Note
Before using this information and the product it supports, read the information in “Notices” on page 25.

This edition applies to Version 2 Release 3 of z/OS (5650-ZOS) and to all subsequent releases and modifications until otherwise indicated in new editions.

Last updated: 2019-02-16

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## Contents

**About this document** .............................................................................................................. v

- Where to find more information .......................................................................................... v

**How to send your comments to IBM** ............................................................................... vii

- If you have a technical problem ........................................................................................ vii

**Chapter 1. Overview of Knowledge Center for z/OS** .......................................................... 1

- What's new in Knowledge Center for z/OS V2R3? .............................................................. 1
- Software delivery options for Knowledge Center for z/OS ................................................ 1
- Software prerequisites ........................................................................................................... 2
- What setup is needed for Knowledge Center for z/OS? ..................................................... 3
- Receiving service updates for Knowledge Center for z/OS ................................................ 3

**Chapter 2. Configuring Knowledge Center for z/OS** .......................................................... 5

- The configuration process ................................................................................................... 5
- Creating space for runtime, data, and logging ..................................................................... 5
  - Creating mount point directories .................................................................................... 5
  - Creating and mounting the runtime, data and log filesystems ..................................... 6
  - Adding ipl-time mount commands for the newly created filesystems ..................... 6
- Configuring initial setup ...................................................................................................... 6
- Configuring RACF ................................................................................................................ 6
- Creating target subdirectories ............................................................................................ 7
- Copying Knowledge Center configuration files ............................................................... 7
- Verifying the installation ..................................................................................................... 8
- Configuring the Knowledge Center server started task to run with system IPL ............ 9
- Configuring additional setup and default overrides ......................................................... 9
  - SSL Support and KC4z .................................................................................................... 9
  - Connecting additional administrator users to the HKCADMIN group ....................... 11
- Configuration files reference ............................................................................................. 12

**Chapter 3. Managing product documentation content in Knowledge Center for z/OS** .... 15

- Content examples ................................................................................................................. 16
- Sharing content within a sysplex ......................................................................................... 16

**Chapter 4. Using Knowledge Center** ............................................................................... 19

- Finding information by searching Knowledge Center ....................................................... 19
- Narrowing search results by selecting products .................................................................. 20
- Refining search results by specifying category attributes .............................................. 20
- Browsing content ................................................................................................................ 20
- Viewing content in your own language ............................................................................. 21

**Chapter 5. Configuring and Using the LookAt Function of Knowledge Center for z/OS** .. 23

- Configuring the LookAt Function ....................................................................................... 23
- Using the End User Component of the LookAt Function .................................................. 23
- Using the RESTful API Component of the LookAt Function ............................................ 23

**Notices** ................................................................................................................................. 25

- Terms and conditions for product documentation ............................................................ 26
About this document

This document provides information for configuring IBM® Knowledge Center for z/OS®. It also provides information related to using IBM Knowledge Center for z/OS.

Where to find more information

For an overview of the information associated with z/OS, see z/OS Information Roadmap.

IBM z/OS Basic Skills Education

IBM z/OS Basic Skills Education is a web-based information resource intended to help users learn the basic concepts of z/OS, the operating system that runs most of the IBM mainframe computers in use today. It is designed to introduce a new generation of Information Technology professionals to basic concepts and help them prepare for a career as a z/OS professional, such as a z/OS system programmer.

Specifically, IBM z/OS Basic Skills Education is intended to achieve the following objectives:

• Provide basic education and information about z/OS without charge
• Shorten the time it takes for people to become productive on the mainframe
• Make it easier for new people to learn z/OS.

To access IBM z/OS Basic Skills Education, open your web browser to the following web site, which is available to all users (no login required): z/OS Basic Skills in IBM Knowledge Center (www.ibm.com/support/knowledgecenter/zosbasics/com.ibm.zos.zbasics/homepage.html).
How to send your comments to IBM

We invite you to submit comments about the z/OS product documentation. Your valuable feedback helps to ensure accurate and high-quality information.

Important: If your comment regards a technical question or problem, see instead “If you have a technical problem” on page vii.

Submit your feedback by using the appropriate method for your type of comment or question:

Feedback on z/OS function
If your comment or question is about z/OS itself, submit a request through the IBM RFE Community (www.ibm.com/developerworks/rfe/).

Feedback on IBM Knowledge Center function
If your comment or question is about the IBM Knowledge Center functionality, for example search capabilities or how to arrange the browser view, send a detailed email to IBM Knowledge Center Support at ibmkc@us.ibm.com.

Feedback on the z/OS product documentation and content
If your comment is about the information that is provided in the z/OS product documentation library, send a detailed email to mhvrcfs@us.ibm.com. We welcome any feedback that you have, including comments on the clarity, accuracy, or completeness of the information.

To help us better process your submission, include the following information:
• Your name, company/university/institution name, and email address
• The following deliverable title and order number: IBM Knowledge Center for z/OS Configuration and User Guide, SC27-6805-30
• The section title of the specific information to which your comment relates
• The text of your comment.

When you send comments to IBM, you grant IBM a nonexclusive right to use or distribute the comments in any way appropriate without incurring any obligation to you.

IBM or any other organizations use the personal information that you supply to contact you only about the issues that you submit.

If you have a technical problem

If you have a technical problem or question, do not use the feedback methods that are provided for sending documentation comments. Instead, take one or more of the following actions:
• Go to the IBM Support Portal (support.ibm.com).
• Contact your IBM service representative.
• Call IBM technical support.
Chapter 1. Overview of Knowledge Center for z/OS

Knowledge Center for z/OS is a web application that provides IBM product publication content to web browser clients from the z/OS server system.

The information in this publication (SC27-6805-30) applies to Version 1.1 of Knowledge Center for z/OS (KC4z 1.1) in z/OS V2R3. Information related to Version 1.0 of Knowledge Center for z/OS (KC4z 1.0) in z/OS V2R2 can be found in publication (SC27-6805-00).

Knowledge Center is IBM’s strategic platform for delivering technical content. There are two types of Knowledge Center applications:

Knowledge Center - Hosted (KC-hosted)
The outward-facing server of IBM content running on the IBM web site. This Knowledge Center can be found by pointing your web browser to IBM Knowledge Center (www.ibm.com/support/knowledgecenter).

Knowledge Center - Customer Installable (KC-CI)
A customer installable version of Knowledge Center packaged for product use.

IBM Knowledge Center for z/OS (KC4z) is an SMP/E packaging of KC-CI Version 1.5, with some additional function added. It is a Java™ web application deployed by the WebSphere Liberty base element of z/OS. Knowledge Center for z/OS is a base element of z/OS. All z/OS customers have access to it as part of the base operating system.

Knowledge Center for z/OS provides the ability to display, navigate and search content in a manner similar to Knowledge Center hosted on the IBM web site. You can manually add content to Knowledge Center for z/OS by copying it to your z/OS directories in Unix System Services. You can also automatically add content there using the SoftCopy Librarian V5 tool. By adding content, you can make Knowledge Center for z/OS serve product publications for many different IBM and vendor products.

Liberty provides an application server runtime environment for Knowledge Center for z/OS.

What’s new in Knowledge Center for z/OS V2R3?
Following are the key enhancements to Knowledge Center for z/OS that are introduced in V2R3 (KC4z 1.1):

• Configuration scripts and defaults have been enhanced to support configuring Knowledge Center for z/OS within a sysplex environment. With this support, a single copy of Knowledge Center product content and properties files may be shared across all systems in a sysplex that exploit shared file system support.

