

# Oracle® Banking Corporate Lending Process Management Security Guide



Release 14.8.0.0.0  
G30097-01  
April 2025

ORACLE®

Copyright © 2018, 2025, Oracle and/or its affiliates.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software, software documentation, data (as defined in the Federal Acquisition Regulation), or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs (including any operating system, integrated software, any programs embedded, installed, or activated on delivered hardware, and modifications of such programs) and Oracle computer documentation or other Oracle data delivered to or accessed by U.S. Government end users are "commercial computer software," "commercial computer software documentation," or "limited rights data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, reproduction, duplication, release, display, disclosure, modification, preparation of derivative works, and/or adaptation of i) Oracle programs (including any operating system, integrated software, any programs embedded, installed, or activated on delivered hardware, and modifications of such programs), ii) Oracle computer documentation and/or iii) other Oracle data, is subject to the rights and limitations specified in the license contained in the applicable contract. The terms governing the U.S. Government's use of Oracle cloud services are defined by the applicable contract for such services. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle®, Java, MySQL, and NetSuite are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Inside are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Epyc, and the AMD logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

# Contents

## Preface

---

Purpose	v
Audience	v
Documentation Accessibility	v
Critical Patches	vi
Diversity and Inclusion	vi
Related Resources	vi
Conventions	vi
Screenshot Disclaimer	vii
Acronyms and Abbreviations	vii
Basic Actions	vii
Symbols and Icons	viii
Scope	xii

## 1 Prerequisites

---

1.1	Operating Environment Security	1-1
1.2	Network Security	1-1
1.3	Oracle Database Security	1-1
1.4	Application Server Security	1-3
1.5	SSL Support	1-3
1.5.1	SSL Setup	1-3
1.5.2	Choice of the SSL Cipher Suite	1-3
1.5.3	Product configurations for SSL	1-4
1.6	Securing the Oracle Banking Corporate Lending Process Management	1-4
1.6.1	Online Web Application	1-5
1.6.2	API Security	1-11
1.6.3	Two-way SSL Connection	1-11

## 2 Securing Oracle Banking Corporate Lending Process Management

---

2.1	Desktop Security	2-1
2.2	Oracle Banking Corporate Lending Process Management Controls	2-1
2.2.1	Overview	2-2

2.2.2	Disable Logging	2-2
2.2.3	Sign-on Messages	2-2
2.2.4	Authentication and Authorization	2-2
2.2.5	Role Based Access Controls	2-3
2.2.6	Access Controls - Branch Level	2-3
2.2.7	Maker – Checker	2-3
2.2.8	Access Enforcement	2-3
2.2.9	Password Management	2-3

## 3 General Information

---

3.1	Cryptography	3-1
3.2	Security Patch	3-1
3.3	Oracle Database Security Suggestions	3-1
3.4	Oracle Software Security Assurance - Standards	3-2

## 4 References

---

### Index

---

# Preface

This topic contains following sub-topics:

- [Purpose](#)
- [Audience](#)
- [Documentation Accessibility](#)
- [Critical Patches](#)
- [Diversity and Inclusion](#)
- [Related Resources](#)
- [Conventions](#)
- [Screenshot Disclaimer](#)
- [Acronyms and Abbreviations](#)
- [Basic Actions](#)
- [Symbols and Icons](#)
- [Scope](#)

## Purpose

This guide provides security-related usage and configuration recommendations for Oracle Banking Corporate Lending Process Management. It also describes the procedures required to implement or secure certain features, but it is not a general-purpose configuration manual.

## Audience

This guide is primarily intended for Developers for Oracle Banking Corporate Lending Process Management and third party or vendor software's. Some information may be relevant to IT decision makers and users of the application are also included.



### Note:

Readers are assumed to possess basic operating system, network, and system administration skills with awareness of vendor/third-party software's and knowledge of Oracle Banking Corporate Lending Process Management application.

## Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

### Access to Oracle Support

Oracle customer access to and use of Oracle support services will be pursuant to the terms and conditions specified in their Oracle order for the applicable services.

## Critical Patches

Oracle advises customers to get all their security vulnerability information from the Oracle Critical Patch Update Advisory, which is available at [Critical Patches](#), [Security Alerts and Bulletins](#). All critical patches should be applied in a timely manner to make sure effective security, as strongly recommended by [Oracle Software Security Assurance](#).

## Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

## Related Resources

For more information on any related features, refer to the following documents:

- *Oracle Banking Microservices Platform Foundation Installation Guide*
- *OBCLPM Installation Guide*
- *OBCLPM API Security Guide*
- *SSL Configuration Setup Guide*

## Conventions

The following text conventions are used in this document:

Convention	Meaning
<b>boldface</b>	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

## Screenshot Disclaimer

Personal information used in the interface or documents is dummy and does not exist in the real world. It is only for reference purposes.

## Acronyms and Abbreviations

The list of the acronyms and abbreviations that are used in this guide are as follows:

**Table 1 Acronyms and Abbreviations**


Acronyms	Abbreviations
AES	Advanced Encryption Standard
API	Application Programming Interface
AV	Audit Vault
DV	Database Vault
JSON	JavaScript Object Notation
JWT	JSON Web Tokens
LDAP	Lightweight Directory Access Protocol
M&A	Mergers and Acquisitions
OAM	Oracle Access Manager
OIM	Oracle Identity Management
SAML	Security Assertion Markup Language
SQL	Structured Query Language
SSL	Secure Sockets Layer
SSO	Single Sign-On
SVS	Security Vulnerability Scanning
TDE	Transparent Data Encryption
TLS	Transport Layer Security

## Basic Actions

**Table 2 List of Basic Actions**

Action	Description
<b>Approve</b>	Click <b>Approve</b> to approve the initiated report. This button is displayed, once the user click <b>Authorize</b> .
<b>Audit</b>	Click <b>Audit</b> to view the maker details, checker details of the particular record, and record status. This button is displayed only for the records that are already created.
<b>Authorize</b>	Click <b>Authorize</b> to authorize the record created. A maker of the screen is not allowed to authorize the report. Only a checker can authorize a record. This button is displayed only for the already created records.
<b>Close</b>	Click <b>Close</b> to close a record. This action is available only when a record is created.
<b>Confirm</b>	Click <b>Confirm</b> to confirm the performed action.

