

Oracle Tuxedo System and Applications Monitor Plus Deployment Guide



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6 Update AI Providers and Models

Preface

Oracle TSAM Plus Manager is a web application that runs in a WebLogic Server domain and uses an Oracle Database to store Oracle Tuxedo system, application performance, and monitoring data. This guide explains how to deploy Oracle TSAM Plus Manager to an Oracle Database server and a WebLogic Server domain.

1

Overview

Oracle TSAM Plus Manager functions as a web application that runs in a WebLogic Server domain. It uses an Oracle Database to store Oracle Tuxedo system and application performance and monitoring data. Before using Oracle TSAM Plus Manager, it must be deployed to an Oracle Database server and a WebLogic Server domain.

After you successfully install Oracle TSAM Plus Manager, the following sub-directories are created under the installation directory `$TSAM_DIR`:

- `bin`: Contains scripts to start and shutdown Oracle TSAM Plus Manager.
- `deploy`: Contains `tsam_22c.ear`, the Oracle TSAM Plus Manager EAR file, and deployment scripts to deploy TSAM Plus Manager to Oracle Database and WebLogic Server.
- `lib`: Contains Java libraries for certain Oracle TSAM Plus Manager features, such as payload collection.
- `wls`: If you selected to install the bundled WebLogic Server during the installation, this sub-directory contains the installation of the bundled WebLogic Server.

2

Prerequisites

Before deploying Oracle TSAM Plus Manager, make sure you have the following software and tools installed:

- Oracle Fusion Middleware Infrastructure 14.1.2, which includes WebLogic Server 14.1.2 and the libraries required by Oracle TSAM Plus Manager.
 - If you have selected to install the bundled WebLogic Server when installing Oracle TSAM Plus Manager, you do not need to install Oracle Fusion Middleware Infrastructure separately
- Oracle Database 19c or higher
 - Oracle database SQL*Plus 19c or higher

Note

Make sure the directory containing sqlplus is included in your \$PATH environment variable

- Oracle Database Server
To use the AI-based Operations Assistant feature, the following Oracle Database releases are required:
 - * Oracle Autonomous AI Database 26ai
 - * Non-autonomous Database 26ai(23.26.2.2.0) or later release updates
- For AI based Operations Assistant,when using non-Autonomous Database Edition, Oracle DBMS_CLOUD family of packages setup required, see https://docs.oracle.com/en/database/oracle/oracle-database/26/sutil/using-dbms_cloud-family-packages.html

To use the Operations Assistant, access to one or more AI providers are required, we have tested with the following AI providers:

Table 2-1 AI Providers

AI Provide Name	Configuration Value
OCI GenAI Service	oci
OpenAI	openai
Azure OpenAI	azure

Below are the models that have been tested with the recommended token limits

Table 2-2 LLM Models

LLM Model	Recommended Token Limit
xai.grok-4.3	Between 1024 and 65536
meta.llama-4-maverick-17b-128e-instruct-fp8	Between 1024 and 4096

Table 2-2 (Cont.) LLM Models

LLM Model	Recommended Token Limit
gpt-5.4	Between 1024 and 65536

Access to LLM models is provided through Oracle Database Select AI Agent. For additional models please refer to Oracle Select AI Agent documentations at <https://docs.oracle.com/en-us/iaas/autonomous-database-serverless/doc/select-ai-about.html>

3

Quick Deployment

Use the shell script `TSAMSetup.sh` to deploy Oracle TSAM Plus Manager from scratch. This script creates Oracle database users, sets up the required database schema, creates a WebLogic Server domain, and deploys the TSAM Plus Manager application to it.

Before running `TSAMSetup.sh`, you must fill in the required values in the template configuration file `TSAMSetup.cfg`.

Table 3-1 TSAMSetup.cfg Parameters

Parameter	Required / Conditional	Description
TSAM_HOME	Required	TSAM Plus Manager installation home directory. Defaults to the parent directory of the running script when TSAM_HOME is not already set.
TSAM_USER_ADMIN_PASSWD	Required	Password for the TSAM Plus Manager application administrator user.
TSAM_EAR_LOCATION	Required	Path to the TSAM Plus Manager Enterprise Archive file to deploy. Defaults to \${TSAM_HOME}/deploy/tsam_22c.ear.
TSAM_ENABLE_AI	Required	Controls whether the TSAM Plus Manager AI feature is enabled. Set to Y to enable AI-related settings; set to N to disable.
DB_CONNSTR	Required	DB_CONNSTR must be host:port/service_name or a complete (DESCRIPTION=...) descriptor. Do not use a TNS alias in the TSAMSetup.cfg wrapper path, and do not include jdbc:oracle:thin:@; the wrapper adds it.
DB_IS_ADB	Required	Flag indicating whether the database is Oracle Autonomous Database (ADB). Use Y for ADB; use N for non-ADB.
DB_ENABLE_PARTITION	Required	Controls whether database partitioning is enabled for TSAM schema objects.
DB_USER_ADMIN	Required	For non-ADB, the account must authenticate to the target database AS SYSDBA, normally as SYS. For ADB, use the predefined ADMIN account through a normal connection.
DB_USER_ADMIN_PASSWD	Required	Password for DB_USER_ADMIN.

