
_default.json.....	144
connections.....	144
authConfig.....	145
displayMode.....	146
systemWorklistconfigs.....	146
tenants.properties.....	149
Enable automatic logon.....	150
Requirements.....	150
Procedure.....	150
Install IIS.....	151
Copy Tomcat files to IIS.....	153
Create Tomcat files for IIS SSO.....	154
jk2.properties.....	155
server.xml.....	155
uriworkermap.properties.....	156
workers.properties.....	157
Registry entries for Windows 2003.....	157
Configure ntlmauthenticate to use IIS.....	158
Configure IIS.....	158
Add an ISAPI restriction.....	158
Add an ISAP filter.....	159
Create virtual directories.....	160
SSO configuration for Windows 7 users.....	162
Internet Explorer.....	162
Windows 7.....	162
SSO configuration for Firefox users.....	163
Install JRE, Tomcat and SAP Java Connector.....	165
Install Java Runtime Environment.....	165
Install Tomcat.....	166
Install the SAP Java Connector.....	167
Install the SAP Java Connector.....	168

- Troubleshoot the application..... 170
  - Where can I find the sample configuration files?..... 170
  - Should I use 32bit or 64bit software versions?..... 170
  - My SSO setup does not work. How can I find the source of error?..... 170
  - The HTTP Error 404 is returned when the Web Application URL is called..... 170
  - When using the Web Application URL, the 'pdweb-app' or 'init.do' file downloads..... 171
  - Suggestions do not work - Exception javax.persistence.PersistenceException error..... 171

# About this guide

This guide describes how to deploy and configure the Kofax ReadSoft PROCESS DIRECTOR Web Application™. It assumes you are already familiar with the general concepts and basic use of Kofax ReadSoft PROCESS DIRECTOR™.

The ReadSoft PROCESS DIRECTOR Web Application only works if ReadSoft PROCESS DIRECTOR is installed. See the PROCESS DIRECTOR Import Guide for instructions on installing ReadSoft PROCESS DIRECTOR.

For performance reasons, we do not recommend using the Web Application for documents with more than 100 line items. Such documents should be processed in the SAP GUI only.

Examples in this guide use Apache Tomcat as the Web Application server. Although other Web Application servers can be used, Tomcat is the recommended server and provides the best default behavior for the ReadSoft PROCESS DIRECTOR Web Application.

## Related documentation

The product documentation set for is available at the following location.

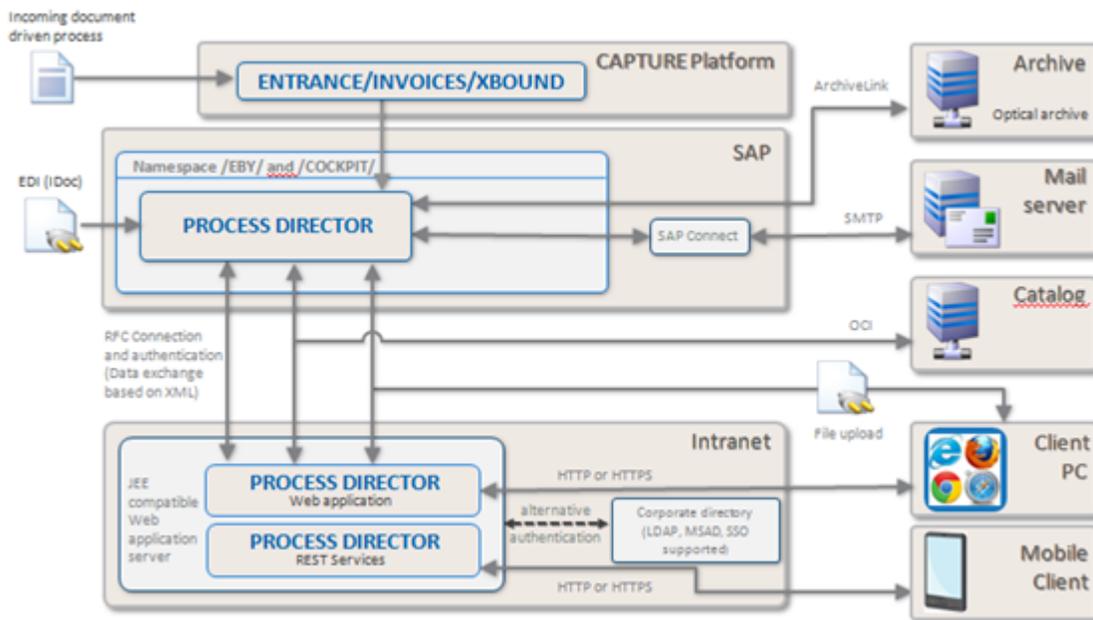
[https://docshield/Portal/Products/RSPD/RS\\_Process\\_Director.htm](https://docshield/Portal/Products/RSPD/RS_Process_Director.htm)

In addition to this guide, the documentation set includes the following items:

- *ReadSoft PROCESS DIRECTOR User Guide*
- *ReadSoft PROCESS DIRECTOR Configuration Guide*
- *ReadSoft PROCESS DIRECTOR Advanced Configuration Guide*
- *ReadSoft PROCESS DIRECTOR Import and Upgrade Guide*
- *ReadSoft PROCESS DIRECTOR Supported SAP Releases*
- *ReadSoft PROCESS DIRECTOR Reference Guide*
- *ReadSoft PROCESS DIRECTOR License Installation Guide*
- *ReadSoft PROCESS DIRECTOR Product Availability and GUI Languages*
- *ReadSoft PROCESS DIRECTOR Troubleshooting Guide*
- *ReadSoft PROCESS DIRECTOR Email-based Approval Configuration Guide*
- *Process Director for use with SAP Fiori® Installation and Configuration Guide*
- *ReadSoft PROCESS DIRECTOR Web Application User Guide*
- *ReadSoft PROCESS DIRECTOR Web Application Configuration Guide*
- *ReadSoft PROCESS DIRECTOR Web Application Patches*
- *ReadSoft PROCESS DIRECTOR Web Application Technical Specifications*

# Architecture overview

The ReadSoft PROCESS DIRECTOR Web Application is part of a larger solution. The following image illustrates the architecture of a typical solution and the place of the ReadSoft PROCESS DIRECTOR Web Application within it. Note that ReadSoft PROCESS DIRECTOR also resides in SAP, as well being a Web Application.



# Deploy the Web Application

For the hardware and software requirements that have to be met, as well as for the test environment requirements, see the PROCESS DIRECTOR Web Application Technical Specifications.

To deploy the ReadSoft Web Application, perform the following procedures.

1. Unpack the required installation ZIP files. The files you need depend on the Web Application server you want to use. For more information, see [Installation files](#).
2. If required, rename the Web Application. For more information, see [Rename the Web Application](#).
3. Deploy the Web Application. Perform the procedure that is applicable for the Web Application server that you want to use.
  - a. [Deploy to Apache Tomcat](#)
  - b. [Deploy to SAP NetWeaver Application Server JAVA >= 7.1](#)
4. If required, you can also deploy more than one Web Application on the same machine. For more information, see [Deploy multiple applications](#).

Optionally, you can complete the following procedures.

[Adjust the memory pool for Java](#)

[Increase the number of connections](#)

## Installation files

The ReadSoft PROCESS DIRECTOR Web Application is a Java Web Application. The files you need depend on the Web Application server you use.

Web server	File	Description
Apache Tomcat	pdweb-app.war	The ReadSoft PROCESS DIRECTOR Web Application.
	wcconfig.war	Configuration files.
SAP NetWeaver	pdweb-app.ear	Contains pdweb-app.war and some configuration files in the META-INF folder.
	wcconfig.ear	Configuration files.

These files are sent as ZIP files and are password protected (to ensure they are not blocked by email server protection filters). The password is readsoft.

## Rename the Web Application

You can rename the Web Application in order to:

- Have a different URL.
- The path after the server name can be changed.  
Example: `http://localhost:8080/newname/init.do`
- [Deploy more than one Web Application on the same machine.](#)

To rename the Web Application, complete the following steps.

1. Rename the `pdweb-app.war` file (that is, *before* deploying it!)  
Example: `pdweb-app_TEST.war`.
2. [Deploy the Web Application.](#)  
Two folders are created: One with the new name (for example, `pdweb-app_TEST`) and `wcconfig`.
3. Rename the `pdweb-app.properties` file in the `../webapps/wcconfig/` folder.

❗ Example: `pdweb-app_TEST.properties`.  
Example: `pdweb-app_TEST.properties`.

4. Rename the `pdweb-app` folder in the `../webapps/wcconfig/` folder.

## Deploy to Apache Tomcat

To deploy the ReadSoft Web Application to Tomcat, complete the following steps.

1. If Tomcat is running, stop it.
2. Place the `pdweb-app.war` and `wcconfig.war` files in the `../Tomcat/webapps/` folder.
3. Start Tomcat.

Tomcat decompresses the WAR files to two new folders: `pdweb-app` and `wcconfig`.

## Deploy to SAP NetWeaver Application Server JAVA >= 7.1

To deploy the ReadSoft PROCESS DIRECTOR Web Application to SAP Netweaver JAVA >= 7.1, complete the following steps.

1. Call the program using `telnet localhost 5<XX>08`.
2. Log in using an administrator user or a user with administration rights.
3. Deploy using one of the following commands:
  - `DEPLOY c:\path\to\file.sca version_rule=all on_prerequisite_error=stop`

- DEPLOY /path/to/file.sca version\_rule=all on\_prerequisite\_error=stop

**i** See SAP Note [1921719](#) for more information on how to deploy the same version of the software/development component into the JAVA system by using the telnet command for 7.1x onward.

See SAP Note [1921719](#) for more information on how to deploy the same version of the software/development component into the JAVA system by using the telnet command for 7.1x onward.

## Deploy multiple applications

You can deploy more than one ReadSoft Web Application on the same machine. For example, you may want to have one instance for testing, and another for production.

To deploy multiple applications, complete the following procedures.

**i** If you are using JCo3, you must also move the jcolayer library to the Tomcat main library folder and remove it from all Web Application library folders. See Using JCo 3.0 in the *PROCESS DIRECTOR Web Application Technical Specifications* guide for more information.

## Rename the applications

To rename the application, complete the following step.

- The first thing to do is to name the applications you want to deploy differently. See [Rename the Web application](#).

Example: pdweb-app\_TEST.war and pdweb-app\_PRODUCTION.war.

Deploy the first application

## Deploy the first application

To deploy the first application, complete the following steps.

1. [Deploy to Apache Tomcat](#).
2. If you have renamed the WAR file you deployed, you must also rename the pdweb-app.properties file and pdweb-app folder as described in [Rename the Web application](#).

## Deploy the second application

To deploy the second application, complete the following steps.

1. Rename the WAR file.  
Example: pdweb-app\_PRODUCTION
2. Make a duplicate of the configuration folder, using the same name as the WAR file.  
Example: Make a duplicate of the ../webapps/wcconfig/pdweb-app\_TEST folder and call it ../webapps/wcconfig/pdweb-app\_PRODUCTION.  
Result: You now have two configuration folders in ../webapps/wcconfig/:

- \* pdweb-app\_TEST
- \* pdweb-app\_PRODUCTION

3. Deploy the second Web Application.

❗ Only deploy the main WAR file (for example, pdweb-app\_PRODUCTION). Do not deploy a second wconfig.war file!

4. Copy the ../webapps/<WebApplication2>/WEB-INF/conf/web-app.properties file to the ../webapps/wconfig/ folder.
5. Rename the web-app.properties file using the same name as the WAR file you deployed.  
Example: web-app\_PRODUCTION.properties

## Adjust the memory pool for Java

For some deployments, the default memory allocated for Java to use may not be enough. As a result, you may receive memory overflow exception errors. You can fix this problem by specifying your own values. ReadSoft recommends about 30 MB per concurrent user session. Thus, if 100 users are logged on simultaneously, you can expect memory usage of around 3 GB.

To change memory values for Apache Tomcat, complete the following steps.

1. Open the Monitor Tomcat utility program.
2. Go to the **Java** tab.
3. Specify the **Initial memory pool** and **Maximum memory pool**.

## Increase the number of connections

The maximum number of simultaneous connections permitted from the ReadSoft Web Application to the SAP system is controlled by the parameter [sysid.maxconnections](#) in the saplogon.properties file.

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. In the ReadSoft PROCESS DIRECTOR Web Application, a connection is allocated when the user logs on and released when he logs off or closes the browser, or when a session timeout occurs. When many users are logged on simultaneously, the default value of the [sysid.maxconnections](#) parameter may often be exceeded.

❗ In previous releases, the maximum number of SAP connections specified could be internally multiplied by 10. This is not done anymore.

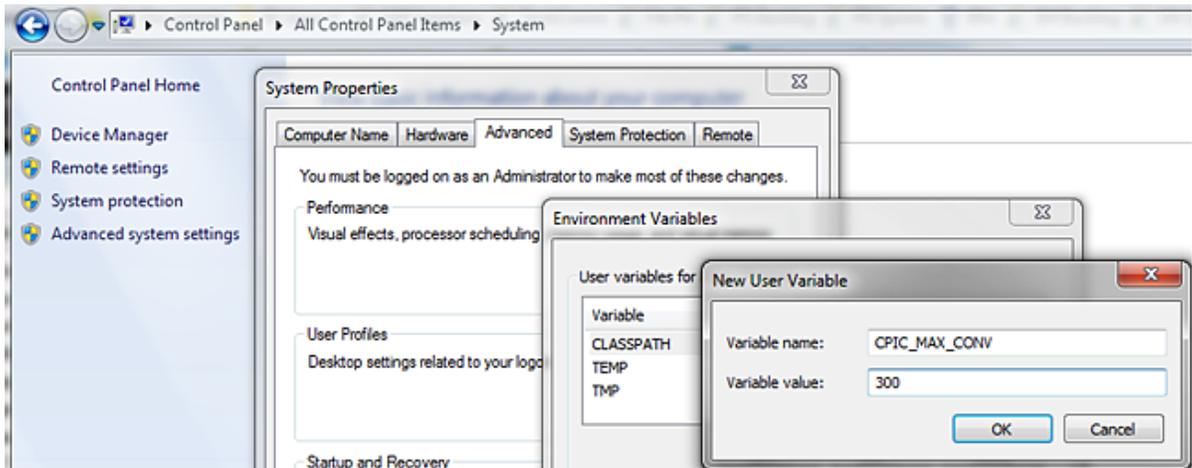
You can increase the maximum number of connections to more than 100 by setting the operating system environment variable `CPIC_MAX_CONV` on the server where JCo is installed, that is, for the Web Application server that runs the application that uses JCo. For example, if you want to set [sysid.maxconnections](#)=300, you must set `CPIC_MAX_CONV=300`.

You can set this variable in the startup script of the application server using the following commands:

- Windows: `set CPIC_MAX_CONV=300`
- Unix: `export CPIC_MAX_CONV=300`

However, the preferable method is to set the variable in the operating system settings. For example, for Windows:

1. Go to **Start > Control Panel > System > Advanced System Settings**.
2. On the **Advanced** tab, click the **Environment Variables** button and add the variable and a value.



## SAP parameters

Additionally, you should check the following SAP parameters. The rdisp/ parameters can also affect the number of permitted connections.

Parameter	Description
gw/max_sys	These SAP profile parameters define the maximum number of connections from the SAP site. Set them to the same value as CPIC_MAX_CONV. For more information, see SAP Notes <a href="#">314530</a> and <a href="#">1507034</a> .
gw/max_conn	
rdisp/tm_max_no	Maximum permitted number of users Setting rdisp/tm_max_no = 2000 will allow 2000 logged-in users combining DIA and RFC on a single SAP application server.
rdisp/rfc_max_login	Percentage of permissible RFC logons Setting rdisp/rfc_max_login = 90 will allow 1800 logged-in RFC users on a single application server (90% of 2000).

Parameter	Description
rdisp/tm_max_own_login	Percentage of permissible RFC logons for a single user Setting rdisp/tm_max_own_login = 6 will allow a single user to occupy a maximum of 120 sessions on a single application server (6% of 2000).

See the SAP documentation for more information.

## Configuration files

### Overview

The ReadSoft PROCESS DIRECTOR Web Application is comprised of [two WAR files](#). After being deployed, these files extract to two separate folders in the `../webapps/` folder:

- `wcconfig`
- `pdweb-app`

All configuration files are in the `wcconfig` folder. The Web Application files are kept separately in the `pdweb-app` folder. This is designed to provide an easy way to upgrade the Web Application (which replaces the `pdweb-app` folder) without affecting existing configuration files.

The primary configuration file is `pdweb-app.properties`, which is saved directly in the `wcconfig` folder.

Most other configuration files are saved in the `wcconfig\pdweb-app\WEB-INF\conf\` folder.

ReadSoft PROCESS DIRECTOR uses the following (default) method to locate the configuration files:

1. It starts in the `..\webapps\pdweb-app` folder.
2. It goes up one folder to the `..\webapps` folder.
3. It goes down to the `..\webapps\wcconfig` folder.
4. It uses the `pdweb-app.properties` file. The `pdweb-app.properties` file also specifies the locations for the other configuration files.

### Specify the location of `pdweb-app.properties`

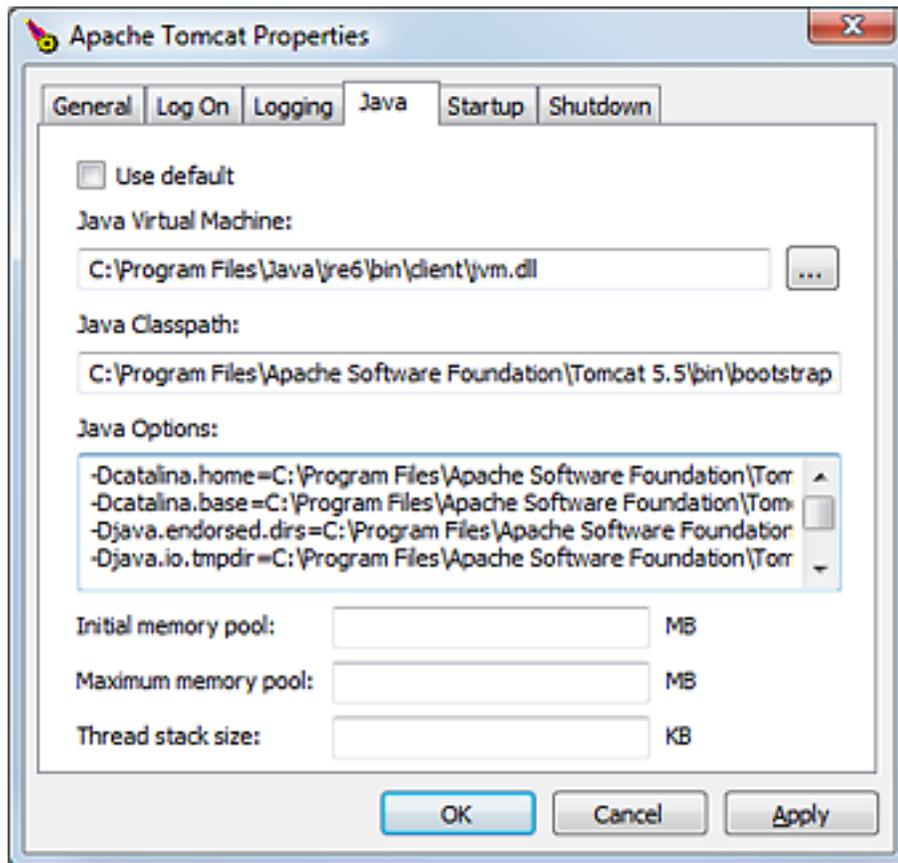
If you do not want to use the [default method](#) for locating `pdweb-app.properties`, you can specify its location explicitly in the Java options of Tomcat.

For Windows running Tomcat 6.0 or later:

1. Open the Configure Tomcat application.

Go to **Start > All Programs > Apache Tomcat 6.0 > Configure Tomcat**.

Select the **Java** tab.



2. In the **Java Options** section, enter the `-Dcom.ebydos.webapp.config` variable, and then the path of the `pdweb-app.properties` file.

You can use the `%context%` variable when using more than one ReadSoft Web Application.

Examples:

One Web Application called `pdweb-app`:

```
-Dcom.ebydos.webapp.config=c:/your/path/pdweb-app.properties
```

More than one Web Application:

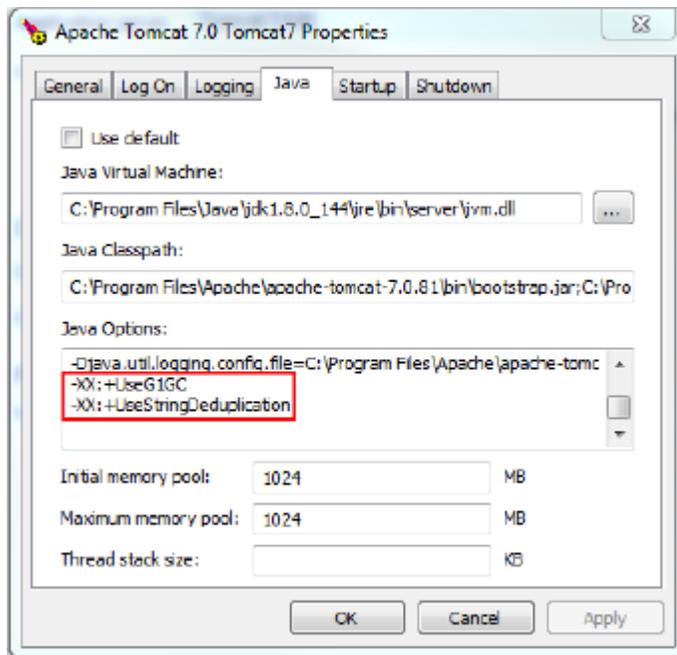
```
-Dcom.ebydos.webapp.config=c:/your/path/%context%.properties
```

If the `pdweb-app.properties` file cannot be found using the default method and if no specific path has been set in the Tomcat configuration, the ReadSoft PROCESS DIRECTOR Web Application uses the `pdweb-app.properties` file in its own internal folder: `../webapps/pdweb-app/WEB-INF/conf/`.

## Reduce memory consumption

To reduce memory consumption, in the Java Options section, enter the following variables.

- -XX:+UseG1GC
- -XX:+UseStringDeduplication



Alternatively, you could use the following set of variables.

- XX:+UseConcMarkSweepGC
- XX:+UseParNewGC

**i** Valid only for JRE 8 or later versions

## Upgrade to a new version

When upgrading to a newer version of the ReadSoft PROCESS DIRECTOR Web Application, you must have a clear understanding of the current installation and where the configuration files are saved. Review the implementation documents for your solution as well as the [Configuration files](#) section of this document, which explains the configuration files and how they are located.

### Upgrading from version 7.1 and later

The steps below describe a scenario where the configuration files are located in the recommended wconfig directory.

To upgrade the ReadSoft Web Application, complete the following steps.

1. Stop Tomcat.
2. If you have modified or created a new [theme](#):  
Copy the folder of your theme from the `pdweb-app/themes` folder to a temporary location.
3. If you have modified any of the `Messages_xx.properties` files:  
Copy the files you have changed from `.../webapps/pdweb-app/WEB-INF/classes/nls/` to a temporary location.
4. Delete the `pdweb-app` folder and `pdweb-app.war` file in the `webapps` folder.
5. Tomcat only: Delete the Catalina folder.  
This is located in the `.../Tomcat/work/` folder.
6. Place the new `pdweb-app.war` file in the `webapps` folder.

 The newly deployed Web Application has to have the same name as the old Web Application. This will allow it to find and use the existing configuration files in the `wcconfig` folder. If you wish to use a new name, see [Rename the application](#).

7. Start Tomcat.  
Tomcat automatically decompresses and deploys the new Web Application WAR file and creates the new folder structure.
8. If you have modified or created a new theme:  
Copy the folder of your theme from the temporary location to the `pdweb-app/themes` folder.  
Change the `theme.pdweb` parameter in `pdweb-app.properties` if necessary to point to your theme folder.
9. If you have modified any of the `Messages_xx.properties` files:  
Copy the files you backed up previously to the `.../webapps/pdweb-app/WEB-INF/classes/nls/` folder.

## Icons not displayed after upgrade

If after upgrading, some of the icons in the Web Application are not properly displayed (for example, instead of an image, the icon code (@08@) is displayed), copy the `icon_mapping.properties` file from `.../webapps/pdweb-app/WEB-INF/conf` to `.../webapps/wcconfig/pdweb-app/WEB-INF/conf`.

## Upgrading from version 3.2 and earlier

Version 3.2.x of the Web Application is called either WEB CYCLE or WORK CYCLE. These Web Applications, like the ReadSoft PROCESS DIRECTOR Web Application, are based on Java and deployed to a Web Application server. Although the appearance is a major improvement and very different to WEB/WORK CYCLE, the system requirements, deployment and configuration of the ReadSoft PROCESS DIRECTOR Web Application is mostly the same. Therefore, upgrading from WEB/WORK CYCLE is a relatively simple process.

To upgrade the Web Application, complete the following steps.

1. Back up the following files:

File	Description
<a href="#">saplogon.properties</a>	Contains the connection settings to your SAP system.
<a href="#">webcycle-app.properties</a>	The main configuration file.
<a href="#">Messages_xx.properties</a>	(Only if modified.) Contains changed GUI strings.

All of these files can be reused.

2. If you have modified your theme, you cannot move the themes folder to the new application and reuse it, as you could with upgrades within WEB CYCLE releases. You must start from the beginning and determine what changes you need to make to the look and feel of the Web Application.
3. Deploy the pdweb-app.war and wconfig.war files (pdweb-app.ear and wconfig.ear for SAP NetWeaver).  
If you want to deploy the ReadSoft PROCESS DIRECTOR Web Application on the same machine as your existing WEB CYCLE/WORK CYCLE Web Application, see [Deploying multiple applications](#).
4. Copy the files you backed up in Step 1 to the same paths in the /webapps/wconfig/... folder.

File	Copy to...
<a href="#">saplogon.properties</a>	../webapps/wconfig/pdweb-app/WEB-INF/conf/
<a href="#">webcycle-app.properties</a>	../webapps/wconfig/
<a href="#">Messages_xx.properties</a>	../webapps/wconfig/pdweb-app/WEB-INF/conf/

5. Rename webcycle-app.properties to pdweb-app.properties.  
Some parameters may not be supported in the PROCESS DIRECTOR Web Application or are obsolete. Review the PDWebApp-SupportedParameters.xlsx, which lists all parameters and whether they are supported or not.
6. Create a Worklist for incoming invoices.

For more information, see the *Configure PROCESS DIRECTOR for use with Accounts Payable* topic in the *PROCESS DIRECTOR Accounts Payable Configuration Guide*.

# Connect to SAP systems

## Connection method

The ReadSoft PROCESS DIRECTOR Web Application connects to SAP systems through a Remote Function Call (RFC). In order to configure the ReadSoft Web Application, the SAP Basis team must first create and configure an RFC user in SAP for this purpose. The RFC user must have authorizations for all activities that the Web Application may need to perform. In particular, the RFC user must have authorization to perform RFC calls for function group ARFC.

## Configuration file

The `saplogon.properties` file is used to configure the connection to the SAP system. It contains information about the SAP system the PROCESS DIRECTOR Web Application connects to.

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

## Parameters

For information about the available parameters, see [About `saplogon.properties`](#).

## Location

The `saplogon.properties` file is located in the `../webapps/wcconfig/pdweb-app/WEB-INF/conf/` folder.

## Connect to an SAP application server

The following example entries in `saplogon.properties` illustrate a typical connection to a single application server:

```
TR1.activate = yes
```

```
TR1.client = 120
TR1.user = system
TR1.passwd = abc123
TR1.lang = EN
TR1.ashost = your.server.local
TR1.sysnr = 0
TR1.maxconnections = 10
```

Here, the system user (**RFC user**) has the abc123 password to connect to the application server located at your.server.local. Each parameter uses the TR1 prefix as the SAP system ID and the TR1.client parameter is the client number.

TR1.activate must be set to yes to enable the subsequent entries.

## Secure passwords

On request, ReadSoft 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**. For example: sec abc123.  
A secure password is generated and displayed
3. Enter this secure password in your saplogon.properties file.
4. Restart Tomcat.

## Connect to multiple application servers

The ReadSoft PROCESS DIRECTOR Web Application can connect to more than one SAP system. For example:

```
TR1.activate = yes
TR1.client = 120
TR1.user = system
TR1.passwd = abc123
TR1.ashost = your.server.local
TR1.sysnr = 0
TR1.maxconnections = 10
PD1.activate = yes
PD1.client = 120
PD1.user = system2
PD1.passwd = xyz789
PD1.ashost = my.server.local
PD1.sysnr = 0
PD1.maxconnections = 10
```

sapsystem = TR1

The sapsystem parameter specifies the default system, in this case TR1. This setting can be overridden in the URL by inserting *sapsystem=<ID>* at the end of the PROCESS DIRECTOR URL. Using the above example, to use PD1 instead of TR1, you can go to: <http://localhost:8080/pdweb-app/init.do?sapsystem=PD1>. The sapsystem parameter is case-sensitive.

The disadvantage of using this method to select the system is that it displays the SAP system ID in the URL. You may not want this for security reasons.

❗ Do not use system selection by URL in cases where you distinguish between a test system and a production system. The ReadSoft PROCESS DIRECTOR Web Application only has one set of configuration and log files. Instead, install the application twice, using different names. URL switching between multiple test systems, or multiple production systems, is OK.

All parameters in `saplogon.properties` are explained in [saplogon.properties](#).

## Connect to an SAP message server

You must use the following two parameters to connect to an SAP message server:

Parameter	Description
<code>sysid.msgghost</code>	The address of the SAP message server.
<code>sysid.group</code>	The name of the message server group.

ℹ The `sysid.ashost` parameter is not needed.

Example:

```
QA1.activate = yes
QA1.client = 120
QA1.user = system
QA1.passwd = abc123
QA1.msgghost = your.server.local
QA1.group = space
QA1.sysnr = 0
QA1.maxconnections = 10
```

## Connect to multiple servers in one Worklist

You can configure the ReadSoft Web Application to display the Worklists of several SAP systems in a single "Master Worklist", enabling users to access documents in these systems with a single logon. You can also include Worklists from CouchDB databases.

### Configuration file

The `_default.json` file is used to configure the Master Worklist and is located in the `wconfig\pdweb-app\WEB-INF\conf\mwc\_default` folder.

### Parameters

The `_default.json` file contains the following parameters.

Parameter	Description
connections	Defines which systems the Master Worklist connects to.
authConfig	Defines which system connection is used to authorize user logon to the Master Worklist.
displayMode	Defines how nodes will be displayed in the Master Worklist: by system with process types as subnodes, or by process type with systems as subnodes.
systemWorklistConfigs	Defines which system Worklists will be displayed in the Master Worklist.

All parameters in `_default.json` are explained in `_default.json`.

❗ If your Master Worklist has more than one system that includes the Accounts Payable process type, you must set the parameter `primary` in the `systemWorklistConfigs` file.

## Provide multiple Worklist configurations

The PROCESS DIRECTOR [Master Worklist](#) configuration supports "multi-tenancy", a concept that enables you to provide access to different Master Worklist configurations depending on the host name of the URL entered in the web browser. Multi-tenancy makes it possible for a single instance of the Web Application to support multiple client organizations, known as "tenants".

For example, suppose you want to provide supplier portals with the host names `tenanta.rs.com` and `tenantb.rs.com`. These portals will use different Master Worklist configurations.

1. In the `wconfig\pdweb-app\WEB-INF\conf\mwc\` folder, create a file called `tenants.properties`.
2. In the `tenants.properties` file, add an entry for each tenant to map the host name/IP address to the tenant name. For example:

```
tenanta.rs.com = TenantA
tenantb.rs.com = TenantB
```

3. In the `wconfig\pdweb-app\WEB-INF\conf\mwc\`, create a subfolder for each tenant name. For example:

```
TenantA
TenantB
```

❗ The subfolder name must not begin with an underscore.

4. For each tenant, create a `_default.json` file in the tenant subfolder and enter the Master Worklist configuration for the tenant in this file.

When the user enters the URL `tenanta.rs.com`, the Web Application searches for a folder called `TenantA` in the `mwc` folder. If a folder with this name is found, the `_default.json` configuration file in this folder is used. If no folder with this name is found, the default configuration file in the `mwc\_default` folder is used. If the user enters the URL `tenantb.rs.com`, the `_default.json` file in the `TenantB` folder is used.

You can create further configuration files for a tenant in the tenant subfolder, for example, `tenanta1.json` and `tenanta2.json`. By default, the system will use the `_default.json` configuration file in the tenant subfolder. This setting can be overridden in the URL by inserting `mwc=<configfile>` at the end of the PROCESS DIRECTOR URL. For example, you can go to: `http://tenanta.rs.com/pdweb-app/init.do?mwc=tenanta1` to load the `tenanta1.json` instead of the `_default.json` configuration.

# SSO and external authentication

The default method for logging on to the ReadSoft PROCESS DIRECTOR Web Application is to manually type a user and password combination, which is evaluated against the user record stored in the SAP system. On successful authentication, the SAP system also determines the user details, including the user type (S=SAP user, I=Web user).

Apart from this, there are two methods for logging on to the ReadSoft PROCESS DIRECTOR Web Application.

- [Single Sign-On \(SSO\)](#)

This method assumes that the user is already authenticated or will be authenticated when the Web Application is accessed.

- [External authentication services](#)

With this method, the user still types a user and password combination into the usual form. However, the authentication is not done against the SAP system. Instead, a different server (typically, a domain controller like the Microsoft Active Directory) is used for the authentication.

In both cases, the Web Application can access information about the authenticated user and pass it on to the SAP system. On the SAP side, only the existence of the user is checked. The user details and user type are also determined on the SAP side. However, the SSO or external authentication method can also provide such information in some cases.

## Single Sign-On (SSO)

The ReadSoft PROCESS DIRECTOR Web Application can be configured to enable users to automatically log on to the application without having to enter their user names and passwords in the ReadSoft Web Application logon form. How you configure the ReadSoft Web Application depends on the SSO method used by the organization.

The following list details all available SSO methods.