Table 2 (Cont.) List of Basic Actions

Action	Description
<b>Cancel</b>	Click <b>Cancel</b> to cancel the performed action.
<b>Compare</b>	Click <b>Compare</b> to view the comparison through the field values of old record and the current record. This button is displayed in the widget, once the user click <b>Authorize</b> .
<b>Collapse All</b>	Click <b>Collapse All</b> to hide the details in the sections. This button is displayed, once the user click <b>Compare</b> .
<b>Expand All</b>	Click <b>Expand All</b> to expand and view all the details in the sections. This button is displayed, once the user click <b>Compare</b> .
<b>New</b>	Click <b>New</b> to add a new record. The system displays a new record to specify the required data.  <div> <b>Note:</b> The fields which are marked with Required are mandatory.</div>
<b>OK</b>	Click <b>OK</b> to confirm the details in the screen.
<b>Save</b>	Click <b>Save</b> to save the details entered or selected in the screen.
<b>View</b>	Click <b>View</b> to view the report details in a particular modification stage. This button is displayed in the widget, once the user click <b>Authorize</b> .
<b>View Difference only</b>	Click <b>View Difference only</b> to view a comparison through the field element values of old record and the current record, which has undergone changes. This button is displayed, once the user click <b>Compare</b> .

## Symbols and Icons

The following symbols and icons are used in the screens.

Table 3 Symbols and Icons - Common



Symbol/Icon	Function
	Minimize
	Maximize



Table 3 (Cont.) Symbols and Icons - Common










Symbol/Icon	Function
	Close
	Perform Search
	Open a list
	Add a new record
	Navigate to the first record
	Navigate to the last record
	Navigate to the previous record
	Navigate to the next record
	Grid view

Table 3 (Cont.) Symbols and Icons - Common










Symbol/Icon	Function
	List view
	Refresh
	Calendar
	Filter
	Copy a record
	Click this icon to add a new row.
	Click this icon to delete an existing row.
	Click to view the created record.
	Click to unlock, delete, authorize or view the created record.

Table 4 Symbols and Icons - Audit Details









Symbol/Icon	Function
	A user
	Date and time
	Unauthorized or Closed status
	Authorized or Open status

Table 5 Symbols and Icons - Widget

Symbol/Icon	Function
	Open status
	Unauthorized status
	Closed status
	Authorized status

# Scope

## Scope

### Read Sections Completely

Each section should be read and understood completely. Instructions should never be blindly applied. Relevant discussion may occur immediately after instructions for an action, so be sure to read whole sections before beginning implementation.

### Understand the Purpose of this Guidance

The purpose of the guidance is to provide security-relevant configuration recommendations. It does not imply the suitability or unsuitability of any product for any particular situation, which entails a risk decision.

### Limitations

This guide is limited in its scope to the security-related guidelines. This guide does not claim to offer comprehensive configuration guidance. For general configuration and implementation guidance, refer to other sources such as Vendor specific sites.

### Test in Non-Production Environment

To the extent possible, guidance should be tested in a non-production environment before deployment.

Ensure that any test environment simulates the configuration in which the application will be deployed as closely as possible.

# 1

## Prerequisites

This topic provides the prerequisites for the Oracle Banking Corporate Lending Process Management security.

This topic contains the following subtopics:

- [Operating Environment Security](#)  
This topic describes about operating environment security.
- [Network Security](#)  
This topic describes about network security.
- [Oracle Database Security](#)  
This topic describes about Oracle Database security.
- [Application Server Security](#)  
This topic describes about application server security.
- [SSL Support](#)  
This topic provides the information for SSL Support.
- [Securing the Oracle Banking Corporate Lending Process Management](#)  
This topic provides the information for securing the Oracle Banking Corporate Lending Process Management Application.

### 1.1 Operating Environment Security

This topic describes about operating environment security.

Refer to the vendor specific documentation to make the environment more safe and secured.

### 1.2 Network Security

This topic describes about network security.

Refer to the vendor specific documentation to make the environment more safe and secured.

### 1.3 Oracle Database Security

This topic describes about Oracle Database security.

Refer to the Oracle Database Security specification document to make the environment more safe and secured.

#### **Oracle Banking Corporate Lending Process Management Recommended Configuration**

The security recommendations for Oracle Banking Corporate Lending Process Management database is described below.

**Table 1-1 Security Recommendations**

File Name	Property	Feature
Init.ora	REMOTE_OS_AUTHENT=FALSE	Authentication
Init.ora	TRACE_FILES_PUBLIC=FALSE	Authorization
Init.ora	REMOTE_OS_ROLES=FALSE	Authorization
Init.ora	O7_DICTIONARY_ACCESSIBILITY = FALSE	Authorization
Init.ora	AUDIT_TRAIL = OS	Audit
Init.ora	AUDIT_FILE_DEST = E:\logs\db\audit	Audit
To audit sessions	SQL> audit session;	Audit
To audit schema changes	SQL> audit user;	Audit
To audit other events	SQL> AUDIT DATABASE LINK; -- Audit create or drop database links SQL> AUDIT PUBLIC DATABASE LINK; -- Audit create or drop public database links SQL> AUDIT SYSTEM AUDIT; -- Audit statements themselves SQL> AUDIT ALTER ANY ROLE by ACCESS; -- Audit alter any role statements SQL> AUDIT ALTER DATABASE by ACCESS; -- Audit alter database statements SQL> AUDIT ALTER SYSTEM by ACCESS; -- Audit alter system statements SQL> AUDIT CREATE ROLE by ACCESS; -- Audit create role statements SQL> AUDIT DROP ANY ROLE by ACCESS; -- Audit drop any role statements SQL> AUDIT PROFILE by ACCESS; -- Audit changes to profiles SQL> AUDIT PUBLIC SYNONYM by ACCESS; -- Audit public synonyms statements SQL> AUDIT SYSDBA by ACCESS; -- Audit SYSDBA privileges SQL> AUDIT SYSOPER by ACCESS; -- Audit SYSOPER privileges SQL> AUDIT SYSTEM GRANT by ACCESS; -- Audit System grant privileges	Audit



**Note:**

To audit the events, login through sqlplus as SYSTEM and issue the commands.

## 1.4 Application Server Security

This topic describes about application server security.

Refer to the Oracle Web Logic Security specification document to make the environment more safe and secured.

Oracle Banking Corporate Lending Process Management supports the following authentication schemes for the online web application.

