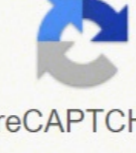
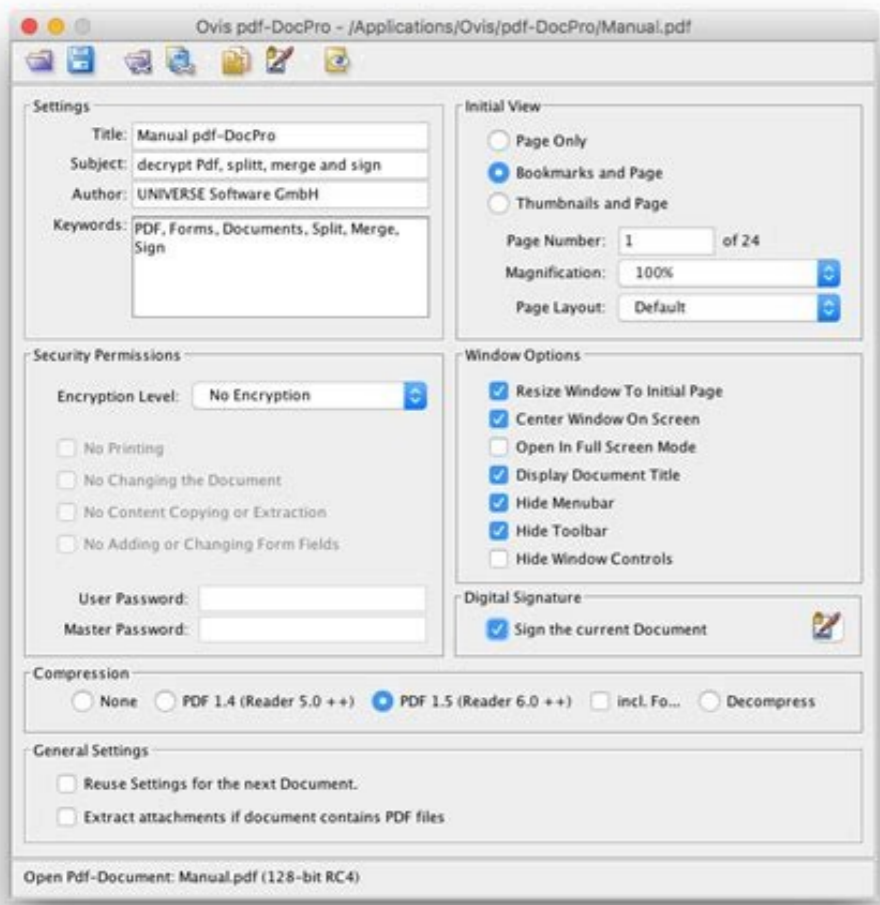


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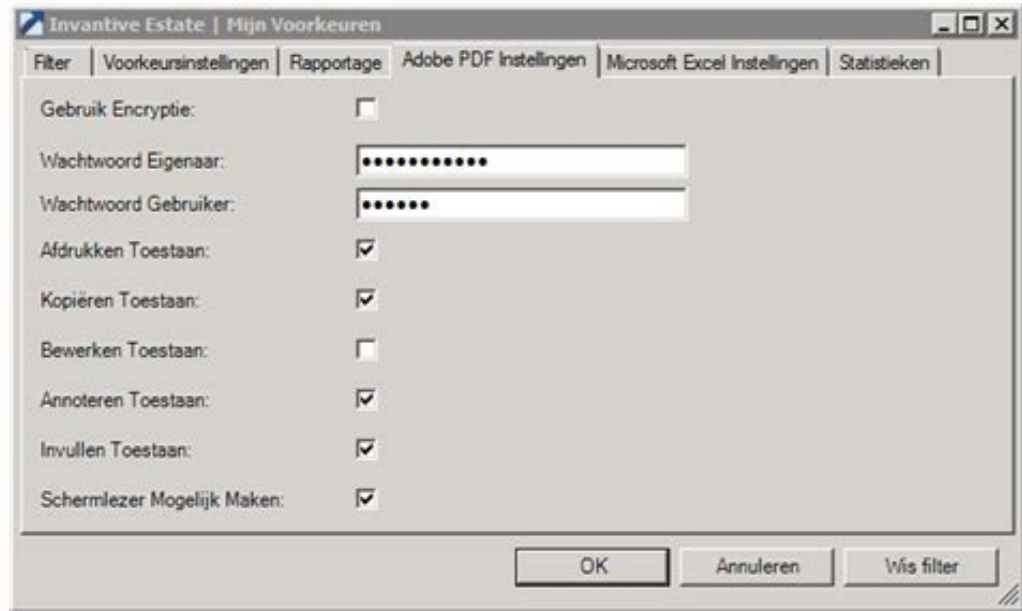
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Red Hat Enterprise Linux 7 System Administrator's Guide

Deployment, Configuration, and Administration of Red Hat Enterprise Linux 7

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See Configuring Password Memory. If you are not using the command line tools to deploy and update the JasperReports Server web application, you will need to manage the deployment of these files and environment variables yourself. By default during installation and upgrade, the keystore files go into the user home directory. Independently of the autocomplete setting described in section Configuring Password Memory, the JavaScript that implements login encryption checks the password field before submitting the page. This ensures that the encrypted password is different every time it is sent, and a potential attacker won't be able to steal the encrypted password to log in or send a different request. See the JasperReports Server Web Services Guide and JasperReports Server Ultimate Guide, respectively. There are 2 possible scenarios: For one-time catalog exchanges, you can use the one-time randomly-generated key for the export (command-line only), and then specify that key during the import (UI or command-line). For repeated sharing of exports, it's better practice to securely share keys between servers, either by sharing keystore files as described above, or by exporting and importing the import-export key from one server to the other beforehand. This parameter is either an absolute path or a file in the webapp classpath, for example /webapps/jasperserver-pro/WEB-INF/classes. Without those keystore files, secure values in a repository cannot be accessed. If the keystore files are accessible, but there is a problem with the keystore file location in jrkskp, you will see exceptions in command line output and JRS log file: java.lang.Exception: Keystore may have been tempered with. If the import does not have the correct key from the export, the import will fail, even if there are no encrypted values (user passwords) in the export catalog; production, can be successfully imported into other environments. The JasperReports Server will not start and the command line tools will not work if the keystore files are missing or invalid for a given repository. If a new alias is specified and does not correspond to an existing key, a new key will be generated and inserted into the keystore. Without HTTPS, all data sent by the user, including passwords, appear unencrypted in the network traffic. A JasperReports Server instance must be given the keystore files for the repository instead of this connecting to. Login encryption is not compatible with password memory in the browser. Note: During an upgrade, the same-db upgrade process to 7.5 does not re-encrypt secure values in the repository. Static Key Encryption However, if dynamic key encryption is not desired, JasperReports Server also supports static key encryption. In this case, a unique key pair is generated automatically on the first user login and remains the same for the entire server installation. Copy the jrksk and jrkskp files and move them to the next server to be installed, in the home directory of the user who will install JasperReports Server. Encryption has two modes, dynamic and static, as determined by the encryption.dynamic.key parameter. Use the following procedure: After installing or upgrading the first server, locate the keystore files in the home directory of the user who installed the server. The keystore files need to be backed up along with the repository. If you want to deploy the keystore files into a given directory ie. Use the following guidelines when creating and implementing your keystore backup policies: Copy both the jrksk and jrkskp files together, keeping the jrkskp file encoded as it is. This affects the strength of encryption and the length of the encrypted string. Static key encryption is very insecure and is recommended only for intranet server installation where the network traffic is more protected. Encryption is off by default. Rather, the pre-existing hard coded keys are used. To enable login encryption, set the following properties. When false, the key will be generated once per application installation. What you have to do: Backup and restore your keystore files at the same time as your repository Make sure the keystore files are accessible by the web app and command line Export/Import Repository exports from