Oracle® MICROS Enterprise Back Office

Security Guide
Release 9.1
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Contents

Preface

This document provides security reference and guidance for the following Oracle MICROS Enterprise Back Office products:

- Reporting and Analytics
- Gift and Loyalty
- Labor Management
- Forecasting and Budget
- InMotion Mobile (server-side security)

This document does not include information specific to Inventory Management.

Audience

This document is intended for the following audience:

- Datacenter administrators
- Database administrators
- Professional services

Customer Support

To contact Oracle Customer Support, access My Oracle Support at the following URL:

https://support.oracle.com

When contacting Customer Support, please provide the following:

- Product version and program/module name
- Functional and technical description of the problem (include business impact)
- Detailed step-by-step instructions to re-create
- Exact error message received
- Screen shots of each step you take

Documentation

Oracle MICROS product documentation is available on the Oracle Help Center at https://docs.oracle.com/en/industries/food-beverage/

Revision History

Date	Description of Change
June 2018	Initial publication.
March 2019	Added references to installations with Oracle Business Intelligence.
April 2019	Added appendix for setting up SSL for WebLogic

April 2022	• Added Understanding the Reporting and Analytics Security Requirements • Added Appendix G • Updated Recommended Deployment Configurations • Updated Reporting and Analytics supported TLS and Ciphers • Updated Understanding the Gift and Loyalty Security Requirements • Updated Configuring HTTPS Ports for Gift and Loyalty • Updated Enabling SSL and Certificates for WebLogic Admin Server and Portal Managed Servers • Updated Configuring Node Manager for SSL • Updated Appendix F
March 2023	• Updated Understanding the Gift and Loyalty Security Requirements • Updated Secure Socket Layer (SSL) • Updated Enabling Secure Socket Layer (SSL) • Updated List of Ciphers • Updated Appendix D
August 2023	• Updated guide title.

1 Enterprise Back Office Security Overview

This chapter provides an overview of Oracle MICROS Enterprise Back Office security and explains the general principles of application security.

Basic Security Considerations

The following principles are fundamental to using any application securely:

- **Keep software up to date.** This includes the latest product release and any patches that apply to it.
- **Limit privileges as much as possible.** Users should be given only the access necessary to perform their work. User privileges should be reviewed periodically to determine relevance to current work requirements.
- **Monitor system activity.** Establish who should access which system components, and how often, and monitor those components.
- **Install software securely.** For example, use firewalls, secure protocols using TLS (SSL), and secure passwords. See Performing a Secure Enterprise Back Office Installation for more information.
- **Learn about and use the Enterprise Back Office security features.** See Implementing Enterprise Back Office Security for more information.
- **Use secure development practices.** For example, take advantage of existing database security functionality instead of creating your own application security. See "Security Considerations for Developers" for more information.
- **Keep up to date on security information.** Oracle regularly issues security-related patch updates and security alerts. You must install all security patches as soon as possible. See the "Critical Patch Updates and Security Alerts" Web site: http://www.oracle.com/technetwork/topics/security/alerts-086861.html

Overview of Enterprise Back Office Security

The following figures show Enterprise Back Office system architectures.

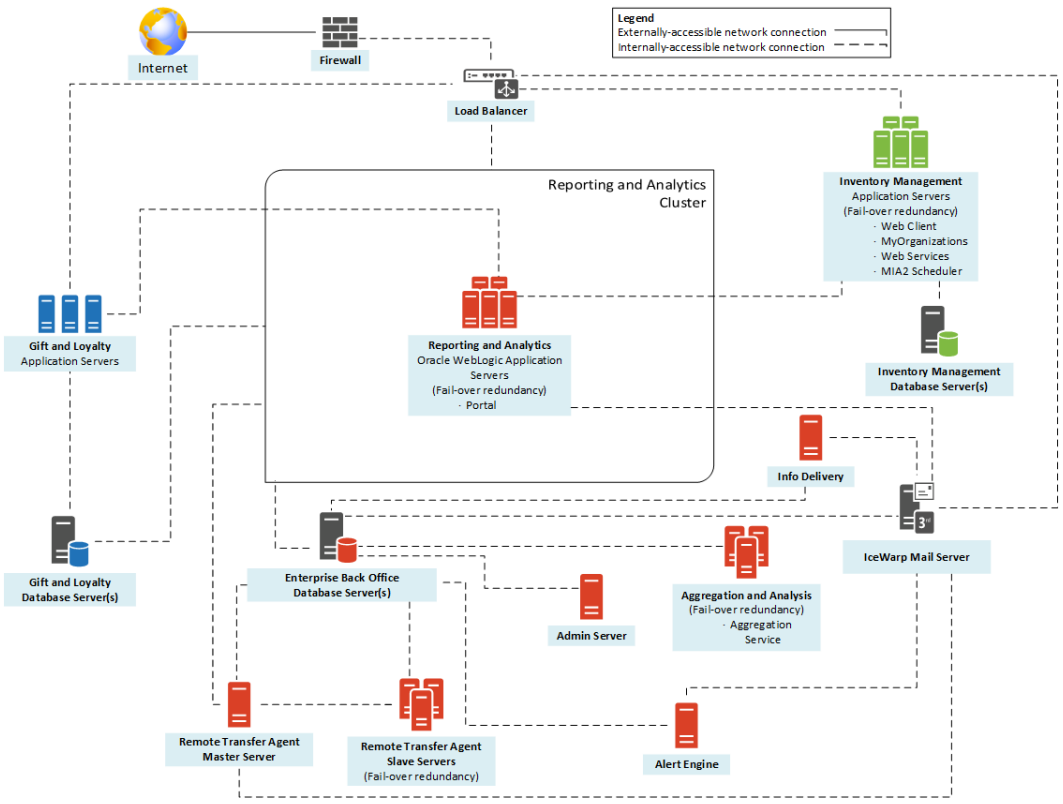


Figure 1-1 – System Architecture of Enterprise Back Office

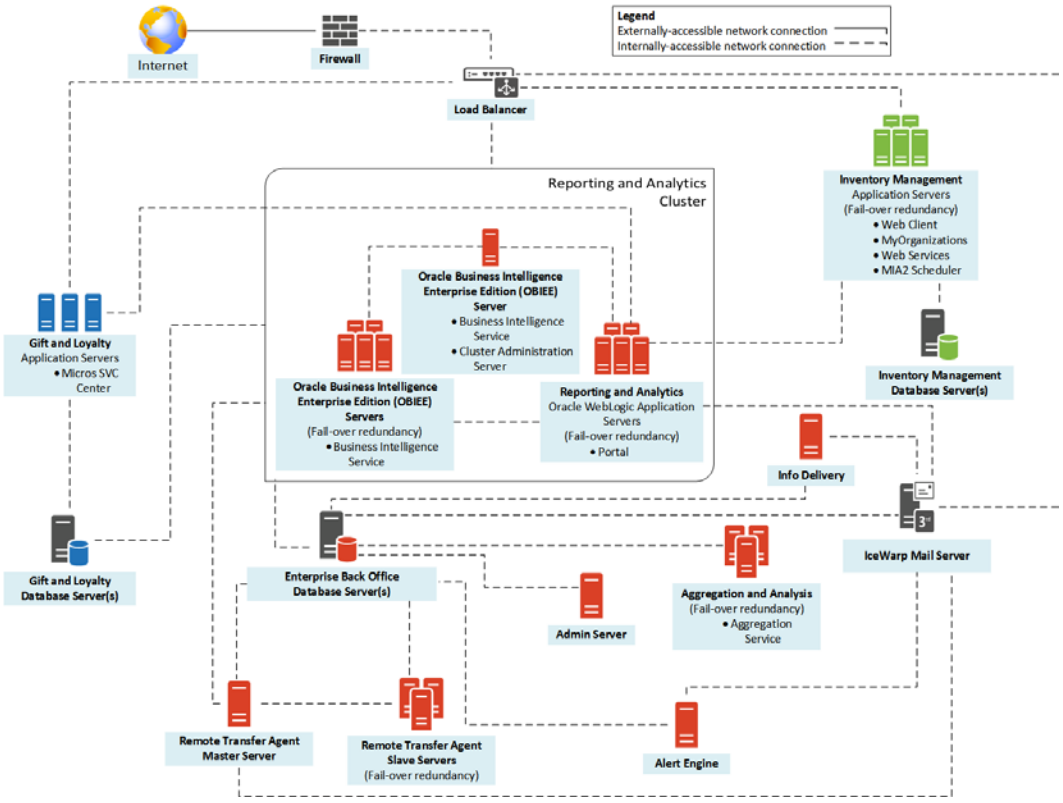


Figure 1-2 – System Architecture of Enterprise Back Office with OBIEE

Reporting and Analytics and Gift and Loyalty are hosted on Oracle WebLogic application servers. Reporting and Analytics is compatible with both Oracle RDBMS and Microsoft SQL database servers. Gift and Loyalty is certified only with Microsoft SQL database server.