Table 3-1 (Cont.) TSAMSetup.cfg Parameters

Parameter	Required / Conditional	Description
DB_USER_TABLESPACE	Required	Default tablespace for newly created DB_USER_TSAM and optional DB_USER_TSAMAI users. However, it is required when TSAM_ENABLE_AI=Y
DB_USER_DROP_IFEXIST	Optional (default: N)	Controls whether existing TSAM-related database users are dropped during setup if they already exist. Y or -dropUser runs DROP USER ... CASCADE for the primary user and, when AI is enabled, the AI user. With N, existing users are not reused and provisioning fails.
DB_USER_TSAM	Required	Primary TSAM database schema username.
DB_USER_TSAM_PASSWD	Required	Password for DB_USER_TSAM.
DB_USER_TSAMAI	Optional	AI-enabled database schema username used when the TSAM AI feature is enabled.
DB_USER_TSAMAI_PASSWD	Required when TSAM_ENABLE_AI=Y	Password for DB_USER_TSAMAI.
WLS_HOME	Required	WebLogic Server home directory. Defaults to the bundled wls directory under TSAM_HOME when WLS_HOME is not already set.
WLS_DOMAIN_LOCATION	Required	The location of the new WebLogic domain to be created. Defaults to user_projects/domains/tsamdomain under WLS_HOME when WLS_DOMAIN_LOCATION is not already set.
WLS_USER_ADMIN	Required	WebLogic domain administrator username.
WLS_USER_ADMIN_PASSWD	Required	Password for WLS_USER_ADMIN.
WLS_PORT	Required	Port number on which WebLogic Server listens for incoming connections.
WLS_DATASERVER_PORT	Required	Port number for the TSAM DataServer channel used by LMS.
WLS_ADMIN_PORT	Required	Port number on which WebLogic Server listens for domain administrative operations.
WLS_TLS_KEYSTORE	Required	Path to the TLS keystore JKS file used by WebLogic/TSAM. Refer to Generate TLS Keystores for all WLS_TLS_* related parameters.

Table 3-1 (Cont.) TSAMSetup.cfg Parameters

Parameter	Required / Conditional	Description
WLS_TLS_KEYSTORE_PASSWD	Required	Password for the WebLogic TLS keystore.
WLS_TLS_TRUSTSTORE	Required	Path to the TLS truststore JKS file used by WebLogic/TSAM.
WLS_TLS_TRUSTSTORE_PASSWD	Required	Password for the WebLogic TLS truststore.
WLS_TLS_PRIVATEKEY_ALIAS	Required	Alias of the private key entry in the TLS keystore.
WLS_TLS_PRIVATEKEY_PASSWD	Required	Password for the TLS private key.
AI_OCI_CRED_USER	Required when any selected AI provider is oci.	OCI user OCID.
AI_OCI_CRED_TENANCY	Required when any selected AI provider is oci.	OCI tenancy OCID.
AI_OCI_CRED_PRIVATEKEY	Required when any selected AI provider is oci.	Path to an existing readable OCI API private key file.
AI_OCI_CRED_FINGERPRINT	Required when any selected AI provider is oci.	Fingerprint for the OCI API key.
AI_OCI_COMPARTMENT_ID	Required when any selected AI provider is oci.	OCI compartment OCID used by OCI Generative AI.
AI_VECTORINDEX_SOURCE_MODE	Required when TSAM_ENABLE_AI=Y.	Document source mode for vector index input. CLOUD uses the product-owned built-in documentation source. This is the default mode. Operators do not configure document-source URLs in TSAMSetup.cfg. LOCAL uses Oracle DIRECTORY-backed sources on the database host. LOCAL is supported only when DB_IS_ADB=N.
AI_MAIN_PROVIDER	Required when TSAM_ENABLE_AI=Y	LLM provider for the main TSAM AI agent.
AI_MAIN_MODEL	Required when TSAM_ENABLE_AI=Y	Main agent LLM model. Should be reasoning-capable because it handles the most complicated tasks.
AI_MAIN_REGION	Optional	OCI region for the main agent LLM deployment.
AI_MAIN_MAX_TOKENS	Optional	Maximum token limit configured for the main agent LLM.
AI_METRICS_PROVIDER	Optional	LLM provider for metric-query functionality.
AI_METRICS_MODEL	Optional	LLM model used for metric-query functionality.
AI_METRICS_REGION	Optional	OCI region for the metric-query LLM deployment.
AI_METRICS_MAX_TOKENS	Optional	Maximum token limit configured for the metric query LLM deployment

Table 3-1 (Cont.) TSAMSetup.cfg Parameters

Parameter	Required / Conditional	Description
AI_USERDOC_PROVIDER	Optional	LLM provider for user-document-based question answering.
AI_USERDOC_MODEL	Optional	LLM model used for user-document-based question answering.
AI_USERDOC_REGION	Optional	OCI region for the user-document QA LLM deployment.
AI_USERDOC_MAX_TOKENS	Optional	Maximum token limit configured for the user document QA LLM deployment.
AI_CONSOLEDOC_MODEL	Optional	LLM model used for console-document-based question answering.
AI_CONSOLEDOC_PROVIDER	Optional	LLM provider for console-document-based question answering.
AI_CONSOLEDOC_REGION	Optional	OCI region for the console-document QA LLM deployment.
AI_CONSOLEDOC_MAX_TOKENS	Optional	Maximum token limit configured for the console document QALLM deployment.
AI_FOLLOWUPDOC_PROVIDER	Optional	LLM provider for follow-up question generation.
AI_FOLLOWUPDOC_MODEL	Optional	LLM model used for follow-up question generation. Can be a more cost-effective worker model because it handles simpler tasks.
AI_FOLLOWUPDOC_REGION	Optional	OCI region for the follow-up generation LLM deployment.
AI_FOLLOWUPDOC_MAX_TOKENS	Optional	Maximum token limit configured for the follow-up generation LLM deployment.
AI_OPENAI_CREDENTIAL_USERNAME	Required when any selected AI provider is openai	OpenAI credential username.
AI_OPENAI_API_KEY	Required when any selected AI provider is openai	OpenAI API key.
AI_AZURE_CREDENTIAL_USERNAME	Required when any selected AI provider is azure.	Azure credential username.
AI_AZURE_API_KEY	Required when any selected AI provider is azure.	Azure API key.
AI_AZURE_RESOURCE_NAME	Required when any selected AI provider is azure	Azure resource name.
AI_AZURE_EMBEDDING_DEPLOYMENT_NAME	Required when any selected AI provider is azure	Optional Azure embedding deployment name. It is rendered only when explicitly set.