- MySAP SSO2 ticket
  - Through the [SAP Java Connector \(JCO\)](#) (only for SAP users)
  - Through the Web Application ([Tomcat scenario](#))
  - Through the Web Application ([SAP NetWeaver or SAP Enterprise Portal scenario](#))
- [Windows NT LAN Manager](#) (NTLM through Microsoft IIS)
- [HTTP header or HTTP cookie value](#) provided by a Web Server
- [X.509 Client Certificate](#) provided by a Web Server

- [OpenSSO](#) (OpenAM) ticket provided by a Web Server
- [SAML2.0](#)

## MySAP SSO2 ticket

### SAP Java Connector (JCO) scenario

In this scenario, the ReadSoft Web Application uses a MySAP SSO2 ticket, which is an encrypted text passed in an HTTP cookie. This ticket is directly passed to the SAP system through the SAP Java Connector, with the first RFC call. If this call is successful, the user ID included in the ticket is determined to be a valid SAP user, and the user details are returned to the ReadSoft Web Application. This works only for SAP users (type, S). Web Application users (type, I) cannot be authenticated using this method.

To set up the SAP Java connector scenario, complete the following steps.

1. Activate Single Sign On.  
Set the `sysid.sso` parameter in `saplogon.properties` to **1**.
2. Specify the name of the cookie.  
Use the `sso-cookiename` parameter in the `pdweb-app.properties` file. The correct name is set by default:  
`sso-cookiename = MYSAPSSO2`
3. Set a fixed name the user ID.  
Set the `sysid.user` parameter in `saplogon.properties` to **`$MYSAPSSO2$`**.  
The `sysid.passwd` parameter is not used in this scenario

**i** With this method, the credentials of the logged-in user are used for all the subsequent RFC calls. If you do not want this, you can specify a different RFC user by setting the `sysid.ssouser` parameter to this user, and `sysid.passwd` to this user's password in `saplogon.properties`.

### Tomcat scenario

In this scenario, the ReadSoft Web Application retrieves the ID of a user by decrypting an encrypted SAP SSO2 ticket, which comes as an HTTP cookie. It uses some of the shared libraries provided by SAP and a certificate.

#### Prerequisites

- The Web server responsible for redirecting to the PD Web Application provides the HTTP cookie, `MYSAPSSO2`, containing the SSO ticket.
- The `sapssoext` and `sapsecu` native libraries need to be copied to the computer where the Web Application runs. These libraries must be copied to a location where they can be found by the environment setting, `PATH` (Windows), or `LD_LIBRARY_PATH` (Unix).  
Windows: `sapssoext.dll` and `sapsecu.dll`  
Unix: `libsapssoext.so` and `libsapsecu.so`
- These libraries are provided by SAP.

## Tomcat scenario setup

To set up the Tomcat scenario, complete the following steps.

1. Set up the `SSO2TicketAuthenticator.properties` configuration file, located in the `WEB-INF/conf` folder of the Web Application responsible for the external configuration. The settings are:
  - `psepath=`  
Specifies the full path to the `verify.pse` certificate file that is needed to verify the ticket. Always use the normal `/`, not the `\`, as a separator in the path specification. If you do not specify this path, the `mySAP.com` Workplace CA certificate is used to verify the ticket, which will normally not work in production environments.
  - `psepasswd=`  
Specifies the password of the certificate given in `psepath`.
  - `seculib=`  
This is an optional setting and necessary only if a library other than `sapsecu` should be used to verify the ticket.
  - `portaluser=`  
Set this to `no` if you want to extract the SAP user, instead of the portal user from the ticket. The default setting is `portaluser=yes`.
2. Activate the scenario with `loginheader=class:SSO2TicketAuthenticator`.

## Localized error messages

The configuration file contains additional keys for error messages that are language specific.

You can copy the priority file and rename the copy to `SSO2TicketAuthenticator_II.properties`, where `II` is a browser language (for example, `de`). This means that first, the configuration file that matches the current browser language is opened. If it is not available, the default file, having no language indicator, is chosen.

If the login fails, more details can be found in the Web Application log file.

## SAP NetWeaver or SAP Enterprise Portal scenario

If the ReadSoft Web Application is deployed on the SAP Java engine (for example, NetWeaver application server 7.4), the procedure described for [MYSAPSSO2 ticket](#) will possibly not work. The reason is that it tries to allocate resources, like shared libraries, that may be in use and cannot be loaded.

For such cases, we have a different class named `NWSSO2TicketAutheticator`, which follows an SAP sample code. It relies on the existence of some SAP jar files in the classpath of the Java engine, plus a properly set-up portal user management. This is a likely case because normally, it will be the SAP portal that creates the SSO ticket.

You do not need any `SAPSSOEXT` or `SAPSECU` libraries.

The installation is similar as for `SSO2TicketAuthenticator`.

To set up the SAP NetWeaver or SAP Enterprise Portal scenario, complete the following steps.

1. Set up the `NWSSO2TicketAuthenticator.properties` configuration file. The parameters are:

- `portalUser=yes/no`; default=`yes`

Specifies whether you want to take the portal user ID or the SAP user ID from the ticket. As this class has been developed to mainly identify WORK CYCLE users and not SAP users, it is usually the portal users who need to be mapped to the WORK CYCLE users. Otherwise, you could use the standard SSO procedure using `saplogon.properties`.

- `checkIaik=yes/no`, default=`no`

Specify yes if this plugin should initialize the IAIK Java crypto library. Normally, this is not necessary because other standard applications would have already done this.

There is only one configured error message: **Cookie MYSAPSSO2 was not found.**

All other possible errors during ticket evaluation will just pass through the original SAP error message or exception that occurs during the ticket evaluation done by the native SAP code.

2. Activate the scenario with `loginheader=class:NWSSO2TicketAuthenticator`.

## List error codes

The following is the list of error codes returned by the `SAPSSOEXT` library (relevant only for `SSO2TicketAuthenticator`). These error codes are displayed only in the Web Application log file.

### **Standard error codes**

- 1 No user provided to function
- 3 Provided buffer too small
- 4 Ticket expired
- 5 Ticket syntactically invalid
- 6 Provided buffer too small
- 8 No ticket provided to function
- 9 Internal error
- 10 API is not initialized
- 11 Memory allocation failure
- 12 Wrong action
- 13 Tried to call null function
- 14 Error occurred in security tk
- 15 Null pointer exception
- 16 Incomplete information
- 17 Couldn't get certificate
- 18 Reserved
- 19 Missing authentication
- 20 Signature couldn't be verified
- 21 Ticket too new for lib
- 22 Conversion error

### SSF error codes

- 0 Operation ok

- 1 No security toolkit found
- 2 Unknown wrapper format
- 3 Input data length zero
- 4 Insufficient. main memory
- 5 There are signer errors
- 6 No memory f. result list
- 7 Priv.Addr.Book not found
- 8 Invalid PAB password
- 9 There are recipient errors
- 10 Unknown MD algorithm
- 11 Could not encode output
- 12 Could not decode input
- 13 Unknown security toolkit error
- 51 No more memory output data
- 52 Signer/recipient ID is empty
- 53 Signer/recipient info empty
- 54 Signer/recipient info list empty
- 21 Security profile is locked
- 22 Unknown signer
- 22 Unknown recipient
- 23 Security profile not found
- 24 Security profile not usable
- 25 Invalid password for signer
- 26 Certificate not found
- 27 Signature invalid
- 27 Operation not ok for recipient
- 28 API\_UNDEFINED\_RESULT

## Windows NT LAN Manager

In this scenario, the ReadSoft Web Application retrieves the username from the Windows NT LAN Manager (NTLM). This method can be used for SAP and Web Application users, as well as in the "email user" scenario.

Use the [ntlmauthenticate](#) parameter in the pdweb-app.properties file to specify the NTLM authentication method.

### ntlmauthenticate

The method used to retrieve user credentials from the Windows NT LAN Manager (NTLM).

Valid value	Description
0	Off

Valid value	Description
1	<p>Only for ReadSoft PROCESS DIRECTOR Accounts Payable and documents in workflow that have been sent to an email address (called "email user"). Email users receive an email that contains a link to the document that they are assigned to work on. The link contains the document GUID, which is a 32-digit hex code.</p> <p>Setting <code>ntlmauthenticate=1</code> prevents others from using this GUID to work on the document. Users who know the GUID will be able to open the document only when:</p> <ul style="list-style-type: none"> <li>• The Web Application can retrieve the username through NTLM</li> <li>• The username can be located in a directory server.</li> </ul> <p>It is necessary to set up the connection to a directory sever by using the <code>ntlm_ldap.properties</code> file.</p> <ul style="list-style-type: none"> <li>• The email address found in the directory server is the same as the one specified for the recipient of the document.</li> </ul>
-1	<p>Only for the "email user" scenario.</p> <p>Setting <code>ntlmauthenticate=1</code> prevents users who know the GUID from opening the document when the information retrieved using the <code>loginheader</code> method is not valid. See the <a href="#">loginheader</a> section for more information.</p>
2	<p>SAP and Web Application users only.</p> <p>The username is retrieved from NTLM by using the HTTP header.</p> <p>The username is matched against the list of SAP and Web Application users in the SAP system.</p> <p>If a match is found, the document list for that user is displayed.</p>
-2	<p>Same as 2. If SSO is not available, or if the user credentials retrieved are incorrect, the standard logon page is displayed for the user to manually log on.</p>
3	<p>SAP and Web Application users only.</p> <p>The username is retrieved by calling the Java <code>getRemoteUser()</code> method.</p> <p>The username is matched against the list of SAP and Web Application users in the SAP system.</p> <p>If a match is found, the document list for that user is displayed.</p>
-3	<p>Same as 3. If SSO is not available, or if the user credentials retrieved are incorrect, the standard logon page is displayed for the user to manually log on.</p>

For 2, 3, -2, and -3: If an SAP user and Web Application user have the same username, the system uses the setting in the `userpriority` parameter to determine which user account to use. If the found user is not available for some reason (for example, the user is locked or has no authorization), the system searches all user types, in the order specified by the priorities set in `/EBY/PDBO_VUSTC` (see the *PROCESS DIRECTOR Configuration Guide* for more information), and then logs the user in when valid user credentials are found.

The server hosting the ReadSoft PROCESS DIRECTOR Web Application needs to be "behind" a Microsoft IIS server. For details on how to set up such a scenario, see the following sections.

- [Enable automatic logon](#)
- [Install IIS](#)
- [Copy Tomcat files to IIS](#)

This setup only supports Microsoft Windows using Internet Explorer, or Firefox (with the help of a plugin).

## HTTP header or HTTP cookie value

In this scenario, the user name is extracted from information that is available through the HTTP request. This can be an HTTP header or an HTTP cookie value. It is also possible that this information is not directly available, but has to be decrypted or verified. It could also possibly involve another server. That is why you could specify a Java class to resolve the SSO information. This concept is similar to the one for browser add-ons. Four add-ons come preconfigured with the Web Application, but it is also possible to write customer-specific add-ons.

The preconfigured add-ons are:

- X509CertRfcAuthenticator
- OpenSSOAuthenticator
- SSO2TicketAuthenticator
- NWSSO2TicketAuthenticator

In general, if any of the loginheader scenarios can find a user name, this user name is matched against the list of SAP and Web Application users in the SAP system. If this does not fail, the document Worklist for that user is displayed.

### loginheader

Specifies the method used to retrieve a user name within an SSO scenario.

Value type	Description
Header	<p>loginheader=someheader: The ReadSoft Web Application looks for an HTTP header named someheader, and the header content is considered to be a user name. The Web Application then attempts to get the document list for this user.</p> <p>When used in the "email user" scenario, together with ntlmauthenticate=-1, the existence of the specified header is enough to access the document.</p>
Cookie	<p>The parameter value may reference a cookie (cookie:somecookie). In this case, the application looks for a cookie namedsomecookie. The value cookie:somecookiecan have the extension, (fromN,toN). In this case, the logon name is taken from the cookie value starting with the character, fromN, up to (but excluding) the character,toN. The character count starts at 0.</p> <p>Example:</p> <p>loginheader=cookie:someuser(2,8)  Value of cookie, someuser = \$\$SmithZABC  User name used = SmithZ</p> <p>When used in the "email user" scenario, together with ntlmauthenticate=-1, the existence of the specified cookie is enough to access the document.</p>

Value type	Description
Java Class	<p>The parameter value can reference a JAVA class (class:someclass). In this case, the application dynamically loads the someclass Java class and tries to call the authenticateUser(HttpServletRequest request) method. This method either returns a null value and sets the logonErrorrequest attribute, or returns the account name of the user logged on to the workstation.</p> <div style="background-color: #e6f2ff; padding: 5px; border: 1px solid #add8e6;"> <p><b>i</b> Java classes are loaded using the default package path, com.ebydos.cockpit.webcycle.app.auth. If a different package path should be used, the full path has to be written before the class name.</p> </div> <p>The preconfigured classes mentioned above are activated through (for example) loginheader=class:X509certRfcAuthenticator.</p> <p>When used in the "email user" scenario, together with ntlmauthenticate=-1, the document can be accessed when the class call returns a non-empty value.</p>

## X.509 Client Certificate

In this scenario, the ReadSoft Web Application tries to analyze X.509 client certificates found in the certificate chain of the HTTP request. It first checks the user's principal name. An example of a principal name is: CN=John Smith, OU=00, O=PS7, C=EN. When the proper name is found, the username and email address are extracted from the certificate details. The values found can be afterwards sent to the SAP system for evaluation/completion.

To set up the X.509 client certificate, complete the following steps.

1. Adjust the X509CertRfcAuthenticator.properties sample configuration file provided by ReadSoft PROCESS DIRECTOR. The settings are:
  - exclude=<comma separated list of values>  
Do not use certificates with the principal name part, CN=, starting with one of the specified values. If no exclude option is set, the first certificate is taken; otherwise, the first one with the CN name not appearing in the exclude list is taken.
  - id\_for\_gid=<identifier>  
If this parameter is given, the username does not directly resolve to the CN name. Instead, the Web Application looks in the details of the principal name to find an attribute name,

<identifier>. If it is found, the attribute value is used as the user name. The default value is SERIALNUMBER. If you want to use the original CN name, specify id\_for\_gid=.

- type\_index=<number1>
- mail\_index=<number2>

In the subject alternatives of the selected certificate, take the first general names with the <number1> type and take the <number2> value from it to extract the email address of the user. Default values are <number1>=1 and <number2>=1.

Once the relevant information is extracted, it can be sent to SAP for evaluation using an RFC.

- rfc\_name=<rfc name>

Name of the RFC to call. There is no default value. Set rfc\_name=null to skip the validation through RFC. In this case, the user ID and email found so far are used for further processing.

The RFC is expected to use the following default import parameters.

- **GID:** Default import parameter to send the user ID. Overwrite it with the parameter, i\_gid=<name>.
- **EMAIL:** Default import parameter to send the email. Overwrite it with the parameter, i\_mail=<name>.

The RFC is expected to use the following default export parameters.

- **USERNAME:** Default export parameter to receive the username. Overwrite it with the parameter, e\_userid=<name>.
- **USERTYPE:** Default export parameter to receive the user type. Overwrite it with the parameter, e\_usertype=<name>.
- **MESSAGE:** Default export parameter to receive an error message. Overwrite it with the parameter, e\_message=<name>.

The contract to determine an RFC call failure is that a non-empty message with a non-initial type is returned. A message is expected for a structure holding the CHAR name, TYPE, and a STRING/CHARN named MESSAGE.

If there is no error message, the user name and user type returned by the RFC are used for further processing.

2. Activate the scenario with loginheader=class:X509CertRfcAuthenticator.

## OpenSSO

In this scenario, the ReadSoft Web Application retrieves the personal ID of a user by validating an encrypted HTTP cookie against an OpenSSO/OpenAM server. The plugin validates the cookie by sending it to a Web Service by using an HTTP(S) URL, and then evaluating the response. If this is successful, the personal ID retrieved is used as the user name, provided the corresponding user exists as an SAP user or a Web Application user in ReadSoft PROCESS DIRECTOR.

To configure the open SSO scenario, complete the following steps.

1. Configure the following parameters in the plugin configuration file, OpenSSOAuthenticator.properties. This file must be located in the WEB-INF/conf folder of the

Web Application. A template with default settings is available in the WEB-INF/conf folder of the Web Application.

Parameter	Description
cookieName	Name of the HTTP cookie containing the OpenSSO Authentication token. The default name is iPlanetDirectoryPro.
serviceURL	The Service URL for token verification. There is no default value. The URL may contain %TOKEN%, which will be replaced by the SSO token. If %TOKEN % is not present, the token will be appended to the Service URL. Example: serviceUrl=http://ssoserver:8080/openam_10.0.1/identity/attributes?subjectid=
attribute_userid	This is the attribute value in the service response, from which the user ID is taken. The default is uid.
attribute_username	Optional attribute to receive the user name. There is no default. This is not required for successful operation because the user master data is taken from SAP (SAP or WUM users). The user name found is just written to the Web Application log file.
attribute_useremail	Optional attribute to receive the user email. There is no default. This is not required for successful operation because the user master data is taken from SAP (SAP or WUM users). The email value found is just written to the Web Application log file.

- If the Service URL uses the https protocol, you need to specify the Java keystore. This holds the SSL certificate. You need to specify the following parameters.

Parameter	Description
cert_store	The full path of the file containing the SSL certificate for the validation services. You need to use a forward slash (/) to separate folders. Example: C:/Programs/Apache Software Foundation/Tomcat 6.0/temp/truststore There is no default. The SSL certificate must be put into a J2EE-compatible keystore file. See <a href="#">Create a keystore for an SSL certificate</a> .
cert_pass	The password of the trust store file. The default is changeit.

- Activate the scenario with loginheader=class:X509CertRfcAuthenticator.

## Create a keystore for an SSL certificate

This procedure explains how to create a keystore on Windows using keytool.exe. This is part of the JDK. Install any JDK and set a PATH member to the bin folder of the JDK, and you can then call keytool.exe from anywhere. If you are running on the Windows OS, you can also use a free Windows tool like Keystore Explorer.

- Export the SSL certificate of the Open SSO Open AM service to a .cer file (for example, by using Internet Explorer). If the certificate file is already available, you can just use it.
- At the location of the certificate file, open the command prompt and execute:  
keytool -import -file <certificate file> -keystore <name for new cert store> -storepass <password for cert store>  
Example: keytool -import -file otrs.cer -keystore mystore -storepass changeit

3. Answer **Yes** when the command asks you if you want to trust this certificate.
4. You can now verify that you have created a valid keystore file by executing:  
`keytool -list -keystore <name for new cert store> -storepass <password for cert store>`

## SAML 2.0

Security Assertion Markup Language (SAML) is an XML- and HTTP-based standard protocol for Web Applications to securely retrieve information about users who are entitled to use the Web Application.

Using SAML, authentication and authorization data can be securely exchanged between an Identity Provider (IdP) and a Service Provider (SP). The SP (in this case, the Web Application) contacts the IdP using a SAML-compatible API. The IdP either returns information about an already authenticated user, or opens a login form for the user to authenticate before returning the information.

The information is not returned as a result of the SAML call. Instead, the IdP calls the SP by using a SAML call. This means that both parties, the IdP and the SP, need to maintain configuration information about the other party. For more information about the impacted entities, see [SAML entities](#).

The security of the HTTP communication is ensured by a Secure Socket Layer (SSL) between the IdP and SP. To ensure message-level security, messages must be signed and encrypted. For more information, see [Message encryption](#).

For more information about the different SSO scenarios, see [SSO scenarios](#).

## SAML entities

The SAML protocol uses a set of entities to authenticate and authorize data.

### Identity Provider

The Identity Provider or authentication provider is the sign-on system that authenticates the user, through a username and password or another verification method. The Web Application allows integration with any identity provider that supports SAML.

### Service Provider

The Service Provider is the application the user needs to access; in this case, the Web Application. Customers using the Web Application get their own dedicated endpoint to access a dedicated tenant. Each tenant can be set up as the customer's dedicated Service Provider.

### Assertion

The assertion is an XML document that contains the metadata that is required to sign on or create a user on the SP side.

 All assertions from the IdP must be signed. For more information, see [Message encryption](#).

### Authentication request

The authentication request is sent from the SP to the IdP, made on behalf of the users after they initiate the sign on.

### Authentication response

The authentication response is sent from the IdP to the SP after the IdP has verified the user credentials. Like all assertions from the IdP, this response must be signed.

### Message encryption

Messages between the IdP and SP can be signed and encrypted.

**!** The ReadSoft Web Application requires that all the assertions from the IdP are signed. Users will not be able to log on to the Web Application if assertions are not signed and encrypted.

This allows the Web Application to verify that the assertion really originated at the trusted IdP. For verification, the Web Application validates the assertion's signature against the trusted IdP's public X.509 certificate. For more information about the configuration of the IdP's public certificate, see [Configure the IdP](#).

For the Web Application, a public X.509 certificate and private key must be configured. The Web Application, as the SP, can then use this key to sign outgoing requests to the IdP, as well as to decrypt assertions from the IdP (if the IdP supports decryption).

**i** To allow customers to determine the strength of the encryption key themselves, the Web Application does not provide a certificate/key pair. If you want to utilize this option, you need to provide your own certificate/key pair.

### Configure SAML

SSO through SAML is activated using the SAMLConfiguration.xml file, which is an empty template file and is shipped with the wconfig.war file. It is not activated using the loginheader parameter.

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<SAMLConfiguration>
  <EnableSAML>false</EnableSAML>
  <IDProviderConfiguration>
    <ArtifactResolutionEndpoint/>
    <Certificate/>
    <IDPEntityID/>
    <SSORedirectionEndpoint/>
    <ProtocolBinding/>
    <SSOLogoutEndpoint/>
  </IDProviderConfiguration>
  <ServiceProviderConfiguration>
    <Certificate/>
    <ConsumerEndPoint/>
    <NameIdFormat/>
    <OrganizationDisplayName/>
    <OrganizationName/>
    <OrganizationUrl/>
    <PrivateKey/>
    <ServiceProviderIdentity/>
    <SingleLogOutEndPoint/>
  </ServiceProviderConfiguration>
</SAMLConfiguration>

```

To configure SAML, complete the following steps.

1. Deploy the SAMLConfiguration.xml file to the appropriate folder:
  - If the Worklist connects to a single system: {tomcat installation dir}\webapps\wcconfig\pdweb-app\WEB-INF\conf
  - If the Worklist connects to [multiple systems](#): {tomcat installation dir}\webapps\wcconfig\pdweb-app\WEB-INF\conf\mwc\{tenantD}
2. Collect the following information about the IdP:
  - Identity Provider entity ID
  - Single Sign-On service
  - Single Logout Service (optional)
  - public X.509 certificate

For descriptions of these parameters, see [Configure the IdP](#).

3. Add the necessary parameters in the corresponding sections of the SAMLConfiguration.xml file, as described in the following procedures.
  - a. [Configure the IdP](#)
  - b. [Configure the SP](#)
4. To enable Single Sign-On with SAML, set the <EnableSAML> parameter in the SAMLConfiguration.xml file to true.

The ReadSoft Web Application immediately switches to the code that executes the SAML protocol. Users who already exist in SAP can then log in with SAML.

**!** To explain the SAML configuration in full detail is beyond the scope of this guide. It is recommended that when introducing SAML SSO in a customer project, an administrator familiar with SAML terminology and the configuration of the customer's IdP server, be involved on the customer side.

## Configure the IdP

To configure the IdP, complete the following step.

- Configure the parameters in the `IDProvider Configuration` section.

### Parameters

Parameter	Required/Optional	Description
ArtifactResolutionEndpoint		The URL of the IDP's service for the SAML 2.0 artifact resolution.
Certificate	Required	The Web Application uses the public X.509 certificate to establish trust with the IdP, as well as to validate any incoming SAML assertions from the IdP. The certificate entry has to contain the BEGIN CERTIFICATE header and the END CERTIFICATE footer. For more information about the certificate, see <a href="#">Message encryption</a> .

Parameter	Required/Optional	Description
IDPEntityID	Required	The unique identifier of the IdP. The Web Application accepts SAML assertions only from this ID.
ProtocolBinding	Required	The protocol binding that is used by the Web Application to make an authentication request to the IdP. The following protocol bindings are supported. <ul style="list-style-type: none"> <li>urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST</li> <li>urn:oasis:names:tc:SAML:2.0:bindings:HTTP-Redirect</li> </ul>
SSORedirectionEndpoint	Required	The Single Sign-On service (SSO endpoint) that the Web Application sends authentication requests to.
SSOLogoutEndpoint	Optional	The Single Logout service (SLO endpoint) that the Web Application sends logout requests to.

**i** Additionally, you need to add the following custom posting parameter:

UserID (case sensitive) - This is the SAP user name that is sent by the IdP to the Web Application.

## Configure the SP

To configure the SP, complete the following step.

- Configure the parameters in the `ServiceProviderConfiguration` section.

### Parameters

Parameter	Required/Optional	Description
AuthnContextClassRef	Optional	The type of authentication that the service provider suggests to the IdP. How the IdP deals with this information is determined by the IdP itself. Default value: <code>urn:oasis:names:tc:SAML:2.0:ac:classes:Password</code> If you do not wish to use this parameter, set it to <code>&lt;AuthnContextClassRef&gt;OFF&lt;/AuthnContextClassRef&gt;</code>

Parameter	Required/Optional	Description
AuthnContextComparison	Optional	<p>This parameter compares the authorization context (<code>AuthnContextClassRef</code>) of the SP to that of the IdP. It can have one of the following values.</p> <ul style="list-style-type: none"> <li>Minimum                             <ul style="list-style-type: none"> <li><i>i</i> This is the default value.</li> </ul> </li> <li>Exact                             <ul style="list-style-type: none"> <li><i>i</i> The values are not case sensitive.</li> </ul> </li> </ul> <ul style="list-style-type: none"> <li>If the value is set to <code>Minimum</code>, the parameter demands that the IdP's <code>AuthnContextClassRef</code> is either equal to or of better quality than what is defined.</li> <li>If the value is set to <code>Exact</code>, the <code>AuthnContextClassRef</code> has to exactly match that of the IdP.</li> </ul>
Certificate	Required	<p>This certificate is used to validate the outgoing request signatures from the ReadSoft Web Application to the IdP, as well as to validate and decrypt responses. The certificate entry has to contain the <i>BEGIN CERTIFICATE</i> header and the <i>END CERTIFICATE</i> footer.</p>
ConsumerEndPoint	Required	<p>The URL of the service provider consuming the SAML HTTP-POST SSO. Usually, this is the Web Application's base URL, followed by <code>/saml/consume/HTTP-POST</code>.</p>
NameIdFormat	Required	<p>The NameID identifies the subject of communication between the Web Application and IdP. The following NameID formats are supported.</p> <ul style="list-style-type: none"> <li><code>urn:oasis:names:tc:SAML:2.0:nameid-format:persistent</code></li> <li><code>urn:oasis:names:tc:SAML:1.1:nameid-format:emailAddress</code></li> <li><code>urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified</code></li> <li><code>urn:oasis:names:tc:SAML:2.0:nameid-format:transient</code></li> </ul> <ul style="list-style-type: none"> <li><i>i</i> It is recommended to use the persistent format. Persistent user names ensure that the identity between the ReadSoft Web Application and IdP never changes.</li> </ul>
OrganizationDisplayName	Optional	<p>The short name that you want to use as the display name for the SP's company.</p>
OrganizationName	Optional	<p>The name that you want to display for the SP's company.</p>

Parameter	Required/Optional	Description
OrganizationUrl	Optional	The URL of the SP's company.
PrivateKey	Required	This key is used to sign requests to the IdP, as well as to decrypt responses from it. The key entry has to contain the BEGIN PRIVATE KEY header and END PRIVATE KEY footer.
ServiceProviderIdentity	Required	The ID of the SP. It can be any name, but has to match the name on the IdP side.
SingleLogOutEndPoint	Optional	The URL of the SP performing the logout. Usually, this is the ReadSoft Web Application's base URL, followed by /saml/authentication/logout.

## Troubleshoot logging in with SAML

❗ The ReadSoft Web Application requires that all the assertions from the IdP are signed. Users will not be able to log on to the Web Application if assertions are not signed and encrypted. For more information, see [Message encryption](#).

If logging in with SAML fails, the Web Application log file could contain any of the following error messages.

### Malformed header/footer

Error	Cause
Empty Input	Distorted or missing certificate header/footer: <ul style="list-style-type: none"> <li>• Not having exactly five hyphens (-) before <i>BEGIN CERTIFICATE</i> and before or after <i>END CERTIFICATE</i></li> <li>• <i>BEGIN</i> and/or <i>END</i> missing or incorrectly written</li> <li>• <i>CERTIFICATE</i> missing or no space between <i>BEGIN/END</i> and <i>CERTIFICATE</i></li> </ul>
Header and Footer do not match	<i>CERTIFICATE</i> written incorrectly in either the header or footer
Illegal Footer	<ul style="list-style-type: none"> <li>• Footer does not contain exactly five hyphens before or after it</li> <li>• <i>END</i> written incorrectly</li> <li>• Missing line break before the footer</li> </ul>
Illegal Header	<ul style="list-style-type: none"> <li>• Not having exactly five hyphens after the header</li> <li>• <i>BEGIN</i> written incorrectly</li> <li>• Missing line break after the header</li> </ul>

### Expectation