• The latest available version of the KC Customer Installable (KC-CI) WAR file and an updated KC Taxonomy ditamap file have been packaged with this release, to improve search granularity, topic navigation and product stability.

• A new LookAt web application has been added with this release to provide a Knowledge Center-based replacement to the legacy BookManager-based LookAt function for performing message lookup functions. This LookAt function has both an End User (browser interface) component and a RESTful API component.

Software delivery options for Knowledge Center for z/OS
Knowledge Center for z/OS is available for installation through the ServerPac order delivery process or as a Custom-Built Product Delivery Option (CBPDO) software delivery package. How your installation sets up Knowledge Center for z/OS — the procedures you use and the instructions that you follow—depends in part on the software delivery option that you use.

These differences are explained as follows:
ServerPac users:

- If you select the full system replacement installation type, a default instance of Knowledge Center for z/OS is set up for you. Here, a base Knowledge Center for z/OS configuration is created through a ServerPac post-installation job, using IBM-supplied defaults.

- If you select the software upgrade installation type, you require the planning and configuration information in this document to create a Knowledge Center for z/OS configuration. Your system programmer can use the provided shell scripts to set up Knowledge Center for z/OS on your system, and add content plug-ins to it.

ServerPac provides customization guidance for configuring Knowledge Center for z/OS. See the copy of *ServerPac: Installing Your Order* that is supplied with your order.

CBPDO users:

If you receive Knowledge Center for z/OS in a Custom-Built Product Delivery Option (CBPDO) software delivery package, you require the planning and configuration information in this document. Your installation's system programmer must set up Knowledge Center for z/OS through shell scripts that are provided with the product.

Software prerequisites

Determine on which z/OS operating system image you want to run this product. Knowledge Center for z/OS V2R3 must be run on z/OS Version 2 Release 3.

Ensure that the following product is installed and operational on your system:


Liberty (the version which is a base element of z/OS). By default, the Knowledge Center for z/OS server started task (HKCSVR1) specifies /usr/lpp/liberty_zos/current as the root directory of Liberty’s installation tree. Note that there are multiple service levels of Liberty installed under the /usr/lpp/liberty_zos directory (for example, 17.0.0.1/ and 17.0.0.2/) and that current/ is a symbolic link that points to the latest (i.e. most current) such level.

This set-up must be done before you run the Knowledge Center for z/OS configuration scripts. By default, the Java SDK resides in the directory /usr/lpp/java/J8.0_64/ on your system. If you installed it in another location, be sure to configure the JAVA_HOME variable in the server.env file before running your shell session.

For ServerPac users, use the jobs and documentation supplied with your ServerPac order to create an initial instance of Knowledge Center for z/OS. During the ServerPac process, you will need sections of this document to complete certain actions. Thereafter, you can refer to this document for information about performing various post-configuration actions.

Installations that install Knowledge Center for z/OS from a Custom-Built Product Delivery Option (CBPDO) software delivery package, or from a ServerPac order using the software upgrade method of installation, should plan to manually run the configuration script procedures described in this document. In contrast, installations that install Knowledge Center for z/OS as part of a ServerPac full system replacement will have these scripts run automatically during the ServerPac post-installation process.

The following web browsers are supported by Knowledge Center for z/OS, and are recommended for best results:

- Microsoft Internet Explorer Version 9 or later
- Mozilla Firefox Version 17 or later
- Google Chrome Version 20 or later
- Apple Safari Version 5 or later
What setup is needed for Knowledge Center for z/OS?

Configuring Knowledge Center for z/OS on your system requires certain z/OS resources to be set up, shell scripts to be run, and security set up to be performed for your security management product, such as RACF (or equivalent).

Using Knowledge Center for z/OS requires sufficient authority in z/OS. Specifically, on the z/OS system to be managed, the resources to be accessed on behalf of Knowledge Center for z/OS users (data sets, operator commands, and so on) are secured through the security management product at your installation; for example, Resource Access Control Facility (RACF®). Your installation’s security administrator must create the authorizations in your security management product. Knowledge Center for z/OS provides scripts and the information in this document to assist your security administrator.

Receiving service updates for Knowledge Center for z/OS

As with other IBM software products, IBM ships service for Knowledge Center for z/OS in the form of program temporary fixes (PTFs).

When planning for service updates, consider that all Knowledge Center for z/OS functions are provided together as one functional modification identifier (FMID): HKCZ110.

For the most current information on APAR fixes and service updates, review the product Preventive Service Planning (PSP) bucket, as referenced in z/OS Program Directory in the z/OS Internet library (www.ibm.com/servers/resourcelink/svc00100.nsf/pages/zosInternetLibrary) (GI11-9848-02). You can also use the IBM Support Portal (support.ibm.com) or the IBM Link (www.ibm.com/ibmlink) web site. For a list of fix category (FIXCAT) values and descriptions, go to IBM Fix Category Values and Descriptions (www.ibm.com/systems/z/os/zos/features/smpe/fix-category.html).

When working with service updates, check the PTF ++HOLD action for specific instructions for deploying the updated code, such as whether you must restart the Knowledge Center for z/OS server to have the updates take effect.
Chapter 2. Configuring Knowledge Center for z/OS

It is strongly recommended that you review all of these steps before performing the configuration.

The configuration process

The shell scripts and configuration files that are provided with Knowledge Center for z/OS are run in the z/OS UNIX System Services environment for proper execution. The scripts and configuration files are installed into default installation directory /usr/lpp/kc4z/samples. If the default installation and runtime directories are used, the scripts, configuration files and sample JCL can be used without modification. If either the default installation or runtime directories are customized, you must also modify copies of the scripts, configuration files and sample JCL before running them.

In Knowledge Center for z/OS V2R3, the default installation directory is /usr/lpp/kc4z, and the default configuration directory is /etc/kc4z. If either of these locations is different on your system, you will need to replace the default value with the customized value in the scripts, configuration files and sample JCL before using them.

The /global/kc4z/data directory is the default for KC product content, and associated properties, data repository. If you wish to override this default value, the customized value must be substituted in copies of the scripts and configuration files that refer to /global/kc4z/data. Note that in z/OS V2R3, a /global directory is always present, either in the sysplex root of a sysplex, or in the root filesystem of a single system not in a sysplex. Refer to “Sharing content within a sysplex” on page 16 for information about how using the /global directory enables sharing a single copy of KC product content and properties across multiple systems within a shared sysplex environment.

The /var/kc4z/runtime directory is the default for the server runtime files. If you wish to override this default value, the customized value must be substituted in copies of the scripts and configuration files that refer to /var/kc4z/runtime.

The /var/kc4z/logs directory is the default for both Knowledge Center and Liberty log files, as specified by the LOG_DIR and WLP_OUTPUT_DIR parameters in server.env. To override this default value, copies of both the server.env file and the scripts and configuration files that refer to /var/kc4z/logs must be modified to substitute the customized value.

The configuration process occurs in several stages, and in the following order:

- Creating space for runtime files, data repository, and logs
- Performing and verifying initial configuration
- Performing additional configuration

This sequence is critical to a successful configuration. Earlier steps create resources, such as directories, that later steps must act upon, such as changing ownership of the directories. This document assumes that you will carry out the steps in the order in which they are presented.

Creating space for runtime, data, and logging

Before continuing with the Knowledge Center for z/OS configuration process, ensure that the following work is done.

Creating mount point directories

Before configuring Knowledge Center for z/OS, you must create mount point directories for the data, runtime and log file systems. You can choose to use the default mount point directories, or you can customize them.