- Standard LDAP Directory (For example, OUD/AD/Embedded Weblogic)
- SSO with OAM (Oracle Access Manager – Part of the Oracle Identity Management Suite)
- SAML assertions with a Service Provider protecting the resource and an Identity Provider.

Oracle Banking Corporate Lending Process Management supports the following authentication scheme for the API layer.

- OAuth (CLIENT CREDENTIALS) with OAM
- OAuth (CLIENT CREDENTIALS) without OAM

If the customer do not have OAM, they can use OAUTH without OAM or it is expected that the customer has an enterprise API Management Layer that protects Oracle Banking Corporate Lending Process Management API layer with the same controls (that is OAuth).

### Support for SSL (Secure Transformation of Data)

Oracle Banking Corporate Lending Process Management should be configured that all HTTP connections to the application over SSL/TLS. In other words, all HTTP traffic in clear is prohibited and only HTTPS traffic is allowed. It is highly recommended to enable this option in the production environment, especially when the WebLogic Server acts as the SSL terminator.

## 1.5 SSL Support

This topic provides the information for SSL Support.

This topic contains following sub-topics:

- [SSL Setup](#)  
This topic provides the information for SSL Setup.
- [Choice of the SSL Cipher Suite](#)  
This topic describes about choice of the SSL cipher suite.
- [Product configurations for SSL](#)  
This topic provides the information for Product configurations for SSL.

### 1.5.1 SSL Setup

This topic provides the information for SSL Setup.

Refer to **SSL Setup Guide** for the setup details.

### 1.5.2 Choice of the SSL Cipher Suite

This topic describes about choice of the SSL cipher suite.

Oracle WebLogic Server allows SSL clients to initiate the SSL connection with a null cipher suite. The null cipher suite does not use any bulk encryption algorithm, as a result of which all data is transmitted over the wire.

The default configuration of Oracle WebLogic Server is to disable the null cipher suite. Make sure that the usage of the null cipher suite is disabled, preventing any client from negotiating an insecure SSL connection.

For installations with regulatory requirements that use high cipher suites, the Oracle WebLogic Server can be configured to support only certain cipher suites. The WebLogic domain can be restricted to config.xml.

Below is an example for config.xml that restricts the cipher suites to those supporting 128-bit symmetric keys or higher. It uses RSA for key exchange.

```
....
<ssl>
    <enabled>true</enabled>
    <ciphersuite>TLS_RSA_WITH_AES_256_CBC_SHA</ciphersuite>
</ssl>
....
```

- The configuration of WebLogic Server to support the above cipher suites requires passing an additional command line argument to the WebLogic Server so that the FIPS 140-2 compliant crypto module is utilized. This is done by adding - **Dweblogic.security.SSL.nojce=true** as a JVM argument.
- The restriction on cipher suites must be done for every managed server.
- The order of cipher suites is important. Oracle WebLogic Server selects the first cipher suite available in the list, which also has client support.
- Cipher suites with RC4 are enabled despite it being second best to AES. This is mainly for older clients that do not support AES. For example, Microsoft Internet Explorer 6, 7, and 8 on Windows XP.

### 1.5.3 Product configurations for SSL

This topic provides the information for Product configurations for SSL.

Refer to Oracle Banking Microservices Architecture Deployments section in *Oracle Banking Microservices Platform Foundation Installation Guide* for SSL Configuration.

## 1.6 Securing the Oracle Banking Corporate Lending Process Management

This topic provides the information for securing the Oracle Banking Corporate Lending Process Management Application.

This topic contains following sub-topics:

- [Online Web Application](#)  
This topic describes about the Online Web Application.
- [API Security](#)  
This topic provides information about the API Security.



- [Two-way SSL Connection](#)  
This topic describes about Two-way SSL connection.

## 1.6.1 Online Web Application

This topic describes about the Online Web Application.

Access to the online web application is granted only through the following methods,

- Standard LDAP Directory authentication
- SSO with OAM
- SSO with other External SSO Agents
- SAML with the Oracle Banking Corporate Lending Process Management application acting as the service provider

### JWT (JSON Web Tokens)

In addition to the authentication, Oracle Banking Corporate Lending Process Management online web application uses JWT to maintain the state for authenticated users.

JSON Web Tokens are an open and industry standard RFC 7519 method that secures the claims between two parties. JWT is compact and URL-safe for transferring claims between two parties. The claims in JWT are encoded as the JSON object, which is used as the payload of the JWS structure or as plain text of the JWE structure, allowing claims to be digitally signed.

- **No Session to Manage (stateless):** The JWT is a self-contained token which has authentication information, expire time information, and other user defined claims digitally signed.
- **Portable:** A single token can be used with multiple backend.
- No cookies required. It is mobile friendly.
- **Good Performance:** It reduces the network round trip time.
- **Decoupled/Decentralized:** The token can be generated anywhere. Authentication can happen on the resource server or easily separated into its own server.

The policies for JWT are as follows,

- **Token Store:** To increase the security and better usability, every authentication/refresh request is secured by random unique key. The generated token and the secure key are persisted in the table, so that during the horizontal scaling of the servers, any API gateway instance can serve for the request.
- **Cipher strength:** The platform security module hashes the JWT footer with HS512 algorithm.
- **Refresh Token:** The users are allowed to get the new token any time before expiring the existing token.
- **Claims:** The JWT Claims Set represents a JSON object whose members are the claims conveyed by the JWT. Platform security module validates below claims during the process.