Note

TSAM Plus supports the several AI providers. The provider can be configured independently for the main agent, and the metrics, user-document, console-document, and follow-up workloads.

Default Value:

An unset worker provider (AI_*_PROVIDER) inherits AI_MAIN_PROVIDER. A worker inherits the main model or Azure deployment, and the OCI region where applicable, only when it uses the same provider as the main agent. For a mixed-provider configuration, explicitly configure the worker's provider-specific model or Azure deployment and, for OCI, its region. Configure credentials and database network access for every provider used by any workload.

The AI_MAX_TOKENS settings are independent for each profile and do not inherit from AI_MAIN_MAX_TOKENS, if not set, the default value will be used.

4

Advanced Deployment Options

You can also use the individual deployment scripts for advanced deployment options.

This section contains the following topics:

- [Database Deployment](#)
- [WebLogic Server Deployment](#)

4.1 Database Deployment

This section contains the following topics:

- [Provision a Database User](#)
- [Set up AI Knowledge Base \(Optional, only for AI features\)](#)
- [Set up Database Schema](#)
- [Reset the password of the TSAM Plus Admin User](#)

4.1.1 Provision a Database User

Oracle TSAM Plus Manager requires a dedicated Oracle database user.

The shell script `TSAMDBUserProvision.sh` is to be used by your database system administrator to create a dedicated database user with the required privileges.

- [Usage](#)
- [Examples](#)

4.1.1.1 Usage

```
./TSAMDBUserProvision.sh -connStr <connection string> -adminUser <admin  
username> -user <new user> -tablespace <tablespace> [-adb] [-walletDir <path  
to DB wallet>] [-dropUser] [-quota <quota limit>] [-enableAI] [-aiUser <new  
aiUser>] [-aiSourceMode <CLOUD|LOCAL>]
```

Table 4-1 Parameter List

Name	Description
-connStr <connection string>	DB connection string. If the connection string contains spaces or special characters like parentheses, enclose it in double quotes.
-adminUser <admin username>	The administrative user with privileges to create users.

Table 4-1 (Cont.) Parameter List

Name	Description
-aiSourceMode <CLOUD LOCAL>	Optional. Specifies the AI source mode. The default value is CLOUD. LOCAL is supported only for non-ADB deployments.
-user <new user>	The name of the new database user to be created.
-tablespace <tablespace>	The tablespace for the new user.
-adb	(Optional) Flag to indicate Autonomous Database.
-walletDir <path to DB wallet>	(Optional) Path to the wallet directory.
-dropUser	(Optional) Drop the user if it already exists, then recreate.
-quota <quota limit>	(Optional) Quota for the user on the tablespace. Examples: 100M, 1G, UNLIMITED. Default is UNLIMITED if not provided.
-enableAI	(Optional) Flag to grant Select-AI related privileges (DBMS_CLOUD, DBMS_CLOUD_AI, etc.). This is required to use Oracle TSAM Plus AI-based Operation Assistant feature.
-enableAI -aiUser <new aiUser>	Required when -enableAI is set. The database AI user used for TSAM Plus AI-based Operation Assistant.
-h or -help	(Optional) Show help message.

Note

Before running TSAMDBSchemaSetup.sh with -enableAI, set AI_VECTORINDEX_SOURCE_MODE in TSAMSetup.cfg. TSAMDBSchemaSetup.sh does not accept -aiSourceMode as a command-line parameter.

4.1.1.2 Examples

To provision a database user on an on-prem Oracle database server:

```
./TSAMDBUserProvision.sh -connStr "hostname:1521/orclpdb1" -adminUser sys -
user tsamuser1 -tablespace USERTABLESPACE -dropUser -quota 100G
```

To provision a database user on an Oracle Autonomous Database in Oracle Cloud:

```
./TSAMDBUserProvision.sh -connStr "(description=(retry_count=20)
(retry_delay=3)(address=(protocol=tcps)(port=1521)(host=adb.oraclecloud.com))
(connect_data=(service_name=tsam22c.adb.oraclecloud.com))
(security=(ssl_server_dn_match=yes)))" -adminUser admin -user tsamuser1 -
tablespace DATA -adb
```

To provision a database user on an Oracle Autonomous Database in Oracle Cloud with the AI feature enabled:

```
./TSAMDBUserProvision.sh -connStr "(description=(retry_count=20)
(retry_delay=3)(address=(protocol=tcps)(port=1521)(host=adb.oraclecloud.com))
(connect_data=(service_name=tsam22c.adb.oraclecloud.com))
(security=(ssl_server_dn_match=yes)))" -adminUser admin -user tsamuser1 -
tablespace DATA -adb -enableAI -aiUser tsamuser2
```

4.1.2 Set up AI Knowledge Base (Optional, only for AI features)

This step is only required if you want to use the AI-based Operation Assistant feature in Oracle TSAM Plus.

Oracle TSAM Plus Operation Assistant depends on the Oracle Tuxedo and Oracle TSAM Plus knowledge bases to achieve certain features.

Set `AI_VECTORINDEX_SOURCE_MODE` in `TSAMSetup.cfg` before running the AI deployment flow.

Use `CLOUD` to use the product-owned built-in documentation source. This is the default mode. Operators do not configure a document-source URL in `TSAMSetup.cfg`.