The default mount point directories are /global/kc4z/data for content-related data, /var/kc4z/runtime for runtime data, and /var/kc4z/logs for log data. If choosing to customize these mount
point defaults, do so in another copy of /usr/lpp/kc4z/samples/makemountpoints.cmd created in a in a writable directory. Note that the names of the subdirectories that subsequently get created under these mount points should not be changed.

Using a privileged or UID 0 userid, run the /usr/lpp/kc4z/samples/makemountpoints.cmd script to create the mount points.

**Important**: Customizing makemountpoints.cmd will necessitate corresponding changes to several of the process steps and associated files used in the configuration process.

**Creating and mounting the runtime, data and log file systems**
Using a privileged or UID 0 user ID (required for the mount step in each job), copy, customize and submit the three sample jobs that define, format, and temporarily mount the three zFS linear sequential VSAM cluster file systems. These sample jobs are installed in SYS1.SAMPLIB.

The three JCL sample job files are:
- HKCRUNFZ
- HKCDATGZ
- HKCLOGFZ

Each of these jobs calls the HKCMNTFS REXX exec in the mount step.

**Important**: If not using the default mount point directories, the PATHPREF= value in the mount step for each of these jobs will also need to be modified with the correct customized directory names.

**Attention**: Although both HFS and zFS file systems are supported by Knowledge Center, the sample JCL file is provided only for zFS file systems.

**Adding ipl-time mount commands for the newly created file systems**
Add the mount commands for the three zFS file system datasets to the BPXPRMxx member of your system parmlib. Use the HKCMOUGZ sample mount commands included in SYS1.SAMPLIB as a model.

**Important**: If not using the default mount point directories, the value of the MOUNTPOINT() arguments will need to be modified to specify customized directory names.

**Configuring initial setup**
The configuration process for the initial default IBM Knowledge Center for z/OS setup involves configuring RACF (or equivalent security management product), creating target subdirectories under the mount points, copying default configuration files to the configuration target subdirectory, verifying installation, and setting up the Knowledge Center server started task.

**Configuring RACF**
You configure RACF for your IBM Knowledge Center for z/OS system by creating the user id and group id to own the subdirectories and run the Knowledge Center server started task HKCSVR1.

**Procedure**
1. Run the /usr/lpp/kc4z/samples/defracf1.cmd script.

The script runs the ADDGROUP and ADDUSER RACF commands for a user id to be assigned to the HKCSVR1 started task.

**If you are using the default configuration settings:**
Run the defracf1.cmd script using a user id with RACF SPECIAL authority. The script will establish the following values assigned to the HKCSVR1 started task:
- User id: hkcsvr
- Group id: hkcadmin
• OMVS home: /u/hkcsvr

If you do not want to use the provided defaults:
Before making your desired modifications to the defracf1.cmd script, make a backup copy in a writable directory. You can specify a customized user id, group id or OMVS home directory. In addition, if the AUTOUID and AUTOGID RACF features are not supported, you will need to specify an existing user id using the UID( ) parameter, as well as an existing group id using the GID( ) parameter, instead of the AUTOUID and AUTOGID defaults specified in defracf1.cmd.

2. After running the defracf1.cmd script, if the specified OMVS home directory (/u/hkcsvr by default) does not already exist, create it (using the mkdir command) with 755 permissions, and assign it the specified user id (hkcsvr, by default) and group id (hkcadmin, by default) using the chown and chgrp commands, respectively.

3. If the TCPIP profile name has an HLQ other than "SYS1" or "TCPIP", then a RACF PERMIT ACCESS(READ) is needed for the hkcsvr user id to the TCPIP profile name.

Creating target subdirectories
You must create target subdirectories under the mount points for the three execution time file systems that you have mounted. You also need to enable the HKCSVR1 started task to use these subdirectories.

If the filesystems are mounted on the default mount points, then you can use a privileged or UID 0 user id to run the /usr/lpp/kc4z/samples/maketargetdirs.cmd script to create the following target subdirectories, and enable the HKCSVR1 started task to use them:

• /etc/kc4z/servers/kc4zServer
• /global/kc4z/data/conf
• /global/kc4z/data/content
• /var/kc4z/data/runtime
• /var/kc4z/data/runtime/index
• /var/kc4z/data/runtime/diskcache
• /var/kc4z/data/runtime/datacache
• /var/kc4z/logs/kc4zServer

If you have customized the default user id or group id, or if the filesystems are not mounted on the default mount points, make a backup copy of maketargetdirs.cmd to a writable directory before modifying the appropriate values with your changes and running the script.

Copying Knowledge Center configuration files
You must copy the default configuration files from the Knowledge Center installation directory to the execution time configuration directory.

If you are using the default installation directory and default execution time configuration directory, you can run the /usr/lpp/kc4z/samples/copycfg.cmd script to copy the configuration files to the execution time configuration directory. Using a privileged or UID 0 user id, run the script to copy the following files from the /usr/lpp/kc4z/samples source directory to the /etc/kc4z/servers/kc4zServer target directory:

• server.xml
• server.env
• kc.properties
• lookat.properties
• bootstrap.properties
• jvm.options
• jvm.security.override.properties
• hkcz.properties
If not using the default /etc/kc4z/servers/kc4zServer directory as your execution time configuration directory, you can specify your customized execution time configuration directory on the command line as demonstrated in this example: /usr/lpp/kc4z/samples/copycfg.cmd / MYCONFIG/kc4z/servers/kc4zServer, with no trailing slash.

If not using the default hkcsvr user id or hkcadmin group id for authorizing the HKCSVR1 started task, make a copy of the copycfg.cmd script in a writable directory before making your customized changes. If you will be running your modified copy of copycfg.cmd from a directory other than the directory in which it was originally installed, you must also modify the “sourceDir=” setting in copycfg.cmd to point to the original installation directory. This is because copycfg.cmd otherwise assumes the files it copies reside in the same directory in which the running script resides.

**Verifying the installation**

After having performed the space creation and initial configuration, you can verify that IBM Knowledge Center for z/OS has been successfully installed and configured, and is ready for Knowledge Center product content deployment.

**Before you begin**

**Restriction:** This procedure assumes that you have used the default settings up to this point. If not, the default settings in the configuration files copied in the previous step will first need to be overridden.

**Attention:** By default, the Java SDK resides in the directory /usr/lpp/java/J8.0_64/ on your system. If you installed it in another location, be sure to configure the JAVA_HOME variable in the server.env file before verifying the installation.

**Note:** There are several references to the SYS1.PROCLIB dataset in this publication, however, in practice a different PROCLIB dataset may apply in your case. Specifically, IBM supplies the KC for z/OS cataloged procedure (HKCSVR1) in your order, as follows:

**ServerPac orders**

For a ServerPac order, IBM supplies the cataloged procedures in SYS1.IBM.PROCLIB. You can rename this data set through the installation dialog if you choose to do so.

**CBPDO orders**

For a CBPDO order, the procedure is installed in the SMP/E defined PROCLIB. IBM recommends using SYS1.PROCLIB. You can rename this data set and set it up as such in your DDDEF for PROCLIB. During installation, you can optionally catalog the data set, or you can defer doing so.