The application servers and database servers are hosted inside a De-Militarized Zone (DMZ) within two firewalls. A DMZ refers to a server that is isolated by firewalls from both the Internet and the intranet, thus forming a buffer between the two. Firewalls separating DMZ zones provide two essential functions:

- Blocking any traffic types that are known to be illegal
- Providing intrusion containment, should successful intrusions take over processes or processors

Users access Enterprise Back Office applications over the HTTP protocol on a TLS-secured network. Clients typically use web browsers as their user agents, but Enterprise Back Office also supports clients who require access to the RESTful and SOAP web services that are deployed on these servers. Access to the web services is secured by basic authentication requiring a username, password, and a tenant identifier for our multi-tenant hosting centers.

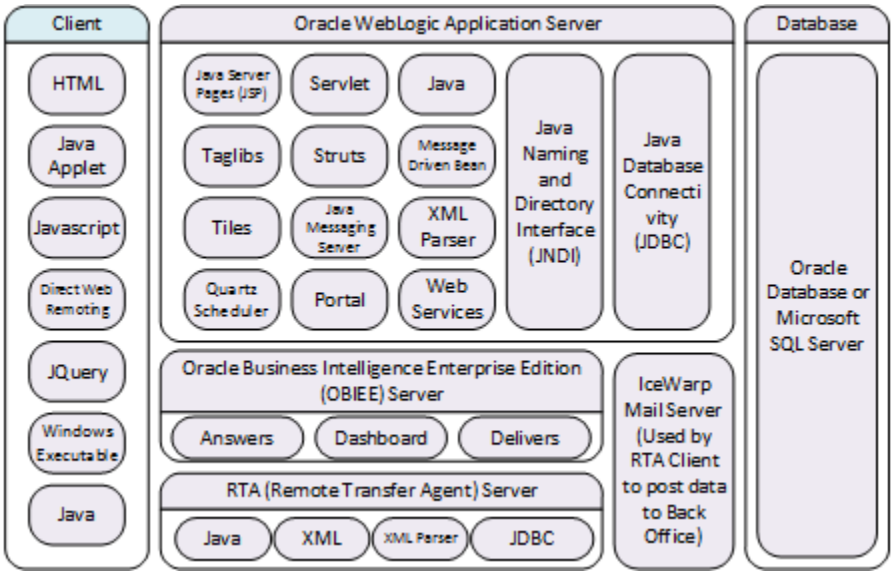


Figure 1-3 - Technology stack of Reporting and Analytics and Gift and Loyalty

The figure shows the technology that is used within the browser, but does not include non-browser-based technology such as the RTA (Remote Transfer Agent) client and standalone executables such as the Timeclock application and the Advanced Scheduler that is used to communicate with the server.

The Oracle WebLogic Application and web servers render the presentation layer to web based clients, provide business logic, host some scheduled jobs, and communicate with the persistent storage in either Oracle RDBMS or Microsoft SQL server.

The IceWarp Mail Server runs outside of Oracle WebLogic and is responsible for holding data to be sent by the RTA client as email messages. The RTA Server is responsible for processing those messages and storing them in our database.

Users can download the RTA client agent program from the Enterprise Back Office web application and install it in the restaurant POS IT infrastructure. Each property is

assigned a username and password at the point of provisioning, which is used by the RTA Client as authentication when sending messages to the SMTP server and when it attempts to consume Enterprise Back Office web service calls. The RTA Client encrypts and stores the password with the corresponding username in a locally-managed properties file.

The *Oracle* MICROS *Inventory Management Security Guide* contains more information to security pertaining to the Inventory Management architecture.

Understanding Load Balancer Impact

This document is intended for environments that do not use a Load Balancer to implement or enforce security.

Understanding the Enterprise Back Office Environment

Enterprise Back Office is designed to host data for multiple tenants, or organizations, within the same database. Users for a tenant are restricted to viewing data for their organization. Provisioning a new organization or tenant involves a super administrator who has view access across multiple tenants for configuring organization-wide parameters.

In a multitenant hosting center, a super administrator is a system administrator account that belongs to the "Micros" organization.

Users with the "portal" portlet can add/edit/revoke privileges for other users within the organization. Care must be taken when assigning administration privileges for the portlet.

Understanding the Gift and Loyalty Security Requirements

Gift and Loyalty must comply with the following security requirements:

- HTTPS using Transport Layer Security (TLS) 1.2. HTTPS Redirect and Enforcing Minimum SSL Protocol contain information and instructions.
- Certificate signed by an authorized Certificate Authority (CA). Appendix D contains instructions for requesting a signed certificate. The 9.1 and 9.1 with OBIEE releases installer for Gift and Loyalty expects the security certificate to have an alias of `Server` because this value is hardcoded in the installer whereas the 9.1 New Tech Stack and 9.1 New Tech Stack with Pentaho release installer does not have a restriction on the alias name.

The My Oracle Support knowledge base article 1557737.1 contains more information about support entitlements for obtaining and updating to the required Java version.

Understanding the Reporting and Analytics Security Requirements

Reporting and Analytics must comply with the following security requirements:

- HTTPS using Transport Layer Security (TLS) 1.2. HTTPS Redirect and Enforcing Minimum SSL Protocol contain information and instructions.

- Certificate signed by an authorized Certificate Authority (CA). Appendix D contains instructions for requesting a signed certificate.

Understanding the InMotion Mobile Security Requirements

To allow users to install and use Oracle MICROS InMotion Mobile versions made available after January 2017, application and server connections must comply with the following security requirements:

- HTTPS using Transport Layer Security (TLS) 1.2. HTTPS Redirect and Enforcing Minimum SSL Protocol contain information and instructions.
- Certificate signed by an authorized Certificate Authority (CA). Appendix D contains instructions for requesting a signed certificate.

The My Oracle Support knowledge base article 1557737.1 contains more information about support entitlements for obtaining and updating to the required Java version.

Recommended Deployment Configurations

This section describes recommended deployment configurations for Enterprise Back Office.

The product can be deployed on a single server as shown in Figure 1-4 or in a cluster of servers as shown in Figure 1-5.

- In a single server environment such as the typical installation when bundled with Simphony, the server should be protected behind a firewall.
- In a clustered mode, the application should reside in a DMZ. Sticky sessions that can be configured in a hardware load balancer should govern the requests to the application servers.

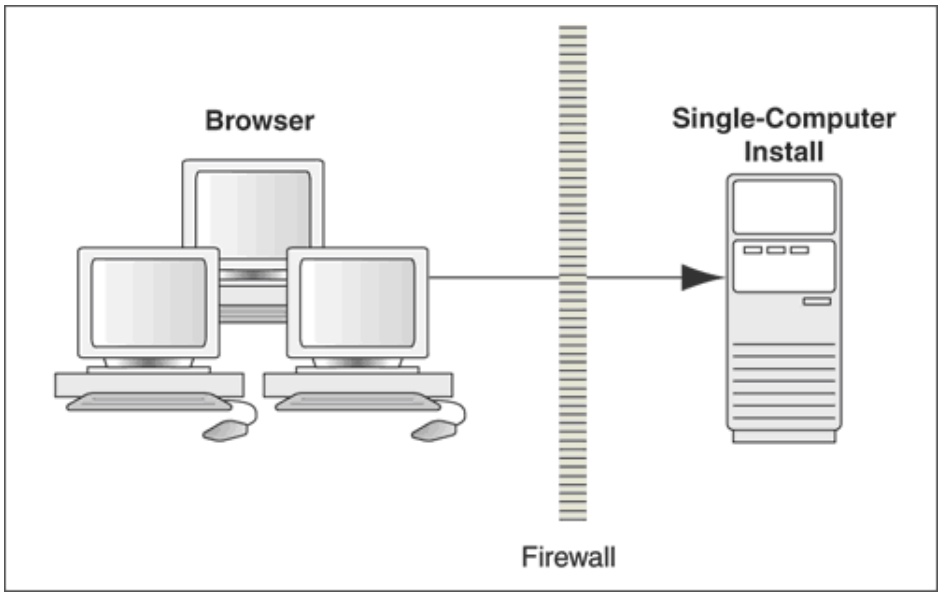


Figure 1-4 Single-Computer Deployment Architecture

The general architectural recommendation is to use the well-known and generally accepted Internet-Firewall-DMZ-Firewall-Intranet architecture shown in Figure 1-4.

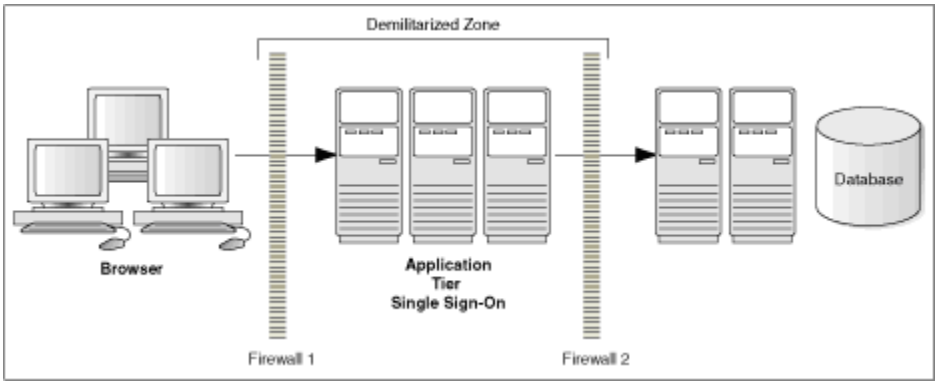


Figure 1-5 Traditional DMZ View

Network Port Requirements

Make sure to open the following ports.