**Table 1-2 Claims**

Claim Name	Description	Mandatory	Type
iss	Issuer	Yes	Registered
sub	Subject	Yes	Registered

**Table 1-2 (Cont.) Claims**

Claim Name	Description	Mandatory	Type
aud	Audience	No	Registered
exp	Expiration Time	Yes	Registered
nbf	Not Before	No	Registered
iat	Issued At	Yes	Registered
jti	JWT Id	Yes	Registered
tid	Tenant Id	Yes	Private

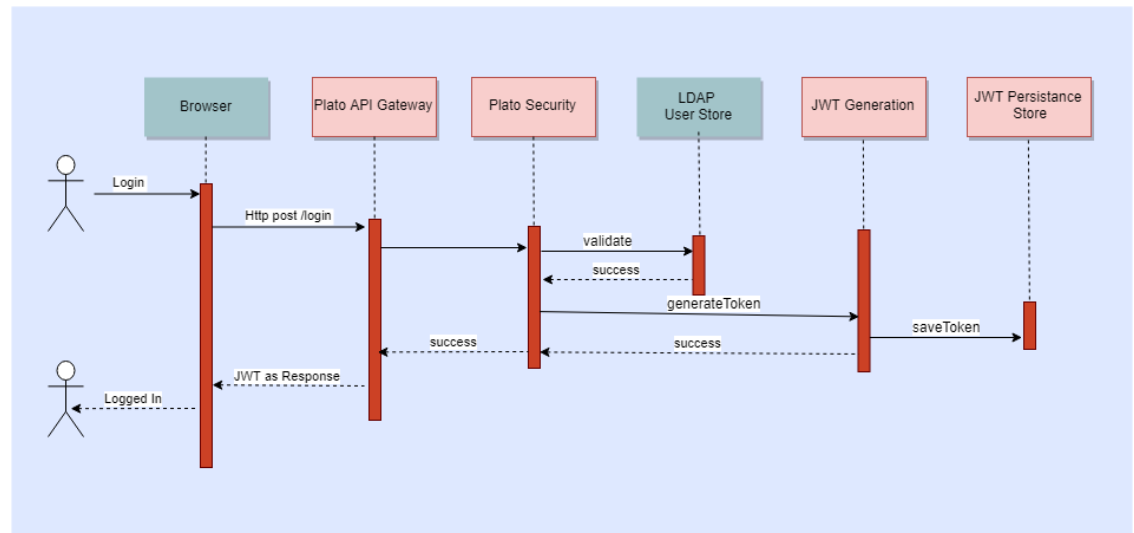
- **Token Expiry:** The platform security module invalidates the token if the client submits after the expiration time.
- **Logout:** While user calls the logout operation, platform security module clears the issued token and deletes the record from the table as well. The old token will no longer be used for any purpose.

The various security flows for **Online Web Application** are as follows,

- OAM based SSO
- LDAP Authentication
- SAML Authentication

#### LDAP Authentication

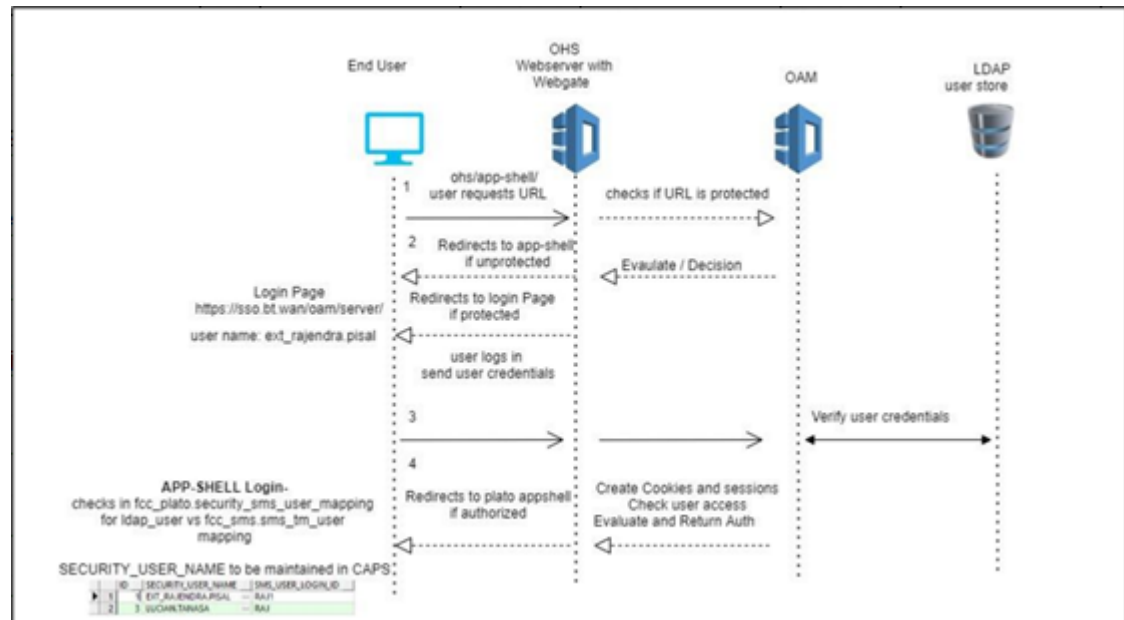
**Figure 1-1 LDAP Authentication**



- The user is presented the standard login page for the Oracle Banking Corporate Lending Process Management application.
- The user enters user ID and password. The credentials are validated against a standard LDAP store.
- If successful, the API Gateway generates a JWT token (using Oracle Security Developer Toolkit part of Oracle Platform Security Services), maintains it in the Database and returns the same.

## OAM Based SSO

Figure 1-2 OAM Based SSO



- The online UI is protected on OAM.
- Client requests protected resource. OAM presents SSO login screen.
- Client enters user ID and password. In case of success, OAM sets the corresponding user profile details in the security context.
- The request is routed to the Gateway which extracts the profile details from the security context.
- The API Gateway creates a JWT token (using Oracle Security Developer Toolkit part of Oracle Platform Security Services), maintains it in the Database, and returns the same.
- The UI layer uses this token to maintain state and conduct subsequent invocations.

### Product configuration:

The following parameters need to be set to enable a successful integration with OAM as SSO in Oracle Banking Microservices Architecture products:

PLATO.SECURITY\_CONFIG table o  
USER\_HEADER\_ATTRIBUTE\_KEY,IS\_SSO\_CONFIGURED USER\_MAPPING\_REQUIRED  
to be set as true

ID	KEY	VALUE
1	USER_HEADER_ATTRIBUTE_KEY	userId
2	USER_HEADER_ATTRIBUTE_REQUIRED	Y
3	IS_SSO_CONFIGURED	true
4	USER_MAPPING_REQUIRED	true