**Procedure**

To verify installation and configuration:

1. Start the HKCSVR1 started task that is included in SYS1.PROCLIB.
   
   For example, run the following command on the Command Input line of the SDSF “ST” function:
   
   ```
   /s hkcsvr1
   ```

   If the installation has succeeded, the resulting Job Log for the started task should include the following message near the beginning of the log:

   ```
   CWWKF0011I: The server kc4zServer is ready to run a smarter planet.
   ```

   In addition, assuming default http port 9080 is used, the resulting console.log file in /var/kc4z/logs/ should include the following message:

   ```
   CWWKT0016I: Web application available (default_host): http://yourHostName:9080/zos/knowledgecenter/
   ```

2. Load the URL from the end of this CWWKT0016I message in a web browser.

   The framed display of the IBM Knowledge Center welcome page should load in the browser with an entry for the IBM Knowledge Center product (i.e. this product content) listed in the table of contents frame, as sample product content. When that product link is clicked, it should expand, and navigation to topics under that product tree should be possible, if the configuration was successful.
Configuring the Knowledge Center server started task to run with system IPL

HKCSVR1 is the started task that drives Liberty to launch the IBM Knowledge Center for z/OS web application. The installed copy of HKCSVR1 in SYS1.PROCLIB contains a USERDIR parameter whose value is the prefix of the default configuration directory (/etc/kc4z), and a ROOT parameter whose value is the prefix of the default Liberty location (/usr/lpp/liberty_zos/current).

Remember: The default ROOT value in the HKCSVR1 started task is indicative that IBM Knowledge Center for z/OS uses the Liberty that is a base element of z/OS.

If you are not using the default configuration directory or default Liberty location, copy SYS1.PROCLIB(HKCSVR1) to USER.PROCLIB(HKCSVR1), and customize the new copy with the appropriate values.

Add a start directive for HKCSVR1 to the COMMANDxx member of your system parmlib so that the Knowledge Center server starts with each system IPL. For example, add the following line to SYS1.PARMLIB(COMMANDxx):

```
COM='S HKCSVR1'
```

Configuring additional setup and default overrides

You can configure additional administrators for IBM Knowledge Center for z/OS and override the default settings.

SSL Support and KC4z

This topic describes SSL concepts, configuration, and options as related to KC4z.

SSL concepts

The https web protocol uses SSL (Secure Sockets Layer) protocol to provide secure data transmission. Secure Sockets Layer (SSL) provides two distinct functions to establish trusted communication. SSL can provide both encrypted data transport and a guarantee of URL owner identity.

Self-signed certificates only support encrypted data transport, they do not guarantee URL owner identity. Browsers will allow encrypted communication without the identity guarantee if the user "adds an exception" to accept a self-signed certificate as trustworthy.

Certificate authorities are third party companies which issue certificates which guarantee URL ownership identity, as well as containing an encryption key. The Certificate Authority (CA) also issues a root certificate and an intermediate certificate for itself. Browsers indicate with an icon or a red background that an https URL with a self-signed certificate is less trustworthy than an https URL with a certificate authority signed certificate.

The browser and the server both need copies of the CA root and intermediate certificates. Browser vendors keep their list of CA certificates current with browser updates. We will need to add the CA root and intermediate certificates to the server as well as our server's URL certificate which the CA will issue to us (for a fee).

The browser manufacturers trust the Certificate Authority, and the Certificate Authority verifies that your URL belongs to you. Thus your ownership of the URL and the trustworthiness of your website can be determined by the browser.

SSL support with KC4z

Four Levels of SSL support are possible with KC4z

1. no support
2. Automatic Self-signed certificate
3. Customized Self-signed certificate
4. Certificate Authority (CA) Signed certificate

Controlling and disabling http and https port numbers to configure NO SSL or SSL Only

Within bootstrap.properties, the SSL port is configured with the variable: hkc.httpsPort=9443 You may choose to disable SSL support by setting the value: hkc.httpsPort=-1. With the -1 value, KC4z is configured with no SSL support.

Similarly, Variable hkc.httpPort specifies the port used for client HTTP requests (non-SSL). Use the setting hkc.httpPort=-1 to disable the non-SSL http port will enforce an SSL only policy.

Your browser will access KC4z using SSL with the https URL. The pattern for the https URL is https://<your.server.url>:<hkc.httpsPort>/zos/knowledgecenter. You may observe the actual value of the URL(s) for your KC4z in console.log or messages.log.

Automatic self-signed certificates

Automatic self-signed certificate support is present without additional configuration or service. Websphere Liberty includes automatic self-signed certificates primarily for developers and not for production environments.

KC4z PTFs UI57513 (z/OS 2.2) and UI57376 (z/OS 2.3) shipped service to support using Certificate Authority certificates with KC4z. Before this service for SSL support, when an SSL port was configured Websphere Liberty would automatically generate and use a default file "key.jks" containing a self-signed certificate in a default directory.

After the SSL support service is in use, KC4z will use the file name "kc4zKeyStore.jks". Automatic self-signed SSL support will now generate and use a file named "kc4zKeyStore.jks" instead of "key.jks". For z/OS 2.2: /sharedapps/kc4z/servers/kc4zServer/kc4zKeyStore.jks is used instead of /var/kc4z/logs/kc4zServer/resources/security/key.jks. For z/OS 2.3 and above: /etc/kc4z/servers/kc4zServer/kc4zKeyStore.jks is used instead of /var/kc4z/logs/kc4zServer/resources/security/key.jks.

Customized Self-signed certificates

Generating a customized self-signed certificate is a necessary step in the procedure to obtain a CA signed certificate. A Certificate Signing Request (CSR) file is generated from the customized self-signed certificate. The CA will use the CSR as an input to generate your CA signed Certificate. If you do not require a CA signed certificate, you would choose to use customized support over automatic support in order to control the distinguished name fields, the expiration, or the algorithm or key size for your self-signed certificate.

To generate (and use) a customized self-signed certificate support, copy, modify, and run "genKC4zKeystore.cmd" to create or replace the kc4zKeyStore.jks file. Please refer to the instructions and notes included in /usr/lpp/kc4z/samples/genKC4zKeystore.cmd. The hkcsvr1 started task must be restarted to pick up the changes made to kc4zKeyStore.jks by genKC4zKeystore.cmd.

Certificate Authority (CA) Signed certificates

To achieve Certificate Authority (CA) SSL support you must replace the self-signed certificate in kc4zKeyStore.jks with your CA Certificate.

To accomplish this, typically a certificate for your URL is purchased from an Certificate Authority (CA) agency such as Digi-Cert. An output from genKC4zKeystore.cmd, the binary Certificate Signing Request (CSR) file must be forwarded/uploaded to the CA.

Once you have received the CA certificate back from your CA, and also the CA's root and intermediate certificate files, you will use the sample importCert.cmd to invoke the keytool commands to replace the self signed certificate with the CA certificate. If the CA is registered in the Trust Store for your browser, the chain of trust from the CA to your server is established and the warning and adding your URL as exception in the browser will be suppressed.
To use CA signed certificate support, copy, modify, and run importCert.cmd Please refer to the instructions and notes included in /usr/lpp/kc4z/samples/importCert.cmd. The hkcsvr1 started task must be restarted to pick up the changes made to kc4zKeyStore.jks by importCert.cmd

**Java Key Store vs RACF Keyring**

kc4zKeyStore.jks is a Java Key Store (JKS). The keytool program in Java Development Kit, (JDK) creates and maintains the JKS. The sample execs, genKC4zKeystore.cmd and importCert.cmd provide well formed calls to keytool for the purposes of creating the JKS and the CSR file and to receive the CA certificates into the JKS. Other tools are available to create and maintain a JKS.

On the z/OS platform, Using a JKS as opposed to a RACF keyring will be an unexpected or even an unwelcome choice for many customers. In particular, z/OSMF customers will wish to use the same configuration and certificates for KC4z. The KC4z team is aware of this opportunity for improvement. To voice your support for the priority of the work to develop and test RACF keyring support, please open an RFE, request for enhancement, to communicate the priority to management, or open a PMR against KC4z to communicate the priority to the developers.