one JasperReports Server deployment/repository contain encrypted values that will not automatically import into a different deployment/repository. The keystore files should be copied only by the system user who installed the server. If the keystore files related to an export are not acceptable for the deployment being imported into, the import will fail Exports from versions of JasperReports Server 7.2 and below will import into 7.5+ deployments What you have to do: If you want to have export and import work easily across all the JasperReports Server 7.5+ deployments you control: Save the set of keystore files from the first environment you install Configure the keystore files to be used before the install/upgrade process is executed in a new environment This will work across export/import in the JasperReports Server user interface, REST API and command line Note that, using this approach, secured values from one environment, ie. Related Articles Please add comments below to ask related questions or use the Answers forum. encryption.key.length integer power of 21024 The length of the generated encryption keys. Restrict access to the backup keystore filesKeystore relating to Export and Import Utilities as you would the originals on production servers. For example, passwords in an export catalog from the production server could be decrypted and viewed on the development server. ie. Also, once key has been created with a password, you cannot change the password through the keystore configuration. Because the key is always the same, the encrypted value of a user's password is always the same. The directories where the key related files are stored for the command line tools is defined in the following locations, inspected in order: "ks" and "ksp" environment variables buildomatic/keystore.init.properties; ks, ksp properties Created when first command is run, based on environment variables or default_master.properties Delete this if you want to update the location in the environment or default_master.properties or revert to default buildomatic/default_master.properties; ks, ksp properties Coded default; \$USER_HOME as per the operating system ks, ksp variables need to be encoded for the operating system, for example: Windows: ks=C:\Users\wood Linux: ks=/home/wood Mac: ks=/Users/wood Updating Keystore files The jrkskp file includes a full path to the jrksk file. While this may be an inconvenience, it is actually more secure to not store passwords in the browser (where they may be compromised) and require typing in the password for every login (because computers can be stolen). A JavaScript in the requested page encrypts the password when the user posts it to the server. If the JasperReports Server cannot find the keystore files - maybe because of permissions as noted above, you will get an exception on server start like: Failed to instantiate [com.jaspersoft.jasperserver.crypto.KeystoreManager]; Please make sure that 'create-keystore' was executed; nested exception is java.lang.RuntimeException: KeystoreManager was never initialized or there are errors while instantiating the instance. This means that an attacker could steal the encrypted password and use it to access the server. The encryption mechanism is used in the following cases: • Passwords sent from the login page. encryption.dynamic.key true false When true, a key will be generated per every single request. Configuration File .../WEB-INF/classes/esapi/security-config.properties Property Value Description keystore.location keystore.jks Path and filename of the keystore file. TL;DR Here are the 7.5 encryption changes and what you MUST do to have successful deployment and use of the Server. With dynamic key encryption, the server uses a new public-private key pair with every login request. Any other value besides case-insensitive "false" is equivalent to true. After making any changes, redeploy the JasperReports Server webapp or restart the application server. Enabling HTTPS, as documented in the JasperReports Server Ultimate Guide, requires a certificate and a careful configuration of your servers. The keystore files are created and maintained through the command line tools. This is why having backups of the keystore files must be a part of your larger backup and recovery plans for your data. This includes digital access security for online backups and physical security for offline backups. These files MUST be available to the JasperReports Server and related command line tools in order to encrypt and decrypt values. The files are literally the keys to the application and should be guarded as such. Meanwhile, the server saves its private key and uses