

# **Oracle Tuxedo Application Runtime for CICS**

Reference Guide

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# Introduction

The purpose of this document is to document the Oracle Tuxedo Application Runtime for CICS configuration, describing the configuration files, the environment variables and the server configuration including CLOPT options.

In addition this document includes information about the Oracle Tuxedo Application Runtime for CICS Preprocessor. Although the CICS Runtime Preprocessor is not a Runtime tool, it is used on an ongoing basis on the target platform when compiling COBOL programs for use with CICS Runtime.

The document includes the following chapters:

- [CICS Runtime Concepts](#)
- [CICS Runtime Servers](#)
- [CICS Runtime Configuration Files](#)
- [VSAM Configuration File](#)
- [CICS Runtime Integration with Non-3270s Terminal](#)
- [Environment Variables](#)
- [Server Configuration](#)
- [Security Configuration](#)
- [CICS Commands and Parameters Coverage](#)
- [System Commands and Transactions](#)
- [CICS Runtime Server Build Tool](#)
- [CICS Runtime Preprocessor](#)
- [CICS Runtime Messages](#)
- [Configuring Oracle Tuxedo XA Connection to DB2 Using DB2 Connect](#)

## Introduction

# CICS Runtime Concepts

This chapter contains the following topics:

- [Purpose](#)
- [CICS Runtime Goals](#)
- [CICS Runtime Architecture](#)
- [System Administration Perspective](#)
- [CICS Runtime for COBOL](#)
- [CICS Runtime for C](#)

## Purpose

There are different approaches to migrating CICS applications to a UNIX/Linux environment. The purpose of this section is to give an understanding not only of what CICS Runtime is and what it does, but also what it is not and what it does not do. Particularly the aim is to explain that CICS Runtime is not an emulation of the CICS application environment on a UNIX/Linux system. CICS Runtime keeps the application logic contained in the COBOL programs but is totally compatible with the Tuxedo client/server architecture for the execution of that logic. CICS Runtime provides a middleware between the CICS coding in the programs and the Tuxedo OLTP system, UNIX/Linux OS and Oracle database responsible for executing transactions and providing persistence.

## CICS Runtime Goals

The first aim of CICS Runtime is to preserve the considerable investment already made in CICS applications by allowing migrated programs to run unchanged (except for a syntactic adaptation) by using an API emulation runtime on top of native Tuxedo features. This means the impact of migration is limited on:

- 3270 screens and BMS management; there is no impact on application end-users.

- EXEC CICS calls; there is no impact on developers.

At the same time, CICS Runtime is run entirely on a robust production environment based on Tuxedo that protects and guarantees application functionality.

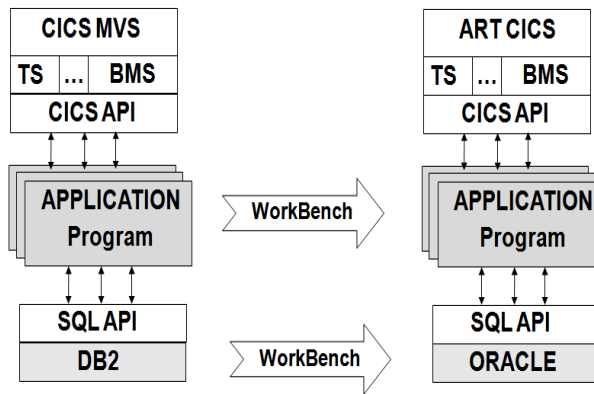
In fact, CICS Runtime gives customers the benefits of Tuxedo distributed architecture without impacting application APIs. It allows the key strengths of Tuxedo to be leveraged and allows routes to the future including SOA to be opened.

# CICS Runtime Architecture

## Software Development Perspective

The following diagram shows the software bricks used to create the application environment on the migration source and target platforms.

Figure 2-1 Migration Software Environments



Except for the top and bottom bricks, there is little else that changes for the software developer.

## Programmatic Interface

CICS Runtime offers a library of CICS API reproducing the functionality of the z/OS CICS API and offering equivalent services to the migrated CICS applications, and in addition it offers BMS capabilities with support for 3270 screens.

In a CICS application on a z/OS platform all interactions with resources are done thru the EXEC CICS API (with the exception of DB2).

The CICS Preprocessor (on Z/OS) transforms these EXEC CICS into calls to the CICS library.

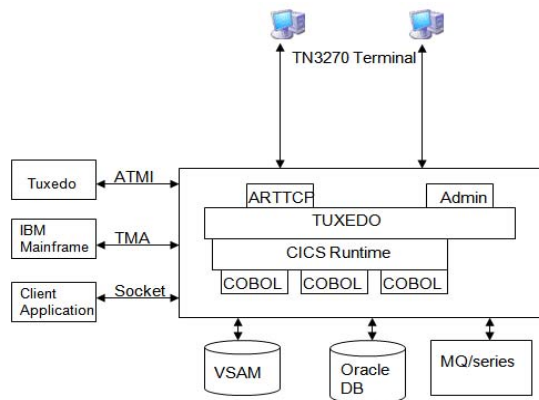
On the target platform, the same philosophy is used; an CICS Runtime Preprocessor (an CICS Runtime compile-time tool) transforms these EXEC CICS into calls to the CICS Runtime library.

For the software developer, there is little that changes. The CICS Runtime preprocessor automatically changes the CICS API that is called. There are some limitations in the command that can be used; these are described in [CICS Commands and Parameters Coverage](#).

## System Administration Perspective

For a software administrator, there is little that remains the same. There are the same applications to be executed and end-users still access applications using the same 3270 terminals. Apart from that, everything else is different and relies on a native Tuxedo architecture to manage transactions with the aid of CICS Runtime to provide an API between the COBOL programs and Tuxedo.

**Figure 2-2 CICS Runtime Architecture**



CICS Runtime provides the run-time support to allow converted CICS applications to run in a robust production ready environment based on TUXEDO /T, while offering applications functionally equivalent behavior.

In term of deployment, the system is distributable on one or multiple machines in a single TUXEDO domain, or several domains communicating through a TUXEDO domain.

In term of administration, the administration is native TUXEDO, with all tuxedo administration tools being normally usable, plus a few administration tables for CICS only concepts, like terminal definitions, and Transaction - First Program table.

## z/OS CICS Concepts in a CICS Runtime Environment

Developers and administrators used to working in a z/OS CICS environment naturally want to know how concepts familiar on the source platform are implemented on the target platform.

[Table 2-1](#) gives an overview of how the source platform notions have an equivalent on the target platform.

**Table 2-1 Source Platform Notions**

| <b>z/OS CICS</b>                                 | <b>CICS Runtime</b>   |
|--|---|
| CICS Session                                     | TUXEDO Session  |
| Transaction                                      | Tuxedo Service  |
| Transaction First Program                        | Program associated with service   |
| L.U.W.<br>SYNCPOINT [ROLLBACK]                   | Transaction<br>tpcommit() / tpabort()   |
| COBOL Program                                    | COBOL Program   |
| CALL "SUBPGMX"                                   | CALL "SUBPGMX"  |
| EXEC CICS LINK local                             | Local call with memory stacking and isolation.                                |
| DPL (Distributed Program Link)                   | Tpcall to a tuxedo service  |
| Conversational Programs<br>Pseudo-Conversational | tpconnect() / tpsend() / tpreceive()<br>Request/Response tpcall() / tpreply() |
| COMMAREA (State Info/Context)                    | Tuxedo is stateless, context passed through buffers                           |

## Administrative Tasks

Most of this guide describes how to administer resources for CICS application running with CICS Runtime on a Tuxedo system. CICS Runtime uses Tuxedo natively with the addition of a few extra resource files and servers.

This provides all the robust characteristics of Tuxedo including:



- Load balancing, priority management, Dynamic routing,
- Supervision, automatic restart of servers,
- Transparent distribution on multiple machines,
- Server migration from one machine to another,
- The distribution of the load of a new machine is very simple.
  - Declare the machine in the UBBCONFIG
  - Launch a few servers offering transactions on this machine

## CICS Runtime for COBOL

ART CICS Runtime supports COBOL programs compiled with different COBOL compilers. Refer to [Supported Platforms](#) for the COBOL compilers ART CICS Runtime supports. COBOL runtime is required in order to run COBOL programs in ART CICS Runtime.

Some ART CICS Runtime features are specific to certain COBOL compiler.

If COBOL-IT is used:

- COBOL programs should be compiled with `-fthread-safe` option.
- When you upgrade the version of COBOL-IT runtime, you may require recompiling the COBOL programs with the new version of COBOL-IT compiler.

If Micro Focus Visual COBOL is used:

- When using Micro Focus Visual COBOL 2.1 or 2.2 on AIX/Solaris OS platforms, make the following soft links in `$COBDIR/lib`.

```
ln -s libcobrts64.so.3 libcobrts64.so.2
ln -s libcobrts64_t.so.3 libcobrts64_t.so.2
ln -s libcobmisc64.so.3 libcobmisc64.so.2
ln -s libcobmisc64_t.so.3 libcobmisc64_t.so.2
ln -s libcobcrtn64.so.3 libcobcrtn64.so.2
```

- When using Micro Focus Visual COBOL 2.2, we recommend you set COBOL runtime tunable parameter `subsystem_cancel_mode=1`, which specifies logical cancel for `CBL_SUBSYSTEM` cancels. See *Micro Focus documentation* for more information.

## CICS Runtime for C

ART CICS Runtime C support is still COBOL depended. All CICS C programs are required to be compiled with COBOL/cob compiler and are executed in COBOL runtime. Therefore, COBOL installer is mandatory and currently only Micro Focus COBOL is supported.

For more information about CICS Runtime C, please refer to [CICS Runtime C Program Support](#).

# CICS Runtime Servers

## The CICS Runtime Servers

This section describes the different servers and the role they play in the overall handling of transactions. The configuration of the servers is described in [Server Configuration](#).

- [3270 Terminals and User Session Management \(ARTTCPL/ARTTCPH\)](#)
- [Connection Server \(ARTCNX\)](#)
- [Logon Server \(ARTLOGN\)](#)
- [System and Resource Management Server \(ARTSRM\)](#)
- [Synchronous Transaction Servers \(ARTSTRN/ARTSTR1\)](#)
- [Temporary Storage Queue Management \(ARTTSQ\)](#)
- [Temporary Storage Queue Pool \(ARTTSQP\)](#)
- [Transient Data Queue Management \(ARTTDQ\)](#)
- [DPL Servers \(ARTDPL\)](#)
- [Asynchronous Transaction Servers \(ARTATRN/ARTATR1\)](#)
- [Conversation Server \(ARTCTRN/ARTCTR1\)](#)
- [Synchronous Transactions Servers for Non-3270s Terminal Of Tuxedo ATMI Base \(ARTWTRN/ARTWTR1\)](#)
- [Delayed Asynchronous Transaction \(/Q Part\)](#)
- [Administration Server \(ARTADM\)](#)
- [Shared Storage Management Server \(ARTSHM\)](#)
- [ART for CICS TCP/IP Listener \(ARTCSKL\)](#)

## 3270 Terminals and User Session Management (ARTTCPL/ARTTCPH)

### Description

The role of these servers is to accept and manage user connections made thru a 3270 terminal emulator and manage the resulting user session and related 3270 inputs and outputs until the end of the user session.

Functionally, this role resembles the one played by the Terminal Owning Region in a CICS MRO configuration.

These 3270 user session management tasks are managed by a couple of server types: ARTTCPL and ARTTCPH, where the final 'L' stands for listener and the final 'H' stands for handler.

- ARTTCPL — Performs the role of a listener server. ARTTCPL listens to a public address – the address to which users wanting to connect to this application with a 3270 emulator will connect – then for each incoming connection request, it transmits this connection to one of its handler processes.
- ARTTCPH — Each handler process manages multiple connections including terminal I/O, user authentication, and calling the requested transactions on behalf of the user.

It is the role of the ARTTCPL to launch and manage the requested number of handler processes (ARTTCPH).

Each time a user requests a transaction, ARTTCPH transmits (via `tpconnect`) this transaction request to the transaction server.

This functionality resembles that provided by T.O.R. in a CICS MRO configuration when it routes a transaction to an A.O.R (Application owning Region).

### Connection Server (ARTCNX)

This server offers technical services needed by terminal handlers during user connection and disconnection phases.

The technical services are offered using internal message oriented services like `connect` and `disconnect`:

- `connect` performs various initialization tasks such as attributing the user Session ID and `Terminal_ID`.
- `disconnect` manages final tasks during disconnection.

The connection server also provides a few classical CICS transactions:

- **CESN**: the Sign on transaction
- **CESF**: the Sign off transaction
- **CSGM**: the Good Morning transaction (default Good Morning transaction)

Specifically, **ARTCNX** handles the request from **ARTTCPH** and **ARTSTRN/ARTSTR1**, **LUNAME** validation check, and **TERMINID/LUNAME** assignment. All services that **ARTCNX** publishes and their functionalities are listed as below.

- **gensess** generates a session ID for each terminal; the session ID is maintained internally in **ART CICS**.
- **delsess** frees session ID when its terminal terminates.
- **connect** generates a locally unique (unique in each CICS region) **TERMINID** and a globally unique **LUNAME** (unique in all CICS regions) for auto-install terminal, checks **LUNAME** validation for the **LUNAME** specified terminal, and changes **TERM** status to **ACQUIRED**.
- **disconnect** frees **TERMINID** and **LUNAME**, and change **TERM** status to **RELEASED**.
- **inquire** handles **INQUIRE NETNAME/TERMINID** request from **ARTSTRN**.
- **update** handles **SET TERMINAL** request from **ARTSTRN**.
- **authfail** outputs the error message in terminal if **CESN** logon fails.
- **CESN** specifies the Sign on transaction
- **CESF** specifies the Sign off transaction
- **CSGM** specifies the Good Morning transaction (default Good Morning transaction)

**Note:** If **ISC\_ENABLE=YES** is set, **gensess** and **delsess** will be published by **ARTLOGN** instead. See “Authentication Transactions” in [System Commands and Transactions](#) for more information.

## Logon Server (ARTLOGN)

This server offers technical services needed by terminal handlers when users log on **ART CICS**.

This server offers the following services:

**ART\_LOGON** sends the "ART runtime welcome" panel and asks for **APPLID** input.

`gensess` generates a globally unique session ID (unique in all CICS regions) with 16 characters for each terminal.

`delsess` removes the session ID when the corresponding terminal disconnects.

**Note:** `ARTLOGN` should be only configured when `ISC_ENABLE=YES` is specified; otherwise, the server will not boot.

## System and Resource Management Server (ARTSRM)

This server centralizes the management of ART runtime information, which is generated and queried by applications.

**Note:**

- System and Resource Management Server (ARTSRM) has three versions: ARTSRM, ARTSRM\_ORA (for Oracle), and ARTSRM\_UDB (for UDB). ARTSRM uses shared memory. ARTSRM\_ORA (for Oracle) and ARTSRM\_UDB (for UDB) use shared memory or database to store data; when configured to use database, the server utilizes DB to provide HA capability.
- When your ARTSRM server uses shared memory and you do not specify `SRM_IPCKEY`, ARTSRM for the same region must be configured in the same Tuxedo group.
- ARTSRM for the same region can be only configured on one host in MP environment.
- ARTSRM does not support "Multiple Servers, Single Queue (MSSQ)" configuration.
- To get correct running time information, ARTSRM must be configured and started when Oracle Tuxedo is booted.
- To use ARTSRM\_ORA or ARTSRM\_UDB, database tables must be created before startup; ARTSRM\_ORA or ARTSRM\_UDB from the same region can belong to different Tuxedo groups on different machines (the Tuxedo group must be TMS group which has `OPENINFO` specified).

## Synchronous Transaction Servers (ARTSTRN/ARTSTR1)

### Description

The task of these servers (`ARTSTRN` and `ARTSTR1`) is to offer application transactions and process the corresponding programs.

This server provides a similar functionality to that provided by an Application Owning Region in a CICS MRO configuration. `ARTSTRN/ARTSTR1` servers present application transactions as Tuxedo services and when receiving a transaction request execute the corresponding programs. These servers are conversational in order to be able to manage true conversational CICS transactions.

## Processing

1. When starting, a `ARTSTRN/ARTSTR1` server publishes one service per transaction it offers.
2. When a user transmits a transaction request, the `ARTTCPH` performs a `tpconnect` to the corresponding transaction (service).
3. One `ARTSTRN/ARTSTR1` server offering this service receives the request with the associated commarea and screen, then processes the transaction.
4. Then:
  - In the case of a normal pseudo-conversational CICS transaction; on the `RETURN {TRANSID}` the server replies to the client, finishing the conversation by a `tpreturn()` returning the new 3270 screen, and the commarea.

## Non Concurrent Synchronous Transaction Servers (`MAXACTIVE = 1 (ARTSTR1)`)

- On CICS:
  - Transactions that are defined as belonging to a transaction class are subject to scheduling constraints before they are allowed to execute.
  - If transactions belonging to an active transaction class are already running, any new transactions are queued.
  - The `MAXACTIVE` attribute is used to specify the maximum number of transactions that you want to run.
  - By putting your transactions into transaction classes, you can control how CICS dispatches tasks.
- In CICS Runtime:
  - The scheduling of transactions and the affectations of resources to group of transactions is performed differently. The number of servers offering transactions determines the scheduling of transactions, and the relative amount of resources affected to a group of transactions.

- The special case of `MAXACTIVE 1`:
  - This case is very specific, because it impacts the functional characteristics of the application.
  - It ensures that two transactions of the same class will never execute concurrently. It defines a mutually exclusive behavior that is preserved on the target platform to guarantee correct behavior of the application.

The transactions belonging to a tranclass with a `maxactive = 1`, will not be offered by `ARTSTRN` servers, because several such servers can automatically be started to manage parallel processing.

Instead, a dedicated type of server—`ARTSTR1`—is allocated to this role. An `ARTSTR1` server publishes the transactions belonging to one `TRANCLASS` with `MAXACTIVE = 1`, guaranteeing that two transactions of the same tranclass with `maxactive = 1`, will not execute concurrently. In Tuxedo terms, guaranteeing than two such transactions are not published by two different servers.

To summarize the differences:

- `ARTSTR1`: Publishes only once transactions belonging to a `MAXACTIVE 1` tranclass.
- `ARTSTRN`: Publish as many times as needed, transactions with `MAXACTIVE > 1`.

## Temporary Storage Queue Management (ARTTSQ)

The role of the `ARTTSQ` servers is to centralise the management the TS Queue operations which are requested by applications. These tasks are managed by `ARTTSQ` servers.

Depending on the workload expected on the TS queue, a single server or many `ARTTSQ` servers are configured.

`ARTTSQ` servers publish technical services:

- `TSQUEUE` to service operations on queues not matching any TS Queue Model.
- `{MODEL}_TSQUEUE` to service operations on queues matching a specific model, one such service must be published using one `ARTTSQ` server for each model.

In a simple configuration, a single `ARTTSQ` server will treat all the TS operations, offering the `TSQUEUE` service, and all `{MODEL}_TSQUEUE` services.

In a more complex configuration, one `ARTTSQ` server may offer the `TSQUEUE` and some `{MODEL}_TSQUEUE` services, while other `ARTTSQ` servers will each offer different `{MODEL}_TSQUEUE` services.



Tuxedo 12c EM pack monitors ARTTSQ, detailed TSQ properties, and statistics information can be retrieved via EM.

## Temporary Storage Queue Pool (ARTTSQP)

The role of the ARTTSQP server is to manage TS queue which is defined in shared TS pool.

It uses database to store queue data. You must configure this server in a Tuxedo TMS group; you can configure more than one ARTTSQP servers serving for the same TSMODEL.

ARTTSQP supports Tuxedo EM TSQ monitor interface, detailed TS queue properties, and statistics information that can be retrieved via EM.

## Transient Data Queue Management (ARTTDQ)

### Description

The role of the ARTTDQ servers is to centralise the management the TD Queue operations which are requested by applications. These tasks are managed by one ARTTDQ server.

A single ARTTDQ server publishes one service per declared queue in the configuration file and will treat all the CICS TD operations, offering the TD QUEUE service for each queue.

Tuxedo 12c EM pack monitors ARTTDQ, detailed TDQ properties, and statistics information can be retrieved via EM.

## DPL Servers (ARTDPL)

In complex configurations an application may need to make distributed program calls. In this case another kind of server ARTDPL is needed to manage DPL program.

ARTDPL servers publish DPL programs or Mirror transactions that are callable by CICS LINK and EXCI interface as services, and manage the execution of these services.

ARTDPL can be also accessed by a native customized Tuxedo client, the client can use Tuxedo FML32 fields or RECORD to compose the request to ARTDPL. Please refer to the section "DPL communication interfaces for external Tuxedo clients" for the details.

Following are the services ARTDPL publishes:

- `<sysid>_<program>`

This service is called when make distributed program calls by "CICS LINK". <program> is defined in programs.desc and loaded by ARTDPL. <sysid> is specified by the ARTDPL CLOPT "-s" argument .

- **CSMI/CVMI**

This service is called if both <applid> and <transid> are not specified in EXCI interface request. CSMI and CVMI are two kinds of CICS system mirror transaction.

- **<applid>\_CSMI/<applid>\_CVMI**

This service is called if <transid> is not specified but <applid> is specified in EXCI interface request. <applid> is specified by the ARTDPL CLOPT "-a" argument or can be specified in the system.desc.

- **MIRROR\_<transid>**

This service is called if <applid> is not specified but <transid> is specified in EXCI interface request. <transid> is defined as a customized mirror transaction in the transactions.desc.

- **<applid>\_MIRROR\_<transid>**

This service is called if both <applid> and <transid> are specified in EXCI interface request. <transid> is defined as a customized mirror transaction in the transactions.desc, <applid> is specified by the the ARTDPL CLOPT "-a" argument or can be specified in the system.desc.

- **<applid>\_info**

The service provides current CICS region <sysid> which is associated with <applid>. For EXCI interface request only.

- **default\_info**

This service is called if <applid> is not specified in EXCI interface by the client. For EXCI interface request only.

## Asynchronous Transaction Servers (ARTATRN/ARTATR1)

An application may request an asynchronous transaction launch using EXEC CICS START TRANSID. In this case, the request needs to be treated asynchronously by another server. These tasks are managed by ARTATRN/ARTATR1.

**Note:** A request using the EXEC CICS START TRANSID command TERMID option is managed by ARTSTRN/ARTSTR1.

These servers publish transactions callable by `EXEC CICS START TRANSID` as services named `ASYN_{Transaction_Name}`, and manage execution of these services.

## Conversation Server (ARTCTRN/ARTCTR1)

An application may request an a conversation launch using 'EXEC CICS CONVERSE' requests. In this case the request needs to be treated by another server. These tasks are managed by ARTCTRN/ARTCTR1 servers.

These servers publish transactions callable by `EXEC CICS CONVERSE` as services named `{SysId}_{Transaction_Name}`, and manage execution of these services.

## Synchronous Transactions Servers for Non-3270s Terminal Of Tuxedo ATMI Base (ARTWTRN/ARTWTR1)

### Description

- Client Description

The non-3270s terminal is different from common 3270 terminal emulator which should follow the 3270 protocol; The non-3270s terminal could be a native Tuxedo client, Java client, and Web UI based on Tuxedo ATMI and should be implemented by customer themselves or 3rd-party.

- Server Description

The task of servers of ARTWTRN/ARTWTR1 is to offer application transactions and process the corresponding programs.

These servers provide a similar functionality to ARTSTRN/ARTSTR1 and present application transactions as Tuxedo services when receiving a transaction request from non-3270s terminals.

These servers are non-conversational and thus can manage pseudo-conversational CICS transactions.

### Processing

When the server boots, it will advertise each transaction defined in `transactions.desc` as a Tuxedo service. When ARTWTRN/ARTWTR1 receives the request from non-3270s terminals, the server loads corresponding CICS program located at directory `$COBPATH` (`$COB_LIBRARY_PATH` For COBOL-IT), reorganizes the application data received from FML buffer according to related COPYBOOK, and passes data to loaded CICS program for

processing. When CICS program returns by invoking CICS RETURN, the server will insert application data into FML buffer and tpreturn to clients.

## Delayed Asynchronous Transaction (/Q Part)

Asynchronous transactions are launched using 'EXEC CICS START TRANSID' requests that may also be launched with a delay set to an interval or to a fixed time.

In this case the transaction request is deposited into a Tuxedo /Q Queue, and when the time is ready, the transaction will be automatically invoked.

For this feature to be available, a few extra components must be activated:

- A Tuxedo /Q Queue Space named `ASYNC_QSPACE` must be created.
- A Tuxedo /Q Queue named `ASYNC_QUEUE` must be created in the queue space.
- A `TMQFORWARD` server must be configured to receive messages from this queue and invoke the application transaction corresponding to the request.

---

**Tip:** `TMQFORWARD` will always call the same technical transaction called `ASYNC_QUEUE` (the name of the queue). This transaction will extract the field `CX_TRANSID`, which will contain the name of the real application transaction to call and will perform a `TPACALL(NOREPLY)` of this transaction and tpreturn immediately.

---

## Administration Server (ARTADM)

### Description

The administration server is responsible for the administration of CICS resources. It provides the following functionalities:

- Takes charge of loading the resource definitions used by other servers.
- Offers the services used by `artadmin` (ART administration console) for dynamic administration of CICS resources and propagates the dynamic configuration requests from `artadmin` to all the appropriate servers in the system.
- Propagates the resource definition files to the slave machines from the central configuration repository when configured on each node in a distributed environment.

The configuration files only need to be configured on the master node, and the administration servers propagate the configuration files to each slave node.

## Shared Storage Management Server (ARTSHM)

### Description

ARTSHM is used to manage shared memory for `GETMAIN SHARED`. It handles shared memory allocation and free request.

Environment variable `KIX_SHR_IPCKEY` and `KIX_SHR_SIZE` specify IPC key and size of shared memory, these two variables must be configured to enable this feature. User can specify shared memory attach address by `KIX_SHR_ATADDR`, default `0x300000000000`, the specified address must be a page-aligned address. Environment variables must same for ARTSHM and application servers.

User can configure more than one ARTSHM in a domain. On startup, the first booted ARTSHM creates/initializes shared memory, following ARTSHM attaches to the shared memory. On shutdown, the last ARTSRM destroys shared memory.

ARTSHM must startup before any ART application servers (`ARTSTRN/1`, `ARTATRN/1` and `ARTDPL`), and shutdown after all ART application servers.

If application servers that use shared memory are still alive when the last ARTSRM shutdown, ARTSRM doesn't destroy shared memory, user must clean up the shared memory manually.

If ARTSHM stops abnormally, the shared memory is not destroyed, when ARTSHM recovered either by Tuxedo `RESTART` feature or manually startup, it attaches to shared memory, the memory management information is kept.

If the feature is not enabled, the server failed to boot.

## ART for CICS TCP/IP Listener (ARTCSKL)

### Description

ARTCSKL is the listener of ART for CICS TCP/IP socket and can perform the same functions as CICS TCP/IP listener CSKL. When client request comes, it passes the request to work task for processing, and then waits for another client request. ARTCSKL can run in standard or enhanced mode; you can set the mode through `FORMAT` parameter of ART for CICS TCP/IP socket listener configuration file (`listener.desc`).

For more information, see "[ARTCSKL Configuration](#)" in this book and "[Implementing Using ART for CICS TCP/IP Socket Interface](#)" in *Oracle Tuxedo Application Runtime for CICS User Guide*.

# CICS Runtime Configuration Files

## Overview

The administration of CICS Runtime is based on Tuxedo native tools with the addition of a limited number of configuration tables for features that are specific to CICS. In CICS configurations, resources are nowadays defined in the CSD when previously they were defined as independent tables. This latter approach is the one used with CICS Runtime.

Each resource configuration table describes a resource of a particular type: transaction, transaction class, program, file, TS Queue model, etc. Each table contains the specific parameters relevant to the resource.

## Shared Responsibilities Between Tuxedo and Resource Files

A CICS resource like a transaction with all its characteristics (first program, restartable, ...) is described in resource configuration files. The Tuxedo configuration elements, like how many servers of which group on which machine will offer this transaction is described in the Tuxedo configuration file `UBBCONFIG`.

This way the responsibilities are clearly distributed:

- Configuration of the resources guaranties the functional behavior of a CICS application.
- Configuration of the Tuxedo system guaranties optimal performance and robustness in production.

## Resource Definition Directory

All resource configuration files are stored in a common directory indicated by a well known environment variable: `${KIXCONFIG}`.

Each table describing CICS type of information is stored in a file read by servers at start time.

# Presentation of Configuration Files

## General Content

Each resource configuration table describes a resource type: transaction, transaction class, program, files, TS Queue, ..., with all the specific parameters relevant to this resource.

The central file defines the lists of resource groups. When configuring a ART CICS server, the administrator specifies which lists to load. A single list may contain a few tens of resource groups that include hundreds or thousands of individual resources.

## Structure

Each resource table contains three columns of parameters:

| Field Name                          | Type                        | Values  | Description  |
|-------------------------------------|-----------------------------|---|--|
| Name of the parameter in the table. | The data type of the field. | When specific values are required they are listed here. | Description of the purpose of the field, and its usage |

The rest of this section describes in detail each of these configuration files:

- [List of Groups Configuration File](#)
- [Transaction Configuration File](#)
- [Tranclasses Configuration File](#)
- [Programs Configuration File](#)
- [TS Queue Model Configuration File](#)
- [ENQ-Model Configuration File](#)
- [TD Queue Extra Partition Configuration File](#)
- [TD Queue Intra Partition Configuration File](#)
- [Mapset Configuration File](#)
- [System Configuration File](#)



- [Terminal Configuration File](#)
- [Typeterm Configuration File](#)
- [Connection Configuration File](#)
- [Web Service Configuration File](#)
- [Programs List Configuration File](#)
- [POOL Definition File](#)
- [TCP/IP Socket Listener Configuration File](#)
- [URIMAP Configuration File](#)

## List of Groups Configuration File

[Table 4-1](#) defines the lists of resource groups that may be loaded by application servers.

The filename is `list_of_groups.desc`.

The format of a `list_of_groups.desc` definition is:

```
List_name;group_name
List_name;group_name
... ..
List_name;group_name
```

For example,

```
LIST1;SIMPAPP
LIST1;SIMPAPP1
```

**Table 4-1 Group List Parameters**

| Field Name | Type  | Values         | Description  |
|------------|-------|----------------|--|
| LIST       | X(10) | Mandatory<br>Y | Name of the list.<br>Referred by - L options of the application servers  |
| GROUP      | X(10) | Mandatory<br>Y | Name of the group to be included in the list.<br>This table contains one line per group to in a list.<br>The same group may present in more than one list. |

## Transaction Configuration File

[Table 4-2](#) lists the transactions available to application users, with their characteristics.

The filename is `transactions.desc`.

**Table 4-2 Transaction Parameters**

| Field Name  | Type  | Values    | Description   |
|-------------|-------|-----------|---|
| TRANSACTION | X(4)  | Mandatory | Name of the transaction.  |
| GROUP       | X(10) | Mandatory | The group notion of CICS allowing a group of related resources to be declared and instantiated or not by a CICS system when starting. |
| DESCRIPTION | X(60) | Optional  | A small textual comment zone for description of the resource.   |
| PROGRAM     | X(8)  | Mandatory | Name of the first program to be called for this transaction.  |
| ALIAS       | X(4)  | Optional  | Reserved for future use.<br>Used to define an alias for the transaction (usually lower case).   |

**Table 4-2 Transaction Parameters**

| <b>Field Name</b> | <b>Type</b> | <b>Values</b>     | <b>Description</b>  |
|-------------------|-------------|-------------------|---|
| CMDSEC            | X(1)        | N Y               | Reserved for future use.<br>The ESM to be called for system programming requests.<br>The default value is N.  |
| CONFDATA          | X(1)        | N Y<br>Optional   | Reserved for future use.<br>As in confidential data: specifies whether CICS is to suppress user data from CICS trace entries when the CONFDATA system initialization parameter specifies HIDETC.<br>If the system initialization parameter specifies CONFDATA=SHOW, CONFDATA on the transaction definition is ignored.<br>The default value is N.   |
| PRIORITY          | 9(3)        | 1   n<br>Optional | Reserved for future use.<br>Specifies the transaction priority. This 1-to 3-digit decimal value from 0 to 255 is used in establishing the overall transaction processing priority. (Transaction processing priority is equal to the sum of the terminal priority, transaction priority, and operator priority, not exceeding 255.) The higher the number, the higher the priority.<br>The default value is 1. |
| RESSEC            | X(1)        | N Y               | Specifies whether resource security checking is to be used for resources accessed by this transaction.<br>The default value is N.   |
| RESTART           | X(1)        | N Y<br>Optional   | Reserved for future use.<br>Specifies whether the transaction restart facility is to be used to restart those tasks that terminate abnormally and are subsequently backed out by the dynamic transaction backout facility.<br>The default value is N.   |

**Table 4-2 Transaction Parameters**

| Field Name  | Type  | Values                | Description   |
|-------------|-------|-----------------------|---|
| STATUS      | X(10) | ENABLED  <br>DISABLED | <p>Specifies the transaction status.</p> <ul style="list-style-type: none"> <li>ENABLED: Allows the transaction to be executed normally.</li> <li>DISABLED: Prevents the transaction being executed.</li> </ul> <p>The default value is ENABLED.</p>  |
| TASKDATAKEY | X(5)  | USER<br> CICS         | <p>Reserved for future use.</p> <p>The default value is USER.</p>   |
| TPNAME      | X(64) | Optional              | <p>Reserved for future use.</p> <p>Specifies the name of the transaction that may be used by an APPC partner, if the 4-character length limitation of the TRANSACTION attribute is too restrictive. This name can be up to 64 characters in length.</p>   |
| TRACE       | X(1)  | Y   N<br><br>Optional | <p>Reserved for future use.</p> <p>Specifies whether the activity of this transaction is to be traced.</p> <p>The default value is Y.</p>   |
| TRANCLASS   | X(8)  | Optional              | <p>Specifies the name of the transaction class to which the transaction belongs. Transactions belonging to a transaction class are subject to scheduling constraints before they are allowed to execute.</p> <p>See <a href="#">Tranclasses Configuration File</a> for more information on the usage of this parameter on the target platform.</p> <p>A Transaction with no tranclass defined will have no other scheduling constraints than the number of servers offering it.</p> |

**Table 4-2 Transaction Parameters**

| Field Name   | Type | Values   | Description   |
|--------------|------|----------|---|
| TWASIZE      | 9(5) | Optional | Specifies the size (in bytes) of the transaction work area to be acquired for this transaction. Specify a 1-to 5-digit decimal value in the range 0 through 32767.<br><br>The default value is 0. |
| REMOTESYSTEM | X(4) | Optional | Specifies the name that identifies the intercommunication link on which the transaction attach request is sent.   |

Each transaction is advertised as an Oracle Tuxedo service by CICS Runtime servers, e.g. ARTSTRN, ARTATRN.... You can divide the transactions into different groups and assign the groups to different servers using option "-1", so that each server just advertise its own services.