```
-----BEGIN CERTIFICATE-----
<content>
-----END CERTIFICATE-----
```



## SNC mapping for SSO ID

Many SSO scenarios require the mapping of an external user ID to the corresponding internal SAP value. You can use one of the following methods to map an external SSO ID to an internal user ID.

**i** When using SNC, set `ntlmauthenticate_remove_domain=no` in the `pdweb-app.properties` file.

### Standard SAP `USRACL` table

If you use this option, verify the following.

- SNC is enabled on the SAP server.
- The external ID is stored in the `PNAME` field.
- The internal ID is stored in the `BNAME` field.

**i** If the user ID exceeds the maximum length of 255 characters, no mapping is performed and an error message is generated.

### ReadSoft PROCESS DIRECTOR mapping table

Go to the `/EBY/PDBO_VUSM` transaction to enter the required values. Refer to the *PROCESS DIRECTOR Configuration Guide* for more information.

**i** This option is disabled by default.

## SSO scenarios

The ReadSoft Web Application supports two primary SAML Single Sign-On (SSO) scenarios. It supports SAML 2.0 SSO, with HTTP Redirect-POST binding.

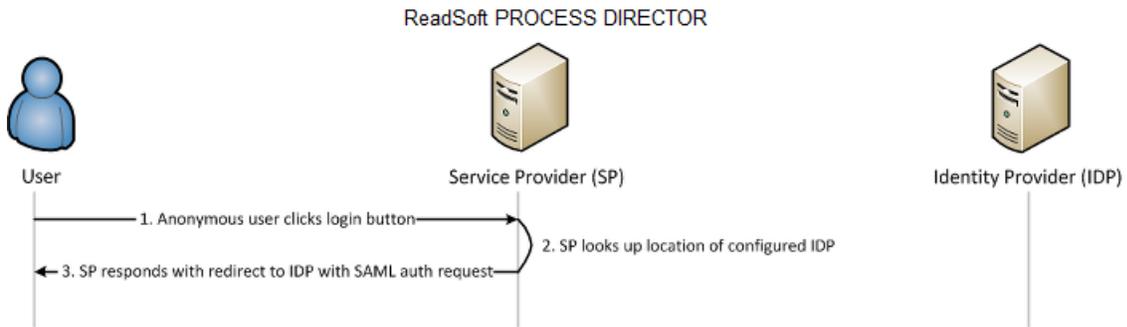
- Authentication requests from the SP are sent to the IdP as either an HTTP redirect, or as an HTTP Post.
- Responses or requests from the IdP to the SP are expected to be sent as HTTP Post.

### SP-initiated SSO

SSO initiated by the SP is a scenario in which the user starts the sign-on flow from the ReadSoft Web Application, either actively or passively.

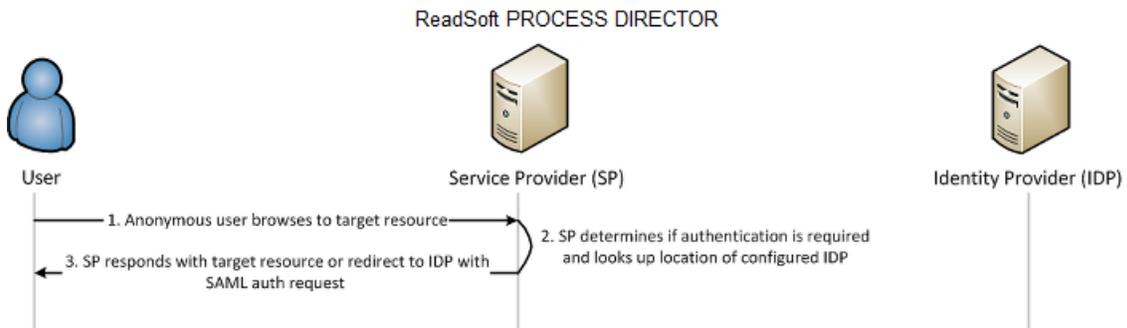
### Active SSO

A user signs into the Web Application by clicking the corresponding sign-on link.



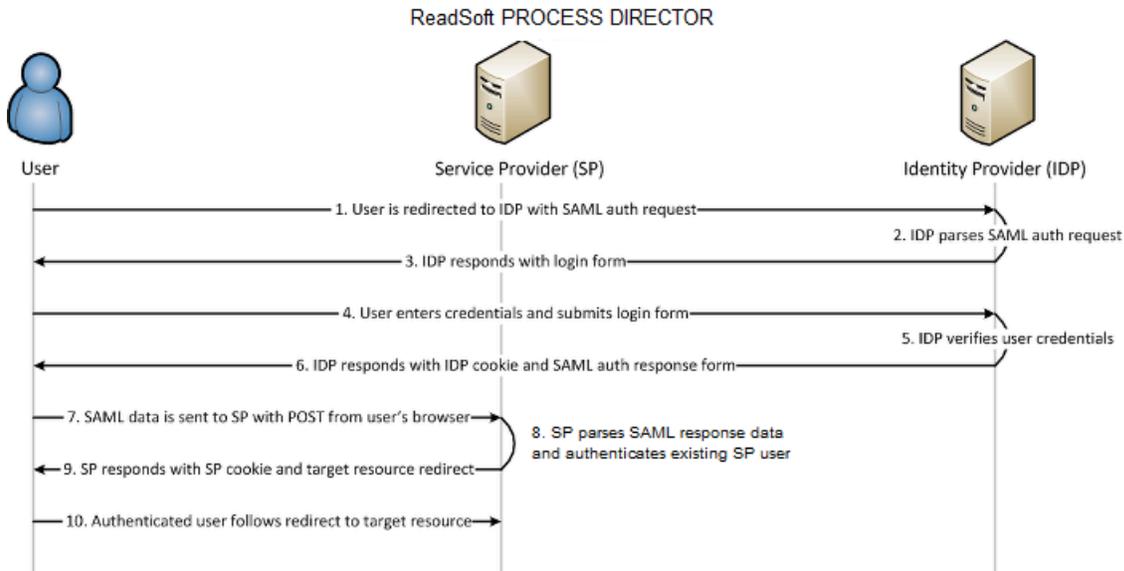
## Passive SSO

A user visits a private page or file attachment, which cannot be accessed without authentication.



## Authenticating with IdP

Both the active SSO and the passive SSO send the user to the IdP for authentication.



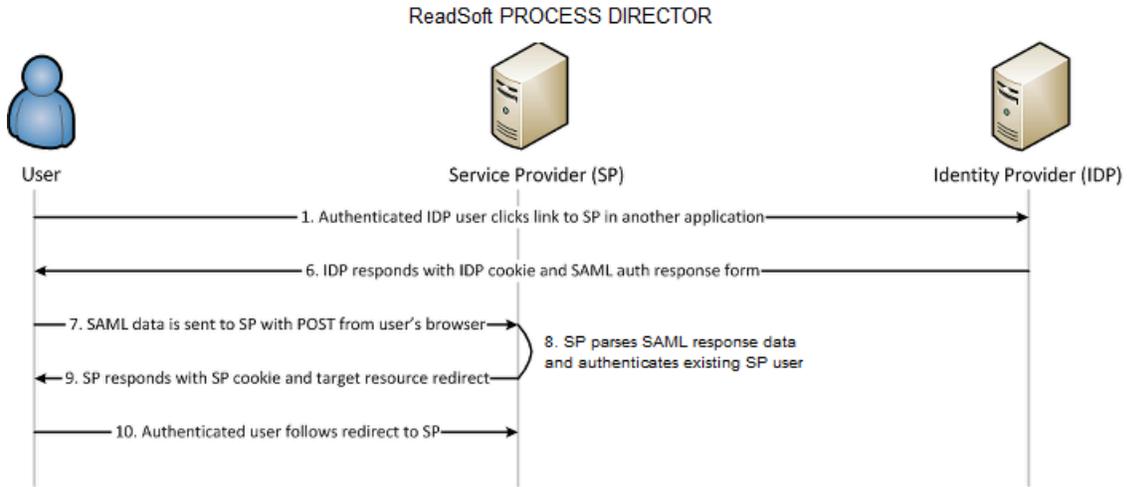
## Authenticating with IdP

Both the active and the passive SSO send the user to the IdP for authentication. To carry out an authentication with the IdP, the following steps are performed.

1. The user is redirected to the IdP with the SAML authentication request.
2. The IdP parses the SAML authentication request.
3. The IdP responds with the login form.
4. The user enters the credentials and submits the login form.
5. The IdP verifies the user credentials.
6. The IdP responds with the IdP cookie and the SAML authentication response form.
7. The SAML data is sent to the SP with the HTTP POST from the user's web browser.
8. The SP parses the SAML response data and authenticates the existing SP user.
9. The SP responds with the SP cookie and the target resource redirect.
10. The authenticated user follows the redirect to the target resource.

## IdP-initiated SSO

A user has an internal application that has already been authenticated with the IdP. The user clicks a link for the ReadSoft Web Application, which begins an SSO session. If an existing user is found, the user is logged in.



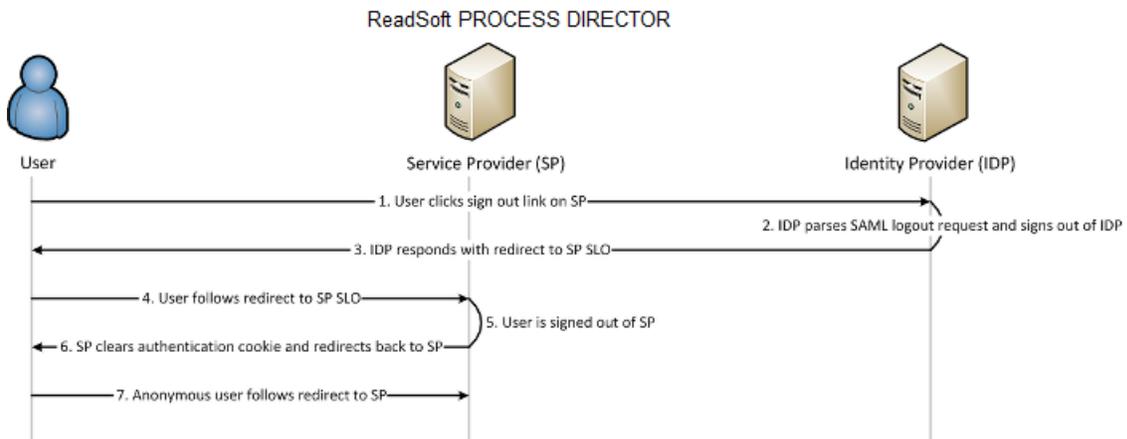
To carry out IdP-initiated SSO, the following steps are performed.

1. The authenticated IdP user clicks the link to the SP in another application.
2. The IdP responds with the IdP cookie and the SAML authentication response form.
3. The SAML data is sent to the SP with the HTTP POST from the user's web browser.
4. The SP parses the SAML response data and authenticates the existing SP user.
5. The SP responds with the SP cookie and the target resource redirect.
6. The authenticated user follows the redirect to the target resource.

## SSL scenarios

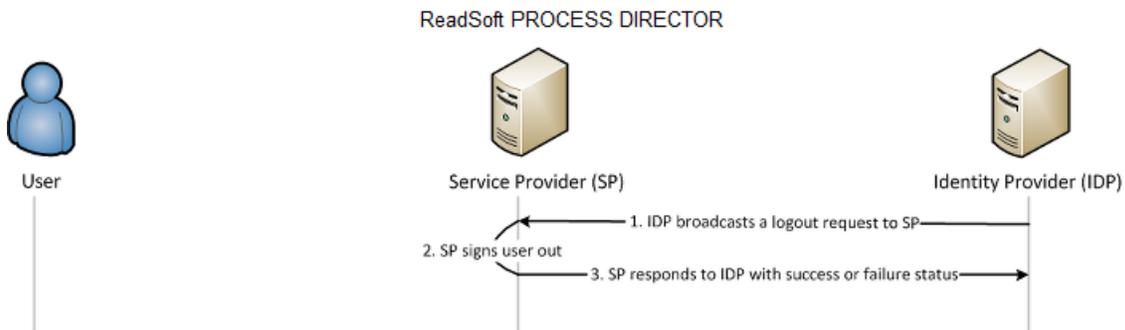
### Log out

The user actively clicks the corresponding link to log out from the ReadSoft Web Application.



## Unsolicited logout request

If the IdP and all the SPs in the federated SSO session are correctly configured and the user signs out of any other application in that session, the ReadSoft Web Application receives a sign-out request from the IdP. It then signs the user out of the Web Application.



## Session timeout

After a period of user inactivity defined by the `pdweb-app.properties` parameter `normaltimeout`, the user is automatically logged out of the Web Application. In a SAML scenario, when the Web Application timeout is reached, a SAML request is sent to the IdP to establish whether the user should be logged out. If the session timeout defined in the IdP has not been reached, the user remains in the Web Application until the IdP timeout is reached. If the IdP session timeout has expired, the user is logged out of the Web Application.

To ensure that the user is logged out when the Web Application timeout is reached, the `pdweb-app.properties` parameter `normaltimeout` must be higher than the session timeout of the IdP. For example, if the session timeout of the IdP is 30 minutes, set `normaltimeout = 1920` (1920 seconds = 1800 seconds + 120 seconds = 30 minutes + 2 minutes).

Popups must be enabled in the user's browser. If popups are blocked, the Web Application receives no response from the IdP and restarts. If the session timeout of the IdP has not been reached, the user remains in the Web Application. If the IdP timeout has expired, the IdP login page is presented to the user.

## External authentication services

You can use an external authentication service for the logon process. The ReadSoft PROCESS DIRECTOR Web Application comes packaged with the following services (Java classes):

- [NovellAuthService](#)
- [MSADAuthService2](#)
- [LDAPSearchAndBindService2](#)

Set the `sysid.ext_auth_svc` parameter in `saplogon.properties` to the name of the authentication service that you wish to use.

**For developers implementing a customer-specific external authentication class:**

The Java class specified is dynamically loaded and the following interface method is called:

```
char userType = authenticateUser (String user, String password, Properties properties)
```

The method checks the user and password and returns the character I if the user is an authenticated Internet (PROCESS DIRECTOR) user, or S if the user is an authenticated SAP user. A space character is returned if an error occurs and the ext.auth.error field of the passed properties object contains the error message.

On method entry, the properties object is initialized using the settings specified in a properties file. The properties files for MSADAuthService and NovellAuthService are saved in ..\webapps\wcconfig\pdwebapp\WEB-INF\conf. The filename is JavaClass\_xx.properties, where xx is the language (if one exists- otherwise JavaClass.properties is used).

**i** Java classes are loaded using the default package path, com.ebydos.cockpit.webcycle.app.auth. If a different package path should be used, the full path has to be written before the class name.

**i** The services ending with 2 are newer versions of the services with the same basic names. This is for internal reasons. The old services are frozen and will not be changed anymore. The new ones are based on the same code, but have additional functionality. It is recommended to use them in order to have all the functionality described in the related sections.

## Novell Authentication Service

To use Novell Authentication Service, set the DEV.ext\_auth\_svc attribute to NovellAuthService.

This service is recommended if you use Novell eDirectory. In addition to the standard parameters that you can use in any LDAP environment, this service enables you to use the Novell-specific checkvalue and checkattr attributes.

### Configuration (NovellAuthService.properties)

Parameter	Description
ldapHost	Name or IP address of the LDAP server. You can define multiple hosts by appending 1, 2, and so on.
ldapPort	IP port (default - 389), append 1, 2 - in connection with ldapHost1, ldapHost2.
userDN	Pattern to find the user (must contain %user%).
checkattr.N	Optional. You can specify an LDAP attribute that has to be available in the user record for the user to be able to log in. Start with N=1. If multiple attributes need to be checked, create more parameters with N=2, 3, etc.
checkvalue.N.M	Valid values for attributes to be checked. Specify all the values that are valid for checkattr.N with checkvalue.N.1, 2, etc.

Parameter	Description
#Localized messages	For an explanation on how to localize error messages, please see <a href="#">Localized_error_messages</a> .
error.invalidobject	The user is unknown.
error.invalidattribute	Attribute not found in the directory entry.
error.invalidcheckvalue	User has insufficient rights.
error.ldap49	Invalid password.
error.ldap91	Communication error with the LDAP sever.
error.nohost	The ldapHost parameter is missing in the configuration file.
error.nouserDN	The userDN parameter is missing in the configuration file.
error.invalidport	Invalid LDAP port number.
error.invaliduserDN	The userDN parameter does not contain %user%.

### The %user% variable

The user name used to log on is copied to %user%, without any modifications.

### Usage of checkattr and checkvalue

Additional authentication checks can be performed by using the checkattr and checkvalue parameters.

In the following example, the user record must contain the groupMembership attribute, which can have both the cn=web-cycle or ou=auth-groups values.

*checkattr.1 = groupMembership*

*checkvalue.1.1 = cn=web-cycle*

*checkvalue.1.2 = ou=auth-groups*

## Microsoft Active Directory

To use Microsoft Active Directory, set the DEV.ext\_auth\_svc attribute to MSADAuthService2.

This service is recommended if you use Active Directory. It has the same options as the General LDAP service, as well as additional MSAD-specific services.

In the MSADAuthService2.properties file, you need to specify the directory server (ldapHost parameter) and a pattern to find the user (userDN parameter). The userDN parameter must contain the %user% variable, and may also contain the %domain% variable.

You can search multiple servers or locations for the user by specifying multiple host/DN combinations, such as ldapHost1/UserDN1 and ldapHost2/UserDN2. Note that the numbering starts with 1 and should not have gaps. Multiple LDAP hosts do not have to be different; you can use the same server, but they need different DNS.

For example:

```
ldapHost = fra-dc
userDN = cn=%user%
ldapHost1 = fra-dc
userDN1 = %user%@readsoft.local
ldapHost2 = ebydos-dc
userDN2 = %user%@ebydos.local
```

### Configuration (MSADAuthService2.properties)

Parameter	Description
ldapHost	Name or IP address of the LDAP server. You can define multiple hosts by appending 1, 2, and so on.
ldapPort	IP port (default - 389), append 1, 2 - in connection with ldapHost1, ldapHost2.
userDN	Pattern to find the user (must contain %user%).
ssl*)	Protocol usage; default is no (SSL) using port 389. Setting ssl=yes changes the default port to 636. The ssl setting is global. You cannot access just one host through SSL, and the others not.
cert_store*)	To be specified in case of ssl=yes. Path to the certificate keystore. The default is a file named keystore in the current user's home directory
cert_pass*)	Keystore password; default is changeit.
#Localized messages	For an explanation on how to localize error messages, please see <a href="#">Localized_error_messages</a> .
error.nohost	The ldapHost parameter is missing in the configuration file.
error.nouserDN	The userDN parameter is missing in the configuration file.
error.invalidport	Invalid LDAP port number.
error.ldap49	User unknown or invalid password.
error.communication	Communication error with the LDAP sever.

\*) Not available in the original MSADAuthService.

## General LDAP Authentication

To use General LDAP Authentication, set the DEV.ext\_auth\_svc attribute to LdapSearchAndBindService2. This configuration can be used to authenticate with any LDAP system. It uses the Java Naming and Directory Interface to follow the LDAP standard definition, RFC-4511. It is recommended to use this service only if you cannot use our vendor-specific services.

The initial LDAP bind is done using either an anonymous bind or a given administrative user account. When the ID typed in by the user is found, the LDAP bind is executed again, this time using the found user and the password typed in by the user. If the binding succeeds, the user is considered a valid user, unless it is rejected by the PD logon RFC (/EBY/PDWA\_RFC\_USER\_CHECK).

LdapSearchAndService2 can handle server referrals (subtrees of the connected server reside on another server).

It can also handle multiple hosts. This means that you can address multiple LDAP servers that are searched for in the sequence specified in the LdapSearchAndService2.properties configuration file.

It is also possible to handle separate userDN specifications, including sub-tree searches for each host.

### Configuration (LdapSearchAndBindService2.properties)

Parameter	Description
ldapHost	Name or IP address of the LDAP server. You can define multiple hosts by appending 1, 2, and so on.
ldapPort	IP port (default - 389), append 1, 2 - in connection with ldapHost1, ldapHost2.
adminUser adminPw	Optional administrativeaccountfor LDAP operations. An anonymous connection is used if not specified. Append 1, 2, in connection with ldapHost1, ldapHost2.
ssl*)	Protocol usage. The default is no (SSL), using port 389. Setting ssl=yes changes the default port to 636. The ssl setting is global. You cannot access just one host via SSL, and the others not.
cert_store*)	To be specified in case of ssl=yes. Path to the certificate keystore. The default is a file named keystore in the current user's home directory.
cert_pass*)	Keystore password; default is changeit.
searchDN	Node to search below; may contain %subTreeSearch%.
subTreeSearchN	If searchDN contains %subTreeSearch%, there can be a list of sub-tree nodes defined by the parameters, subTreeSearch1, subTreeSearchN.
addAttrN	Additional attributes (name,value) can be defined to refine the user search(for example, addAttr1 = primarygroupid,513). If you use additional attributes, only a user having those attributes will be found. This is a way to implement access restrictions.
userID	Specify the userID parameter to identify the LDAP attribute that matches the ID that is typed in by the user.
resUserID	You can modify the default behavior (user ID in SAP is equal to the user ID typed in) by specifying an LDAP attribute, whose value will be the user ID in SAP.Defaults to sn.

Parameter	Description
bindUserID	You can modify the default behavior (the userPrincipalName attribute is used for binding) by specifying an LDAP attribute, whose value will be used to do the binding. In case login fails with your configuration, another login attempt will be made with the full LDAP path for your user.
resUserType	You can modify the default behavior (user is a WORK CYCLE user (type I) in SAP) by setting type S here.
#Localized messages	For an explanation on how to localize error messages, please see <a href="#">Localized_error_messages</a> .
error.invalidport	The LDAP port specification is invalid.
error.config	The mandatory parameter {0} is missing.
error.Ldap01	The admin user ID could not be found in the LDAP directory.
error.Ldap1	The user ID given could not be found in the LDAP directory.
error.Ldap2	The password is incorrect.
error.Ldap3	A protocol or communication error occurred.

\*) Not available in the original LdapSearchAndBindService.

### Multiple hosts

You can address multiple LDAP servers by adding each one as a host to the LDAPSearchAndBind.properties file. The servers are searched for in the sequence in which they are specified in this file. You must specify the port for each server.

### Subtree searches

Add %subTreeSearch% to the searchDN parameter, and then use the SubtreeSearchN parameter to add subtrees.

### Example:

The following example displays a company structure for the abc.com group, showing only that part of the structure where users should be searched for.

```
.o=Company1
.ou=Division1
.ou=Department1
.ou=Division2
.ou=Department2
.ou=Department3
.o=Company2
.ou=Division2
.ou=Department1
.ou=Division2
.ou=Department2
searchDN=%subTreeSearch%,dc=abc,dc=com
subTreeSearch1=ou=Department1,ou=Division1,o=Company1
subTreeSearch2=ou=Department2,ou=Division2,o=Company1
```

```
subTreeSearch3=ou=Department3,ou=Division2,o=Company1  
subTreeSearch4=ou=Department1,ou=Division2,o=Company2  
subTreeSearch5=ou=Department2,ou=Division2,o=Company2
```

This results in five searches:

```
ou=Department1,ou=Division1,o=Company1,dc=abc,dc=com  
ou=Department2,ou=Division2,o=Company1,dc=abc,dc=com  
ou=Department3,ou=Division2,o=Company1,dc=abc,dc=com  
ou=Department1,ou=Division2,o=Company2,dc=abc,dc=com  
ou=Department2,ou=Division2,o=Company2,dc=abc,dc=com
```

 The search path is always from the bottom to the top.

### Modifying the default behavior

By default, the user ID in SAP needs to be the same as the user ID that the user types in, but you can specify an LDAP attribute, whose value will be the user ID in SAP.

By default, the userPrincipalName attribute is used for binding, but you can specify an LDAP attribute, whose value will be used for binding.

By default, the user is an Internet user (type I), but you change this to an SAP user.

To know what LDAP attributes you have at your disposal, you have to look up the specific attribute list of your LDAP service. You can use any of the attributes that the service provides.

# Common configuration tasks

You can perform the following common configuration tasks in the ReadSoft PROCESS DIRECTOR Web Application.

- [Set the display language](#)
- [Enable users to edit profiles](#)
- [Configure user settings](#)
- [Enable workflow recall for AP](#)
- [Create your own buttons](#)
- [Use custom user searches \(Accounts Payable only\)](#)
- [Add a help link](#)

**i** Most of the configuration for the ReadSoft Web Application (for example, specifying fields and field states, available actions, etc.) is done in SAP. See the *PROCESS DIRECTOR Configuration Guide* for more information.

## Set the display language

There are three ways you can set the display language for the ReadSoft PROCESS DIRECTOR Web Application:

Method	Description
Language setting in the web browser	Users can select a default language in their browser settings.
SAP logon language	SAP users can change the <b>Logon language</b> setting in the <b>SAP GUI under System &gt; User profile &gt; Own data</b> , on the <b>Defaults</b> tab.

Method	Description
PROCESS DIRECTOR logon language selection	<p>Users can have the option to select the display language when logging in to ReadSoft PROCESS DIRECTOR.</p>  <p>The screenshot shows the 'PROCESS DIRECTOR by ReadSoft' logon page. It features a 'Please log on' header, input fields for 'User' and 'Password', a 'Language' dropdown menu currently set to 'English', and a 'Log on' button. The footer contains 'Disclaimer · Copyright · ReadSoft®' and 'DEMO'.</p>

## Parameters

There are four parameters in `pdweb-app.properties` that determine which of the above settings is used, as well as which languages are available:

Parameter	Description
<a href="#">browserlocale</a>	Turn on this parameter to use the browser's language setting.
<a href="#">languages</a>	<p>Lists the supported/available languages. To support another language, complete the following steps.</p> <ol style="list-style-type: none"> <li>1. Add the two-character ISO 639-1 language code to the list above. You can specify a three-character language code to explicitly set an SAP language.</li> <li>2. Create the <a href="#">Messages_xx.properties</a> file for the language.</li> </ol>

Parameter	Description
<a href="#">addlanguages</a>	<p>Lists the unsupported languages that can nevertheless be selected. In this case, English is used as the language together with the local numbering format of the selected language.</p> <p>To add an unsupported language, complete the following steps.</p> <ol style="list-style-type: none"> <li>1. Add the two-character ISO 639-1 language code.</li> <li>2. Add the language.II=Language string to the <a href="#">Messages_xx.properties</a> files, where: <ul style="list-style-type: none"> <li>• II = The two-character ISO 639-1 language code.</li> <li>• Language = The name of the language in the language of the respective <a href="#">Messages_xx.properties</a> file.</li> </ul> </li> </ol>
<a href="#">languageselection</a>	<p>Turn on this parameter to display the drop-down language box in the PROCESS DIRECTOR logon screen. To use this parameter, <a href="#">browserlocale</a> must be set to 0.</p>

## Enable users to edit profiles

You can permit users to edit their user profile using the Web Application.

The screenshot shows a web application interface for editing a user profile. The main container is titled "User profile" and contains a sub-section titled "Personal data". The form fields are as follows:

- Full Name:** Barbara Jones
- User:** JONES
- Email address:** wcuser@demo.readsoft.com
- Telephone:** (empty field)
- Department:** Purchasing Department
- Language:** (empty field)
- Password:** (header for the password section)
- Old password:** (input field)
- New password:** (input field)
- New password:** (input field)

You can determine which **User profile** panes are displayed.

### Parameters

To enable/disable the **User profile** button in the ReadSoft PROCESS DIRECTOR Web Application, set the following parameters to yes/no:

User type	Parameter
SAP	<a href="#">editprofilesap</a>
SAP and Web Application	<a href="#">editprofile</a>

**i** For SAP users, *both* of these settings must be set to yes to enable the User profile button.

To enable/disable the respective User profile panes, set the following parameters to *yes/no*:

Submenu	Parameter
Personal data	<a href="#">editmasterdata</a>
Password	<a href="#">editpassword</a>
Substitutes	<a href="#">editsubstitutes</a>

## Configure user settings

You can enable users to change their user settings in the ReadSoft Web Application. You can define any `pdweb-app.properties` parameter as a setting. It should, of course, make sense to allow the user to change the parameter; not all parameters are suitable for user settings.

### Prerequisites

- The `pd_user_profile_as_node=yes` parameter is set in the [pdweb-app.properties](#) file.
- The `PDDataProviderUSER_PROFILE = UserXMLSapProvider` entry is present in the [plugin\\_configuration.properties](#) file.
- The `user_settings.xml` file is present in the `../webapps/wcconfig/pdweb-app/WEB-INF/conf/` folder.

If you want to put this file in a different folder, you must use the `pdweb-app.properties` parameter [pd\\_user\\_settings](#) to specify the path to this file.

To configure the user settings, for each setting, complete the following steps.

1. As the `<field id>`, add the desired `pdweb-app.properties` parameter.  
You can define any `pdweb-app.properties` parameter as a setting. It should, of course, make sense to allow the user to change the parameter; not all parameters are suitable for user settings.
2. As the `<name>`, add the label of the field. Then, as the `<description>`, add the text of the field tooltip.  
You can specify the `<name>` and `<description>` values directly in the `user_settings.xml` file, or reference a key from the `Messages.properties` file. For more information, see [Use](#)

**Messages.properties keys.** You must use `Messages.properties` keys if you need to provide user settings in different languages.

**i** Currently it is only possible to use `Messages.properties` keys for the `<name>` and `<description>` tags, not for the `<possibleValues>` tag. This means that you can translate the field label and tooltip, but not the selectable values.

3. As `<possibleValues>`, add a set of possible values that the user can select.

**i** When you add settings to the `user_settings.xml` file, you must activate at least one of the corresponding parameters in the `pdweb-app.properties` file with one of the possible values. For example, if you add `pd_imagedocking_width` as a user setting, make sure that you activate and specify a value for `pd_imagedocking_width` in the `pdweb-app.properties` file. You can then add further settings without specifying a value in `pdweb-app.properties`.

4. Restart Tomcat or refresh the context (add `?refreshctx` at the end of the Web Application URL).

For more information about the settings, see the [user\\_settings.xml](#) configuration file.

## Use Messages.properties keys

To use keys from the `Message.properties` file, complete the following steps.

1. Copy the necessary `Messages_xx.properties` file(s) from the `../webapps/pdweb-app/WEB-INF/lib/webcycle-app-X.X.jar/nls/` folder to the `../webapps/wcconfig/pdweb-app/WEB-INF/conf/` folder located in your configuration folder.
2. In the `Messages.properties` file, for each field, add a key and its corresponding value for the name, and also a key and its corresponding value for the tooltip.
3. In the `user_settings.xml` file, in the `<name>` and `<description>` tags, enter the `Messages.properties` keys.

## Examples

### Specify the name and value in the user\_settings.xml file

To display the Display last list and Image display width settings in the user profile, complete the following step.

- Add the pd\_select\_last\_node and pd\_imagedocking\_width parameters to the user\_settings.xml file.

```
<?xml version="1.0" encoding="UTF-8"?>
- <structuredDocumentView lang="EN" version="7.4" xmlns="http://www.readsoft.com/documentView" id="USER_SETTINGS">
  - <header id="HEADER">
    - <tab id="SETTINGS">
      - <field id="pd_select_last_node" editable="YES" iType="SELECT">
        <name>Display last list</name>
        <description>At logon display the last used document list</description>
        - <possibleValues>
          - <pair>
            <key>yes</key>
            <value>yes</value>
          </pair>
          - <pair>
            <key>no</key>
            <value>no</value>
          </pair>
        </possibleValues>
      </field>
      - <field id="pd_imagedocking_width" editable="YES" iType="TEXT" fType="NUMERIC" length="000003">
        <name>Image display width</name>
        <description>Set the width in pixels of the document image</description>
      </field>
    </tab>
  </header>
</structuredDocumentView>
```

Reference keys from the Message.properties file

## Reference keys from Message.properties file

To provide the following settings in English and German, complete the following steps.

Benutzereinstellungen

Letzte Liste anzeigen	no
Bild Anzeigebreite	800

Breite des Bilds in Pixel setzen

1. Copy messages\_en.properties and messages\_de.properties to ../webapps/wcconfig/pdweb-app/WEB-INF/conf/.
2. Add keys for the field names and descriptions to these files. You can use any value, but it is advisable to include the parameter name so that you can easily recognize the key's purpose.

```
Messages_en.properties - Notepad
File Edit Format View Help
pd_select_last_node_name=Display last list
pd_select_last_node_desc=At logon display the last used document list
pd_imagedocking_width_name=Image display width
pd_imagedocking_width_desc=set the width in pixels of the document image
```

```
Messages_de.properties - Notepad
File Edit Format View Help
pd_select_last_node_name=Letzte Liste anzeigen
pd_select_last_node_desc=Beim Start die zuletzt benutzte Dokumentliste anzeigen
pd_imagedocking_width_name=Bild Anzeigebreite
pd_imagedocking_width_desc=Breite des Bilds in Pixel setzen
```

3. Enter the messages.properties keys in the user\_settings.xml file.

```
<?xml version="1.0" encoding="UTF-8"?>
- <structuredDocumentView lang="EN" version="7.4" xmlns="http://www.readsoft.com/documentView" id="USER_SETTINGS">
  - <header id="HEADER">
    - <tab id="SETTINGS">
      - <field id="pd_select_last_node" editable="YES" iType="SELECT">
        <name>pd_select_last_node_name</name>
        <description>pd_select_last_node_desc</description>
        - <possibleValues>
          - <pair>
            <key>yes</key>
            <value>yes</value>
          </pair>
          - <pair>
            <key>no</key>
            <value>no</value>
          </pair>
        </possibleValues>
      </field>
      - <field id="pd_imagedocking_width" editable="YES" iType="TEXT" fType="NUMERIC" length="000003">
        <name>pd_imagedocking_width_name</name>
        <description>pd_imagedocking_width_desc</description>
      </field>
    </tab>
  </header>
</structuredDocumentView>
```

## Enable workflow recall for AP

You can permit users to recall Accounts Payable documents that they have already approved.

**i** A document can only be recalled if the workflow has not yet been completed.

**i** These settings apply only to Accounts Payable documents. It is not possible to recall individual workflow steps for other process types.

Two settings are necessary:

1. In `/COCKPIT/WI3`, activate the **Recall documents in WA** option for the workflow step. The document can only be recalled if the workflow step to which the user is assigned has this option activated.
2. In the `pdweb-app.properties` file, enter one of these settings for the undo parameter:
  - 1 - Documents that have been approved or forwarded can be recalled if after approving or forwarding action, the documents have not been changed.
  - 2 - Documents can be recalled if in the `/COCKPIT/WI3` transaction, the **Recall documents in WA** option has been activated for the current step.

## Create invoices for MM or FI documents

You can use the invoice create function to create MM and FI invoices.

To enable this feature, complete the following steps.

1. In the `/COCKPIT/WI` transaction, create a workflow for the invoice creation function.
2. In the `/COCKPIT/WI7` transaction, activate the workflow for FI and MM documents. Refer to the *Work Cycle Configuration Guide* for more information about creating and assigning workflows.
3. In the `pdweb-app.properties` file, set the `wb_create` configuration parameter to 1. This setting enables the invoice creation function in the Web Application.
4. In the same configuration file, set the `invoice.createatonce` parameter to `no`.
5. Restart the web server to reload the configuration.

## Create custom buttons

You can create custom buttons to extend the functionality of the ReadSoft Web Application by allowing it to interact with external web services when users click the button.

When you create custom buttons, you need to specify:

- The URL of the external web server.
- Parameters whose values are used as queries to the external web server.

### Example URL

`http://www.company.com/?user=JOHN&usertype=S&docno=00000000123456`

Here, the username, document number and user type (S for SAP user) is included in the URL and passed to the `www.company.com` web server.

## Create a custom button

To create a custom button, complete the following steps.

1. Create a file called `customer_buttons.properties`. Save it in the `..\Tomcat\webapps\wcconfig\pdweb -app\WEB-INF\conf\` folder.
2. Specify the parameters in the `customer_buttons.properties` file.  
Among other things, you need to specify the page the button appears on, as well as the URL, the name of the button label, and the parameters that you wish to send to the external web server when the button is clicked.
3. Add the values for the `ButtonN.textkey` and `ButtonN.tipkey` parameters to the `Messages_xx.properties` localization file(s).  
These values are references to keys in `Messages_xx.properties`, whose values in turn are the label and tooltip strings for the button.

### Example

In `customer_buttons.properties`:

```
Button1.textkey = EmployeeSearchButtonLabel  
Button1.tipkey = EmployeeSearchButtonTooltip
```

In `Messages_en.properties`:

```
EmployeeSearchButtonLabel = Employee search  
EmployeeSearchButtonTooltip = Search for employees
```

Important: Custom `Messages_xx.properties` files must be saved in the `..\Tomcat\webapps\wcconfig\pdweb -app\WEB-INF\conf` folder and the icons must be saved in the `..\Tomcat\webapps\pdweb-app\themes\procdir \images\pd` folder.

### Example

In the following example, clicking a button opens Google. The button will be displayed in the Detail view of all the process types.

#### Entry in the `customer_buttons.properties` file

```
Button1.page = TAB_HEAD_PROCESS_DIRECTOR  
Button1.textkey = customer.button1.text  
Button1.icon = exit.gif  
Button1.tipkey = customer.button1.tip  
Button1.winprops = height=500,width=1000,location=yes
```

Button1.url = http://www.google.com/search  
Button1.row = 1

Entries in Messages\_en.properties file

customer.button1.text = Search Vendor

customer.button1.tip = Search for vendor on Google

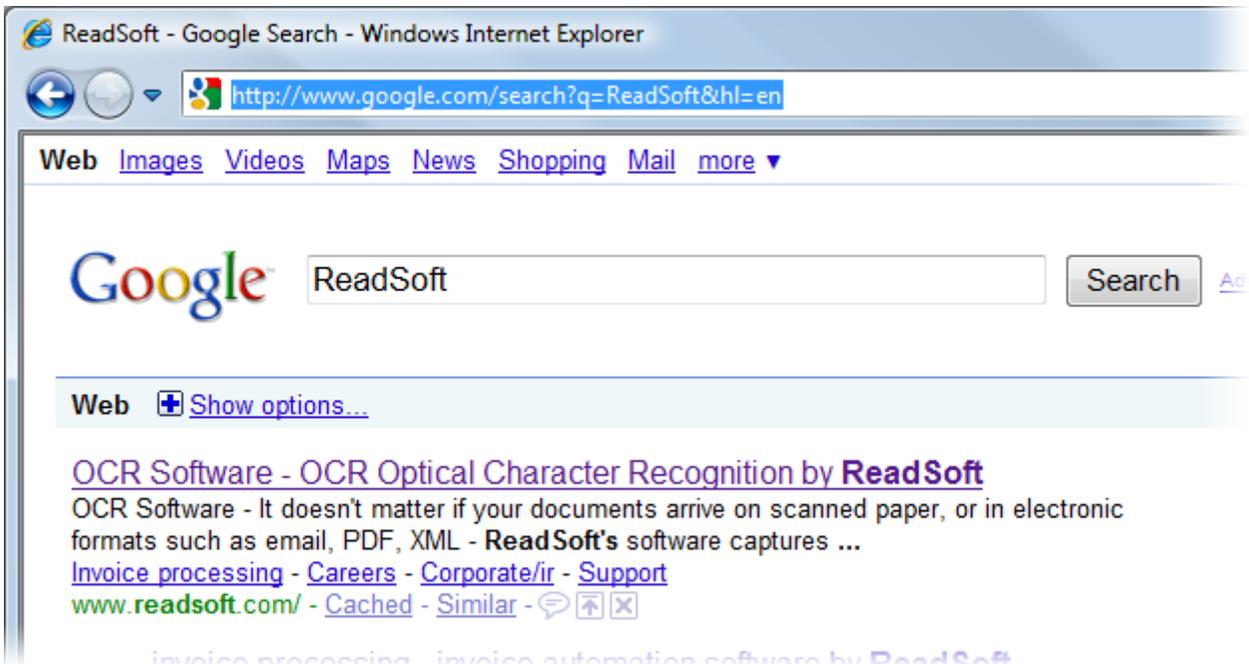
Result



Result



In the browser...



## Use custom user searches (PD AP only)

When forwarding documents (including querying and assigning), you must search for users in order to add them to the list of recipients.

	User type	Processor ↑	Full Name	E-Mail
<input type="radio"/>	SAP user	BILLICH	Claude Billich	claudio.billich@sap.com
<input type="radio"/>	SAP user	BILLTEST22	Bill Timm	william.timm@sap.com
<input type="radio"/>	SAP user	SP_BILLCLRK	Bette Anderson	

User types: SAP user, Internet (WORK CYCLE) user, User group, Email user.

The default procedure for searching and selecting users is:

1. The `RFC_WC_USER_GETLIST` function is called, using values entered in the user search form. The program calculates the search results based on:
  - Type of forward (forwarding, querying, or assigning)
  - WORK CYCLE ID, Step ID and sub-position
  - Document GUID
2. `RFC_WC_USER_GETLIST` returns the search results, using the `/COCKPIT/SWC_USERLIST` table.
3. The user selects one or more users to forward the document to.

This procedure however only applies for searching SAP (S) and WORK CYCLE (I) users, and user groups (G). It is not used for Email users (E). This is because Email users are not “users” in the normal sense—they are not listed in SAP or WORK CYCLE. To forward documents to Email users, their email address must be entered manually.

## Customize user searches

You can customize user searches as follows:

- [Search an external source for Email users](#). There is an interface that allows you to provide a Java plugin to search this source.

- Replace the [RFC\\_WC\\_USER\\_GETLIST](#) search function with a custom one you create.

## Interface to search Email users

You can plug in a custom Java class to the user search process. This enables users who are Email users to be searched and included on the recipient list, without having to manually enter the users' email addresses.

To plug in a custom Java class, complete the following procedures.

1. [Create the Java class.](#)
2. Add the Java class name to [sysid.ext\\_search](#).
3. [Create the Properties file.](#)

### Create the Java class

The Java class is dynamically loaded and the following interface method is called:

```
WCUser[ ] users = searchUser (Propertiesproperties, String userid, String name, String mail)
```

Using the values passed, an external directory is searched for matching users and a list of matches returned. If no match is found, the result is null.

If the Java class name contains a period (.), the class is loaded absolutely. Otherwise the `com.ebydos.cockpit.webcycle.backend.services` package name is automatically prefixed.

### Create the Properties file

On method entry, the properties object is initialized using the `JavaClass_lang.properties` file, where:

- `JavaClass`: The name of the Java class.
- `lang`: The language code, retrieved from the web browser.

Example: `ExampleEmailUserSearchService_de.properties`.

This file must be saved in the `../webapps/wconfig/pdweb-app/WEB-INF/conf/` directory. If the web browser's language is not available, `JavaClass.properties` is used instead.

The `EmailUserSearchService.properties` file contains some sample settings for you base your file on.

## Use another search function

To replace the [RFC\\_WC\\_USER\\_GETLIST](#) function and use a custom one to search for SAP, WEB CYCLE, and Email users, complete the following steps.

1. Set `sysid.ext_search = StdUserSearchService`.  
This parameter is located in the `saplogon.properties` file.
2. Create a `StdUserSearchService.properties` file.  
Save it in the `../webapps/wconfig/webcycle-app/WEB-INF/conf/` directory.

3. Specify the function name you wish to use.  
In StdUserSearchService.properties, add the following entry:  
rfcFunctionName = CUSTOM\_FUNCTION  
For example: rfcFunctionName = ZEIC\_CUST\_RFC\_WC\_USER\_GETLIST
4. Add your function to SAP.

## Configure icons for follow-up flags (PD AP only)

A follow-up flag is an indicator that appears in the document list and the document detail view. Follow-up flags help users to identify important documents and documents that need attention. By default, follow-up flag IDs are displayed in the ReadSoft Process Director Web Application, for example, AT if the document has an attachment. See the *ReadSoft PROCESS DIRECTOR Accounts Payable Configuration Guide* for detailed information on follow-up flags.

To display icons for follow-up flags instead of the IDs, you must change a setting for the FOLLOW\_UP field in the view model. The following procedure provides brief instructions for changing this setting. For detailed information on configuring the view model, see the *PROCESS DIRECTOR Configuration Guide*.

To configure icons, complete the following steps.

1. In the Incoming Invoices IMG, click **Change system settings > Presentation and interface > Configure view model**.
2. If you do not already have an entry for the component type WA List Header, add one.
3. Click the component type WA List Header, then in the **Dialog Structure**, double-click **Field catalog**.
4. Add the FOLLOW\_UP field to the field catalog.
5. Click the FOLLOW\_UP field, then click **Details** .
6. In change mode, in the **Web Field Properties** group, in the **Input type** list, select **Image**.
7. Click **Save** .
8. Repeat these steps for the component type WA Document Detail/logical level HEADER if you want to display icons in the document detail view as well as in the document overview.
9. To specify which icon to display, in the icon\_mapping.properties file, for each follow-up flag, add the entry icons.followupflag.XX = icon.png, where XX is the follow-up flag ID and icon.png is the name of the icon image file.  
**Example** icons.follow-upflag.AT = green  
icons.follow-upflag.CN = stop

## Add a help link

You can add a help link to the ReadSoft Web Application to provide information in a custom URL.

To add a help link, complete the following steps.

1. In the help\_configuration.properties file, enter:

\*.help = <custom URL that contains the information>

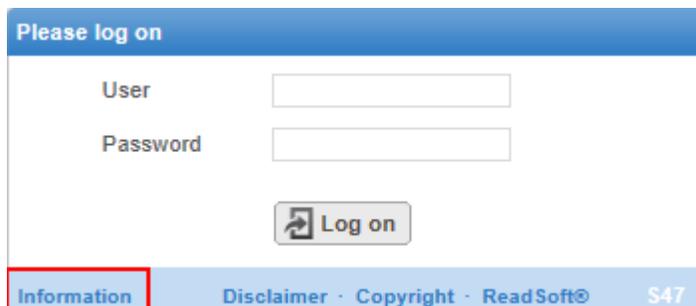
For example: \*.help = http://intranet/documents/help.pdf.

A link called **Help** will then be visible at the bottom of the logon page, the document overview page and the document detail page. Clicking the link calls up the linked page or document.

You can specify [parameters](#) to display the link only on the logon page, or only on pages within the application.

2. (Optional) To rename the **Help** link, [create a copy of the messages.properties file](#) and overwrite the common.help message key.

For example: common.help = Information



You can even specify different help links for different languages by adding multiple links to the help\_configuration.properties file. For example:

\*.help.en = <custom URL that contains the information in English>

\*.help.de = <custom URL that contains the information in German>

\*.help.fr = <custom URL that contains the information in French>

Add language-specific messages\_xx.properties files, where xx is the language (for example: en, de, fr) and change the common.help parameter in these files so that the help link name is in the appropriate language.

**i** The possibility to add help links at field level, which was available in previous versions of the ReadSoft PROCESS DIRECTOR Web Application and the WORK CYCLE Web Application, is no longer supported.

# ReadSoft PROCESS DIRECTOR appearance

The appearance of the ReadSoft PROCESS DIRECTOR Web Application can be configured and customized in several ways.

- [Themes](#)

The overall look of the interface is controlled by themes. Themes can be configured using a Cascading Style Sheet (CSS) file, logos, icons, and other images.

- [GUI texts](#)

The text strings that appear in dialog boxes, messages and other areas of the user interface are located in the Message.properties files (one for each language), in the `..\webapps\pdweb-app\WEB-INF\classes\nls` folder. These files can be copied to your configuration folder for customization.

- [Attachments display](#)

Attachments can be displayed in a docked panel to the right of the document details or in a separate popup window.

- [Node counters](#)

Numbers showing how many documents are available in a Worklist node can be hidden.

- [Number of rows displayed](#)

You can specify how many rows are displayed per page in tables, such as the document overview list or the search results list.

- [File format conversion](#)

For document images, you can configure ReadSoft PROCESS DIRECTOR to convert TIFF images to PDF files and display those.

## Themes

The overall look and feel of the ReadSoft PROCESS DIRECTOR Web Application is controlled by themes. The themes are located in the `.../pdweb-app/themes/` folder; the default theme is the `procdir` theme.

You can specify the current theme in the `pdweb-app.properties` file.

To change the appearance, make a copy of the `themes/procdir/` folder and change the content in the copied folder accordingly.

## CSS

Path: ../themes/procdir/theme.css

The CSS file is used for all text styles (including highlights). You can change the styles as you wish but you must retain the existing element names.

## Print CSS

Path: ../themes/procdir/pdprint.css

For [printing](#) document data.

## Logos

Folder: ../themes/procdir/images

File	Use
logo.png	All ReadSoft PROCESS DIRECTOR pages, except the logon page.
logo_big.png	The ReadSoft PROCESS DIRECTOR logon page.

There are no requirements for using other images as logos. They do not have to be a specific size—they are not scaled to fit a predefined area.

## Other images

Folder: ../themes/procdir/images/

Type	Use
../images	All background images.
../images/cal	Calendar icons.
../images/icons	All other icons.

 Some images are displayed according to a specific height and width. In these cases, icons that differ in size to the originals will be resized.

## GUI texts

All language text strings (apart from field labels) are stored in localization files in the ../webapps/pdweb-app/WEB-INF/lib/webcycle-app-X.X.jar/nls/ folder.

The files are called Messages\_xx.properties where xx is the two-character ISO 639-1 language code (for example, EN for English and DE for German).

**i** webcycle-app-X.X.jar is a zip file. If your file system does not display the nls folder when you double-click the webcycle-app-X.X.jar file, you need to unzip the file (you may need to change the extension to .zip first).

## Change GUI texts

To change the text strings, complete the following steps.

1. Copy the necessary Messages\_xx.properties file(s) from the ../webapps/pdweb-app/WEB-INF/lib/webcycle-app-X.X.jar/nls/ folder to the ../webapps/wcconfig/pdweb-app/WEB-INF/conf/ folder located in your configuration folder.
2. Edit the strings as required.

The changes will take effect the next time users login. It is not necessary to restart the web server.

## Attachments

Attachments can be displayed in a docked pane to the right of the document detail view or in a separate popup window.

- Use the [pd\\_imagedocking\\_width](#) parameter in the pdweb-app.properties file to specify the width of the docked pane in pixels, or disable this parameter to display attachments in a popup window.
- Use the [pd\\_attachment\\_list\\_minimized](#) parameter to specify whether when the user selects an attachment in the Attachments pane, the attachment list is minimized or not.

Uploaded attachments (for example, PDFs and TIFFs) are automatically converted into PNG or JPG images. If an attachment contains multiple pages, a series of images is created - one image for each page.

Use the [imageconvertpng](#), [imageconvertjpg](#), or [imageconvertpdf](#) parameters in the pdweb-app.properties file to configure the conversion, as required.

In `/COCKPIT/WI15` you can specify which document types users can upload in the Web Application and specify a maximum file size for the upload of an attachment.

## Node counters

Node counters show how many documents are available in a Worklist node. If node counters are suppressed in the Worklist configuration on the SAP side for performance reasons, all nodes in the Web Application will display (0). To avoid this, in the pdweb-app.properties file, set the [pd\\_node\\_counters](#) parameter to no.

See the *PROCESS DIRECTOR Configuration Guide* for more information on suppressing node counters.

## Number of rows displayed in tables

You can specify how many rows are displayed per page in tables, such as the document overview list or the search results list. For example, you can specify that 50 documents (rows) should be displayed by default in the document overview list. If more documents are available, paging controls are displayed, allowing the user to browse through the other pages.

Use the following parameters to specify the number of rows to display in tables:

GUI area	Parameter
Document list	<a href="#">pd_page_size_list</a>
Search results	<a href="#">pd_page_size_search</a>
Document detail header	<a href="#">pd_page_size_hdr_table</a>
Document detail items	<a href="#">pd_page_size_table</a>

## File format conversion

By default, document images are displayed in TIF format. However, this may not always be practical unless users have a TIF viewer installed on their machine. In these cases, you can make ReadSoft PROCESS DIRECTOR convert and display the images as PDF files instead.

### Requirements

The external library `itex-1.4.8.jar` must be present in the `../Tomcat/shared/lib/` folder. This library is not delivered with ReadSoft PROCESS DIRECTOR.

**Note for SAP NetWeaver:** If you intend to use any external libraries, including the one above, these must be manually included in the `pdweb-app.ear` file before deploying it. Otherwise, these libraries will not work.

### Parameters

In the `pdweb-app.properties` file, use the [imageconvertpdf](#) parameter as follows.

- Set the parameter to 1 to display images in PDF format.
- Set the parameter to A to give the user the option to view images in the original TIF format.

# Administration tools and logs

Administration of the ReadSoft PROCESS DIRECTOR Web Application is composed of:

- [Log files](#)
- [Administrator mode](#) for SAP users of ReadSoft PROCESS DIRECTOR

## Log files

There are two kinds of log files for the ReadSoft PROCESS DIRECTOR Web Application:

- Web server log files
- SAP log files

Web server log files

<b>Configuration file</b>	<b><a href="#">log.properties</a></b>
Configuration file path	Specified using the <a href="#">logconfig</a> parameter in the pdweb-app.properties file.
Description	The <a href="#">log.properties</a> file determines the content of the log files, including logging level (ERROR, DEBUG, etc.)

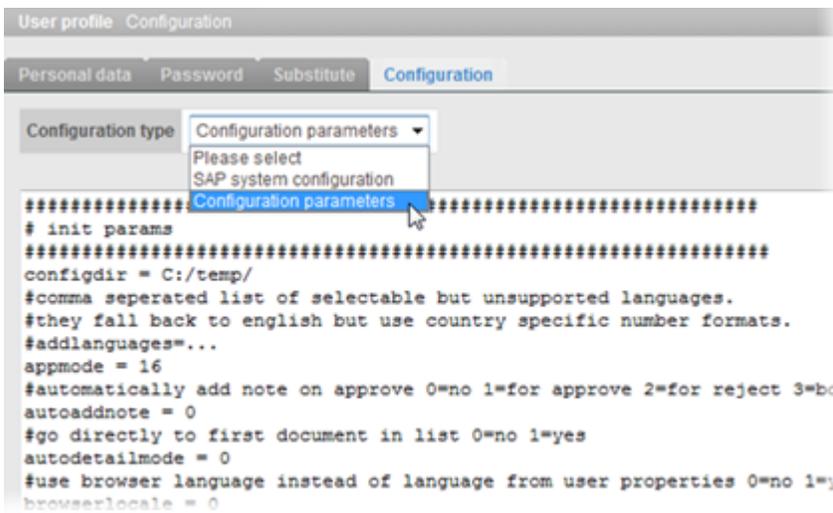
SAP log files

<b>Configuration file</b>	<b><a href="#">log4sap.properties</a></b>
Configuration file path	Specified using the <a href="#">saplogconfig</a> parameter in the pdweb-app.properties file.

Configuration file	log4sap.properties
<p>Description</p>	<p>The log4sap.properties file determines the content of the SAP log files.</p> <p>Requirements:</p> <ul style="list-style-type: none"> <li>• The <a href="#">saplogging</a> parameter must be set to 1 to activate SAP logging.</li> <li>• SAP Netweaver 7.0 or later.</li> </ul> <p>The <code>com.sap.logging.bridge.log4j.SapLogAppender</code> is used to create the log files (packaged with the PROCESS DIRECTOR Web Application). SapLogAppender uses the SAP logging API to write log entries, therefore it only runs in an SAP Netweaver environment, which provides the needed libraries.</p>

## Administrator mode

One or more SAP users (they must be SAP users and not just Web Application users) can be designated as administrators. This gives them the ability to edit the [saplogon.properties](#) and [pdweb-app.properties](#) files, and to view the [log file](#), using the ReadSoft PROCESS DIRECTOR Web Application. To view the log file, the parameter [pd\\_user\\_profile\\_as\\_node](#) must be set to yes.



To edit the configuration files that are displayed on a separate tab, complete the following step.

- For each administrator, add the following entry to [pdweb-app.properties](#).  
[administratorN](#)= SAP User ID

The value for N for the first entry must be 1 and increment sequentially for subsequent entries. For example:

administrator1 = johnsmith  
administrator2 = martinmueller  
administrator3 = susandoe

## Initial configuration

The [saplogon.properties](#) and [pdweb-app.properties](#) files can also be edited in the web browser, as in [administrator mode](#), but without logging on, provided the configuration files have not yet been edited since they were shipped by ReadSoft.

Go to: <http://localhost:8080/pdweb-app/init.do?configInit>

# Configuration files

You can configure the ReadSoft PROCESS DIRECTOR Web Application with the following configuration files.

File	Location	Description
<a href="#">pdweb-app.properties</a>	../webapps/wcconfig/	Main configuration file.
<a href="#">saplogon.properties</a>	../webapps/wcconfig/pdweb-app/WEB-INF/conf	SAP system information.
<a href="#">log.properties</a>	../webapps/wcconfig/pdweb-app/WEB-INF/conf	Web server log settings.
<a href="#">log4sap.properties</a>	../webapps/wcconfig/pdweb-app/WEB-INF/conf	SAP log settings.
<a href="#">plugin_configuration.properties</a>	../webapps/wcconfig/pdweb-app/WEB-INF/conf	Enables use of WEB CYCLE features.
<a href="#">icon_mapping.properties</a>	../webapps/wcconfig/pdweb-app/WEB-INF/conf	Specifies which icons to use.
<a href="#">mimetypes.properties</a>	../webapps/wcconfig/pdweb-app/WEB-INF/conf	Maps MIME types to file extensions.
<a href="#">Messages.properties</a>	../webapps/pdweb-app/WEB-INF/classes/nls/	Contains localized language text strings.
<a href="#">customer_buttons.properties</a>	../webapps/wcconfig/pdweb-app/WEB-INF/conf	Enables you to create your own buttons.
<a href="#">help_configuration.properties</a>	../webapps/wcconfig/pdweb-app/WEB-INF/conf	Enables you to add help to the application.
<a href="#">user_settings.xml</a>	/webapps/wcconfig/pdweb-app/WEB-INF/conf/	Configuration file for user settings.
<a href="#">_default.json</a>	../webapps/wcconfig/pdweb-app/WEB-INF/conf/mwc/_default	Configuration file for the Master Worklist.
<a href="#">tenants.properties</a>	../webapps/wcconfig/pdweb-app/WEB-INF/conf/mwc/	Configuration file for creating Master Worklist configurations for different client organizations.

## Parameter syntax and path notation

# parameter = value

- Parameter names must be lowercase (they are case sensitive).
- Value names use both lowercase and uppercase. Some values may be invalid if the incorrect case is used. Refer to the parameter descriptions and examples.
- Use the hash symbol # to disable a parameter. In these cases, the default value is used for some settings.
- Path names must use forward slashes /, not backward slashes \, even for Windows installations.
- Relative paths may be relative to different folders depending on the parameter.
- Absolute paths are allowed.

## pdweb-app.properties

### accounting.copy.FIELD (PD AP only)

When creating new accounting lines, this setting determines if the value from the selected field from the first line is automatically added to the new line.

Example:

```
accounting.copy.COSTCENTER = yes
accounting.copy.ORDERID = yes
```

This would copy the values of the cost center and purchase order number from the first accounting line to all the newly created lines.

Valid values	Description
no	Does not copy fields from the first line to the new line.
yes	Copies the selected field from the first line to the new line.

### accounting.modifycount (PD AP only)

Determines whether users can add and delete account assignment lines.

Valid values	Description
no	Adding and deleting account assignment lines is not allowed.
yes (default)	Adding and deleting account assignment lines is allowed.

## accounting.preset (PD AP only)

When creating new accounting lines, this setting determines if values from non-editable fields from the first line are automatically added to the new line.

See [accounting.preset.STEPID](#) to apply this behavior to specific workflow steps only.

Valid values	Description
no	Do not preset non-editable fields for new accounting lines with values from the first line.
yes (default)	Preset non-editable fields for new accounting lines with values from the first line.

## accounting.preset.STEPID (PD AP only)

When creating new accounting lines for the specified workflow step, this setting determines if values from non-editable fields from the first line are automatically added to the new line. This setting is the same as [accounting.preset](#), except that you can specify exactly which workflow step(s) to apply it to.

Valid values	Description
no	Do not preset non-editable fields for new accounting lines with values from the first line, for the specified workflow step.
yes	Preset non-editable fields for new accounting lines with values from the first line, for the specified workflow step.

## addlanguages

The list of languages *unsupported* by ReadSoft PROCESS DIRECTOR. If the [languageselection](#) parameter is enabled, these languages appear together with those listed for the [languages](#) parameter in the dropdown box on the logon screen.

For these unsupported languages, English is used as the display language, but the numbering formats used will be those of the selected language. For information on how to add additional unsupported languages, see [Set the display language](#).

## administratorN

Specifies one or more SAP users as administrators. This gives them the ability to edit the [saplogon.properties](#) and [pdweb-app.properties](#) files, and to view the [log file](#), using the PROCESS DIRECTOR Web Application. To view the log file, the parameter [pd\\_user\\_profile\\_as\\_node](#) must be set to yes.

See [Administrator mode](#) for details.

Syntax

administratorN =SAP User ID

The value for N for the first entry must be 1 and increment sequentially for subsequent entries. For example:

administrator1 = johnsmith  
 administrator2 = martinmueller  
 administrator3 = susandoe

## autodetailmode (PD AP only)

This setting only applies to the Workflow Inbox node of the Accounts Payable process type.

If this setting is activated, the detail view of the first document is displayed instead of the document list when the user clicks the Workflow Inbox node. After a document has been processed, the Web Application displays the next document. The document list can be viewed by clicking the Back button.

Valid values	Description
0 (default)	The document list view is displayed.
1	The document detail view is displayed.

## browserlocale

This setting determines which display language is used based on the web browser's language setting.

Valid values	Description
0 (default)	Before logon: The language in the browser's setting is used. After logon: The language in the SAP user profile is used.
1	The browser's language setting is used before and after logon.
xx	A two-character ISO 639-1 language code (for example, EN for English and DE for German). The specified language is used before and after logon.
xxXX	A two-character ISO 639-1 language code plus the two-character ISO 3166 country code (for example, enUS for American English and enGB for British English). The specified language is used before and after logon.

**i** If a language is used that PROCESS DIRECTOR does not support, English is used as the display language together with the numbering format of the selected language.

## createtaxes (PD AP only)

Determines whether in the Taxes pane, users can enter the tax information for editable Accounts Payable documents or not.

Valid values	Description
no (default)	The Taxes pane is read-only and visible only when the tax information is available.
yes	Users can add the tax information in the Taxes pane.

## csvDownloadList

The csvDownloadList parameter allows users to copy or export the documents in the document list to a CSV file. When this parameter is enabled, the Export list button appears in the document list.

You can use a combination of the following variables to determine which data is included in the list.

Valid values	Description
%jco	The field name in SAP.
%desc	The display name of the field.
%data	The field value from the document.
%sep{x} %sep{x+}	The field separator, where x can be any character, such as a semicolon. If you add a + sign, the first line of the exported file will specify the separator. For example, %sep{;} shows sep=; in the first line of the file.
%quote{x}	Adds the specified character x before and after each field value, where x can be any character. For example, %quote{'} displays field values like this: '1000' '120.00' 'EUR'.
default (default)	Default uses the following variables: %jco%desc%data%sep{;}
:copy	By appending :copy to one of the variable combinations above, the Export list button opens a new window showing the Current documents list as a simple table. This window contains a Copy button, which copies the contents of the table, including the HTML tags, to the clipboard.

### Examples:

```
%jco%desc%data%sep{,}%quote{"}
```

```

1  SEP=,
2  STATE_ICON,WC_STATE_ICON,NUMBR,PO_NUMBER,PREQ_NO,VENDOR,DOC_DATE,NET_PRICE,CURRENCY,COMP_CODE,
3  Status,Wf status,PD doc no,Purch.Doc.,Purch.reg.,Vendor,Doc. date,Amount,Crcy,CoCode,
4  "@0Y@", "", "6826", "", "", "1004", "", "999.00", "EUR", "1000",
5  "@0Y@", "", "6825", "", "", "1060", "", "999.00", "EUR", "1000",
6  "@0Y@", "", "6824", "", "", "1060", "", "999.00", "EUR", "1000",
7  "@5C@", "", "6823", "", "", "1000", "", "120.00", "EUR", "1000",

```

%desc%data%sep{;}:copy



## editmasterdata

When [editing user profiles](#) is enabled, editmasterdata determines if users can edit their personal data (name, email address, phone number, department and display language).

Valid values	Description
no	Personal data cannot be edited.
yes (default)	Personal data can be edited.
r/o	Personal data is visible, but cannot be edited.

**i** If editmasterdata is set to yes or r/o, users can view their user profile data, even if the editprofile parameter is set to no.

## editpassword

When [editing user profiles](#) is enabled, editpassword determines if users can change their passwords.

Valid values	Description
no (default)	Passwords cannot be changed.
yes	Passwords can be changed.

## editpersonalsettings

When [editing user profiles](#) is enabled, editpersonalsettings determines if the Personal settings tab is displayed. This tab allows users to clear the histories for entered users and values, and provides the option to view documents in their original file format.

Valid values	Description
no	Personal settings tab is not displayed.
yes (default)	Personal settings tab is displayed.

## editprofile

Determines whether SAP and ReadSoft PROCESS DIRECTOR users can edit their user profiles. For SAP users, the [editprofilesap](#) parameter must also be set to yes.

Valid values	Description
no	User profiles cannot be edited.
yes (default)	User profiles can be edited.

**i** The default value is yes for normal mode only. In portal mode, the default is no.

## editprofilesap

Determines whether SAP users can edit their profiles. To enable this setting, the [editprofile](#) parameter must also be set to yes.

Valid values	Description
no (default)	SAP user profiles can be edited.
yes	SAP user profiles cannot be edited.

## editsubstitutes

When [editing user profiles](#) is enabled, editsubstitutes determines if users can assign substitutes.

Valid values	Description
no (default)	Substitutes cannot be assigned.
yes	Substitutes can be assigned.

## editusercustfields (PD AP only)

Allows users to edit custom ReadSoft PROCESS DIRECTOR user data fields. These fields can also be edited using `/cockpit/wum`.

Valid values	Description
no (default)	Disables editing of custom ReadSoft PROCESS DIRECTOR user data.
yes	Enables editing of custom ReadSoft PROCESS DIRECTOR user data.

## extsearch.default

If an external Email user search has been added (using the [sysid.ext\\_search](#) setting in [saplogon.properties](#)), extsearch.default determines if this search method is used as the default for all the workflow steps.

To use the external search for only specific workflow steps, use [extsearch.STEPID](#).

Valid values	Description
no	Do not use the external search method.
yes (default)	Use the external search method (if available).

## extsearch.STEPID

If an external user search has been added (using the [sysid.ext\\_search](#) setting in [saplogon.properties](#)), [extsearch.STEPID](#) determines if this search method is used as the default for the specified workflow step(s). Add an entry for each workflow step for which the external search is used.

Use [extsearch.default](#) to make the external search the default for all the steps.

Valid values	Description
no	Do not use the external search method for the specified workflow step.
yes	Use the external search method for the specified workflow step.

## formspath (PD AP only)

The path to the forms directory. (PDF and HTML forms can be attached to invoices. See the *PROCESS DIRECTOR Accounts Payable Configuration Guide* for details.)

Default	../webapps/wcconfig/pdweb-app/pdf_forms
Example result	C:\Program Files\Apache Software Foundation\Tomcat\webapps\wcconfig\pdweb-app\pdf_forms
Requirements	HTML forms – tidy.jar PDF forms – itext-v.v.jar (where v.v is the current version).

## helpconfig

The path to the help configuration file.

Default	../WEB-INF/conf/help_configuration
Example result	C:\Program Files\Apache Software Foundation\Tomcat 5.5\webapps\wcconfig\webcycle-app\WEB-INF\conf\help_configuration.xml

## history.attachfile (PD AP only)

This parameter gives users the ability to upload and attach files to documents when viewing documents in the History tab.

Valid values	Description
no (default)	Files cannot be attached in the History tab.
yes	Files can be attached in the History tab.

## history.onlyapprovals (PD AP only)

This parameter controls whether the documents displayed in the History tab include only approved documents or not.

**i** To use this parameter, the [history.stateselection](#) parameter must be disabled.

Valid values	Description
no (default)	Both approved and unapproved documents are displayed in the History tab.
yes	Only approved documents are displayed in the History tab.

## history.stateselection (PD AP only)

Determines whether the Show only approvals check box is displayed in the History tab. If this box is checked, only approved documents are displayed in the search results. Otherwise, non-approved documents are also shown.

Alternatively, you can hide this check box and configure this option as standard for all users, using the [history.onlyapprovals](#) parameter. If set to yes, the results will include only approved documents, for all users.

Valid values	Description
yes (default)	Displays the Show only approvals check box in the History mode.
no	Does not display the Show only approvals check box in the History mode.

## ignorefieldstateinlist (PD AP only)

This parameter controls the evaluation of a workflow step field status in the overview list. If the parameter is set to yes, the value of a field that is hidden by the field status in the document detail will be displayed in the overview list. If the parameter is set to no, the field will be displayed in the overview list, but the value will not be displayed.

Set to yes, this parameter can help to improve performance when using User Exit 22, Determining the field status in the detail screen.

Valid values	Description
no	The field value of the hidden field is not displayed in the overview list.

Valid values	Description
yes (default)	The field value of the hidden field is displayed in the overview list.

## imageattach (PD AP only)

Determines whether the Attach image button is displayed in the Current documents detail view. (Applies only to those documents that do not have an image attached to them.) After uploading an image, the Attach image button changes to Show invoice as image.

**i** Only one image can be attached to a document.

Valid values	Description
no	Hides the Attach image button.
yes (default)	Displays the Attach image button.

## imageattach.STEPID (PD AP only)

Determines whether the Attach image button is displayed in the Current documents detail view for the specified workflow step. This setting is the same as [imageattach](#), except that you can specify for exactly which workflow step(s) users are allowed to upload images.

Valid values	Description
no	Hides the Attach image button for the specified workflow step.
yes	Displays the Attach image button for the specified workflow step.

## imageconvertjpg

This parameter applies to the Web Service version of the Web Application, which is required in order to run the Web Application on ReadSoft Mobile.

Converts TIFF and PDF documents into a series of JPG images.

**i** The conversion of documents into images can be configured with the [imageconvertpng](#), [imageconvertjpg](#), or [imageconvertpdf](#) parameter. To display the images correctly, use only one of these parameters for the configuration, and set 0 as the value for the others.

Valid values	Description
0 (default)	Does not convert TIFF and PDF documents into a series of JPG images
1	Converts TIFF documents into a series of JPG images
2	Converts TIFF and PDF documents into a series of JPG images

## imageconvertpdf

Converts and displays document images as PDFs.

**i** The external library itex-1.4.8.jar must be present in the ../Tomcat/shared/lib/ folder. This library is not delivered with ReadSoft PROCESS DIRECTOR.

**!** Warning: The conversion of documents into images can be configured with the imageconvertpng, imageconvertjpg, or imageconvertpdf parameter. To display the images correctly, use only one of these parameters for the configuration, and set 0 as the value for the others.

Valid values	Description
0 (default)	Do not display document images as PDFs.
1	Displays document images as PDFs.
A	Displays document images as PDFs. Also gives users the option to display documents as TIFFs.

## imageconvertpdf.permissions

This parameter specifies the security settings for [PDF images](#). You can use a combination of the following values, each separated by a semicolon (;).

By default, imageconvertpdf.permissions is disabled, which means that all of the actions below are allowed, and that PDFs are not encrypted. As soon as you enable this setting and specify one of the values, the other actions not specified are disallowed. PDFs are always not encrypted, unless you specify 1.

Valid values	Description
AllowPrinting	Printing is permitted.
AllowModifyContents	PDF editing is permitted.
AllowCopy	Copy/paste functions are permitted.
AllowModifyAnnotations	Annotation editing is permitted.
AllowFillIn	Data entry in forms is permitted.
AllowScreenReaders	Permit screen readers to access PDFs.
AllowAssembly	Changing pages, bookmarks and thumbnails permitted.
AllowDegradedPrinting	Lower resolution printing is permitted.
0	PDF is not encrypted.
1	PDF is encrypted.

## imageconvertpng

This parameter applies to the Web Service version of the Web Application, which is required in order to run the Web Application on ReadSoft Mobile.

Converts TIFF and PDF documents into a series of PNG images.

**i** If the PDF documents contain JBIG2-compressed images, you have to add the external levigo-jbig2-imageio-1.6.1.jar library to the lib folder.

**Warning:** The conversion of documents into images can be configured with the imageconvertpng, imageconvertjpg, or imageconvertpdf parameter. To display the images correctly, use only one of these parameters for the configuration, and set 0 as the value for the others.

Valid values	Description
0 (default)	Does not convert TIFF and PDF documents into a series of PNG images
1	Converts TIFF documents into a series of PNG images
2	Converts TIFF and PDF documents into a series of PNG images

## imageinlist (PD AP only)

Displays the invoice image in the overview list.

Valid values	Description
0 (default)	Does not display the invoice image.
1	Displays the invoice image.

## invoice.createatonce (PD AP only)

Determines if, when creating an invoice, the invoice is created immediately, or if an invoice form must first be filled in and saved.

Valid values	Description
no	Invoice form must first be filled in before the invoice is created. After clicking Save, messages from SAP are displayed about the invoice creation.
yes (default)	Invoice is created without filling in a form. User is immediately taken to the Detail view of the invoice.

## languages

This setting specifies the languages supported by PROCESS DIRECTOR.

If the [languageselection](#) parameter is enabled, the list of languages here also appears in the dropdown box on the logon screen.

- PROCESS DIRECTOR ships with localizations for these languages:  
de, en, fr, es, nl, ja, no, fi (Finnish is not available for Accounts Payable)
- Additionally these languages are available for Accounts Payable:  
pt, it, pl, sv, cs, sl, hu, ro, tr, zh, ru, sk

**i** When the user logs in to the Web Application, the first language code in the list of languages is used as the default language.

For information on how to support additional languages, see [Set the display language](#).

## languageselection

Displays the language selection box on the logon screen. To use this parameter, [browserlocale](#) must be set to 0.

Valid values	Description
0 (default)	The language selection box is not displayed.
1	The language selection box is displayed, using values from the <a href="#">languages</a> and <a href="#">addlanguages</a> parameters.

## lineitems.editable (PD AP only)

This parameter determines whether line items for MM invoices can be edited or not. The line item field must be set as editable in SAP for it to be editable in the ReadSoft PROCESS DIRECTOR Web Application. If it is not, changing the `lineitems.editable` setting has no effect – the field will remain read-only.

This parameter can also be enabled or disabled for individual workflow steps by adding the step ID (for example, `lineitems.modifycount.WFSTEP1=no`).

Valid values	Description
no	Do not allow MM line item fields to be edited.
yes (default)	Allow MM line item field values to be changed (for editable fields only).

## lineitems.modifycount (PD AP only)

This parameter determines whether line items for MM invoices can be added and deleted or not. This parameter can also be enabled or disabled for individual workflow steps by adding the step ID (for example, `lineitems.modifycount.WFSTEP1=no`).

Valid values	Description
no	Do not allow MM line items to be added or deleted.
yes (default)	Allow MM line items to be added or deleted.

## logconfig

Determines the path of the web server log configuration file.

Default value	WEB-INF/conf/log.properties
Example result	C:\Program Files\Apache Software Foundation\Tomcat 6.0\webapps\wcconfig\pdweb-app\WEB-INF\conf\log.properties

## loginheader

Specifies the method used to retrieve a user name within an SSO scenario.

Value type	Description
Header	<p>loginheader=someheader: The ReadSoft Web Application looks for an HTTP header named someheader, and the header content is considered to be a user name. The Web Application then attempts to get the document list for this user.</p> <p>When used in the "email user" scenario, together with ntlmauthenticate=-1, the existence of the specified header is enough to access the document.</p>
Cookie	<p>The parameter value may reference a cookie (cookie:somecookie). In this case, the application looks for a cookie namedsomecookie. The value cookie:somecookiecan have the extension, (fromN,toN). In this case, the logon name is taken from the cookie value starting with the character, fromN, up to (but excluding) the character,toN. The character count starts at 0.</p> <p>Example:</p> <p>loginheader=cookie:someuser(2,8)  Value of cookie, someuser = \$\$SmithZABC  User name used = SmithZ</p> <p>When used in the "email user" scenario, together with ntlmauthenticate=-1, the existence of the specified cookie is enough to access the document.</p>

Value type	Description
Java Class	<p>The parameter value can reference a JAVA class (class:someclass). In this case, the application dynamically loads the someclass Java class and tries to call the authenticateUser(HttpServletRequest request) method. This method either returns a null value and sets the logonErrorrequest attribute, or returns the account name of the user logged on to the workstation.</p> <div data-bbox="873 583 1451 747" style="background-color: #e6f2ff; padding: 5px;"> <p><b>i</b> Java classes are loaded using the default package path, com.ebydos.cockpit.webcycle.app.auth. If a different package path should be used, the full path has to be written before the class name.</p> </div> <p>The preconfigured classes mentioned above are activated through (for example) loginheader=class:X509certRfcAuthenticator. When used in the "email user" scenario, together with ntlmauthenticate=-1, the document can be accessed when the class call returns a non-empty value.</p>

## logo

Filename of the image that is displayed in the upper-right corner of the browser window.

<b>Default value</b>	<b>logo.png</b>
File type	Either JPG, PNG, or GIF.
Size	See <a href="#">logoheight</a> .
Location	The <i>images</i> folder of the current theme.

## logoff\_redirect\_url

This parameter redirects users to a specific URL when they click Log off or the Close button, or when they are logged off automatically after a period of inactivity.

You can enable this parameter by setting it to the desired URL.

For example, logoff\_redirect\_url = http://www.readsoft.com

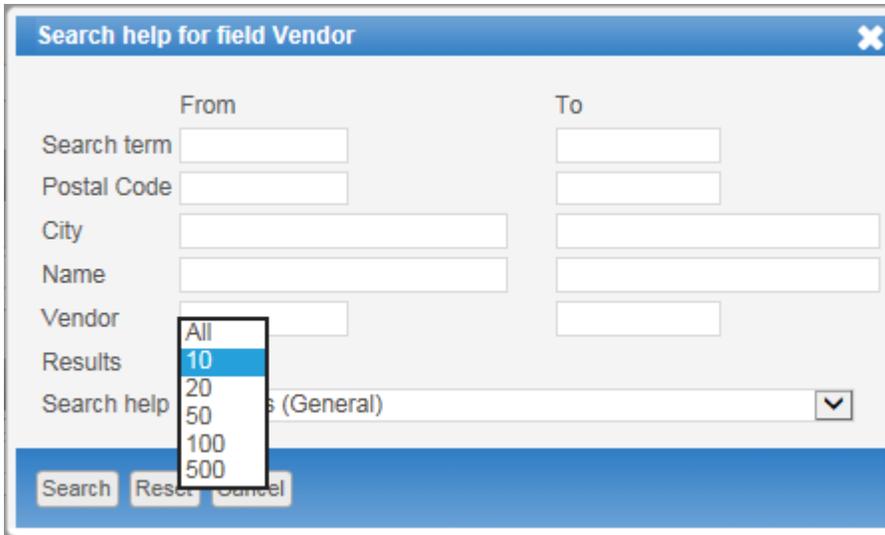
## logoheight

The height of the [logo](#), in pixels.

**Default value:** 60

## maxresult.search

This parameter defines the selection options for the Results drop-down list when using search helps (for example, searching for vendors and purchase orders). The values specify the maximum number of search results to display. You can use the parameter `pd_page_size_search` to specify how many of the returned search results to display on a single page.



<b>Valid values</b>	Any series of positive integers, comma separated. The 0 value displays the All text. The first non-zero value is selected by default. In the example shown above, the valid values would be 10,20,50,100,500, and 10 would be selected by default.
<b>Default</b>	10,50,100,500.

## messageconfig

The path to the customized localization files/text strings.

**i** The default localization files are saved in the `../webapps/pdweb-app/WEB-INF/classes/nls/` folder. If you want to edit these strings, you must move the `Messages_xx.properties` files to the location you specify below.

<b>Default</b>	<b>../WEB-INF/conf/Messages</b>
Example result	C:\Program Files\Apache Software Foundation\Tomcat 6.0\webapps\wcconfig\pdweb-app\WEB-INF\conf\Messages_xx.properties

## multiaccounting.check

Determines if the following check is performed:

Sum of the amounts and quantities in the multi-account assignment items = Totals of the respective line item

This check also verifies whether G/L accounts and cost objects entered in the accounting lines are valid.

Valid values	Description
no (default)	No check of totals and validity is performed.
yes	The above multi-account assignment total check is performed. If the totals are not the same, or if the entered G/L account and cost objects are not valid, an error message is displayed.

## multiaccounting.check.STEPID

This parameter performs the same check as the [multiaccounting.check](#) setting. Using [multiaccounting.check.STEPID](#) though, you can restrict the check to one or more single workflow steps. Do this by inserting the name of the step after the setting name. For example:

multiaccounting.check.MYWORKFLOWSTEP

Valid values	Description
no (default)	No check of totals is performed for the specified step.
yes	The <a href="#">multi-account assignment total check</a> is performed for the specified workflow step.

## multiprocessing.approve

When enabled, users can approve documents from the Current documents List view, as well as approve multiple documents simultaneously.

You can specify if documents must be in the same workflow step for them to be approved together. See the [multiprocessing.approve.checksteps](#) parameter.

Valid values	Description
no (default)	Disables document approval in the List view.
yes	Enables document approval in the List view.

## multiprocessing.approve.checksteps

When enabled, documents must be in the same workflow step for them to be approved together.

To use this parameter, [multiprocessing.approve](#) must be enabled.

**i** The approval will function only if none of the selected invoices need to have users assigned.

Valid values	Description
no	Documents can be in different workflow steps and approved together using <a href="#">multiprocessing.approve</a> .
yes (default)	Documents must be in the same workflow step for them to be approved together using <a href="#">multiprocessing.approve</a> .

## [multiprocessing.forward](#)

When enabled, users can forward documents from the Current documents List view, as well as forward multiple documents simultaneously.

You can specify if documents must be in the same workflow step for them to be forwarded together. See the [multiprocessing.forward.checksteps](#) parameter.

Valid values	Description
no (default)	Disables document forwarding in the List view.
yes	Enables document forwarding in the List view.

## [multiprocessing.forward.checksteps](#)

When enabled, documents must be in the same workflow step for them to be forwarded together.

To use this parameter, [multiprocessing.forward](#) must be enabled.

Valid values	Description
no	Documents can be in different workflow steps and forwarded together using <a href="#">multiprocessing.forward</a> .
yes (default)	Documents must be in the same workflow step for them to be forwarded together using <a href="#">multiprocessing.forward</a> .

## [multiprocessing.reject](#)

When enabled, users can reject documents from the Current documents List view, as well as reject multiple documents simultaneously.

You can specify if documents must be in the same workflow step for them to be rejected together. See the [multiprocessing.reject.checksteps](#) parameter.

Valid values	Description
no (default)	Disables document rejection in the List view.
yes	Enables document rejection in the List view.

## multiprocessing.reject.checksteps

When enabled, documents must be in the same workflow step for them to be rejected together.

To use this parameter, [multiprocessing.reject](#) must be enabled.

Valid values	Description
no	Documents can be in different workflow steps and rejected together using <a href="#">multiprocessing.reject</a> .
yes (default)	Documents must be in the same workflow step for them to be rejected together using <a href="#">multiprocessing.reject</a> .

## multiprocessing.substitution

When enabled, a user (acting as a substitute) can take over documents from the Current documents List view, as well as take over multiple documents simultaneously.

Valid values	Description
no (default)	Disables the taking over of documents in the List view.
yes	Enables the taking over of documents in the List view.

## normaltimeout

The session timeout period, in seconds.

After the specified period of inactivity, the current session is terminated. The user is logged off and all existing locks are removed (this also occurs if the user closes the browser before logging off).

**i** In a SAML SSO scenario, the session timeout of the IdP is also taken into account. The Web Application timeout must be higher than the IdP timeout. For more information, see [Session timeout](#).

## ntlmauthenticate

The method used to retrieve user credentials from the Windows NT LAN Manager (NTLM).

Valid value	Description
0	Off

Valid value	Description
1	<p>Only for ReadSoft PROCESS DIRECTOR Accounts Payable and documents in workflow that have been sent to an email address (called "email user"). Email users receive an email that contains a link to the document that they are assigned to work on. The link contains the document GUID, which is a 32-digit hex code.</p> <p>Setting <code>ntlmauthenticate=1</code> prevents others from using this GUID to work on the document. Users who know the GUID will be able to open the document only when:</p> <ul style="list-style-type: none"> <li>• The Web Application can retrieve the username through NTLM</li> <li>• The username can be located in a directory server.</li> </ul> <p>It is necessary to set up the connection to a directory sever by using the <code>ntlm_ldap.properties</code> file.</p> <ul style="list-style-type: none"> <li>• The email address found in the directory server is the same as the one specified for the recipient of the document.</li> </ul>
-1	<p>Only for the "email user" scenario.</p> <p>Setting <code>ntlmauthenticate=1</code> prevents users who know the GUID from opening the document when the information retrieved using the <code>loginheader</code> method is not valid. See the <a href="#">loginheader</a> section for more information.</p>
2	<p>SAP and Web Application users only.</p> <p>The username is retrieved from NTLM by using the HTTP header.</p> <p>The username is matched against the list of SAP and Web Application users in the SAP system.</p> <p>If a match is found, the document list for that user is displayed.</p>
-2	<p>Same as 2. If SSO is not available, or if the user credentials retrieved are incorrect, the standard logon page is displayed for the user to manually log on.</p>
3	<p>SAP and Web Application users only.</p> <p>The username is retrieved by calling the Java <code>getRemoteUser()</code> method.</p> <p>The username is matched against the list of SAP and Web Application users in the SAP system.</p> <p>If a match is found, the document list for that user is displayed.</p>
-3	<p>Same as 3. If SSO is not available, or if the user credentials retrieved are incorrect, the standard logon page is displayed for the user to manually log on.</p>

For 2, 3, -2, and -3: If an SAP user and Web Application user have the same username, the system uses the setting in the `userpriority` parameter to determine which user account to use. If the found user is not available for some reason (for example, the user is locked or has no authorization), the system searches all user types, in the order specified by the priorities set in `/EBY/PDBO_VUSTC` (see the *PROCESS DIRECTOR Configuration Guide* for more information), and then logs the user in when valid user credentials are found.

The server hosting the ReadSoft PROCESS DIRECTOR Web Application needs to be "behind" a Microsoft IIS server. For details on how to set up such a scenario, see the following sections.

- [Enable automatic logon](#)
- [Install IIS](#)
- [Copy Tomcat files to IIS](#)

This setup only supports Microsoft Windows using Internet Explorer, or Firefox (with the help of a plugin).

## ntlmauthenticate.error

When using the [NTLM method](#) to authenticate users, and a user cannot be authenticated (because the user name cannot be determined), you can enable this setting to force the web server to return the error, instead of the ReadSoft PROCESS DIRECTOR Web Application.

Valid value	Description
401	Forces the web server to return the NTLM authentication error, instead of the ReadSoft PROCESS DIRECTOR Web Application.

## ntlmauthenticate\_remove\_domain

This parameter is used to define whether the domain is removed from the user credentials during SSO authentication. By default, the domain is removed, but some SSO scenarios, such as SNC, require the domain name as well as the user ID for authentication.

Valid value	Description
No	The domain name is retained.
Yes	Default value. The domain is removed from the username and just a plain username is used for authorization.

## pd\_attachment\_list\_minimized

Determines whether when the user selects an attachment in the Attachments pane, the attachment list is minimized or not. A minimized list allows for invoice attachments to be displayed in a larger document viewer.

Valid values	Description
yes	<p>On selecting an attachment, the attachment list in the Attachments pane is minimized.</p> <p><b>i</b> This value requires that the <a href="#">pd_imagedocking_width</a> parameter is set such that attachments are displayed in a docked pane. If the <a href="#">pd_imagedocking_width</a> parameter is set to display the attachments in a popup, the document viewer will not be available.</p>
no (default)	On selecting an attachment, the attachment list in the Attachments pane stays maximized.

## pd\_bg\_search\_def

This parameter requires that the [extended search functionality](#) is activated.

Since a field can have multiple search helps, this parameter enables you to define a specific search help to be used for the background search. For example, for the vendor search, you can specify which of the available search helps should be used.

**i** This parameter is obsolete if you are running the Web Application with ReadSoft PROCESS DIRECTOR 7.4. Instead, you use the **Primary search help** setting in the ReadSoft PROCESS DIRECTOR view model. See the *PROCESS DIRECTOR Configuration Guide* for more information.

Syntax:

```
pd_bg_search_def[_<DT>]_<FIELD> = <SEARCH>
```

where <FIELD> is the field in which the user types the value and <SEARCH> is the search help to be used for the background search.

<DT> enables you to specify use of the search help for a specific PROCESS DIRECTOR document type only, such as PO for Requisitions or IV for Accounts Payable.

Examples:

pd\_bg\_search\_def\_COSTCENTER = KOSTS uses the search help named KOSTS for all fields named COSTCENTER.

pd\_bg\_search\_def\_PO\_VENDOR = KREDA uses the search help named KREDA for all fields named VENDOR in the PO Requisitions document type.

You can look up suitable values in SAP customizing or by analyzing the XML communication between the PROCESS DIRECTOR Web Application and the SAP system.

## pd\_client\_download\_url

All attachments in the ReadSoft PROCESS DIRECTOR Web Application are streamed to the client through a DownloadServlet to ensure attachment availability and security. With this parameter, you can specify which URLs for Web Application attachments should not be streamed through the DownloadServlet, but called directly.

Enter a comma separated list of URL patterns. For example, this configuration excludes all URLs beginning with http://server1 and https://:

```
pd_client_download_url = http://server1.*; https://.*
```

## pd\_date\_format

With this parameter, you can specify the date format in the Web Application (including language-specific formats). If the parameter is available as a [user setting](#), users can also specify their own date formats individually.

The default value is default, which means that the default format is taken from the Java runtime, depending on the user locale.

The following are the possible date formats:

```
MM/dd/yyyy  
yyyy/MM/dd  
dd/MM/yyyy  
yyyy.dd.MM  
yyyy.MM.dd  
dd.MM.yyyy  
dd.MM.yyyy  
yyyy.MM.dd  
yyyy. MM. dd  
MM-dd-yyyy  
dd-MM-yyyy  
yyyy-MM-dd
```

So if you set pd\_date\_format= yyyy. MM. dd, this format will be used for all users regardless of their locale (except for users who override this value in their user settings).

 The official Java notation uses mixed case, but you can also specify the format completely in uppercase or lowercase.

Example of language-specific format:

```
pd_date_format_de=yyyy. MM. dd
```

In this case, the specified date format is used only for those users who have their current language set to de (German). If a user has a different language, the default setting for that language is used.

If both pd\_date\_format and pd\_date\_format\_de are set, pd\_date\_format\_de is not used.

## pd\_doc\_navigate

Determines whether users can navigate to the previous or next document from the document detail view or not.

Valid values	Description
yes (default)	Allows users to navigate to the previous or next document.
no	Does not allow users to navigate to the previous or next document.

### Can be configured as a user setting

Yes

## pd\_extended\_search

This parameter extends the [suggestions functionality](#) to also call a field's search help (if available) in the background. When the user types at least two characters in the field, the results from the background search are added to the suggestions list.

If you are running the Web Application with a version of ReadSoft PROCESS DIRECTOR prior to 7.4, you can further define the extended search functionality using the following parameters.

- [pd\\_bg\\_search\\_def](#): specifies the search help to be used for the background search
- [pd\\_text\\_search\\_key](#): extends the background search to match user input in the field descriptions as well as values

If you are running the Web Application with ReadSoft PROCESS DIRECTOR 7.4, you further define the background search functionality in the ReadSoft PROCESS DIRECTOR view model instead of using these parameters. See the PROCESS DIRECTOR Configuration Guide for more information on configuring search helps.

Valid values	Description
no (default)	Only previously stored suggestions are returned when the user starts typing in the field.
yes (default)	When the user types at least two characters in the field, the field's search help is called in the background and the search results are added to the suggestions list (up to a maximum of 16 entries). <div style="background-color: #e0f2f7; padding: 5px; margin-top: 10px;"> <p><b>i</b> With the <a href="#">pd_search_on_change_DOCTYPE_FIELDID</a> parameter, you can extend the number of characters that the user must type in a specific field before the search help is called in the background.</p> </div>

Example:

This proposal comes from the stored suggestions because the value 1000 has been entered before.

Company Code	1 ? IDES AG
Validity per. start	1000 IDES AG

The additional four proposals come from the background search.

Company Code	10 ? IDES AG
Validity per. start	1000 IDES AG 2100 IDES Portugal
Validity period end	3010 Euro Subsidiary - Belgium F100 Bankhaus Frankfurt R100 IDES Retail GmbH

If the user selects an entry from the search results, this entry is added to the saved suggestions.

Company Code	? IDES Portugal
Validity per. start	1000 IDES AG 2100 IDES Portugal
Validity period end	

**Can be configured as a user setting**

Yes

**pd\_field\_help\_delay**

For fields that have search help, you can display details of the current field value in a popup window. To do this, set pd\_field\_help\_delay to a value in milliseconds, which specifies how long the mouse cursor must hover over the field before the details are displayed.

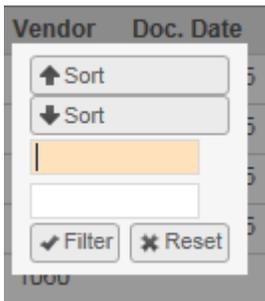
Vendor	Plant	A	GR
1060	1000	K	<input type="checkbox"/>
Country	KN		
City	FRANKFURT AM MAIN		
Search term	CHEMIE		
Name	READSOFT EBYDOS AG		
Vendor	1060		
Company Code	1000		

For example, 1500 means that the mouse cursor must hover one and a half seconds over a field before the details are displayed.

Valid values	Description
<Positive integer>	Displays the full search help value for all fields with search help.
<Negative integer> Default: -500	Displays the full search help value only for read-only fields with search help.

## pd\_filter\_list

When enabled, users can filter documents in the document overview list. Clicking a column heading opens a popup in which the user can select a sort order (ascending or descending) and enter a value or value range to filter the list.



Valid values	Description
yes (default)	Enables filtering the document overview list.
no	Disables filtering the document overview list.

### Can be configured as a user setting

Yes

## pd\_formats\_from\_sap

Determines whether the date and number formats for SAP users are taken from the default user settings in the SAP user profile.

Valid values	Description
yes (default)	Date and number formats are taken from the default user settings in the SAP user profile, regardless of the current user language and pd_date_format and pd_number_format parameters.

Valid values	Description
no	Date and number formats are taken from the pd_date_format and pd_number_format parameters. If these parameters are not configured or are set to default, date and number formats are taken from the Java runtime depending on the user locale.

**i** If pd\_formats\_from\_sap is set to yes (default), and a user wants to specify date and number formats themselves in their user settings, they must also set pd\_formats\_from\_sap=no in their user settings to override the default setting.

### pd\_group\_message

Determines the order in which messages resulting from a document processing action are displayed.

Valid values	Description
yes (default)	Messages are displayed sorted by severity (error, warning and success).
no	Messages are displayed in the same order as they are received from SAP. This can be useful when searching for errors.

#### Can be configured as a user setting

Yes

### pd\_header\_display\_mode

Determines whether the header data is presented in tabs or data panels.

Valid values	Description
BOXES (default)	The header data is presented in data panels.
TABS	The header data is presented in tabs.

The screenshot shows a web application interface for configuring 'Purchase Requisition - Header data'. It is divided into three main sections:

- General:** Includes fields for Document status (checkbox), Postable, Workflow status, PD document number (100), Document Date (12/11/2014), Delivery date (12/25/2014), Currency amount (0.00), and Currency (EUR).
- Organization data:** Includes fields for Purchasing Document, Purchase Requisition, Purchasing Doc. Type (NB), Purch. Organization (1000 IDES Deutschland), Purchasing Group (001 Dickens, B.), and Company Code (1000 IDES AG).
- Vendor:** Includes fields for Vendor (1000 C.E.B. BERLIN) and Terms of Payment (ZB01).

Header data presented in data panels

Purchase Requisition - Header data

General
Organization data
Vendor
Texts

<b>Document status</b>	<input type="checkbox"/>	Postable
<b>Workflow status</b>		
<b>PD document number</b>	100	
<b>Document Date</b>	<input type="text" value="12/11/2014"/>	
<b>Delivery date</b>	<input type="text" value="12/25/2014"/>	
<b>Currency amount</b>	0.00	
<b>Currency</b>	<input type="text" value="EUR"/>	

Header data presented in tabs

**Can be configured as a user setting**

Yes

**pd\_help\_icon\_pos**

Determines the position of the icon that opens the search help or the calendar help for a field.

The value of this parameter is the offset relative to the right-hand border of the field where the icon appears. The default value is -16, so the icon appears in the right-hand corner of the field.



If you set this value to 0, the icon will appear directly behind the field.



**pd\_ics\_only\_quickstart (PD AP only)**

This parameter must be set to yes in order to create a Quick Start menu for Accounts Payable in a [Master Worklist](#). The Quick Start menu provides rapid access to frequently used lists or actions.

See the PROCESS DIRECTOR Configuration Guide for information on creating a Quick Start menu.

Valid values	Description
yes (default)	A Quick Start menu for Accounts Payable can be used in a Master Worklist.
no	A Quick Start menu for Accounts Payable cannot be used in a Master Worklist.

## pd\_ignore\_att\_url (Web Service only)

This parameter only applies to the Web Service version of the Web Application, which is required in order to run the Web Application on ReadSoft Mobile. This parameter must be set to yes in order to display images correctly.

It enables you to specify that attachments are always read using binary data. If the backend is not able to serve attachments in a binary way, an error message is shown. This may be the case for PROCESS DIRECTOR Accounts Payable images if the Image transfersetting in /COCKPIT/C21 is set to Y Archive first (image data), then Web server (URL).

Valid values	Description
no (default)	Do not read attachments using binary data.
yes	Read attachments using binary data.

## pd\_imagedocking\_width

Determines whether attachments are displayed in a docked panel displayed to the right of the document details or in a separate popup window.

Valid values	Description
0	The image is displayed in a popup window.  <div style="background-color: #ffe6e6; padding: 5px; border: 1px solid #ffe6e6;"> <p><b>!</b> This value is not compatible with the <a href="#">imageconvertpng</a> and <a href="#">imageconvertpdf</a> parameters. If one of these parameters is set to 1 or 2, the pd_imagedocking_width parameter is automatically set to 400 (disabled).</p> </div>
Disabled (default)	The image is docked with a default width of 400 pixels.
Positive integer	Defines the width (in pixels) of the panel that displays the docked image; for example, 400 = the panel is 400 pixels wide.

### Can be configured as a user setting

Yes

## pd\_initialsplit

This parameter controls the default width of the Worklist. The default value is 20%. Enter a different value (in percentage, pixels or points) to increase or decrease the default width.

## pd\_mime\_detection

Activates automatic MIME-type detection to prevent malware uploads.

Setting the value to 1 activates malware detection based on file content, not its extension.

Valid values	Description
0 (default)	MIME-type is set based on file extension.
1	MIME-type is set based on file content.

## pd\_node\_counters

The `pd_node_counters` parameter determines whether counters are displayed in the Worklist nodes.

Valid values	Description
yes (default)	Worklist node counters are displayed.
no	Worklist node counters are not displayed. If node counters are suppressed in the Worklist configuration on the SAP side for performance reasons, all nodes in the Web Application will display (0). To avoid this, set this parameter to no.

### Can be configured as a user setting

Yes

## pd\_notes\_in\_detail

Determines whether notes are displayed in the table area of the document detail view or in the Additional information area.

Valid values	Description
yes	Notes are displayed in the table area of the document detail view.
no (default)	Notes are displayed in the Additional information area.

### Can be configured as a user setting

Yes

## pd\_number\_format

With this parameter, you can specify the number format in the ReadSoft Web Application (including language-specific formats). If the parameter is available as a [user setting](#), users can also specify their own number formats individually.

The default value is default, which means that the default format is taken from the Java runtime, depending on the user locale.

The following are the possible number formats:

9 999,9

9'999.99  
9,999.99  
9.999,99

So if you set `pd_number_format=9,999.99`, this format will be used for all users regardless of their locale (except for users who override this value in their user settings).

Example of language-specific format:

`pd_number_format_de=9 999,9`

In this case, the specified number format is used only for those users who have their current language set to `de` (German). If a user has a different language, the default setting for that language is used.

If both `pd_number_format` and `pd_number_format_de` are set, `pd_number_format_de` is not used.

## pd\_page\_size\_list

This parameter controls how many documents are displayed in the document list. If more documents are available, paging controls are displayed, allowing the user to browse through the other pages. The default value is 20 documents. If this parameter is set to -1, the number of documents displayed is calculated automatically.

### Can be configured as a user setting

Yes

## pd\_page\_size\_hdr\_table

This parameter controls how many lines are visible for tables in the header panel on the document detail page. If more lines are available, paging controls are displayed, allowing the user to browse through the other pages. The default value is 7 lines. If this parameter is set to -1, the number of visible lines is calculated automatically.

### Can be configured as a user setting

Yes

## pd\_page\_size\_search

This parameter controls how many search results are displayed on a single page. The default value is 10 lines. If more than the specified number of lines are available, paging controls are displayed below the search results, allowing the user to browse through the other pages. You can use the [maxresult.search](#) parameter to specify values for the maximum number of results to display in total.

**Search help for field Vendor**
✕

From	To
Search term <input style="width: 90%;" type="text"/>	<input style="width: 90%;" type="text"/>
Postal Code <input style="width: 90%;" type="text"/>	<input style="width: 90%;" type="text"/>
City <input style="width: 90%;" type="text"/>	<input style="width: 90%;" type="text"/>
Name <input style="width: 90%;" type="text"/>	<input style="width: 90%;" type="text"/>
Vendor <input style="width: 90%;" type="text"/>	<input style="width: 90%;" type="text"/>
Results <input style="width: 40%;" type="text" value="20"/> ▼	
Search help <input style="width: 90%;" type="text" value="Vendors (General)"/> ▼	

Search
Reset
Cancel

	Search term	Postal Code	City	Name	Vendor ↑
<input type="radio"/>	CPG	27563	HAMBURG	FORKS MANUFACTURING GMBH	1
<input type="radio"/>	AUTO	66386	ST. INGBERT	WALD & MAIER	100
<input type="radio"/>	ALLGEMEIN	12001	BERLIN	C.E.B. BERLIN PERSONAL &	1000
<input type="radio"/>	AUTO/PUMPE	97341	SCHWEINFURT	SKF KUGELMEIER KGAA	1001
<input type="radio"/>	AUFZÜGE	83204	ROSENHEIM	MÜLLER KG	1002
<input type="radio"/>	AUTO	90710	HARBOR CITY	GUSSWERK US	1003
<input type="radio"/>	AUTO	67102	W1 LONDOND	JONES LTD.	1004
<input type="radio"/>	ELEKTO	68301	MANHEIM	PAQ DEUTSCHLAND GMBH	1005
<input type="radio"/>	CHEMIE	66000	FRANKFURT/MAIN	BLACKS AG	1006
<input type="radio"/>	BIKE	30095	HANNOVER	BIKE RETAIL & CO.	1007

⏪
⏩
1-10
▼
⏪
⏩

**Can be configured as a user setting**

Yes

**pd\_page\_size\_table**

This parameter controls how many lines are visible for tables on the document detail page. If more lines are available, paging controls are displayed, allowing the user to browse through the other pages. The default value is 10 lines.

**Can be configured as a user setting**

Yes

## pd\_print\_full\_text

Determines how much of the text typed in a field in the ReadSoft Web Application is printed.

Valid values	Description
0 (default)	Only the first 40 characters will be printed.
1	The whole text will be printed.
n	The first n letters will be printed, whereby n>1.

### Can be configured as a user setting

Yes

## pd\_print\_page

Displays a Print button  at the top right of the page in the document detail view that enables users to print the document data, including notes.

You can make printing available for specific process types only by appending the process type ID. For example, the following settings allow printing for requisitions (PO) and goods receipts (DN) only:

```
pd_print_page = no
pd_print_page.PO = yes
pd_print_page.DN = yes
```

You can customize the look and feel of the printed page by editing the `pdprint.css` file in the `themes/procdir` folder.

Valid values	Description
no (default)	Print button is not displayed.
yes	Print button is displayed.
0	Print button is not displayed (same as no).
1	Print button is displayed (same as yes).
2	Print button is displayed without the printer dialog popup.

### Can be configured as a user setting

Yes

## pd\_search\_auto\_select

This parameter determines whether the search help result value is automatically inserted in the field if the search returns only one result.

You can also set this parameter for a specific field or a specific document type and field, for example:

- `pd_search_auto_select_COMP_CODE = yes`: The value is inserted for the Company Code field.
- `pd_search_auto_select_IV_VENDOR_NO = no`: The value is not inserted for the Vendor field in Accounts Payable documents.

Valid value	Description
yes	The value is automatically inserted in the field.
no (default)	The user must select the value.

## pd\_search\_on\_change

This parameter determines whether field values are validated or not.

If they are validated, when the user enters some data in a field, and the value entered is not found by the background search or is not unique, the parameter determines whether or not the search help for the field should be displayed.

Valid value	Description
0	The field value is not validated. The validity of the value is checked only on the SAP side.
1 (default)	The field value is validated when the user presses the Enter or Tab key, or clicks outside the field. If the validation is not successful, the field is highlighted in red to indicate an incorrect value
2	The field is validated when the user presses the Enter or Tab key, or clicks outside the field. If the validation is not successful, the search help is displayed

### Can be configured as a user setting

Yes

## pd\_search\_on\_change\_DOCTYPE\_FIELDID

This parameter determines how many characters the user must type in a specific field before the search help for the field is called in the background.

You must activate the background search by setting the parameter `pd_extended_search=yes`. See [pd\\_extended\\_search](#) for more information.

By default, the parameter `pd_extended_search=yes` calls a field's search help in the background when the user types at least two characters in the field. With the `pd_search_on_change_DOCTYPE_FIELDID` parameter, you can override this setting for specific fields in specific document types. This is advisable if the search is likely to yield many results.

For example:

- `pd_search_on_change_IV_EMAIL = 4` means that for Incoming Invoice documents (IV), the background search will only be called when the user types at least 4 characters in the EMAIL field.
- `pd_search_on_change_EMAIL = 4` means that for all document types, the background search will be called when the user types at least 4 characters in the EMAIL field.

If the parameter has a value of 0 (zero), the background search will not be called.

**Can be configured as a user setting**

Yes

### pd\_searchhelpkey

Determines which key(s) is used to open the search help popup (to search for valid values in the database).

`pd_searchhelpkey=<code><modifier>`

Valid values	Description
<code>	p=F1, q=F2, r=F3, s=F4, t=F5, u=F6, v=F7, w=F8, x=F9, y=F10, z=F12.
<modifier>	0=No modifier 1=Shift 2=Ctrl 3=Shift+Ctrl 4=Alt 5=Shift+Alt 6=Ctrl+Alt 7=Shift+Ctrl+Alt 8=AltGr 9=Shift+AltGr 10=Ctrl+AltGr 11=Shift+Ctrl+AltGr 12=Alt+AltGr 13=Shift+Alt+AltGr 14=Ctrl+Alt+AltGr 15=Ctrl+Shift+Alt+AltGr

**Examples**

`pd_searchhelpkey=s0` Result: F4 (Default)

`pd_searchhelpkey=p4` Result: Alt+F1

### pd\_select\_last\_node

Determines whether the last used Worklist node or the Quick Start menu is displayed when the user logs on to the ReadSoft Web Application.

Valid values	Description
yes	Displays the document list of the Worklist node that the user was working with when they logged off.
no (default)	The Quick Start menu is displayed (if available).

**Can be configured as a user setting**

Yes

### pd\_select\_mode

By default, the ReadSoft Web Application displays standard select boxes, in which the user selects an entry with the mouse:

Doc status	<input type="checkbox"/>
PD doc number	210
Action for data record	Insert <input type="button" value="v"/>
G/L Account No.	22233310

### Standard select box

The Web Application can also render a new, non-standard select box that shows only the internal value in an input field. When the user clicks the arrow icon in the select box, the external values are displayed in a popup. The internal value is generally very short, while the external value is longer, but easier to understand. Users who know the internal value can type the value directly into the select box.

Doc status	<input type="checkbox"/>
PD doc number	210
Action for data record	I <input type="button" value="v"/>
G/L Account No.	Insert (I)
Company Code	Change (U)
	Delete (D)

### New select box

The new select box saves space in tables and also provides a quick input mode for users who prefer to use the keyboard rather than mouse. You can also configure the new select box to display the external value.

Doc status	<input type="checkbox"/>
PD doc number	210
Action for data record	Insert
G/L Account No.	22233310
Company Code	1000

### New select box with external values

Valid values	Description
0 (default)	Always use standard select boxes.
1	Use the standard select box in the header and the new select box in tables (for example, in line items).
2	Always use new select boxes.
3	Use the standard select box in the header and the new select box showing external values in tables.
4	Always use new select boxes showing external values.

#### Can be configured as a user setting

Yes

### pd\_show\_last\_note

Determines whether or not the last note added to the document is displayed in a popup window when the document is in a workflow. This popup window is displayed only once per document and user session. However, if the Notes pane is already open, the popup is not displayed.

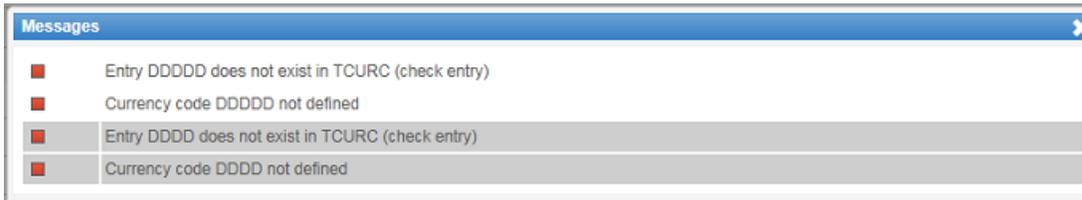
Valid value	Description
<Number of characters>	Determines the number of characters displayed in the note. For example, the value 100 displays only the first hundred characters of the note.

#### Can be configured as a user setting

Yes

### pd\_show\_old\_messages

Determines whether older messages (from previous checks) are displayed or not. Click the Messages button to view the older messages.



Valid values	Description
yes (default)	Displays recent and older messages.
no	Displays only recent messages.

**Can be configured as a user setting**

Yes

### pd\_show\_tif\_embedded

Determines whether an attached TIFF image in a document is displayed in a separate browser window or in the PROCESS DIRECTOR viewer.

Valid value	Description
No (default)	File opens in a separate application.
Yes	File is displayed in the PROCESS DIRECTOR viewer.

### pd\_skip\_selection\_screen

Specifies whether or not the start-up selection screen is displayed when users start ReadSoft PROCESS DIRECTOR.

Valid value	Description
No (default)	The start-up selection screen is displayed.
Yes	The start-up selection screen is not displayed and all document types are available in the Worklist.

### pd\_subtable\_first

For tables that have sub-tables, a field (of the type icon) should be defined in the field catalog that triggers opening and closing of the sub-tables. If there is only one sub-table, the definition of the trigger field can be skipped and a default icon is rendered. This option controls whether this default icon appears as the first or the last field in the table line above.

Valid values	Description
yes (default)	The default icon appears as the first field.
no	The default icon appears as the last field.

## pd\_suggest\_mode

Text fields of a normal text type (in general, all fields that do not contain price or quantity values) have a built-in function to automatically save previously entered field values and offer a list of these values as suggestions to users when they begin to type a value in the field. With the `pd_suggest_mode` parameter, you can add additional functionality to this list, such as allowing the user to edit or clear the suggestions list.



You can use this parameter together with `pd_extended_search`, which adds values found by a background search to the user's suggestions list.

**i** The suggestions are saved according to the process type.

<b>pd_suggest_mode value</b>	<b>pd_extended_search=yes</b>	<b>pd_extended_search=no</b>
default	Background search results are displayed. No previously entered values are displayed. The edit and clear options are not available.	Previously entered values are displayed. No background search results are displayed. The edit and clear options are not available.
append	Previously entered values are displayed, followed by the option to edit, and then the background search results. The clear option is not available. Previously entered values are displayed after entering one character; background search results are displayed after entering two characters.	Previously entered values are displayed, followed by the option to edit. No background search results are displayed. The clear option is not available.
edit	Only background search results are displayed. The edit and clear options are not available.	Previously entered values are displayed, followed by the option to edit. No background search results are displayed. The clear option is not available.
clear	Only background search results are displayed. The edit and clear options are not available.	Previously entered values are displayed, followed by the option to clear. No background search results are displayed. The edit option is not available.

pd_suggest_mode value	pd_extended_search=yes	pd_extended_search=no
off	Only background search results are displayed. The edit and clear options are not available.	The suggestions list is not used at all; no suggestions are saved and no values are displayed.

## pd\_text\_search\_key

This parameter requires that the [extended search functionality](#) is activated.

It enables you to extend the background search to match the user input not only in the actual field values, but also in the field descriptions.

**i** This parameter is obsolete if you are running the Web Application with ReadSoft PROCESS DIRECTOR 7.4. Instead, you use the Search relevant field setting in the ReadSoft PROCESS DIRECTOR view model. See the PROCESS DIRECTOR Configuration Guide for more information.

### Syntax

```
pd_text_search_key[_<DT>]_<FIELD> = <SFIELD>[:<SFIELD>]
```

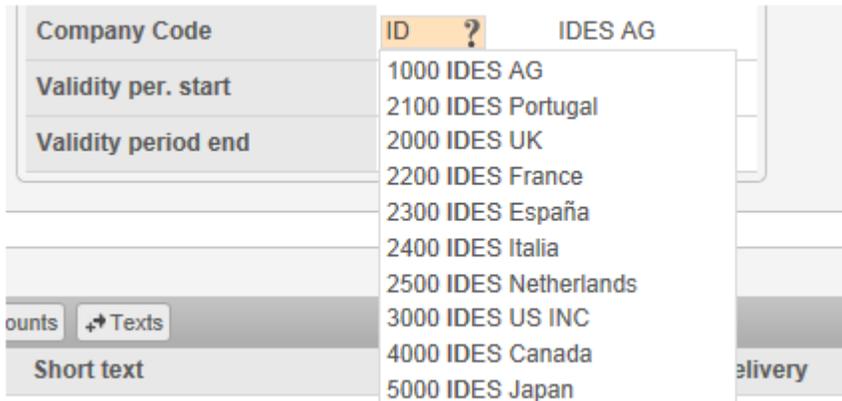
where <FIELD> is the field in which the user types the value and <SFIELD> is the search help match code field to be used for the background search.

<DT> enables you to specify for the search help for a specific document type only, such as PO for Requisitions or IV for Accounts Payable.

[<SFIELD>]: If different fields are used for searching and displaying results, specify the name of the search field and the name of the display field separated by a colon (see example below).

### Examples

pd\_text\_search\_key\_COMP\_CODE = BUTXT uses the field BUTXT of the background search help for a text search in all fields named COMP\_CODE. This enables the user to search for the company code description.



- `pd_text_search_key_IV_VENDOR_NO = MCOD1` uses the field `MCOD1` of the background search help for a text search in all fields named `VENDOR_NO` in the IV Incoming Invoices document type.
- `pd_text_search_key_PLANT = MC_NAME1:NAME1` uses the field `MC_NAME1` of the background search help for a text search in all fields named `PLANT`. When displaying the results, the field `NAME1` of the search help is used.
- `pd_text_search_key_WC_RECEIVER = EMAIL` uses the field `EMAIL` of the background search help for a text search in all fields named `WC_RECEIVER`. This enables the user to search for workflow recipients by email address.

## pd\_user\_profile\_as\_node

Determines whether the user profile will be displayed or not.

If it is, it can be displayed as a Worklist node, as a link in the Quick Start menu, or both.

Valid values	Description
0	Hides the user profile.
1 (default)	Displays the user profile as a node, as well s in the Quick Start menu.
2	Displays the user profile as a node only.

Important: This parameter requires the entry `PDDDataProviderUSER_PROFILE = UserXMLSapProvider` in the `plugin_configuration.properties` file.

## pd\_user\_settings

Specifies the path to the `user_settings.xml` file, which enables you to define settings that users can change themselves in their user profile. The default is path is `../webapps/wcconfig/pdweb-app/WEB-INF/conf/`.

## pd\_value\_summary.IV (PD AP only)

When configured, the total amount values of the invoices selected by the user in the document overview list are displayed in a message panel above the list.

The parameter settings determine which fields are used to calculate the values and how the values are displayed.

For example, the following settings calculate the total gross amount of the selected invoices and display this amount for each currency.

```
pd_value_summary.IV = [FIELD_GROSS_AMOUNT] : [SUM_GROSS_AMOUNT] [CURRENCY] :
[ CURRENCY]
```

You can also add additional text by defining a value for `pdgui.summary` in your language-specific `messages.properties` file.

For example, if you define the value `pdgui.summary=Total value for selected invoices` in the `messages_en.properties` file, the following settings calculate the total gross and net amounts of the selected invoices and display these amounts for each currency, preceded by the text "Total value for selected invoices".

```
pd_value_summary.IV = {pdgui.summary}[FIELD_GROSS_AMOUNT] :
[SUM_GROSS_AMOUNT] --- [FIELD_NET_AMOUNT] : [SUM_NET_AMOUNT] [CURRENCY] :
[ CURRENCY]
```

## pd\_visual\_timeout

Activates a visual counter that is displayed as an additional bar above the document list. The counter shows the time (in minutes and seconds) that is left until the current session times out, decreases by seconds, and resets every time a call to the server is executed (for example, to retrieve or save data).

The font and color of the counter can also be configured.

### Syntax

```
pd_visual_timeout = fg:bg
```

Valid values	Description
fg	The CSS-style color code for the counter's foreground color. All combinations of hexadecimal colors, decimal RGB colors, and RGB color names can be used.
bg	The CSS-style color code for the counter's background color. All combinations of hexadecimal colors, decimal RGB colors, and RGB color names can be used. If the background color is not set, the default grey is used.

### Format

- Hexadecimal color: #<color code>
- Decimal RGB color: rgb(R,G,B)
- RGB color name: <color name>

### Examples

pd\_visual\_timeout = #345678:#E0E0E0

pd\_visual\_timeout = rgb(10,20,30):white

pd\_visual\_timeout = orange:#A1A2A3

pd\_visual\_timeout = orange

## pd\_warning\_new\_version

When a user logs on to the Web Application, a check for a cookie named pdVersion is performed. If this cookie is found and the value is different from the internal application version number, a message is displayed suggesting that the user should clear the browser cache.

Valid values	Description
yes (default)	The message is displayed
no	The message is not displayed

## pd\_wfsteps\_in\_header

Determines whether in the header, the workflow processors are displayed in the Workflow status pane or not. The current, previous, and next processors, as well as any combination of them, can be displayed.

Valid values	Description
0 (default)	The workflow processors are not displayed.
C	The current processor is displayed.
P	The previous processors are displayed.
N	The subsequent processors are displayed.

### Examples

pd\_wfsteps\_in\_header=C displays the current processor.

pd\_wfsteps\_in\_header=CN displays the current and any subsequent processors.

### Can be configured as a user setting

Yes

## pdap\_auto\_image (AP only)

Determines whether when the user opens the document detail view, the invoice image is automatically displayed or not. If the invoice does not have an attached image, no image is displayed.

If an invoice image is displayed, and the user navigates to the next invoice in the document detail view, the image of that invoice is displayed.

**i** This parameter is evaluated for images only. It is not evaluated for other types of invoice attachments.

Valid values	Description
0	The invoice image is not automatically displayed.
1 (default)	If the <a href="#">pd_imagedocking_width</a> parameter is set for attachments to be displayed in a docked pane in the document detail view, the invoice image is automatically displayed. If the <a href="#">pd_imagedocking_width</a> parameter is set to display the attachments in a popup, the invoice image is not automatically displayed.
2	On opening the document detail view, the invoice image is automatically displayed. Depending on the <a href="#">pd_imagedocking_width</a> parameter value, the invoice image is displayed in a docked panel to the right of the document detail view, or in a separate popup window.

#### Can be configured as a user setting

Yes

### pdap\_goto\_next\_doc\_approve

Determines whether when the user leaves the document detail view (for example, after approving or rejecting a document), the next available document is automatically displayed or not, instead of the document overview list.

Valid values	Description
yes	The next available document is displayed. Important: If you set the value to yes, you need to set the <a href="#">pdap_show_processed</a> parameter to no. Otherwise, the document overview list will be displayed when the user leaves the document detail view.
no (default)	The document overview list is displayed.

#### Can be configured as a user setting

Yes

### pdap\_mark\_unread (AP only)

Determines whether documents that have not yet been opened are highlighted in bold type in the document overview list.

Valid values	Description
no (default)	No documents are highlighted in bold type in the document overview list.
yes	Documents that have not yet been opened are highlighted in bold type in the document overview list.

#### Can be configured as a user setting

Yes

### pdap\_show\_maa\_table (AP only)

Determines whether the account assignments for purchase order item are displayed in MM invoices.

Valid values	Description
yes (default)	Users can click the Posting lines button to view the account assignments for purchase order item.
no	The Posting lines button and the account assignments for purchase order item are not available.

### pdap\_show\_po\_history

Determines whether the Purchase Order history table is displayed in MM invoices and when it is not displayed if a number of line items in the invoice exceeds a certain number.

Valid values	Description
yes (default)	Users can click the Purchase Order History button to view the purchase order history.
no	The Purchase Order history button and table are not available.
0-N (where N is natural number)	Purchase Order history table is displayed if the MM invoice has N or less line items. Purchase Order history table is not displayed if the MM invoice has more than N line items.

### pdap\_show\_processed

Determines whether after the user has successfully executed a workflow action (forward/approve/reject/query), the processed invoice is displayed in the document list (workflow inbox) or not.

Valid values	Description
yes (default)	The processed invoice is displayed in the document overview list.

Valid values	Description
no	The processed invoice is not displayed in the document overview list. Important: If the <a href="#">pdap_goto_next_doc_approve</a> parameter is set to yes, you need to set the <a href="#">pdap_show_processed</a> parameter to no. Otherwise, the <a href="#">pdap_goto_next_doc_approve</a> parameter will not work correctly.

## pdap\_show\_userid\_in\_search (AP only)

Determines whether the user ID of a workflow recipient is displayed in the user search result lists.

Valid values	Description
no	The user ID is hidden. If, in addition, the <a href="#">userformat.workflow.status</a> parameter is set to %n, only the full name and email address of the user are displayed.
yes (default)	The user ID is displayed.

## pdap\_use\_pd\_field\_names (PD AP only)

In ReadSoft PROCESS DIRECTOR, field labels and table titles are taken from the field catalog of the WC and IV process types and can be customized there.

For ReadSoft PROCESS DIRECTOR Accounts Payable, in order to ensure consistency with the old WORK CYCLE Web Application, these field catalog labels are taken from the Web Application [messages.properties](#) file instead. With this parameter, you can disable this.

**i** It is recommended to set [pdap\\_use\\_pd\\_field\\_names=yes](#) for new installations and leave the default value for upgrade installations.

See the PROCESS DIRECTOR Configuration Guide for more information on the field catalog.

Valid values	Description
no (default)	Field labels are taken from the <a href="#">messages.properties</a> file.
yes	Field labels are taken from the PROCESS DIRECTOR field catalog.

## pluginconfig

The path to the [plugin configuration file](#).

Default	../WEB-INF/conf/plugin_configuration
Example result	C:\Program Files\Apache Software Foundation\Tomcat 6.0\webapps\wcconfig\pdweb-app\WEB-INF\conf\plugin_configuration.xml

## portalmode

Activates portal mode. This parameter should be used only in conjunction with a [Single Sign On \(SSO\)](#) implementation.

Valid values	Description
0 (default)	Portal mode is not used.
1	Portal mode is used.
2	Portal mode is used, but adds screen header elements (like logo, user name, copyright message, and optional help button) that would not normally be visible when in portal mode.

## profile.department.editable

Determines whether the Department field is displayed in the user profile settings, and if yes, whether it is mandatory to enter a department or not.

**i** If the profile.department.editable parameter is disabled, it is mandatory to enter a department.

Valid values	Description
MANDATORY (default)	It is mandatory to enter a department.
YES	A department can be entered, but it is not mandatory to do so.
NO	The Department field is read only. It is not possible to enter a value.
HIDDEN	The Department field is not displayed.

## profile.phone.editable

Determines whether the Telephone field is displayed in the user profile settings, and if yes, whether it is mandatory to enter a telephone number or not.

**i** If the profile.phone.editable parameter is disabled, it is mandatory to enter a telephone number.

Valid values	Description
MANDATORY (default)	It is mandatory to enter a telephone number.
YES	A telephone number can be entered, but it is not mandatory to do so.
NO	The Telephone field is read only. It is not possible to enter a value.
HIDDEN	The Telephone field is not displayed.

## saplogconfig

Determines the path of the SAP log configuration file.

**i** SAP logs are only produced if `saplogging` is set to 1.

Default value	WEB-INF/conf/log4sap.properties
Example result	C:\Program Files\Apache Software Foundation\Tomcat 6.0\webapps\wcconfig\pdweb-app\WEB-INF\conf\log4sap.properties

## saplogging

Use SAP logging (for SAP Netweaver 7.0 or later).

Valid values	Description
0 (default)	Do not use SAP logging.
1	Use SAP logging.

The ReadSoft Web Application uses the `saplogconfig` parameter to determine the location of the `log4sap.properties` file.

(The Web Application uses Apache Log4j as the logging API. This makes it possible to attach to customer specific or application server specific logging systems.)

## saplogonconfig

The path to the SAP logon properties file.

Default	../WEB-INF/conf/saplogon.properties
Example result	C:\Program Files\Apache Software Foundation\Tomcat 6.0\webapps\wcconfig\pdweb-app\WEB-INF\conf\saplogon.properties

## showimagebutton

Determines where to place the Show image button and icon in the detail view.

Valid values	Description
1	Text button at the top.
2	Text button at the bottom.
3	Text button at the top and bottom.
4	Icon at the top.
5	Text button and icon at the top.

Valid values	Description
6	Text button at the bottom and icon at the top.
7	Text button at the top and bottom and icon at the top.

## showlastlogin

Determines whether the last logon information is displayed in the header after logging on.

Valid values	Description
no (default)	Does not display last logon information.
yes	Displays last logon information.

## showlinks

Determines which of the following links are displayed on the logon page and in the header of all other (non-popup) pages:

- Home page
- Copyright notice
- Disclaimer

Valid values	Description
1	Home page.
2	Copyright notice.
3	Home page and copyright notice.
4	Disclaimer.
5	Home page and disclaimer.
6	Copyright notice and disclaimer.
7	All links.

## showtaxes (PD AP only)

Determines whether the tax field is displayed in the detail view. The field is a link that opens a popup window that displays the tax details of the document.

Valid values	Description
no	Hides the tax field.
yes (default)	Displays the tax field.

## sso-cookiename

The name of the cookie containing the single sign on ticket. (When using a SAP single sign on logon scenario.)

<b>Default value</b>	<b>MYSAPSSO2</b>
----------------------	------------------

## template.createfrom (PD AP only)

Allows users to create new invoices based on templates that they have previously created.

**i** Users can only use templates that they themselves have created. Templates are not shared between users.

These settings must be enabled:

- `wb_create`. Allows invoices to be created.
- `template.save`. Allows invoice templates to be created.

Valid values	Description
no (default)	Invoices cannot be created using templates.
yes	Invoices can be created using templates.

## template.save (PD AP only)

This setting gives users the option of creating invoice templates. The Save template button appears when creating a new invoice.

**i** The `wb_create` setting, which allows invoices to be created, must be enabled.

Valid values	Description
0 (default)	Invoice templates cannot be created.
1	Invoice templates can be created.
2	Invoice templates cannot be created. (At present, values 0 and 2 have the same effect, but changes are planned in the future.)

## theme.procdir

Specifies the location of the GUI theme.

Default value: `themes/procdir/`

**i** For bigger buttons and input fields, as well as sharper edges, you can use `themes/procdir1/` instead.

Note the presence of the ending forward slash.

This points to the `../pdweb-app/themes/procdir/` folder.

## undo (PD AP only)

Determines whether users can recall Accounts Payable workflow steps in the ReadSoft Web Application.

Valid values	Description
0	Disables the Recall Worklist node for all Web Application users.
1	Documents that have been approved or forwarded can be recalled if after approving or forwarding action, the documents have not been changed.
2	Documents can be recalled if in the /COCKPIT/WI3 transaction, the Recall documents in WA option has been activated for the current step.

## upload.html.pdfconverter

Use this setting to convert HTML forms to PDF for archiving. The value is the path to the converter tool:

full\_path\_to\_convert.exe <in> <out>

Where the <in> and <out> variables are replaced by the input and output filenames.

**For example:**

c:/program files/html2pdfconverter\convert -i{in} -o{out}

## userformat.profile

This setting controls what information is displayed in the substitutes table on the User profile page.

The default value is %n.

Valid values	Description
%n	Full name
%m	Email address
%d	Department
%p	Phone number
%u	User ID
%t	User type

## userformat.superior

This setting controls what information is displayed in the Worklist node for substitutes.

The default value is %n.

Valid values	Description
%n	Full name
%m	Email address
%d	Department
%p	Phone number
%u	User ID
%t	User type

### userformat.superior.tooltip

This setting controls what information is displayed in the Worklist node tooltip for substitutes.

The default value is %n.

Valid values	Description
%n	Full name
%m	Email address
%d	Department
%p	Phone number
%u	User ID
%t	User type

### userformat.workflow.status (PD AP only)

This setting controls what user information is displayed on the Workflow Status page.

The default value is %n (%t: %u) - full name (user type; user ID).

Valid values	Description
%n	Full name
%m	Email address
%d	Department
%p	Phone number
%u	User ID
%t	User type

### userpriority

When using a [Single Sign On](#) method, this setting determines which user account to use if an SAP user and Internet (Web Application) user have the same user name.

userpriority has no effect in the following scenarios:

- When logging on manually with a password. ReadSoft PROCESS DIRECTOR determines the user account in accordance with the user type priority configuration settings in `/EBY/PDBO_VUSTC`. See the PROCESS DIRECTOR Configuration Guide for more information.
- For logons through [MySAP SSO2](#). The SAP user is used.
- For logons through an SSO plugin (see [loginheader](#)). The plugin can specify the user value. Only if none is specified, is userpriority used.

Valid values	Description
S (default)	Use the SAP user account.
I	Use the Internet user account.

## wb\_create (PD AP only)

Determines whether or not users can create invoices (for their supplier[s] only).

Valid values	Description
0 (default)	Creating invoices is not permitted.
1	Creating invoices is permitted.

## wallowsapsbst

This setting allows SAP users to act as substitutes for Internet (Web Application) users.

Valid values	Description
no	SAP users cannot be substitutes for PROCESS DIRECTOR users.
yes (default)	SAP users can be substitutes for Internet users.

## wintitle

The title displayed in the web browser title bar.

Valid values	Any string.
Default value	(The product name and version.)

## xss\_security\_header.n

This setting enables you to configure which HTTP headers are added to the HTTP response in order to prevent [cross-site scripting](#) (XSS).

The parameter value must be of type `<header>:<value>`. If this parameter is set, an HTTP header named `<header>` with value `<value>` is added to the HTTP response.

The default values shipped with the PROCESS DIRECTOR Web Application are:

- `xss_security_header.1 = X-Frame-Options: sameorigin`

- `xss_security_header.2 = X-XSS-Protection: 1; mode=block`
- `xss_security_header.3 = X-Content-Type-Options: nosniff`
- `xss_security_header.4 = Content-Security-Policy: script-src 'self' 'unsafe-inline' 'unsafe-eval'`

**i** This value enables you to specify a content security policy header for HTTP responses.

- `xss_security_header.5 = Cache-Control: no-store`
- `xss_security_header.6 = Pragma: no-cache`

## saplogon.properties

The `saplogon.properties` file is used to configure the connection to the SAP system. It contains information about the SAP system the PROCESS DIRECTOR Web Application connects to.

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

### sapsystem

Specifies the default SAP system when there is more than one defined in `saplogon.properties`.

### sysid.activate

Determines if the connection to the system is enabled or not.

Valid values	Description
no	The connection to the SAP system is deactivated.
yes	The connection to the SAP system is activated.

### sysid.ashost

The host name of the application server. You can set the host name in the following ways.

- Using an SAP router string

Example:

`D76.ashost = /H/saprouter-snc.ebydos.org/S/3298/W/p3e8aejng9hb1ry/H/d76.r3.ebydos.local`

- Using the IP address of an SAP server

Example:

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

### sysid.client

The three-digit SAP client identifier.

### *sysid.ext\_auth\_svc*

Specifies the Java class used to authenticate users.

### *sysid.ext\_search*

Specifies the Java class used to search 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.

JCo traces are written to the same folder as the logs of the Web Application (specified using the logDir setting).

### *sysid.lang*

Not used (deprecated).

### *sysid.maxconnections*

The maximum number of simultaneous connections permitted from the ReadSoft PROCESS DIRECTOR Web Application 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. If you need more than 100 connections, set the `CPIC_MAX_CONV` environment variable on the server where JCo is installed to the desired number and set the *sysid.maxconnections* parameter accordingly. For more information, see [Increase the number of connections](#).

Example: Setting *sysid.maxconnections*=10 will allow 10 connections.

**!** In previous releases, the maximum number of SAP connections specified could be internally multiplied by 10. This is not done anymore.

### *sysid.msgghost*

The host name of a message server.

## *sysid.passwd*

The SAP system user password.

For SAP system releases in which passwords are not case sensitive, never use lowercase letters in passwords. New versions of the RFC library (like in JCO 2.1.7 and above) do not automatically convert passwords to uppercase. See also: SAP Note 792850.

**i** On request, ReadSoft 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.

## *sysid.sso*

Enables Single Sign On (SSO).

Valid values	Description
1	Enabled.
2	Disabled.

## *sysid.ssouser*

In a normal Single Sign On (SSO) scenario, the credentials of a user is used to logon and connect to an SAP system. When using the `sysid.ssouser` parameter, users logon in the regular SSO way, but the user specified in this setting is used for all subsequent RFC calls.

**i** To use this setting, `sysid.sso` must be set to 1.

## *sysid.sysnr*

The SAP system number.

## *sysid.system*

The SAP system ID, if different to the `sysidprefix`.

The SAP system ID is automatically taken using the `sysid` prefix, which is used for all settings in `saplogon.properties`. This parameter is only needed if you want to use the same file to connect to more than one system that differ only in client or `sysnr`.

### **Example:**

DR1-800.client = 800

DR1-800.system = DR1

DR1-0.client = 0

DR1-0.system = DR1

## *sysid.user*

The SAP system user.

## log.properties

Change the log.properties file to configure the output of the web server log files. This section describes all the settings found in log.properties.

### Sample log entry

A log line is composed as follows.

[Date]<Sep>Time<Sep>[Host]<Sep>SessionID<Sep>Level<Sep>Message

- Square brackets indicate optional values.
- <Sep> is the separator character.
- The message is a free-formatted text. If the log level is set to FATAL, ERROR or WARNING, an error number and one more separators is prefixed.

Java-based logging

You can also use the log.properties file to enable your own log4j logging configuration. To do so, add settings starting with log4j., as required.

Example: log4j.appender.WEBAPPLOGFILE.DatePattern='\_yyyy-MM-dd-HH'.log'

If you enable your own log4j logging configuration, the standard settings in the log.properties file are ignored. The log4j.properties file is also ignored. Therefore, it is recommended that you copy all the available log4j settings from the log4j.properties file to the log.properties file.

## appName

The name of the Web Application, inserted at the start of every log entry.

Valid values	Any string.
Default value	<blank>

## dailyFile

Determines if a new log file is created every day.

Valid values	Description
no	The same log file is used every day.
yes (Default)	A new log file is created every day.

## dateFormat

The format of the date inserted in log entries.

Example: yyyy/MM/dd converts to 2009/08/13

**i** When `showDate = no`, the date is not used.

Valid values	Any date conformant with the Java SimpleDateFormat.
Default value	yyyy/MM/dd

## host

The hostname of the application server, inserted in log entries.

Valid values	Any string. If the name is specified as %host, the name is taken from the HTTP request.
Default value	%host

## level

Specifies the level of activity that is written to the log files.

Valid values	Description
0	OFF
1	FATAL
2	ERROR
3 (Default)	WARN
4	DEBUG
5	INFO

## logDir

The directory where the log files are saved.

If the path is not absolute, it is relative to the web server's working directory. For example: temp1/ would save log files in ../Tomcat 6.0/temp1/

The path must end with a forward slash (/).

If no value is specified (default), the ReadSoft PROCESS DIRECTOR Web Application creates a directory in the web server's log directory. For example: ../Tomcat 6.0/logs/pdweb-app/

## logName

The name format of the log files.

The %date variable is replaced by the current date. If no value is specified the default value is used.

Valid values	Any string
Default value	wctrc%date.log

## separator

The character used to separate columns in log file entries.

Valid values	Any character.
Default value	;

## showDate

Determines if the date is included in log entries. It is set to no by default, because the [dailyFile](#) setting is used to produce a new log file for each day.

Valid values	Description
no (Default)	The date is not included.
yes	The date is included.

## timeFormat

The format of the time inserted in log entries.

Valid values	Any time conformant with the Java SimpleDateFormat. If no value is specified, the default value is used.
Default value	kk:mm:ss.SSS

## log4sap.properties

Change the log4sap.properties file to configure the output of the SAP log files.

See [Log files](#) for more information.

## plugin\_configuration.properties

This file contains settings that allow ReadSoft PROCESS DIRECTOR to use features from the WORK CYCLE Web Application (such as user management).

### PDDataProvider

Set this to XMLSapProviderImpl (default).

**i** If you are using the `pd_user_profile_as_node` parameter, you must add the entry `PDDataProviderUSER_PROFILE = UserXMLSapProvider` to the `plugin_configuration.properties` file.

### OtherPool\_1

Set this to `com.readsoft.ebydos.web.pd.base.PDDataPoolImpl` (default).

### OtherPool\_16

Set this to `com.readsoft.ebydos.web.pd.base.PDDataPoolImpl` (default).

## icon\_mapping.properties

The `icon_mapping.properties` file contains the mapping of application-specific codes that are sent to the ReadSoft PROCESS DIRECTOR Web Application to display an icon.

For example, this can be a status icon from the document list, an icon for an action button on the document detail page or a generic icon like for deleting and adding lines in a table.

Normally, there is no need to change this file because it is shipped with useful values. All values in this file are names of \*.gif files that are located in the `images/pd` folder of the currently active [theme](#) in the Web Application.

## mimetypes.properties

The `mimetypes.properties` file maps MIME types to file extensions. You specify which file types can be uploaded in SAP transaction `OAC3`, but the ReadSoft PROCESS DIRECTOR Web Application can only recognize file extensions, for example, `invoice_note.txt`. The mappings in `mimetypes.properties` allow the Web Application to match the file extension with the list of allowed file types in `OAC3`.

For example, when the user selects a PDF file to upload, the Web Application looks up the matching file type in `mimetypes.properties`, checks whether this file type is listed in `OAC3`, and if so, allows the document to be uploaded.

Parameter	Description	Default
application/msword	MIME type for Microsoft Word documents	doc
application/vnd.ms-excel	MIME type for Microsoft Excel documents	xls
application/vnd.ms-powerpoint	MIME type for Microsoft PowerPoint documents	ppt
application/vnd.rn-realmedia	MIME type for Real Media files	rm
application/x-shockwave-flash	MIME type for Adobe Flash files	swf
application/pdf	MIME type for Adobe PDF documents	pdf
text/plain	MIME type for plain text documents	txt
text/html	MIME type for Hypertext Markup Language documents	htm
image/tiff	MIME type for Tagged Image File Format images	tif, tiff

## Messages.properties

This file contains all language text strings (apart from field labels). Localized versions are provided in the `../webapps/pdweb-app/WEB-INF/lib/webcycle-app-X.X.jar/nls/` folder.

The files are called `Messages_xx.properties` where `xx` is the two-character ISO 639-1 language code (for example, `EN` for English and `DE` for German).

### Create a language-specific Messages.properties file

**!** If you need to modify it in any scenario, create your own file by completing the following steps.

If you need to modify it in any scenario, create your own file by completing the following steps.

1. Copy the necessary `Messages_xx.properties` file(s) from the `../webapps/pdweb-app/WEB-INF/lib/webcycle-app-X.X.jar/nls/` folder to the `../webapps/wcconfig/pdweb-app/WEB-INF/conf/` folder located in your configuration folder.
2. Add your text strings, as required, and save the file with a language code-specific name, for example; `Messages_EN.properties`.

The changes will take effect the next time users login. It is not necessary to restart the web server.

## customer\_buttons.properties

The customer\_buttons.properties is where you create your own buttons that appear in the Web Application. It is not part of the PROCESS DIRECTOR deployment file – you must create it yourself and save it in the ..webapps/wcconfig/pdweb-app/WEB-INF/conf folder.

The customer\_buttons.properties file can contain the parameters described below (optional ones are indicated).

### Syntax

ButtonN.Parameter=Value

N = The number of the button. The first button must be Button1. Additional buttons must be Number1 sequentially. For example:

Button1.page = TAB\_HEAD\_PROCESS\_DIRECTOR

Button1.textkey = customer.button1.text

...

Button2.page = TAB\_HEAD\_PROCESS\_DIRECTOR

Button2.textkey = customer.button2.text

...

Button3.page = TAB\_HEAD\_PROCESS\_DIRECTOR

Button3.textkey = customer.button3.text

### Parameters

Parameter	Description	Valid values
ButtonN.page	The page the button appears on:	
	On all lists	TAB_HEAD_PROCESS_DIRECTOR_LIST
	On lists for document type XX	TAB_HEAD_PROCESS_DIRECTOR_LIST.XX
	On all detail pages	TAB_HEAD_PROCESS_DIRECTOR
	On detail pages for document type XX	TAB_HEAD_PROCESS_DIRECTOR.XX
	To the right of the User profile button	TAB_HEAD_PROCESS_DIRECTOR_MAIN
	On the Worklist	TAB_HEAD_PROCESS_DIRECTOR_WORKLIST

Parameter	Description	Valid values
ButtonN.textkey	<p>The name of the text key in Messages_xx.properties. The value of this key in Messages_xx.properties is the string that appears on the button.</p> <p>Example</p> <ul style="list-style-type: none"> <li>In customer_buttons.properties: Button1.textkey = EmployeeSearchButtonLabel</li> <li>In Messages_en.properties: EmployeeSearchButtonLabel = Employee search</li> </ul> <p>Important: Custom Messages_xx.properties files must be saved in the ..webapps/wcconfig/pdweb-app/WEB-INF/conf folder.</p>	Any text.
ButtonN.icon	<p>Optional</p> <p>The name of the icon file that is included in the button.</p>	Any image file. It must be saved in the ..\Tomcat\webapps\pdweb - app\themes\procdir \images\pd folder.
ButtonN.tipkey	<p>Optional</p> <p>The name of the key for the tooltip text.</p>	Any text.
ButtonN.winprops	<p>Optional</p> <p>The properties of popup window. For example, you can specify the width and height.</p>	Any properties/value combination valid for the window.open() Javascript function. For example: height=500,width=1000,location=yes
ButtonN.url	<p>The URL of the page to display in the popup window.</p>	Any fully qualified URL. For example: http://www.readsoft.com

Parameter	Description	Valid values
ButtonN.row	<p>The row number the button appears on.</p> <p> Currently, ReadSoft PROCESS DIRECTOR only supports one row of buttons, therefore the only valid value here is ButtonN.row = 1.</p>	1 (default) - Row 1
ButtonN.parameter. <i>query_param</i>	<p>The name of the fields you wish to pass as a parameter value. You can pass three types of fields:</p> <ul style="list-style-type: none"> <li>• Document header fields</li> <li>• User fields</li> <li>• Document GUID</li> </ul> <p>You include multiple fields by creating a separate entry for each, where <i>query_param</i> is the name of the parameter that appears in the URL. For example:</p> <p>Button1.parameter.user = USER-WC_USER          Button1.parameter.usertype = USER-USERTYPE          Button1.parameter.docno = HEADER-DOCNO          Button1.parameter.id = \$GUID</p> <p>The resulting URL would look like:</p> <p>http://www.company.com/?          user=JOHN&amp;usertype=          S&amp;docno=000000000123456&amp;id=xyz123</p>	<ul style="list-style-type: none"> <li>• Document header fields Any PROCESS DIRECTOR header field name. Values must be preceded by HEADER-</li> <li>• User fields</li> <li>• \$GUID The GUID of the document. For example, Button1.parameter.id = \$GUID</li> </ul>

## help\_configuration.properties

This file enables you to add a Help link to the Web Application and link a file or web address to it. The link can be displayed on the logon page, or on every page within the application, or both.

Enter the appropriate value in the help\_configuration.properties file, using the format .help=http://<server><path><filename>.

For example, to display the Help link on the logon page and link to a file stored in a folder called "documents" on your intranet, enter Logon.help=http://intranet/documents/help.pdf

You can add a language code to the help value to display different files or addresses for different languages. For example,

Logon.help.en=http://intranet/documents/english/help.pdf

Logon.help.de=http://intranet/documents/german/Hilfe.pdf

Valid values	Description
Logon.help	Displays the Help link on the logon page.
PDEnter.help	Displays the Help link on every page in the application.
*.help	Displays the Help link on the logon page and on every page in the application.

**i** You can rename the help link.

**i** The possibility to add help links at field level, which was available in previous versions of the ReadSoft PROCESS DIRECTOR Web Application and the WORK CYCLE Web Application, is no longer supported.

## user\_settings.xml

The user\_settings.xml file enables you to define settings that users can change themselves in their user profile.

This feature is available only in combination with a PROCESS DIRECTOR 7.4 (or above) system. In addition, the following settings have to be available.

- The saplogon.properties file is used to configure the connection to the SAP system. It contains information about the SAP system the PROCESS DIRECTOR Web Application connects to.
- In the parameter names, replace *sysid* with the SAP system ID. For example, replace *sysid.activate* with *TR1.activate*.

For each setting, you must specify the following values.

**i** When you add settings to the user\_settings.xml file, you must activate at least one of the corresponding parameters in the pdweb-app.properties file with one of the possible values. For example, if you add `pd_imagedocking_width` as a user setting, make sure that you activate and specify a value for `pd_imagedocking_width` in the pdweb-app.properties file. You can then add further settings without specifying a value in pdweb-app.properties.

Setting	Description
<field id>	<p>Name of the pdweb-app.properties parameter. You can define a set of parameters as a setting. It should, of course, make sense to allow the user to change the parameters; not all parameters are suitable for user settings.</p> <p>You can set the following properties for the field ID:</p> <p>iType: SELECT enables users to select a value, TEXT enables them to enter a value in the field. Usually you will use SELECT and specify possible values.</p> <p>length: For use with iType TEXT. Specifies the maximum allowed length of the entered value.</p> <p>fType: For use with iType TEXT. Specifies the type of field. Possible values are DEFAULT, NUMERIC, DECIMAL, DATE, TIME, CURRENCY.</p> <p>editable: This must be set to YES to enable users to change the setting. If it is set to NO, the field label is displayed, but no values can be entered or selected. MANDATORY requires the user to select or enter a value.</p>
<name>	<p>Field label displayed in the user profile.</p> <p>You can specify the &lt;name&gt; and &lt;description&gt; values directly in the user_settings.xml file, or reference a key from the Messages.properties file. For more information, see <a href="#">Use Messages.properties keys</a>. You must use Messages.properties keys if you need to provide user settings in different languages.</p>
<description>	<p>Text displayed in the field tooltip in the user profile.</p> <p>You can specify the &lt;name&gt; and &lt;description&gt; values directly in the user_settings.xml file, or reference a key from the Messages.properties file. For more information, see <a href="#">Use Messages.properties keys</a>. You must use Messages.properties keys if you need to provide user settings in different languages.</p>
<possibleValues>	<p>For use with iType SELECT. List of values that can be selected. Each value must be enclosed in &lt;pair&gt;&lt;/pair&gt; tags. Each pair consists of a key and a value. The key must be a valid value for the pdweb-app.properties parameter; the value is what is displayed to the user in the interface.</p>

**i** After making changes to the user\_settings.xml file, you must restart Tomcat or refresh the context (add ?refreshctx at the end of the Web Application URL).

## \_default.json

This section describes all of the settings in the \_default.json file, with which you can configure a [Master Worklist](#). The \_default.json file is located in the wconfig\pdweb-app\WEB-INF\conf\mwc\\_default folder.

Note the following:

- This file must be saved with UTF-8 encoding without BOM, so the editor used must support this encoding.
- Settings in the \_default.json file are case-sensitive.

The following shows a sample \_default.json file. In this example, the Master Worklist connects to two SAP systems, N47 and S47.