- 24
- 25
- 80
- 110
- 443
- 465
- 995
- 1433
- 1521
- 9443

Component Security

- The product relies on SSL (TLS) to be enabled on port 443 to enable https.
- The product relies on secure SMTP (SMTPs).
- The product relies on SFTP.

2 Performing a Secure Enterprise Back Office Installation

The *Oracle* MICROS *Enterprise Back Office Installation Guide* contains information and instructions for installing the application.

Pre-Installation Configuration

The *Oracle* MICROS *Enterprise Back Office Release Notes* contains information about new functionality and technology changes. Make sure your installation environment adheres to the supportability and requirements information for your release.

Secure Certificate

The Enterprise Back Office installation requires a Secure Socket Layer (SSL) certificate for each server. Appendix D contains instructions for requesting an SSL certificate from a Certificate Signing Authority.

Microsoft Windows User Group

The installation requires the creation of the Microsoft Windows user group 'OHGBU_ADMIN,' which is given privileges for browsing the installation directory, editing configuration files, and reading log files. As a result, the user running the installation must have permissions for creating groups and assigning file permissions. All other users will not have access to the installation directory.

Installing Enterprise Back Office

Database Passwords

For all database passwords, you must follow the password security guidelines outlined for the respective databases:

- Oracle Database: *Oracle Database Security Guide*
- Microsoft SQL Server: *Security Center for SQL Server Database Engine*

HTTPS Redirect

When installing the portal service, the option to force an https redirect is enabled by default. You should leave the option enabled and configure a signed certificate from a trusted authority prior to load balancing.

To disable the HTTPS redirect, open `microsConfig.properties` in a text editor and uncomment the following line: `forceProtocol=https`

Secure Socket Layer (SSL)

- For 9.1 and 9.1 with OBIEE releases:
  The installer provides an option to enable SSL after the installation. You use the Oracle WebLogic Console to configure SSL after the installation.

- For 9.1 New Tech Stack and 9.1 New Tech Stack with Pentaho release:
  The installer requests the SSL certificate and passwords during the installation.

Appendix D contains information about requesting a SSL certificate.

You can enable SSL for Java Remote Method Invocation (RMI) when installing the portal service, the master service, and the slave service. Enterprise Back Office only uses the RMI when the master service is installed. You do not need RMI for Oracle MICROS Simphony-only installations.

Appendix B contains information about SSL for RMI.

Enforcing Minimum Required SSL Protocol

You can configure the minimum required SSL protocol accepted by Enterprise Back Office by setting the `-Dweblogic.security.SSL.minimumProtocolVersion` parameter in the WebLogic startup script.

For example, if you want to set TLS 1.2 as the earliest supported protocol:
`-Dweblogic.security.SSL.minimumProtocolVersion=TLSv1.2`

Service Installation Requirements

The following services are required for a Simphony-only installation:

- Portal
- Aggregation Adjustment Service
- Simphony Mobile Aggregation
- infoDelivery (report mail)
- Alert Engine

These services are required to support non-Simphony POS systems

- Master (one instance only)
- Posting
- Optional Services include:
- Admin Server (used for scheduled exports/imports)
- Weather (allows weather information to be recorded with daily sales)
- iCare (must be installed on a separate server from portal, used for Gift and Loyalty)
- Analysis Aggregation (Used for Segmentation and Exports)

File-Based Encryption

A unique encryption key is generated during installation for areas requiring file-based encryption. This key is unique to the machine installed and is re-generated and replaced on upgrade or reinstallation.

Post-Installation Configuration

Entering the Organization Passwords

After successful installation, the system administrator must log into the `m` organization and enter the following passwords to enable the respective functionality:

- External Application
- Forecasting Messaging Queue (for Forecasting and Budget)
- ExactTarget FTP (for Gift and Loyalty)
- Urban Airship (for Alert Engine)
- Bounce eMail (for Gift and Loyalty CRM)
- iCare Messaging Queue (for Gift and Loyalty)
- WLST (for Reporting and Analytics WebLogic AdminServer in environments with Oracle Business Intelligence)
- SOAP (for Reporting and Analytics WebLogic AdminServer in environments with Oracle Business Intelligence)
- myInventory DB (for Inventory Management)
- Simphony DB (for Simphony Point-of-Sale)

Configuring the OHGBU_ADMIN User Group

After successful installation, add users that will administer the product to the OHGBU_ADMIN group. Users must log out before the change takes effect.

Enabling Secure Socket Layer (SSL)

For the 9.1 New Tech Stack and 9.1 New Tech Stack with Pentaho release, the installer forcibly enables SSL as part of the installation whereas the 9.1 and 9.1 with OBIEE release installer provides an option to enable SSL after the installation.
If you installed Enterprise Back Office without enabling SSL, perform the following instructions to enable SSL:

1. Log in to the Oracle WebLogic console, and then upload the security certificate and enable SSL. Refer to the Oracle WebLogic help for information and instructions.
2. If your environment uses Oracle Business Intelligence, change the Published URL to comply with SSL requirements.

   WARNING: If you do not enable TSL 1.2, your deployment will not be compliant with security standards.

Reporting and Analytics supported TLS and Ciphers

TLS protocol

Before RNA 8.5.1 Patch 126 and 9.0 Patch 8:

- TCA client/TCA server (component of RNA Server) support TLSv1, TLSv1.1
- RTA client/RTA Server support TLSv1 and TLSv1.1

From RNA 8.5.1 Patch 126 and 9.0 Patch 8:

- TCA client/TCA server (component of RNA Server) support TLSv1, TLSv1.1, and TLSv1.2
- RTA client/RTA Server support TLSv1 and TLSv1.1, and TLSv1.2

List of Ciphers

RTA client, RTA Server and TCA server (a component of RNA Server) support Ciphers are below:

- 8.5.1 support Cipher Suites is in link https://docs.oracle.com/javase/6/docs/technotes/guides/security/SunProviders.html#SunJSSEProvider and scroll down a little to go to “Cipher Suites” section.
- 9.1 and 9.1 with OBIEE support Cipher Suites is in link https://docs.oracle.com/javase/7/docs/technotes/guides/security/SunProviders.html#SunJSSEProvider and scroll down a little to go to “Cipher Suites” section.
- 9.1 New Tech Stack and 9.1 New Tech Stack with Pentaho support Cipher Suites for Java8 is in link https://docs.oracle.com/javase/8/docs/technotes/guides/security/SunProviders.html#SunJSSEProvider and scroll down a little to go to “Cipher Suites” section.

TCA client support Cipher is below:
Before RNA 8.5.1 Patch 126 and 9.0 Patch 8

- 8.5.1 and 9.0 support Cipher Suites are in link https://msdn.microsoft.com/en-us/library/windows/desktop/aa374757(v=vs.85).aspx

Configuring HTTPS Ports for Gift and Loyalty

You can enable other ports for HTTPS in Gift and Loyalty, such as 443:

1. Log in to the Gift and Loyalty Oracle WebLogic console.
2. In the Domain Structure, click **iCare_Domain**, click **Environment**, click **Servers**, and then in the table of servers, click **icare_server**.
3. Click the **Protocol** tab, click the **Channels** tab, click **Lock & Edit**, and then click **New**.
4. Fill out the **Create a New Network Channel** form:
    a. Enter a name, and then select `https` from the **Protocol** drop-down list.
    b. Enter `443` (or another open and unused port) in **Listen Port** and **External Listen Port**. Do not enter 7002 or 9443.
    c. Select **Enabled** and **HTTP Enabled for This Protocol**.
    d. If you installed a security for 9443 during the Gift and Loyalty installation, select **Use Server's SSL Identity** from the **Channel Identity** drop-down list. Select **Customize Identity** if you want to enter a new SSL certificate.
5. Click **Finish** and activate the changes.

Securing the Mail Server

Appendix A contains information and instructions.

3 Implementing Enterprise Back Office Security

Password Strength and Maintenance

Make sure passwords in the Enterprise Back Office application adhere to the following strength requirements:

1. The password must be at least 8 characters long and maximum 20 characters.
2. The password must contain letter(s), number(s), and punctuation character(s): ! " # $ % & ' ( ) * + , - . / : ; < => ? @ [\ ] ^ _ ` { | } ~
3. Client may not choose a password equal to the last 4 passwords used.

Database Passwords

For database passwords, refer to your database security standards for strength requirements and guidelines.

Appendix E contains instructions for setting up the environment to allow database password changes.

Appendix C contains instructions for using the Database Password Change Utility to update the password used by Enterprise Back Office to access the databases.

Operating System Passwords

Refer to the secure configuration guide for your operating system:

- Secure configuration guide for Microsoft Windows
- Secure configuration guide for Oracle Linux

Changing the Default Passwords

Reporting and Analytics is installed with a default password for the Sys Admin user account for Micros organization. Change the password as soon as possible.

Changing the Forecasting Messaging Queue Password

1. Log in to the Oracle WebLogic console.
2. Under the **bifoundation_domain** domain structure, click **Security Realms**, click **myrealm**, click **Users and Groups**, and then click **Users**.
3. Search for the messaging user, and then change the password.
4. Log in to Reporting and Analytics using the M organization and system administrator credentials.
5. Navigate to the MICROS organization and enter the new **Forecasting Messaging Queue Password**.