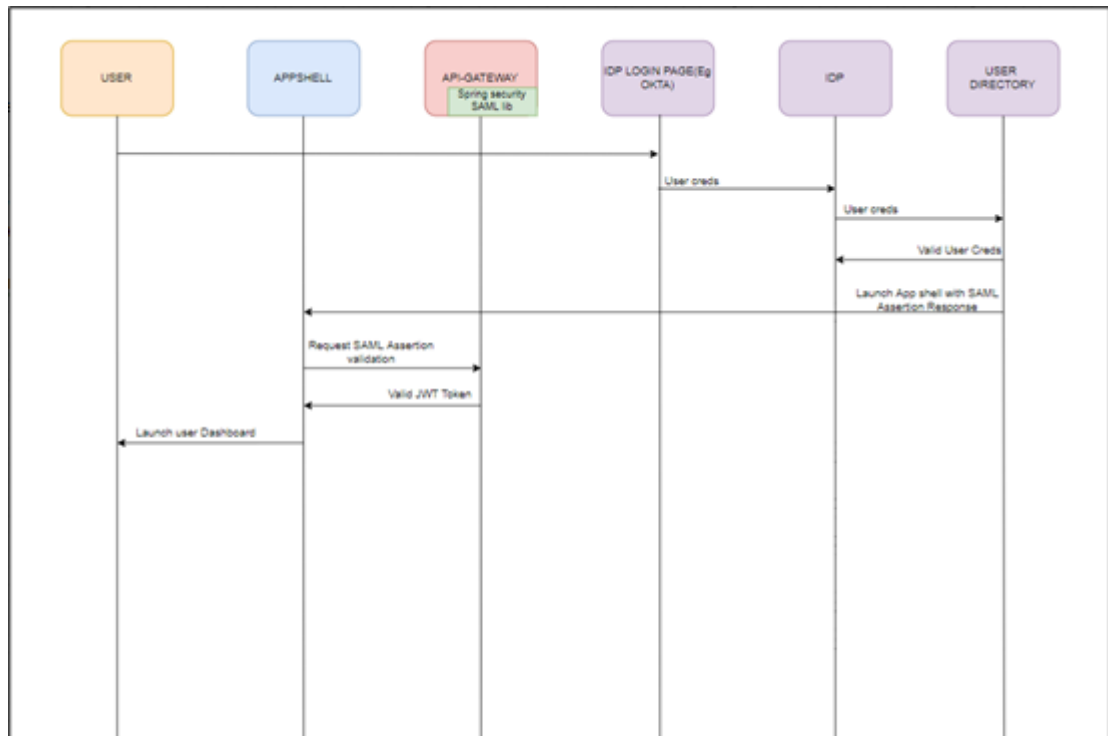
Figure 1-3 PLATO.SECURITY\_SMS\_USER\_MAPPING table

	ID	SECURITY_USER_NAME	SMS_USER_LOGIN_ID
▶ 1	1	EXT_RAJENDRA.PISAL	RAJ1
2	3	LUCIAN.TANASA	RAJ

## SAML Authentication

### IDP Initiated SAML Authentication

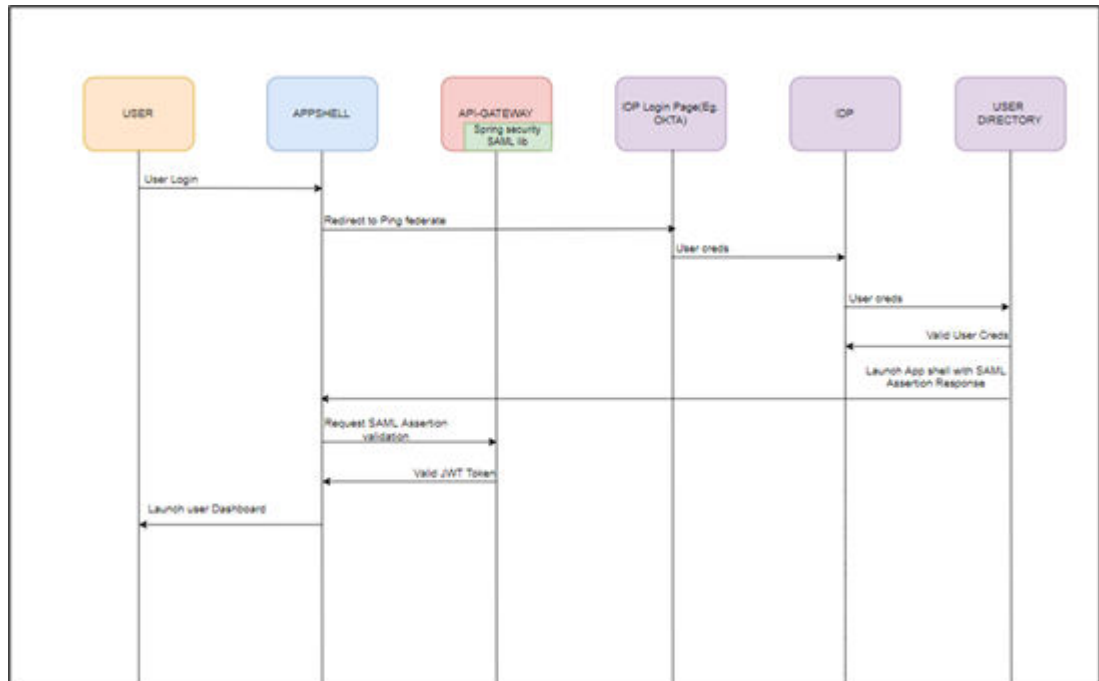
Figure 1-4 IDP Initiated SAML Authentication



- The Identity Provider is external to the Oracle Banking Corporate Lending Process Management application with the Oracle Banking Corporate Lending Process Management application acting as the Service Provider. For example, OKTA.
- Client requests protected resource from Oracle Banking Corporate Lending Process Management. The Idp presents a configured login screen to the user.
- Client enters a user ID and password. In case of success, the Idp sets the corresponding user profile details in the security context.
- The request is routed to the Gateway which extracts the profile details by decoding the SAML response.
- The API Gateway creates a JWT token (using Oracle Security Developer Toolkit part of Oracle Platform Security Services), maintains it in the Database, and returns the same.