**Note:** It is not recommended to define all transactions to one group, as it causes every service to be advertised by every server and results in enormous consumption of Oracle Tuxedo services.

## Tranclasses Configuration File

[Table 4-3](#) lists and defines tranclasses available to regulate parallel transactions activities.

The filename is `tranclasses.desc`.

**Table 4-3 Transclass Parameters**

| Field Name | Type  | Values    | Description  |
|------------|-------|-----------|--|
| TRANCLASS  | X(8)  | Mandatory | Name of the transaction class.<br><br>A tranclass defines a category of transactions, which should not be running in parallel; probably because they use some resources in a non-serializable way. |
| GROUP      | X(10) | Mandatory | The group notion of CICS allowing a group of related resources to be declared and instantiated or not by a CICS system when starting.  |

**Table 4-3 Transclass Parameters**

| Field Name  | Type  | Values   | Description  |
|-------------|-------|----------|--|
| DESCRIPTION | X(60) | Optional | A small textual comment zone for description of the resource.  |
| MAXACTIVE   | 9(3)  | 0 - 999  | Defines the degree of parallelism of execution.<br><br>The only value for which we do a special processing is value 1, see below for more information. |

## Semantic Information

### Native Source CICS Definition

Transactions that are defined as belonging to a transaction class are subject to scheduling constraints before they are allowed to execute. If transactions belonging to an active transaction class are already running, any new transactions are queued. Use the `MAXACTIVE` attribute to specify the maximum number of transactions that you want to run. To limit the size of the queue, you can use the `PURGETHRESH` attribute.

By putting your transactions into transaction classes, you can control how CICS dispatches tasks.

### Mapping to Target Platform Concepts

On Tuxedo, the scheduling of transactions and the affectation of resources to groups of transactions is performed differently; it is the number of servers offering given transactions which manages the scheduling of transactions, and the relative amount of resources affected to a group of transactions.

### The Special Case of `MAXACTIVE 1`

This case is very specific, because it impacts the functional characteristics of the application.

It ensures that two transactions of this class will never execute concurrently. It defines a mutually exclusive behavior that is preserved on the target platform to guarantee the correct behavior of the application.

A single server `ARTSTR1` will offer the transactions belonging to one `TRANCLASS` with `MAXACTIVE = 1`.

# Programs Configuration File

Table 4-4 lists and defines programs available to be referenced either as first program of a transaction, or being invoked by EXEC CICS LINK and XCTL.

The filename is `programs.desc`.

**Table 4-4 Programs Parameters**

| Field Name   | Type  | Values                | Description  |
|--------------|-------|-----------------------|--|
| PROGRAM      | X(8)  | Mandatory             | Name of the program.   |
| GROUP        | X(10) | Mandatory             | The group notion of CICS allowing a group of related resources to be declared and instantiated or not by a CICS system when starting.  |
| DESCRIPTION  | X(60) | Optional              | A small textual comment zone for description of the resource.  |
| LANGUAGE     | X(8)  | COBOL   C<br>  C++    | The language of the program, required to know how to communicate with it.<br>Current release supports COBOL and C.   |
| EXECKEY      | X(4)  |                       | Reserved for future use.<br>Concerns memory protection of CICS shared structures.  |
| STATUS       | X(10) | ENABLED  <br>DISABLED | Specifies the program status. <ul style="list-style-type: none"> <li>ENABLED: Allows the program to execute normally.</li> <li>DISABLED: Prevents the program being executed.</li> </ul> |
| REMOTESYSTEM | X(4)  | Optional              | Specifies that the program is not offered locally but in a DPL server.   |
| REMOTENAME   | X(10) | Optional              | Specifies for a DPL program the name of the program on the distant site.<br>Useful only if the remote name is different from the local name.   |

**Table 4-4 Programs Parameters**

| Field Name    | Type  | Values                | Description   |
|---------------|-------|-----------------------|---|
| RESCOUNT-STAT | X(10) | ENABLED  <br>DISABLED | Specifies whether to enable the RESCOUNT information for the specified program. The default value is DISABLED, which is used when this field is not specified.  |
| IN-TYPE       | X(64) | Optional              | Program input type. It describes the COMMAREA that is passed to the program.<br><br>It must be the same as the subtype of the Tuxedo buffer that you use. It is only supported in ARTDPL when it is called with Tuxedo RECORD buffer. |
| OUT-TYPE      | X(64) | Optional              | Program output type. It describes the COMMAREA that the program returns.<br><br>It must be the same as the subtype of the Tuxedo buffer that you use. It is only supported in ARTDPL when it is called with Tuxedo RECORD buffer.     |

## TS Queue Model Configuration File

Table 4-5 lists and defines the TS Queue models available to be referenced by the CICS application.

The filename is `tsqmodel.desc`

**Table 4-5 TS Queue Parameters**

| Field Name  | Type  | Values    | Description   |
|-------------|-------|-----------|---|
| TSMODEL     | X(8)  | Mandatory | Name of the TS Queue model.   |
| GROUP       | X(10) | Mandatory | The group notion of CICS allowing a group of related resources to be declared and instantiated or not by a CICS system when starting. |
| DESCRIPTION | X(60) | Optional  | A small textual zone for description of the resource.   |



**Table 4-5 TS Queue Parameters**

| <b>Field Name</b> | <b>Type</b> | <b>Values</b>          | <b>Description</b>   |
|-------------------|-------------|------------------------|--|
| LOCATION          | X(9)        | AUXILIARY<br> <br>MAIN | <p>Specifies the kind of storage to use.</p> <ul style="list-style-type: none"> <li>AUXILIARY (default): Both RDBMS-based location and file-based location are supported. If RECOVERY is set to Y, database-based location is used; If RECOVERY is set to N, file-based location is used.</li> <li>MAIN: TSQ in main storage is used. This can get better access performance. TSQ data stored in main storage is unrecoverable.</li> </ul> |
| PREFIX XPREFIX    | X(16)       | Mandatory              | <p>Specifies the character string that is to be used as the prefix for this model. The prefix may be up to 16 characters in length.</p>  |
| RECOVERY          | X(1)        | N Y                    | <p>Specifies whether or not queues matching this model are to be recoverable.</p> <ul style="list-style-type: none"> <li>Y: Queue is stored in the RDBMS to provide recovery capabilities.</li> <li>N (default): Queue is stored in file or main storage, and does not support recovery capabilities.</li> </ul>   |
| POOLNAME          | X(8)        | Optional               | <p>Deprecated. There are other ways on target to arrive to the same result.</p> <p>Specifies the 8-character name of the shared TS pool definition that you want to use with this TSMODEL definition.</p>  |

**Table 4-5 TS Queue Parameters**

| Field Name                    | Type  | Values   | Description   |
|-------------------------------|-------|----------|---|
| REMOTESYSTEM                  | X(4)  | Optional | Reserved for future use.<br><br>On source platform, specifies the name of the connection that links the local system to the remote system where the temporary storage queue resides.<br><br>On the target platform, used only in case of TS shipping to another system, either another TUXEDO system or native CICS system.                 |
| REMOTEPREFIX<br>XREMOTEPREFIX | X(16) | Optional | Reserved for future use.<br><br>Specifies the character string that is to be used as the prefix on the remote system. The prefix may be up to 16 characters in length.<br><br>These options are useful (on source and target platforms) only if one wants to translate queue name when shipping TS Queue access from one system to another. |
| SECURITY                      | X(1)  | N Y      | Reserved for future use.<br><br>Specifies whether security checking is to be performed for queues matching this model.<br><br>The default value is N.   |

## ENQ-Model Configuration File

[Table 4-6](#) lists and defines ENQ Models available to be referenced by the CICS application.

The filename is `enqmodel.desc`.

**Table 4-6 ENQ Model Parameters**

| Field Name  | Type   | Values    | Description   |
|-------------|--------|-----------|---|
| ENQMODEL    | X(8)   | Mandatory | Name of the ENQ model.  |
| GROUP       | X(10)  | Mandatory | The group notion of CICS allowing a group of related resources to be declared and instantiated or not by a CICS system when starting. |
| DESCRIPTION | X(60)  | Optional  | A small textual zone for description of the resource.   |
| ENQNAME     | X(255) | Mandatory | Specifies the 1 to 255-character resource name.   |
| ENQSCOPE    | X(4)   | Optional  | If omitted or specified as blanks, matching enqueue models will have a local scope, else they will have a global scope                |
| STATUS      | X(1)   | E D       | Reserved for future use.<br>E = Enabled.<br>D = Disabled.   |

## TD Queue Extra Partition Configuration File

[Table 4-7](#) lists and defines extra partitions TD queues available to the CICS application.

The filename is `tdqextra.desc`.

**Table 4-7 TD Queue Parameters**

| Field Name | Type  | Values    | Description   |
|------------|-------|-----------|---|
| TDQUEUE    | X(4)  | Mandatory | Specifies the 1- to 4-character name of a transient data queue.   |
| GROUP      | X(10) | Mandatory | The group notion of CICS allowing a group of related resources to be declared and instantiated or not by a CICS system when starting. |

**Table 4-7 TD Queue Parameters**

| <b>Field Name</b> | <b>Type</b> | <b>Values</b> | <b>Description</b>  |
|-------------------|-------------|---------------|---|
| DESCRIPTION       | X(60)       | Optional      | A small textual zone for description of the resource.   |
| DDNAME            | X(8)        | Mandatory     | Specifies a 1-to 8-character value that may refer to a data set defined in the startup JCL.   |
| DISPOSITION       | X(3)        | Optional      | <p>Specifies the disposition of the data set.</p> <ul style="list-style-type: none"> <li>• <b>MOD:</b> ART-CICS first assumes that the data set exists. For an existing sequential data set, MOD causes the read/write mechanism to be positioned after the last record in the data set. The read/write mechanism is positioned after the last record each time the data set is opened for output. If ART-CICS cannot find volume information for the data set: <ul style="list-style-type: none"> <li>– On the DD statement.</li> </ul> <p>A data set allocated dynamically in this way is deleted when the queue is closed, and all records are lost. For a new data set, MOD causes the read/write mechanism to be positioned at the beginning of the data set.</p> </li> <li>• <b>OLD:</b> The data set existed before this job step.</li> <li>• <b>SHR:</b> The data set existed before this job step and can be read by other concurrent jobs.</li> </ul> |
| ERRORPTION        | X(1)        | I   S         | <p><b>UNSUPPORTED</b></p> <p>Specifies the action to be taken if an I/O error occurs. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>I = IGNORE:</b> The block that caused the error is accepted.</li> <li>• <b>S = SKIP:</b> The block that caused the error is skipped.</li> </ul>   |

Table 4-7 TD Queue Parameters

| Field Name   | Type         | Values   | Description   |
|--------------|--------------|----------|---|
| OPENTIME     | X(1)         | D   I    | <p><b>UNSUPPORTED</b></p> <p>Specifies the initial status of the data set. The initial status can be one of the following:</p> <ul style="list-style-type: none"> <li>D = DEFERRED: The data set remains closed until you indicate that you want to open it by using the CEMT INQUIRE SET TDQUEUE command.</li> <li>I = INITIAL: The data set is to be opened at install time. However, if the DSNAME attribute is not specified, and the data set name is not specified in the DD statement in the startup JCL, the transient data queue is allocated to JES during CICS startup.</li> </ul> |
| RECORDFORMAT | X(1)         | F   V    | <p>Specifies the record format of the data set.</p> <ul style="list-style-type: none"> <li>F= FIXED: Fixed records. If you specify RECORDFORMAT FIXED, you must also specify a block format.</li> <li>V= VARIABLE: Variable records. If you specify RECORDFORMAT VARIABLE you must also specify a block format.</li> </ul>  |
| PRINTCONTROL | X(1)         | A        | <p><b>UNSUPPORTED</b></p> <p>Specifies the control characters to be used. There is no default. If you allow RECORDFORMAT to default to blank, you cannot specify anything in the PRINTCONTROL field. The control characters that can be used are:</p> <ul style="list-style-type: none"> <li>A= ASA: ASA control characters.</li> <li>blank: No control characters are to be used.</li> </ul>   |
| RECORDSIZE   | 9(4)<br>COMP | Optional | Specifies the record length in bytes, in the range 0 through 32767.   |
| TYPEFILE     | X(6)         | Optional | <p>Specifies the type of data set the queue is to be associated with:</p> <ul style="list-style-type: none"> <li>INPUT: An input data set.</li> <li>OUTPUT: An output data set.</li> </ul>  |

**Table 4-7 TD Queue Parameters**

| Field Name  | Type  | Values   | Description  |
|-------------|-------|----------|--|
| DSNAME      | X(80) | Optional | Specifies the name of the file that is to be used to store records written to this extrapartition queue. This file must exist even if empty.   |
| SYSOUTCLASS | X(1)  | Optional | <b>UNSUPPORTED</b><br>Instead of allocating an extra partition queue to a physical data set, you can allocate it to a system output data set (referred to as SYSOUT). Use the SYSOUT CLASS attribute to specify the class of the SYSOUT data set.<br><br>A..Z 0..9 A single alphabetic or numeric character that represents an output class that has been set up on the z/OS system on which the CICS Runtime job is to run. |
| TRT         | X(1)  | S   I    | New optional CICS Runtime argument, allowing integrators and customers to make their own specific implementation of extra partition queues.<br><br>No value or S (for Standard) will invoke normal CICS Runtime TDQueue functionalities<br><br>Setting the value I, will trigger the call to a function <code>td_extra_actions_int</code> , which must be provided by the integrator.  |
| INTRDR      | X(1)  | Y   N    | Specifies whether to define the TDQ as internal reader for JCL.<br><br><ul style="list-style-type: none"> <li>Y: The extra TDQ is internal reader for JCL.</li> <li>N or Not specified: Normal TDQ.</li> </ul>   |
| BLOCKFORMAT | X(1)  | B   U    | Specifies the BLOCK format:<br><br><ul style="list-style-type: none"> <li>B: Block format</li> <li>U: Unblocked format</li> </ul>  |

## TD Queue Intra Partition Configuration File

[Table 4-8](#) lists and defines intra partitions TD queues available to the CICS application.

The filename is `tdqintra.desc`.

**Table 4-8 TD Queue Parameters**

| Field Name  | Type  | Values       | Description  |
|-------------|-------|--------------|--|
| TDQUEUE     | X(4)  | Mandatory    | Specifies the 1- to 4-character name of a transient data queue.  |
| GROUP       | X(10) | Mandatory    | The group notion of CICS allowing a group of related resources to be declared and instantiated or not by a CICS system when starting.  |
| DESCRIPTION | X(60) | Optional     | A small textual zone for description of the resource.  |
| RECOVSTATUS | X(8)  | NO   LOGICAL | <p>Specifies if the queue is logically recoverable or not.</p> <p>If a queue is logically recoverable, its elements will be written to tuxedo /Q in the context of the transaction and will be rolled back with the rest of the transaction in case of a rollback.</p> <p>If the queue is non-recoverable, then each enqueue in the /Q queue will be permanent and not rolled back in case of a rollback or abort.</p> |
| TRANSID     | X(4)  | Optional     | Specifies the name of the transaction that is to be automatically initiated when the trigger level is reached. Transactions are initiated in this way to read records from the queue. If the TRANSID attribute is not specified (or if TRIGGERLEVEL(0) is specified), you must use another method to schedule transactions to read records from transient data queues.   |

**Table 4-8 TD Queue Parameters**

| <b>Field Name</b> | <b>Type</b> | <b>Values</b>  | <b>Description</b>   |
|-------------------|-------------|----------------|--|
| TRIGGERLEVEL      | X(1)        | 1   n          | <p>Specifies the number of records to be accumulated before a task is automatically initiated to process them. (This number is known as the trigger level.) If you specify the TRANSID attribute, TRIGGERLEVEL defaults to 1. Specify a trigger level of 0 if you want to disable ATI processing. If you do not specify a transaction ID, the trigger level is ignored.</p> <p>For logically recoverable transient data queues, the ATI task is not attached until the task commits forward. This may mean that the trigger level is far exceeded before ATI occurs.</p> |
| USERID            | X(8)        | Optional       | Specifies the userid you want CICS to use for security checking when verifying the trigger-level transaction specified in the TRANSID field.   |
| WAIT              | X(1)        | YES   NO       | <b>INACTIVE field</b><br>accepted only in the resource loading   |
| WAITACTION        | X(6)        | REJECT   QUEUE | <b>INACTIVE field</b><br>Accepted only in the resource loading.  |
| QSPACENAME        | X(15)       | Mandatory      | <p>New mandatory CICS Runtime argument, specifying the name of the tuxedo /Q QSPACE into which this queue is physically stored.</p> <p>Consult your Tuxedo /Q documentation for more information on qspaces and queue administration.</p>  |
| TRT               | X(1)        | S   I          | <p>New optional CICS Runtime argument, allowing integrators and customers to make their own specific implementation of intra-partition queues.</p> <p>No value or S (for Standard) will invoke normal CICS Runtime TSQueue functionalities</p> <p>Setting the value I, will trigger the call to a function <code>td_intra_actions_int</code>, which must be provided by the integrator.</p>  |



**Table 4-8 TD Queue Parameters**

| Field Name  | Type | Values   | Description                                     |
|-------------|------|----------|---|
| ATIFACILITY | X(1) | T        | Indicates a TERMINAL when it is set to T.       |
| FACILITYID  | X(4) | Optional | The terminal name when ATIFACILITY is set to T. |

## Mapset Configuration File

[Table 4-9](#) lists and defines mapsets available to be referenced by the CICS application. For more information, see [tcxmapgen\(1\)](#) in System Commands and Transactions.

The filename is `mapsets.desc`.

The format of a `MAPSET` definition is:

```
[mapset]
<field_name_1>=<field_value_1>
<field_name_2>=<field_value_2>
... ..
<field_name_n>=<field_value_n>
```

For example,

```
[mapset]
name=ABANNER
filename=abanner.mpdef
```

**Table 4-9 Mapset Parameters**

| Field Name  | Type  | Values    | Description   |
|-------------|-------|-----------|---|
| NAME        | X(8)  | Mandatory | Name of the mapset.   |
| DESCRIPTION | X(60) | Optional  | A small textual comment zone for description of the resource. |

**Table 4-9 Mapset Parameters**

| Field Name | Type  | Values             | Description  |
|------------|-------|--------------------|--|
| FILENAME   | X(79) | Mandatory          | This specifies the physical (binary) file name of the mapset, which is generated by the tcxmapgen tool.<br><br>It will be searched in directories defined by the KIX_MAP_PATH environment variable if the absolute path is not specified.<br><br>If this field is not specified, the default mapset binary file name <MAPSET_name>.mpdef will be used, in which the <MAPSET_name> is the MAPSET name parameter specified in CICS MAP related APIs. |
| RESIDENT   | X(3)  | NO   YES           | Specifies the residence status of the map set. <ul style="list-style-type: none"> <li>• NO: The map set is not to be permanently resident.</li> <li>• YES: The map set is to be loaded on first reference and is then to be permanently resident in virtual storage, but is to be pageable by the system.</li> </ul>   |
| swastatus  | X(10) | ENABLED   DISABLED | Specifies the resource status. <ul style="list-style-type: none"> <li>• If set to ENABLED, the resource is available.</li> <li>• If set to DISABLED, the resource is unavailable for use by the system.</li> </ul>   |
| Usage      | X(10) | NORMAL   TRANSIENT | This attribute specifies the caching scheme to be used once the MAPSET is loaded. NORMAL keeps the MAPSET loaded in a cache. Unload it when the cache overflows and it is the oldest, least used MAPSET in the cache. TRANSIENT unloads the MAPSET if it is not being used.  |

## System Configuration File

Table 4-10 lists and defines `system` available to the CICS application.

The filename is `system.desc`.

The format of a `system.desc` definition is:

```
[SYSIDNT]
<field_name_1>=<field_value_1>
<field_name_2>=<field_value_2>
```

... ..

For example,

```
[KIXA]
APPLID = DBDCKIXA
INITPARM =(DBCONNA='instance1,database1,artuser1,abc123')

[KIXB]
APPLID = DBDCKIXB
INITPARM =(DBCONNA='instance2,database2,artuser2,123abc')
```

**Notes:** Blank lines and comment lines are supported. You can use an asterisk in column 1 to code comments, or to remove temporarily an initialization parameter from a particular execution of CICS.

Using a “\”, you can continue parameters on another line. Oracle Tuxedo Application Runtime for CICS concatenates the operands, omitting the remaining blanks after “\” in the current line. In this usage, only blank characters can appear after “\” in the current line; otherwise, “\” will be treated as a backslash.

## Load/Discover the Defined System Initialization Parameters

To load and/or discover the defined system initialization parameters, CLOPT “-s” is required to specify.

For example,

```
ARTSTRN
CLOPT="-- -s KIXA"
```

In this example, ARTSTRN will only load the system section named KIXA (KIXB will not be loaded).

## Define APPLID of Current CICS Region

To define APPLID of current CICS region, you can either specify CLOPT “-a” ([Listing 4-1](#)) or specify APPLID parameters in `system.desc` ([Listing 4-2](#)).

---

**Listing 4-1 Example to Specify CLOPT "-a"**

---

```
*SERVERS  
CLOPT="-- -a abcdefgh"
```

---

---

**Listing 4-2 Example to Specify APPLID**

---

```
[KIXR]  
APPLID=1234567a
```

---

Oracle Tuxedo Application Runtime for CICS will firstly check whether CLOPT “-a” is specified. If it is, its value will be used as `JOBNAME`; otherwise, the value of `APPLID` set in `system.desc` file will be used as `JOBNAME`. If neither “-a” nor `APPLID` in `system.desc` is set, default value `DBDCCICS` will be used.

In either ways, if the value is more than 8 characters, it will be truncated to contain only the first 8 characters; if the value is less than 8 characters, `APPLID` will be padded spaces afterwards to be just 8 characters.

## Specify GMTEXT

See this example to specify `GMTEXT`.

---

**Listing 4-3 Example of Specifying GMTEXT**

---

```
[KIXR]  
APPLID=DBDCKIXR  
GMTEXT='An Information Development CICS Terminal'
```

---

`GMTEXT` has the following two formats.

- Mainframe CICS format

The whole message must be enclosed by a pair of single delimiting apostrophes. You can use apostrophes as punctuation in your text; to do that, you must code two successive apostrophes to represent a single apostrophe.

For example:

```
GMTEXT='User''s logon message text.'
```

- ART for CICS format

Apostrophe does not act as an escape character. (This way is an easier way to edit your message.)

For example:

```
GMTEXT=User's logon message text.
```

**Table 4-10 System Parameters**

| Field Name | Type | Values                           | Description   |
|------------|------|----------------------------------|---|
| SYSIDNT    | X(4) | Mandatory                        | <p>Name of a system section to define a CICS region. The length of name is 1 - 4 characters. The default name is CICS.</p> <p>The name of a system section and that of the defined CICS region should be the same.</p> <p><b>Note:</b> If more than one sections share a same SYSIDNT, the final configuration for this CICS region will possess all the parameters defined in these sections. If a parameter is defined more than once in these sections, only the last one will make sense.</p> |
| APPLID     | X(8) | DBDCCICS a<br>pplid,<br>Optional | <p>Identifies the CICS region in the VTAM network. The length of name is 1 - 8 characters. The default value is DBDCCICS.</p>   |

Table 4-10 System Parameters

| Field Name | Type   | Values             | Description  |
|------------|--------|--------------------|--|
| INITPARM   | X(60)  | Mandatory          | <p>Specifies initialization parameters in system initialization table (SIT) for each CICS application program that invokes ASSIGN INITPARM.</p> <p>The INITPARM format is<br/>INITPARM=(pgmname_1='parmstring_1'[, ..., pgmname_n='parmstring_n']). We now support at most 255 sets of program='parmstring'.</p> <p>The value of program should consist of 1 - 8 alphanumeric characters and will be truncated if exceeding the length limit.</p> <p>The value of parmstring should be at most 60 characters and will be truncated if exceeding the length limit. Parameter string should be enclosed by single quotes; any quotes imbedded in the string must be duplicated.</p> <p><b>Note:</b> In each section, if INITPARM parameters are specified more than one time, only the last definition will take effect.</p> |
| LGNMSG     | X(3)   | NO   YES, Optional | A system initialization parameter which specifies whether logon data is available to an application program.   |
| GMTEXT     | X(246) | Optional           | <p>GMTEXT is a system initialization parameter. GMTEXT specifies whether the default logon message text (Oracle Tuxedo Application Runtime for CICS) or your own message text is to be displayed on the logon screen. The message text is displayed by CSGM transaction when a terminal is logged on to ART for CICS.</p> <p>GMTEXT should be at most 246 characters long and is truncated if it is longer. (See <a href="#">Specify GMTEXT</a> for an example.)</p> <p>To enable GMTEXT, it is required to configure CLOPT -s option with your [SYSIDNT] for ARTCNX server. For more information, see <a href="#">ARTCNX Configuration</a>.</p>   |

Table 4-10 System Parameters

| Field Name | Type  | Values                 | Description   |
|------------|-------|------------------------|---|
| GMTRAN     | X(4)  | Optional               | <p>A system initialization parameter which specifies the name of the transaction that is initiated by ATI when terminals are logged on to ART CICS. The GMTRAN format is GMTRAN={CSGM CESN transaction-id}, where the default value is CSGM.</p> <p><b>Note:</b> To enable GMTRAN, it's also required to specify LOGONMSG=YES in typeterms.desc; however, if LOGONMSG is specified to NO, the screen will be cleared.</p>   |
| BMS        | X(60) | DDS NODDS,<br>Optional | <p>Specifies whether to enable DDS (Device Dependent Support). The default value is DDS, meaning DDS is enabled.</p> <p>With DDS, BMS uses the following rules to select a physical map:</p> <ul style="list-style-type: none"> <li>• BMS appends the suffix specified in ALTSUFFIX to map set names if the screen size being used is the same as the alternate screen size. In other word, if a transaction has SCRNSIZE (ALTERNATE) specified in the TYPETERM definition, or if the default screen has the same size as the alternate screen, BMS map selection routines try to load the map set with the suffix specified in ALTSUFFIX.</li> <li>• If there is no such map set found, BMS tries to load an unaffixed map set version.</li> </ul> |
| TYPE       | X(8)  | ARTCICS  <br>TMASNA    | Optional. The default value is ARTCICS.   |
| PLTPI      | X(2)  | Optional               | Name of the PLT suffix. The length of SUFFIX is 1-2 characters.   |
| PLTSD      | X(2)  | Optional               | Name of the PLT suffix. The length of SUFFIX is 1-2 characters.   |

**Table 4-10 System Parameters**

| Field Name       | Type   | Values                | Description  |
|------------------|--------|-----------------------|--|
| SRM_IPCKEY       | 9 (6)  | IPCKEY                | <p>Optional. SRM_IPCKEY specifies the IPCKEY (the identifier) of the shared memory segment.</p> <p>Use SRM_IPCKEY only when your ARTSRM server uses shared memory to store runtime information (if ARTSRM uses database, SRM_IPCKEY is ignored). If you do not specify SRM_IPCKEY when using shared memory, ARTSRM uses its Tuxedo group number to generate an IPCKEY.</p> <p>Within in a single CICS region, SRM_IPCKEY must be the same for every ARTSRM in this region, and all of these ARTSRM servers must run on the same machine.</p> |
| SRM_LOCATI<br>ON | X (32) | MEMORY   DB           | <p>Specifies the storage media for ARTSRM.</p> <ul style="list-style-type: none"> <li>Memory (default): uses shared memory to store data</li> <li>DB: uses database to store data</li> </ul>   |
| PGAIPGM          | X (8)  | INACTIVE   A<br>CTIVE | <p>The PGAIPGM system initialization parameter specifies the state of the program autoinstall function at initialization.</p> <ul style="list-style-type: none"> <li>INACTIVE: The program autoinstall function is disabled.</li> <li>ACTIVE (default): The program autoinstall function is enabled.</li> </ul>  |
| CICS_RELEA<br>SE | X (4)  | Optional              | <p>Specifies CICS system code that returns in CICS INQUIRE SYSTEM RELEASE command.</p> <p>You can specify CICS system code either through environment variable KIX_CICS_RELEASE or through CICS_RELEASE in system configuration file.</p> <p>If both KIX_CICS_RELEASE and CICS_RELEASE in systems.desc are configured, the value in systems.desc is returned.</p> <p>If neither KIX_CICS_RELEASE nor CICS_RELEASE in systems.desc is configured, value '0660' (corresponding to CICS 4.1) is returned.</p>                                   |



**Note:** Section names and keys are case-insensitive; however, values are case-sensitive. The max length of each key is 64 characters and that of each value is 32767 characters.

## Terminal Configuration File

[Table 4-11](#) lists and defines `terminal` available to the CICS application.

The filename is `terminals.desc`.

The format of a `terminal` definition is:

```
[terminal]
<field_name_1>=<field_value_1>
<field_name_2>=<field_value_2>
... ..
```

For example,

```
[terminal]
name=0001
netname=CICS0001
katakana=YES

[terminal]
name=0002
netname=CICS0002
katakana=YES
```

ART CICS stores all the terminal runtime status by using Tuxedo /Q. For more information about configuring and using Tuxedo /Q, please see [Implementing Asynchronous CICS Delayed Transactions](#).

**Table 4-11 Terminal Parameters**

| Field Name | Type  | Values                       | Description   |
|------------|-------|------------------------------|---|
| ALTSUFFIX  | X(1)  | 0-9   a-z   A-Z,<br>Optional | Specifies a 1-character ALTSUFFIX name for the terminal. Only an alphanumeric character or a blank, which means no suffix, is accepted. The value is case-insensitive and will be converted to upper-case automatically.  |
| KATAKANA   | x (3) | NO   YES,<br>Optional        | Specifies whether KATAKANA support is required.<br>NO: Default value. KATAKANA function is disabled.<br>YES: KATAKANA function is enabled.<br><br>Other values: Invalid values. System will automatically search KATAKANA in <code>typeterms.desc</code> .  |
| GROUP      | X(10) | Mandatory                    | The group notion of CICS allowing a group of related resources to be declared and instantiated or not by a CICS system when starting.   |
| NAME       | X(4)  | Mandatory                    | Terminal identifier.<br><br><b>Note:</b> When there are multiple entries with same <code>TERMID</code> , the last entry takes effect.<br><br>If the length exceeds, the value will be ignored and warning message will be logged in <code>ULOG</code> ; if the length is shorter than four characters, spaces will be padded on the right.  |
| NETNAME    | X(8)  | Mandatory                    | Network name of the terminal.<br><br><b>Note:</b> The value of <code>NETNAME</code> must be unique; otherwise, <code>ARTCNX</code> server fails to boot and reports the error output in <code>ULOG</code> and <code>stdout</code> .<br><br>If the length exceeds, the value will be ignored and warning message will be logged in <code>ULOG</code> ; if the length is shorter than eight characters, spaces will be padded on the right. |

**Table 4-11 Terminal Parameters**

| <b>Field Name</b> | <b>Type</b> | <b>Values</b>         | <b>Description</b>  |
|-------------------|-------------|-----------------------|---|
| INSERVICE         | X(3)        | NO   YES,<br>Optional | <p>Specifies the status of the terminal that is being defined.</p> <p>YES: Transactions may be initiated and messages may automatically be sent to the terminal.</p> <p>NO: The terminal can neither receive messages nor transmit input.</p> <p>The default value is YES. If this field is defined to neither of above values, it is treated as YES.</p> |

**Table 4-11 Terminal Parameters**

| <b>Field Name</b> | <b>Type</b> | <b>Values</b>         | <b>Description</b>  |
|-------------------|-------------|-----------------------|---|
| ATI               | X(3)        | NO   YES,<br>Optional | <p>Specify whether or not the terminal is available for use by transactions that are automatically initiated from within CICS.</p> <p>YES: The terminal is available for use by transactions that are automatically initiated from within CICS.</p> <p>NO: The terminal is not available for use by transactions that are automatically initiated from within CICS.</p> <p>If this field is defined to neither of above values, it is treated as UNKNOWN. However, in the event that the same field in <code>typeterms.desc</code> is defined to UNKNOWN as well, the final value of this field is YES.</p> |

Table 4-11 Terminal Parameters

| Field Name | Type | Values                | Description   |
|------------|------|-----------------------|---|
| TTI        | X(3) | NO   YES,<br>Optional | <p>Specifies whether transactions can be initiated at the terminal by a user.</p> <p>YES:</p> <p>Transactions can be initiated at the terminal by a user. If you also specify <code>ATI (YES)</code>, transactions can also be initiated automatically. In this case, the automatic transaction initiation, either by transient data control or interval control, sets a condition in an appropriate terminal control table terminal entry. If both <code>ATI</code> and <code>TTI</code> are specified as <code>YES</code>, and if there is no transaction at the terminal, terminal control initiates the user-defined task. This task is expected to send messages to the terminal.</p> <p>For a terminal used in the processing of transactions such as inquiries or order entries, specify <code>TTI (YES)</code> and <code>ATI (NO)</code>. This also applies to a display station or hard-copy terminal to which no messages are sent without a terminal request and through which transactions are entered. Note that this is the only specification allowed for 3790 inquiry logical units.</p> <p>NO:</p> <p>Transactions cannot be initiated at the terminal by a user. If you specify <code>NO</code>, specify <code>ATI (YES)</code> to allow transactions to be initiated automatically. An example of this type of terminal is one that is located in a remote location, such as a warehouse, and is unattended but may receive messages.</p> <p>If this field is defined to neither of above values, it is treated as <code>UNKNOWN</code>. However, in the event that the same field in <code>typeterms.desc</code> is defined to <code>UNKNOWN</code> as well, the final value of this field is <code>YES</code>.</p> |

**Notes:** The section name must be set to "terminal"; all keywords are case-insensitive.

ART CICS reserves "."; users can use it neither in `NAME` nor in `NETNAME` when defining `terminals.desc`.