Use `LOCAL` to use Oracle `DIRECTORY`-backed sources on the database host. `LOCAL` is supported only when `DB_IS_ADB=N` in the current full-wrapper flow.

- [Usage](#)
- [Example](#)

4.1.2.1 Usage

For `LOCAL` mode, copy the source files to all three database-host directories:

- `/u02/tsam_ai/userdoc`
- `/u02/tsam_ai/consolodoc`
- `/u02/tsam_ai/followupdoc`

To mirror the shipped `CLOUD` source, download the files from:

- [Knowledge Base](#)
- [Oracle® Tuxedo System and Applications Monitor Plus Configuration Guide](#)
- [Oracle® Tuxedo System and Applications Monitor Plus Deployment Guide](#)
- [Oracle® Tuxedo System and Applications Monitor Plus Installation Guide](#)
- [Oracle® TSAM Plus Overview](#)
- [Oracle® Tuxedo System and Applications Monitor Plus Programming Guide](#)
- [Oracle® Tuxedo System and Applications Monitor Plus Quick Start Guide](#)
- [TSAM Plus Server, Command, and API Reference](#)
- [Oracle® Tuxedo System and Applications Monitor Plus User's Guide](#)

4.1.2.2 Example

CLOUD Example:

```
AI_VECTORINDEX_SOURCE_MODE="CLOUD"
```

LOCAL Example:

```
AI_VECTORINDEX_SOURCE_MODE="LOCAL"
```

4.1.3 Set up Database Schema

The shell script `TSAMDBSchemaSetup.sh` is to be used to create database assets for Oracle TSAM Plus Manager.

- [Usage](#)
- [Examples](#)

4.1.3.1 Usage

```
./TSAMDBSchemaSetup.sh -connStr <connection string> -user <username> \
  [-enablePartition] [-walletDir <dir>] \
  [-enableAI -aiUser <aiusername>]
```

```
./TSAMDBUserProvision.sh -connStr <connection string> -adminUser <admin
username> -user <new user> -tablespace <tablespace> [-adb] [-walletDir <path
to DB wallet>] [-dropUser] [-quota <quota limit>] [-enableAI] [-aiUser <new
aiUser>] [-aiSourceMode <CLOUD|LOCAL>]
```

Option:

- `-aiSourceMode <CLOUD|LOCAL>` (optional): Specifies the AI source mode. The default is CLOUD. Values must be specified in uppercase (CLOUD or LOCAL). The LOCAL option is not supported when `-adb` is specified.

Table 4-2 Parameter List

Name	Description
<code>-connStr <connection string></code>	DB connection string. If the connection string contains spaces or special characters like parentheses, enclose it in double quotes.
<code>-user <user name></code>	The name of the TSAM database user.
<code>-enablePartition</code>	(Optional) Flag to enable partitioning in database.
<code>-walletDir <path to DB wallet></code>	(Optional) Path to the wallet directory.

Table 4-2 (Cont.) Parameter List

Name	Description
-enableAI	(Optional) Flag to enable AI setup (credentials, profile, agent, and metadata). You must configure the values in TSAMSetup.cfg file. Note Before running TSAMDBSchemaSetup.sh with -enableAI, set AI_VECTORINDEX_SOURCE_MODE in TSAMSetup.cfg. TSAMDBSchemaSetup.sh does not accept -aiSourceMode as a command-line parameter.
-aiUser <AI username>	(Optional) The name of the TSAM database AI user when -enableAI is set. The target schema must own no tables, and -aiUser is required whenever -enableAI is used.
-h or -help	(Optional) Show help message.

4.1.3.2 Examples

To set up database schema for an on-prem Oracle database server:

Use either a shell continuation character after -connStr or keep the connection descriptor on the same line. For example:

```
./TSAMDBSchemaSetup.sh -connStr "hostname:1521/orclpdb1" -user tsamuser1
```

To set up database schema for an Oracle Autonomous Database in Oracle Cloud, with partitioning enabled:

```
./TSAMDBSchemaSetup.sh -connStr
"(description=(retry_count=20)(retry_delay=3)(address=(protocol=tcps)
(port=1521)(host=adb.oraclecloud.com))
(connect_data=(service_name=tsam22c.adb.oraclecloud.com))
(security=(ssl_server_dn_match=yes)))" -user tsamuser1 -enablePartition
```

To set up database schema for an Oracle Autonomous Database in Oracle Cloud, with AI feature enabled:

```
./TSAMDBSchemaSetup.sh -connStr "(description=(retry_count=20)
(retry_delay=3)(address=(protocol=tcps)(port=1521)(host=adb.oraclecloud.com))
(connect_data=(service_name=tsam22c.adb.oraclecloud.com))
(security=(ssl_server_dn_match=yes)))" -user tsamuser1 -enableAI -aiUser
tsamuser2
```

Note

If the TSAMDBSchemaSetup.sh script fails, it's recommended to rerun TSAMDBUserProvision.sh with the -dropUser parameter to redo the database user provision from scratch.

4.1.4 Reset the password of the TSAM Plus Admin User

The shell script TSAM_AdminPasswordReset.sh is to be used to reset the password of the TSAM Plus Manager admin user.

- [Usage](#)
- [Examples](#)

4.1.4.1 Usage

```
./TSAM_AdminPasswordReset.sh -connStr <connection string> -user <username> [-walletDir <dir>]
```

Table 4-3 Parameter List

Name	Description
-connStr	DB connection string. If the connection string contains spaces or special characters like parentheses, enclose it in double quotes.
-user	The name of the TSAM Plus database user, not the name of the TSAM Plus database AI user.
-walletDir	(Optional) Path to the wallet directory
-h or -help	(Optional) Show help message.