- It is possible to configure an external service to do the SAML Verification instead of the API Gateway using the `EXTERNAL_SSO_VALIDATION_URL` parameter in the `SECURITY_CONFIG` table in `PLATO-SECURITY` schema

### SP Initiated SAML Authentication

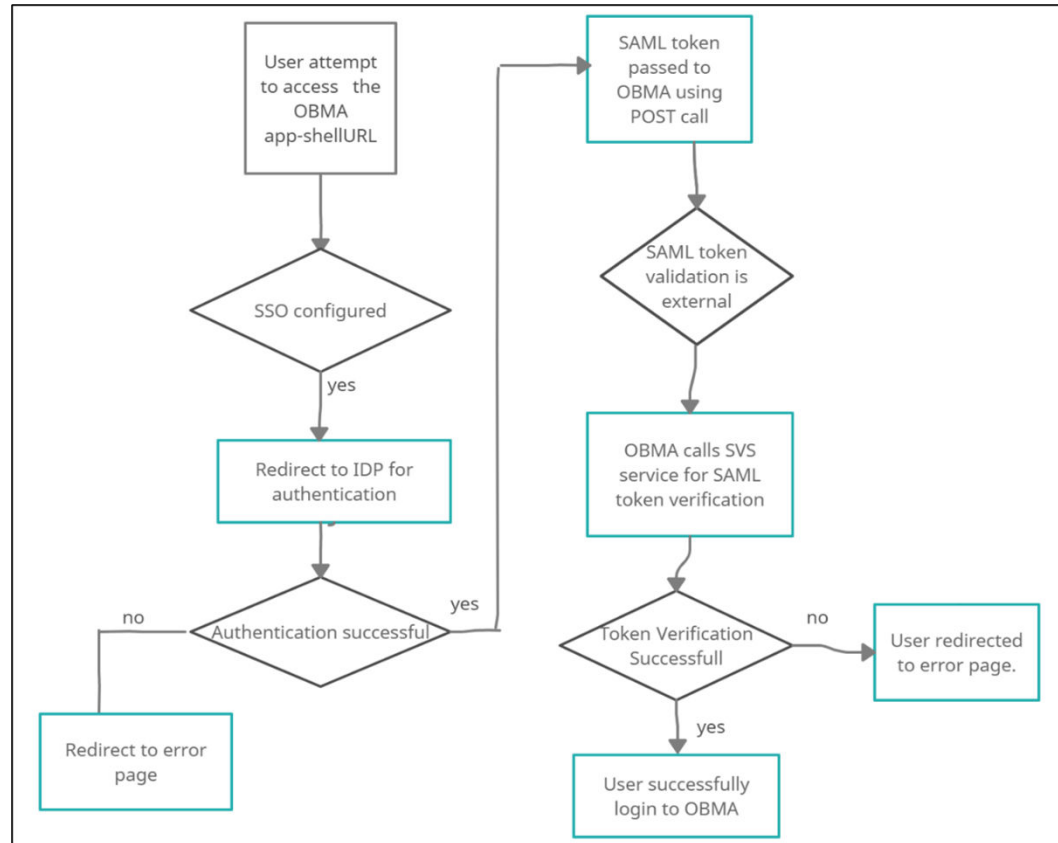


- The user initiates a call to the Oracle Banking Corporate Lending Process Management application and is redirected to the federate login page of the bank.
- The Identity Provider is external to the Oracle Banking Corporate Lending Process Management products (e.g. OKTA) with the Oracle Banking Corporate Lending Process Management products acting as the Service Provider.
- The Idp presents a configured login screen to the user
- Client enters a user id and password. In case of success, the Idp sets the corresponding user profile details in the security context
- The request is routed to the Gateway which extracts the profile details by decoding the SAML response
- The API Gateway creates a JWT token (Utilizing Oracle's Security Developer Toolkit part of Oracle's Platform Security Services), persists it in the Database and returns the same.

### SAML SSO Implementation

It is possible to configure an external service to do the SAML Verification instead of the API Gateway.

**Figure 1-5 SAML SSO Implementation**



**Steps to achieve SSO-SAML Authentication:**

- Bank user will try to access the Oracle Banking Microservices Architecture app-shell URL.
- Oracle Banking Corporate Lending Process Management will check if the IS\_SSO\_CONFIGURED parameter is set to true in the SECURITY\_CONFIG table.
- If the IS\_SSO\_CONFIGURED parameter is true the user will be redirected to the IDP for authentication.
- On successful authentication IDP will generate the SAML token and pass the token to the Oracle Banking Corporate Lending Process Management assertion consumer service URL in the body of POST method through EXTERNAL\_SSO\_KEY parameter.
- Oracle Banking Corporate Lending Process Management will receive the token and check if the SSO\_SERVICE\_PROVIDER is set to EXTERNAL in the SECURITY\_CONFIG table.
- If SSO\_SERVICE\_PROVIDER is EXTERNAL, Oracle Banking Corporate Lending Process Management would make a HTTP Post call to SVS using the EXTERNAL\_SSO\_VALIDATION\_URL configured in the SECURITY\_CONFIG table for SAML token validation. Oracle Banking Corporate Lending Process Management will pass the SAML token through EXTERNAL\_SSO\_TOKEN\_KEY parameter in the body of the POST to SVS.
- SVS will return a XML response with IsValid tag as TRUE or FALSE. If the tag value is TRUE, Oracle Banking Microservices Architecture would generate JWT token using the user id from the <subject> </subject> tag of SVS response and allow the user to login.

- In case of failure, Oracle Banking Corporate Lending Process Management would give login error to the user.

#### Product Configurations required:

The following parameters needs to be configured in the SECURITY\_CONFIG table in the PLATO-SECURITY schema to enable SAML SSO.

KEY	VALUE
IS_SSO_CONFIGURED	True
JWT_EXP_SECONDS	JWT expiry time
JWT_ALGORITHM	HS512
EXTERNAL_SSO_VALIDATION_URL	SVS URL
EXTERNAL_SSO_KEY	Parameter in which the SAML token will be passed to Oracle Banking Corporate Lending Process Management from IDP after user authentication.
SSO_SERVICE_PROVIDER	EXTERNAL
EXTERNAL_SSO_TOKEN_KEY	Parameter in which the SAML token will be passed to SVS URL for token validation.
HEADERS	Request headers for making HTTP call to SVS URL

#### FCUBS integration with Oracle Banking Microservices Architecture as SSO Provider

Refer to Launching Oracle Banking Corporate Lending Process Management from UBS section in the *Oracle Banking Corporate Lending Process Management Installation Guide*.

## 1.6.2 API Security

This topic provides information about the API Security.

Refer to *Oracle Banking Corporate Lending Process Management API Security Guide* for the detailed explanation.

## 1.6.3 Two-way SSL Connection

This topic describes about Two-way SSL connection.