## Typeterm Configuration File

Table 4-12 lists and defines Typeterms supported by ARTTCP.

The filename is `typeterms.desc`.

The format of a `typeterm` definition is:

```
[typeterm]
<field_name_1>=<field_value_1>
<field_name_2>=<field_value_2>
... ..
<field_name_n>=<field_value_n>
```

For example,

```
[typeterm]
name=IBM-3278-2
userarealen=255
katakana=YES
```

**Table 4-12 Typeterm Parameters**

| Field Name         | Type   | Values                         | Description   |
|--------------------|--------|--------------------------------|---|
| ALTSREENCOLU<br>MN | 9 (3)  | {80   132  <br>...}            | Specifies the terminal screen size total columns. If the <code>SCRNSIZE=alternate</code> , this parameter is mandatory.   |
| ALTSREENROW        | 9 (3)  | {24   32   4<br>3   27   ...}  | Specifies the terminal screen size total rows. If the <code>SCRNSIZE=alternate</code> , this parameter is mandatory.  |
| ALTSUFFIX          | X (1)  | 0-9   a-z  <br>A-Z<br>Optional | Specifies a 1-character <code>ALTSUFFIX</code> name for the <code>typeterm</code> . Only an alphanumeric character or a blank which means no suffix is accepted. The value is case-insensitive and will be converted to upper-case automatically. |
| DESCRIPTION        | X (79) | Optional                       | A small textual zone for description of the resource.   |

Table 4-12 Typeterm Parameters

| Field Name          | Type  | Values   | Description   |
|---------------------|-------|--|---|
| EXTERCODE           | X(10) | {ibm-37<br> <br>ibm-1388<br> ibm-138<br>0 ...} | Specifies which encoding type of outbound data is used. The value of this attribute could be any EBCDIC encoding type used in z/OS platform. The default value is ibm-37.   |
| INTERCODE           | X(10) | {ASCII  <br>UTF-8  Sh<br>ift-JIS  <br>...}     | Specifies which encoding type of inbound data is used. The value of this attribute could be any encoding type used in universal platform. The default value is ASCII.   |
| NAME                | X(79) | Mandator<br>y                                  | Name of the typeterm.   |
| PROGSYMBOLS         | X(3)  | NO   YES                                       | Specifies whether the programmed symbol (PS) facility is supported or not. The default value is NO.   |
| SCRNSIZE            | X(9)  | DEFAULT  <br>ALTERNAT<br>E                     | Optional. Specifies whether to send/receive map/text with alternative screen size or not. The default value is DEFAULT which does not send/receive map/text with alternative screen size.   |
| SOSI                | X(3)  | NO   YES                                       | Specifies whether mixed EBCDIC and double-byte character set (DBCS) is supported or not. The default value is NO.   |
| color               | X(3)  | NO   YES                                       | Designates extended color attributes.   |
| defscreencolu<br>mn | 9(3)  | 80   | Number of columns of the default screen size.   |
| defscreenrow        | 9(3)  | 24   | Number of rows of the default screen size.  |
| hilight             | X(3)  | NO   YES                                       | Indicates whether a terminal supports the highlight feature or not.   |
| logonmsg            | X(3)  | NO   YES                                       | Indicates whether the “Good Morning” (CSGM) transaction is automatically started on the terminal or not. Oracle Tuxedo ART provides a default CSGM transaction. Please refer to section for the configuration of the default “Good Morning” (CSGM) transaction. |

**Table 4-12 Typeterm Parameters**

| Field Name  | Type  | Values             | Description  |
|-------------|-------|--------------------|--|
| outline     | X(3)  | NO   YES           | Indicates whether the terminal supports field outlining or not.  |
| swastatus   | X(10) | ENABLED   DISABLED | Specifies the resource status. <ul style="list-style-type: none"> <li>If set to ENABLED, the resource is available.</li> <li>If set to DISABLED, the resource is unavailable for use by the system</li> </ul>  |
| uctran      | X(10) | NO   YES   TRAN    | <ul style="list-style-type: none"> <li>YES: translate lowercase alphabetic characters to uppercase.</li> <li>NO: do not translate lowercase alphabetic characters to uppercase</li> <li>TRAN: only translate the transaction ID from lowercase to uppercase.</li> </ul>  |
| userarealen | 9(3)  | 0 ~ 255            | The terminal control table user area (TCTUA) area size for the terminal.   |
| KATAKANA    | x(3)  | NO   YES, Optional | Specifies whether KATAKANA support is required. The default value is NO. KATAKANA function can be enabled only if KATAKANA is specified to YES. <p><b>Note:</b> You can either set KATAKANA in <code>terminals.desc</code> or <code>typeterms.desc</code>; however, only if KATAKANA in <code>terminals.desc</code> is not specified to YES or NO, KATAKANA specified in <code>typeterms.desc</code> will take effect.</p> |



Table 4-12 Typeterm Parameters

| Field Name | Type | Values                | Description   |
|------------|------|-----------------------|---|
| ATI        | X(3) | NO   YES,<br>Optional | <p>Specifies whether transactions can start at the terminal by automatic transaction initiation.</p> <p>YES: Transactions can start at the terminal by automatic transaction initiation.</p> <p>NO: Transactions cannot start at the terminal by automatic transaction initiation.</p> <p>ATI (YES) allows transactions to be started at the terminal by transient data control or by an EXEC CICS START command issued by another transaction. If there is already a transaction at the terminal, the ATI transaction is held until it ends. If you specify ATI (YES), you must specify an IOAREALEN of at least one byte, except for DEVICE (APPC) when ATI and IOAREALEN have forced default values of YES and 0.</p> <p>If ATI is specified as YES and CREATESESS is specified as YES, and if a transaction is initiated when the terminal is not ACQUIRED, it is automatically acquired.</p> <p>If this field is defined to neither of above values, it is treated as YES.</p> |

**Table 4-12 Typeterm Parameters**

| Field Name | Type | Values                | Description   |
|------------|------|-----------------------|---|
| TTI        | X(3) | NO   YES,<br>Optional | <p>Specifies whether transactions can be initiated at the terminal by a user.</p> <p>YES:</p> <p>Transactions can be initiated at the terminal by a user. If you also specify <code>ATI (YES)</code>, transactions can also be initiated automatically. In this case, the automatic transaction initiation, either by transient data control or interval control, sets a condition in an appropriate terminal control table terminal entry. If both <code>ATI</code> and <code>TTI</code> are specified as <code>YES</code>, and if there is no transaction at the terminal, terminal control initiates the user-defined task. This task is expected to send messages to the terminal.</p> <p>For a terminal used in the processing of transactions such as inquiries or order entries, specify <code>TTI (YES)</code> and <code>ATI (NO)</code>. This also applies to a display station or hard-copy terminal to which no messages are sent without a terminal request and through which transactions are entered. Note that this is the only specification allowed for 3790 inquiry logical units.</p> <p>NO:</p> <p>Transactions cannot be initiated at the terminal by a user. If you specify <code>NO</code>, specify <code>ATI (YES)</code> to allow transactions to be initiated automatically. An example of this type of terminal is one that is located in a remote location, such as a warehouse, and is unattended but may receive messages.</p> <p>If this field is defined to neither of above values, it is treated as <code>YES</code>.</p> |

## Connection Configuration File

[Table 4-13](#) lists and defines `connections` that can be loaded by ART CICS application servers. Connection configuration file is mandatory to set for `ARTCTRN` but optional to set for other servers.

The filename is `connections.desc`.

The format of a `connection` definition is:

```

[CONNID]
<field_name_1>=<field_value_1>
<field_name_2>=<field_value_2>
...
<field_name_n>=<field_value_n>

```

**Table 4-13 Connection Parameters**

| Field Name   | Type             | Values                          | Description  |
|--------------|------------------|---------------------------------|--|
| CONNID       | X(4)             | Mandatory                       | Name of the connection.  |
| GROUP        | X(10)            | Mandatory                       | The group notion of CICS allowing a group of related resources to be declared and instantiated or not by a CICS system when starting.                          |
| PROTOCOL     | X(4)             | Mandatory<br>APPC   LU61        | Specifies the type of protocol that implements the connection.   |
| NETNAME      | X(8)             | Mandatory                       | Specifies the APPLID of a CICS region, which <i>receives</i> the connection.   |
| MAXIMUM      | 0~999 ,<br>0~999 | Mandatory<br>(only for<br>APPC) | Specifies the maximum number of sessions in the modeset. The format is<br>MAXIMUM=value_1, value_2, where Value_1<br>must be greater than or equal to value_2. |
| RECEIVECOUNT | 999              | Mandatory<br>(only for<br>LU61) | Specifies the number of receive sessions; receive sessions can only receive before sending.  |
| SENDCOUNT    | 999              | Mandatory<br>(only for<br>LU61) | Specifies the number of send sessions; send sessions must send before they can receive.  |

## Web Service Configuration File

Table 4-14 defines the `web_services` available to the CICS application.

The filename is `webservice.desc`.

**Table 4-14 Web Services Parameters**

| Field Name  | Type   | Values            | Description  |
|-------------|--------|-------------------|--|
| SERVICE     | X(256) | Mandatory         | Name of the service  |
| REQUEST     | X(256) | Mandatory         | RECORD name of the request   |
| RESPONSE    | X(256) | Mandatory         | RECORD name of the response  |
| TRANSACTION | X(1)   | N   Y<br>Optional | Specifies the service to support or not support the transaction. If this field is not specified, the service does not support the transaction. |

## Programs List Configuration File

[Table 4-15](#) lists and defines programs list available to the CICS application server ARTDPL boot or shutdown.

The filename is `program_list_table.desc`.

The format of a `program_list_table.desc` definition is:

```
[plt]
<field_name_1>=<field_value_1>
<field_name_2>=<field_value_2>
...
<field_name_n>=<field_value_n>
```

For example,

```
[plt]
SUFFIX=p1
PROGRAM= RSSBT001, RSSBT002
```

**Notes:** Blank lines and comment lines are supported. You can use an asterisk in column 1 to code comments, or to remove temporarily an initialization parameter from a particular execution of CICS.

Using a "\", you can continue parameters on another line. Oracle Tuxedo Application Runtime for CICS concatenates the operands, omitting the remaining blanks after "\" in

the current line. In this usage, only blank characters can appear after "\" in the current line; otherwise, "\" is treated as a backslash

To load and/or discover the defined programs list, you have two ways: one is add "-b" or "-d" option in ARTDPL CLOPT, and the other is to define the SUFFIX in the system.desc PLTPI/PLTSD parameter.

For example:

```
ARTDPL CLOPT="-s KIXA -l SIMPAPP -b p1"
```

In this example, ARTDPL will load and execute the programs named RSSBT001, RSSBT002 during its initialization.

**Table 4-15 CICS Application Programs List**

| Field Name | Values  | Type      | Description   |
|------------|---------|-----------|---|
| SUFFIX     | X(2)    | Mandatory | Name of the PLT suffix. The length of SUFFIX is 1-2 characters  |
| PROGRAM    | X(1024) | Mandatory | Specifies the program list. The format is:<br>PROGRAM=program [, ..., programn].<br>The value of program should consist of 1 - 8 alphanumeric characters. |

If the programs in the PROGRAM is not defined or is disabled in programs.desc, when the application server boot or shutdown, it will ignore this program.

If more than one items in the Program\_list\_table.desc with the same SUFFIX are defined, only the first takes effect.

## POOL Definition File

Table 4-16 defines the pools available to the CICS application.

The filename is pool.desc.

The format of a pool.desc definition is:

```
[POOL]
```

```
<field_name_1>=<field_value_1>
```

```
<field_name_2>=<field_value_2>
```

...

For example,

[POOL]

NAME=TSPOOL1

**Table 4-16 POOL Parameters**

| Field Name   | Type  | Values              | Description  |
|--------------|-------|---------------------|--|
| NAME         | X(8)  | A-Z 0-9 \$ @<br># _ | Mandatory. Specifies the 8-character pool name.  |
| MAXSIZE      | 9(18) | number              | Reserved for future use.<br><br>Optional. Specifies the maximum size in Kilobytes allocated for the pool. The default value is 0, standing for no limit. |
| AUTOINCREASE | X(1)  | Y N                 | Reserved for future use.<br><br>Optional. Specifies auto-increase space if no room is left. The default value is N.                                      |
| ELEMENTWARN  | 9(3)  | 1-100               | Reserved for future use.<br><br>Optional. Specifies the percentage of space usage at which a warning message is uttered. The default value is 80.        |

## TCP/IP Socket Listener Configuration File

This configuration file defines TCP/IP socket listener information. [Table 4-17](#) lists its parameters.

The file name is `listener.desc`; it does not support dynamic configuration. The format is:

```
[ListenerGroupID]
```

```
<field_name_1>=<field_value_1>
```

```
<field_name_2>=<field_value_2>
```

**Table 4-17 TCP/IP Socket Listener Parameters**

| Field Name | Type  | Values                                   | Description  |
|------------|-------|--|--|
| AF         | X(5)  | Optional                                 | Listener Address Family. Use INET (default) or INET6.  |
| APPLID     | X(8)  | Optional                                 | Reserved for future use.<br>The APPLID for this listener.  |
| BACKLOG    | Short | Optional                                 | The number of unaccepted connections that can be queued to this listener. The default value is 20.   |
| CSDELAY    | X(6)  | Optional                                 | Reserved for future use.<br>This parameter is specific to the enhanced version of the listener and is applicable only if CSSTTYP is IC. It specifies the delay interval to be used on the EXEC CICS START command, in the form hhhmss (hours/minutes/seconds).   |
| CSSTTYP    | X(2)  | Optional<br>(Used in enhanced mode)      | This parameter is specific to the enhanced version of the listener and specifies the default start method for the user transaction.<br>Only supports KC value (default), indicating that the user transaction is started using EXEC CICS START with no delay interval.   |
| CSTRAN     | X(4)  | Optional<br>(Mandatory in enhanced mode) | This parameter is specific to the enhanced version of the listener and specifies the default transaction that the listener starts in ARTATRN/ARTATR1.  |
| FORMAT     | X(8)  | Optional                                 | Mode of the listener.<br>The default value of STANDARD indicates that this is the original ART for CICS listener that requires the client to send the standard header. The value of ENHANCED indicates that this is the enhanced ART for CICS listener that does not expect the standard header from the client. |

**Table 4-17 TCP/IP Socket Listener Parameters**

| <b>Field Name</b> | <b>Type</b> | <b>Values</b>                       | <b>Description</b>   |
|-------------------|-------------|-------------------------------------|--|
| GIVTIME           | Short       | Optional                            | The time in seconds this listener waits for a response to a TAKESOCKET. If this time expires, the listener assumes that either the server transaction did not start or the TAKESOCKET failed. At this time, the listener sends the client a message indicating the server failed to start and close the socket (connection). The default value is 60.  |
| IPADDRESS         | X(46)       | Optional                            | IP address.  |
| MSGLEN            | Short       | Optional<br>(Used in enhanced mode) | This parameter is specific to the enhanced version of the listener and specifies the length of the data to be received from the client. The valid range is 0 to 999 byte. If the value is 0, the listener does not read in any data from the client.   |
| PEEKDAT           | Short       | Optional<br>(Used in enhanced mode) | This parameter is specific to the enhanced version of the listener and applies only if MSGLEN is not 0.<br><br>A value of NO indicates that the listener performs a normal read of the client data. The user transaction accesses this data in the data area-2 portion of the transaction input message (TIM). A value of YES indicates that the listener reads the data using the peek option; the data remains queued in TCP/IP and the user transaction actually read it in rather than accessing it through the TIM. |
| PORT              | Short       | Mandatory                           | The port number this listener uses for accepting connections.  |
| REETIME           | Short       | Optional                            | The time in seconds this listener waits for a response to a RECV request. If this time expires, the listener assumes that the client has failed and terminates the connection by closing the socket. If this parameter is not specified, checking for read timeout is not performed.   |
| TRANID            | X(4)        | Optional                            | Reserved for future use.<br><br>The transaction name for this listener.  |
| TYPE              | X(3)        | Optional                            | Type of the created socket. Only supports TCP.   |



# URIMAP Configuration File

The resource definitions that match the URIs of HTTP and provide information on how to process the requests.

The file name is `urimaps.desc`.

**Table 4-18 URIMAP Parameters**

| Field Name  | Type   | Values                            | Description   |
|-------------|--------|-----------------------------------|---|
| URIMAP      | X(8)   | Mandatory                         | Name of URIMAP  |
| GROUP       | X(10)  | Mandatory                         | The group notion of CICS allowing a group of related resources to be declared and instantiated or not by a CICS system when starting.   |
| DESCRIPTION | X(60)  | Optional                          | A small textual comment zone for description of the resource.   |
| STATUS      | X(10)  | ENABLED   DISABLED                | This parameter describes URIMAP status. Default value is ENABLED.   |
| PATH        | X(255) | Mandatory                         | This parameter specifies the path component of the URI to which the URIMAP definition applies. PATH can be up to 255 characters, including the forward slash (/) at the beginning of the path component.  |
| SCHEME      | X(6)   | HTTP   HTTPS                      | This parameter specifies the scheme component of the URI to which the URIMAP definition applies. Default value is HTTP.   |
| USAGE       | X(10)  | CLIENT   SERVER   PIPELINE   ATOM | This parameter specifies whether this URIMAP definition is for CICS as an HTTP server (SERVER), CICS as an HTTP client (CLIENT), a Web service (PIPELINE), or an Atom feed (ATOM). Default value is SERVER.<br><br>ART for CICS only supports CLIENT. |

**Table 4-19 Client Parameters**

| Field Name   | Type   | Values    | Description  |
|--------------|--------|-----------|--|
| HOST         | X(116) | Mandatory | This parameter specifies the host name of the URI to which the URIMAP definition applies, or its IPv4 or IPv6 address.   |
| PORT         | X(8)   | NO Number | This parameter specifies the decimal number of the port used by a CICS application when it communicates with a server. PORT must be a number in the range 1 – 65535.<br><br>Set NO to indicate that the attribute is not used. |
| CERTIFICATE  | X(32)  | Optional  | Not supported.<br><br>This parameter specifies the label of the X.509 certificate that is used as the SSL client certificate during the SSL handshake.   |
| CIPHERS      | X(56)  | Optional  | Not supported.<br><br>This parameter specifies a string of up to 56 hexadecimal digits that is interpreted as a list of up to 28 2-digit cipher suite codes.   |
| AUTHENTICATE | X(10)  | NO BASIC  | Not supported.<br><br>This parameter specifies whether to send HTTP basic authentication information to the HTTP server. Default value is NO.  |
| SOCKETCLOSE  | X(6)   | 0 hmmss   | Not supported.<br><br>This parameter specifies if, and for how long, CICS keeps a client HTTP connection open after the CICS application has finished using it.  |
| SERVICE      | X(64)  | Mandatory | This parameter specifies Tuxedo SALT service name that maps for remote endpoint.   |

# VSAM Configuration File

## Overview

VSAM configuration file specifies the VSAM accessor and related attribute of each VSAM file used in ART CICS runtime. VSAM configuration file is generated by Oracle Tuxedo Application rehosting Workbench and should not be modified.

ART CICS runtime will find VSAM configuration file through the environment variable `$DD_VSAMFILE`, which could be exported or defined in the envfile and used to indicate the location of VSAM configuration file.

## VSAM Configuration Parameters

[Table 5-1](#) lists and defines VSAM file configuration parameters available to be referenced by the CICS application.

The filename is `desc.vsam`.

**Table 5-1 VSAM Configuration Parameters**

| Field Name   | Type   | Values    | Description   |
|--------------|--------|-----------|---|
| NAME         | X(8)   | Mandatory | Name of the VSAM file. Logical name of VSAM file used in EXEC CICS related to this file.  |
| ACCESSOR     | X(256) | Mandatory | Name of the VSAM accessor referenced by CICS application according to the corresponding VSAM file. The VSAM accessor is generated by ART Workbench. |
| ORGANIZATION | X(1)   | Mandatory | I/i: Indexed Record<br>R/r: Relative Record<br>S/s: Sequential Record   |

**Table 5-1 VSAM Configuration Parameters**

| <b>Field Name</b> | <b>Type</b>      | <b>Values</b>                               | <b>Description</b>   |
|-------------------|------------------|---|--|
| RECORD TYPE       | X(1)             | Mandatory                                   | F/f: Fixed Length Record<br>I/i: Indefinited Length Record |
| RECORD LENGTH     | NUM<br>1-32768   | Mandatory, if<br>TYPE is Fixed              | The length of each fixed record in VSAM file.              |
| KEY POSITION      | NUM<br>1 - 32768 | Mandatory, if<br>ORGANIZATION is<br>Indexed | The start position of KEY of each record in<br>VSAM file.  |
| KEY LENGTH        | NUM<br>1 - 256   | Mandatory, if<br>ORGANIZATION is<br>Indexed | The length of KEY of each record in VSAM file.             |

Table 5-1 VSAM Configuration Parameters

| Field Name | Type  | Values                           | Description   |
|------------|-------|----------------------------------|---|
| STATUS     | X (9) | ENABLED<br>DISABLED<br>UNENABLED | <p>Specifies the initial status of the file (the default is ENABLED) :</p> <p>ENABLED: Normal processing is allowed against this file.</p> <p>DISABLED. Any request against this file from a command-level application program causes the DISABLED condition to be passed to the program.</p> <p>UNENABLED: This prevents the file being opened by an implicit open from an application program. Any such attempt to access the file raises the NOTOPEN condition. By contrast, an explicit request to open the file (for example, EXEC CICS SET FILE OPEN command) changes the status to ENABLED before attempting to open the file.</p> |
| OPENTIME   | X (8) | STARTUP<br>FIRSTREF              | <p>Specifies when the file is opened. Default STARTUP.</p> <p>STARTUP: The file is opened immediately after CICS initialization, unless the status of the file is UNENABLED when the file is left closed.</p> <p>FIRSTREF: The file remains closed until a request is made to open it by using one of the following methods:</p> <ul style="list-style-type: none"> <li>• A master terminal command</li> <li>• An EXEC CICS SET FILE OPEN command in an application program</li> <li>• An implicit open</li> </ul>  |

**Note:** The file status, after CICS Runtime is booted up, is ENABLESTATUS (ENABLED) and OPENSTATUS (OPEN) .

## VSAM Configuration File

# Debug Configuration File

## Overview

This COBOL cross-session debug configuration file determines whether any of the trigger resources are configured for debugging.

The filename is `kix_cobol_dbg.cfg`.

The format of a `kix_cobol_dbg.cfg` definition is:

```
ANIMSRVID;UserID;termID;SYS_ID;TransID;Program
```

For example,

```
ANIMSRVID1;UserID1;termID1;SYS_ID1;TransID11;Program11
```

```
ANIMSRVID1;UserID2;termID2;SYS_ID1;TransID1X;Program1X
```

```
ANIMSRVID2;UserID3;termID3;SYS_ID2;TransID21;Program21
```

```
ANIMSRVID2;UserID4;termID4;SYS_ID2;TransID2X;Program2X
```

## Debug Configuration File Parameters

[Table 6-1](#) lists and defines debug configuration file parameters available to be referenced by the CICS application.

**Table 6-1 Debug Configuration Parameters**

| Field Name | Type                            | Values    | Description   |
|------------|---------------------------------|-----------|---|
| ANIMSRVID  | X(40)<br>or<br>1 ~<br>999999999 | Mandatory | <p>When a transaction is running, ART for CICS uses this ANIMSRVID to enable animation for the program.</p> <p>For Micro Focus COBOL application programs, ANIMSRVID is a string that is required for enabling animation in COBOL. It is a character string of up to 40 characters. The string can have alphanumeric characters and the underscore character.</p> <p>For COBOL-IT COBOL application programs, ANIMSRVID is a number ranging from 1 to 999999999.</p> <p><b>Note:</b> You can specify multiple ANIMSRVID with the same name; however, ART for CICS application server will only find the first ANIMSRVID that matches all required fields as the trigger resource, which is then triggered by anim / deet utility.</p> |
| TermID     | X(4)                            | Optional  | Specifies the four-character identifier of the terminal on which the transaction that is to be tested will be run.  |
| UserID     | X(8)                            | Optional  | Specifies the eight-character identifier of the user, who is to be diagnosed.   |
| SYS_ID     | X(4)                            | Optional  | Specifies the four-character identifier of the remote system (CICS region or CICS client) where the transaction that is to be diagnosed will originate.   |
| TransID    | X(4)                            | Optional  | Specifies the four-character identifier of the transaction that is to be diagnosed.   |
| Program    | X(30)                           | Optional  | Specifies the name of the program that is to be diagnosed.  |





## Debug Configuration File

# CICS Runtime Integration with Application List Transaction

ART for CICS enables you to use application list transaction (ALST) to manage multiple sessions. It is integrated with user plug-in to enable you to get and show application list.

## Integration with User Plug-In

When ALST transaction is running by synchronous transaction servers (ARTSTRN/ARTSTR1), it calls user plug-in to get the application list.

For user plug-in, make sure

- It is implemented in C language.
- It is built as a dynamic shared library named `libkixauthalst.so`.
- It provides a function entry called `ARTKIX__GET_USER_ALST`. For more information, see [ARTKIX\\_\\_GET\\_USER\\_ALST](#).

## ARTKIX\_\_GET\_USER\_ALST

### Synopsis

```
int ARTKIX__GET_USER_ALST(ALST_INOUT_PARAM * alst)
```

### Description

In terms of input, when calling `ARTKIX__GET_USER_ALST`, ART for CICS fills `VERSION`, `USERID`, and `LISTSZ` fields, and sets the `RESERVED` field to 0.

In terms of output, `ARTKIX__GET_USER_ALST` updates `LISTSZ` and fills `APPLIST`.

**Table 7-1 Input/Output Parameters**

| Field    | Type                  | I/O Type            | Description   |
|----------|-----------------------|---------------------|---|
| VERSION  | Integer,<br>4 bytes   | Input               | Version number. The current version is 1.   |
| RESERVED | Integer,<br>4 bytes   | Input               | Reserved field. Must be binary zero.  |
| USERID   | Char,<br>8 bytes      | Input               | User ID who needs to get its application list.  |
| LISTSZ   | Integer,<br>4 bytes   | Input and<br>output | <p>When using <code>LISTSZ</code> as input, it specifies the length of <code>APPLIST</code>, indicating how many applications that the application list can contain at most. Fill the application list in the address right after this field. See <a href="#">Listing 7-1</a> for an example, which denotes that the application list can contain 128 applications at most.</p> <p>When using <code>LISTSZ</code> as output, <code>ARTKIX__GET_USER_ALST</code> returns the number of applications that are actually used.</p>  |
| APPLIST  | Applications<br>array | Output              | <p>List of applications to be authorized. Array length is specified in <code>LISTSZ</code> field; every array item is composed of seven sub-fields.</p> <ul style="list-style-type: none"> <li><code>transid</code> (4 bytes): Transaction ID of the application. This must be a valid transaction in ART for CICS.</li> <li><code>sessid</code> (8 non-blank bytes): Session ID. It should be unique for a user.</li> <li><code>fnkey</code> (1 byte): Reserved for future use. The value of function key associating with the application. This value uses ASCII encoding.</li> <li><code>label</code> (35 bytes): Business name of the application.</li> <li><code>startupACLName</code> (8 bytes): Startup ACL CICS program name.</li> <li><code>termACLName</code> (8 bytes): Reserved for future use.</li> <li><code>reserved</code> (3 bytes): Must be binary zero.</li> </ul> |

**Listing 7-1 C Definitions of ALST\_INOUT\_PRARM**

---

```
typedef struct {
    char    transid[4];
    char    sessid[8];
    char    fnkey;
    char    label[35];
    char    startupACLName[8];
    char    termACLName[8];
    char    reserved[3];
} ALST_APPLICATION;

// Input & Output
typedef struct {
    int     version;
    int     reserved;
    char    userid[8];
    int     listsz;
    ALST_APPLICATION applst[128];
} ALST_INOUT_PARAM;
```

---

## Return Code

Return Code: 0 is success. -1 is failure.

## COMMAREA Between DFHALST and Startup ACL

[Listing 7-2](#) is an example.

**Listing 7-2 Example of COMMAREA**

---

```

01  COMM-ACL .
      05  ACL-USERID      PIC X(8) .
      05  ACL-TRANSID    PIC X(4) .
      05  ACL-RETCODE    PIC S9(8) COMP-5 .
      05  ACL-RETMSG     PIC X(1920) .
      05  ACL-MSGLEN     PIC S9(8) COMP-5 .
      05  FILLER        PIC X(60) .

```

---

## Input

ALST fills following fields when DFHALST LINK ACL:

**ACL-USERID**

USERID of the user.

**ACL-TRANSID**

The transaction ID to be started.

## Output

ACL fills following fields when ACL RETURN to ALST:

**ACL-RETCODE**

The return code (0 is success; -1 is failure).

**ACL-RETMSG**

If ACL-RETCODE=0, ACL-RETMSG contains initial input string that denotes how to call a transaction (the input string is the exact input that user types in 3270 terminal instead of the real 3270 data stream. ART for CICS will compose the 3270 data stream from the input string). The size of this field is 1920 bytes (padded with trailing spaces if needed).  
If ACL-RETCODE=-1, ACL-RETMSG contains the detailed error message, which ALST shows it on terminal. The error message is 160 bytes long (padded with trailing spaces if needed).

**ACL-MSGLEN**

Length of the initial input string ACL-RETMSG.

If the value is zero, ART for CICS removes trailing spaces/binary zero from ACL-RETMSG.

If the value is non-zero, this value should be the size of the message (a positive integer less than or equal to 1920), and then ART for CICS uses this size to call the transaction.

**FILLER**

Reserved 60 characters for future use. It must be binary zeros.

## API for Startup ACL

### ARTKIX\_\_SET\_TRAN\_INIT\_STR

#### Synopsis

```
int ARTKIX__SET_TRAN_INIT_STR (char* pbuf, int size, char * aid)
```

#### Description

Set transaction input string just like you enter on a 3270 blank screen

(ARTKIX\_\_SET\_TRAN\_INIT\_STR will convert this input string to 3270 data stream for you).

If you issue RECEIVE command after the call, RECEIVE can get the input data; if you do not issue RECEIVE command, the data stream is discarded when the transaction returns to ARTTCP.

**pbuf**

Input. The input string used to start the transaction. It should be ASCII encoded other than EBCDIC.

For example, If you type XXXX abcd1234 in 3270 console, XXXX is the transaction ID to be started, and abcd1234 is the input message. Therefore, XXXX abcd1234 should be passed with pbuf.

**size**

Input. Length of the input string.

**aid**

Input. The Action ID. It should be ASCII encoded other than EBCDIC. If aid is NULL, the aid DFHENTER will be used by default.

#### Return Code

Return Code: 0 is success. -1 is failure.

## ARTKIX\_\_GET\_TRAN\_OUT\_STR

### Synopsis

```
int ARTKIX__GET_TRAN_OUT_STR(char* pbuf, int size)
```

### Description

Get output data string that the last SEND verb (in the transaction) sends. You do not need to decompose this output string to 3270 data stream as ARTKIX\_\_GET\_TRAN\_OUT\_STR will do it for you.

#### **pbuf**

Output. Returns output data string, which is just like the data string that 3270 terminal displays.

#### **size**

Input. Max length of the buffer that pbuf points.

### Return Code

Return Code: Returning the length of the received buffer denotes success. Returning -1 denotes failure.

## See Also

["Implementing Using Multiple Session Management"](#) in *Oracle Tuxedo Application Runtime for CICS User Guide*



# CICS Runtime Integration with Non-3270s Terminal

This chapter contains the following topics:

- [Interface](#)
- [Oracle Tuxedo External DPL Communication Interfaces](#)

## Interface

Non-3270s terminal should submit request and get response through Tuxedo ATMI `tpcall()`. The service name of `tpcall()` should follow the convention described in the following section; in addition, data buffer type exchanged with server `ARTWTRN/ARTWTR1` could only be Tuxedo FML32. The detailed FML32 fields and each data structure will be described in the following section.