```
{
  " connections " : {
    "N47" : {
      "@type" : "SAP",
      "poolName" : "N47"
      "sessionAlive" : "1800"
    },
    "S47" : {
      "@type" : "SAP",
      "poolName" : "S47"
      "sessionAlive" : "1800"
    },
  },
  " authConfig " : {
    "connectionLogicalName" : "N47",
    "backendSystemType" : "PD_AND_ICS"
  },
  " displayMode " : "SYSTEM_FIRST",
  {
    " systemWorklistConfigs " : [
      {
        "systemLogicalName" : "N47",
        "systemDisplayName" : {
          "_default" : "Dev System"
        }
      },
      {
        "connectionLogicalName" : "N47",
        "backendSystemType" : "PD_AND_ICS"
      },
      {
        "systemLogicalName" : "S47",
        "systemDisplayName" : {
          "_default" : "QA System"
        }
      },
      {
        "connectionLogicalName" : "S47",
        "backendSystemType" : "PD_AND_ICS"
      }
    ]
  }
}
```

## connections

Defines which systems the [Master Worklist](#) connects to. Currently only SAP is supported.

```
{
  "connections" : {
    "N47" : {
      "@type" : "SAP",
      "poolName" : "N47"
      "sessionAlive" : "1800"
    },
    "S47" : {
      "@type" : "SAP",
      "poolName" : "S47"
      "sessionAlive" : "1800"
    }
  },
}
```

Parameter	SAP	Description
connection name	x	Enter a name for the connection. For SAP systems, this is usually the same as the pool name.
@type	x	The type of system. Currently only SAP is supported.
poolName	x	SAPpool name, as specified in the <a href="#">saplogon.properties</a> file.
sessionAlive	x	Specifies the timeout in seconds for the Web Service, that is, how long the session will be maintained before it expires. The Web Service is required for ReadSoft Mobile (see the ReadSoft Mobile documentation for more information). If this parameter is not set, the session automatically expires after 10 minutes (600 seconds). This parameter applies only to the Web Service, not to the normal ReadSoft PROCESS DIRECTOR Web Application.

## authConfig

Defines which system connection is used to authorize user logon to the [Master Worklist](#). If you do not specify a system connection here, the Web Application will default to the first connection specified in the [systemWorklistConfigs](#) section. However, it is good practice to set this parameter.

```
"authConfig" : {
  "connectionLogicalName" : "N47",
  "backendSystemType" : "PD_AND_ICS"
},
```

Parameter	Description
connectionLogicalName	The name of the system connection that will be used to authorize user logon. The user must have valid logon credentials for this system. This connection must be declared in the <a href="#">connections</a> section of the configuration file.
backendSystemType	The type of system that the Web Application connects to: <ul style="list-style-type: none"> <li>• PD_AND_ICS (default) for systems that run PROCESS DIRECTOR and include the Accounts Payable process type.</li> <li>• PD for systems that run PROCESS DIRECTOR without the Accounts Payable process type.</li> <li>• ICS for systems that run PROCESS DIRECTOR only with the Accounts Payable process type.</li> </ul>

## displayMode

Determines how nodes will be displayed in the [Master Worklist](#). If you do not declare a display mode, the default will be used.

"displayMode" : "SYSTEM_FIRST",	
Value	Description
SYSTEM_FIRST (default)	System name followed by process type. The systems are displayed in the order specified in the systemWorklistconfigs parameter.
PROCESS_FIRST	Process type followed by system name

## systemWorklistconfigs

Defines which system Worklists will be displayed in the [Master Worklist](#).

```
{
  "systemWorklistConfigs" : [
    {
      "systemLogicalName" : "N47",
      "systemDisplayName" : {
        "_default" : "Dev System"
      },
      "connectionLogicalName" : "N47",
      "backendSystemType" : "PD_AND_ICS"
    },
    {
      "systemLogicalName" : "S47",
      "systemDisplayName" : {
        "_default" : "QA System"
      },
      "connectionLogicalName" : "S47",
      "backendSystemType" : "PD_AND_ICS"
    }
  ]
}
```

Parameter	Description
systemLogicalName	A logical name for the system. The system logical name is usually the same as the connection logical name, but it is possible that different systems may use the same logical connection. The name should contain only alphanumeric ASCII characters and spaces.

Parameter	Description
systemDisplayName	<p>This is the text that is displayed in the Master Worklist.</p> <p><code>_default</code> specifies the standard text that will be used if no localized display name is available for the user's logon language.</p> <p>To declare a localized display name, enter the ISO character code for the language to be used and then the text. For example:</p> <pre>"systemDisplayName" : {   "_default" : "Dev System"   "de" : "Entw. System"</pre> <p>If you do not specify a display name, the system logical name is used.</p> <p> In <b>system-first display mode</b>, the Master Worklist will be sorted by localized system display name using the default collation.</p>
connectionLogicalName	<p>A logical name for the connection.</p> <p>The name should contain only alphanumeric ASCII characters without spaces.</p>

Parameter	Description
backendSystemType	<p>The type of system that the Web Application connects to:</p> <ul style="list-style-type: none"> <li>• PD_AND_ICS (default) for systems that run ReadSoft PROCESS DIRECTOR and include the Accounts Payable process type.</li> <li>• PD for systems that run ReadSoft PROCESS DIRECTOR without the Accounts Payable process type.</li> <li>• ICS for systems that run ReadSoft PROCESS DIRECTOR only with the Accounts Payable process type.</li> </ul> <p>Important: If the Master Worklist configuration contains one or more systemWorklistconfigs with the backendSystemTypeICS, then it must also contain one or more systemWorklistconfigs with the backendSystemType PD_AND_ICS and the setting primary : true.</p> <p>Example:</p> <pre> {   "systemWorklistConfigs" : [     {       "systemLogicalName" : "N47",       "systemDisplayName" : {         "_default" : "Dev System"       },       "connectionLogicalName" : "N47",       "backendSystemType" : "PD_AND_ICS",       "primary" : true     },     {       "systemLogicalName" : "S47",       "systemDisplayName" : {         "_default" : "QA System"       },       "connectionLogicalName" : "S47",       "backendSystemType" : "PD_AND_ICS"     },     {       "systemLogicalName" : "DR1",       "systemDisplayName" : {         "_default" : "ICS only System"       },       "connectionLogicalName" : "DR1",       "backendSystemType" : "ICS_ONLY"     }   ] } </pre>

Parameter	Description
primary	<p>Set this to true to identify this systemWorklistconfig as the primary configuration. The field catalog of the system specified in the primary configuration will be used for the Accounts Payable process type. Other process types are not affected by this setting.</p> <p>Important: You must specify a primary configuration if you have more than one system that includes Accounts Payable, otherwise the field catalog will not be read.</p> <p>If several systemWorklistconfigs are defined as primary configurations, the first primary configuration is used; if the system specified in this configuration is not found, the second primary configuration will be used; and so on.</p>

## tenants.properties

The tenants.properties file maps host names/IP addresses to tenant names. You need this file if you want to create [Master Worklist configurations for different client organizations](#).

Parameter	Description
host name/IP address	The host name/IP address that users enter in the browser to access the ReadSoft PROCESS DIRECTOR Web Application.
tenant folder name	The name of the subfolder containing the tenant configuration files.

# Enable automatic logon

You can configure your system to enable automatic logon to the ReadSoft PROCESS DIRECTOR Web Application using the logon credentials of the current Windows user.

## Requirements

- The ReadSoft PROCESS DIRECTOR Web Application must be deployed to *Apache Tomcat*.
- The SAP and ReadSoft PROCESS DIRECTOR user names must be exactly the same as the Windows user names.

## Procedure

To enable automatic logon, complete the following steps.

1. [Install IIS](#)
2. [Copy Tomcat files to IIS](#)
3. [Create required Tomcat files](#)
4. [Create registry entries](#) (Windows 2003 only)
5. [Configure ntlmauthenticate to use IIS](#)
6. [Configure IIS](#)

Additional configuration is required on users' machines if they run the following:

- [Windows 7](#)
- [Firefox](#)

Once you have performed the above tasks, the URL of the Web Application is:

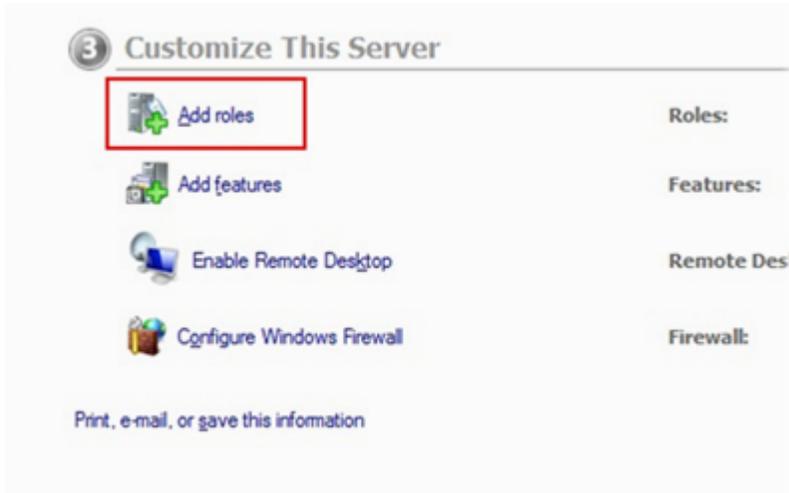
`http://servername/pdweb-app/init.do`

 the standard Tomcat port 8080 is no longer part of the URL.

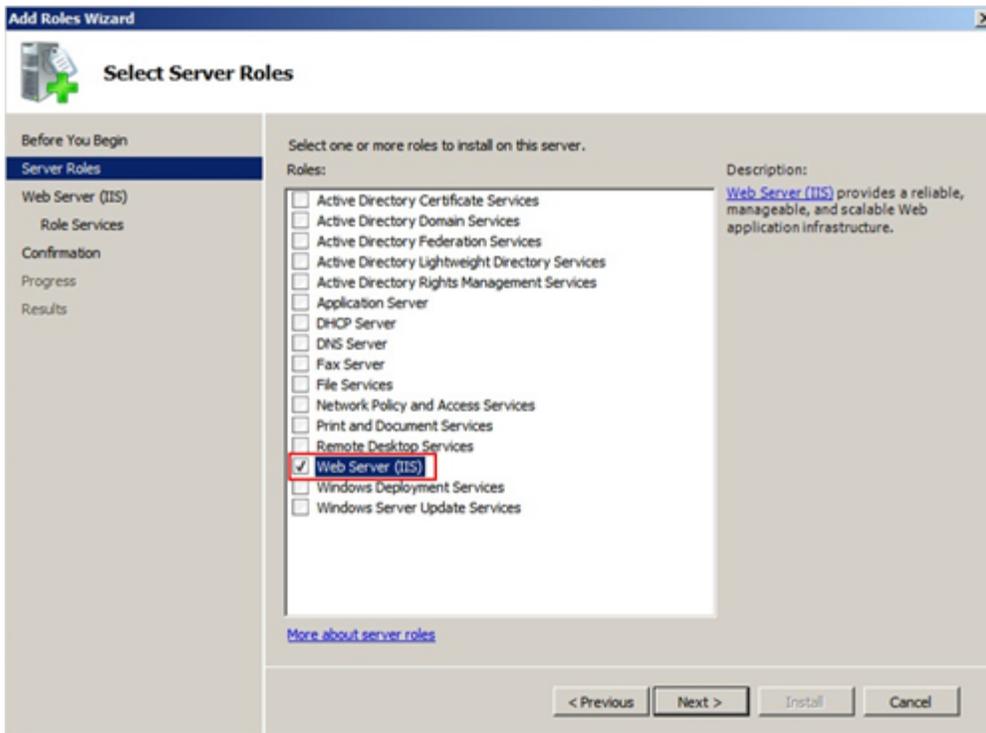
## Install IIS

The following procedure is based on Windows Server 2008 R2. To install IIS, complete the following steps.

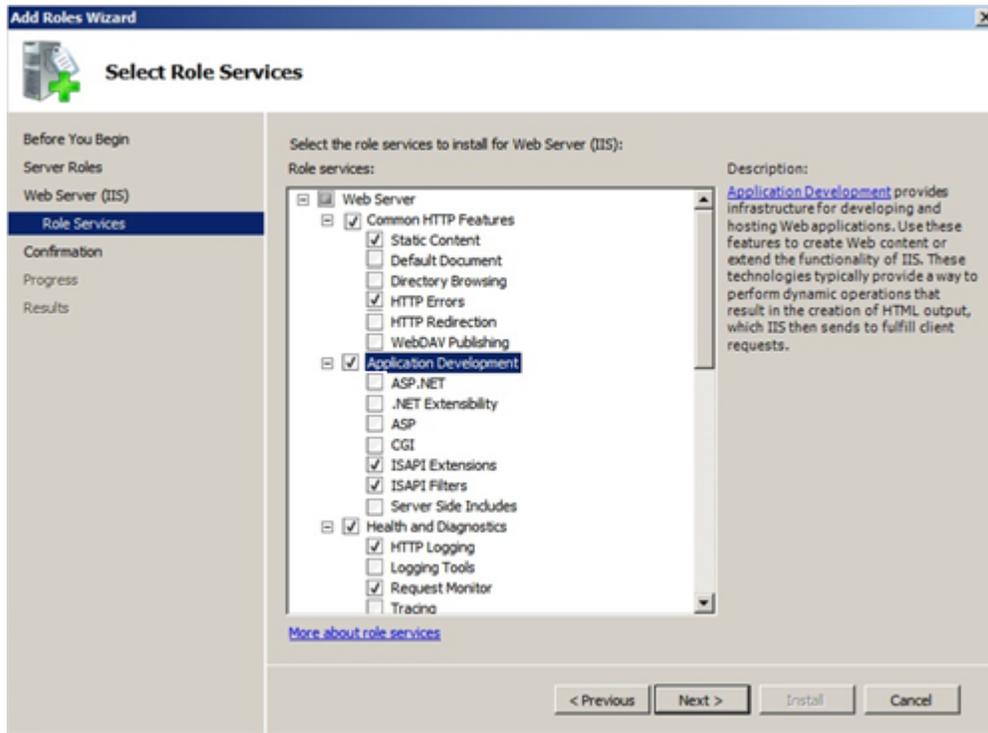
1. Right-click on My Computer > Manage > **Add roles**.



2. Select **Web Server (IIS)** under **Server Roles**.



3. Select **ISAPI Extensions**, **ISAPI Filters** and **Windows Authentication** under **Role Services**. You may need other services depending on your requirements, but only the above three are required for Single-Sign On.



If there are no other web sites running on the IIS server you should only install the minimal setup:

Setting	Setup
Common HTTP features	Static content HTTP Errors
Application Development	ISAPI Extensions ISAPI Filters
Health and Diagnostics	HTTP Logging Request Monitor
Security	Windows Authentication Request Filtering
Management Tools	ISS Management Console

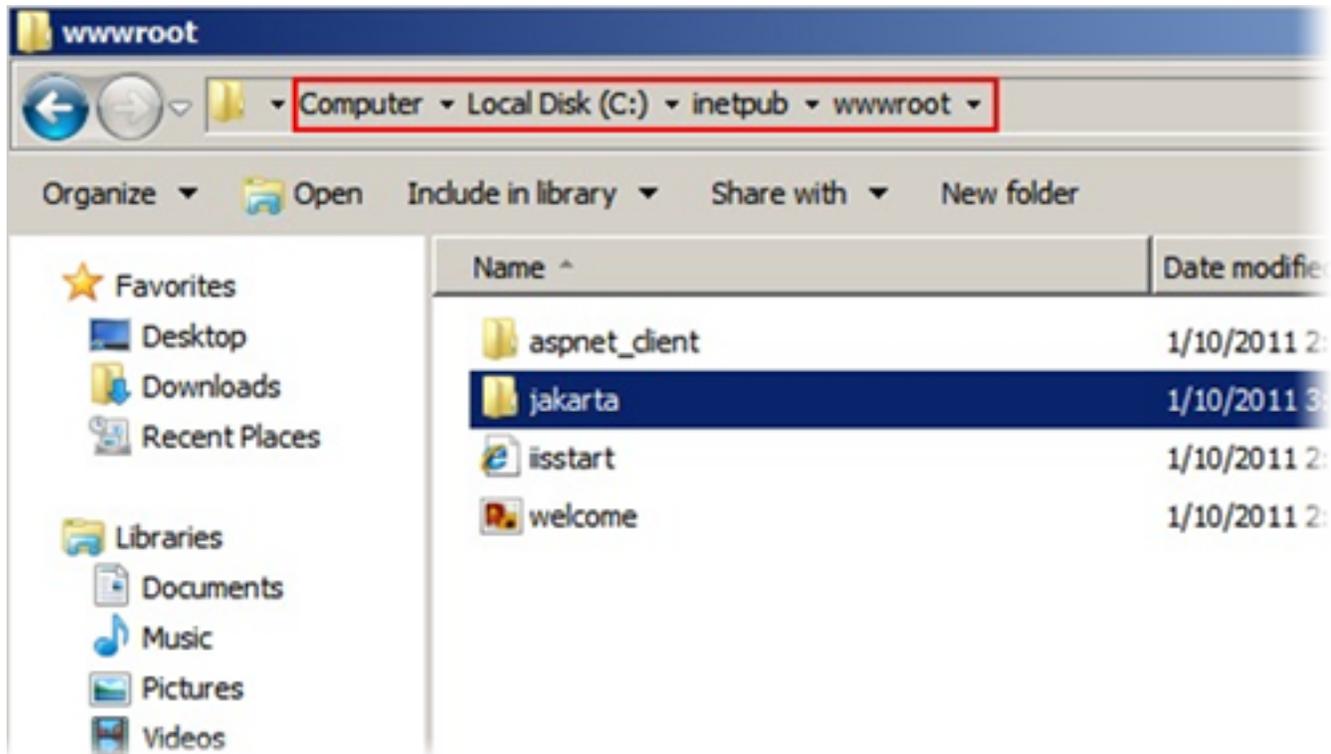
4. Click **Install** in the **Confirmation** window to start the installation.

❗ If you plan to run SAP Content Server on the same IIS, ensure the machine name is not longer than 8 characters, otherwise SAP Content Server will not work.

## Copy Tomcat files to IIS

To copy Tomcat files to IIS, complete the following steps.

1. Create a new folder called jakarta in C:\inetpub\wwwroot\.



2. Copy the following two files to the jakarta folder:

- isapi\_redirect.dll

This file is available from the Tomcat website <http://tomcat.apache.org/download-connectors.cgi> or from ReadSoft.

- isapi\_redirect.properties

You must create this file and add the following text to it:

```
extension_uri=/jakarta/isapi_redirect.dll
```

```
log_file=C:\Program Files\Apache Software Foundation\Tomcat 6.0\logs\isapi_redirect.log
```

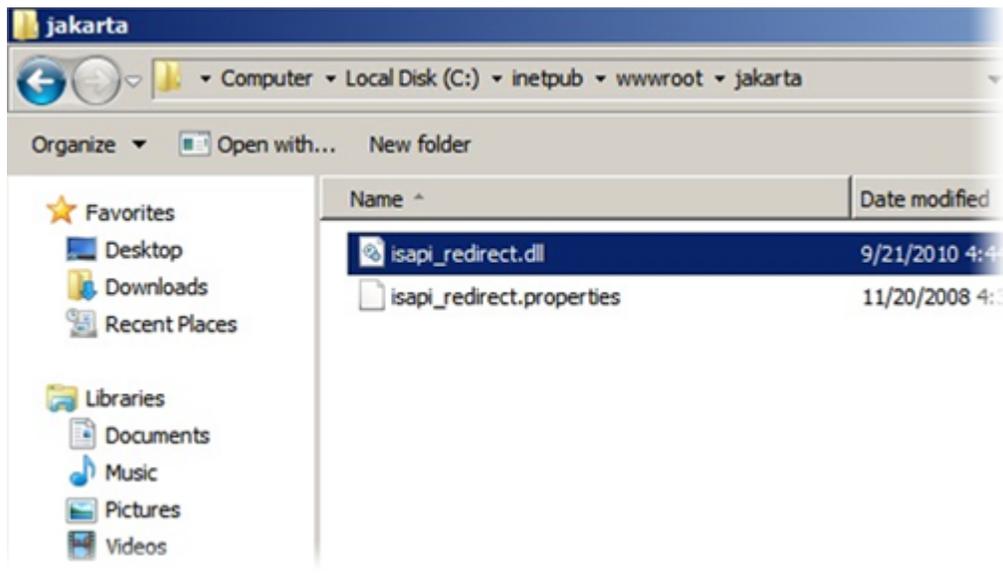
```
log_level=debug
```

```
worker_file=C:\Program Files\Apache Software Foundation\Tomcat 6.0\conf
```

```
\workers.properties worker_mount_file=C:\Program Files\Apache Software Foundation  
\Tomcat 6.0\conf\uriworkermap.properties
```

Be sure to modify the above paths as appropriate.

**i** After you have completely finished setting up IIS to work with Tomcat, set the log\_level to error.



The jakarta folder must contain the above two files.

More information about these two files can be found on the Tomcat website: [http://tomcat.apache.org/connectors-doc/webserver\\_howto/iis.html](http://tomcat.apache.org/connectors-doc/webserver_howto/iis.html)

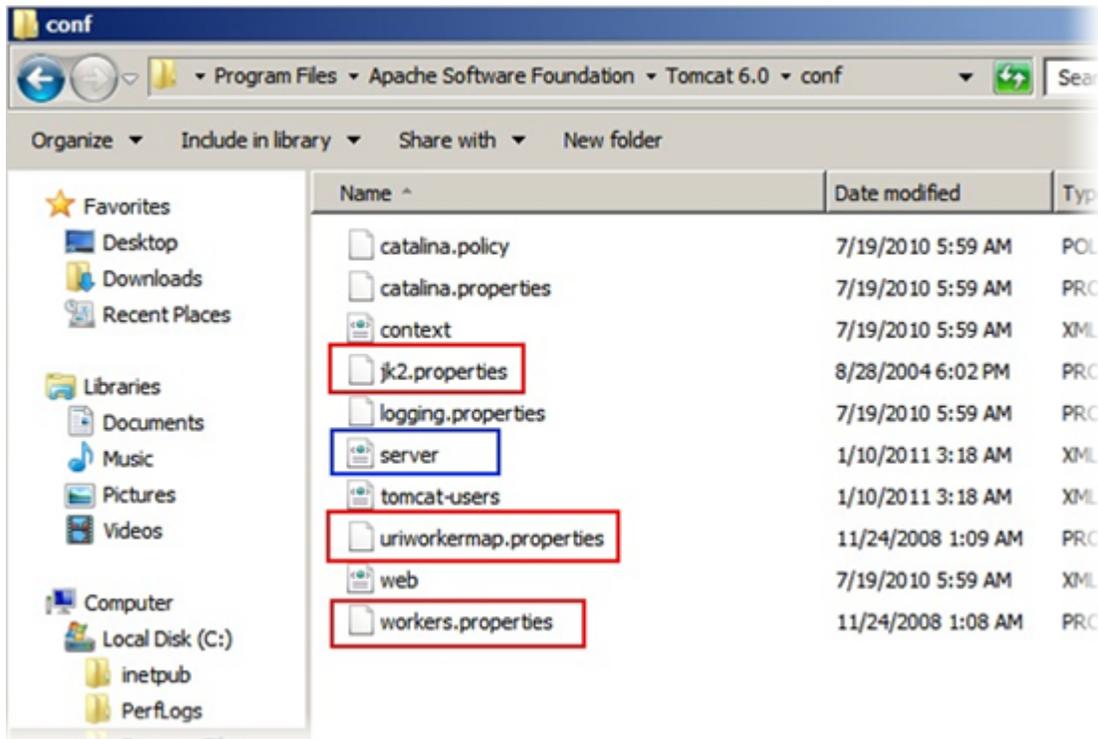
## Create Tomcat files for IIS SSO

There are four files you must create and add to your Tomcat installation:

- [jk2.properties](#)
- [server.xml](#)
- [uriworkermap.properties](#)
- [workers.properties](#)

Sample files can be obtained from <http://tomcat.apache.org> or from ReadSoft.

These files must be added to the conf folder:



## jk2.properties

The only entry you require in this file is:

```
request.tomcatAuthentication = false
```

This allows the ReadSoft PROCESS DIRECTOR Web Application to easily access the Windows user account by calling the `request.getRemoteUser()` method. Otherwise, the application must extract the account name by decoding an encrypted HTTP header, which may vary between Windows versions.

## server.xml

You must replace a section in this Tomcat file to enable SSO with IIS.

Search for the following entry:

```
<!-- Define an AJP 1.3 Connector on port 8009 -->  
<Connector port="8009"  
enableLookups="false" redirectPort="8080" debug="0"  
protocol="AJP/1.3"/>
```

Replace it with this:

```
<!-- Define an AJP 1.3 Connector on port 8009 -->  
<Connector port="8009"  
enableLookups="false" redirectPort="8443" protocol="AJP/1.3"  
tomcatAuthentication="false" packetSize="65536" />
```

**i** If you are experiencing problems with the layout of the Web Application, try removing `packetSize="65536"`.

If you are experiencing problems when uploading files that are bigger than 8KB, increase the `read ByteBuffer` as follows.