Maintaining the User Group for System File Access

Members of the OHGBU_ADMIN group have been granted permissions to traverse the folder structure. This will give users who are both administrator users and OHGBU_ADMIN users the ability to traverse the folder structure to areas where additional permissions are required and to make any necessary changes.

For example, if it is necessary to add additional files to the Pentaho custom folders, the administrator or OHGBU_ADMIN user can navigate to `myportal\pentaho-solutions\myMicros` folder and modify the permissions on the containing folder to allow the OHGUB_ADMIN group to insert files.

Encryption Key Rotation

Enterprise Back Office automatically rotates the encryption key after upgrades and after 180-day intervals in which no upgrade takes place.

You can view the date of the last rotation in the cedb.ce_rotation_schedule table. Make sure only cedb users have view access to the table. Do not allow other users, such as support2, to view the table.

Enabling Secure Socket Layer (SSL) Certificates

If you install 9.1 and 9.1 with OBIEE releases in an unsecure state, follow these instructions to enable SSL, enter or update security certificate information, update the WebLogic Node Manager, and to enable SAML (for Enterprise Back Office with Oracle Business Intelligence).

Enabling SSL and Certificates for WebLogic Admin Server and Portal Managed Servers

Enable SSL using a security certificate on the WebLogic Admin Server or on managed Oracle Business Intelligence or Reporting and Analytics application servers:

1. In the WebLogic Server Administration Console, click **Environment** from the **Domain Structure**, click **Servers**, and then click **AdminServer(admin)** or a portal managed server, such as **appServ1**.

   If you changed name of the Reporting and Analytics application server during installation, that name appears instead of the default **appServ1** name.
2. Click **Lock & Edit.**
3. On the **Configuration** tab, click the **General** tab, deselect **Listen Port Enabled**, select **SSL Listen Port Enabled**, and then click **Save**.
4. Click the **Keystores** tab, and then click **Change** next to the **Keystores** field.
5. Select **Custom Identity and Java Standard Trust**, and then click **Save**.
   To verify that your certificate is from an approved certificate authority, open a command prompt, and then enter the following command:
   ```
   keytool -list -v -keystore
   %JAVA_HOME%\jre\lib\security\cacerts  -storepass changeit
   ```
6. Enter the certificate identity details:
   - For the **Custom Identity Keystore**, enter *`PATH_TO_ID`*`/identity.jks`

- Enter `JKS` in the **Custom Identity Keystore Type**. This is typically the default setting.
- Enter and confirm the **Custom Identity Keystore Passphrase**.

7. For the trust details, change the **Java Standard Trust Keystore Passphrase** if you changed the Java cacerts.
8. Click **Save**, and then click the **SSL** tab.
9. Enter the identity details:
   - Enter the server alias in **Private Key Alias**.
   - Enter and confirm the keystore passphrase in **Private Key Passphrase**.
10. Click **Advanced,** select **Use JSSE SSL**, and then click **Save**.
11. Click **Activate Changes**, and then restart the managed server.

Configuring Node Manager for SSL

Update Node Manager properties for each managed server after enabling SSL and entering certificate details in the Oracle WebLogic Administration Console.

Navigate to *`$WL_HOME/common/`*`nodemanager/` and open `nodemanager.properties` in a text editor, and then add or edit the following entries:

```
KeyStores=CustomIdentityAndJavaStandardTrust
CustomIdentityKeyStoreFileName=PATH_TO_ID\\identity.jks
CustomIdentityKeyStorePassPhrase=KEYPASS
CustomIdentityPrivateKeyPassPhrase=PRIVATEPASS
CustomIdentityAlias=SERVER_ALIAS
CustomTrustKeyStorePassPhrase=STOREPASS
```

When entering the path, you must escape colons (:) and slashes (\). For example:
`C\:\\myMicros\\Oracle\\MIDDLE~1\\WLSERV~1.3\\common\\NODEMA~1\\`

Restart Node Manager after saving the changes to the properties file.

Enabling or Updating Security Assertion Markup Language (SAML)

If you installed Enterprise Back Office with Oracle Business Intelligence, update SAML settings after making changes to SSL or certificate configurations for OBIEE or Reporting and Analytics managed servers.

1. In the WebLogic Server Administration Console, click **Environment** from the **Domain Structure**, click **Servers**, and then click a managed server, such as **appServ1**.

   If you changed name of the Reporting and Analytics application server during installation, that name appears instead of the default **appServ1** name.
2. Click **Lock & Edit.**
3. On the **Configuration** tab, click the **Federation Services** tab, and then click the **SAML 2.0 General** tab.

4. In the **Single Sign-On** section, enter the keystore details:
    a. Enter the server alias in **Single Sign-on Signing Key Alias**.
    b. Enter and confirm the keystore passphrase in **Single Sign-on Signing Key Pass Phrase**.
5. Click **Save**, and then click **Activate Changes**.

Changing the Published Site URL in Environments with Oracle Business Intelligence

1. In the Oracle WebLogic console, navigate to the **Summary of Servers** page, click OBI server name (typically **bi_server***number*), click **Configuration**, click **Federation Services**, click **SAML 2.0 General**, and then change the **Published Site URL**.

   The **Published Site URL** is case sensitive in server cluster deployments.
2. Publish the metadata to the following location:
   `INSTALLATION_DIR\Oracle\Middleware\user_projects\domains\bifoundation_domain\obiee_metadata.xml`
3. Navigate to **Security Realms**, click **myrealm**, click **Providers**, click **Credential Mapper**, click the **saml2CMP** credential mapping provider, and then click **Management**.
    a. Delete and then re-create the **obiee** service provider partner.
    b. Use the metadata file you created for the new published site URL.
    c. Select **Enabled**, select **Key Info Included**, and then select **Only Accept Signed Artifact Requests**.
4. Change the value for **OBIEE.PUBLISH_URL** in `microsConfig.properties`.
5. Change the values for **OBIEE.SOAPWSDLURL** and **OBIEE.URL** in `obieeConfig.properties`.
6. Redeploy `portal.ear` and `obieeWebService.war`.

Changing the Published Site URL for Reporting and Analytics in Environments with Oracle Business Intelligence

1. In the Oracle WebLogic console, navigate to the **Summary of Servers** page, click the application server name (typically **appServ***number*), click **Configuration**, click **Federation Services**, click **SAML 2.0 General**, and then change the **Published Site URL**.

   The **Published Site URL** is case sensitive in server cluster deployments.
2. Publish the metadata to the following location:
   `INSTALLATION_DIR\Oracle\Middleware\user_projects\domains\bifoundation_domain\app_metadata.xml`
3. In a two-box or cluster installation, the WebLogic console creates the metadata file on the Reporting and Analytics application server. You must copy the file to the OBI server running the Oracle WebLogic Administration Server.
4. Navigate to **Security Realms**, click **myrealm**, click **Providers**, click **Authentication**, click the **saml2AP** identity assertion provider, and then click **Management**.

a. Delete and then re-create the **app_data** service provider partner.
b. Use the metadata file you created for the new published site URL.
c. Select **Enabled**, enter `/analytics/*` in the **Redirect URIs** field, and then select **Only Accept Signed Artifact Requests**.

5. Change the value for **portalDomainURL** in `microsConfig.properties`.
6. If you are not changing the OBIEE published URL, redeploy `portal.ear`.

Requiring PIN for Gift and Loyalty myiCard.net

1. Log in to Gift and Loyalty organization.
2. From Gift and Loyalty side menu, navigate to **Gift and Loyalty GPL | Programs, Cards, Coupons and Rules | Programs**.
3. Select **Loyalty** or **Gift or Debit card** program, and then click **Edit**.
4. On **General** tab, select **Prompt for PIN on myicard.net**.
5. Select **Pin Type**.
   a. If you select **Final 4 Digits of Account Number** then you should be able to use last 4 digit of account number to log in to myiCard.net. For example: If your card number is `11110001`, then your PIN will be `0001`.
   b. If you select **Birthdate Month and Day** then you should be able use birthday month and day to log in to myiCard.net.

4 Security Considerations for Developers

Adding Additional Datasources

1. In myPortal/microsConfig.properties, add the datasource name to the list on the variable db.dsNames. The name chosen here will be used as the reference in any report accessing this datasource.
2. Add the database name to the list on the variable db.dbNames. This should be the name of the database or schema being added.
3. Add the additional properties in myPortal/microsConfig.properties, replacing '*YourDSName*' with the datasource name entered in db.dsNames:

   ```
   db.vendor.YourDSName=oracle-9i
   (oracle-9i will work for all versions of oracle)
   db.server.YourDSName=<ServerName>
   db.user.YourDSName=<DatabaseUserName>
   db.password.YourDSName=
   db.port.YourDSName=<PortNumber>
   ```

4. After these fields have been added and saved, run passwordChangeUtility/ChangePassword.vbs. Use this utility to set passwords for new database users.