- [Service Name Convention](#)
- [Fml32 Buffer Definition](#)

## Service Name Convention

In order to distinguish the service invoked by non-3270s clients from the service invoked by TN3270 terminal, `ARTWTRN/ARTWTR1` sever advertises each CICS transaction as a Tuxedo service with the name prefix `WEB_`. When client submits the request to `ARTWTRN/ARTWTR1`, the service name of `tpcall` must follow the convention.

## Fml32 Buffer Definition

The interface between non-3270s client and ARTWTRN/ARTWTR1 could only be Tuxedo FML32 buffer. All the application data and some terminal control information will be encapsulated in the FML32 buffer.

[Table 1](#) lists all FML32 FIELDS, which will be published in \$KIXDIR/include/msgflds32.

**Table 1 FML 32 Buffer Definition for CICS Runtime Integration with Non-3270s Terminal**

| Field Name         | Type     | Tuxedo Buffer Type | Length | Comments  |
|--------------------|----------|--------------------|--------|---|
| CX_WEB_TRANSID     | Outbound | CARRAY             | 4      | Transaction name to be invoked.<br>This field will be added/changed by ARTWTRN/1. Client can get the transaction name from this field and use it for the next tpcall.     |
| CX_WEB_MAPSET_NAME | Outbound | CARRAY             | 7      | The name of the current MAPSET, which will be displayed in Client's UI.<br>This field will be added/changed by ARTWTRN/1. Client can get the MAPSET name from this field. |
| CX_WEB_MAP_NAME    | Outbound | CARRAY             | 7      | The name of the current MAP, which will be displayed in Client's UI.<br>This field will be added/changed by ARTWTRN/1. Client can get the MAP name from this field.       |

**Table 1 FML 32 Buffer Definition for CICS Runtime Integration with Non-3270s Terminal**

| Field Name       | Type                  | Tuxedo Buffer Type | Length                 | Comments  |
|------------------|-----------------------|--------------------|------------------------|---|
| CX_WEB_APPDATA   | Outbound /<br>Inbound | CARRAY             | Depends on<br>Copybook | <p>The application data requiring to be displayed in the Client's UI or processed by transaction.</p> <p>This field will be added/changed/read by both ARTWTRN/1 and Client.</p> <p>When Client receives the FML buffer, it needs to get the application data from this field and split into each map filed according to Copybook.</p> <p>Client could also re-organize latest application data according to Copybook and send it to ARTWTRN/1. When receiving the FML buffer, ARTWTRN/1 will get the application data from this field and pass the data to transaction for processing.</p> |
| CX_WEB_CTRL_CHAR | Outbound              | CARRAY             | 12                     | <p>The terminal control characters of the command "CICS SEND", "CICS SEND MAP", "CICS SEND TEXT", and "CICS SEND CONTROL".</p> <p>At times, CICS APIs above will be invoked with some control options, such as FREEKB, ALARM, ERASE, ERASEUP, CURSOR, etc; therefore, these control options should be inserted to this FML field.</p> <p>The field will be added/changed by ARTWTRN/1. Client can get the control options from this field and handle them accordingly.</p>  |

**Table 1 FML 32 Buffer Definition for CICS Runtime Integration with Non-3270s Terminal**

| Field Name   | Type               | Tuxedo Buffer Type | Length | Comments   |
|--------------|--------------------|--------------------|--------|--|
| CX_WEB_AID   | Inbound            | CARRAY             | 3      | The attention ID and cursor position when doing “CICS RECEIVE” and “CICS RECEIVE MAP”.<br><br>When 3270 terminal sends the application data to the CICS runtime, it will always contain the AID and current cursor position of the screen; therefore, this field will be added/changed by Client. ARTWTRN/1 will get data from this field and pass the data to transaction for processing. |
| CX_SESSIONID | Outbound / Inbound | STRING             | 16     | The session ID of client. If it’s not filled in client side, ARTWTRN/1 will generate one randomly.   |
| CX_TERMID    | Outbound / Inbound | CARRAY             | 4      | The term ID of client. If it’s not filled in client side, ARTWTRN/1 will generate one by randomly.   |
| CX_USERID    | Outbound / Inbound | CARRAY             | 8      | The user ID of client. If it’s not filled in client side, ARTWTRN/1 will fill it with “WEBGUEST”.  |

**Note:** Outbound means the field is only included in the FML buffer from ARTWTRN/1 to Client; Inbound means the field is only included in the FML buffer from Client to ARTWTRN/1.

#### CX\_WEB\_APPDATA

Mainframe CICS provides a utility to generate the Copybook from the Mapset file. The Copybook is used to define the structure of the application data when transaction invokes CICS SEND/RECEIVE MAP.

At ART CICS runtime, we also provide a corresponding utility `tcxmapgen`, which generates the Copybook from Mapset file; regarding that the structure of Copybook generated by `tcxmapgen` is almost the same as the one generated in Mainframe CICS, application data exchanged between the Client and ARTWTRN/1 must follow the definition in the Copybook of each Mapset.

For CICS SEND/RECEIVE and CICS SEND TEXT, ARTWTRN/1 and Client just need to insert the plain textual characters into the field CX\_WEB\_APPDATA.

The head file might not match the copybook generated from BMS file by ART CICS offline utility tcxmapgen at runtime due to data structure alignment on open system. It might need customers to adjust copybook by padding appropriate FILLER.

#### CX\_WEB\_CTRL\_CHAR

In Mainframe CICS, an outbound data stream is a data stream sent from the application program to the terminal with the following format:

```
| Command | Write Control Character | Indicate Cursor | Orders | Data | Orders
| Data | ...
```

CMD defines the function to be performed by the terminal. ARTWTRN/1 will support W and EW. It's a one byte.

WCC instructs how to perform the CMD function. It's a one byte with the following format:

```
| 0 | 1 | 2/3 | 4 | 5 | 6 | 7 |
| * | Reset | Printout | Start | Sound | Keyboard | Reset |
| | | Format | Print | Alarm | Restore | MDT |
```

If SEND MAP/TEXT command sets cursor option, IC should be inserted into the header of 3270 data stream with the following format in the case of SEND command without cursor option. If this command sets option ERASE, the cursor will set to the upper left corner of the screen.

```
| SBA | ROW | COL | IC |
```

Besides CMD, WCC, and IC described above, other control characters could be also contained in the header of 3270 data stream, such as EUA.

At ART CICS runtime, we define a FML field CX\_WEB\_CTRL\_CHAR, a CARRAY with 12 bytes, to store these control characters; however, in this release, we plan to support CMD, WCC, and IC, all of which are mostly used. The data sequence of this field is as below:

```
| CMD | WCC | SBA | ROW | COL | IC | ...
```

Only the first 6 characters will be used in this field, the rest 6 characters will be reserved with X'00', and the code of these characters will be set as EBCDIC, not ASCII. SBA, ROW, COL, and IC will be set with X'00' in the buffer if there is no need to set cursor; If IC is

not set via the option cursor of CICS commands, but set in MAPSET/MAP file, no IC will be set in this field and customers need to handle IC themselves.

### CX\_WEB\_AID

In Mainframe CICS, an inbound data stream is sent from the terminal to the application program and contains an attention identifier (AID) followed by cursor or by data directly. The AID describes the action that caused the transmission of the inbound data stream with the following format:

```
| AID | ROW | COL |
```

At ART CICS runtime, we defined a FML field CX\_WEB\_AID to store these three characters and AID will always be function key of the keyboard, such as Enter, Clear, F01~F24, etc. ROW and COL mean the current cursor position when terminal sends the inbound data stream to application program. The code of these characters will be set as EBCDIC, not ASCII.

## Oracle Tuxedo External DPL Communication Interfaces

- [Clients](#)
- [Interface](#)
- [Making ARTDPL Service Calls](#)
- [Fml32 Buffer Definition](#)
- [Mirror Transaction and TWA](#)
- [EIBTRNID In Executed DPL Program](#)
- [ABEND Condition](#)

### Clients

ART for CICS allows user to make distributed program calls from a native Tuxedo client or Tuxedo ud32 utility.

The client uses Tuxedo FML32 fields or RECORD to communicate with ARTDPL.

In case of using Tuxedo FML32 buffer, COMMREA can be exchanged in the request/response, mirror transaction and TWA can be validated, even CHANNEL and CONTAINER can also be used.

In case of using Tuxedo RECORD buffer, COMMAREA can be exchanged using RECORD data area. Mirror transaction, TWA, or CHANNEL/CONTAINER are not supported.

## Interface

Tuxedo client should send/receive request/response through Tuxedo ATMI `tpcall()`. In addition, data buffer type exchanged with server ARTDPL can only be Tuxedo FML32 or RECORD. Please refer to section [DPL Servers \(ARTDPL\)](#) for the details of ARTDPL services.

## Making ARTDPL Service Calls

Three kinds of services published by ARTDPL can be accessed by Tuxedo clients. User can choose one of them depending on real scenario.

- Type A: `<sysid>_<program>`

DPL `<program>` can be advertised by ARTDPL as a Tuxedo service. And the prefix of service name is the CICS region `<sysid>_` which current ARTDPL server belongs to. If client tries to call this service and exchange the COMMAREA with ARTDPL server, the following FML32 fields must be present in the request:

`CX_USERID`

`CXMW_MESSAGE`

Meanwhile, the FML32 field `CX_PROGRAM` must not be present, because ARTDPL server can realize the name of DPL program to be executed from the service name.

You can enable the mirror transaction and TWA. Please refer to next section for the details.

- Type B: `MIRROR_<transid>`
- Type C: `<applid>_MIRROR_<transid>`

Mirror transaction can also be advertised by as a Tuxedo service. And the prefix of service name is the `MIRROR_` or `<applid>_MIRROR_`. In this case, mirror transaction and TWA is always enabled. User needs configure the mirror transactions and their TWA size in the `transactions.desc` at first. If client tries to call these two services and exchange the COMMAREA with ARTDPL server, the following FML32 fields MUST be present in the request:

- `CX_USERID`
- `CXMW_MESSAGE`
- `CX_PROGRAM`

To use RECORD as the data buffer to call ARTDPL server, you should configure `IN-TYPE` and `OUT-TYPE` for the called program in `programs.desc`. When you use RECORD, Tuxedo clients can only use Type A services.

## Fml32 Buffer Definition

Table 2 lists all FML32 FIELDS, which will be published in `$(KIXDIR)/include/msgflds32`.

**Table 2 FML32 FIELDS**

| Field Name   | Type    | Tuxedo Buffer Type | Length | Mandatory or Not   | Comments   |
|--------------|---------|--------------------|--------|--|--|
| CX_SESSIONID | Inbound | STRING             |        | Optional   | Session ID, can be omitted.  |
| CX_PROGRAM   | Inbound | CARRAY             | 8      | Forbidden for Type A services<br>Mandatory for Type B/C services | Used to specify the name of DPL program to be executed by ARTDPL server.   |
| CX_TRANSID   | Inbound | CARRAY             | 4      | Optional   | Used to specify current mirror transid. The value can be acquired from EIBTRNID inside executed DPL program.         |
| CX_USERID    | Inbound | CARRAY             | 4      | Mandatory  | There is no security support, but the USERID can be acquired by “CICS INQUIRE USERID()” inside executed DPL program. |
| CX_USERNAME  | Inbound | CARRAY             | 20     | Optional   | The USERNAME can be acquired by “CICS INQUIRE USERNAME()” inside executed DPL program.                               |
| CXMW_TASKN   | Inbound | CARRAY             | 4      | Optional   | The EIBTASKN, if not present in the buffer, ARTDPL can generate automatically.                                       |



Table 2 FML32 FIELDS

| Field Name                 | Type             | Tuxedo Buffer Type | Length        | Mandatory or Not | Comments   |
|----------------------------|------------------|--------------------|---------------|------------------|--|
| CXMW_MESSAGE               | Inbound/outbound | CARRAY             | Less than 32K | Mandatory        | Used to exchange COMMAREA with ARTDPL.   |
| CXMW_COMMAREA<br>AINLENGTH | Inbound          | LONG               |               | Optional         | Can be used to specify the real COMMAREA data length to be exchanged online. Due to performance consideration.     |
| CX_CHANNEL_NAME            | Inbound          | CARRAY             | 16            | Optional         | CHANNEL name to be passed to program, used for CHANNEL support. Only one occurrence can be present in the request. |
| CX_CONTAINER_NAME          | Inbound/outbound | CARRAY             | 16            | Optional         | Container name in the channel. Multiple occurrences can be present in the request.                                 |
| CX_CONTAINER_DATA          | Inbound/outbound | CARRAY             | No limit      | Optional         | Container channel in the channel. Multiple occurrences can be present in the request.                              |
| CX_ABENDCODE               | outbound         | CARRAY             | 4             | N/A              | CICS ABCODE when DPL program abend happens.  |

## Mirror Transaction and TWA

### Prerequisites

- You must define the mirror transactions and their TWA size in `transactions.desc`. The definitions can be CICS system mirror transactions `CSMI/CVMI` or customized mirror

transactions. For more information, see [Supporting TWA in ARTDPL](#) in the *Oracle Tuxedo Application Runtime for CICS User Guide*.

The following example defines two mirror transactions. CSMI is the system default mirror transaction; MIR1 is the user-defined mirror transaction.

```
CSMI;SIMPAPP;system default mirror tran;DFHMIRS; ; ; ; ; ;ENABLED; ;  
; ; ;15000  
MIR1;SIMPAPP;user defined mirror tran;DFHMIRS; ; ; ; ; ;ENABLED; ; ;  
; ; ;10000
```

- Specify the target mirror transaction and its TWA size in the request to ARTDPL, the following FML32 fields must to be present:

CX\_TRANSID:

Specify the target mirror transaction to be used in executed DPL program. If CX\_TRANSID is not present in the request, system mirror transaction CSMI/CVMI will be located. If CSMI/CVMI is not present in transactions.desc, SYSIDERR occurs. If the specified CX\_TRANSID is not a valid mirror transaction defined in the transactions.desc, SYSIDERR occurs.

## EIBTRNID In Executed DPL Program

In request to ARTDPL, if CX\_TRANSID is present, ARTDPL sets EIBTRNID as the value of CX\_TRANSID. If CX\_TRANSID is not present, the EIBTRNID is set to system mirror transaction CSMI/CVMI.

## ABEND Condition

If DPL program aborts, ARTDPL server returns TPFFAILS to client. User can get the CICS ABEND code from FML32 field CX\_ABENDCODE in the response of ARTDPL.

## See Also

- [Oracle Tuxedo Application Runtime for CICS User Guide](#)

# Environment Variables

## CICS Runtime Environment Variables

Two important Tuxedo environment variables are `MANDATORY`.

- `TUXDIR` – must be set to indicate the directory in which Tuxedo is installed.
- `APPDIR` – must be set to indicate the directory where the application server binaries are installed.

**Note:** For CICS Runtime, `APPDIR` must be set to the directory containing the CICS Runtime server binaries.

## CICS Runtime Specific Environment Variables

### `ART_IMS_CONFIG`

`ART_IMS_CONFIG` is an optional environment variable that specifies the absolute path where the IMS configuration files are located. This is required by Oracle Tuxedo Application Runtime for IMS when you access IMS DB. For more information, see "[Oracle Tuxedo Application Runtime for IMS Users Configuration](#)" in *Oracle Tuxedo Application Runtime for IMS Users Guide*.

### `ART_IMS_DB`

`ART_IMS_DB` is an optional environment variable that specifies the container path where GSAM files are located. This is required by Oracle Tuxedo Application Runtime for IMS when you access IMS DB. For more information, see "[Oracle Tuxedo Application Runtime for IMS Users Configuration](#)" in *Oracle Tuxedo Application Runtime for IMS Users Guide*.

### `ARTKIX_XA_DISABLE`

This is optional environment variable for local transaction optimization. When `ARTKIX_XA_DISABLE=yes`, it uses database local transaction instead of XA transaction. All ART application servers, such as `ARTSTRN/1`, `ARTATRN/1`, `ARTCTRN/1`, `ARTWTRN/1`, and `ARTDPL` support `ARTKIX_XA_DISABLE` by default; however, when rebuilding your own ART application

server, you should specify `-n` option in `buildartcics` command to support `ARTKIX_XA_DISABLE`. This local transaction optimization should be used only in local transaction scenario. Default value is `NO`.

### **COB\_ENABLE\_XA**

This is a mandatory environment variable when using COBOL-IT with ART CICS Runtime. It indicates VSAM file support with COBOL-IT/BDB under XA environment is enabled. It should be set to `1`.

### **DD\_VSAMFILE**

`DD_VSAMFILE` is a mandatory environment variable that indicates the location of VSAM configuration file `"desc.vsam"` generated by ART Workbench, if the CICS program contains some VSAM operations.

### **DBCONNECT**

If `ARTKIX_XA_DISABLE=yes`, then `DBCONNECT` must be set, it specifies database connection string, for example, `USER/PASSWD@SID` when using Oracle.

### **ISC\_ENABLE**

`ISC_ENABLE` is an optional environment variable. Set `ISC_ENABLE=YES` to enable the following ISC related features:

- `ASSIGN`  
`ABDUMP/ABPROGRAM/ASRAINTRPT/ASRAKEY/ASRAPSW/ASRAREGS/ASRASPC/ASRASTG/INITPARM/INITPARMLN/KATAKANA/NETNAME/SOSI/USERNAME`
- `CANCEL`
- `INQUIRE/SET FILE`
- `INQUIRE PROGRAM RESCOUNT`
- `INQUIRE SYSTEM JOBNAME`
- `INQUIRE TERMINAL ALTSUFFIX/USERID`
- `INQUIRE TRANSACTION PROGRAM`
- `INQUIRE TERMINAL/NETNAME ACQSTATUS CREATSESS`
- `ISSUE DISCONNECT`
- `ISSUE PASS and EXTRACT LOGONMSG`

- SEND LAST
- SET/INQUIRE TERMINAL
- SET TERMINAL ACQSTATUS CREATE ACQUIRED RELEASED
- START TRANSID with <ANY> TERMID
- START TRANSID features:
  - START TRANSID AFTER HOURS MINUTES SECONDS
  - START TRANSID AT HOURS MINUTES SECONDS
  - START TRANSID INTERVAL
  - START TRANSID REQID
  - START TRANSID SYSID
  - START TRANSID TERMID
  - START TRANSID TIME
- Configurable default transaction - GMTRAN (Good morning transaction)
- 3270 printer support

**Note:**

- When `ISC_ENABLE=YES`, ART CICS cannot validate `LUNAME` across multi-CICS regions. Users must ensure `LUNAME` is unique across different CICS regions.
- The validation is completed after users log on a CICS region (that is when users pass LOGON screen).

**KIXCONFIG**

`KIXCONFIG` is a mandatory environment variable that indicates the directory where resource configuration files are located.

**KIXDIR**

`KIXDIR` is a mandatory environment variable that indicates the directory where the CICS Runtime product is installed.

Usually, the Tuxedo environment variable `APPDIR` should be set to `${KIXDIR}/bin`.

## **KIX\_CBL\_TRAP\_ERROR**

`KIX_CBL_TRAP_ERROR` is used to enable or disable the COBOL LE (language environment) error procedure. The default value is `Y`, meaning the error procedure is enabled. If `KIX_CBL_TRAP_ERROR=N` is specified, the error procedure will be disabled. For more information, see [Error Processing in CICS Runtime](#).

## **KIX\_CICS\_RELEASE**

This is an optional environment variable that specifies CICS system code that returns in CICS `INQUIRE SYSTEM RELEASE` command. `KIX_CICS_RELEASE` is four characters long. Alternatively, you can specify the CICS system code by using system configuration file parameter `CICS_RELEASE`; if you do it, `CICS_RELEASE` configuration overrides `KIX_CICS_RELEASE` configuration.

## **KIX\_CURRENT\_YEAR**

This environment variable is optional. It specifies the "year" value returned by `ASKTIME` API. The value of `KIX_CURRENT_YEAR` is an integer greater than 0.

## **KIX\_CURRENT\_MONTH**

This environment variable is optional. It specifies the "month" value returned by `ASKTIME` API. The value of `KIX_CURRENT_MONTH` is a number 1 through 12, representing the months of the year beginning with January.

## **KIX\_CURRENT\_DAY**

This environment variable is optional. It specifies the "day" value returned by `ASKTIME` API. The value of `KIX_CURRENT_DAY` is a number 1 through 31, representing the days of the month.

## **KIX\_CURRENT\_HOUR**

This environment variable is optional. It specifies the "hour" value returned by `ASKTIME` API. The value of `KIX_CURRENT_HOUR` is a number 0 through 23, indicating the hours of the day.

## **KIX\_CURRENT\_MINUTE**

This environment variable is optional. It specifies the "minute" value returned by `ASKTIME` API. The value of `KIX_CURRENT_MINUTE` is a number 0 through 59, indicating the minutes of the hour.

## KIX\_CURRENT\_SECOND

This environment variable is optional. It specifies the "second" value returned by ASKTIME API. The value of `KIX_CURRENT_SECOND` is a number 0 through 59, indicating the seconds of the minute.

## KIX\_CWA\_IPCKEY

The Common Work Area (CWA), when defined (see `KIX_CWA_SIZE`), is implemented on each machine by a shared memory segment. The `KIX_CWA_IPCKEY` variable indicates the `IPCKEY` (the identifier) of the shared memory segment. The value must be defined in the range from 1 to 99 999 999.

**Note:** This variable is mandatory when `KIX_CWA_SIZE` is set to a value greater than zero.

## KIX\_CWA\_SIZE

This environment variable is optional.

On the source platform the Common Work Area (CWA) is shared by all the Programs executing inside a single CICS Region. The size of this CICS zone can vary from 0 to 32765 bytes, 0 indicating that no CWA is defined.

On the target platform, the `KIX_CWA_SIZE` variable also indicates the size of the CWA, ranging from 0 to 32765 bytes. If this environment variable is not set, the value defaults to 0. A value of zero (either explicit or implicit) indicates that no CWA is defined.

## KIX\_DUMP\_FILE

`KIX_DUMP_FILE` is an optional environment variable that indicates the file where the COBOL-IT memory dumps are located. Currently, the `KIX_DUMP_FILE` only take effect for COBOL-IT. And you must make sure the COBOL-IT version is newer than 3.7.7. The COBOL-IT version older than 3.7.8 can lead an infinite loop condition for memory DUMP.

If `KIX_DUMP_FILE` is set to a valid local file, the final memory information of the program will be dumped in this specified dump file when CICS program aborts; otherwise, no dump file will be generated.

## KIX\_DUMP\_TYPE

Specifies dump type. Valid values are `NONE`, `SYSTEM`, `COBOL`, and `BOTH`. Default value is `BOTH`.

### **NONE**

Dump no information

### **SYSTEM**

Dump process absolute path, memory maps, backtrace, and process core file

### **COBOL**

Dump COBOL-IT runtime information

### **BOTH**

Dump SYSTEM and COBOL information

## **KIX\_IMSDB\_TRACE\_LEVEL**

`KIX_IMSDB_TRACE_LEVEL` is an optional environment variable that specifies IMS DB access log trace level; its value equals to the level in Oracle Tuxedo Application Runtime for IMS.

## **KIX\_JOURNAL\_DIR**

`KIX_JOURNAL_DIR` is a mandatory environment variable for `WRITE JOURNALNAME`. It indicates the directory where the files corresponding to journal records are located.

## **KIX\_MAP\_PATH**

This optional variable defines the path (the list of directories) in which the physical file of the mapset will be searched, in case the absolute path is not specified in the `FILENAME` field of Mapset in the Typeterm configuration file.

## **KIX\_MAX\_FATAL\_NUM**

Specifies the maximum exception count that one server can tolerate.

Default value is 16. It should be a value greater than 0 and less than 129.

## **KIX\_PROFILING**

`KIX_PROFILING` is used to enable or disable the CICS runtime statistics function. Specify `KIX_PROFILING=YES` to enable the statistics function. The default value is `NO`. For more information, see [CICS Runtime Statistics](#).

## **KIX\_QSPACE\_IPKEY**

This mandatory variable is used to create the Tuxedo qspace named `ASYNC_QSPACE` utilized by `ARTATRN` for delayed asynchronous transactions.

The value for the IPC key should be picked so as not to conflict with your other requirements for IPC resources. It should be a value greater than 32 768 and less than 262 143.



## KIX\_RESSEC

KIX\_RESSEC is an optional environment variable that enables or disables resource-based authorization.

- KIX\_RESSEC=A: performs resource-based authorization when you access a resource in a transaction. This applies to all transactions.
- KIX\_RESSEC=Y: performs resource-based authorization when you access a resource in a transaction. This only applies to the transactions whose RESSEC=Y is specified in transactions.desc.
- KIX\_RESSEC=N: no resource-based authorization is performed. This is the default value.

## KIX\_SHR\_IPCKEY

Mandatory for GETMAIN SHARED, it indicates the IPCKEY of the shared memory segment used for GETMAIN SHARED.

The IPCKEY must be unique for shared memory. If the IPCKEY value specified to KIX\_SHR\_IPCKEY is in use, then the feature does not work correctly -- if the shared memory with this IPCKEY is not used for GETMAIN SHARED, then server failed to boot; if it is used for GETMAIN SHARED, then server tries to attach to the shared memory and tries to use it to allocate memory.

## KIX\_SHR\_SIZE

Mandatory for GETMAIN SHARED, it indicates the size of shared memory used for GETMAIN SHARED in unit of Mega-byte. Valid range is from 0 to 32768\*1024. A value of 0 indicates no GETMAIN SHARED support. Since the overhead introduced by internal implementation mechanism, the actual memory size that can be used by user is less than the value indicated by KIX\_SHR\_SIZE.

## KIX\_SHR\_ATADDR

Optional for GETMAIN SHARED, the attaching address of shared memory, default: 0x300000000000. If the value is specified, it must be a page-aligned address, address in range 0x300000000000 ~ 0x500000000000 is taken as valid.

## KIX\_SO\_SUBSYS\_WRAPPER

This is an optional environment variable. When using Micro Focus COBOL, set KIX\_SO\_SUBSYS\_WRAPPER=YES, then ART uses a wrapper program to call real user program,

this workarounds working-storage variables initialization when user program is in .so format. Default value is NO.

### **KIX\_SPOOL\_JOB\_AUTO\_SUBMIT**

This is an optional environment variable for SPOOL functions. Only if `KIX_SPOOL_JOB_SUBMIT` is not set, `KIX_SPOOL_JOB_AUTO_SUBMIT` submits the spool files automatically when it is set to YES or yes.

For example: `KIX_SPOOL_JOB_AUTO_SUBMIT=yes`

### **KIX\_SPOOL\_JOB\_SUBMIT**

This is a mandatory environment variable used for SPOOL functions. It indicates the command line for the spool files submission. The command line should contain the first mandatory %s symbol that refers to the spool file name and the second facultative %s symbol that refers to the CLASS.

For example: `KIX_SPOOL_JOB_SUBMIT=/my_path/my_shell_script -f %s -c %s`

**Note:** This script should be run in the batch execution environment. You can use “nohup” and “&” command to keep running the script in the background after you have logged out.

### **KIX\_SPOOL\_OUTPUT\_DIR**

This is a mandatory environment variable used for SPOOL functions. It indicates the directory where the CICS Runtime writes the spool files named

`<spool_token>.<sever_pid>.<time_in_microseconds>.<occurrence_number>`

### **KIX\_TD\_DIR**

`KIX_TD_DIR` is a mandatory environment variable that indicates the directory where files corresponding to the extra partition TDQueues are located.

### **KIX\_TD\_QSPACE\_DEVICE**

`KIX_TD_QSPACE_DEVICE` is a mandatory environment variable for TD QUEUE (INTRA). It indicates the Tuxedo QSPACE needed by the `tdq_srv` server.

### **KIX\_TD\_QSPACE\_IPCKEY**

`KIX_TD_QSPACE_IPCKEY` is a mandatory environment variable for TD QUEUE (INTRA). It indicates the Tuxedo QSPACE ipckey needed by the `tdq` server.

## KIX\_TD\_QSPACE\_NAME

`KIX_TD_QSPACE_NAME` is a mandatory environment variable for `TD QUEUE (INTRA)`. It indicates the Tuxedo QSPACE name needed by the `tdq` server.

## KIX\_TECH\_DIR

`KIX_TECH_DIR` is a mandatory environment variable that indicates the directory where technical files used internally by ART CICS, for example to manage named `DELAYS` and `CANCELS` (thru the `REQID` option) or `ENQ/DEQ` are written. It should be the same for each server until one wants to reproduce the source limitation, where a named `DELAY` submitted on one CICS region, could not be canceled easily in another region.

## KIX\_TS\_DIR

`KIX_TS_DIR` is a mandatory environment variable that indicates the directory where files corresponding to non-recoverable TS are located. It can be differentiated for each `tsq` server by setting it differently in the server `envfile` (see the [Tuxedo documentation](#)).

## KIX\_TRACE\_LEVEL

This optional variable allows the administrator to get traces for the system activities.

It can be set from 0 to 9, 0 represents no trace, 9 represents maximum trace. The default value is 0 when the variable is not defined. The most relevant trace levels are:

- 0 – servers startup and fatal errors information
- 1 – transaction / command audit information
- 2 – loading resources and advertising services information
- 3 – informations exchanged with the terminal
- 5 – SPOOL (`CICS SPOOL`) function traces
- 7 – CICS function traces (`KIX__`)
- 9 – traces for support team

Other levels are reserved for support team. The higher level covers all traces delivered by lower level.

## **KIX\_TRACE\_PATH**

If `KIX_USER_TRACE` is set to `SID`, `KIX_TRACE_PATH` variable must be set. It defines the directory containing the trace files (the file name is ended by ".trc").

This variable is not used to store other files.

## **KIX\_TSQ\_FILE\_OPT**

Optional variable for `ARTTSQ`. Set `KIX_TSQ_FILE_OPT=YES` to enable file open/close optimization for non-recoverable `TSQ`. Default is `NO`.

## **KIX\_USER\_TRACE**

This optional variable defines the type of traces, one trace file per connection or all traces in the same file.

`KIX_USER_TRACE=SID` represents one trace file per connection. The other value is `STD`, in this case traces will be in each `stdout` of server, if the variable is not set to `STD` is assumed.

When you want to use transaction / command audit tool against multiple homonymous `ART` servers, `SID` should be used.

## **KIX\_USERID\_TOUPPER**

`KIX_USERID_TOUPPER` is an optional environment variable that enables or disables user `ID` uppercase conversion. When `KIX_USERID_TOUPPER` is set to `Y`, user `ID` that is specified in the `CESN` transaction is converted to uppercase after authentication. The default value is `N`.

## **KIX\_XA\_REOPEN\_THRESHOLD**

`KIX_XA_REOPEN_THRESHOLD` is an optional environment variable. It defines threshold to trigger `RM` reopen. Threshold is continuous `XA` operation failure times; `XA` operation is `tpbegin/tpcommit/tpabort`, from `Tuxedo` perspective. When the threshold is met, `ART` for `CICS` application servers (`ARTSTRN/1`, `ARTATRN/1`, `ARTCTRN/1`, `ARTWTRN/1` and `ARTDPL`) suspend its transaction service, and then try to re-open `RM` to recover the failure.

`KIX_XA_REOPEN_THRESHOLD` must be a positive value in decimal format; if it is not set, "XA error detect and `RM` reopen" function is not enabled.

## **KIX\_XA\_REOPEN\_INTERVAL**

`KIX_XA_REOPEN_INTERVAL` is an optional environment variable. It defines interval in seconds between two `XA` reopen tries. Specify `KIX_XA_REOPEN_INTERVAL` when

`XA_REOPEN_THRESHOLD` is set. Its value must be positive integer in decimal format; the default interval is 30 seconds.

## **LD\_LIBRARY\_PATH**

`LD_LIBRARY_PATH` is an optional environment variable that specifies the location of library.

## Environment Variables

# Language Environment

## ART3ABD

### Description

ART3ABD does the same things as CICS verb `CICS ABEND ABCODE (name) NODUMP`.

When ART3ABD is issued, ART for CICS runtime terminates the running CICS transaction and rolls it back, and finally outputs the specified ABCODE in ART for CICS traces as follows.

```
Abend ABCODE detected in transaction xxxx program xxxx.
```

### Parameter(s)

**abcode**

A 4-byte integer. Specifies the issued ABEND code.

**clean-up**

Not used.

## ARTEXTFH

### Description

ARTEXTFH is ART for CICS extension for Micro Focus Callable File Handler (ExtFH).

ARTEXTFH provides the same implementation of ARTEXTFH as Oracle Tuxedo ART for IMS.

- When user program uses `CALLFH ("ARTEXTFH")` and `OUTDD` compiling directives, the application outputted traces (such as `DISPLAY`) are redirected to ART for CICS traces.
- When user program uses `NOOUTDD` compiling directive, the application outputted traces (such as `DISPLAY`) are redirected to ART for CICS traces.

ARTEXTFH is only applicable for Micro Focus COBOL runtime.

# Server Configuration

This chapter contains the following topics:

- [CICS Runtime Servers References](#)
- [Generic CLOPT Options of CICS Runtime Servers](#)
- [Configuration Reference of CICS Runtime Servers](#)

## CICS Runtime Servers References

### About Generic Tuxedo Server Configuration

All Tuxedo servers configured in the Tuxedo UBBCONFIG configuration file use standard arguments common to all servers. CICS Runtime servers benefit automatically from this flexibility.