```
<!-- Define an AJP 1.3 Connector on port 8009 -->  
<Connector port="8009"  
protocol="AJP/1.3" socket.appReadBufSize="65536" redirectPort="8443" />
```

## uriworkermap.properties

If your Web Application is called `pdweb-app` then you do not need to modify this file. If your application has another name, you need to map it to use the default worker.

The default entries are:

```
# Default worker to be used through our mappings  
#  
default.worker=ajp13  
/pdweb-app=$(default.worker)  
/pdweb-app/*=$(default.worker)
```

**i** Thus, if you have three different systems, for development, test, and production, you would need the following entries:

Thus, if you have three different systems, for development, test, and production, you would need the following entries:

```
/pdweb-app_DEV=$(default.worker)
/pdweb-app_DEV/*=$(default.worker)
/pdweb-app_TEST=$(default.worker)
/pdweb-app_TEST/*=$(default.worker)
/pdweb-app_PROD=$(default.worker)
/pdweb-app_PROD/*=$(default.worker)
```

## workers.properties

You must ensure the paths for `workers.tomcat_home` and `workers.java_home` point to the respective folders for your Tomcat and Java installations. For example:

```
workers.tomcat_home="C:\Programme\Apache Software Foundation\Tomcat 6.0"
```

```
workers.java_home="C:\Program Files\Java\jre6"
```

The `ps` parameter must also be set to `\` (indicating a Windows system).

## Registry entries for Windows 2003

Windows 2003 requires registry entries for certain IIS and Tomcat files.

1. Open a text editor and enter the following:

```
REGEDIT4
[HKEY_LOCAL_MACHINE\SOFTWARE\ApacheSoftwareFoundation\JakartaIsapi Redirector\1.2]
"extension_uri"="/jakarta/isapi_redirect.dll"
"log_file"="C:\\Program Files\\Apache Software Foundation\\Tomcat 6.0\\logs\\iis_redirect.log"
"log_level"="debug"
"worker_file"="C:\\Program Files\\Apache Software Foundation\\Tomcat 6.0\\conf\\workers.properties"
"worker_mount_file"="C:\\Program Files\\Apache Software Foundation\\Tomcat 6.0\\conf\\uriworkermap.properties"
```

2. Save the file as `iis.reg`.
3. Double-click the file to add the entries to the registry.

## Configure ntlmauthenticate to use IIS

`ntlmauthenticate` is a parameter in the `pdweb -app.properties` file. In order to use IIS and SSO with the ReadSoft PROCESS DIRECTOR Web Application, you must set `ntlmauthenticate` to 3 or -3. The -3 value is a failsafe setting, so if SSO is not available for some reason, the standard logon page is displayed.

## Configure IIS

After [copying various files to IIS](#) and Tomcat and [configuring ntlmauthenticate](#), you must perform some final configuration of IIS before you can use Single Sign-On.

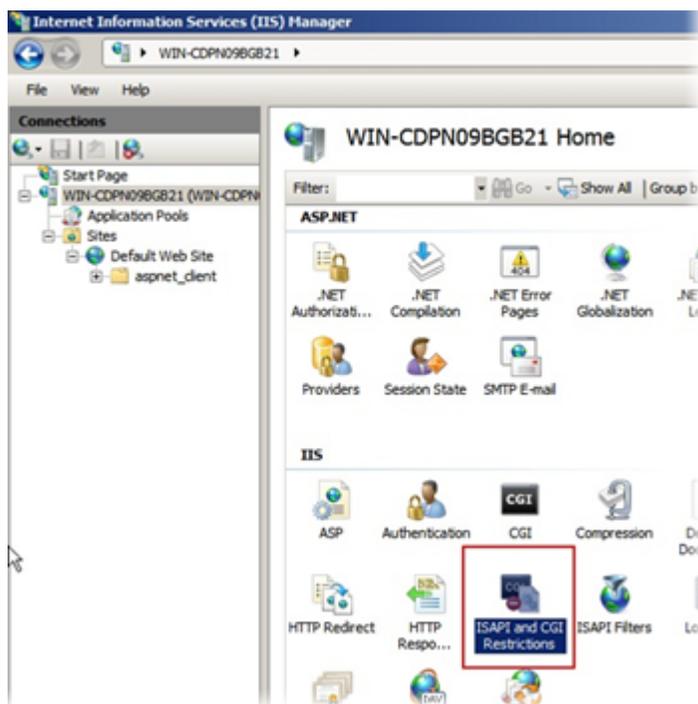
To configure IIS in IIS Manager, complete the following steps:

1. [Add an ISAPI restriction](#)
2. [Add an ISAP filter](#)
3. [Create virtual directories](#)

### Add an ISAPI restriction

To add an ISAPI restriction, complete the following steps.

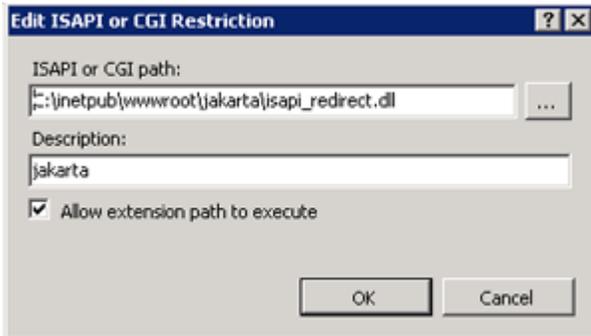
1. Select your machine name and open **ISAPI and CGI Restrictions**.



2. Add the following restriction:

ISAPI or CGI path: C:\inetpub\wwwroot\jakarta\isapi\_redirect.dll

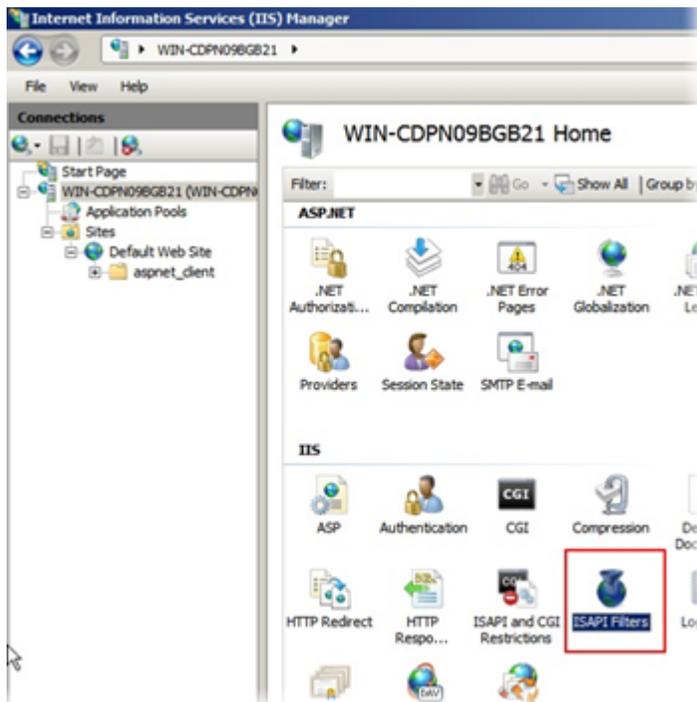
Description: jakarta



## Add an ISAP filter

To add an ISAPI filter, complete the following steps.

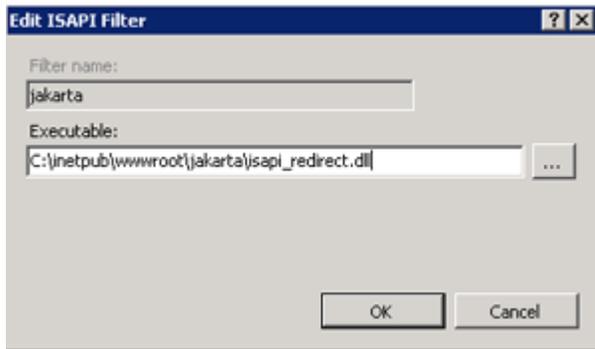
1. Select your machine name and open **ISAPI Filters**.



2. Add the following filter:

Filter name: jakarta

Executable: C:\inetpub\wwwroot\jakarta\isapi\_redirect.dll



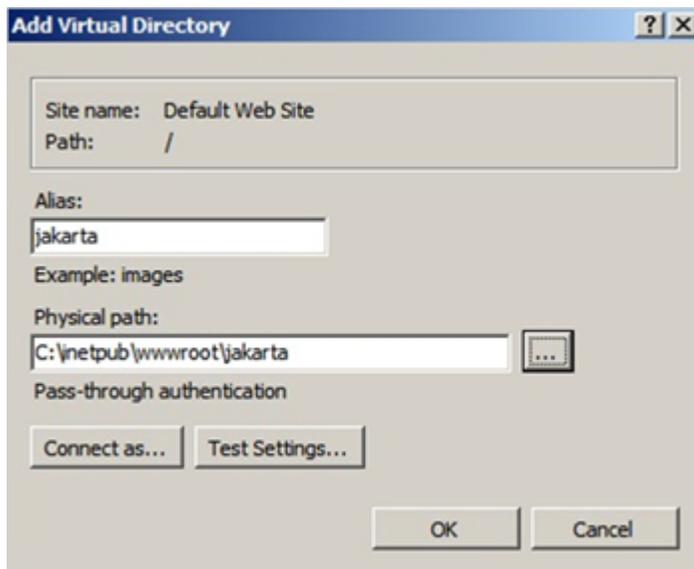
## Create virtual directories

You must create two virtual directories and configure the Handler Mappings and Authentication for each one. To create the virtual directories, complete the following procedures.

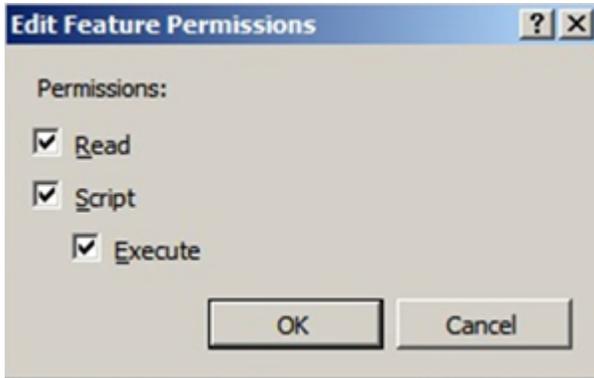
### Add two virtual directories

To add two virtual directories, complete the following steps.

1. **jakarta** (The name of the folder you created [here](#).)



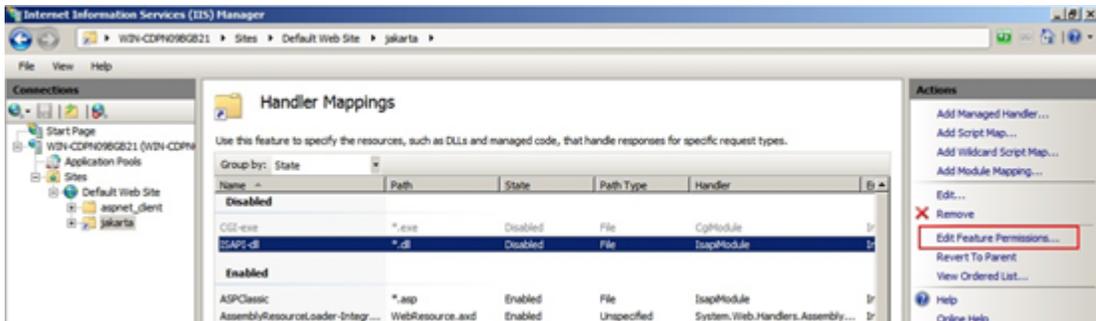
2. **pdweb -app** (The name of the folder in Tomcat where the PROCESS DIRECTOR Web Application is running.)



Set the Feature Permissions for both directories

To set the feature permissions for both directories, complete the following steps.

1. Select the virtual directory.
2. Click **Handler Mappings**.
3. Select **ISAPI-dll**.
4. Click **Edit Feature Permissions**.



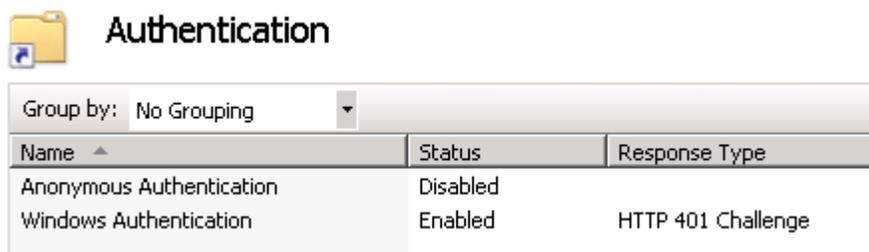
5. Set the permissions to **Read**, **Script** and **Execute**.



## Set the Authentication for both directories

To set the authentication for both directories, complete the following steps.

1. Select the virtual directory.
2. Click **Authentication**.
3. Set **Windows Authentication** to **Enabled** and **Anonymous Authentication** to **Disabled**.



## SSO configuration for Windows 7 users

For users running Windows 7, the default security settings in Windows 7 and Internet Explorer must be changed:

### Internet Explorer

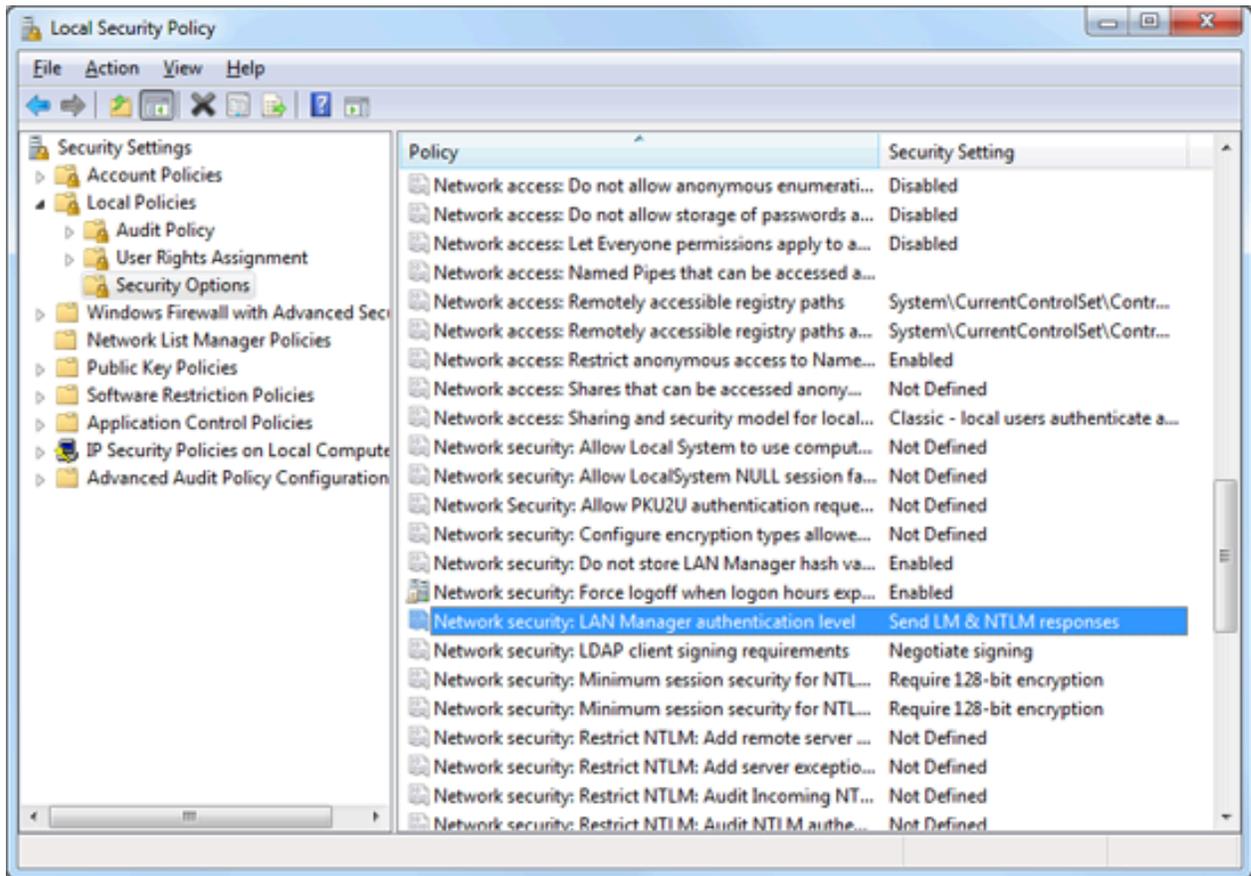
To change the security settings for the Internet Explorer, complete the following steps.

1. Go to Tools > Internet Options > **Advanced** tab.
2. Check **Enable Integrated Windows Authentication**.
3. Go to the **Security** tab.  
Select **Local Intranet** and click **Custom level...**
4. Under **User Authentication**, check **Automatic logon with current user name and password**.  
You must restart Internet Explorer to apply the changes.

### Windows 7

To change the security settings for Windows 7, complete the following steps.

1. Open **Local Security Policy**.  
Use the Start menu Search box to open the application.
2. Go to Local Policies > **Security Options**.
3. Set **Network security: LAN Manager authentication level** to **Send LM & NTLM responses**.

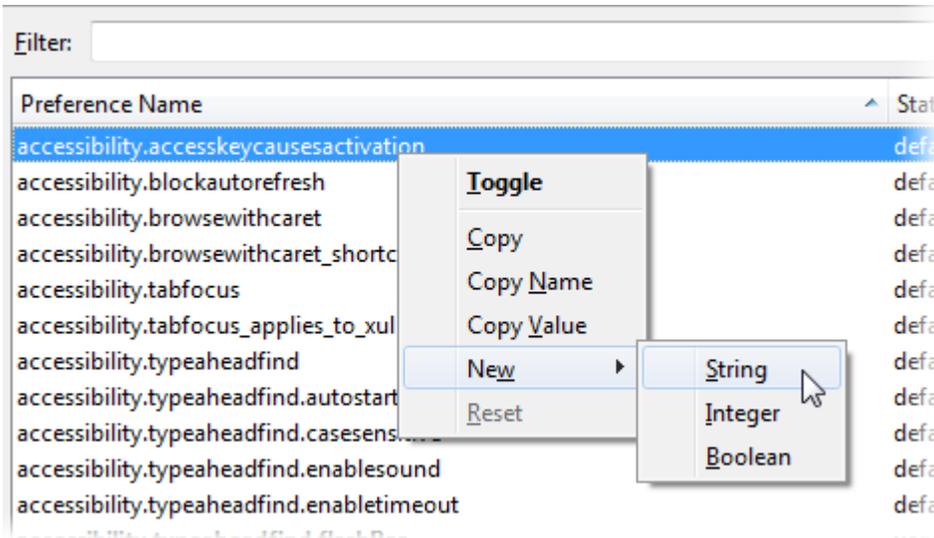


## SSO configuration for Firefox users

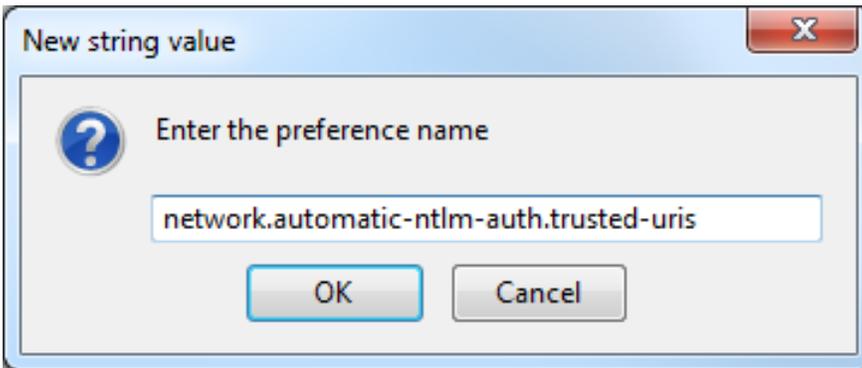
For users running Firefox, the following parameter must be set:

1. Open Firefox and enter **about:config** in the Address Bar.

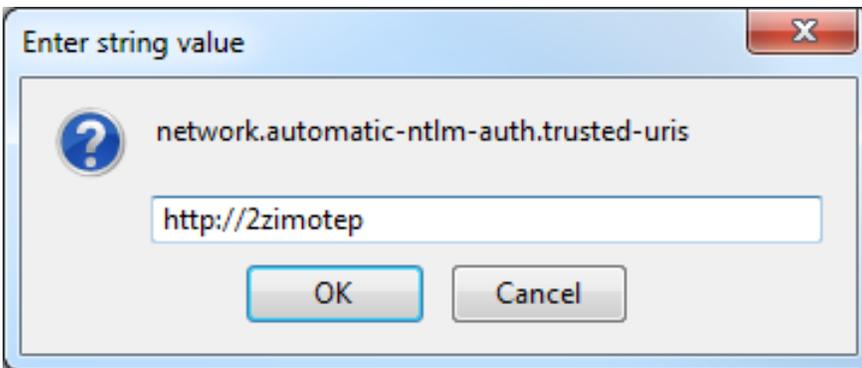
2. Enter a new string.  
Right-click and select New > **String**.



Enter **network.automatic-ntlm-auth.trusted-uris** as the name.



Enter **http://2zimotep** as the value.



3. Restart Firefox to apply the changes.

# Install JRE, Tomcat and SAP Java Connector

This section explains how to install the three software components required by the Web Application:

1. [Java Runtime Environment \(JRE\)](#)

This can be downloaded at <http://www.java.com>. This web page also provides a link that you can use to find out if a JRE version is already installed.

2. [Tomcat servlet container](#)

This can be downloaded at <http://tomcat.apache.org>

Other servlet containers are also supported. However, Tomcat is recommended.

3. [SAP Java Connector \(JCo\)](#)

This can be downloaded from the SAP Service Marketplace at <http://service.sap.com/connectors> (Registration required)

## Install Java Runtime Environment

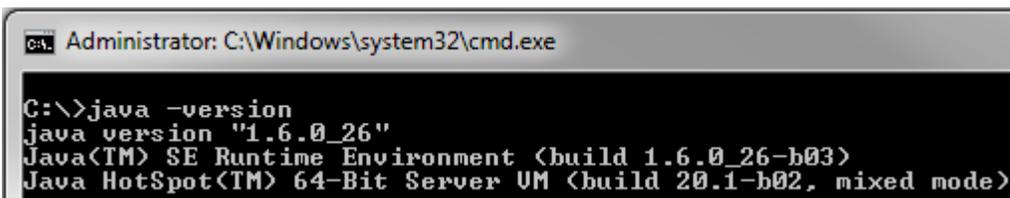
Run through the Setup Wizard to install JRE. No special options need to be specified. To test the installation, or to find out if a JRE version is already installed:

1. Open a Windows command window:

- In Windows NT, 2000 or XP: Click **Start**, click In Windows Vista or 7: Click **Start**, type cmd and press **ENTER.Run**, then type cmd and press **ENTER**.
- In Windows Vista or 7: Click **Start**, type cmd and press **ENTER**.

2. Enter java -version.

The JRE version is displayed:



```
C:\>Administrator: C:\Windows\system32\cmd.exe
C:\>java -version
java version "1.6.0_26"
Java(TM) SE Runtime Environment (build 1.6.0_26-b03)
Java HotSpot(TM) 64-Bit Server VM (build 20.1-b02, mixed mode)
```

**i** As of version 5, the "1." prefix of the version number was dispensed with. Thus "java version 1.6" is equivalent to JRE6 and "java version 1.5" is equivalent to JRE5.

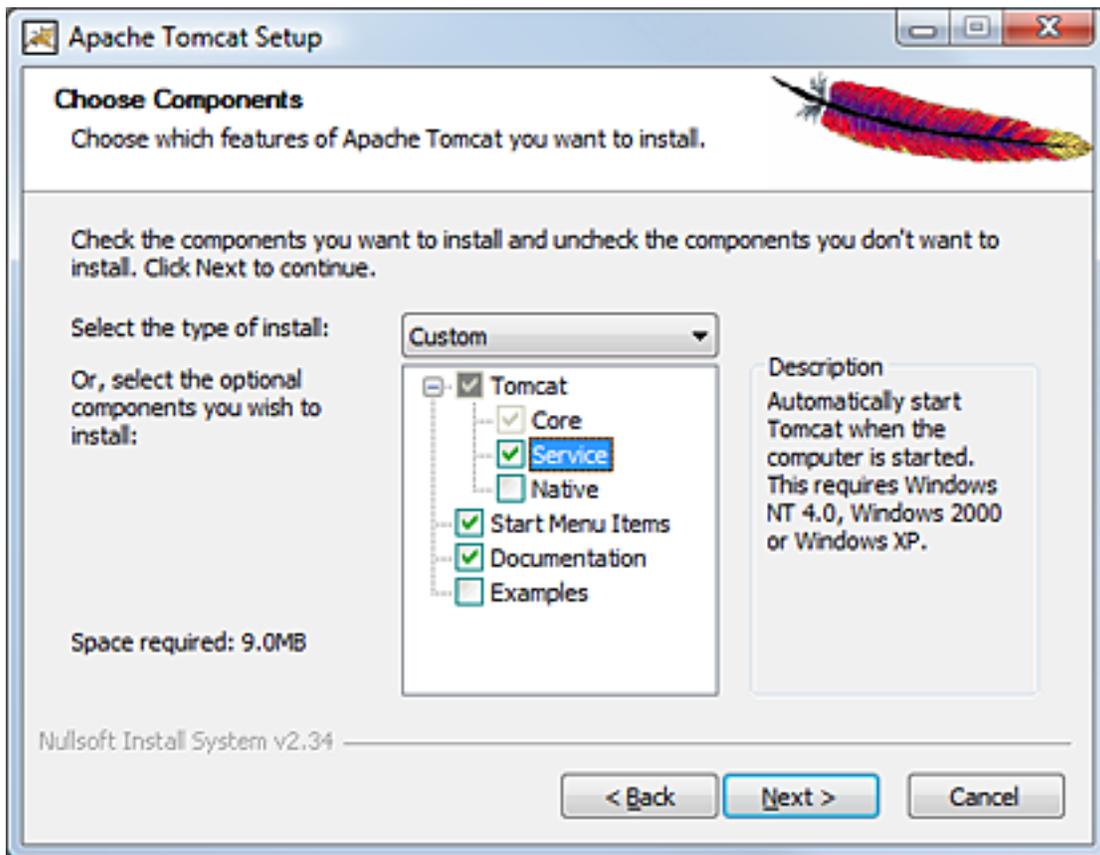
Alternatively, [www.java.com](http://www.java.com) provides a link that you can use to find out which JRE version is installed ("Do I have Java?").

## Install Tomcat

To install Tomcat, you must have already installed the [Java Runtime Environment](#).

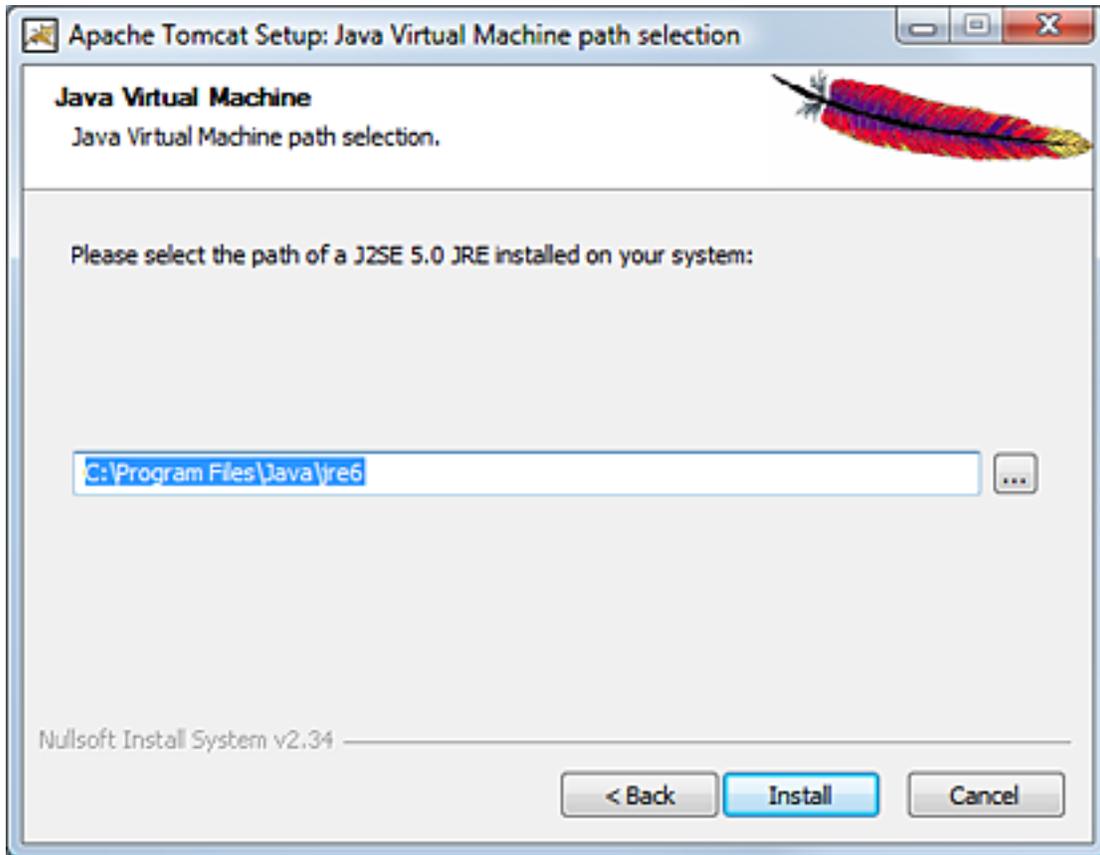
Run through the Setup Wizard to install Tomcat. Take note of the following two options:

- Running Tomcat as a Windows service



Running Tomcat as a Windows Service is recommended, as it makes it easier to start and stop the server.

- Selecting the JRE



If a JRE is already installed, the path to it should automatically appear in the Tomcat Setup Wizard. If you have more than one JRE installed on the machine, ensure the correct one is selected here.

To check that Tomcat has been successfully installed, open a web browser and enter `http://localhost:8080/`. If the installation was successful, the Tomcat home page is displayed.

## Install the SAP Java Connector

SAP Java Connector (SAP JCo) is a middleware component that enables two-way communication between SAP systems and Java applications: inbound calls (Java calls ABAP) and outbound calls (ABAP calls Java).

SAP JCo is used to enable communication between the ReadSoft PROCESS DIRECTOR Web Application and the SAP system hosting ReadSoft PROCESS DIRECTOR.

-

## Install the SAP Java Connector

To install the connector, complete the following steps.

1. Extract the SAP JCo ZIP file to a temporary folder.
2. Copy the following files to their corresponding folders:  
librfc32.dll > C:\Windows\System32\

! If another copy of librfc.dll is in this folder, back it up! (The SAP GUI also installs this file.) You should use the most recent file. However, you may find that replacing this file prevents your SAP GUI from logging into systems.

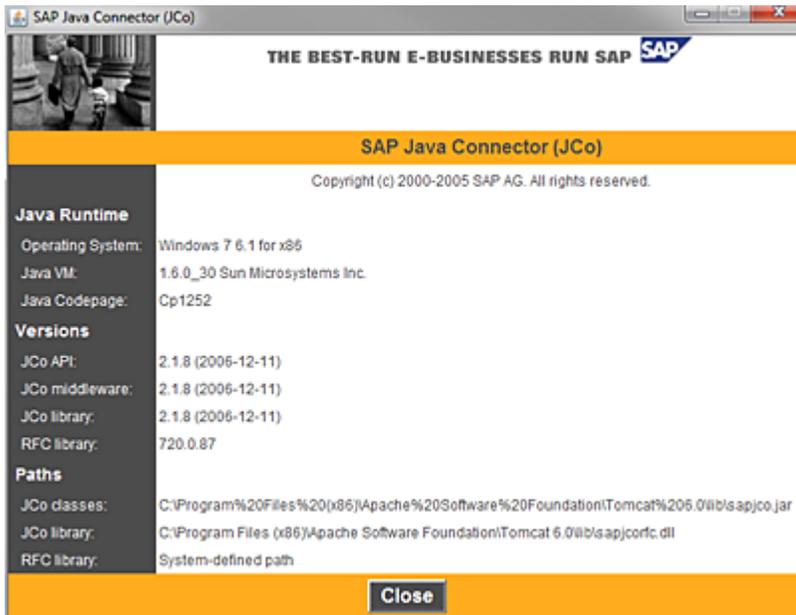
- **sapjco.jar** and **sapjcorfc.dll** > The shared library folder of your Tomcat installation.

For example:

Tomcat 6.0: C:\Program Files\Apache Software Foundation\Tomcat 6.0\lib\

- i Only the above three files are required.

Check that you have downloaded the correct JCo version for your platform. To do so, double-click on the **sapjco.jar** file. If all fields in the **Versions** section have been filled and there is no error message, this is the correct version.

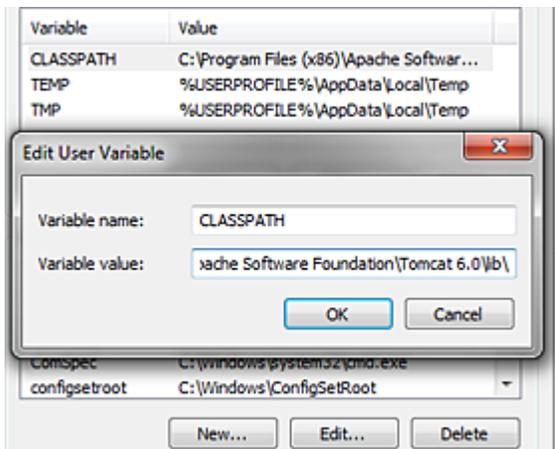


3. Add the path to **sapjco.jar** to the **Windows CLASSPATH**.
4. Restart Tomcat.  
After restarting, you are now ready to [deploy the PROCESS DIRECTOR Web Application](#).

## Set the Windows CLASSPATH

To set the Windows CLASSPATH, complete the following steps.

1. Open the System Properties:
  - Windows XP: Select Start > Control Panel > Performance and Maintenance > System > **Advanced** tab.
  - Windows Vista and 7: In Windows Explorer, right-click **My Computer** and choose Properties > **Advanced system settings**.
2. Click **Environment Variables ...**
3. If the CLASSPATH variable does not exist, click **New** to add it. Enter the variable name CLASSPATH and the path to your sapjco.jar file (your Tomcat shared library folder) as the variable value.



4. Click **OK**.
5. Close all remaining windows by clicking **OK**.

### Further reading

The SAP JCo ZIP file has a docs folder that contains the Javadocs for SAP JCo. The Javadocs describe all SAP JCo classes and interfaces, together with a detailed description of the corresponding objects, methods, parameters, and fields.

SAP Java Connector (SAP JCo) is a middleware component that enables two-way communication between SAP systems and Java applications: inbound calls (Java calls ABAP) and outbound calls (ABAP calls Java).

SAP JCo is used to enable communication between the ReadSoft PROCESS DIRECTOR Web Application and the SAP system hosting ReadSoft PROCESS DIRECTOR.

# Troubleshoot the application

The following topics offer useful tips and tricks on what to do if something is going wrong with ReadSoft PROCESS DIRECTOR Web Application configuration.

## Where can I find the sample configuration files?

Sample files can be obtained from <http://tomcat.apache.org> or from ReadSoft.

## Should I use 32bit or 64bit software versions?

If your OS supports 64bit you should use only the 64bit installations of JRE, JCO, Tomcat and isapi\_redirect.dll.

## My SSO setup does not work. How can I find the source of error?

First try to find out if the error occurs in IIS or on the Tomcat server. Check the log location of isapi\_redirect.dll (if you followed the guide the path is: C:\Program Files\Apache Software Foundation\Tomcat 6.0\logs\isapi\_redirect.log). If the log file does not exist or has no content, the error is most probably in the IIS configuration of ISAPI and CGI Restrictions or ISAPI Filter. If the file exists, check the content. The error is most probably caused by Tomcat configuration.

## The HTTP Error 404 is returned when the Web Application URL is called.

To resolve this issue, check your worker.properties and uriworkers.properties file. The standard worker AJP13 must point to the Web Application folder.

## When using the Web Application URL, the 'pdweb-app' or 'init.do' file downloads.

To resolve this issue, in the Handler Mappings, set the Feature Permission of the ISAPI-dll to execute for your entire virtual folders. If it still does not work enable the Execute permission in the Default web site.

## Suggestions do not work - Exception javax.persistence.PersistenceException error

**Suggestions** configured in your application may not work in some conditions, or an error message may display when a user logs into the system, if the hsqldb.script file is not correctly generated.

```
BackendServlet (cmd=3): Exception javax.persistence.PersistenceException:  
org.hibernate.exception.GenericJDBCException: Cannot open connection:  
org.hibernate.exception.GenericJDBCException: Cannot open connection
```

This file is used by the Web Application to create memory tables that are needed to manage suggestions.

To resolve this problem, complete the following steps.

1. Stop the application server (Tomcat, if this is used).
2. Remove the folder hsqldb from the Tomcat\webapps\wcconfig\pdweb-app folder.
3. Start Tomcat.
4. Have the user log in to the Web Application.

The folder hsqldb should have been created and the hsqldb.script file has entries that begin with CREATE MEMORY TABLE.