**KeyStore and certificate Passwords**

You may choose to periodically change the password for the keystore and the certificate. The password for kc4zKeyStore.jks does not expire, but your company policies might require password changes.

The password for kc4zKeyStore.jks must be synchronized with the password saved in bootstrap.properties. The sample updatePWD.cmd can be used to maintain this synchronization. To avoid disaster, either use the root userid, IBMUSER, or the permissions and ownership of kc4zKeyStore.jks and bootstrap.properties MUST be synchronized prior to running. Please refer to instructions and notes included in updatePWD.cmd

**Certificate Expiration:**

SSL certificates expire. Browser response to an expired certificate will not be good, access might be prevented.

Automatically generated self-signed certificates have a one year validity period. To respond to an expired automatic self-signed certificate, delete kc4zKeystore.jks and restart the hkcsvr1 started task.

The expiration of a customized self-signed certificate will follow the number of days specified in the keytool -validity parameter coded in genKC4zKeystore.cmd. The default is 9999 days. When 9999 days have passed, you will need to re-run genKC4zKeystore.cmd and restart hkcsvr1.

The expiration of a CA certificate will be determined by the CA certificate process. The CA will most likely have a "RENEW" process which may require the original CSR as input and produce a fresh .CRT CA signed certificate file. Having received that file, you will need to re-do importCert.cmd with the fresh .CRT file from the CA to have a certificate with an un-expired validity period.

To pro-actively monitor certificate expiration date use the keytool command

```
keytool -list -v -keystore kc4zKeyStore.jks
```

from a telnet or omvs command prompt.

**Connecting additional administrator users to the HKCADMIN group**

Running the /usr/lpp/kc4z/samples/defracf1.cmd script created group id hkadmin and user id hkcsvr, by default, as a member of the HKCADMIN group. Other user id's that need access to server configuration data, content-related data, runtime data or log data in the Knowledge Center execution time directories (/etc/kc4z, /global/kc4z and /var/kc4z, by default) and owned by hkcsvr must also be included in the HKCADMIN group.

**Procedure**

To connect any additional administrator users to the HKCADMIN group:
1. Using a privileged user id with RACF SPECIAL authority, run the following RACF command on the TSO command line for another such administrative user. For example, for an administrator user named adminuser:

   ```
   CONNECT ADMINUSER GROUP(HKCADMIN)
   ```

2. Verify that the user id is connected to the group by running the following RACF command on the TSO command line (using adminuser as an example):

   ```
   LISTUSER ADMINUSER
   ```

   **Attention:** If the default group id hkcadmin was not used in the defracf1.cmd script, modify the CONNECT command with the appropriate value.

### Configuration files reference

The configuration files copied into the configuration directory (`/etc/kc4z/servers/kc4zServer`, by default) by the copycfg.cmd script during initial configuration should be modified to reflect any customization of the default values made during the configuration process. The following list provides some customization considerations for each configuration file. Using a privileged or UID 0 user id, modify the files in the configuration directory to override default values.

**server.xml**

This is the main Knowledge Center server configuration file. Generally, it should not be modified. It is designed so that the bootstrap.properties file may be used to specify values for the parameters within server.xml.

Modify the bootstrap.properties file to make changes to the default server configuration, if necessary.

**server.env**

This file specifies important environment variables to be used by Liberty when launching the Knowledge Center server. The `/etc/kc4z` and `/var/kc4z` default directory path prefixes should be modified if you specified values other than the default in the setup and configuration instructions. The JAVA_HOME setting needs to be modified if you choose to point to another Java installation directory (IBM Java SDK8 64-bit is supported by Knowledge Center, and is the configuration default).

The following environment variable values need to be updated with new path prefixes if you do not use the default values shown here:

```
KC_HOME=/etc/kc4z/servers/kc4zServer
LOG_DIR=/var/kc4z/logs
WLP_OUTPUT_DIR=/var/kc4z/logs
JAVA_HOME=/usr/lpp/java/J8.0_64
```

**kc.properties**

This file specifies important settings required by the Knowledge Center application. The `/global/kc4z` and `/var/kc4z` default directory path prefixes should be modified if you specified values other than the defaults in the setup and configuration instructions. Also, if Knowledge Center is installed in a customized `PathPrefix` directory other than the default root filesystem, then all `/usr/lpp/kc4z` occurrences should be changed to `PathPrefix/usr/lpp/kc4z`.

The following parameters need to be updated with new path prefixes if you do not use the default values shown here:

```
conf.path=/global/kc4z/data/conf,/usr/lpp/kc4z/kc4z.infocr/conf
taxonomy.path=/usr/lpp/kc4z/samples/KC_taxonomy.ditamap
diskcache.path=/var/kc4z/data/runtime/diskcache
ditacache.path=/var/kc4z/data/runtime/ditacache
index.path=/var/kc4z/data/runtime/index
```
Important: The conf.path value is a list of comma-delimited directories within which Knowledge Center monitors product properties files. These properties files are normally deployed with product content by the Softcopy Librarian tool. If Softcopy Librarian is configured to deploy product properties files to directories other than, or in addition to, the default /global/kc4z/data/conf path specified in conf.path, those directories need to be appended to the list.

lookat.properties
This file specifies important settings required by the LookAt application.

The following keyword needs to be updated with the settings applicable to your installation. Following are the keyword values and a description of their possible settings:

msgReleases
A json structure of products, and the releases within each product, available for scoping the LookAt message search function. For the LookAt EUI component, these are the products, and product releases, presented to the end user for selection. For the LookAt RESTful API component, this is the json structure of available products and product releases returned via the msgReleases RESTful API call. The default setting for this keyword is for release V2R3 of the z/OS product only, as follows:

msgReleases= { "count": "1", "products": [{"product":"z/OS", "releases": [{"title":"z/OS V2R3", "key":"SSLTBW_2.3.0"}] } ]

The lookat.properties file also has a commented out msgReleases keyword that demonstrates how to specify multiple releases for multiple products. Specifically it shows how to specify releases V2R2 and V2R1 for z/OS, releases V6.3 and V6.2 of z/VM and releases V6.1 and V5.3 of z/VSE as follows:

msgReleases= { "count": "3", "products": [{"product":"z/OS", "releases": [{"title":"z/OS V2R2", "key":"SSLTBW_2.2.0"}, {"title":"z/OS V2R1", "key":"SSLTBW_2.1.0"} }, {"product":"z/VM", "releases": [{"title":"z/VM 6.3", "key":"SSB27U_6.3.0"}, {"title":"z/VM 6.2", "key":"SSB27U_6.2.0"} ] }, {"product":"z/VSE", "releases": [{"title":"z/VSE 6.1", "key":"SSB27H_6.1.0"}, {"title":"z/VSE 5.3", "key":"SSB27H_5.3.0"} ] } ] }

searchAPIurl
The URL prefix to be used by the LookAt message search function in both the EUI and the RESTful API components. The default setting for this keyword, as appears in the sample lookat.properties file, is:

searchAPIurl=/zos/knowledgecenter/api/search

which targets the LookAt message search to the Knowledge Center for z/OS (KC4z) running on the same host as LookAt.

If targeting the LookAt message search to a KC4z running on a different host than LookAt, the setting for this keyword should be as follows:

searchAPIurl=http://my.kc4z.host.com:9080/zos/knowledgecenter/api/search

where my.kc4z.host.com is the host on which KC4z is running, and 9080 is the corresponding server port.