4.1.4.2 Examples

To reset the TSAM Plus Manager admin user (username is admin) password in the tsamuser database schema on an on-premises Oracle Database server, run:

```
./TSAM_AdminPasswordReset.sh -connStr "localhost:1521/orclpdb1" -user tsamuser
```

4.2 WebLogic Server Deployment

This section contains the following topics:

- [Provision WebLogic Server Domain](#)
- [Deploy Oracle TSAM Plus Manager](#)
- [Start and Shutdown WebLogic Server Domain](#)

4.2.1 Provision WebLogic Server Domain

Oracle TSAM Plus Manager is a web application running in a WebLogic Server domain. The shell script `TSAMWLSProvision.sh` is to be used to create a new WebLogic Server domain to host Oracle TSAM Plus Manager.

- [Usage](#)
- [Generate mTLS Keystores and Wallets](#)
- [Configure mTLS Certificate on Oracle TSAM Plus Agent](#)
- [Example](#)
- [Output](#)

4.2.1.1 Usage

TLS is enabled by default. When TLS is enabled, specify `-adminPort`, `-identityKeystore`, `-trustKeystore`, and `-privateKeyAlias`. Use `-disableTLS` only for non-TLS domains.

```
./TSAMWLSProvision.sh [-WLSHome <path to WLS Home>] -domainLoc <path to domain> -port <Listen Port> -dataServerPort <DataServer Port> [-adminPort <Admin Port>] -adminUser <admin username> [-identityKeystore <path>] [-trustKeystore <path>] [-privateKeyAlias <alias>] [-disableTLS]
```

For example:

```
-port 8001 -dataServerPort 8002
```

The `-dataServerPort` argument is required. If it is not specified, the provisioning script exits with an error.

`-WLSHome` is optional; if omitted, the bundled WebLogic Server is used. `-domainLoc`, `-port`, `-dataServerPort`, and `-adminUser` are required. TLS is enabled by default. Unless `-disableTLS` is specified, `-adminPort`, `-identityKeystore`, `-trustKeystore`, and `-privateKeyAlias` are also required

Table 4-4 Parameter List

Name	Description
<code>-WLSHome <path to WLS Home></code>	(Optional) ORACLE_HOME of WLS installation. If not set, uses the bundled WLS.
<code>-domainLoc <path to domain></code>	Location for the new WLS domain.
<code>-port <Listen Port></code>	[1-65535] Port number on which WebLogic Server listens for incoming connections
<code>-adminPort <Admin Port></code>	Required when TLS is enabled. [1-65535] Port number for WebLogic administrative operations.
<code>-adminUser <new user></code>	Admin user name of the new WLS domain.
<code>-dataServerPort <DataServer Port></code>	Required. [1-65535] Port number for the TSAM DataServer channel used by LMS.
<code>-disableTLS</code>	(Optional) TLS disabled

Table 4-4 (Cont.) Parameter List

Name	Description
-identityKeystore <path>	Required when TLS is enabled. Path to the identity keystore.
-trustKeystore <path>	Required when TLS is enabled. Path to the trust keystore.
-privateKeyAlias <alias>	Required when TLS is enabled. Alias for the private key in the identity keystore.
-h or -help	(Optional) Show help message.

4.2.1.2 Generate mTLS Keystores and Wallets

TSAM supports mTLS by default. For example, the hostnames (both the short name and the fully qualified domain name, or FQDN) of the machines running WebLogic Server (WLS) and Tuxedo should be included in the SANs. Otherwise, the mTLS connection will fail to be established. Therefore, the Subject Alternative Names (SANs) in the certificate must be configured correctly. Otherwise, the mTLS connection will fail to be established.

Use the commands below to create a CA, endpoint certificate, traditional JKS identity and trust stores, and an LMS wallet. Replace only the example values and enter a secure password when prompted.

1. Set the example environment variables

```
export HOST='tsam.example.com'
export CA_NAME='TLS-Example-Root-CA'
export SERVER_ALIAS='tsam-server'
export CLIENT_ALIAS='tsam-lms'
export APPDIR='/opt/example/tsam-app'
export SANS='DNS:tsam-tls,DNS:tsam-
tls.example.com,DNS:*.example.com,IP:127.0.0.1'
export CA_SUBJ="/C=US/ST=CA/L=ExampleCity/O=Example/OU=Security/
CN=$CA_NAME"
export SERVER_SUBJ="/C=US/ST=CA/L=ExampleCity/O=Example/OU=IT/CN=$HOST"
export CLIENT_SUBJ="/C=US/ST=CA/L=ExampleCity/O=Example/OU=LMS/
CN=$CLIENT_ALIAS"
```

2. Generate the CA

```
openssl genpkey -algorithm RSA -pkeyopt rsa_keygen_bits:4096 -out tls-ca-
key.pem
openssl req -x509 -new -sha256 -days 9000 -key tls-ca-key.pem -out tls-ca-
cert.pem -subj "$CA_SUBJ" \
    -addext "basicConstraints=critical,CA:true,pathlen:0" \
    -addext "keyUsage=critical,keyCertSign,cRLSign"
```

3. Create the WebLogic server certificate

The SAN list must contain every hostname clients use to reach the TLS endpoint.

```
openssl genpkey -algorithm RSA -pkeyopt rsa_keygen_bits:4096 -out tls-
server-key.pem
openssl req -new -sha256 -key tls-server-key.pem -out tls-server-csr.pem -
subj "$SERVER_SUBJ" \
    -addext "subjectAltName=$SANS" \
```

```
-addext "extendedKeyUsage=serverAuth,clientAuth"
openssl x509 -req -sha256 -days 9000 -copy_extensions copy \
-in tls-server-csr.pem -CA tls-ca-cert.pem -CAkey tls-ca-key.pem \
-CACreateserial -out tls-server-cert.pem
```