Appendix A Secure Socket Layer (SSL)/Transport Layer Security (TLS) on the Mail Server

Setting Up SSL/TLS on an IceWarp Mail Server

1. Create the Certificate Signing Request (CSR) and Private Key.
    a. Start the IceWarp Server Administration console.
    b. From the menu, click **System** and click **Certificates**.
    c. On the **Server Certificates** tab, click **Create CSR/Server Certificate**.
    d. Fill out the **Create CSR/Server Certificate** form, click **Create Certificate Signature Request (CSR)**, and click **OK** to create and save the CSR file. The mail server uses the information you entered in the **Common Name** field as the mail server hostname.
2. Send the CSR to a Certification Authority (CA) for signing.
3. Run the following command to merge the signed certificate with the private key generated by the IceWarp Server Administration console:
    ```
    copy
    IceWarpInstallationPath\config\_certs\csr\name_private.k
    ey + SignedCertificate.pem nameCert.pem
    ```
4. Import the merged certificate into the IceWarp Mail Server:
    a. In the IceWarp Server Administration console, click the **Server Certificates** tab and then click **Add**.
    b. Enter the IP address of the Mail Server, browse to the merged certificate, and then click OK.
5. Enable SSL/TSL for SMTP messaging:
    a. From the menu, click **System** and click **Advanced**.
    b. On the **Protocol** tab, click **Enable SSL/TLS**, and then click **Apply**.
    c. On the **Advanced** tab, click **Use TLS/SSL (Secured Delivery)**, and then click **Apply**.
6. Restart all modules:
    a. From the menu, click **System** and then click **Services**.
    b. Click **Restart All Modules**.

Setting Up SSL/TSL on RTA Master E-mails

Set the SMTP SSL and TSL properties in the MasterServer.properties file as follows:
#enable SSL on emails
mail.smtp.ssl.enable = true
mail.smtp.starttls.enable = true

If the properties are not in the file, add them as shown above.

Setting Up SSL/TLS on RTA Client E-mails

Set the SSL properties in the serverInfo.properties file as follows:

```
#enable SSL on emails
smtpSslPort = 465
pop3SslPort = 995
```

If the properties are not in the file, add them as shown above.

Setting Up SSL/TLS on Portal Client E-mails

1. Go to the following file on the Admin server:
   `INSTALLATION_DIR\myPortal\portal.ear\portal.war\config\microsConfig.properties`
2. Set the SMTP SSL and TLS properties in the file as follows:
   #enable SSL on emails
   mail.smtp.ssl.enable=true
   mail.smtp.starttls.enable=true
   mail.smtp.port=465

   If the properties are not in the file, add them and set the values as shown above.
3. Redeploy the `INSTALLATION_DIR\myPortal\portal.ear` application as described at:

   https://docs.oracle.com/cd/E80526_01/doc.91/e84936/t_troubleshooting_redeploy.htm#EBOIG-ManuallyDeployingApplications-7FCA522F

The changes to the Admin server microsConfig.properties file are propagated to the managed servers. Verify the property files at:

```
<installation_path>\Oracle\Middleware\user_projects\domains\bifoundation_domain\servers\<hostname>_appServ1\stage\portal\portal.ear\portal.war\config\microsConfig.properties
```

Appendix B Secure Socket Layer (SSL) in Java Remote Method Invocation (RMI)

You must create a single keystore with a certificate signed by a Certification Authority (CA) to support Secure Socket Layer (SSL) in Java Remote Method Invocation (RMI) communication between Remote Transfer Agent (RTA) Master and Clients (RTA Slave, Portal, EMS). Deploy the keystore during installation to all RTA-related modules (Master, Slave, Portal and EMS) directory.

1. Make sure Java is installed on the machine. The following commands use the Java keytool command to create the keystore, to generate the Certificate Signing Request (CSR) file, and to import a certificate signed by a CA.
2. Create the keystore:
   a. Run the following command:
      ```
      keytool -genkey –v –storepass yourStorePassword
      –keypass yourKeyPassword -alias rta –keyalg RSA
      -keystore rta.keystore
      ```
   b. Enter the following required information:
      ```
      What is your first and last name?
      [Unknown]: RTA
      What is the name of your organizational unit?
      [Unknown]: HGBU
      What is the name of your organization?
      [Unknown]: Oracle
      What is the name of your City or Locality?
      [Unknown]: Columbia
      What is the name of your State or Province?
      [Unknown]: Maryland
      What is the two-letter country code for this unit?
      [Unknown]: US
      Is<CN=RTA Master, OU=HGBU, O=Oracle, L=Columbia,
      ST=Maryland, C=US> correct?
      [no]: yes
      ```
3. Run the following command to create the CSR:
   ```
   keytool -certreq –v –storepass yourStorePassword
   –keypass yourKeyPassword -alias rta
   –keystore rta.keystore -file rta.csr
   ```
   Make sure the -storepass, -keypass, -alias, and -keystore values are the same as the ones used to create the keystore in Step 2.
4. Send the CSR to a Certification Authority (CA) for signing.
5. Run the following command to import the signed certificate to the keystore:
   ```
   keytool -import –v –storepass yourStorePassword
   –keypass yourKeyPassword -alias rta
   -keystore rta.keystore -file rta.cer
   ```
6. Run the following command to verify the keystore entries:
   ```
   keytool -list –v –storepass yourStorePassword
   –keystore rta.keystore
   ```

Appendix C Database Password Changes

Use the Password Change Utility to update passwords within Enterprise Back Office to align with database password changes. Refer to the Security Guidelines in your Point-of-Sales application for information about database password maintenance.

Warning: The Password Change Utility updates the new passwords for the Enterprise Back Office configuration files and does not change the passwords in the database. If you do not change the passwords in the database or enter the passwords incorrectly in the utility, the database connections will fail.

1. Navigate to *`InstallationPath`*`\PasswordChangeUtility\` and double-click `ChangePassword.cmd`.
2. For each database user account that you want to change, select the checkbox next to the account name and enter the new password. You can select **Show Passwords** to unmask the passwords being entered.
3. Click **Apply Changes** to update the new passwords. The utility creates a backup of the `.properties` files in the same folder.

Appendix D Requesting and Renewing a Secure Socket Layer (SSL) Certificate

You must create a Java keystore containing a Secure Socket Layer (SSL) certificate to be used when enabling SSL during Enterprise Back Office installation. The installer for Gift and Loyalty expects the security certificate to have an alias of `Server` because this is hardcoded in the installer.

1. The following commands use the Java keytool command to create the keystore, to generate the Certificate Signing Request (CSR) file, and to import a certificate signed by a Certification Authority (CA).
2. Run the following command to create the keystore:

```
keytool -genkey –alias server –storepass yourStorePassword
      -keypass yourStoreKeypass –keyalg RSA
      -keysize 2048 –keystore keystoreName.keystore
      –dname "CN=domain,O=company,L=city/locality,
            ST=state,C=countrycode"
```

   Passwords must not contain any special characters, symbols, or spaces.

3. Run the following command to create the CSR:

```
keytool -certreq –v –alias server –file filename. Csr
      –keystore keystoreName.keystore
      -storepass yourStorePassword
      –sigalg SHA256withRSA
```

   Make sure the `-keystore` and `-storepass` values are the same as the ones used to create the keystore in Step 2.

4. Send the CSR to a Certification Authority (CA) for signing.
5. Run the following command to import the signed certificate:
   For JDK version below 8 (9.1. and 9.1 with OBIEE releases), use the following command:

```
keytool –v import –alias server –file signedFilename
      –keystore keystoreName.keystore
```

   For JDK 8 and above (9.1 New Tech Stack and 9.1 New Tech Stack with Pentaho release), use the following command:

```
keytool -v -importcert -alias server –file signedFilename
      –keystore keystoreName.keystore
```

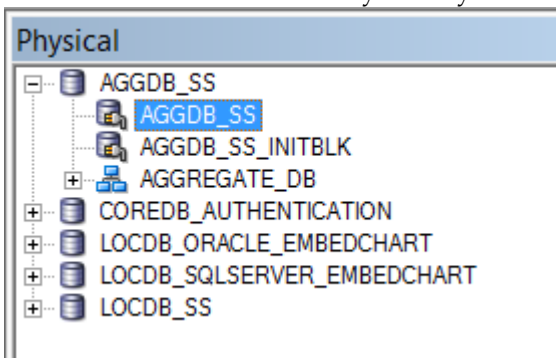
   Make sure the `-keystore` value is the same as the one used to create the keystore in Step 2.

For SSL certificate renewal on the server, follow the same above procedure to renew the certificate using the same keystore, alias, and password. This applies to all release variations.
See Doc ID 2215862.1:
https://support.oracle.com/epmos/faces/DocumentDisplay?parent=DOCUMENT&sourceId=HOWTO&id=2215862.1

Appendix E Setting Up Database Password Changes

You must perform the following steps to enable changing database passwords:

1. Run the password change utility to change the Reporting and Analytics jdbc xml.
2. Use the WebLogic console to change the data source:
3. In the Oracle WebLogic console, open the **Deployments** page, click on `portal`, and then for each data source:
    a. Click the data source name, navigate to **Connection Pool** tab under **Configuration** tab, verify the user name in the **Properties** field, and then change the password.
    b. Click **Lock & Edit**, and then click **Save**.
4. Click **Activate Changes**.
5. Change the OBIEE Repository file (RPD) password:
    a. In the Oracle BI Administration tool, click **File**, and then click **Open RPD in Online mode**.
    b. Enter the Oracle WebLogic credentials and the RPD password created during installation.
    c. Click the data source in the Physical layer.



    d. Change the login credentials for database connections. You must update all connection pools for each physical database.
    e. Click the **Check in your changes** button, and then click **Save**.
6. Restart all managed servers.