The required arguments are `SVRGRP` and `SVRID`.

Other common arguments like `MIN`, `MAX`, `SEQUENCE`, `CONV` etc. are also available.

For precise information about the use of Tuxedo server configuration, consult the Tuxedo documentation, specifically the `SERVERS` section of `UBBCONFIG(5)`.

One of the most useful of these optional arguments is the `CLOPT` (Command Line OPTions) argument. The `CLOPT` option is a string of command-line options that is passed to Tuxedo servers when they are booted.

This command line option is divided in two parts:

- A generic part, common to every Tuxedo server, common server options are:

```
[-e stderr_file] [-o stdout_file]
```

directing standard output and errors to specific files.

- A server specific part containing options referenced as `uargs` in Tuxedo documentation.



For precise information about using CLOPT options see the Tuxedo documentation, more specifically the [servopts](#) section.

The description of CICS Runtime specific servers systematically includes the two mandatory server arguments `SVRGRP` & `SVRID`, plus only the arguments needed specifically by the server type.

## Generic CLOPT Options of CICS Runtime Servers

This section describes the options common to all CICS Runtime servers. These options are documented in this section only.

- [CICS SYSID Argument](#)
- [CICS Application ID Argument](#)
- [Dynamic List of Groups Argument](#)
- [Static List of Groups Argument](#)
- [WebSphere MQ Queue Manager Name](#)
- [IMS DB Argument](#)
- [RM Reconnect Argument](#)

### CICS SYSID Argument

This argument defines the name of the CICS system.

#### Synopsis

```
-s TEST
```

#### Description

Sets the value returned to programs by `EXEC CICS ASSIGN SYSID`.

Character, 1-256, A-Za-z0-9[/:-].

The system identifier (CICS SYSID) is limited to four characters.

#### Exclusion

This option does not apply to ARTTCPL servers and connection servers.

## CICS Application ID Argument

This argument defines the APPLID name of the CICS system.

### Synopsis

```
-a INVOICE
```

### Description

Sets the value returned to programs by EXEC CICS ASSIGN APPLID.

Character, 1-256, A-Za-z0-9[/:-].

The application id (CICS APPLID) is limited to eight characters.

### Exclusion

This option does not apply to ARTTCPL servers and connection servers.

## Dynamic List of Groups Argument

This argument defines the lists of resource groups to be loaded by this server.

### Synopsis

```
-L LIST1:LIST2:...
```

### Description

Enables a dynamic change of the groups in a list for a running server. The lists referred by the -L argument should be defined in the `list_of_groups` configuration file. This argument replaces the -l option which is deprecated now.

Lists in the resources configuration files are defined by 10 character strings. A server only loads in memory resources belonging to one of the groups included in one of the lists.

As a facility for tests or generic servers, it is possible to remove the filtering by using -L '\*' to allow a server to load all the lists defined in the `list_of_groups` configuration file. A group can be loaded by a server specifying -L '\*' only if it is included in at least one list.

### Exclusion

This option does not apply to ARTTCPL servers and connection servers.

## Static List of Groups Argument

This argument is now deprecated and replaced by `-L` argument. It is still supported in this release but will be removed in future releases.

This argument lists the resource groups to be considered by the server when loading resources.

The list of groups defined statically in the CLOPT cannot be dynamically modified. For implementing a dynamic change of the list, use `-L` option instead.

### Synopsis

```
-l group1:group2:...:groupn
```

### Description

Groups in the resources configuration files are defined by 10 character strings. A server only loads in memory resources belonging to one of these groups.

As a facility for tests or generic servers, it is possible to remove the filtering by using `-l '*'` to allow a server to load all the resources defined in the configuration file.

### Exclusion

This option does not apply to ARTTCPL servers and connection servers.

## WebSphere MQ Queue Manager Name

This argument specifies a default name of the WebSphere MQ queue manager.

### Synopsis

```
-m queue_manager_name
```

### Description

Specifies a default name of the WebSphere MQ queue manager to be monitored.

You can specify only one WebSphere MQ queue manager for one server. The default queue manager is used when there are no `MQCONN` actions in transaction program migrated from mainframe.

### Exclusion

This option does not apply to ARTTCPL servers and connection servers.

## See Also

[Implementing Integration with WebSphere MQ](#) in *Oracle Tuxedo Application Runtime for CICS User Guide*

## IMS DB Argument

This argument defines the IMS/DB system to be accessed.

### Synopsis

```
--IMSDB -x -o host:port:dra
```

### Description

Defines the IMS/DB system to be accessed. This argument should be the last argument in CLOPT.

#### **--IMSDB**

The start flag for IMS configuration.

#### **host**

Hostname or ipv4 address of ODBA proxy to be connected.

#### **port**

Port of ODBA proxy for receiving ODBA request.

#### **dra**

Name of the DRA table where the IMS/DB system to be accessed is defined.

### Exclusion

This option only applies to the following servers: ARTSTRN, ARTSTR1, ARTATRN, ARTATR1, ARTCTRN, ARTCTR1, ARTWTRN, ARTWTR1, and ARTDPL.

## RM Reconnect Argument

This argument enables ART application servers to reconnect to RM when requested.

### Synopsis

```
-R [MAX_TRANS_NUM]
```

## Description

This argument enables ART application servers to reconnect to RM when requested.

### **-R MAX\_TRANS\_NUM**

MAX\_TRANS\_NUM specifies the maximum number of transactions, no later than which ART for CICS server must reconnect to RM (after ART for CICS receives a reconnect request). Meaning, after receiving a reconec request, an ART for CICS application server will reconnect to RM randomly (either during the next transaction in this case, or during any transaction no later than the one that MAX\_TRANS\_NUM specifies).

-R MAX\_TRANS\_NUM can appear anywhere in a server's CLOPT; however, if you omit MAX\_TRANS\_NUM (as MAX\_TRANS\_NUM is optional), -R must be the last argument of the CLOPT.

## Exclusion

This option only applies to the following servers: ARTSTRN, ARTSTR1, ARTATRN, ARTATR1, ARTCTRN, ARTCTR1, ARTWTRN, ARTWTR1, and ARTDPL.

# Configuration Reference of CICS Runtime Servers

## ARTTCPL/ARTTCPH Configuration

### Server Name

ARTTCPL – Terminal Control Program Listener.

### Synopsis

```
ARTTCPL SRVGRP="identifier" SRVID="number" CLOPT="[servopts options] -- -n
netaddr -S ssladdr -L pnetaddr [-m minh] [-M
maxh] [-x session-per-handler] [-p profile-name] [-z minencryptbits] [-Z
maxencryptbits] [-t Application_list_transid] [-T minutes] [-D] [+H
trace-level] [-K seconds]"
```

### Description

The terminal control program (ARTTCP) is a group of Tuxedo servers that manage the connections of 3270 terminal emulators to CICS Runtime. When you run programs, the ARTTCP connects terminal emulators to the network ports assigned to ARTTCP. ARTTCP communicates with the emulator using a Telnet protocol.

The ARTTCPL server is composed of two types of servers: a single ARTTCPL listener (ARTTCPL) process and one or more ARTTCPL handler (ARTTCPH) processes. The ARTTCPL process establishes a well-known listening port address to which terminal emulators may connect. The ARTTCPH process listens on this port and accepts incoming connection requests. The ARTTCPH process establishes your user session for the connection and handles all subsequent screen I/O for the terminal emulator. As a performance enhancement, each ARTTCPH process can manage multiple sessions simultaneously. When you disconnect the emulator from the port, the ARTTCPH terminates the session.

To join 3270 terminal to ART Runtime, you must specify the `MAXWSCLIENTS` parameter in the `MACHINES` section of the `UBBCONFIG` file. `MAXWSCLIENTS` is the only parameter that has special significance for ARTTCPL. `MAXWSCLIENTS` tells the Oracle ART at boot time how many accesser slots to reserve exclusively for 3270 terminals.

For `MAXWSCLIENTS`, specify the maximum number of 3270 terminal that may connect to a node. The default is 0. If not specified, terminal may not connect to the machine being described.

The syntax is `MAXWSCLIENTS=number`.

## Parameters

The following CLOPT run-time parameters are recognized:

### **-n netaddr**

This address specifies where TN3270 terminal emulators connect to ARTTCPL. The address is a string in standard internet URL format. For example:

```
//computer:4000 designates port 4000 on machine computer.
```

Character, 1-256, A-Za-z0-9[/:-]. Mandatory option if option `-S` is not specified.

### **-S ssladdr**

This address specifies where TN3270 terminal emulators connect to ARTTCPL via SSL. The address is a string in standard internet URL format. For example:

```
//computer:5000 designates port 5000 on machine computer.
```

Character, 1-256, A-Za-z0-9[/:-]. Mandatory option if option `-n` is not specified.

ARTTCPL shares the same SSL related configuration with Tuxedo, so the following attributes should be configured in the `RESOURCES` section of Tuxedo `UBBCONFIG` configuration file: `SEC_PRINCIPAL_NAME`, `SEC_PRINCIPAL_LOCATION`, `SEC_PRINCIPAL_PASSVAR`. Please refer to the corresponding Tuxedo documentation for details.

Information (including password) exchanged between TN3270 terminal emulator and ARTTCPL server is vulnerable unless SSL is enabled.

**-L pnetaddr**

This address is used by the system internally between ARTTCPL and ARTTCPH. The address is a string in standard internet URL format. For example:

`//computer1:4001` designates port 4000 on machine computer.

Character, 1-256, A-Za-z0-9[/:-]. Mandatory option.

**[-m minh]**

The minimum number of handler processes that will be started by ARTTCPL. The actual number of handler processes will always be between the minh and maxh based on system load.

Numeric, 1-4096. Default value is 1.

**[-M maxh]**

The maximum number of handler processes that will be started by ARTTCPL. The actual number of handler processes will always be between the minh and maxh based on system load.

Numeric, 1-4096. Default value is 4096.

**[-x session-per-handler]**

The number of sessions a ARTTCPH can maintain concurrently.

Numeric, 1-255. Default value is 32.

**[-p profile-name]**

The default security profile file name. Please refer to Security configuration for details.

String. The default value is `~/ .tuxAppProfile`.

**[-z minencryptbits]**

The minimum level of encryption required when a network link is being established between a TN3270 terminal emulator and ARTTCPL. 0 means no encryption, while 40, 56, 128, and 256 specify the length (in bits) of the encryption key. If this minimum level of encryption cannot be met, link establishment fails.

Numeric. Default value is 0. This option will be ignored if -S option is not specified.

**[-Z maxencryptbits]**

The maximum level of encryption required when a network link is being established between a TN3270 terminal emulator and ARTTCP. 0 means no encryption, while 40, 56, 128, and 256 specify the length (in bits) of the encryption key.

Numeric. Default value is 256. This option will be ignored if `-s` option is not specified.

**[-t Application\_list\_transid]**

This option specifies the transaction (application list `TRANSID`) to enable ARTTCP multiple session management function. You should also define this transaction in `transactions.desc`, using the same `TRANSID`.

For more information, see "[Implementing Using Multiple Session Management](#)" in *Oracle Tuxedo Application Runtime for CICS User Guide*.

**[-T minutes]**

Enable timeout mechanism between ARTTCPL/ARTTCPH and TN3270 terminal emulators. Numeric (in minutes). This numeric is a threshold value, after which ARTTCPL/ARTTCPH begins to disconnect TN3270 terminal emulators if there isn't application data exchanged on the link. 0 means no timeout; a negative value is forbidden.

**[-D ]**

Enable Debug.

**[+H trace-level]**

Specify the trace level:

-1: trace off.

0: trace for all ARTTCPH.

n (n>0): trace the first n ARTTCPH.

**[-K seconds]**

Enable sending of keep-alive messages between ARTTCPL/ARTTCPH and TN3270 terminal emulators.

Numeric (in `seconds`). This numeric is a threshold value, after which ARTTCPL/ARTTCPH begins to send keep-alive messages to TN3270 terminal emulators. 0 means to use the system default value; a negative value means this keep-alive feature is disabled. This option only supports Linux and AIX platforms.

**Example(s)**

```
*MACHINES
```



```

DEFAULT:
MAXWSCLIENTS = 20
...
*SERVERS ARTTCPL SRVGRP="TCPGRP" SRVID=1000 RESTART=Y GRACE=0
CLOPT="-- -n //hostname:4000 -L //hostname:4002 -m1 -M10 "

```

## ARTSTRN Configuration

### Server Name

ARTSTRN – CICS Runtime main server for synchronous terminal oriented transactions with MAXACTIVE > 1.

### Synopsis

```

ARTSTRN SRVGRP="identifier" SRVID="number" CONV=Y MIN=minn MAX=maxn
RQADDR=queueaddr REPLYQ=Y CLOPT="[servopts] -- -s System_ID -a
Application_ID -L list1:list2 --IMSDB -x -o host:port:dra"

```

### Description

ARTSTRN servers present application transactions as Tuxedo services and, when receiving a transaction request, execute the corresponding programs.

These servers are conversational in order to manage true conversational CICS transactions.

1. When starting, an ARTSTRN server publishes one service per transaction it offers.
2. When a user transmits a transaction request, the ARTTCPH managing the user performs a tconnect to the corresponding transaction (service).
3. One ARTSTRN server offering this service receives the request with the associated commarea and screen and then processes the transaction.
4. After processing the transaction, the ARTSTRN server:
  - In the case of a Normal Pseudo-Conversational CICS transaction: On the RETURN {TRANSID} a reply is sent to the client, finishing the conversation by a tpreturn() returning the new 3270 screen, and the commarea.
  - In the case of a Conversational CICS transaction with loop of SEND & RECEIVE:

- On the **RECEIVE** the ARTSTRN server transmits the prepared 3270 stream via `tpsend()`, then waits for a `tpreceive`, for the next user input to complete the **RECEIVE**
- On the **RETURN {TRANSID}** the ARTSTRN server replies to the client, finishing the conversation by a `tpreturn()` returning the new 3270 screen, and the commarea.

Only transactions belonging to no tranclass, or to a tranclass with `maxactive > 1` are advertised by these servers.

## Parameters

### CONV

The generic parameter CONV is mandatory for this server type, and must be defined as `CONV=Y`, because ARTSTRN is non-transactional.

### minn and maxn

Specify respectively the initial and maximum number of servers with this configuration to start. For more information see the [UBBCONFIG](#) section of the Tuxedo documentation.

### CLOPT options

The following CLOPT run-time parameters are recognized:

- s SystemID  
Mandatory argument, see [CICS SYSID Argument](#).
- l GroupList  
Mandatory option, see [Static List of Groups Argument](#).
- a Application\_ID  
Optional argument, see [CICS Application ID Argument](#).
- L List\_name(s)  
Mandatory argument, see [Dynamic List of Groups Argument](#).
- IMSDB -x -o host:port:dra  
Optional argument, see [IMS DB Argument](#).

## Environment Variables Used

- [KIXCONFIG](#)
- [KIX\\_CWA\\_IPCKEY](#)
- [KIX\\_TRACE\\_LEVEL](#)
- [KIX\\_MAP\\_PATH](#)

- [KIX\\_Tech\\_Dir](#)
- [KIX\\_ResSec](#)
- [KIX\\_SO\\_Subsys\\_Wrapper](#)
- [KIX\\_Shr\\_IPKey](#)
- [KIX\\_Shr\\_Size](#)
- [KIX\\_Shr\\_AtAddr](#)
- [KIX\\_XA\\_Reopen\\_Threshold](#)
- [KIX\\_XA\\_Reopen\\_Interval](#)
- [ART\\_ims\\_config](#)
- [ART\\_ims\\_db](#)
- [KIX\\_imsdb\\_trace\\_level](#)
- [LD\\_Library\\_Path](#)
- [ARTKIX\\_XA\\_Disable](#)

## Example(s)

```
*SERVERS

ARTSTRN SRVGRP="TCPGRP" SRVID=1000 RESTART=Y GRACE=0

CONV=Y MIN=2 MAX=3 RQADDR=QKIX1000 REPLYQ=Y

CLOPT=" -- -s PROW -a INVOICE -L list1:list2 --IMSDB -x -o
wasas.us.oracle.com:6799:IMSD"
```

## ARTSTR1 Configuration

### Server Name

ARTSTR1 – CICS Runtime main server for synchronous terminal oriented transactions with  
MAXACTIVE = 1.

### Synopsis

```
ARTSTR1 SRVGRP="identifier" SRVID="number" CONV=Y MIN=1 MAX=1
CLOPT="[servopts] -- -s System_ID -a Application_ID-L list1:list2,... --IMSDB
-x -o host:port:dra"
```

## Description

These servers are a specialized version of ARTSTRN servers presenting only transactions with `MAXACTIVE = 1`; While ARTSTRN servers present only transactions with `MAXACTIVE > 1`.

It is critical and verified by STR1 servers at boot time that `MIN` and `MAX` number of servers are set to 1. The goal of these servers being to guarantee the parallel processing of only one transaction in a group (with `MAXACTIVE = 1`), to start or let Tuxedo start a few servers offering the same transactions will be self-defeating for STR1 Servers.

Since `MIN` and `MAX` are set to 1 the Tuxedo argument `RQADDR`, become unnecessary, and should be avoided for simplicity.

The rest of the configuration and behavior of STR1 servers are exactly the same a STRN servers.

## Example(s)

```
*SERVERS
ARTSTR1 SRVGRP="TCPGRP" SRVID=1000 RESTART=Y GRACE=0
CONV=Y MIN=1 MAX=1
CLOPT=" -- -s PROW -a INVOICE -L list1:list2 --IMSDB -x -o
wasa.us.oracle.com:6799:IMSD"
```

## ARTTSQ Configuration

### Server Name

ARTTSQ – CICS Runtime Temporary Storage Queue Server

### Synopsis

```
ARTTSQ SRVGRP="identifier" SRVID="number" MIN=1 MAX=1
CLOPT"[servopts] -- -L list1:list2"
```

### Description

ARTTSQ manages temporary storage queues, it serves the functionalities required by EXEC CICS: WRITEQ TS, READQ TS and DELETEQ TS. Two versions of ARTTSQ server are delivered : ARTTSQ (for Oracle db), and ARTTSQ\_UDB (for UDB) . TMS and OPENINFO should be defined accordingly.

ARTTSQ publishes two main kinds of services:

- **TSQUEUE:** This service is published only once when the first ARTTSQ starts. TSQUEUE processes TSQ requests for queues matching no TSMODEL.
- **{TSMODEL}\_TSQUEUE:** One of those services is published for each TSMODEL.

The server publishing this service will accomplish all the operations needed on the queues matching this TSMODEL.

One server will publish the TSMODELS belonging to the resource groups assigned to this server thru the `-l` option.

A group of resources must be assigned to a single tsq server to avoid trying to publish the same service twice. This is checked at boot time and will generate error messages during the boot phase when not respected, but no action will be taken.

It is critical, and verified by TSQ servers at boot time, that `MIN` and `MAX` number of servers are set to 1.

It is critical that the same server which created one queue (first write) also serves all other read/write delete requests to this queue. This is the reason why each service, either generic or corresponding to a specific model, must be advertised by a single server.

This unicity is verified when services are published.

The auxiliary TSQ data is lost after the server is down (e.g. stop or crash).

## Parameters

The following CLOPT run-time parameters are recognized:

`-L ListName(s)`

Mandatory argument, see [Dynamic List of Groups Argument](#) for more information.

## DBMS Constraints

The DBMS user indicated in the `OPENINFO` of the group containing the server, must have access to the `TS_QCONTENT` table; either directly (objects created in this schema) or thru a `DBLINK`.

On this pre-existing table it must have select, insert, update, delete permissions.

The script to create the table for Oracle is listed below:

---

### Listing 11-1 TS\_QCONTENT Creation

```
drop table TS_Q_CONTENT purge;
```

```

create table TS_Q_CONTENT
( TS_QUEUE   char(16) NOT NULL,
  TS_ITEM    number(8) NOT NULL,
  TS_LENGTH  number(8),
  TS_RAW     LONG RAW,
  primary key (TS_QUEUE, TS_ITEM)
);

```

---

## Environment Variables Used

- [KIXCONFIG](#)
- [KIX\\_TS\\_DIR](#)
- [KIX\\_TRACE\\_LEVEL](#)
- [KIX\\_MAP\\_PATH](#)
- [KIX\\_TECH\\_DIR](#)
- [KIX\\_TSQ\\_FILE\\_OPT](#)

## Example(s)

```

*SERVERS

ARTTSQ SRVGRP="GRP02" SRVID=30 RESTART=Y GRACE=0
      MIN=1 MAX=1 CLOPT=" -- -L list1:list2"

```

## ARTTSQP Configuration

### Server Name

ARTTSQP - CICS Runtime Temporary Storage Queue Pool Server

### Synopsis

```

ARTTSQP SRVGRP="identifier" SRVID="number"
CLOPT="[servopts] -- -L list1:list2 -p"

```

## Description

ARTTSQP manages temporary storage queues which are defined in TS pool. It serves the functionalities required by EXEC CICS (WRITEQ TS, READQ TS and DELETEQ TS). Two versions of ARTTSQP server are delivered: ARTTSQP (for Oracle DB) and ARTTSQP\_UDB (for UDB). TMS and OPENINFO should be defined accordingly. Every CICS region can have multiple ARTTSQP servers, and different Tuxedo domains can use the same database; therefore, the TS queue can be shared among different CICS regions in Tuxedo domains.

The fact that you can configure more than one ARTTSQP servers to serve for the same TSMODEL features the HA capability of ART for CICS.

## Parameters

The following CLOPT run-time parameters are recognized:

**-L List\_name(s)**

Mandatory argument, see [Dynamic List of Groups Argument](#).

**-p**

Indicates ART TSQ pool server (ARTTSQP or ARTTSQP\_UDB) to use database stored procedure to access database.

**Note:** This feature requires Oracle Tuxedo Application Runtime for CICS 12c Release 2 (12.1.3) Rolling Patch 042 or later. If you already used `crtsttable_{Oracle|UDB}` to create database table, you must run script `'$KIXDIR/tools/upgtsp_{Oracle|UDB}.sh'` to define procedure in database prior to using `-p` option.

## DBMS Constraints

The DBMS user indicated in the OPENINFO of the group containing the server, must have access to ARTTSQP\_INFO, ARTTSQP\_CONTENT and ARTTSQP\_MAN tables, either directly (objects are created in this schema) or through a DBLINK.

On these pre-existing tables the DBMS user must have select, insert, update, delete permissions.

You can find the sample script `crtsttable_{Oracle|UDB}` in `$KIXDIR/tools` to create tables.

When using UDB, do the followings to rebind ARTTSQP\_UDB.

1. Set environment variable `MT_DB_LOGIN` to enter database connection information.
2. Go to `$KIXDIR/bin`.
3. Execute:

```
../tools/bind.sh tspool_UDB.bnd
```

The `bind.sh` script issues `DB2 BIND` command; you can change its parameter to meet your actual scenario. The changes you make will affect not only `ARTTSQP_UDB` but also `ARTSRM_UDB` and `ARTTSQ_UDB` via commands like `buildartcics`.

## Environment Variables Used

- [KIXCONFIG](#)
- [KIX\\_TRACE\\_LEVEL](#)
- [KIX\\_MAP\\_PATH](#)
- [KIX\\_TECH\\_DIR](#)

## Example(s)

```
*SERVERS
ARTTSQP SRVGRP="GRP02" SRVID=1000 RESTART=Y
CLOPT=" -- -L list1:list2"
```

## ARTTDQ Configuration

### Server Name

ARTTDQ – CICS Runtime Transient Data Queue Server

### Synopsis

```
ARTTDQ SRVGRP="identifier" SRVID="number" MIN=1 MAX=1
CLOPT"[servopts] -- -L list1:list2:..."
```

### Description

ARTTDQ manages transient data storage queues, it serves the functionalities required by EXEC CICS: WRITEQ TD, READQ TD and DELETEQ TD.

ARTTDQ publishes one service per declared queue as the name of the TDQueue suffixed by “\_TDQ”:

A group of resources must be assigned to a single ARTTDQ server to avoid trying to publish the same service twice. This is checked at boot time and will generate error messages during the boot phase when not respected, but no action will be taken.

It is critical, and verified by TDQ server at boot time, that MIN and MAX number of servers are set to 1.



The extra partition TDQ data is lost after this server is down (e.g. stop or crash).

## Parameters

### ARTTDQ

The following CLOPT run-time parameters are recognized:

#### **-L ListName(s)**

Mandatory argument, see [Dynamic List of Groups Argument](#) for more information.

## Environment Variables Used

- [KIXCONFIG](#)
- [KIX\\_TS\\_DIR](#)
- [KIX\\_TRACE\\_LEVEL](#)
- [KIX\\_TECH\\_DIR](#)

## Example(s)

```
*SERVERS
ARTTDQ SRVGRP="GRP02" SRVID=30 RESTART=Y GRACE=0
      MIN=1 MAX=1 CLOPT=" -- -s PROW -l group1:group2"
```

# ARTDPL Configuration

## Server Name

ARTDPL – CICS Runtime server for distributed program link execution.

## Synopsis

```
ARTDPL SRVGRP="identifier" SRVID="number" MIN=minn MAX=maxn
      CLOPT="[servopts] -- -s System_ID -a Application_ID -L list1:list2
-b suffix -d suffix --IMSDB -x -o host:port:dra"
```

## Description

These servers present application programs restricted to DPL subsets as tuxedo services and when receiving a DPL service request execute the corresponding program. These programs are screenless programs which cannot interact directly with terminal users. These servers do not

need to (cannot) address the principal facility (the user terminal) and so do not need to be conversational. They are pure RPC mode servers.

When a program requests a LINK, if the requested program is configured as DPL then the link is not resolved as usual by a call, but by a `tpcall`, which will be served by one of the DPL servers offering this service (this DPL program).

Only programs with the attribute `REMOTESYSTEM(sysid)` positioned to DPL, will be advertised by DPL servers, and only by servers with this `sysid` as system indicated thru the `-s` option.

ARTDPL can choose whether to invoke some special programs for themselves during its initialization and shutdown. There are two methods. One is specifying the `"-b suffix_name"` or `"-d suffix_name"` option in their `CLOPT` of `UBBCONFIG` file. The other specify the `PLTPI` or `PLTSD` parameters in the `system.desc` configuration file. Both ways need to write the `program_list_table.desc` configuration file. This function does not support the `"XA DISABLE"` feature.

- Method 1:

For `CLOPT`, when ARTDPL specifies the `-b suffixname` or `-d suffixname` option, the server loads `program_list_table.desc` configuration file to obtain the right program list (with `suffix_name`). Then in `tpsvrinit()` or `tpsvrdone()`, the server executes these programs.

In the initialization programs, you may want to invoke some `EXEC CICS` commands, these command require ART CICS provided services. ARTDPL (which invokes the initialization programs), needs to be configured last in the `UBBCONFIG` file, so that it is booted last during ART CICS boot. The initialization programs can use the services provided in the previous application servers.

If ARTDPL specifies the `-d` option, it executes some programs during shutdown. You must first shutdown ARTDPL separately, and then shutdown all remaining ART CICS servers. For example, you must use `"shutdown -g groupname -I SRVID"` first, and then run `shutdown -y` to shutdown the entire ART CICS region.

- Method 2:

If you specify `PLTPI` or `PLTSD` in the `system.desc` file, when ARTDPL boots or shutdown, it invokes the programs list where `SUFFIX` is the same as the `PLTPI/PLTSD` value.

During the initialization or shutdown, the programs listed in `program_list_table.desc` (which is indicated by the `PLTPI` or `PLTSD`), are executed first, and then are the programs indicated by the `-b` or `-d` options.

## Parameters

### **minn and maxn**

Specify respectively the initial and maximum number of servers to start. For more information see the [UBBCONFIG](#) section of the Tuxedo documentation.

### **CLOPT options**

The following CLOPT run-time parameters are recognized:

`-s SystemID`

Mandatory option, see [CICS SYSID Argument](#).

**-b suffix**

Specifies the SUFFIX value in the `program_list_table.desc` to choose which programs the ARTDPL want to execute during its initialization.

**-d suffix**

Specifies the SUFFIX value in the `program_list_table.desc` to choose which programs the ARTDPL want to execute during its shutdown.

`-a Application_ID`

Optional argument, see [CICS Application ID Argument](#).

**Note:** You must configure at least one ARTDPL for each CICS region.

`-L List_name(s)`

Mandatory argument, see [Dynamic List of Groups Argument](#).

`-l GroupList`

Mandatory option, see [Dynamic List of Groups Argument](#).

**Note:** For both `-l` and `-L` options, if there are multiple ARTDPL in one ART CICS region and `-s` is configured in such region, please set the same value for all `-l` specified in this region, and set the same value for all `-L` specified in this region. For more information about `-L` configurations, please refer to [List of Groups Configuration File](#).

`-S`

Optional argument. ARTDPL servers can receive service requests from Tuxedo client, such as JCA client. In the Tuxedo client, you just need to add the COMMAREA data to the FML field `CXMW_MESSAGE`, and then `TPCALL` the corresponding program which is published as a service by ARTDPL. After receiving the service request, ARTDPL executes the corresponding program and finally `TPRETURN` the COMMAREA data returned by program with FML field `CXMW_MESSAGE`.

Sometimes, the length of the COMMAREA data returned by program is larger than the length of the COMMAREA data initialized in Tuxedo client. In this case, you need to add one more FML field `CXMW_COMMAREAINLENGTH` before `TPCALL` to the Tuxedo client. The `CXMW_COMMAREAINLENGTH` must be specified the total length of

COMMAREA which is initialized in Tuxedo client, and its data type is long. In this way, ARTDPL can TPRETURN COMMAREA data with the total length CXMW\_COMMAREAINLENGTH which is definitely larger than the length of the data filled in COMMAREA.

When the length of COMMAREA data returned by program is smaller than the total length CXMW\_COMMAREAINLENGTH, ARTDPL normally adds x'00' (null padding character) at the end in the return FML field CXMW\_MESSAGE. If you want to strip the NULL padding characters to reduce the data communications between the Tuxedo client and ARTDPL and improve the performance, add "-s" in the CLOPT options of ARTDPL. ARTDPL server will strip the padding characters and then TPRETURN the COMMAREA data with FML field CXMW\_MESSAGE.

```
--IMSDB -x -o host:port:dra
```

Optional argument, see [IMS DB Argument](#).

## Environment Variables Used

- [DBCONNECT](#)
- [KIXCONFIG](#)
- [KIX\\_CWA\\_SIZE](#)
- [KIX\\_CWA\\_IPCKEY](#)
- [KIX\\_TRACE\\_LEVEL](#)
- [KIX\\_TECH\\_DIR](#)
- [ARTKIX\\_XA\\_DISABLE](#)
- [KIX\\_SO\\_SUBSYS\\_WRAPPER](#)
- [KIX\\_SHR\\_IPCKEY](#)
- [KIX\\_SHR\\_SIZE](#)
- [KIX\\_SHR\\_ATADDR](#)
- [KIX\\_XA\\_REOPEN\\_THRESHOLD](#)
- [KIX\\_XA\\_REOPEN\\_INTERVAL](#)
- [ART\\_IMS\\_CONFIG](#)
- [ART\\_IMS\\_DB](#)
- [KIX\\_IMSDB\\_TRACE\\_LEVEL](#)
- [LD\\_LIBRARY\\_PATH](#)

## Example(s)

```
*SERVERS

ARTDPL SRVGRP="GRP02" SRVID=60 RESTART=Y GRACE=0

MIN=1 MAX=1

CLOPT=" -- -s PROW -a INVOICE -L list1:list2 --IMSDB -x -o
wasa.us.oracle.com:6799:IMSD"
```

## ARTATRN Configuration

### Server Name

ARTATRN – CICS Runtime server for asynchronous oriented transactions with `MAXACTIVE > 1`.

### Synopsis

```
ARTATRN SRVGRP="identifier" SRVID="number" CONV=N MIN=minn MAX=maxn
RQADDR=QKIXATR REPLYQ=Y CLOPT="[servopts] -- -s System_ID -a Application_ID
-L list1:list2:... --IMSDB -x -o host:port:dra"
```

### Description

ARTATRN servers present application transactions as Tuxedo services and when receiving a transaction request, execute the corresponding programs.

These programs are screenless programs which cannot interact directly with the terminal user.

In contrast to ARTSTRN servers, these servers are transactional in order to manage true CICS transactions. They are only called from other servers (START TRANSID) and never directly from terminals or clients.

When starting, an ARTATRN server publishes one service per transaction it offers. These transactions are named "ASYNC\_{transaction\_name} (.

This server also publishes an internal transaction called `ASYNC_QUEUE`.

1. When a user program calls a transaction, the `KIX__START_TRANSID` function makes a `tpacall` to the corresponding transaction (service).
2. One ARTATRN offering this service receives the request with the associated message, then processes the transaction.

3. The transactions ends without returning a message to the caller.

Only transactions belonging to no tranclasses, or to a tranclass with maxactive >1 are advertised by these servers.

## Parameters

### CONV

The generic parameter CONV is optional for this server type, if you use it, it must be defined as CONV=N, because the ARTATRAN is non conversational.

### minn and maxn

Specify the initial and maximum number of servers to be used to start with this configuration. For more information, see the [UBBCONFIG](#) section of the Tuxedo documentation.

### CLOPT

A string of command-line options that is passed to the ARTATRAN when it is booted. The following run-time parameters are recognized:

- s SystemID  
Mandatory argument, see [CICS SYSID Argument](#).
- a Application\_ID  
Optional argument, see [CICS Application ID Argument](#).
- L List\_name(s)  
Mandatory argument, see [Dynamic List of Groups Argument](#).
- IMSDB -x -o host:port:dra  
Optional argument, see [IMS DB Argument](#).