A two-way SSL is used when the server needs to authenticate the client. In a two-way SSL connection, the client verifies the identity of the server and then passes its identity certificate to the server. The server then validates the identity certificate of the client before completing the SSL handshake.

To establish a two-way SSL connection, the user must have two certificates as follows,

- Server
- Client

Below configuration has to be ensured in weblogic.xml within the deployed application ear.

- Cookies are set with Http only as true
- Cookie secure flag set to true

- Cookie path to refer to deployed application

```
<wls: session-descriptor>  
  <wls: cookie-http-only>true</wls: cookie-http-only>  
</wls: session-descriptor>
```

```
<wls: session-descriptor>  
  <wls: cookie-secure>true</wls: cookie-secure>  
  <wls: url-rewriting-enabled>false</wls: url-rewriting-enabled>  
</wls: session-descriptor>
```

Always make sure Cookies are set with always Auth Flag enabled by default for WebLogic server.



# 2

## Securing Oracle Banking Corporate Lending Process Management

This topic describes about securing the Oracle Banking Corporate Lending Process Management.

This topic contains following sub-topics:

- [Desktop Security](#)  
This topic describes about desktop security.
- [Oracle Banking Corporate Lending Process Management Controls](#)  
This topic describes about the Oracle Banking Corporate Lending Process Management controls.

### 2.1 Desktop Security

This topic describes about desktop security.

Refer to the vendor specific relevant sections for securing the Desktops Operating system. Also refer to the Browser specific security settings mentioned in the vendor specific documents.

Refer to the client browser setting required for Oracle Banking Corporate Lending Process Management.

### 2.2 Oracle Banking Corporate Lending Process Management Controls

This topic describes about the Oracle Banking Corporate Lending Process Management controls.

This topic contains following sub-topics:

- [Overview](#)  
This topic describes the various programs available within Oracle Banking Corporate Lending Process Management, to help in the maintenance of security.
- [Disable Logging](#)  
This topic provides the information about disabling the debug logging facility.
- [Sign-on Messages](#)  
This topic lists the sign-on messages and its explanations.
- [Authentication and Authorization](#)  
This topic describes about the authentication and authorization to have the access to the system.
- [Role Based Access Controls](#)  
This topic describes about role based access controls.

- [Access Controls - Branch Level](#)  
This topic describes about access controls at branch levels.
- [Maker – Checker](#)  
This topic describes about maker and checker.
- [Access Enforcement](#)  
This topic describes about access enforcement.
- [Password Management](#)  
This topic describes about password management.

## 2.2.1 Overview

This topic describes the various programs available within Oracle Banking Corporate Lending Process Management, to help in the maintenance of security.

Access to the system is possible only if the user logs in with a valid ID and the correct password. The user activities are reviewed by the Security Officer in the Event Log and the Violation Log reports.

## 2.2.2 Disable Logging

This topic provides the information about disabling the debug logging facility.

When the system is in production, it is recommended to turn off the debug logging facility of the application. This is achieved by updating the logback.xml file of the application. It does not disable logging performed by the application in the database tier but can be disabled by running the lockdown scripts provided.

The lockdown scripts disables logging across all modules and across all users in the system.

## 2.2.3 Sign-on Messages

This topic lists the sign-on messages and its explanations.

**Table 2-1 Sign-on Messages**

Message	Explanation
User Authentication Failed/Invalid Login	An incorrect user ID or password was entered.
User Status is Locked. Please contact your System Administrator	The user profile has been disabled due to an excessive number of attempts to login, using an incorrect user ID or password. The number of attempts could have matched either the successive number of login failures (configured for the system).

## 2.2.4 Authentication and Authorization

This topic describes about the authentication and authorization to have the access to the system.

Only authenticated users can access the system.

A user must have access rights to execute a function. The user profile of a user contains the User ID and the functions to which the user has access. Oracle Banking Corporate Lending Process Management operation such as new, copy, query, unlock, and so on are enabled

based on function rights available for the user. The function rights are checked for each operation performed by the user in Security Management Service module of Oracle Banking Corporate Lending Process Management.

## 2.2.5 Role Based Access Controls

This topic describes about role based access controls.

- Application level access has implemented through the Security Management System module.
- Security Management System supports "ROLE BASED" access of screens and different types of operations.
- Oracle Banking Corporate Lending Process Management supports the dual control methodology, in which the another user must be authorized with the requisite rights for each operation performed.
- Security Management System provides an option to map multiple roles for a user in each branch. Allowed operations are mapped to the roles and Security Management System authorizes the user based on it.

## 2.2.6 Access Controls - Branch Level

This topic describes about access controls at branch levels.

Security Management System provides the branch level access through the roles provided for the user at a particular branch.

## 2.2.7 Maker – Checker

This topic describes about maker and checker.

The application supports dual control methodology, in which another user must have the necessary rights for each operation performed.

## 2.2.8 Access Enforcement

This topic describes about access enforcement.

Access management in Oracle Banking Corporate Lending Process Management can be done in two steps.

- **Branch level:** The user cannot view even the menu list of Oracle Banking Corporate Lending Process Management when the user tries to login into the restricted branch. Thus, no transactions could be performed.
- **Roles wise:** Based on the user-roles mapping, the user can access different functions of Oracle Banking Corporate Lending Process Management. For example, a bank clerk has access to customer creation, opening the account, opening the term-deposits, and liquidation screens, but does not have access to User Creation function activity.

## 2.2.9 Password Management

This topic describes about password management.

Oracle Banking Corporate Lending Process Management application relies on external password management and does not store any credentials. If an external LDAP is used,

password management and policy rules can be set on that (For example, the user and password rules can be configured through the admin console for Weblogic Embedded-LDAP).

If OIM/OAM is configured, password management and policy rules can be set on OIM. The IdP (Identity Provider) in case of SAML takes care of the password policies.

Certain user password related parameters should be defined at the system level. These parameters will apply to all the users of the system. Examples of such parameters are the number of invalid login attempts after which a user-id should be disabled, the maximum and minimum length for a password.