Appendix F Setting Up WebLogic SSL for 9.1 and 9.1 with OBIEE Releases

1. On the portal server, open the following file:
   `C:\OHRA\Oracle\Middleware\user_projects\domains\bifoundation_domain\bin\startWebLogic.cmd`
2. Set the following line:

```
set JAVA_OPTIONS=%JAVA_OPTIONS%
-Dlaunch.main.class=%SERVER_CLASS%
-Dlaunch.class.path="%CLASSPATH%"
-Dlaunch.complete=weblogic.store.internal.LockManagerImpl
-cp %WL_HOME%\server\lib\pcl2.jar
-Dweblogic.security.SSL.minimumProtocolVersion=TLSv1.2
```

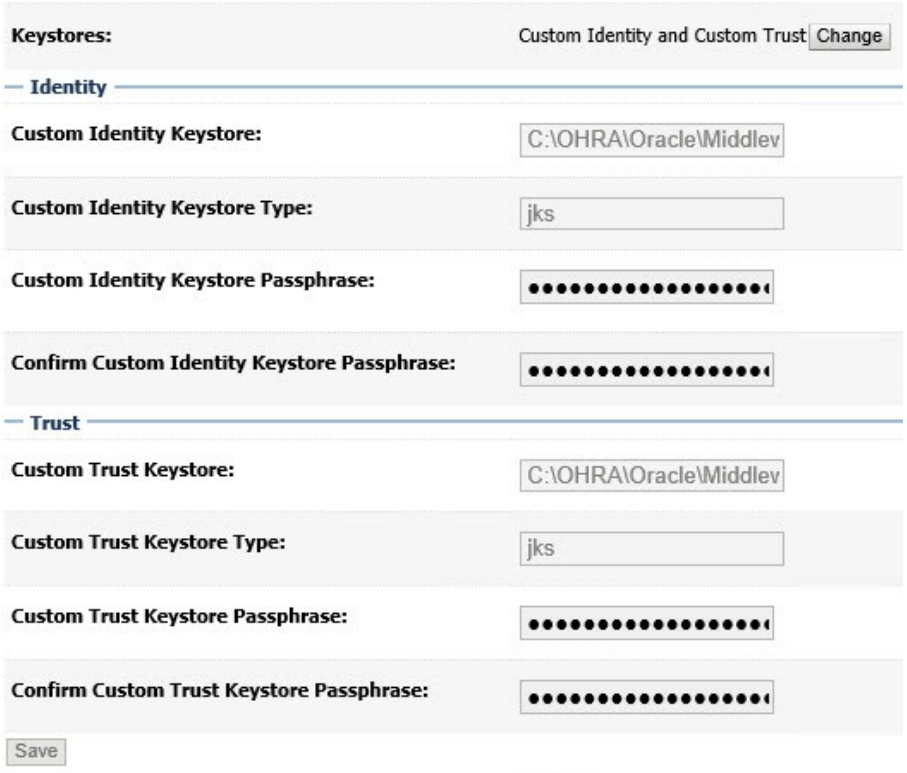
3. Open the following file:
   `C:\OHRA\Oracle\Middleware\user_projects\domains\bifoundation_domain\binstartWebLogic.sh`
4. Set the following line:
   From:

```
# Force system generated URLs to use a specific protocol
(needed by some SSL accelerators which mask the
protocol).
#forceProtocol=https
```

   To:

```
# Force system generated URLs to use a specific protocol
(needed by some SSL accelerators which mask the
protocol).
forceProtocol=https
```

5. Copy the keystore to the following location:
   `C:\OHRA\Oracle\Middleware\wlserver_10.3\server\lib`
6. Go to the WebLogic Console: http://ServerName:7001/console/
7. Edit the appServer1 settings: Domain Structure | bifundation_domain | Environment | Servers | appServ1 | Keystores
8. Click the Lock & Edit button in the Change Center to modify the settings on the following page:



9. Change the Keystores to: Custom Identity and Custom Trust:

   Identity:

   Custom Identity Keystore:
   `C:\OHRA\Oracle\Middleware\wlserver_10.3\server\lib\reportin g.jks (my keystore)`

   Custom Identity Keystore Type: jks
   Custom Identity Keystore Passphrase: my keystore password
   Confirm Custom Identity Keystore Passphrase: my keystore password

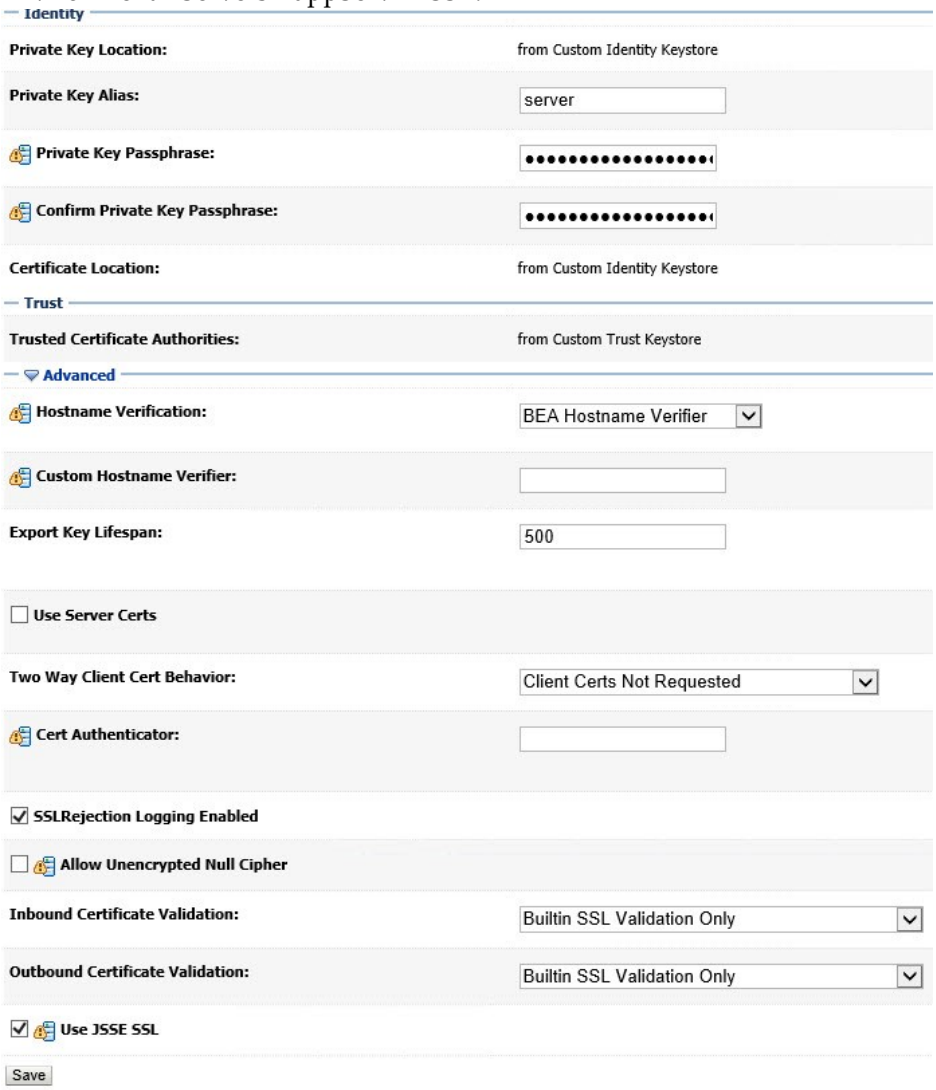
   Trust:

   Custom Identity Keystore:
   `C:\OHRA\Oracle\Middleware\wlserver_10.3\server\lib\reportin g.jks (my keystore)`

   Custom Identity Keystore Type: jks
   Custom Identity Keystore Passphrase: my keystore password
   Confirm Custom Identity Keystore Passphrase: my keystore password

10. Save the settings.

11. Edit the appServer1 settings: Domain Structure | bifundation_domain | Environment | Servers | appServ1 | SSL:



Identity:

Private Key Alias: server (defined on the keystore)
Custom Identity Keystore Passphrase: my keystore password
Confirm Custom Identity Keystore Passphrase: my keystore password

Advanced:

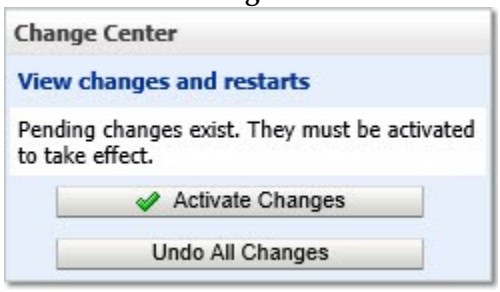
Enable: Use JSSE SSL

12. Save the settings.

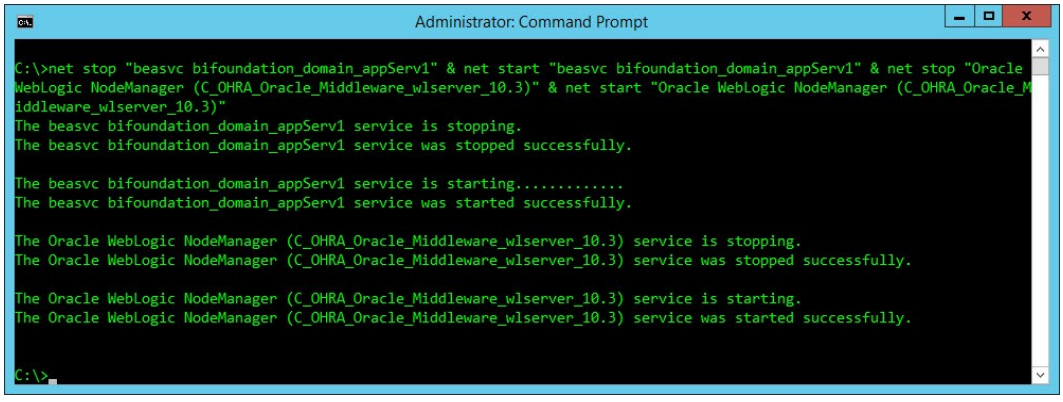
13. Edit additional appServer1 settings: Domain Structure | bifundation_domain | Environment | Servers | appServ1 | SSL:

Listen Address: your server DNS name
Enable: SSL Listen Port Enabled
Enable: Client Cert Proxy Enabled

14. Save the settings.
15. Click **Activate Changes**.



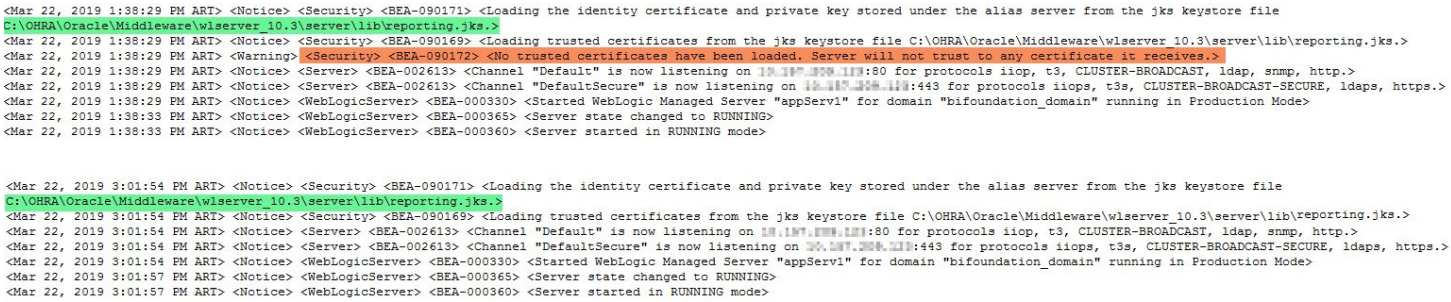
16. Restart the following Microsoft Windows services:
net stop "beasvc bifoundation_domain_appServ1" & net start "beasvc bifoundation_domain_appServ1" & net stop "Oracle WebLogic NodeManager (C_OHRA_Oracle_Middleware_wlserver_10.3)" & net start "Oracle WebLogic NodeManager (C_OHRA_Oracle_Middleware_wlserver_10.3)"



17. Verify the app logs at:
    `C:\OHRA\Oracle\Middleware\user_projects\domains\bifoundation_domain\servers\appServ1\logs`

    File names:
    `appServ1.log`
    `appServ1_service.log`

    The following example shows an appServ1_service.log file. The top part of the image shows the result of a self-signed certificate. The bottom part of the image shows the service was started with a CA-signed certificate.



Appendix G Setting Up WebLogic SSL for the 9.1 New Tech Stack Releases

1. On portal and admin server box, open the following file:
   `C:\OHRA\Oracle\Middleware\MW_HOME\wlserver\common\bin\commEnv.cmd`

2. Add the following line to top of above file
   ```
   set JAVA_OPTIONS=%JAVA_OPTIONS%
   -Dweblogic.security.SSL.protocolVersion=TLSv1.2
   -Dweblogic.security.SSL.minimumProtocolVersion=TLSv1.2
   ```

3. On portal and admin server box, open the following file:
   `C:\OHRA\Oracle\Middleware\Oracle_common\common\bin\setWlstEnv_internal.cmd`

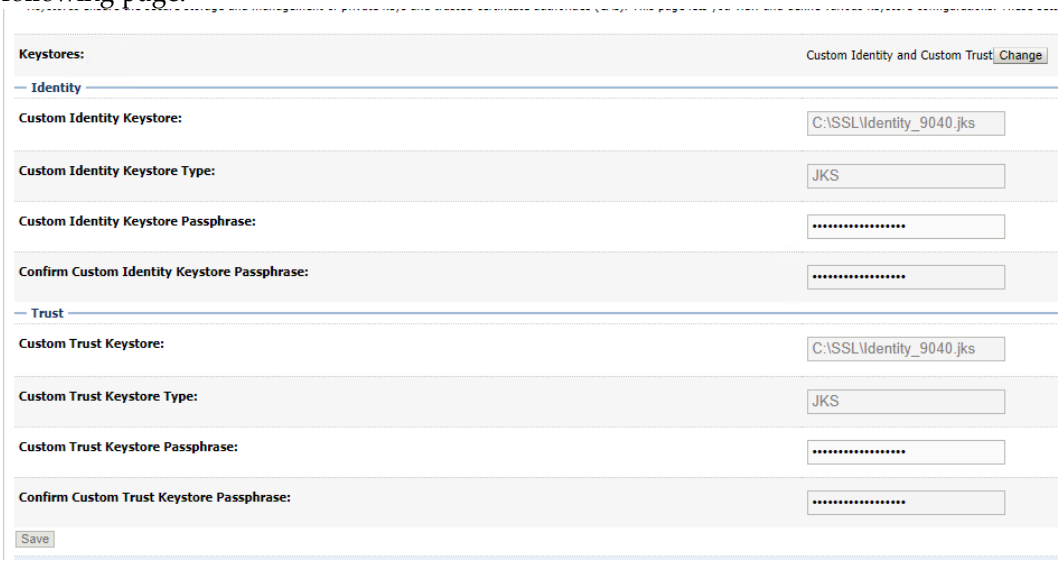
4. Append following to line starting with 'SET JVM_ARGS' :
   `-Dweblogic.security.SSL.minimumProtocolVersion=TLSv1.2`

5. Copy the keystore to the following location:
   `C:\OHRA\Oracle\Middleware\wlserver\server\lib`

6. Go to the WebLogic Console: http://ServerName:7001/console/

7. Edit the settings: Domain Structure | bifoundation_domain | Environment | Servers | AdminServer | Configuration | Keystores

8. Click the Lock & Edit button in the Change Center to modify the settings on the following page:



9. Change the Keystores to: Custom Identity and Custom Trust:

Identity:

Custom Identity Keystore:
`C:\OHRA\Oracle\Middleware\wlserver\server\lib\reporting.jks (my keystore)`

Custom Identity Keystore Type: jks
Custom Identity Keystore Passphrase: my keystore password
Confirm Custom Identity Keystore Passphrase: my keystore password

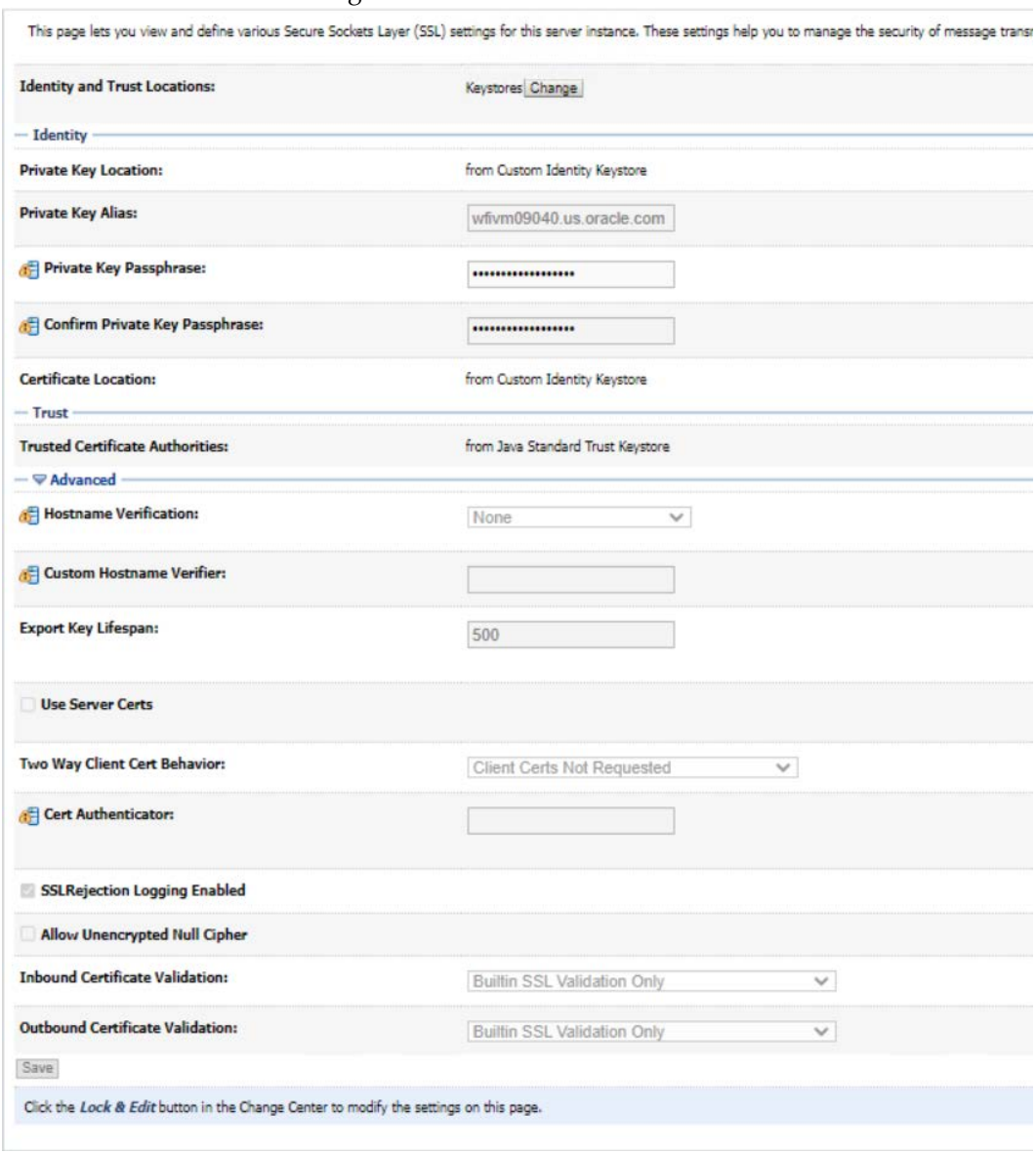
Trust:

Custom Identity Keystore:
`C:\OHRA\Oracle\Middleware\wlserver\server\lib\reporting.jks (my keystore)`

Custom Identity Keystore Type: jks
Custom Identity Keystore Passphrase: my keystore password
Confirm Custom Identity Keystore Passphrase: my keystore password

10. Save the settings.

11. Edit the settings: Domain Structure | bifoundation_domain | Environment | Servers | AdminServer | Configuration | SSL:



Identity:

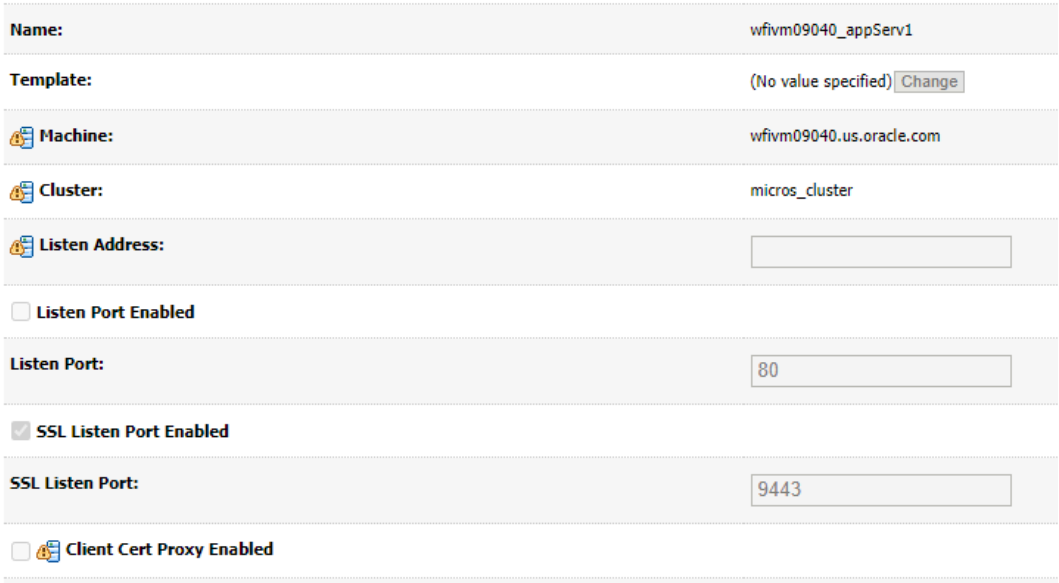
Private Key Alias: <fully qualified domain name> (defined on the keystore)
Custom Identity Keystore Passphrase: my keystore password
Confirm Custom Identity Keystore Passphrase: my keystore password

Advanced:

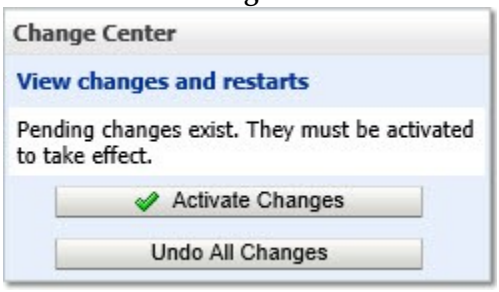
Hostname Verification : None
Two Way client cert Behavior : Client Certs Not Requested

12. Save the settings.

13. Edit additional settings for admin server and all the app servers:
    Domain Structure | bifoundation_domain | Environment | Servers | <server_name> | Configuration | General:



    Listen Address: your server DNS name
    Disable: Listen Port Enabled
    Enable: SSL Listen Port Enabled
14. Save the settings.
15. Click **Activate Changes**.



16. Stop weblogic admin server and weblogic app server services.

    a. On machine with weblogic admin server installed, edit the following cmd file:
    `INSTALL_DIR\myPortal\installAdminServerService.cmd`

    In the line starting with "`set JAVA_OPTIONS`", append the following
```
-Djdk.tls.client.protocols=TLSv1.2
-Dhttps.protocols=TLSv1.2
```

    E.g - `set JAVA_OPTIONS=-Xverify:none -Djdk.tls.client.protocols=TLSv1.2 -Dhttps.protocols=TLSv1.2`

    Save

b. On all machines with portal installed, edit the following cmd file :
`INSTALL_DIR\myPortal\installApp_serv1Service.cmd`

In the line starting with "`set ADMIN_URL`", change t3 to t3s and port 7001 to Admin Server SSL Listen Port

E.g - `set ADMIN_URL=t3s://wfivm09040.us.oracle.com:7002`
Admin server name should match listen-address configured for SSL certificate.

Save

c. Uninstall Appserver and AdminServer windows services by running following cmd files
- `INSTALL_DIR\myPortal\unInstallApp_serv1Service.cmd`
- `INSTALL_DIR\myPortal\unInstallAdminServerService.cmd`

d. Install Appserver and AdminServer windows services by running following cmd files
- `INSTALL_DIR\myPortal\installAdminServerService.cmd`
- `INSTALL_DIR\myPortal\installApp_serv1Service.cmd`

Start weblogic admin server and weblogic app server services.

17. Verify the app logs at:
`C:\OHRA\Oracle\Middleware\user_projects\domains\bifoundation_domain\servers\appServ1\logs`

File names:
`appServ1.log`
`appServ1_service.log`

The following example shows an appServ1_service.log file.

```
<Mar 29, 2022 5:19:13,041 AM EDT> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to RESUMING.>
<Mar 29, 2022 5:19:13,104 AM EDT> <Notice> <Cluster> <BEA-000162> <Starting "async" replication service with remote cluster address "null">
<Mar 29, 2022 5:19:13,276 AM EDT> <Notice> <Security> <BEA-090171> <Loading the identity certificate and private key stored under the alias
wfivm09534.us.oracle.com from the jks keystore file C:\myMicros\Oracle\Middleware\server\lib\Identity_9534.jks.>
<Mar 29, 2022 5:19:13,307 AM EDT> <Notice> <Security> <BEA-090169> <Loading trusted certificates from the jks keystore file
C:\PROGRA~1\Java\JDK18~1.0_3\jre\lib\security\cacerts.>
<Mar 29, 2022 5:19:13,322 AM EDT> <Warning> <Server> <BEA-002611> <The hostname "wfivm09534.us.oracle.com", maps to multiple IP addresses:
10.40.230.0, 0:0:0:0:0:0:0:1.>
<Mar 29, 2022 5:19:13,322 AM EDT> <Notice> <Server> <BEA-002613> <Channel "DefaultSecure" is now listening on 10.40.230.0:9443 for protocols iiops,
t3s, CLUSTER-BROADCAST-SECURE, ldaps, https.>
<Mar 29, 2022 5:19:13,322 AM EDT> <Notice> <Server> <BEA-002613> <Channel "DefaultSecure[1]" is now listening on 127.0.0.1:9443 for protocols iiops,
t3s, CLUSTER-BROADCAST-SECURE, ldaps, https.>
<Mar 29, 2022 5:19:13,322 AM EDT> <Notice> <Server> <BEA-002613> <Channel "Channel-0[1]" is now listening on 127.0.0.1:443 for protocols https.>
<Mar 29, 2022 5:19:13,322 AM EDT> <Notice> <Server> <BEA-002613> <Channel "Channel-0[2]" is now listening on 0:0:0:0:0:0:0:1:443 for protocols
https.>
```