## Environment Variables Used

- [DBCONNECT](#)
- [KIXCONFIG](#)
- [KIX\\_CWA\\_SIZE](#)
- [KIX\\_CWA\\_IPCKEY](#)
- [KIX\\_QSPACE\\_IPCKEY](#)
- [KIX\\_TRACE\\_LEVEL](#)
- [KIX\\_TECH\\_DIR](#)
- [ARTKIX\\_XA\\_DISABLE](#)

- [KIX\\_RESSEC](#)
- [KIX\\_SO\\_SUBSYS\\_WRAPPER](#)
- [KIX\\_SHR\\_IPCKEY](#)
- [KIX\\_SHR\\_SIZE](#)
- [KIX\\_SHR\\_ATADDR](#)
- [KIX\\_XA\\_REOPEN\\_THRESHOLD](#)
- [KIX\\_XA\\_REOPEN\\_INTERVAL](#)
- [ART\\_IMS\\_CONFIG](#)
- [ART\\_IMS\\_DB](#)
- [KIX\\_IMSDB\\_TRACE\\_LEVEL](#)
- [LD\\_LIBRARY\\_PATH](#)

### Example(s)

```
*SERVERS

ARTATR1 SRVGRP="TCPGRP" SRVID=2000 RESTART=Y GRACE=0

    CONV=N MIN=2 MAX=3 RQADDR=QKIXATR REPLYQ=Y

    CLOPT=" -- -s PROW -a INVOICE -L list1:list2 --IMSDB -x -o
wasas.us.oracle.com:6799:IMSD"
```

## ARTATR1 Configuration

### Server Name

ARTATR1 - CICS Runtime main server for asynchronous oriented transactions with `MAXACTIVE = 1`.

### Synopsis

```
ARTATR1 SRVGRP="identifier" SRVID="number" CONV=N MIN=1 MAX=1
CLOPT="[servopts] -- -s System_ID -a Application_ID -L list1:list2:...
--IMSDB -x -o host:port:dra"
```

### Description

ARTATR1 servers are a specialized version of ARTATR1N servers presenting only transactions with `MAXACTIVE = 1`, whereas ARTATR1N servers present transactions with `MAXACTIVE > 1`.

It is critical, and verified by ATR1 servers at boot time, that `MIN` and `MAX` number of servers are set to 1. The goal of these servers is to guarantee the parallel processing of only one transaction in a group (with `MAXACTIVE =1`). To permit Tuxedo to start several servers offering the same transactions would be self-defeating for ATR1 Servers.

Since `MIN` and `MAX` are set to 1, the Tuxedo argument `RQADDR`, becomes unnecessary, and should be avoided for simplicity.

The rest of the configuration and behavior of ATR1 servers are exactly the same as ATRN servers.

### Example(s)

```
*SERVERS
ARTATR1 SRVGRP="TCPGRP" SRVID=2000 RESTART=Y GRACE=0
CONV=N MIN=1 MAX=1
CLOPT=" -- -s PROW -a INVOICE -L list1:list2 --IMSDB -x -o
wasa.us.oracle.com:6799:IMSD"
```

## ARTCTRN Configuration

### Server Name

`ARTCTRN` – CICS Runtime server for conversation oriented transactions with `MAXACTIVE > 1`.

### Synopsis

```
ARTCTRN SRVGRP="identifier" SRVID="number" CONV=Y MIN=minn MAX=maxn
RQADDR=QKIXCTR REPLYQ=Y CLOPT="[servopts] -- -s System_ID -a Application_ID
-L list1:list2:... --IMSDB -x -o host:port:dra"
```

### Description

`ARTCTRN` servers present application transactions as Tuxedo services and when receiving a transaction request, execute the corresponding programs.

These programs are screenless programs which cannot interact directly with the terminal user.

In contrast to `ARTSTRN` servers, these servers are transactional in order to manage true CICS transactions. They are only called from other servers (`CONVERSE`) and never directly from terminals or clients.



When starting, a ARTCTRN server publishes one service per transaction it offers. These transactions are named `{SysId}_{transaction_name}`.

The `{SysId}` is the name of this region defined in the `-s` parameter.

1. When a user program calls a transaction, the `KIX__CONVERSE` function makes a `tpacall` to the corresponding transaction (service).
2. One ARTCTRN offering this service receives the request with the associated message, then processes the transaction.
3. The transactions ends and the server returns a message to the caller.

Only transactions belonging to no tranclasses, or to a tranclass with `maxactive >1` are advertised by these servers.

## Parameters

### CONV

The generic parameter `CONV` is mandatory to be set as `Y` for this server type.

### minn and maxn

Specify the initial and maximum number of servers to be used to start with this configuration.

**Note:** If it's required to invoke multiple sessions simultaneously, users should both configure `MAXIMUM` in `connections.desc` and configure multiple ARTCTRN servers using ARTCTRN `minn` and `maxn` parameters in UBB. For more information, please refer to [UBBCONFIG](#).

### CLOPT

A string of command-line options that is passed to the ARTCTRN when it is booted. The following run-time parameters are recognized:

- `-s SystemID`  
Mandatory argument, see [CICS SYSID Argument](#).
- `-l GroupList`  
Mandatory option, see [Static List of Groups Argument](#).
- `-a Application_ID`  
Optional argument, see [CICS Application ID Argument](#).
- `-L List_name(s)`  
Mandatory argument, see [Dynamic List of Groups Argument](#).

--IMSDB -x -o host:port:dra  
 Optional argument, see [IMS DB Argument](#).

## Environment Variables Used

- [KIXCONFIG](#)
- [KIX\\_CWA\\_SIZE](#)
- [KIX\\_CWA\\_IPCKEY](#)
- [KIX\\_QSPACE\\_IPCKEY](#)
- [KIX\\_TRACE\\_LEVEL](#)
- [KIX\\_TECH\\_DIR](#)
- [KIX\\_RESSEC](#)
- [KIX\\_SO\\_SUBSYS\\_WRAPPER](#)
- [KIX\\_XA\\_REOPEN\\_THRESHOLD](#)
- [KIX\\_XA\\_REOPEN\\_INTERVAL](#)
- [ART\\_IMS\\_CONFIG](#)
- [ART\\_IMS\\_DB](#)
- [KIX\\_IMSDB\\_TRACE\\_LEVEL](#)
- [LD\\_LIBRARY\\_PATH](#)
- [ARTKIX\\_XA\\_DISABLE](#)

## Example(s)

```
*SERVERS
ARTCTR1 SRVGRP="TCPGRP" SRVID=2500 RESTART=Y GRACE=0
CONV=Y MIN=2 MAX=3 RQADDR=QKIXATR REPLYQ=Y
CLOPT=" -- -s PROW -a INVOICE -L list1:list2 --IMSDB -x -o
wasa.us.oracle.com:6799:IMSD"
```

## ARTCTR1 Configuration

### Server Name

ARTCTR1 – CICS Runtime main server for conversation oriented transactions with MAXACTIVE=1.

## Synopsis

```
ARTCTR1 SRVGRP="identifier" SRVID="number" CONV=Y MIN=1 MAX=1
CLOPT="[servopts] -- -s System_ID -a Application_ID -L list1:list2:...
--IMSDB -x -o host:port:dra"
```

## Description

ARTCTR1 servers are a specialized version of ARTCTR servers presenting only transactions with `MAXACTIVE = 1`, whereas ARTCTR servers present transactions with `MAXACTIVE > 1`.

It is critical, and verified by ARTCTR1 servers at boot time, that `MIN` and `MAX` number of servers are set to 1. The goal of these servers is to guarantee the parallel processing of only one transaction in a group (with `MAXACTIVE =1`). To permit Tuxedo to start several servers offering the same transactions would be self-defeating for ARTCTR1 servers.

Since `MIN` and `MAX` are set to 1, the Tuxedo argument `RQADDR`, becomes unnecessary, and should be avoided for simplicity.

The rest of the configuration and behavior of ARTCTR1 servers are exactly the same as ARTCTR servers.

## Example(s)

```
*SERVERS
ARTCTR1 SRVGRP="TCPGRP" SRVID=2000 RESTART=Y GRACE=0
CONV=Y MIN=1 MAX=1
CLOPT=" -- -s PROW -a INVOICE -L list1:list2 --IMSDB -x -o
wasa.us.oracle.com:6799:IMSD"
```

# ARTWTRN Configuration

## Server Name

ARTWTRN – CICS Runtime application server for synchronous non-3270s clients oriented transactions with `MAXACTIVE > 1`.

## Synopsis

```
ARTWTRN SRVGRP="identifier" SRVID="number" CONV=N MIN=minn MAX=maxn
CLOPT="[servopts] -- -s System_ID -a Application_ID -L list1:list2 --IMSDB
-x -o host:port:dra"
```

## Description

ARTWTRN servers present application transactions as Tuxedo services and, when receiving a transaction request, execute the corresponding programs.

These servers are non-conversational in order to support pseudo-conversational CICS transactions.

1. When starting, an ARWTRN server publishes one service per transaction it offers.
2. Non-3270s clients submit the request to ARTWTRN via tpcall and then ARTWTRN/1 will receive the request.
3. One ARTWTRN server offering this service receives the request with the associated application data from FML buffer and then processes the transaction.
4. After processing the transaction, on the RETURN {TRANSID}, a reply is sent to the client and the ARTWTRN server finishes the conversation by a tpreturn() to return the application data and TRANSID with FML buffer.
5. If users change the application data and re-submit it to transaction, Non-3270s clients could submit the request to ARTWTRN according the TRANSID received in step 4.

Only transactions belonging to no tranclass or to a tranclass with MAXACTIVE > 1 are advertised by these servers.

## Parameters

### CONV

The generic parameter CONV is an option for this server type; however, it must be defined as CONV = N because ARTWTRN is non-conversational.

### minn and maxn

Specify the initial and maximum number of servers, respectively. For more information, see [UBBCONFIG](#) section of the Tuxedo documentation.

### CLOPT options

The following CLOPT run-time parameters are recognized:

- s SystemID  
Mandatory argument, see [CICS SYSID Argument](#).
- l GroupList  
Mandatory option, see [Dynamic List of Groups Argument](#).
- a Application\_ID  
Optional argument, see [CICS Application ID Argument](#).

- L List\_name(s)  
Mandatory argument, see [Dynamic List of Groups Argument](#).
- IMSDB -x -o host:port:dra  
Optional argument, see [IMS DB Argument](#).

## Environment Variables Used

- [KIXCONFIG](#)
- [KIX\\_CWA\\_IPCKEY](#)
- [KIX\\_TRACE\\_LEVEL](#)
- [KIX\\_MAP\\_PATH](#)
- [KIX\\_TECH\\_DIR](#)
- [KIX\\_RESSEC](#)
- [KIX\\_SO\\_SUBSYS\\_WRAPPER](#)
- [KIX\\_XA\\_REOPEN\\_THRESHOLD](#)
- [KIX\\_XA\\_REOPEN\\_INTERVAL](#)
- [ART\\_IMS\\_CONFIG](#)
- [ART\\_IMS\\_DB](#)
- [KIX\\_IMSDB\\_TRACE\\_LEVEL](#)
- [LD\\_LIBRARY\\_PATH](#)
- [ARTKIX\\_XA\\_DISABLE](#)

## Example(s)

```
*SERVERS
ARTWTRN SRVGRP="TCPGRP" SRVID=1000 RESTART=Y GRACE=0
MIN=2 MAX=3
CLOPT=" -- -s PROW -a INVOICE -L list1:list2 --IMSDB -x -o
was.a.us.oracle.com:6799:IMSD"
```

## ARTWTR1 Configuration

### Server Name

ARTWTR1 – CICS Runtime application server for synchronous non-3270s clients oriented transactions with MAXACTIVE = 1.

### Synopsis

```
ARTWTR1 SRVGRP="identifier" SRVID="number" CONV=N MIN=1 MAX=1
CLOPT="[servopts] -- -s System_ID -a Application_ID-L list1:list2,... --IMSDB
-x -o host:port:dra"
```

### Description

These servers are a specialized version of ARTWTRN servers presenting only transactions with MAXACTIVE = 1; by contrast, ARTWTRN servers present only transactions with MAXACTIVE > 1.

It is critical and verified by WTR1 servers at boot time that MIN and MAX number of servers are set to 1. The goal of these servers being to guarantee the parallel processing of only one transaction in a group (with MAXACTIVE = 1), to start or let Tuxedo start a few servers offering the same transactions will be self-defeating for WTR1 Servers.

The rest of the configuration and behavior of WTR1 servers are exactly the same as WTRN servers.

### Example(s)

```
*SERVERS

ARTWTR1 SRVGRP="TCPGRP" SRVID=1000 RESTART=Y GRACE=0

MIN=1 MAX=1

CLOPT=" -- -s PROW -a INVOICE -L list1:list2 --IMSDB -x -o
wasa.us.oracle.com:6799:IMSD"
```

## ARTCNX Configuration

### Server Name

ARTCNX — CICS Runtime connection server for user connection management.

## Synopsis

```
ARTCNX SRVGRP="identifier" SRVID="number" CONV=Y MIN=1 MAX=1 RQADDR=QKIX110
REPLYQ=Y CLOPT="[servopts]"
```

## Description

This server offers internal services needed by terminal handlers during user connection and disconnection phases.

It offers internal message oriented services such as connect and disconnect:

- connect is in charge of various initialization tasks such as attributing the user Session ID and Terminal\_ID.
- disconnect manages the disconnection final tasks.

It also offers a few classical CICS transactions:

- CESN: the Sign oN transaction
- CESF: the Sign ofF transaction
- CSGM: the Good Morning transaction (default Good Morning transaction)

It also publishes an internal transaction, `authfail` used by the handler in case of authentication error.

Theses servers are conversational in order to manage CICS transactions CESN, CESF.

This server must be unique in a CICS Runtime system.

## Parameters

### CONV

The generic parameter `CONV` is mandatory for this server type, and must be defined as `CONV=Y`, because `ARTSTRN` is conversational.

### minn and maxn

Must be set to 1. This will still be true in the next release, where each server will be allocated a range of terminal identifiers (see `CLOPT` for more details)

### CLOPT

#### -t

A string of command-line options that is unique in global scope for `ARTCNX` and is passed to the `ARTCNX` when it is booted. The following run-time parameter is recognized:

`[-t]` (x is included in these ranges, "0 to 9", "A to Z" or "a to z").

Optional parameter used for determine the terminals number (`TRMID`).

If the parameter is not set you can start only one `ARTCNX` server (this restriction is checked at start), in this case the terminals number is between 0 to 25,411,680 (0000 to zzzz in base 71).

If you use this parameter, you can start up to 62 `ARTCNX` servers, each server has up to 357,911 terminals numbers, between 0 to 357,910 (000 to zzz in base 71), in this case the `TRMID` is composed as follow: x000 to xzzz (x is the character in `-t` parameter).

At the startup the server cannot check if you have set the same character in the `-t` parameter in many servers. It is your responsibility to not start several servers with the same parameter, or you risk having duplicated terminal numbers.

#### Notes:

- `ARTCNX` will check whether `-t` is unique in global scope when booting; if it is not, `ARTCNX` fails to boot.
- You can use `-t` to change the auto-assigned `TRMID` prefix, but make sure the auto-assigned `TRMID` is not same as the one defined in `terminals.desc`.

#### `-s`

Specifies the `SYSID` of a CICS region (the region which `ARTCNX` belongs to). The `SYSID` is limited to 4 characters and must be unique in each CICS region.

#### `-a`

Specifies the `APPLID` of a CICS region (the region which `ARTCNX` belongs to). The `APPLID` is limited to 8 characters.

**Note:** Users must set either `-s` or `-a` to configure at least one `ARTCNX` for each CICS region to associate the initialization parameters which are defined in `system.desc`; otherwise, if users set `-s` together with `-a`, warning messages will occur in `ULOG`, only `-s` will take effect, and `-a` will be ignored.

#### `-l:`

Specifies the resource group where `ARTCNX` should install. The resource is always terminals.

#### `-L:`

Specifies the list of resource groups where `ARTCNX` should install.

**Note:** For both `-l` and `-L` options, if there are multiple `ARTCNX` in one ART CICS region and `-s` is configured in such region, please set the same value for all `-l` specified in this



region, and set the same value for all `-L` specified in this region. For more information about `-L` configurations, please refer to [List of Groups Configuration File](#).

## Environment Variables Used

[KIX\\_TRACE\\_LEVEL](#)

## Example(s)

```
*SERVERS
```

```
ARTCNX SRVGRP="TCPGRP" SRVID=1000 CONV=Y MIN=1 MAX=1
```

## ARTLOGN Configuration

### Server Name

ARTLOGN – CICS Runtime Logon Server

### Synopsis

```
ARTLOGN SRVGRP="identifier" SRVID="number" CONV=Y MIN=1 MAX=1
RQADDR=QKIX110 REPLYQ=Y CLOPT="[servopts]"
```

### Description

This server offers the following technical services needed by terminal handlers when users log on ART CICS.

`ART_LOGON` sends the "ART runtime welcome" panel and asks for `APPLID` input.

`gensess` generates a globally unique session ID (unique in all CICS regions) with 16 characters for each terminal.

`delsess` removes the session ID when the corresponding terminal disconnects.

### Notes:

- ARTLOGN must be unique in a CICS Runtime system.
- ARTLOGN should be only configured when `ISC_ENABLE=YES` is specified; otherwise, the server will not boot.

## Parameters

### CONV

The generic parameter CONV is mandatory for this server type, and must be defined as CONV=Y, because ARTLOGN is conversational.

## Environment Variables Used

ISC\_ENABLE

## ARTADM Configuration

### Server Name

ARTADM — Administration Server

### Synopsis

```
ARTADM SRVGRP="identifier" SRVID="number" SEQUENCE=1
```

### Description

This server is responsible for the administration of CICS resource. It provides the following functionalities:

- Takes charge of loading the resource definitions used by other servers.
- Offers the services used by artadmin (ART administration console) for dynamic administration of CICS resources and propagates the dynamic configuration requests from artadmin to all the concerned servers in the system.
- Propagates the dynamic configuration requests submitted by artadmin to all the concerned servers in the system.
- Propagates the resource definition files to the slave machines from the central configuration repository when configured on each node in a distributed environment.

The configuration files only need to be configured on the master node, and the administration servers propagate the configuration files to each slave node.

It is now compulsory to configure a ARTADM server on each machine (master or slave) of the system. The ARTADM server must be started up before other ART servers. The ARTADM server on the master machine must be started up before others on the slave machines. To ensure this sequence, it is necessary to make the following configurations using SEQUENCE:

- For a single machine, configure the ARTADM with SEQUENCE=1.

- For multiple machines, configure the ARTADM on each node:
  - On the master machine, set SEQUENCE=1.
  - On the slave machines, set SEQUENCE=2.

**WARNING:** Do not use SEQUENCE for other servers, or in any case set with greater numbers.

## Environment Variables Used

KIXCONFIG

KIX\_TRACE\_LEVEL

## Example(s)

```
*SERVERS
```

```
ARTADM SRVGRP="ADMGRP" SRVID=1000 RESTART=Y SEQUENCE=1
```

# ARTCKTI Configuration

## Server Name

ARTCKTI — ART CICS Transaction Trigger Monitor

## Synopsis

```
ARTCKTI SRVGRP="identifier" SRVID="number" CLOPT="[servopts options] -- [-i
trigger_interval] [-s retry_interval] [-u DFLTUSER] [-m queue_manager_name]
-q queue_name1,queue_name2,..."
```

## Description

The ART CICS Transaction Trigger Monitor (ARTCKTI) behaves the same as the CICS CKTI transaction. It listens on one or multiple WebSphere MQ initiation queues, gets the trigger message when trigger event occurs, and then forward the trigger message to the target transaction for further operations.

ARTCKTI server accepts the following parameters for the ubbconfig file.

### **-i trigger\_interval**

Specifies the maximum time (in milliseconds) that the ARTCKTI server waits for a message to arrive on the initiation queue within each MQGET call.

Numeric, 0-2147483647. Default value is 5000.

**-s retry\_interval**

Specifies the retry interval (in seconds) for ARTCKTI to reconnect to the WebSphere MQ queue manager or to reopen the WebSphere MQ initiation queue upon failure.

Numeric, 0-2147483647. Default value is 5.

**-u DFLTUSER**

DFLTUSER is passed to application server ARTATRNL through transaction request so that ASSIGN USERID can get the expected userid. If -u option is not specified, CICS default userid CICSUSER takes effect.

**-m queue\_manager\_name**

Specifies the name of the WebSphere MQ queue manager to be monitored. Only one WebSphere MQ queue manager can be specified for one ARTCKTI server. The default queue manager is used when this parameter is not specified.

**-q queue\_name1,queue\_name2,.....**

Specifies the names of the initiation queue to be monitored. Multiple WebSphere MQ initiation queues in a WebSphere MQ queue manager can be monitored by one ARTCKTI server.

## Server Connection Parameters

ARTCKTI server acts as an WebSphere MQ client, so the channel info for MQ client is needed for ARTCKTI to connect to the WebSphere MQ queue manager.

Generally there are two ways to do this. One is to specify it in the client configuration file, and the other one is to specify it with the environment variable MQSERVER.

The channel info should contain the location of the WebSphere MQ server and the communication method to be used. It is a string of the format ChannelName/TransportType/ConnectionName.

ConnectionName must be a fully-qualified network name. ChannelName cannot contain the forward slash (/) character because this character is used to separate the channel name, transport type, and connection name.

ARTCKTI server requires WebSphere MQ multi-threaded library.

For details, please refer to Websphere MQ Client document.

## Build ARTCKTI Server

Object files are also provided for users who want to build their own ARTCKTI server based on a different version of WebSphere MQ.

To build the ARTCKTI server, execute the following command as the Tuxedo administrator with write permission for the `$KIXDIR/bin` directory:

```
buildserver -o $KIXDIR/bin/ARTCKTI -t -f "$KIXDIR/objs/ARTCKTI.o
$KIXDIR/objs/list.o" -l "-L/$MQM/lib64 -lmqic_r"
```

`$MQM` is the path that WebSphere MQ has been installed.

## ARTSRM Configuration

### Server Name

ARTSRM — CICS System and Resource Management Server.

### Synopsis

```
ARTSRM SRVGRP="identifier" SRVID="number" MIN=minn MAX=maxn
CLOPT="[servopts] -- -s System_ID -a Application_ID -L list1:list2:... -l
GroupList"
```

### Description

ARTSRM centralizes the management of ART runtime information, which is generated and queried by applications. This server can be used for interval control for delaying the start of a transaction instead of using /Q. This server can also be used to release the runtime resources (such as file resources and ENQ resources) when some ART for CICS application server die abnormally. ARTSRM does not support "Multiple Servers, Single Queue (MSSQ)" configuration.

System and Resource Management Server (ARTSRM) has three versions: ARTSRM, ARTSRM\_ORA (for Oracle), and ARTSRM\_UDB (for UDB). ARTSRM uses shared memory. ARTSRM\_ORA (for Oracle) and ARTSRM\_UDB (for UDB) use shared memory or database to store data; when configured to use database, the server utilizes DB to provide HA capability.

When your ARTSRM server uses shared memory and you do not specify `SRM_IPCKEY`, ARTSRM for the same region must be configured in the same Tuxedo group.

To use ARTSRM\_ORA or ARTSRM\_UDB, database tables must be created before startup. The sample script to create these tables is named as `crsrmtable_{Oracle|UDB}` and is placed at `$KIXDIR/tools`. The Tuxedo group where ARTSRM\_ORA or ARTSRM\_UDB resides must configure `OPENINFO`; ARTSRM\_ORA or ARTSRM\_UDB of the same region must use the same database.

When using ARTSRM\_UDB, do the following steps to rebind.

1. Set environment variable `MT_DB_LOGIN` to enter database connection information.

2. Go to `$KIXDIR/tools`.

3. Execute:

```
bindsrm.sh
```

In terms of user application, all configured ARTSRM must use the same storage media, either database or memory; otherwise, the named counter cannot work correctly.

If the server is rebooted, runtime information will be lost.

Two system servers must be configured in the `UBBCONFIG` file before ARTSRM can work correctly:

- `TMUSREVT`

This server is used to support updating terminals attributes.

When a terminal updates another terminal attribute, ARTSRM publishes the event to notify the terminal that being updated.

- `TMSYSEVT`

This server is used to release the file resource and ENQ resource.

When some servers die, ARTSRM releases the dead server acquired file resource and the dead server acquired ENQ resource.

## Parameters

### CLOPT options

The following CLOPT run-time parameters are recognized:

`-s SystemID`

Mandatory argument, see [CICS SYSID Argument](#).

`-l GroupList`

Mandatory option, see [Static List of Groups Argument](#).

`-a Application_ID`

Optional argument, see [CICS Application ID Argument](#).

`-L List_name(s)`

Mandatory argument, see [Dynamic List of Groups Argument](#).

## Related Features

It is required to set ARTSRM to enable the following related features.

- ASSIGN  
ABDUMP/ABPROGRAM/ASRAINTRPT/ASRAKEY/ASRAPSW/ASRAREGS/ASRASPC/ASRASTG/INITPARM/INITPARMLN/KATAKANA/NETNAME/SOSI/USERNAME
- CANCEL
- INQUIRE/SET FILE
- INQUIRE PROGRAM RESCOUNT
- INQUIRE SYSTEM JOBNAME
- INQUIRE TERMINAL ALTSUFFIX/USERID
- INQUIRE TRANSACTION PROGRAM
- INQUIRE TERMINAL/NETNAME ACQSTATUS CREATSESS
- ISSUE DISCONNECT
- ISSUE PASS and EXTRACT LOGONMSG
- SEND LAST
- SET/INQUIRE TERMINAL
- SET TERMINAL ACQSTATUS CREATE ACQUIRED RELEASED
- START TRANSID with <ANY> TERMID
- START TRANSID features:
  - START TRANSID AFTER HOURS MINUTES SECONDS
  - START TRANSID AT HOURS MINUTES SECONDS
  - START TRANSID INTERVAL
  - START TRANSID REQID
  - START TRANSID SYSID
  - START TRANSID TERMID
  - START TRANSID TIME
- Configurable default transaction - GMTRAN (Good morning transaction)
- 3270 printer support

## ARTSHM Configuration

### Server Name

ARTSHM - Shared storage management server

### Synopsis

```
ARTSHM SRVGRP="identifier" SRVID="number"
```

### Description

This server is responsible for the shared memory management for GETMAIN SHARED. It create/initialize shared memory for GETMAIN SHARED, manages memory allocation and free, and provides HA capability.

The server must configure to startup before any ART CICS application servers, and shutdown after all application servers.

### Environment Variables Used

- [KIX\\_SHR\\_IPCKEY](#)
- [KIX\\_SHR\\_SIZE](#)
- [KIX\\_SHR\\_ATADDR](#)

### Example(s)

```
*SERVERS
ARTSHM SRVGRP="SHMGRP" SRVID=10 RESTART=Y
```

## ARTCSKL Configuration

### Server Name

ARTCSKL — ART for CICS TCP/IP Socket Listener.

### Synopsis

```
ARTCSKL SRVGRP="identifier" SRVID="number" MIN=minn MAX=maxn
CLOPT="[servopts] -- -g ListenerGroupID -p port -D -t seconds"
```

### Description

ARTCSKL is the listener of ART for CICS TCP/IP socket and can perform the same functions as CICS TCP/IP listener CSKL. When client request comes, it passes the request to work task for



processing, and then waits for another client request. ARTCSKL can run in standard or enhanced mode; you can set the mode through `FORMAT` parameter of ART for CICS TCP/IP socket listener configuration file (`listener.desc`).

### Notes:

- ARTCSKL is the only supported socket listener; user-written listener is not supported.
- ARTCSKL and ARTATRN/ARTATR1 servers should be configured on the same machine.

## Parameters

### **minn and maxn**

Specify the initial and maximum number of servers to be used to start with this configuration. Both of them must be set to 1. For more information, see `UBBCONFIG` section of Oracle Tuxedo documentation.

### **CLOPT**

A string of command-line options that is passed to the ARTCSKL when it is booted. The following run-time parameters are recognized:

#### **-g ListenerID**

Specifies the section in ART for CICS TCP/IP Socket Listener Configuration File (`listener.desc`) to be loaded when it is booted.

#### **-p port**

Specifies the `PORT` that ARTCSKL listens to. If this option is set, the `-g` option will be ignored and all of other ARTCSKL parameters use default values. This option can only work for IPv4 users.

#### **-D**

Enables debug output.

#### **-t seconds**

Specifies how long in seconds (at most) the main thread can wait for the initiation of worker threads.

## Environment Variables Used

- [KIX\\_TECH\\_DIR](#)

## Example(s)

```
*SERVERS
```

```
ARTCSKL      SRVGRP=GRP02

              SRVID=30

              MIN=1 MAX=1 RESTART=Y MAXGEN=10

              CLOPT="-o
/home/kixdev/KIX12130RP/test/CIT_ORA/sample_04/LOGS/sysout/stdout_cskl -e
/home/kixdev/KIX12130RP/test/CIT_ORA/sample_04/LOGS/sysout/stderr_cskl -r
-- -g section2 -D -t 1"
```

### See Also

["Implementing Using ART for CICS TCP/IP Socket Interface"](#) in *Oracle Tuxedo Application Runtime for CICS User Guide*

# Security Configuration

## Security Configuration

### Authentication Configuration

CICS provides two system transactions for authentication purposes:

- CESN is the sign on transaction;
- CESF is the sign off transaction;

ARTTCP implements a similar authentication function leveraging Tuxedo's security mechanisms. Two Tuxedo system services CESN and CESF are provided by CICS Runtime to emulate the CESN and CESF transactions in CICS.

When a terminal connects to ARTTCP, ARTTCP creates a 3270 session and the session joins Tuxedo with the default security profile. The user name defined in the default security profile has the similar role as the CICS default user CICSUSER. The authentication process is then as follows:

1. The operator calls the CESN transaction to sign on to Tuxedo CICS Runtime Runtime.
2. CESN sends a sign-on MAP to ask for username and password.
3. The username and password are entered from the terminal.
4. ARTTCP re-joins Tuxedo using the username and password entered from the terminal.
5. If the authentication:
  - succeeds, a success message is returned to the terminal.
  - fails, an error message is returned to the terminal.
6. When completing the operations, the operator calls service CESF to sign off from Tuxedo CICS Runtime Runtime.

## Tuxedo Security Mechanisms

ARTTCP supports three types of Tuxedo security mechanisms: application password (`APP_PW`), user-level authentication (`USER_AUTH`), and access control list (`ACL` and `MANDATORY_ACL`).

The application password security mechanism requires that every client provide an application password as part of the process of joining the Tuxedo ATMI application. The administrator defines a single password for the entire Tuxedo ATMI application and gives the password only to authorized users. For more information on how to configure Tuxedo application password, please refer to Tuxedo documentation.

The user-level authentication security mechanism requires that in addition to the application password, each client must provide a valid username and password to join the Tuxedo ATMI application. The per-user password must match the password associated with the user name stored in a file named `tpusr`. Client name is not used. The checking of per-user password against the password and user name in `tpusr` is carried out by the Tuxedo authentication service `AUTHSVC`, which is provided by the Tuxedo authentication server `AUTHSVR`. For more information on how to configure Tuxedo user-level authentication, please refer to Tuxedo documentation.

When Tuxedo security is enabled, a default security profile, which includes the default `USER_AUTH` username and password and/or the `APP_PW` password, is required to allow users to join the Tuxedo domain before calling the CESN service. A security profile generator tool is introduced to generate the default security profile. Please refer to [Security Profile Generator](#) for details.

In the case of `APP_PW`, the Tuxedo application password must be created in Tuxedo configuration.

In the case of `USER_AUTH`, the Tuxedo application password, a Tuxedo username and password must be created in the Tuxedo configuration.

In both cases, the password (and username for `USER_AUTH`) must be specified in the default security profile file that is specified in the command line option (`-p profile-name`) of the Tuxedo `ARTTCPL` server. The password (and username for `USER_AUTH`) will be used as parameters of `tpinit()` when ARTTCP server joins Tuxedo.

## Integration with the External Security Manager

CICS Runtime offers a security framework which allows a customer to choose integration with an external security manager. The Tuxedo application key (`appkey`) is used as the credential to be passed to an external security manager. The `appkey` is 32 bits long, Tuxedo user identifier is in the low order 17 bits and the Tuxedo group identifier is in the next 14 bits (the high order bit

is reserved for administrative keys). For more information, please refer to Tuxedo documentation.

The `appkey` is passed in `AUTH-GROUPID`.

An authorisation function `CheckResourceAuth.gnt` is available for customization by the integration team. This function is called by CICS Runtime each time a resource authorization should be checked for a given resource.

A default function that always returns an ok status is provided. It can be replaced by a project specific version by the integration team, for a project where CICS resource authorization must be activated in addition to transaction authorization.

---

#### Listing 12-1 COBOL CICS Resource Authorization Interface

---

```

01 ret-code                usage int.

LINKAGE SECTION.

01 AUTH-USERID             PIC X(30) .
01 AUTH-GROUPID           PIC X(256) .
01 AUTH-RSRCE-TYPE        PIC X(256) .
01 AUTH-RSRCE-NAME        PIC X(512) .
01 AUTH-ACCESS-TYPE       PIC X(6) .

PROCEDURE DIVISION USING LK-AUTH-USERID LK-AUTH-GROUPID
                        LK-AUTH-RSRCE-TYPE LK-AUTH-RSRCE-NAME
                        LK-AUTH-ACCESS-TYPE.