it to decrypt the password when it arrives. keystore.password.jasper123 Password for the whole keystore file. Configuration File .../WEB-INF/classes/esapi/security-config.properties Property Value Description encryption.on true/false Turns login encryption on or off. This can cause problems if the web app runs as a different user that the user used to install, ie.: Installed/Upgraded JasperReports Server as root user By default, keystore files were generated into /root. jrkskp property ksPath = /root/jrksk The web app is run as tomcat Tomcat fails to start, as the tomcat user does not have access to /root. To delete keys or change a keystore password, the server administrator must use the Java keytool.exe utility in the bin directory of the JRE or JDK. See descriptions in Dynamic Key Encryption and Static Key Encryption below. The disadvantage of dynamic keys is that generating keys slows down each login, though it is not usually visible to users. • Passwords sent from the user management pages by an administrator. If you need to restore from the backups, the system user who installed the server should copy the files to their home directory. As a result, most browsers will never prompt to remember the encrypted password. To fully upgrade to 7.5 with encryption by a new and random key, you will need to export from the pre-7.5 repository and import into a target 7.5 repository. The encryption logic in 7.5 requires copied jrksk files need to be in exactly the same directory path as when the related key files were created, and they are accessible by the user running the JRS command line or web app. After decrypting the password, the server continues with the usual authentication methods. The disadvantage of login encryption is the added processing and the added complexity of web services login. Your applications must first obtain the key from the server and then encrypt the password before sending it. Proceed only if you are certain the old keystore is no longer in use. If you change the keystore password or the key password, the keystore configuration above must reflect the new values or login will fail for all users. After installation or upgrade of one server, the easiest way to share data (passwords) between servers is to copy the keystore files to the other servers before installing or upgrading them. For password encryption to achieve this, the password must be encrypted differently every time it is sent. Keystore files for the JasperReports Server web application Keystore file locations are defined - in precedence order: "ks" and "ksp" environment variables WEB-INF/classes/keystore.init.properties; ks, ksp properties This properties file and the keystore files are deployed automatically to the JRS web application via the command line tools. Once the keys are shared, export catalogs can be freely imported. Key related file locations are defined - in precedence order: "ks" and "ksp" environment variables WEB-INF/classes/keystore.init.properties; ks, ksp properties This properties file and the key related files are deployed automatically to the JRS web application via the command line tools. The only advantage of static encryption over no encryption at all is that passwords cannot be deciphered and used to attack other systems where users might have the same password. Dynamic Key Encryption The advantage of encrypting the password at login is to prevent it from being seen, but also to prevent it from being used. Keystores and Backups Without the keystore files, your instance of the server cannot function and all information it contains becomes inaccessible. Warning: Sharing keys means that sensitive data from one environment can be decrypted in another environment. /path/to/files Base64 decode the jrkskp file Update the ksPath property in the decoded file to the full path where you want to deploy ie. Because it is more secure, dynamic key encryption is the default setting when encryption is enabled. If the installation or upgrade process detects an existing keystore, you will be prompted to use or overwrite it with a new one. When login encryption is enabled, web services and URL parameters must also send encrypted passwords. ksPath = /path/to/files/jrksk Base64 encode the updated jrkskp file Put the updated jrkskp and jrksk in /path/to/files Update the keystore.init.properties to point to the /path/to/files/jrksk and jrkskp Additional Use Cases Installation and Upgrade The first system you install or upgrade to 7.5 will create the new keystore and key related files (jrksk, jrkskp, and keystore.init.properties). In a cluster, all machines need the same keystore. More advanced use cases are covered