If targeting the LookAt message search to the Knowledge Center hosted on www.ibm.com, the setting for this keyword, which appears as a comment line in the sample lookat.properties file, should be as follows:

searchAPIurl=http://www.ibm.com/support/knowledgecenter/v1/search

bootstrap.properties
This file contains Knowledge Center configuration settings that are used by the server.xml configuration file. The /var/kc4z default directory path prefixes should be modified if you specified values other than that default in the setup and configuration instructions. Also, if Knowledge Center is installed in a customized PathPrefix directory other than the default root filesystem, then all /usr/lpp/kc4z occurrences should be changed to PathPrefix/usr/lpp/kc4z. There are other
settings such as host, port numbers, context root, ssl information, and trace settings that may be customized, as necessary.

The following parameters need to be updated with new path prefixes or with other settings if you do not use the default values shown here:

**hkc.ssl.client.auth.supported**
Choose whether an ssl port is enabled. The default value is true.

**com.ibm.ws.logging.trace.specification**
Trace settings string. The default value is *=warning*.

**com.ibm.ws.logging.log.directory and hkc.log.dir**
The names of directories to contain logs. The default values are:

```
com.ibm.ws.logging.log.directory=/var/kc4z/logs
hkc.log.dir=/var/kc4z/logs/
```

**hkc.install.dir**
The parent directory of the kc.war file. The default value is /usr/lpp/kc4z/.

**hkc.context.root**
The Knowledge Center URL prefix. The default value is zos/knowledgecenter.

**hkc.httpHost, hkc.httpPort, and hkc.httpsPort**
The httpEndpoint variables. The default values are as follow, but care should be taken to ensure the specified values do not conflict with those specified for another server, such as z/OSMF:

```
hkc.httpHost=*  
hkc.httpPort=9080  
hkc.httpsPort=9443
```

**hkc.unauthenticated.user**
This is the guest RACF userid. The default value is HKCGUEST.

**jvm.options**
This file specifies the Java options that are used by the Knowledge Center JVM. The /etc/kc4z default directory path prefix specified should be modified if another path prefix has been specified in the setup and configuration instructions. Other option settings may be overridden or added, as required, but you should consult the Java documentation before making changes to these values.

The following parameter needs to be updated with the new path prefix or with other settings if you do not use the default value shown here:

```
-Djava.security.properties=/etc/kc4z/servers/kc4zServer/jvm.security.override.properties
```

**jvm.security.override.properties**
This file contains Java security property information and should not be modified.

**hkcz.properties**
This file contains Knowledge Center product identifiers and should not be modified.
Chapter 3. Managing product documentation content in Knowledge Center for z/OS

The Knowledge Center for z/OS kc.properties configuration file designates a list of directories as the Knowledge Center conf.path. Product properties files (*.properties) within the conf.path directories connect product content to the Knowledge Center taxonomy (KC_taxonomy.ditamap) which is used to form the Knowledge Center table of contents. The Knowledge Center for z/OS server monitors the conf.path directories for new or changed product properties files, and when detected, updates the Knowledge Center table of contents and search index for the corresponding products.

About this task

Adding content automatically by following the procedure described in the readme.txt provided at https://public.dhe.ibm.com/systems/z/zos/stfp/kc/ is the new supported method for provisioning product content supplied by IBM to Knowledge Center for z/OS. This new procedure replaces Softcopy Librarian.

For more information about using SoftCopy Librarian to provision new or updated content to Knowledge Center for z/OS, and the other functions it provides, see the IBM Softcopy Librarian: User’s Guide (GC23-3414-17). Additional information, including the download link for Softcopy Librarian V5, can be found at IBM Softcopy Librarian (www.ibm.com/support/docview.wss?uid=swg27018846).

Adding content manually to Knowledge Center for z/OS, for a product, is possible if you copy product plugins to a content directory yourself, build and add your own product properties file to a conf.path directory, and register (if necessary) the product id with the Knowledge Center taxonomy file. The details for manually provisioning content are detailed in the following procedure:

Procedure

1. Copy a product's plugins to a subdirectory of the content directory.
   The default location for the content directory is /global/kc4z/data/content. If your content subdirectory is named example, then you place your content in /global/kc4z/data/content/example.

2. Create a product.properties file, in ASCII format, in a directory specified by the conf.path property within your kc.properties configuration file. For example, if the product id for your content is SSBLLD, then your product properties file should be named SSBLLD.properties.
   The following is an example of the contents of a properties file for a product with id SSBLLD and a content subdirectory named example:

   ```
   product=SSBLLD
   path=/global/kc4z/data/content/example
   toc=com.ibm.zos.v2rl.isp.isp.ditamap
   ```

   The toc property defines the name of the product's master ditamap file within the path directory. The master ditamap defines the table of contents structure for the product.

   **Important:** The conf.path property is specified in the kc.properties file located in /etc/kc4z/servers/kc4zServer/, by default. You can specify one directory for the value of conf.path, or multiple directories delimited by commas. The default conf.path value is /global/kc4z/data/conf.

3. Register the product in the Knowledge Center taxonomy file if it has not been registered already.
   The kc.properties file contains a configuration parameter called taxonomy.path. The value for this parameter is the fully qualified name of the KC_taxonomy.ditamap file. By default:

   ```
   taxonomy.path=/usr/lpp/kc4z/samples/KC_taxonomy.ditamap
   ```
You edit the KC_taxonomy.ditamap file to register your content with Knowledge Center. For example, to add a product named ISPF for z/OS Version 1.9.0 with a product id of SSBLLD, you might add the following line to the KC_taxonomy.ditamap file:

```xml
<subjectdef type="CT701" class="map/topicref subjectScheme/subjectdef"
    id="SSBLLD" keys="SSBLLD" navtitle="ISPF for z/OS 1.9.0"
toc="no" processing-role="resource-only" product="product"/>
```

4. After modifying KC_taxonomy.ditamap, stop and restart the HKCSVR1 Knowledge Center Server started task in order to pick up the taxonomy changes.

Content examples

A product's content is stored in a content directory indicated by the path keyword within its corresponding product.properties file. This file is located in one of the directories specified by the conf.path keyword within the kc.properties file. The product's content directory contains all of the product plugins, as well as the product's master ditamap file, which defines the product table of contents. Plugins can be stored as directories or as .jar files.

**Important:** Your product's product.properties file must also identify your table of contents master ditamap file (relative to the path value) via the toc keyword. In these examples, the "demo" product.properties file might look like this:

```properties
product=SSBLLD
path=/global/kc4z/data/content/demo/
toc=com.ibm.zos.v2r1.isp_isp.ditamap
```

**Directory style plugin example**

If your product content plugins are "directory style", each plugin directory is placed under the product content directory along with the product table of contents master ditamap file. In the following example, the "demo" product content directory has three content plugin directories, a root plugin directory, and the table of contents master ditamap file:

```text
/globa1/kc4z/data/content/demo/com.ibm.zos.v2r1.f54em00/
/globa1/kc4z/data/content/demo/com.ibm.zos.v2r1.f54pd00/
/globa1/kc4z/data/content/demo/com.ibm.zos.v2r1.f54ug00/
/globa1/kc4z/data/content/demo/com.ibm.zos.v2r1.isp_isp.ditamap
```

**.jar file style plugin example**

If your product content plugins are " .jar style", each plugin .jar file is placed under the product content directory along with the product table of contents master ditamap file. In the following example, the "demo" product content directory has three content plugin .jar files, a root plugin .jar file, and the table of contents master ditamap file:

```text
/globa1/kc4z/data/content/demo/com.ibm.zos.v2r1.f54em00.jar
/globa1/kc4z/data/content/demo/com.ibm.zos.v2r1.f54pd00.jar
/globa1/kc4z/data/content/demo/com.ibm.zos.v2r1.f54ug00.jar
/globa1/kc4z/data/content/demo/com.ibm.zos.v2r1.isp.jar
/globa1/kc4z/data/content/demo/com.ibm.zos.v2r1.isp_isp.ditamap
```

Sharing content within a sysplex

By exploiting the new /global directory (introduced in z/OS V2R3) in a shared sysplex environment, a single copy of Knowledge Center product content and properties files can be shared by multiple IBM Knowledge Center for Z/OS server instances in the sysplex.