```

---

### Accepting

---

|                              |   |
|------------------------------|---|
| <code>AUTH-USERID</code>     | Connection name of the user limited to 8 characters                 |
| <code>AUTH-GROUPID</code>    | Reserved for future extension                                       |
| <code>AUTH-RSRCE-TYPE</code> | Type of resource being checked (see <a href="#">Codification</a> ). |

---

|                  |  |
|------------------|--|
| AUTH-RSRCE-NAME  | Name of the resource to check authorization on                       |
| AUTH-ACCESS-TYPE | Type of access requested on the resource ("READ", "ALTER", "UPDATE") |

## Returning

|    |                                      |
|----|--------------------------------------|
| 0  | For authorization approved.          |
| -1 | For authorization refused or failed. |

## Codification

The resources types are codified as in a native CICS/RACF environment: XTST for Temporary Storage resources, XFCT for files, ...

See native CICS documentation for more information. The default version of this function provided with CICS Runtime always returns 0.

# TDI\_TRIGGER command

## Synopsis

```
TDI_TRIGGER [[-d </Q space_name> -q </Q queue_name>] | [-t
<transaction_name>]] [-p <profile>];
```

## Parameters

### space\_name

Specifies the /Q QSPACE name.

### queue\_name

Specifies the /Q QUEUE name.

### transaction\_name

Specifies the transaction to be triggered. If -d and -q are specified, -t is ignored.

### profile

The name of the profile file to use for authentication; this file must have been created with genappprofile. When not provided it defaults to ~/.TDappProfile.

# Security Profile Generator

When Tuxedo security is enabled, a default security profile, which includes the `APP_PW` password and the default `USER_AUTH` username and password, is required to allow the user to join the Tuxedo domain before calling the CESN service.

A security profile generator tool is introduced to generate the default security profile for TCP.

## genappprofile (1)

### Name

`genappprofile` — Security Profile Generator

### Synopsis

```
genappprofile [-f <output_file>]
```

### Description

This utility generates the security profile for Tuxedo applications. When the utility is launched, you are prompted to enter the Tuxedo application password, user name and user password. The output is a security profile file which contains the user name and encrypted passwords. The generated security profile file can be used by CICS Runtime ARTTCPL server to login to the Tuxedo domain.

### Options

The command option is:

#### **[-f <output\_file>]**

The location of the generated security profile file. If this option is not specified, the default value is `~/.tuxAppProfile`.

## Security Configuration



# System Commands and Transactions

This chapter contains the following topics:

- [System Commands](#)
- [System Transactions](#)

## System Commands

**Table 1 System Commands**

| Name                               | Description   |
|------------------------------------|---|
| <a href="#">artadmin(1)</a>        | ART CICS Runtime administration   |
| <a href="#">artcicsutil(1)</a>     | ART for CICS Control Utility  |
| <a href="#">checkcicsbinver(1)</a> | Checks Rolling Patch number where your COBOL program is compiled                                |
| <a href="#">cpy2view32(1)</a>      | Generates VIEW32 definition from COPYBOOK   |
| <a href="#">kixrpt(1)</a>          | Transaction / Command Audit Tool  |
| <a href="#">Mif2View32(1)</a>      | Generates VIEW32 definition per metadata input file and updates the given FML32 definition file |
| <a href="#">tcxscdvt(1)</a>        | CICS CSD Converter  |
| <a href="#">tcxmapgen(1)</a>       | CICS Runtime MAPSET Generator   |

### cpy2view32(1)

#### Name

`cpy2view32`—Generates Oracle Tuxedo VIEW32 definition file from COBOL copybook file.

## Synopsis

`cpy2view32 [OPTION... ] FILE`

## Description

This utility parses the COBOL copybook file and generates the corresponding Oracle Tuxedo VIEW32 definition files.

It supports the following options:

- `-i`  
With `-i` option, `cname` in VIEW32 definition files is not converted to lowercase; without `-i` option, `cname` is converted to lowercase.
- `-n`  
Specifies the source copybook is in "normal" format (i.e., copybook contains sequence number area (columns 1 through 6 is the sequence number area, followed by the indicator area)).
- `-e`  
Specifies the source copybook is in "exceptional" format (i.e., copybook does not contain a sequence number area (the first column is the indicator area)).
- `-o`  
Specifies the output file name, followed parameter is the output file name. If this parameter is not specified, the output file name changes the suffix of the input file name to `.v`. For example, `abc.cbl` is converted to `abc.v`.

This utility supports the following annotation in the source copybook:

\* `@binary`: by default, copybook data types without the following qualifiers are converted to `string`: `BINARY`, `COMP`, `COMP-1`, `COMP-2`, `COMP-3`, `COMP-4`, `COMP-5`, `PACKED-DECIMAL`. With the \* `@binary=true` annotation, the copybook data types without those qualifiers are converted to `CARRAY`. \* `@binary=false` changes the conversion rule back to the default. When this annotation is defined on a group, all subordinates in the group are affected.

## Environment Variables

`PATH`

The `cpy2view32` utility is written in Java. You must install JDK 1.6 or above and add the Java command "java" to the `PATH` environment variable.

**Example(s)**

1. The following example converts normal copybook file `abc_orig.cbl` to view file `abc_orig.v`:  

```
cpy2view32 /home/abc_orig.cbl
```
2. The following example converts exceptional copybook file `abc.cbl` to view file `abc.v`:  

```
cpy2view32 -e /home/abc.cbl
```
3. The following example converts normal copybook file `abc_orig.cbl` and outputs to view file `xyz.v`:  

```
cpy2view32 -o xyz.v /home/abc_orig.cbl
```
4. [Listing 13-1](#) through [Listing 13-4](#) provide Copybook and view file output Example(s):

**Listing 13-1 Copybook Example 1**

---

```
#####
      01 BOOK-INFO.
          05 BOOK-ID      PIC 9(9) COMP-5.
          05 BOOK-NAME    PIC X(100).
          05 PUBLISHER    PIC X(100).
          05 PRICE        USAGE COMP-1.
#####
```

---

**Listing 13-2 VIEW32 Output Example 1**

---

```
#####
#type          cname          fbname          count
flag   size   null
VIEW book_info
unsignedint          book_id          -          1 - - -
```

## System Commands and Transactions

```
string          book_name          -          1 - 100 -
string          publisher          -          1 - 100 -
float           price              -          1 - - -
END
#####
```

---

### Listing 13-3 Copybook Example 2

---

```
#####
01 COMPUTER.
    05 COMPUTER-ID      PIC 9(9) COMP-5.
    05 COMPUTER-NAME   PIC X(20).
    05 PRODUCER        PIC X(40).
    05 FILLER          PIC X(4).

    05 SELL-PRICE      USAGE COMP-2.
    05 RENTAL-PRICE    PIC S9999V999 PACKED-DECIMAL.
    05 KEYBOARD-PRICE  PIC S9(4) SIGN IS LEADING SEPARATE.
    05 MOUSE-PRICE     PIC S9(4) SIGN IS LEADING.

    05 FILLER PIC X(4).
* define other computer components below
    05 CPU.
        10 MODEL      PIC X(20).
        10 PRODUCER   PIC X(40).
        10 PRICE      USAGE COMP-1.
    05 COMPUTER-MEMORY OCCURS 4 TIMES.
```

```

10 MODEL PIC X(20) .
10 PRODUCER PIC X(40) .
10 PRICE USAGE COMP-1 .
05 MAINBOARD .
10 MODEL PIC X(20) .
10 PRODUCER PIC X(40) .
10 PRICE USAGE COMP-1 .
05 MONITOR .
10 MODEL PIC X(20) .
10 PRODUCER PIC X(40) .
10 PRICE USAGE COMP-1 .
05 HARDDISK .
10 MODEL PIC X(20) .
10 PRODUCER PIC X(40) .
10 PRICE USAGE COMP-1 .

```

```
#####
```

---

### Listing 13-4 VIEW32 Output Example 2

---

```
#####
```

| #type    | cname    | fbname | count    |
|----------|----------|--------|----------|
| flag     | size     | null   |          |
| VIEW cpu |          |        |          |
| string   | model    | -      | 1 - 20 - |
| string   | producer | -      | 1 - 40 - |
| float    | price    | -      | 1 - - -  |
| END      |          |        |          |

## System Commands and Transactions

VIEW computer\_memory

|        |          |   |   |   |    |   |
|--------|----------|---|---|---|----|---|
| string | model    | - | 1 | - | 20 | - |
| string | producer | - | 1 | - | 40 | - |
| float  | price    | - | 1 | - | -  | - |

END

VIEW mainboard

|        |          |   |   |   |    |   |
|--------|----------|---|---|---|----|---|
| string | model    | - | 1 | - | 20 | - |
| string | producer | - | 1 | - | 40 | - |
| float  | price    | - | 1 | - | -  | - |

END

VIEW monitor

|        |          |   |   |   |    |   |
|--------|----------|---|---|---|----|---|
| string | model    | - | 1 | - | 20 | - |
| string | producer | - | 1 | - | 40 | - |
| float  | price    | - | 1 | - | -  | - |

END

VIEW harddisk

|        |          |   |   |   |    |   |
|--------|----------|---|---|---|----|---|
| string | model    | - | 1 | - | 20 | - |
| string | producer | - | 1 | - | 40 | - |
| float  | price    | - | 1 | - | -  | - |

END

VIEW computer

|             |             |   |   |   |   |   |
|-------------|-------------|---|---|---|---|---|
| unsignedint | computer_id | - | 1 | - | - | - |
|-------------|-------------|---|---|---|---|---|

```

string          computer_name      -                1 - 20 -
string          producer           -                1 - 40 -
string          filler1            -                1 - 4 -
double         sell_price          -                1 - - -
carray         rental_price       -                1 - 4 -
string         keyboard_price     -                1 - 5 -
string         mouse_price        -                1 - 4 -
string         filler2            -                1 - 4 -
struct         cpu                 cpu              1 - - -
struct         computer_memory     computer_memory
4 - - -
struct         mainboard           mainboard        1
- - -
struct         monitor             monitor          1 - - -
struct         harddisk            harddisk         1
- - -
END
#####

```

---

## Limitations

The following are general cpy2view32 limitations:

1. This tool does not parse REDEFINES clause, REDEFINES clause and their subordinate items are skipped.
2. POINTER phrase, FUNCTION-POINTER phrase and PROCEDURE-POINTER phrase are skipped in the conversion.
3. VALUE clause is skipped in the conversion.
4. SYNCHRONIZED clause is skipped in the conversion.
5. JUSTIFIED clause is skipped in the conversion.

6. `BINARY`, `COMP`, and `COMP-4` are synonyms, they are converted to `CARRAY` in view file.

## Mif2View32(1)

### Name

`Mif2View32`—Generates `VIEW32` definition file according to the metadata input file and updates the given `FML32` definition file.

### Synopsis

```
Mif2View32 -i miffile -o viewfile -f fml32file -w webservice.desc [-v]
```

### Description

`Mif2View32` generates `VIEW32` definition file according to the metadata input file and updates the given `FML32` definition file. The generated nest `VIEW32` definition file keeps the same structure with `MIF`; therefore, we can map the `C` structure to an `FML32` structure.

### Options

`Mif2View32` supports the following options.

- i miffile**  
Specifies the metadata input file name.
- o viewfile**  
Specifies the output `View32` definition file name.
- f fml32file**  
Specifies the updated `FML32` definition file.
- w webservice.desc**  
Specifies `webservice.desc` configuration file.
- v**  
Indicates whether to output details or not.

### Example(s)

1. [Listing 13-5](#) provides an `MIF` example.



**Listing 13-5 MIF Example**

---

```
#####
# SERVICE: * DFH0XCMNOperation
#####
service=DFH0XCMNOperation
servicetype=service
export=Y
inbuf=FML32
outbuf=FML32
tuxservice=DFH0XCMNOperation
errbuf=FML32
servicemode=webservice
param=DFH0XCMNOperation
count=1
requiredcount=0
fldnum=10025
type=fml32
access=in
paramschema=XSD_E:DFH0XCMNOperation@http://www.DFH0XCMN.DFH0XCP3.Request.c
om
(
param=ca_request_id
count=1
requiredcount=0
fldnum=10019
type=string
access=in
```

## System Commands and Transactions

```
paramschema=XSD_E:ca_request_id@http://www.DFH0XCMN.DFH0XCP3.Request.com
primetype=string
param=ca_response_message
count=1
requiredcount=0
fldnum=10021
type=string
access=in

paramschema=XSD_E:ca_response_message@http://www.DFH0XCMN.DFH0XCP3.Request
.com
primetype=string
param=ca_inquire_request
count=1
requiredcount=0
fldnum=10009
type=fml32
access=in

paramschema=XSD_E:ca_inquire_request@http://www.DFH0XCMN.DFH0XCP3.Request.
com
(
param=ca_list_start_ref
count=1
requiredcount=0
fldnum=10017
type=short
access=in

paramschema=XSD_E:ca_list_start_ref@http://www.DFH0XCMN.DFH0XCP3.Request.c
om
```

```
primetype=unsignedShort
param=ca_cat_item
count=15
requiredcount=0
fldnum=10001
type=fml32
access=in
paramschema=XSD_E:ca_cat_item@http://www.DFH0XCMN.DFH0XCP3.Request.com
(
param=ca_item_ref
count=1
requiredcount=0
fldnum=10013
type=short
access=in
paramschema=XSD_E:ca_item_ref@http://www.DFH0XCMN.DFH0XCP3.Request.com
primetype=unsignedShort
param=on_order
count=1
requiredcount=0
fldnum=10029
type=short
access=in
paramschema=XSD_E:on_order@http://www.DFH0XCMN.DFH0XCP3.Request.com
primetype=unsignedShort
)
)
```

)

---

2. [Listing 13-6](#) provides a VIEW32 output file example.

### Listing 13-6 VIEW32 Output Example

---

```
VIEW ca_cat_item_v
#TYPE CNAME FBNAME COUNT FLAG SIZE NULL
short ca_item_ref_v_times ca_item_ref_times 1 - - 0
short ca_item_ref_v ca_item_ref 1 - - 0
short on_order_v_times on_order_times 1 - - 0
short on_order_v on_order 1 - - 0
END

VIEW ca_inquire_request_v
#TYPE CNAME FBNAME COUNT FLAG SIZE NULL
short ca_list_start_ref_v_times ca_list_start_ref_times 1 - - 0
short ca_list_start_ref_v ca_list_start_ref 1 - - 0
short ca_cat_item_v_times ca_cat_item_times 1 - - 0
struct ca_cat_item_v ca_cat_item 15 - - 0
END

VIEW DFH0XCMNOperation_v
#TYPE CNAME FBNAME COUNT FLAG SIZE NULL
short ca_request_id_v_times ca_request_id_times 1 - - 0
string ca_request_id_v ca_request_id 1 - 255 '\0'
short ca_response_message_v_times ca_response_message_times 1 - - 0
string ca_response_message_v ca_response_message 1 - 255 '\0'
```

```
short ca_inquire_request_v_times ca_inquire_request_times 1 - - 0
struct ca_inquire_request_v ca_inquire_request 1 - - 0
END
```

---

## tcxcsdcvt(1)

### Name

`tcxcsdcvt` -- translates RDO file to all z/OS resource configuration files.

### Synopsis

```
tcxcsdcvt [-option] [Filename]
```

### Description

`tcxcsdcvt` translates RDO files to all z/OS resource configuration files. The generated resource configuration files by default are found in the current directory where this tool is run.

`tcxcsdcvt` supports the following options:

- h  
Display help information for this tool.
- d <director>  
Specifies the target directory for generated configuration files.
- D  
Generate log file in case there is error information during conversion.

### Example(s)

To convert the RDO file "lirgao.cicsb.dfhcsd", enter following command:

```
tcxcsdcvt lirgao.cicsb.dfhcsd
```

## tcxmapgen(1)

### Name

`tcxmapgen` — CICS Runtime MAPSET Generator.

## Synopsis

```
tcxmapgen [-options] <file>
```

## Description

CICS Runtime provides a mapset generator to compile BMS macro source files, to produce a physical (binary) file and a symbolic (copybook) file. There is also an option to produce a listing file. During execution, the mapset generator validates the syntax and level of support for each BMS macro statement.

The generated physical (binary) file should be used in the MAPSET configuration file. See “Mapset Configuration File” in [CICS Runtime Configuration Files](#).

The generated symbolic (copybook) file should be included when you compile the CICS/COBOL program which uses the MAP in this MAPSET

## Options

The command options are:

- `[-c]`  
Specifies that only COBOL copybook (`.cpy`) output file is generated.
  - `[-l]`  
Specifies a listing output file (`.lst`) is produced.
  - `[-m]`  
Specifies that only binary mapset file (`.mpdef`) is produced.
  - `[-o file]`  
Specifies the name used for the generated output files. The compiler uses the file name with an appended extension when creating the output file names.
  - `[-u]`  
Specifies that the output fields are not sorted but kept in the defined order. Without specifying this option, all fields in a map are sorted according to their positions by default.
  - `[-A]`  
Generates aligned map. In aligned map, the length field associated with a BMS data field in the BMS DSECT is always aligned on a halfword boundary.
- Note:** With `-A`, users can generate aligned map; without `-A`, users can generate unaligned map (default behavior).

## Example(s)

To compile the BMS source file `file.map`, use the following command:

```
$ tcxmapgen -o file file.map
```

The resulting binary mapset file is `file.mpdef`.

# artadmin(1)

## Name

`artadmin` — ART CICS Runtime administration.

## Synopsis

```
artadmin [-p <profile>] [-v]
```

## Parameter

### Profile

The name of the profile file used for authentication. This parameter is useful for secure Oracle Tuxedo configuration. The profile file must be created with `genappprofile`. If no file name is provided, it defaults to `~/ADMINappProfile`.

### -v

Displays ART CICS Runtime version number and patch level. After printing out the information, `artadmin` exits.

## Description

In some cases it is necessary to modify the configuration while the system is running. Normally, configuration changes which are relative to performances are managed by Oracle Tuxedo or the RDBMS level using commands (for example, `tmadmin`) or Oracle TSAM for Oracle Tuxedo dynamic configuration.

However, if the requirement is more functional (for example, needing to put some transactions online, installing a hot fix for some programs and screens, or changing some resource configurations), you must use `artadmin`.

`artadmin` is useful when making hot configuration changes in the CICS resources of a running ART CICS system. It allows the administrator to:

- request all or partial servers to take in changes to the CICS resources configuration files.
- transmit a New Copy request to do a hot fix of some modified programs or maps.

`artadmin` is launched interactively (similar to `tadmin`). When the `artadmin` is launched and connects to Oracle Tuxedo successfully, it returns a prompt requiring you to enter the commands.

### **artadmin commands**

Commands can be entered either by full name or abbreviation (as given in the parentheses), followed by any appropriate arguments. Arguments appearing in the square brackets `[]` are optional, and those in curly braces `{ }` indicate a selection from mutually exclusive options.

To let a set of commands be executed together, the administration commands entered are kept in the buffer and performed only when the administrator enters a `perform` command.

The commands with their abbreviation and options are described below.

#### **clear (cl)**

Resets the commands buffer.

#### **config\_update (cu) [on|off] (default is on)**

Propagates the configuration changes and requests the application servers to take in the changes in the configuration.

#### **help (h) [command]**

Without extra argument: prints a list of all the commands.

With a command argument: prints the synopsis of the command.

#### **list (l)**

Displays the commands buffer.

If the buffer is empty, the message "WARNING: No command in buffer." is displayed.

#### **newcopy (n) {p|s} object\_name 1 object\_name2 ...**

Enters a `newcopy` command for screen or program object types.

#### **perform (p)**

Performs the commands submitted to the server and clears the commands buffer.

If the buffer is not empty, the buffer content is displayed and a confirmation is required.

If the submission fails, the message "Perform cancelled." is displayed, and the error is logged into the `USERLOG`.



**quit (q)**

Quits this session.

If the buffer is not empty, the buffer container is displayed and a confirmation is required.

**shmstat (sh)**

Displays the statistics for GETMAIN SHARED allocated by ARTSHM.

**sysid (s) {\*:SSSS}**

By default, the administration commands are transmitted to all servers in the ART CICS system. The configuration is global. For the newcopy, you may want to limit it to some specific servers. The `sysid` command is used to limit the command effect to the servers with a specific SYSID.

**tspstat (ts) TSMODEL**

Shows TS queue statistics information under TSMODEL in shared pool. A sample output for the command is listed as follows:

```
> tspstat TSM00000
```

| QueName  | NumItem | TRNID | TotLen | MinLen | MaxLen | ReadCnt | WritCnt | ReWrCnt | LifeTm | ElapTm |
|----------|---------|-------|--------|--------|--------|---------|---------|---------|--------|--------|
| LOGQHELO | 3       | HELO  | 118    | 56     | 56     | 0       | 3       | 0       | 5m     | 13s    |
| LOGQSTCA | 6       | STCA  | 180    | 16     | 52     | 0       | 6       | 0       | 8m     | 25s    |

**tspdel (td) TSMODEL qname**

Deletes TS queue `qname` in TSMODEL in the shared pool.

**tspdsp (tp) TSMODEL qname itemno**

Displays item `itemno` message of TS queue `qname` in TSMODEL in the shared pool. This command does not change read cursor of the queue. If the message is too large, only part of the message is displayed.

**tspclr (tc) poolname**

Clears all queues in TS pool `poolname`.

**Limitations**

- The resources which are taken in account on a dynamic reloading operation are limited to transactions, programs, and mapsets.

- The `transactions.desc` `TRANCLASS` parameter cannot be changed dynamically.
- When using `NEWCOPY` command to reload programs, you must delete the compiled executable file before copying new compiled executable file to runtime environment.

# kixrpt(1)

## Name

`kixrpt.sh` — ARTKIX transaction/command report utility.

## Synopsis

```
kixrpt.sh [-d "YYYY/MM/DD[hh:mm:ss]"] [-D "YYYY/MM/DD[hh:mm:ss]"] [-c] trace
```

## Description

`kixrpt` reports transaction/command timing statistics information, including total number of transactions/commands running in specified time slot, total time cost, the average running time, etc. For each transaction/command, such tool reports the details of running information: total number, total time cost, average time cost, failure count, etc.

`kixrpt` analyzes the standard output of ARTKIX servers to provide a summary of transaction / command processing time within the servers. The report shows the number of times dispatched and average elapsed time in milliseconds of each transaction / command in the covered period. `kixrpt` takes its input from the ARTKIX trace file or a directory (like `KIX_TRACE_PATH`) including trace files. The traces are valid by being set as below:

```
KIX_TRACE_LEVEL=1 (or higher level)
```

## Options

`kixrpt` supports the following options:

- d "YYYY/MM/DD[ hh:mm:ss] "  
Limits the start time. The default is no limitation.
- D "YYYY/MM/DD[ hh:mm:ss] "  
Limits the end time. The default is no limitation.
- c  
Generates the clear trace output instead of statistics report.

## Example

1. Set following environment variables before ARTKIX system is started:

```
KIX_TRACE_LEVEL=1
TP_USER_TRACE=SID
TRACE_PATH=${APPHOME}/LOGS/traces
```

2. After running some time, the statistic tool, `kixrpt.sh`, can be used to generate the report with given time slot.

```
$ kixrpt.sh -d 2012/06/21 -D 2012/06/22 $TRACE_PATH
```

3. [Listing 13-7](#) provides the output example:

### Listing 13-7 kixrpt Output Example

---

Transactions:

```
-----
CPMI(10000) totalTime(2254147) avgTime(225) errNum(0)
```

```
-----
totals(10000) totalTime(2254147) avgTime(225)
```

Commands:

```
-----
KIX__LINK(10000) totalTime(1047970) avgTime(104) errNum(0)
```

```
KIX__DELETEQ_TS(20000) totalTime(9377) avgTime(0) errNum(0)
```

```
KIX__RETURN(20000) totalTime(1016) avgTime(0) errNum(0)
```

```
KIX__WRITEQ_TS(380000) totalTime(153888) avgTime(0) errNum(0)
```

```
KIX__ASSIGN(300000) totalTime(19702) avgTime(0) errNum(0)
```

```
-----
totals(730000) totalTime(1231953) avgTime(1)
```

Programs:

```
-----  
TUX2CXD(10000)totalTime(1047970)avgTime(104)  
-----
```

```
totals(10000)totalTime(1047970)avgTime(104)  
-----
```

## checkcicsbinver(1)

### Name

checkcicsbinver—checks Rolling Patch number where your COBOL program is compiled.

### Synopsis

```
checkcicsbinver <PROGRAM-ID>
```

### Description

checkcicsbinver checks Rolling Patch number where your COBOL program is compiled.

checkcicsbinver supports the following options:

#### **PROGRAM-ID**

Name of the COBOL program without any suffix.

### Environment Variables

Declare these environment variables, as prerequisites, to run checkcicsbinver.

For Micro Focus COBOL, you should do the followings.

#### **COBDIR**

Specify the COBOL installation directory for COBDIR.

#### **LD\_LIBRARY\_PATH (Linux and Solaris platforms) / LIBPATH (AIX platforms)**

Add \$COBDIR/lib to LD\_LIBRARY\_PATH (Linux and Solaris platforms) / LIBPATH (AIX platforms).

**COBPATH**

Specify the path where the COBOL program locates for COBPATH.

**PATH**

Add the location of `checkcicsbinver` into PATH.

For COBOL-IT COBOL, you should do the followings.

**COBOLITDIR**

Specify the COBOL installation directory for COBOLITDIR.

**LD\_LIBRARY\_PATH (Linux and Solaris platforms) / LIBPATH (AIX platforms)**

Add `$(COBDIR)/lib` to LD\_LIBRARY\_PATH (Linux and Solaris platforms) / LIBPATH (AIX platforms).

**COB\_LIBRARY\_PATH**

Specify the path where COBOL program locates for COB\_LIBRARY\_PATH.

**PATH**

Add the location of `checkcicsbinver` into PATH.

**Example(s)**

For COBOL programs built on 12.1.3.0.0 GA through 12.1.3.0.0 Rolling Patch 018, the output will be:

```
Program <xxxx> version No.12.1.3.0.0 RP000
```

For COBOL programs built on 12.1.3.0.0 Rolling Patch 019 or higher, the output will be:

```
Program <xxxx> version No.12.1.3.0.0 RP019 or higher
```

## artcicsutil(1)

**Name**

`artcicsutil`—ART for CICS Control Utility.

**Synopsis**

```
artcicsutil [-t command_mode] [-p <profile>] [-d]
```

**Description**

`artcicsutil` is the premier control utility to track and dominate the CICS related resources from ART for Batch.

It's always triggered by ART for Batch jobs. With the single command, ART for Batch jobs can open/close files, enable/disable CICS transactions, initiate CICS transactions, and etc.

Currently, `artcicsutil` offers two kinds of subcommands `set`, `IPCP` and `CAFC`. Besides that, `artcicsutil` provides `NATIVE` mode, which can work as a native Oracle Tuxedo client without involving ART for Batch.

`artcicsutil` supports the following options:

**-t `command_mode`**

The mode of command set. Possible values are `IPCPBTCH`, `CAFC`, and `NATIVE` (default value).

- `IPCPBTCH` means `artcicsutil` accepts `IPCP` command set (`artcicsutil` acts as `IPCP` utility). The supported `IPCP` command set is listed as follows.
  - `CICS CC ONLY=cics1[,cics2,...]` (Choose the target ART for CICS region to process this request)
  - `CLOS|CLOSE [DB] ddname1[,ddname2,ddname3,...]` (Similar to `SET FILE OPEN/CLOSE`)
  - `OPEN [DB] filea[,fileb,filec,filed,...]`
  - `DISA KC trna[,trnb,trnc,trnd,...]` (Similar to `SET TRANSACTION DISABLED`)
  - `ENAB KC trna[,trnb,trnc,trnd,...]` (Similar to `SET TRANSACTION ENABLED`)
  - `INIT KC trna[,data]` (similar to `START TRANSID`)
- `CAFC` means `artcicsutil` accepts `CAFC` command set (`artcicsutil` acts as `CAFC` utility). The supported `CAFC` command set is listed as follows.
  - `c.....c,STRT,xxxx,rrrr,ll,v.....v` (Similar to `START TRANSID`)
- `NATIVE` (default value) means `artcicsutil` accepts interactive command set (`artcicsutil` acts as a native client, launched interactively by end users). The supported interactive command set is listed as follows. Those subcommands are full name or abbreviation, followed by appropriate arguments. Arguments in square brackets `[]` are optional. For enable/disable `transid` subcommands, you can set 18 `transid` items at most. For open/close `VSAM` file subcommands, you can set 18 file items at most.
  - `applid (ap) [SSSSSSS]:get/set applid`

- `enable (ena) trna [trnb trnc ...]`: enable transaction(s)
- `disable (dis) trna [trnb trnc ...]`: disable transaction(s)
- `start (str) trna ['data']`: start one transaction
- `open (op) FILE`: open VSAM file
- `close (cs) FILE`: close VSAM file
- `inquire (inq) FILE`: inquire VSAM file
- `help (h) [command]`: helps
- `quit (q)`: quit the tool

**-p profile**

The name of the profile file used for authentication. This parameter is useful for secure Oracle Tuxedo configuration. The profile file must be created with `genappprofile`. If no file name is provided, it defaults to `~/ADMINappProfile`.

**-d**

This option enables diagnostic message output in IPCP or CAFC command set.

## System Transactions

- [Authentication Transactions](#)
- [CSGM](#)
- [ALST \(Application List Transaction\)](#)

## Authentication Transactions

### CESN

The CESN transaction uses `MAPSET CSIGNON`. The following `MAPSET` definition must be added to the `MAPSET` configuration file `${KIXCONFIG}/mapsets.desc` if CESN transaction is required:

```
[mapset]
name=CSIGNON
filename="<${KIXDIR}>/sysmap/csignon.mpdef"
```

Using this default `MAPSET` definition, CESN supports a maximum eight-character username and a maximum eight-character password. If the following `MAPSET` definition is added to the

MAPSET configuration file, CESN allows a maximum 20-character username and a maximum 32-character password.

```
[mapset]
name=LSIGNON
filename="<${KIXDIR}>/sysmap/lsignon.mpdef"
```

If two MAPSET definitions are both added to the MAPSET configuration file, the default MAPSET definition CSIGNON is used. CESN, in this case, allows a maximum eight-character username and a maximum eight-character password.

The CESN transaction ignores the UCTRAN setting in the TYPETERM configuration file. The username and password entered from terminal are always case-sensitive, no matter which UCTRAN value is set.

## CESF

No special configuration is required for CESF transaction.

## CSGM

Oracle Tuxedo Application Runtime for CICS provides a default "Good Morning" transaction CSGM, which can be added to the Transaction configuration file `${KIXCONFIG}/transactions.desc`.

The default CSGM transaction uses MAPSET ABANNER. So the following MAPSET definition must be added to the MAPSET configuration file if the default CSGM transaction is configured:

```
[mapset]
name=ABANNER
filename="<${KIXDIR}>/sysmap/abanner.mpdef"
```

## ALST (Application List Transaction)

ALST (Application List Transaction) is used to do multiple session management. It is integrated with user plug-in to enable you to get and show application list.

To use this transaction, you should define it in `transactions.desc` configuration file and specify `DFHALST` as its `PROGRAM` as follows. `DFHALST` is written in C language; ART for CICS provides it to implement ALST.

```
ALST;SIMPAPP;Application list transaction;DFHALST
```



For more information, see "[Implementing Using Multiple Session Management](#)" in *Oracle Tuxedo Application Runtime for CICS User Guide*.

## System Commands and Transactions

# CICS Runtime Server Build Tool

## Overview

### Definition

CICS Runtime server build tool constructs one or more Oracle ART CICS server(s) load module. All supported servers which can be built by this build tool are listed in [Table 13-1](#). With a set of prefixes for the server names, Oracle Tuxedo Application Runtime for CICS now allows users to customize server names started with these prefixes. The asterisk (\*) character is a wildcard character that can be replaced with zero or more characters. Each prefix stands for one class of servers with special functions as shown on [Table 13-1](#). For example, you can build a server named “ARTSTRN\_UDB”.

**Table 13-1 Servers Need to be Built by CICS Server Build Tool**

| Server Name          | Description   |
|----------------------|---|
| ARTSTR1*<br>ARTSTRN* | The task of these servers is to offer application transactions and process the corresponding programs.                      |
| ARTSQ*               | The role of these servers is to centralize the management of the TS Queue operations which are requested by applications.   |
| ARTDPL*              | ARTDPL servers publish programs that are callable by EXEC CICS LINK as services and manage the execution of these services. |

**Table 13-1 Servers Need to be Built by CICS Server Build Tool**

| Server Name          | Description   |
|----------------------|---|
| ARTATR1*<br>ARTATRn* | These servers publish transactions callable by EXEC CICS START TRANSID as services named ASYNC_{Transaction_Name} and manage execution of these services. |
| ARTCTR1*<br>ARTCTRn* | These servers publish transactions callable by EXEC CICS CONVERSE as services named {SysId}_{Transaction_Name} and manage execution of these services.    |
| ARTWTR1*<br>ARTWTRn* | CICS Runtime application server for synchronous (non-conversational) non-3270s clients.   |

## Administration

To make this tool work correctly, several environment variables must be set firstly as shown in [Table 13-2](#).