4. Create the WebLogic identity and trust JKS files

The final WebLogic identity and trust stores are traditional JKS. The PKCS12 file below is only an intermediate import source for the private key pair.

```
openssl pkcs12 -export -out tls-server-source.p12 -inkey tls-server-
key.pem -in tls-server-cert.pem -certfile tls-ca-cert.pem -name
"$SERVER_ALIAS"
keytool -importkeystore -noprompt -srckeystore tls-server-source.p12 -
srcstoretype PKCS12 -destkeystore tsam_tls_keystore.jks -deststoretype JKS
-alias "$SERVER_ALIAS"
keytool -import -noprompt -trustcacerts -alias "$CA_NAME" -file tls-ca-
cert.pem -keystore tsam_tls_truststore.jks -storetype JKS
```

5. Verify the WebLogic JKS Files

```
keytool -list -v -keystore tsam_tls_keystore.jks -storetype JKS
keytool -list -v -keystore tsam_tls_truststore.jks -storetype JKS
openssl verify -CAfile tls-ca-cert.pem tls-server-cert.pem
```

4.2.1.3 Configure mTLS Certificate on Oracle TSAM Plus Agent

Create the LMS client certificate, package it with the CA chain as an Oracle-compatible wallet, and place the wallet in the LMS application directory.

1. Create the LMS client certificate

```
openssl genpkey -algorithm RSA -pkeyopt rsa_keygen_bits:4096 -out tls-
client-key.pem
openssl req -new -sha256 -key tls-client-key.pem -out tls-client-csr.pem -
subj "$CLIENT_SUBJ" \
-addext "extendedKeyUsage=clientAuth"
openssl x509 -req -sha256 -days 9000 -copy_extensions copy \
-in tls-client-csr.pem -CA tls-ca-cert.pem -CAkey tls-ca-key.pem \
-CACreateserial -out tls-client-cert.pem
```

2. Package the LMS client key pair as a wallet

```
openssl pkcs12 -export -out ewallet.p12 -inkey tls-client-key.pem -in tls-
client-cert.pem -certfile tls-ca-cert.pem -name "$CLIENT_ALIAS"
mkdir -p "$APPDIR/wallet.tsam-lms"
cp ewallet.p12 "$APPDIR/wallet.tsam-lms/ewallet.p12"
```

3. Configure LMS in UBBCONFIG

Add the LMS settings to the *SERVERS section. Set SEC_PRINCIPAL_LOCATION to the parent directory of wallet.tsam-lms. Enter the wallet password when prompted by tmloadcf.

```
LMS SRVGRP=LMSGRP SRVID=100 CLOPT="-A -- -l https://<example-
host>:<example-port>/tsam"
```

```
SEC_PRINCIPAL_NAME="$CLIENT_ALIAS"
SEC_PRINCIPAL_LOCATION="<parent directory of wallet.tsam-lms>"
SEC_PRINCIPAL_PASSVAR="PASSVAR"
```

4. Load and start the configuration

```
tmloadcf <UBBCONFIG>
# Start Tuxedo after the WebLogic domain is running
tmboot -y
```

Note

Final WebLogic stores must report `Keystore type: JKS`. The LMS wallet remains PKCS12 because it is the Oracle wallet artifact. Keep private keys and passwords restricted.

4.2.1.4 Example

To create a WebLogic Server domain using the bundled WLS:

```
./TSAMWLSProvision.sh -domainLoc /u01/oracle/user_projects/domains/
tsam_domain \
  -port 7002 -dataServerPort 7003 -adminPort 9002 -adminUser tsamops \
  -identityKeystore /home/oracle/ssl/identity.jks \
  -trustKeystore /home/oracle/ssl/trust.jks \
  -privateKeyAlias myserver
```

To create a WebLogic Server domain with TLS disabled:

```
./TSAMWLSProvision.sh ... -port 8001 -dataServerPort 8002 -adminUser weblogic -
disableTLS
```

4.2.1.5 Output

A new WebLogic Server domain is created. Start it by executing `$TSAM_DIR/bin/startup.sh -domainLoc <DOMAIN_HOME>`, where `<DOMAIN_HOME>` is the same directory specified with `TSAMWLSProvision.sh -domainLoc`.

4.2.2 Deploy Oracle TSAM Plus Manager

The related DB users must be provisioned before the TSAM Plus ear file deployment.

The Oracle TSAM Plus Manager application is packaged in an EAR file `tsam_22c.ear`. Oracle TSAM Plus Manager uses a dedicated WebLogic Server data source to access the database. The JNDI name of the data source is `jdbc/TSAM_db1`. Also, when `-enableAI` is set, then another data source `jdbc/TSAM_db2` is created. This option adds `TSAM_DS2 (jdbc/TSAM_db2)` with `-createDataSource`. It does not provision AI users, credentials, profiles, agents, or schemas, and `-dbAIUser` is required.

Before deployment, run `TSAMOIDC_enable.sh -oidcPropertiesFile <file>` to preprocess `tsam_22c.ear`. The properties file must define `issuer`, `clientId`, `clientSecret`, and

redirectUrl; inactivityTimeout is optional. Deploy the modified EAR with -enableOIDC. This option configures the OIDC identity assertter in myrealm. Map the administrator and viewer principals to the corresponding application roles, and protect the properties file and modified EAR because they contain the client secret.

The shell script TSAMDeploy.sh can be used optionally to create the data source, and deploy the Oracle TSAM Plus Manager EAR file to a WebLogic server domain.

Make sure the WebLogic Server domain is up and running. If it is not running, execute \$TSAM_DIR/bin/startup.sh to start the WebLogic Server domain.