In a z/OS V2R3 sysplex, if the Data file system is mounted at the default /global/kc4z/data directory in the sysplex root, it is shareable by all IBM Knowledge Center for Z/OS (KC4z) server instances in the sysplex running on systems that exploit shared file system support. Since KC4z 1.1 (z/OS V2R3) servers,
by default, are pre-configured to read data from the Data file system mounted at /global/kc4z/data/, such a KC4z 1.1 (z/OS V3R3) server would automatically use the shared copy of the data content and properties in the sysplex root.

Any older KC4z 1.0 (z/OS V2R2) servers in the sysplex that exploit shared file system support can also be made to read the same data from the shared Data file system mounted at /global/kc4z/data/ in the sysplex root by editing their /sharedapps/kc4z/servers/kc4zServer/kc.properties file to replace the conf.path keyword value of “/sharedapps/kc4z/data/conf” with “/global/kc4z/data/conf”.

If you wish to migrate KC product content and configuration data previously provisioned to a KC4z 1.0 (z/OS V2R2) server to a KC4z 1.1 (z/OS V2R3) server(s), whether in a sysplex or single system environment, please refer to z/OS Migration (GA32-0889-30) for complete migration instructions.
Chapter 4. Using Knowledge Center

Knowledge Center for z/OS is a central location for finding and organizing information about your products. You can use advanced search tools to sort and filter your search. From either the search results or Table of Contents pane, you can browse through product or solution sets of information.

Accessing Knowledge Center for z/OS in a web browser
To access Knowledge Center content, point your web browser to your Knowledge Center for z/OS landing page, such as:

http://yourHostName:9080/zos/knowledgecenter/

The actual URL for your Knowledge Center for z/OS landing page is logged by the Knowledge Center for z/OS server started task (HKCSVR1) in the /var/kc4z/logs/console.log file. For example:

CWWKT0016I: Web application available (default_host):
http://yourHostName:9080/zos/knowledgecenter/

Accessibility
Accessibility features help users who have a disability, such as restricted mobility or limited vision, to use information technology products successfully. Documentation is provided in HTML so that it is easily accessible through assistive technology.

With the accessibility features of Knowledge Center for z/OS, you can do the following tasks:

• Use screen-reader software and digital speech synthesizers to hear what is displayed on the screen. Consult the product documentation of the assistive technology for details on using assistive technologies with HTML-based information.
• Use screen magnifiers to magnify what is displayed on the screen.
• Operate specific or equivalent features by using only the keyboard.

Keys help:
• To move through the user interface controls, links, and subject areas, press the Tab key. To return to the previous control, link, or subject area, press Shift+Tab. Control keys vary, depending on the browser or operating system. For example, the operating system on recent Macintosh machines uses Ctrl+Opt instead of Shift+Alt and Chrome browsers use Alt instead of Shift+Alt.
• To go directly to the content area, press Shift+Alt+V.
• To go directly to the search field, press Shift+Alt+X.
• To go to the navigation area, press Shift+Alt+Z.
• To go directly to the Table of Contents tab, press Shift+Alt+T.
• To go directly to the Search Results tab, press Shift+Alt+S.
• To print the content that is in focus, press Shift+Alt+P.

Finding information by searching Knowledge Center
To search for information in Knowledge Center, enter your search terms into the search field. Knowledge Center returns a list of pages, ordered by relevance, that match your search terms. By default, only the topics that contain all the terms are returned.

Each search result shows which product and version that page is from. You can use operators to refine your searches.
OR

To search for pages that have one of two or more terms, include OR (capitalized) between the terms. Without OR, only pages that have all the terms in the specified search string are returned in the search results.

Each search displays a maximum of 500 results in ranked order. To see more than the first 20 search results, click Next 20 results to show 40 results. Click again to see 60 results in a single list, and so on.

Narrowing search results by selecting products

If a general search provides too many results, reduce the scope of the search to one or more products. You specify your product search scope by using the dialog presented when clicking Add Products... under the search field. Click Done to apply your search scope. Only results from the version, product, or products that you selected are returned. The products you selected are shown on the search bar.

Knowledge Center for z/OS tracks products as you browse content and follow links. This is called auto-select. To turn it off so that product filters are not added as you browse, clear the Auto-select check box. Auto-select does not add a product if you come to a topic through search; however, if you click a topic in the navigation tree after a search, the context is set to the product that contains that topic.

To broaden the scope of your search, click Add Products..., select another version or product, and click Done. Click Clear All to remove all the selected products from the search scope.

The product filters remain active until you select another option.

Refining search results by specifying category attributes

To find information more quickly, you can limit your search results by specifying attributes in the categories appearing beneath Search Results in the Navigation pane.

You can refine your search results by selecting attributes within any or all of the following categories:

Date Range
See only topics added or changed in the last week, month, or year, or define your own range of dates.

Tasks
Limit results to specific task types, such as installing, migrating, or troubleshooting. Only topics that are defined as that task type are included in search results. Results might be incomplete if some topics have not been assigned task types.

Operating System
You can limit search results to specific operating systems and versions.

Your specified search result refinements within categories can be removed by clicking any or all of Any Time, Any Task or Any Operating System in the corresponding category, as desired.

Browsing content

To browse content, click Table of Contents, then select a product, version, and topic. Expand the contents tree to see more content. When you select a version of a product, the Table of Contents scope adjusts to show the contents of the product that you have chosen. You can move back up the tree by clicking the link in the contents tree that has an up-arrow.

You can also browse content from any topic. For example, you can browse content from search results. When you click a search result, the topic opens and the Table of Contents shows the content structure for the product in which that topic appears. In the Table of Contents, you can then find related topics in that product.
Viewing content in your own language

By default, Knowledge Center shows content in the language that is specified in the Languages setting for your browser. For example, if your browser is set to French, then French content is shown if it exists. If content does not exist in your preferred language, that content is shown in English. You can also set your language preference in Knowledge Center by selecting a language from the Language list.
Chapter 5. Configuring and Using the LookAt Function of Knowledge Center for z/OS

The LookAt message lookup function in Knowledge Center for z/OS is a Knowledge Center based replacement for the legacy BookManager based version of LookAt. This new LookAt function has both an end user component and a RESTful API component. This chapter describes how to configure LookAt, and how to use both components.

Configuring the LookAt Function

Configuration for the LookAt function is performed by setting the `msgReleases` and `searchAPIurl` values in the `lookat.properties` file.

For the EUI component the specified `msgReleases` value dictates which products and product releases are presented to the end user as radio button selections for scoping the message search to a particular product release. For the RESTful API component, the specified JSON string value is what is returned by the `msgReleases` API call for as the product release to search in a subsequent `msgURLs` call.

The `searchAPIurl` value is used by both the EUI and RESTful API components of LookAt to indicate where to target the message search, either to a local Knowledge Center for z/OS (KC4z) server, or to the Knowledge Center hosted via the support portal on ibm.com.