later in this document. This is the location where the server expects to find them at runtime. Jaspersoft recommends implementing HTTPS but recognizes that it is not always feasible. Be sure to customize the keystore parameters listed in the following table to make your keystore file more unique and secure. During installation, buildomatic has a create-keystore target and a create-ks task that creates the keystore files. JasperReports Server 7.5 introduces a change in the use of encryption to improve the management of secured values in the JasperReports Server repository, web application, APIs and import/export processes. keystore.key.alias Jasper Name by which the single key is retrieved from keystore. Before setting encryption.dynamic.key=false to use static encryption, you must also configure the secure file called keystore where the key pair is kept. For security reasons, always change the default keystore passwords immediately after installing the server. Overwriting the keystore of an existing server with data will make the server unavailable (impossible to login and possible shut down with errors) and its data impossible to access (user accounts will need to be recreated manually with new passwords). Installing across Multiple Servers You might want the same keystore to be used across dev/test/production environments. When changing the key alias, the old key will not be deleted; it can be used again by resetting the key alias. If you are not using the command line tools to deploy and update the JasperReports Server web application, you will need to manage the deployment of these files and environment variables yourself. This exposes secured values in a way that may not be acceptable according to your security requirements. This password is used to verify keystore's integrity. If the path to the files is different, you must edit the properties file per: Updating Keystore files Install or upgrade this server using this keystore. Another effect of dynamic key encryption is that it does not allow remembering passwords in the browser. By default, the keystore.jks file is shipped with the server and doesn't contain any keys. Importing and Exporting As in the case above, in order to share server contents by exporting and importing, both servers must have the same keys. The key related files created or present at the installation or upgrade time for a given repository database MUST be used going forward. When a browser requests one of these pages, the server generates a private-public key pair and sends the public key along with the page. Because passwords should never be visible, JasperReports Server provides an independent mechanism for encrypting the password values without using HTTPS. If you want to have an export that is import-able by anyone, including outside your organization: You must use the JasperReports Server command line tools Export from command line: js-export --output-zip export_what_to_export.zip --keyalias deprecatedImportExportEncSecret Import from command line: js-import.sh -input-zip export_what_to_export.zip --keyalias deprecatedImportExportEncSecret Keystore files The encryption process is based on "keystore related files" on the operating system where the JasperReports Server processes are running: jrksk - Java keystore file jrkskp - keystore properties Java properties file Base64 encoded Managed through provided tools - cannot edit directly Decode to see with 'cat ~/jrkskp | openssl base64 -d' By default, these are created in the user home directory of the operating system user running install/upgrade. Every time someone logs in, the server generates a new key pair and sends the new public key to the JavaScript on the page that sends the password. keystore.key.password.jasper321 Password for the key whose alias is specified by keystore.key.alias. To fix this, you need to move the keystore files into a directory that is accessible by the user running the web app process. By default, JasperReports Server does not enable the Secure Socket Layer/Transport Layer Security (SSL/TLS) to encrypt all data between the browser and the server, also known as HTTPS. These modes provide different levels of security and are further described in the following sections. If the username and home directory path is the same on both servers, JasperReports Server is ready to be installed. encryption.type RSA Encryption algorithm; currently, only RSA is supported. For backward compatibility, login encryption is disabled by default. Keystore files There are keystore files created during installation and upgrade that now need to be managed carefully.

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