(Optional) Configures a WebLogic OpenID Connect identity assertter named oidc in myrealm and places it first in the authentication-provider order when no provider with that name exists. This option does not modify the EAR or update an existing oidc provider. Before using this option, preprocess tsam_22c.ear with TSAMOIDC_enable.sh -oidcPropertiesFile <file>.

- [Usage](#)
- [Examples](#)
- [Output](#)

4.2.2.1 Usage

```
./TSAMDeploy.sh -WLSHome <path to WLS Home> -WLSURL <WLS URL> -WLSAdminUser
<admin username> [-WLSHostnameVerification] [-disableTLS] [-trustKeystore
<path>] [-createDataSource] [-dbConnStr <DB connection string>] [-dbUser <DB
user>] [-enableAI] [-dbAIUser <DB AIUser>] [-enableOIDC] [-EARFile <path to
EAR file> [-domainLoc <path to domain>]]
```

Table 4-5 Parameter List

Name	Description
-WLSHome <path to WLS Home>	(Optional) ORACLE_HOME of WLS installation. If not set, then it uses the bundled WLS.
-WLSURL <URL>	Admin URL of the target WebLogic Server.
-WLSAdminUser <username>	Admin username of the WLS domain.
-WLSHostnameVerification	(Optional) Flag to enable hostname verification.
-disableTLS	(Optional) TLS disabled
-trustKeystore <path>	(Optional) Path to trust keystore.
-createDataSource	(Optional) Creates the Data Source
-dbConnStr <string>	(Optional) Database connection string. Required if creating a data source.
-dbUser <username>	(Optional) Database username. Required if creating a data source.
-enableAI	(Optional) Enable AI feature for TSAM.
-dbAIUser <aiusername>	(Optional).Database AI username when creating AI Data Source. It is mandatory if you are creating a data source and -enableAI is set.
-enableOIDC	Preprocess tsam_22c.ear with TSAMOIDC_enable.sh -oidcPropertiesFile <file>, then deploy that EAR with TSAMDeploy.sh ... -enableOIDC. List issuer, clientId, clientSecret, and redirectUrl; document myrealm and administrator/viewer principal-to-role mappings; and restrict access to the properties file and EAR because clientSecret is embedded.

Table 4-5 (Cont.) Parameter List

Name	Description
-EARFile	Optional unless deploying or redeploying the TSAM Plus Manager EAR. When -EARFile is set, -domainLoc is required.
-domainLoc <path to domain>	Required when -EARFile is set. Location of the target WebLogic domain.
-h or -help	(Optional) Show help message.

4.2.2.2 Examples

To create a data source in the bundled WebLogic Server and deploy Oracle TSAM Plus, specify the -domainLoc parameter when using the -EARFile option.

To create a data source in the bundled WLS, and deploy the Oracle TSAM Plus When -EARFile is set, -domainLoc is required.

```
./TSAMDeploy.sh -WLSURL t3s://localhost:9002 \ -WLSAdminUser weblogic
               -trustKeystore /home/oracle/ssl/tsam-tls-truststore.jks -createDataSource
               -dbConnStr
               "jdbc:oracle:thin:@//dbhost:1521/ORCL" -dbUser tsamuser1 -enableAI -
               dbAIUser tsamuser2
               -EARFile ${TSAM_DIR}/deploy/tsam_22c.ear -domainLoc <domain_directory>
```

EAR Only Deployment

```
./TSAMDeploy.sh -WLSURL t3s://localhost:9002 -WLSAdminUser weblogic \
               -trustKeystore /u01/keystores/trust.jks \
               -EARFile /workspace/tsam/tsam-adf-app/Mgr/target/tsam_22c.ear \
               -domainLoc /u01/oracle/user_projects/domains/tsam_domain
```

To create Data Source only in the bundled WLS, without deploying Oracle TSAM Plus Manager EAR file:

```
./TSAMDeploy.sh -WLSURL t3s://localhost:9002 -WLSAdminUser weblogic -
trustKeystore /home/oracle/ssl/tsam-tls-truststore.jks -createDataSource -
dbConnStr "jdbc:oracle:thin:@//dbhost:1521/ORCL" -dbUser tsamuser1 -enableAI -
dbAIUser tsamuser2
```

```
./TSAMDeploy.sh -WLSURL t3s://localhost:9002 \-WLSAdminUser weblogic \v-
trustKeystore /u01/keystores/trust.jks \ -EARFile ${TSAM_HOME}/deploy/
tsam_22c.ear\
-domainLoc <DOMAIN_HOME>
```

To deploy the Oracle TSAM Plus Manager EAR file to the bundled WLS, without creating a data source:

```
./TSAMDeploy.sh -WLSURL t3s://localhost:9002 -WLSAdminUser weblogic -  
trustKeystore /u01/keystores/trust.jks -EARFile /workspace/tsam/tsam-adf-  
app/Mgr/target/tsam_22c.ear
```

4.2.2.3 Output

The Oracle TSAM Plus Manager application is deployed to the WebLogic Server domain. You can access the Oracle TSAM Plus Console from a browser via `https://<hostname>:<port>/tsam` with username `admin` and the password you entered when prompted “Enter TSAM Plus admin password” during the execution of `TSAMDBSchemaSetup.sh`.

Note

- Use HTTPS when TLS is enabled and HTTP with `-disableTLS`.
- `<port>` is the WebLogic console listen port, not the TSAM DataServer channel port

4.2.3 Start and Shutdown WebLogic Server Domain

To start the WebLogic Server domain:

```
$TSAM_DIR/bin/startup.sh -domainLoc <DOMAIN_HOME>
```

To shutdown the WebLogic Server domain:

```
$TSAM_DIR/bin/shutdown.sh -domainLoc <DOMAIN_HOME> -trustKeystore <path> [-  
WLSHostnameVerification]
```

The `-trustKeystore` option is required. Hostname verification is disabled by default and is enabled only when `-WLSHostnameVerification` is specified.