### Password Policies

To enable password validation, there is a flag given in SECURITY\_CONFIG table called:

PASSWORD\_VALIDATION\_FLAG – It has to be set as Y to enable

Password validation criteria are configurable through the table created called SECURITY\_PASSWORD\_VAL\_CONFIG. Each property in that is being explained through the following table:

Property	Value	Description
MIN_PSWD_LEN	Any integer	Minimum password length required
MAX_PSWD_LEN	Any integer	Maximum password length allowed
MIN_PSWD_AGE	Any integer	Not used currently
MAX_PSWD_AGE	Any integer	Not used currently
FLAG_UPPER_CHAR	Y/N	Y- UpperCase characters required
NUM_MAND_UPPER	Integer	Minimum uppercase characters required Checked only if FLAG_UPPER_CHAR is set to Y
FLAG_LOWER_CHAR	Y/N	Y- LowerCase characters required
NUM_MAND_LOWER	Integer	Minimum lowercase characters required Checked only if FLAG_LOWER_CHAR is set to Y
FLAG_SPECIAL_CHAR	Y/N	Y- Special characters required
NUM_MAND_SPECIAL	Integer	Minimum special characters required Checked only if FLAG_SPECIAL_CHAR is set to Y
FLAG_NUMERIC_CHAR	Y/N	Y- Numeric characters required
NUM_MAND_NUMERIC	Integer	Minimum numeric characters required Checked only if FLAG_NUMERIC_CHAR is set to Y

# 3

## General Information

This topic provides the general security information for Oracle Banking Corporate Lending Process Management.

This topic contains following sub-topics:

- [Cryptography](#)  
This topic describes about cryptography.
- [Security Patch](#)  
This topic describes about security patch.
- [Oracle Database Security Suggestions](#)  
This topic describes provides suggestions about Oracle Database Security.
- [Oracle Software Security Assurance - Standards](#)  
This topic describes about the standards of Oracle Software Security Assurance.

### 3.1 Cryptography

This topic describes about cryptography.

Oracle Banking Corporate Lending Process Management uses cryptography to protect the sensitive data.

For encryption, AES is used which is considered the gold standard.

It produces a key size of 256 bits when it comes to symmetric key encryption.

### 3.2 Security Patch

This topic describes about security patch.

Security patches needs to be applied whenever it is available for the applicable product version.

### 3.3 Oracle Database Security Suggestions

This topic describes provides suggestions about Oracle Database Security.

#### **Access Control**

Database Vault (DV) provides enterprises with protection from the insider threats and in advantage leakage of sensitive application data. Access to application data by users and administrators is controlled using DV realms, command rules, and multi factor authorization. DV also addresses the Access privilege by separating responsibilities.

### **Data Protection**

Advance Security provides the most advanced encryption capabilities to protect sensitive information without requiring any change to the application. TDE is native database solution that is completely transparent to existing applications.

It also provides strong protection for data in transit by using network encryption capabilities. Features like Easy to deploy, Ensure secure by default to accept communication from the client using encryption, Network encryption using SSL/TLS.

### **Monitoring and Compliance**

Audit Vault (AV) transparently collects and consolidates the audit data from multiple databases across the enterprise. It provides valuable insight into all details including privileged users. The integrity of the audit data is ensured using controls including DV and Advance Security. Access to AV data is strictly controlled. It also provides graphical summaries of the activity causing alerts. The database audit settings are centrally managed and monitored.

## **3.4 Oracle Software Security Assurance - Standards**

This topic describes about the standards of Oracle Software Security Assurance.

Every acquired organization must complete the Mergers and Acquisitions (M&A) Security Integration process. The issues identified during this review must be addressed according to the agreed upon M&A remediation plan. The acquired organization must complete SPOC assignments and plan the integration of OSSA methodologies and processes into its SDLC.

# 4

## References

This topic provides the reference links for the various security considerations.

### **Datacenter Security Considerations**

Refer the following link to understand the Datacenter Security considerations.

<https://docs.oracle.com/en/middleware/fusion-middleware/weblogic-server/12.2.1.4/depgd/understanding.html#GUID-F6E8BF0B-FBCF-44D2-A33F-13C4EF2E0031>

### **Database Security Considerations**

Refer the following link to understand the Database Security considerations.

<https://www.oracle.com/security/database-security/>

<https://docs.oracle.com/en/database/oracle/oracle-database/19/dbseg/database-security-guide.pdf>

### **Security Recommendations / Practices followed for Database Environment**

Refer the following link to understand the Security recommendations / practices followed for Database Environment.

<https://docs.oracle.com/en/database/oracle/oracle-database/19/security.html>

<https://docs.oracle.com/en/database/oracle/oracle-database/19/dbseg/index.html>

### **Common Security Considerations**

Refer the following links to understand the common security considerations.

<https://www.oracle.com/database/technologies/high-availability/fusion-middleware-maa.html>

<https://www.oracle.com/database/technologies/high-availability/oracle-database-maa-best-practices.html>

<https://docs.oracle.com/en/middleware/fusion-middleware/weblogic-server/12.2.1.4/perfm/basics.html#GUID-178B107B-10E9-4563-BCA4-E06E14F5D3FF>

<https://docs.oracle.com/en/middleware/fusion-middleware/weblogic-server/12.2.1.4/lockd/securing-production-environment-oracle-weblogic-server.pdf>

<https://docs.oracle.com/en/middleware/fusion-middleware/weblogic-server/12.2.1.4/secmg/index.html>

<https://docs.oracle.com/en/middleware/fusion-middleware/weblogic-server/12.2.1.4/index.html>

# Index

## A

---

Access Controls - Branch Level, [2-3](#)  
Access Enforcement, [2-3](#)  
API Security, [1-11](#)  
Application Server Security, [1-3](#)

## C

---

Choice of the SSL Cipher Suite, [1-3](#)  
Cryptography, [3-1](#)

## D

---

Desktop Security, [2-1](#)  
Disable Logging, [2-2](#)

## M

---

Maker – Checker, [2-3](#)

## N

---

Network Security, [1-1](#)

## O

---

Online Web Application, [1-5](#)

Operating Environment Security, [1-1](#)  
Oracle Banking Corporate Lending Process  
    Management Controls, [2-1](#)  
Oracle Database Security, [1-1](#)  
Oracle Database Security Suggestions, [3-1](#)  
Oracle Software Security Assurance - Standards,  
    [3-2](#)

## P

---

Password Management, [2-3](#)  
Product configurations for SSL, [1-4](#)

## R

---

Role Based Access Controls, [2-3](#)

## S

---

Security Patch, [3-1](#)  
Sign-on Messages, [2-2](#)  
SSL Setup, [1-3](#)  
SSL Support, [1-3](#)

## T

---

Two-way SSL Connection, [1-11](#)