See “lookat.properties” in topic “Configuration files reference” on page 12 for details.

Using the End User Component of the LookAt Function

The LookAt EUI component is invoked by launching the `http://my.kc4z.host.com:9080/zos/LookAT` URL in a web browser, where my.kc4z.host is the domain of the host running your IBM Knowledge Center for z/OS server.

The LookAt dialog presented to the end user has a Message ID field in which the message to be searched must be specified. For example, "arc0506i" without the quotes. Then after clicking one of the product release radio buttons presented in the dialog (e.g. `z/OS 2.3`), clicking the Retrieve Message Topic button triggers the search. The following information is returned for a successful message search:

- The content for the topic whose topic title identifies the requested Message ID. Typically this content contains an explanation of the message, the system action, programmer response, source of the message and a link to the parent topic of this topic.
- The URL for the topic whose content is presented
- The URL that was submitted for the message search
- A JSON structure containing information about all the topics that were returned from the search. Note that the content for only the topic which best identifies the Message ID description is displayed in the content frame

If a suitable topic for the requested Message ID couldn't be found, an error message and associated information is returned.

Using the RESTful API Component of the LookAt Function

The Knowledge Center for z/OS message lookup function, LookAt, exposes three RESTful application programming interfaces:

- `msgReleases`
Give me a JSON structure containing all the LookAt-configured releases on the server (as per lookat.properties)

• **msgURLs**
  
  For the specified message number and specified product release (one of the product releases returned from the LookAt "msgReleases" RESTful API call), give me a JSON structure containing the topic title, the complete KC api URL and the complete KC web URL for the topic of the specified message number

• **msgContent**
  
  For the specified KC api URL (one of those returned from the LookAt "msgURLs" REST API call), return me the content for the message number in the specified format

The output from msgReleases serves as input for msgURLs and the output from msgURLs serves as input for msgContent. Output from msgContent is meant to be presented to end users, and can be included programmatically in the EUI of other applications.

The apiDiscovery feature of Liberty presents these APIs, documentation for them, and a user interface to demonstrate the API in action. The apiDiscovery feature is similar to swagger which is a popular tool for RESTful API documentation.

To use the apiDiscovery for learning about the LookAt RESTful APIs included with Knowledge Center for z/OS, point your browser to your host with a URL suffix of "ibm/api/explorer/". For example, as so: "https://my.kc4z.host.com:9443/ibm/api/explorer/"

Note that "http://my.kc4z.host.com:9080/ibm/api/explorer/" will be redirected to "https://my.kc4z.host.com:9443/ibm/api/explorer/"

Accept the self signed certificate and then login with "user" as your userid and "pwd" as your password. Future changes to apiDiscovery may rescind the requirement for authentication and SSL.
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Glossary of terms and abbreviations

This glossary defines technical terms and abbreviations used in Knowledge Center for z/OS help information. If you do not find the term you are looking for, refer to the IBM Glossary of Computing Terms (www.ibm.com/software/globalization/terminology). The following cross-references are used in this glossary:

- **Contrast with:** This refers to a term that has an opposed or substantively different meaning.
- **See:** This refers the reader to (a) a related term, (b) a term that is the expanded form of an abbreviation or acronym, or (c) a synonym or more preferred term.
- **Synonym for:** This indicates that the term has the same meaning as a preferred term, which is defined in its proper place in the glossary.
- **Synonymous with:** This is a reference from a defined term to all other terms that have the same meaning.
- **Obsolete term for:** This indicates that the term should not be used and refers the reader to the preferred term.

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**C**

**client**
A system or process that is dependent on another system or process (usually called the server) to provide it with access to data, services, programs, or resources. Contrast with server.

**component ID**
Alphanumeric identifier that uniquely identifies the z/OS component.

**content area**
In a web page that is based on a page template, the editable region of the page.
Area of the Knowledge Center for z/OS browser interface (the central pane) in which data for the active task is displayed.

**Custom-built Product Delivery Option (CBPDO)**
A software delivery package consisting of uninstalled products and unintegrated service. Installation requires the use of SMP/E. CBPDO is one of the two entitled methods for installing z/OS; the other method is ServerPac.

**D**

**deploy**
To install software into an operational environment.
IBM Support Center
The IBM organization responsible for software service.

installation
A particular computing system, including the work it does and the people who manage it, operate it, apply it to problems, service it, and use the results it produces.

JCL
See job control language.

job control language (JCL)
A command language that identifies a job to an operating system and describes the job’s requirements.

plugin
In Knowledge Center for z/OS, a collection of a product’s content. A plugin can be added or updated to Knowledge Center for z/OS.

PMR
See problem management record.

problem management record (PMR)
The number in the IBM support mechanism that represents a service incident with a customer.
A record of the activities performed during the course of resolving a customer reported problem.
Customers with access to IBMLink can view their PMRs.

RACF
See Resource Access Control Facility.

Remote Technical Assistance and Information Network (RETAIN)
Database used by IBM Support Centers to record all known problems with IBM licensed programs.

Resource Access Control Facility (RACF)
A component of z/OS Security Server that provides access control by identifying and verifying the users to the system, authorizing access to protected resources, logging detected unauthorized attempts to enter the system, logging unauthorized attempts to enter the system, and logging detected accesses to protected resources.

RETAIN
See Remote Technical Assistance and Information Network.
server
In a network, hardware or software that provides facilities to clients. Examples of a server are a file server, a printer server, or a mail server.

A computer that contains programs, data, or provides the facilities that other computers on the network can access.
The party that receives remote procedure calls. Contrast with client.

ServerPac
A software-delivery package consisting of products and service for which IBM has performed the System Modification Program/Extended (SMP/E) installation steps and some of the post-SMP/E installation steps.

software deployment
Process of making software available to be used on a system by users and other programs.

software instance
For z/OS platform software, the SMP/E target and distribution zones associated with a product set and the target and distribution libraries described by those zones.
Collection of one or more SMP/E target and distribution zone pairs defined under a single global zone, the related libraries, and any additional data sets associated with a product set.
Deployable unit of SMP/E installed software.

z/OS
An IBM mainframe operating system that uses 64-bit real storage.

z/OS host system
The system on which Knowledge Center for z/OS is running.
Index

A
About this document v
adding content manually 15
adding content with Softcopy Librarian V5 15

B
base configuration
description 5

C
CA 9
Certificate Authority 9
configuration 5
configuration file
description 5
configuration process
overview 5
configuring
additional 9
additional administrators 11
creating mount point directories 5
default 6
mount points 7
RACF 6
started task 9
content sharing 16
content sharing in a sysplex 16
creating mount point directories 5

E
environment variables 5

F
feedback vii
full system replacement installation
considerations 1

H
host system
required software 5
https 9

I
IBM Knowledge Center for z/OS
base configuration 5
configuration process 5
LookAt function 23
overview 1–3
publications v

IBM Knowledge Center for z/OS (continued)
what’s new 1
ipl-time mount commands 6

L
LookAt
configuration process 23
description 23
end user usage 23
RESTful API usage 23
LookAt configuration
overview 23
LookAt configuration file
description 23
LookAt end user component
overview 23
LookAt function
description 23
LookAt RESTful API component
overview 23
LookAt usage 23

M
mounting filesystems
ipl-time mount commands 6

O
override file
description 5

P
prerequisites 5

S
sending to IBM
reader comments vii
ServerPac order
considerations 1
service
applying updates to KC4z 3
software upgrade installation
considerations 1
SSL
description 9

V
verifying installation 8