5

Upgrade Knowledge Base

Follow this procedure when TSAM Plus is already deployed and AI is already enabled, and you only need to refresh the knowledge base.

- [Update Source Documents](#)
- [Verify DIRECTORY Privileges Before AI Profile Rebuild](#)
- [Regenerate the AI Helper SQL Files with the TSAM Plus Database User](#)
- [Rebuild the AI profiles and Vector Indexes with the TSAM DB AI User](#)

5.1 Update Source Documents

- In `CLOUD` mode, operators do not update a document-source URL; rebuild the vector indexes from the built-in source.
- In `LOCAL` mode, update the files under the fixed database-host paths:

In `LOCAL` mode, update the files under the fixed database-host paths:

- `/u02/tsam\_ai/userdoc`
- `/u02/tsam\_ai/consolodoc`
- `/u02/tsam\_ai/followupdoc`

- In `LOCAL` mode, make sure the Oracle database process user can still read the updated files from those directories.

5.2 Verify DIRECTORY Privileges Before AI Profile Rebuild

- If they were dropped in an already-deployed environment, the DBA should recreate the fixed `DIRECTORY` objects (`TSAM\_USERDOC\_DIR`, `TSAM\_CONSOLEDODIR`, and `TSAM\_FOLLOWUPDOC\_DIR`) with the same database-host paths and grant `READ, WRITE` to the existing TSAM Plus DB AI user before continuing to next step.
- Rerun `TSAMDBUserProvision.sh -enableAI -aiSourceMode LOCAL` only when you intentionally recreate the TSAM Plus database users.
- Keep `AI\_VECTORINDEX\_SOURCE\_MODE="LOCAL"` in `TSAMSetup.cfg` before continuing to next step.
- CREATE OR REPLACE DIRECTORY TSAM_USERDOC_DIR AS '/u02/tsam_ai/userdoc';
- CREATE OR REPLACE DIRECTORY TSAM_CONSOLEDODIR AS '/u02/tsam_ai/consolodoc';
- CREATE OR REPLACE DIRECTORY TSAM_FOLLOWUPDOC_DIR AS '/u02/tsam_ai/followupdoc';
- GRANT READ, WRITE ON DIRECTORY TSAM_USERDOC_DIR TO <TSAM_DB_AI_USER>;
- GRANT READ, WRITE ON DIRECTORY TSAM_CONSOLEDODIR TO <TSAM_DB_AI_USER>;

- GRANT READ, WRITE ON DIRECTORY TSAM_FOLLOWUPDOC_DIR TO <TSAM_DB_AI_USER>;

5.3 Regenerate the AI Helper SQL Files with the TSAM Plus Database User

Run this as the TSAM Plus schema owner (not the AI user).

```
$TSAM_DIR/deploy/TSAMDBSchemaUpdateConfig.sh <dbUser>
```

- In `CLOUD` mode it uses the built-in documentation source.
- In `LOCAL` mode it generates the fixed `TSAM\_USERDOC\_DIR:`, `TSAM\_CONSOLEDOC\_DIR:`, and `TSAM\_FOLLOWUPDOC\_DIR:` locations. The corresponding Oracle `DIRECTORY` objects must exist in the database. Missing or empty worker LLM values inherit from `AI\_MAIN` only for same-provider workers; mixed-provider workers must set their provider-specific model or Azure deployment values explicitly.

Table 5-1 Parameter List

Name	Description
<db_user>	The name of the TSAM Plus database user, not the name of the TSAM Plus database AI user
./TSAMDBSchemaUpdateConfig.sh [--validate-only] <db_user>	The script accepts --validate-only only before the database user.

To generate the AI helper SQL files for the TSAM Plus database user **tsamuser**, run the command:

```
$TSAM_DIR/deploy/TSAMDBSchemaUpdateConfig.sh tsamuser
```

To change an AI provider, model, region, Azure deployment, or maximum token value independently of a knowledge-base refresh, see [Update AI Providers and Models](#).

5.4 Rebuild the AI profiles and Vector Indexes with the TSAM DB AI User

```
sqlplus -L "<dbAIUser>@<DB connection string>" @${TSAM_DIR}/deploy/TSAMCreateAIProfile.sql
```

It prompts for the password to access the DB. This step drops and recreates the AI profiles, vector indexes, and Select AI agent objects so the updated knowledge-base content is picked up. If the credential values also changed, run TSAMCreateAICredential.sql as the AI user before running the profile script.

6

Update AI Providers and Models

To change an AI provider, LLM model, token limit or other provider-specific settings after deployment:

1. Update `$TSAM_DIR/deploy/TSAMSetup.cfg` with desired AI profile configuration parameters.
2. Validate the updated configuration.
`bash "$TSAM_DIR deploy TSAMDBSchemaUpdateConfig.sh" --validate-only <dbUser>`

Note

`<dbUser>` is the primary TSAM database schema user, not the TSAM DB AI user.

3. If the provider or its credentials changed, run the regenerated credential script as the TSAM DB AI user.
`sqlplus -L "<dbAIUser>@<DB connection string>" @$TSAM_DIR/deploy/TSAMCreateAICredential.sql`
4. Run the regenerated profile script as the TSAM DB AI user.
`sqlplus -L "<dbAIUser>@<DB connection string>" @$TSAM_DIR/deploy/TSAMCreateAIProfile.sql`

The profile script drops and recreates the AI profiles, vector indexes, and Select AI agent objects. For a non-ADB deployment, switching to OpenAI also requires the appropriate database-side host and wallet ACEs for the TSAM DB AI user.