**Table 13-2 Required Environment Variables**

| Variable Name       | Description   |
|---------------------|---|
| TUXDIR              | Mandatory.<br>Install directory of Tuxedo. If it is not set, the tool will stop with a clear error message.   |
| KIXDIR              | Mandatory.<br>Install directory of ART CICS Runtime. It's <ART_INSTALL_DIR>/Cics_RT. If it is not set, the tool will stop with a clear error message.<br>Besides, "\$KIXDIR/bin" must be included in "\$PATH" to execute buildartcics.            |
| COBDIR   COBOLITDIR | Mandatory.<br>Install directory of COBOL compiler (COBDIR is for Micro Focus COBOL; COBOLITDIR is for COBOL-IT). One and only one can be set in the environment. If neither or both of them exist, the tool will stop with a clear error message. |

**Table 13-2 Required Environment Variables**

| Variable Name        | Description  |
|----------------------|--|
| DB2DIR   ORACLE_HOME | <p>Mandatory in some situations.</p> <p>Optional for others.</p> <p>Install directory of database (DB2DIR is for UDB and is mandatory when “-r UDB_XA*” is specified; ORACLE_HOME is for Oracle and is mandatory when “-r Oracle_XA*” is specified).</p> <p>If either of them does not exist when required, the tool will stop with a clear error message.</p> |
| MT_DB_LOGIN          | <p>Mandatory for ARTTSQ* servers built with UDB database.</p> <p>Optional for others.</p> <p>The connect parameter for DB2 database is used in:</p> <pre>db2 connect to [...]</pre> <p>General Syntax: “db-alias user username using password”</p>   |
| DB2INSTANCE          | <p>Mandatory for ARTTSQ* servers built with UDB database.</p> <p>Optional for others.</p> <p>Specifies current DB instance.</p>  |
| MQM                  | <p>Optional.</p> <p>Stands for the install dir of WebSphere MQ. If not set, it equals to “/usr/mqm” for AIX platforms and “/opt/mqm” for Linux and Solaris platforms.</p>  |

**Notes:**

- To use COBOL-IT compiler, please make a copy or create a symbol link of “\$COBOLITDIR/bin/cobmf” as “\$COBOLITDIR/bin/cob”. For example, you can use following command: 

```
ln -s $COBOLITDIR/bin/cobmf $COBOLITDIR/bin/cob.
```
- For Solaris platform, please make sure that \$LD\_LIBRARY\_PATH includes library path for 64-bit “libc\*” libraries, which are located in 

```
<SUN_STUDIO_INSTALL_DIR>/lib/v9.
```
- To build ARTTSQ with UDB, please make sure the table “TS\_Q\_CONTENT” already exists in the Database; if not, you can run 

```
"<ARTINSTALL_DIR>/Cics_RT/tools/crtstable_UDB"
```

 after all required environment variables are set correctly.

## buildartcics

All servers can be built by following synopsis of this tool, except for ARTTSQ that does not support multiple RMs. If “-M” is specified when ARTTSQ is built, a warning message will be displayed and only the first “-r” will be taken as the resource manager.

### Name

`buildartcics` – Constructs one or more Oracle ART CICS server(s) load module.

### Synopsis

```
buildartcics [-v] [-n] [-M] [-r rmname] [-f firstfiles] [-l lastfiles] -o
svrname
```

### Description

`buildartcics` is used to construct one or more Oracle ART CICS server(s) load module. This command invokes “`buildserver`” to build the specified ART CICS server(s).

-v

Specifies that `buildartcics` should work in verbose mode. In particular, it writes the compilation command to its standard output.

-n

Supports non-XA for Oracle ART CICS server `ARTATR/1` and `ARTDPL`. When rebuilding `ARTATR/1` or `ARTDPL`, specify this option if you require non-XA support. Both Oracle and DB2 database support non-XA local transaction optimization. For more information, see [ARTKIX\\_XA\\_DISABLE](#).

-M

Specifies multiple resource managers associated with this server. This option is mandatory if you want to associate your service with multiple XA complaint resource managers. If this option is not specified and you try to boot a server with a configuration file, in which this server is specified in a non-multiple resource manager server group, a warning message will be printed in the user log; in addition, the sever will revert to a general server associated with one resource manager if the “-r” option is specified when `buildserver` command is executed.

-r `rmname`

Specifies the resource manager associated with this server. Multiple “-r `rmname`” can be specified if “-M” is used. The value `rmname` must appear in the resource manager table located in `$TUXDIR/udataobj/RM`.

`-f firstfiles`

`-f` option will be passed to `buildserver` command. It specifies one or more user files to be included in the compilation and link edit phases of `buildserver` first, before the Oracle Tuxedo ATMI libraries. If you specify more than one file, use spaces to separate those filenames and enclose the entire list in quotation marks (see [Listing 4](#)). You can specify this option multiple times. For more information, see [buildserver \(1\)](#) in *Oracle Tuxedo documentation*.

`-l lastfiles`

`-l` option will be passed to `buildserver` command. It specifies one or more user files to be included in the compilation and link edit phases of `buildserver` last, after the Oracle Tuxedo ATMI libraries. If you specify more than one file, use spaces to separate those filenames and enclose the entire list in quotation marks (see [Listing 4](#)). You can specify this option multiple times. For more information, see [buildserver \(1\)](#) in *Oracle Tuxedo documentation*.

`-o svrname`

Specifies the name of the server to load. This option is mandatory. If “`svrname`” is a standalone filename without any “/” character, the server will be generated to `$KIXDIR/bin` by default.

**Note:** Currently, supported resource managers include `Oracle_XA*`, `UDB_XA*`, `BERKELEY-DB*`, and `MQSeries_XA_RMI*`; therefore, the “`rmname`” must use one of these four strings as a prefix.

Specially, for ARTTSQ\* servers, only RMs provided by Oracle or DB2 UDB are supported. If other RMs are specified when ARTTSQ\* servers is built, the TSQ data may not be stored correctly. Besides, to build ARTTSQ\* servers with “`TMS_UDB`” RM, please make sure that table “`TS_Q_CONTENT`” exists in the DB2 Database; if this table doesn't exist, you can create it by running “`$KIXDIR/tools/crtstable_UDB`”.

## Example

### Listing 3 Example 1

---

```
buildartcics - M - r Oracle_XA - r BERKELEY-DB - o ARTSTRN
```

---

**Listing 4 Example 2**

---

```
buildartcics -r Oracle_XA -o ./ARTSTRN -f "-lkix" -f "-lkixc" -l "-lc -lnsl  
-ldl -lm"
```

---



# CICS Commands and Parameters Coverage

## CICS Commands and Parameters Coverage

- [Supported CICS Commands](#)
- [Supported EIB Fields](#)
- [Supported BMS Macros](#)
- [Supported ECI C API Parameters](#)
- [Supported CPIC API Parameters](#)

## Supported CICS Commands

The following tables describe the CICS commands and parameters that are supported by Oracle Tuxedo ART for CICS.

**Note:** Commands and parameters not listed in [Table 15-1](#) and [Table 15-2](#) are not supported.

## CICS Command and Parameter Support Table

Table 15-1 CICS Command (COBOL Support)

| Category | CICS Command | Command Parameter | Notes  |
|----------|--------------|-------------------|--|
| ABEND    | ABEND        | ABCODE (name)     |  |
|          |              | CANCEL            |  |
|          |              | NODUMP            |  |
|          | HANDLE ABEND | CANCEL            |  |
|          |              | LABEL (label)     | Support HANDLE ABEND generated by command ABEND; partially support system ABEND. |
|          |              | PROGRAM (name)    |  |
|          |              | RESET             | Recognized   |

Table 15-1 CICS Command (COBOL Support)

| Category                 | CICS Command    | Command Parameter       | Notes      |
|--------------------------|-----------------|-------------------------|------------|
| APPC Mapped conversation | ALLOCATE (APPC) | NOQUEUE                 | Recognized |
|                          |                 | STATE (cvda)            |            |
|                          |                 | SYSID (systemname)      |            |
|                          | CONNECT PROCESS | CONVID (name)           |            |
|                          |                 | PROCLENGTH (data-value) |            |
|                          |                 | PROCNAME (data-area)    |            |
|                          |                 | STATE (cvda)            |            |
|                          |                 | SYNLEVEL (data-value)   |            |
|                          | CONVERSE (APPC) | CONVID (name)           |            |
|                          |                 | FROM (data-area)        |            |
|                          |                 | FROMLENGTH (data-value) |            |
|                          |                 | FROMLENGTH (data-value) |            |
|                          |                 | INTO (data-area)        |            |
|                          |                 | MAXLENGTH (data-value)  |            |
|                          |                 | MAXLENGTH (data-value)  |            |
|                          |                 | NOTRUNCATE              |            |
|                          |                 | SET (ptr-ref)           |            |
|                          |                 | STATE (cvda)            |            |
|                          |                 | TOLENGTH (data-area)    |            |
| TOLENGTH (data-area)     |                 |                         |            |

**Table 15-1 CICS Command (COBOL Support)**

| Category                 | CICS Command          | Command Parameter       | Notes |
|--------------------------|-----------------------|-------------------------|-------|
| APPC Mapped conversation | EXTRACT<br>PROCESS    | CONVID (name)           |       |
|                          |                       | SYNLEVEL (data-area)    |       |
|                          | FREE (APPC)           | CONVID (name)           |       |
|                          |                       | STATE (cvda)            |       |
|                          | ISSUE<br>CONFIRMATION | CONVID (name)           |       |
|                          |                       | STATE (cvda)            |       |
|                          | RECEIVE<br>(APPC)     | CONVID (name)           |       |
|                          |                       | FLENGTH (data-area)     |       |
|                          |                       | INTO (data-area)        |       |
|                          |                       | LENGTH (data-area)      |       |
|                          |                       | MAXFLENGTH (data-value) |       |
|                          |                       | MAXLENGTH (data-value)  |       |
|                          |                       | NOTRUNCATE              |       |
|                          |                       | SET (ptr-ref)           |       |
|                          |                       | STATE (cvda)            |       |

**Table 15-1 CICS Command (COBOL Support)**

| Category                 | CICS Command       | Command Parameter      | Notes      |
|--------------------------|--------------------|------------------------|------------|
| APPC Mapped conversation | SEND (APPC)        | CONFIRM                |            |
|                          |                    | CONVID (name)          |            |
|                          |                    | FLENGTH (data-value)   |            |
|                          |                    | FROM (data-area)       |            |
|                          |                    | INVITE                 |            |
|                          |                    | LAST                   |            |
|                          |                    | LENGTH (data-value)    |            |
|                          |                    | STATE (cvda)           |            |
|                          |                    | WAIT                   |            |
|                          | WAIT CONVID (APPC) | CONVID (name)          |            |
| STATE (cvda)             |                    |                        |            |
| AUTHENTICATIO<br>N       | SIGNOFF            |                        |            |
|                          | SIGNON             | USERID (data-value)    |            |
|                          |                    | PASSWORD (data-value)  |            |
|                          | VERIFY<br>PASSWORD | CHANGETIME (data-area) | Recognized |
|                          |                    | DAYSLEFT (data-area)   | Recognized |
|                          |                    | ESMREASON (data-area)  | Recognized |

**Table 15-1 CICS Command (COBOL Support)**

| Category           | CICS Command   | Command Parameter        | Notes  |
|--------------------|--|--------------------------|--|
| AUTHENTICATIO<br>N | VERIFY<br>PASSWORD   | ESMRESP (data-area)      | <b>Return values</b> <ul style="list-style-type: none"> <li>• 0</li> <li>• LDAP_BIND_ERROR</li> <li>• CICS_EAM_RETURN_NOT_RESPONDING</li> <li>• CICS_EAM_RETURN_OK</li> <li>• CICS_EAM_RETURN_NO_SUCH_USER</li> <li>• CICS_EAM_RETURN_PASSWORD_EXPIRED</li> <li>• CICS_EAM_RETURN_NOT_ACTIVE</li> <li>• CICS_EAM_RETURN_PASSWORD_EXPIRED</li> <li>• CICS_EAM_RETURN_WRONG_PASSWORD</li> <li>• LDAP_INVALID_LOGON_HOURS</li> <li>• CICS_EAM_RETURN_INVALID</li> </ul> |
|                    |  | EXPIRYTIME (data-area)   | Recognized   |
|                    |  | INVALIDCOUNT (data-area) | Recognized   |
|                    |  | LASTUSETIME (data-area)  | Recognized   |
|                    |  | PASSWORD (data-value)    |  |
| RESP (data-area)   | <b>Return values</b> <ul style="list-style-type: none"> <li>• 0</li> <li>• INVREQ</li> <li>• NOTAUTH</li> <li>• USERIDERR</li> </ul> |                          |  |

Table 15-1 CICS Command (COBOL Support)

| Category       | CICS Command       | Command Parameter   | Notes  |
|----------------|--------------------|---------------------|--|
| AUTHENTICATION | VERIFY<br>PASSWORD | RESP2 (data-area)   | Return values <ul style="list-style-type: none"> <li>• 0: N/A</li> <li>• 2: The supplied password is wrong.</li> <li>• 3: A new password is required.</li> <li>• 8: The user ID is not known to the external security manager.</li> <li>• 13: There is an unknown return code in ESMRESP from the external security manager.</li> <li>• 18: The CICS external security manager interface is not initialized.</li> <li>• 19: The user ID is revoked.</li> <li>• 29: The external security manager is not responding.</li> </ul> |
|                |                    | USERID (data-value) | To use VERIFY PASSWORD, you must configure XAUTHSVR in Oracle Tuxedo.  |

**Table 15-1 CICS Command (COBOL Support)**

| Category | CICS Command  | Command Parameter   | Notes                            |
|----------|---------------|---------------------|----------------------------------|
| BMS      | PURGE MESSAGE |                     | Not supported by ARTWTRN/ARTWTR1 |
|          | RECEIVE MAP   | ASIS                |                                  |
|          |               | FROM (data-area)    | Not supported by ARTWTRN/ARTWTR1 |
|          |               | INTO (data-area)    |                                  |
|          |               | LENGTH (data-value) | Not supported by ARTWTRN/ARTWTR1 |
|          |               | MAP (name)          |                                  |
|          |               | MAPSET (name)       |                                  |
|          |               | SET (ptr-ref)       | Not supported by ARTWTRN/ARTWTR1 |
|          |               | TERMINAL            |                                  |
|          | SEND CONTROL  | ACCUM               | Not supported by ARTWTRN/ARTWTR1 |
|          |               | ALARM               |                                  |
|          |               | CURSOR (data-value) |                                  |
|          |               | DEFAULT             | Not supported by ARTWTRN/ARTWTR1 |
|          |               | ERASE               |                                  |
|          |               | ERASEAUP            | Not supported by ARTWTRN/ARTWTR1 |
|          |               | FREEKB              |                                  |
|          |               | FRSET               |                                  |
|          |               | PRINT               |                                  |
|          |               | TERMINAL            | Not supported by ARTWTRN/ARTWTR1 |
|          |               | WAIT                |                                  |



Table 15-1 CICS Command (COBOL Support)

| Category | CICS Command | Command Parameter   | Notes                            |
|----------|--------------|---------------------|----------------------------------|
| BMS      | SEND MAP     | ACCUM               | Not supported by ARTWTRN/ARTWTR1 |
|          |              | ALARM               |                                  |
|          |              | CURSOR (data-value) |                                  |
|          |              | DATAONLY            | Not supported by ARTWTRN/ARTWTR1 |
|          |              | DEFAULT             |                                  |
|          |              | ERASE               |                                  |
|          |              | ERASEAUP            |                                  |
|          |              | FORMFEED            | Recognized                       |
|          |              | FREEKB              |                                  |
|          |              | FROM (data-area)    |                                  |
|          |              | FRSET               |                                  |
|          |              | LENGTH (data-value) |                                  |
|          |              | MAP (name)          |                                  |
|          |              | MAPONLY             | Not supported by ARTWTRN/ARTWTR1 |
|          |              | MAPSET (name)       |                                  |
|          |              | NOFLUSH             | Not supported by ARTWTRN/ARTWTR1 |
|          |              | PRINT               |                                  |
|          |              | SET (ptr-ref)       |                                  |
|          |              | TERMINAL            | Not supported by ARTWTRN/ARTWTR1 |
|          |              | WAIT                |                                  |

**Table 15-1 CICS Command (COBOL Support)**

| Category            | CICS Command | Command Parameter    | Notes                               |
|---------------------|--------------|----------------------|-------------------------------------|
| BMS                 | SEND PAGE    | RELEASE              | Not supported by<br>ARTWTRN/ARTWTR1 |
|                     |              | RETAIN               |                                     |
|                     |              | TRAILER (data-area)  |                                     |
|                     |              | TRANSID (name)       |                                     |
|                     | SEND TEXT    | ACCUM                | Not supported by<br>ARTWTRN/ARTWTR1 |
|                     |              | ALARM                |                                     |
|                     |              | CURSOR (data-value)  |                                     |
|                     |              | ERASE                |                                     |
|                     |              | FREEKB               |                                     |
|                     |              | FROM (data-area)     |                                     |
|                     |              | HEADER (data-area)   | Not supported by<br>ARTWTRN/ARTWTR1 |
|                     |              | JUSTIFY (data-value) |                                     |
|                     |              | LENGTH (data-value)  |                                     |
|                     |              | NLEOM                |                                     |
|                     |              | PRINT                |                                     |
|                     |              | TRAILER (data-area)  | Not supported by<br>ARTWTRN/ARTWTR1 |
|                     |              | TERMINAL             |                                     |
|                     |              | WAIT                 |                                     |
|                     |              | Built-in Functions   | BIF DEEDIT                          |
| LENGTH (data-value) |              |                      |                                     |

Table 15-1 CICS Command (COBOL Support)

| Category | CICS Command                     | Command Parameter        | Notes      |
|----------|----------------------------------|--------------------------|------------|
| Channel  | DELETE<br>CONTAINER<br>(CHANNEL) | CHANNEL (data-value)     |            |
|          | ENDBROWSE<br>CONTAINER           | BROWSETOKEN (data-value) |            |
|          | GET<br>CONTAINER<br>(CHANNEL)    | CHANNEL (data-value)     |            |
|          |                                  | FLENGTH (data-area)      |            |
|          |                                  | INTO (data-area)         |            |
|          |                                  | NODATA                   |            |
|          |                                  | SET (ptr-ref)            |            |
|          | GETNEXT<br>CONTAINER             | BROWSETOKEN (data-value) |            |
|          | MOVE<br>CONTAINER<br>(CHANNEL)   | AS (data-value)          |            |
|          |                                  | CHANNEL (data-value)     |            |
|          |                                  | TOCHANNEL (data-value)   |            |
|          | PUT<br>CONTAINER<br>(CHANNEL)    | CHANNEL (data-value)     |            |
|          |                                  | FLENGTH (data-value)     |            |
|          |                                  | FROM (data-area)         |            |
|          | STARTBROWSE<br>CONTAINER         | BROWSETOKEN (data-area)  |            |
|          |                                  | CHANNEL (data-value)     |            |
|          | START<br>CHANNEL                 | CHANNEL (name)           |            |
|          | COLLECT<br>STATISTICS            | SET (ptr-ref)            | Recognized |
|          |                                  | MONITOR (data-value)     |            |

**Table 15-1 CICS Command (COBOL Support)**

| Category            | CICS Command        | Command Parameter       | Notes   |
|---------------------|---------------------|-------------------------|---|
| Console Support     | WRITE<br>OPERATOR   | TEXT (data-value)       | We provide a stub function. This function can be replaced by the integration team for project needs.  |
|                     |                     | TEXTLENGTH (data-value) |   |
| Diagnostic Services | DUMP<br>TRANSACTION |                         | All its options are recognized by ART CICS.   |
|                     | ENTER<br>TRACENUM   |                         | <ul style="list-style-type: none"> <li>All its options are recognized by ART CICS.</li> <li>ENTER TRACENUM was written as ENTER TRACEID in Mainframe CICS v3 or earlier.</li> </ul> |

Table 15-1 CICS Command (COBOL Support)

| Category             | CICS Command | Command Parameter         | Notes      |
|----------------------|--------------|---------------------------|------------|
| Environment services | ADDRESS      | COMMAREA (ptr-ref)        |            |
|                      |              | CWA (ptr-ref)             |            |
|                      |              | EIB (ptr-ref)             |            |
|                      |              | TCTUA (ptr-ref)           |            |
|                      |              | TWA (ptr-ref)             |            |
|                      | ADDRESS SET  | SET (data-area/ptr-ref)   |            |
|                      |              | USING (ptr-ref/data-area) |            |
|                      | ASSIGN       | ABCODE (data-area)        |            |
|                      |              | ABDUMP (data-area)        |            |
|                      |              | ABPROGRAM (data-area)     |            |
|                      |              | APPLID (data-area)        |            |
|                      |              | ASRAINTRPT (data-area)    | Recognized |
|                      |              | ASRAKEY (cvda)            | Recognized |
|                      |              | ASRAPSW (data-area)       | Recognized |
|                      |              | ASRAREGS (data-area)      | Recognized |
|                      |              | ASRASPC (cvda)            | Recognized |
|                      |              | ASRASTG (cvda)            | Recognized |
|                      |              | CHANNEL (data-area)       |            |
|                      |              | CWALENG (data-area)       |            |

**Table 15-1 CICS Command (COBOL Support)**

| Category             | CICS Command     | Command Parameter       | Notes  |
|----------------------|------------------|-------------------------|--|
| Environment services | ASSIGN           | FACILITY (data-area)    | Recognized   |
|                      |                  | FCI (data-area)         | Recognized   |
|                      |                  | INITPARM (data-area)    | In each section, if INITPARM parameters are specified more than one time, only the last definition will take effect. |
|                      |                  | INITPARMLEN (data-area) |  |
|                      |                  | KATAKANA (data-area)    |  |
|                      |                  | NETNAME (data-area)     |  |
|                      |                  | OPID (data-area)        | Recognized   |
|                      |                  | PROGRAM (data-area)     |  |
|                      |                  | SOSI (data-area)        |  |
|                      |                  | STARTCODE (data-area)   |  |
|                      |                  | SYSID (data-area)       |  |
|                      |                  | TCTUALENG (data-area)   |  |
|                      |                  | TERMCODE (data-area)    | Recognized   |
|                      |                  | TWALENG (data-area)     |  |
|                      |                  | USERID (data-area)      |  |
| USERNAME (data-area) |                  |                         |  |
| Exception Support    | HANDLE CONDITION | condition (label)       |  |
|                      | IGNORE CONDITION | condition               |  |
|                      | PUSH HANDLE      |                         |  |
|                      | POP HANDLE       |                         |  |

Table 15-1 CICS Command (COBOL Support)

| Category              | CICS Command | Command Parameter                   | Notes   |
|-----------------------|--------------|-------------------------------------|---|
| File control services | DELETE       | DATASET(filename)                   |   |
|                       |              | FILE(filename)                      |   |
|                       |              | GENERIC (VSAM KSDS only)            | Not supported in File2File when using COBOL-IT.   |
|                       |              | KEYLENGTH (data-value)              |   |
|                       |              | NUMREC (data-area) (VSAM KSDS only) | Recognized  |
|                       |              | RBA                                 | <ul style="list-style-type: none"> <li>Not supported in File2File when using COBOL-IT.</li> <li>DELETE RBA can only be used in KSDS dataset.</li> </ul> |
|                       |              | RIDFLD (data-area)                  |   |
|                       |              | SYSID (systemname)                  | Recognized  |
|                       | ENDBR        | DATASET(filename)                   |   |
|                       |              | FILE(filename)                      |   |
|                       |              | REQID (data-value)                  | Recognized  |
|                       |              | SYSID (systemname)                  | Recognized  |

**Table 15-1 CICS Command (COBOL Support)**

| Category              | CICS Command | Command Parameter     | Notes   |
|-----------------------|--------------|-----------------------|---|
| File Control Services | READ         | DATASET(filename)     |   |
|                       |              | EQUAL                 |   |
|                       |              | FILE(filename)        |   |
|                       |              | GENERIC               | Not supported in File2File when using COBOL-IT. |
|                       |              | GTEQ                  |   |
|                       |              | INTO(data-area)       |   |
|                       |              | KEYLENGTH(data-value) |   |
|                       |              | LENGTH(data-area)     |   |
|                       |              | RBA                   | Not supported in File2File when using COBOL-IT. |
|                       |              | RIDFLD(data-area)     |   |
|                       |              | RRN                   | Recognized                                      |
|                       |              | SET(ptr-ref)          |   |
|                       |              | SYSID(systemname)     | Recognized                                      |
|                       |              | UPDATE                | Recognized                                      |



Table 15-1 CICS Command (COBOL Support)

| Category              | CICS Command | Command Parameter     | Notes   |
|-----------------------|--------------|-----------------------|---|
| File Control Services | READNEXT     | DATASET(filename)     |   |
|                       |              | FILE(filename)        |   |
|                       |              | INTO(data-area)       |   |
|                       |              | KEYLENGTH(data-value) |   |
|                       |              | LENGTH(data-area)     |   |
|                       |              | RBA                   | Not supported in File2File when using COBOL-IT. |
|                       |              | RIDFLD(data-area)     |   |
|                       |              | RRN                   | Recognized                                      |
|                       |              | SET(ptr-ref)          |   |
|                       |              | SYSID(systemname)     | Recognized                                      |
|                       | READPREV     | DATASET(filename)     |   |
|                       |              | FILE(filename)        |   |
|                       |              | INTO(data-area)       |   |
|                       |              | KEYLENGTH(data-value) |   |
|                       |              | LENGTH(data-area)     |   |
|                       |              | RBA                   | Not supported in File2File when using COBOL-IT. |
|                       |              | RIDFLD(data-area)     |   |
|                       |              | RRN                   | Recognized                                      |
|                       |              | SET(ptr-ref)          |   |
|                       |              | SYSID(systemname)     | Recognized                                      |

**Table 15-1 CICS Command (COBOL Support)**

| Category              | CICS Command      | Command Parameter     | Notes   |
|-----------------------|-------------------|-----------------------|---|
| File Control Services | RESETBR           | DATASET(filename)     |   |
|                       |                   | EQUAL                 |   |
|                       |                   | FILE(filename)        |   |
|                       |                   | GENERIC               | Not supported in File2File when using COBOL-IT. |
|                       |                   | GTEQ                  |   |
|                       |                   | KEYLENGTH(data-value) |   |
|                       |                   | RBA                   | Not supported in File2File when using COBOL-IT. |
|                       | RIDFLD(data-area) |                       |   |
|                       | REWRITE           | DATASET(filename)     |   |
|                       |                   | FILE(filename)        |   |
|                       |                   | FROM(data-area)       |   |
|                       |                   | LENGTH(data-value)    |   |
|                       |                   | SYSID(systemname)     | Recognized                                      |

**Table 15-1 CICS Command (COBOL Support)**

| Category              | CICS Command | Command Parameter     | Notes   |
|-----------------------|--------------|-----------------------|---|
| File Control Services | STARTBR      | DATASET(filename)     |   |
|                       |              | EQUAL                 |   |
|                       |              | FILE(filename)        |   |
|                       |              | GENERIC               | Not supported in File2File when using COBOL-IT. |
|                       |              | GTEQ                  |   |
|                       |              | KEYLENGTH(data-value) |   |
|                       |              | RBA                   | Not supported in File2File when using COBOL-IT. |
|                       |              | REQID(data-value)     | Recognized                                      |
|                       |              | RIDFLD(data-area)     |   |
|                       |              | RRN                   | Recognized                                      |
|                       |              | SYSID(systemname)     | Recognized                                      |
|                       | UNLOCK       | DATASET               | Recognized                                      |
|                       |              | FILE(filename)        |   |
|                       |              | TOKEN(data-area)      |   |

**Table 15-1 CICS Command (COBOL Support)**

| Category                  | CICS Command | Command Parameter     | Notes  |
|---------------------------|--------------|-----------------------|--|
| File Control Services     | WRITE        | DATASET(filename)     |  |
|                           |              | FILE(filename)        |  |
|                           |              | FROM(data-area)       |  |
|                           |              | KEYLENGTH(data-value) |  |
|                           |              | LENGTH(data-value)    |  |
|                           |              | RBA                   | <ul style="list-style-type: none"> <li>Not supported in File2File when using COBOL-IT.</li> <li>WRITE RBA can only be used in ESDS dataset.</li> </ul> |
|                           |              | RIDFLD(data-area)     |  |
|                           |              | RRN                   | Recognized   |
|                           |              | SYSID(systemname)     | Recognized   |
| Interval Control Services | ASKTIME      | ABSTIME(data-area)    |  |
|                           | CANCEL       | REQID(name)           | Not supports for cancelling the remote requests issued by DELAY command.   |
|                           |              | SYSID(systemname)     |  |
| TRANSID(name)             |              |                       |  |
| Interval Control Services | DELAY        | FOR                   |  |
|                           |              | HOURS(data-value)     |  |
|                           |              | INTERVAL(hhmmss)      | The default value is INTERVAL(0).  |
|                           |              | MINUTES(data-value)   |  |
|                           |              | REQID(name)           |  |
|                           |              | SECONDS(data-value)   |  |
|                           |              | TIME(hhmmss)          |  |

Table 15-1 CICS Command (COBOL Support)

| Category                  | CICS Command | Command Parameter       | Notes |
|---------------------------|--------------|-------------------------|-------|
| Interval Control Services | FORMATTIME   | ABSTIME (data-area)     |       |
|                           |              | DATE (data-area)        |       |
|                           |              | DATEFORM (data-area)    |       |
|                           |              | DATESEP (data-value)    |       |
|                           |              | DAYCOUNT (data-area)    |       |
|                           |              | DAYOFMONTH (data-area)  |       |
|                           |              | DAYOFWEEK (data-area)   |       |
|                           |              | DDMMYY (data-area)      |       |
|                           |              | DDMMYYYY (data-area)    |       |
|                           |              | FULLDATE (data-area)    |       |
|                           |              | MMDDYY (data-area)      |       |
|                           |              | MMDDYYYY (data-area)    |       |
|                           |              | MONTHOFYEAR (data-area) |       |
|                           |              | TIME (data-area)        |       |
|                           |              | TIMESEP (data-value)    |       |
|                           |              | YEAR (data-area)        |       |
|                           |              | YYDDD (data-area)       |       |
|                           |              | YYDDMM (data-area)      |       |
|                           |              | YYMMDD (data-area)      |       |
|                           |              | YYYYDDD (data-area)     |       |
| YYYYDDMM (data-area)      |              |                         |       |
| YYYYMMDD (data-area)      |              |                         |       |

**Table 15-1 CICS Command (COBOL Support)**

| <b>Category</b>                 | <b>CICS Command</b> | <b>Command Parameter</b> | <b>Notes</b> |
|---------------------------------|---------------------|--------------------------|--------------|
| Interval<br>Control<br>Services | RETRIEVE            | INTO (data-area)         |              |
|                                 |                     | LENGTH (data-area)       |              |
|                                 |                     | QUEUE (data-area)        |              |
|                                 |                     | RTERMID (data-area)      |              |
|                                 |                     | RTRANSID (data-area)     |              |
|                                 |                     | SET (ptr-ref)            |              |

Table 15-1 CICS Command (COBOL Support)

| Category                  | CICS Command | Command Parameter    | Notes   |
|---------------------------|--------------|----------------------|---|
| Interval Control Services | START        | AFTER                |   |
|                           |              | AT                   |   |
|                           |              | FROM (data-area)     |   |
|                           |              | HOURS (data-value)   |   |
|                           |              | INTERVAL (hhmmss)    |   |
|                           |              | LENGTH (data-value)  | If not specified, START LENGTH will be automatically set. Its default value is in "LENGTH OF data-area" format; "data-area" is the one specified in FROM. |
|                           |              | MINUTES (data-value) |   |
|                           |              | NOCHECK              | Recognized  |
|                           |              | PROTECT              |   |
|                           |              | QUEUE (name)         | This option cannot be used with TERMID.   |
|                           |              | REQID (name)         | The specified REQID must be unique in START asynchronous CICS delayed transactions when /Q, or ARTSRM_ORA or ARTSRM_UDB implementation is used.           |
|                           |              | RTERMID (name)       |   |
|                           |              | RTRANSID (name)      |   |
| SECONDS (data-value)      |              |                      |   |

**Table 15-1 CICS Command (COBOL Support)**

| Category                  | CICS Command | Command Parameter  | Notes   |
|---------------------------|--------------|--------------------|---|
| Interval Control Services | START        | SYSID(systemname)  |   |
|                           |              | TERMID(name)       | The Oracle Tuxedo server, TMUSREVT, must be configured in the UBBCONFIG file to support this command.       |
|                           |              | TIME(hhmmss)       |   |
|                           |              | TRANSID(name)      | TERMID option cannot be used together with the RTRANSID/RTERMID/QUEUE option for the START TRANSID command. |
|                           |              | USERID(data-value) | The security stub is called with USERID and TRANSID.  |



**Table 15-1 CICS Command (COBOL Support)**

| Category   | CICS Command         | Command Parameter    | Notes   |
|------------|----------------------|----------------------|---|
| Journaling | JOURNAL              | FROM (data-area)     |   |
|            |                      | JFILEID (data-value) | Specifies a value in the range 1 through 99, the number that is to be taken as the journal identifier. When specifying JFILEID as nn, the journal will be written to journal file DFHJnn. |
|            |                      | JTYPEID (data-value) |   |
|            | WRITE<br>JOURNALNAME | FLENGTH (data-value) |   |
|            |                      | FROM (data-area)     |   |
|            |                      | JTYPEID (data-value) |   |
|            |                      | PFXLENG (data-value) |   |
|            |                      | PREFIX (data-value)  |   |
|            |                      | STARTIO              | Recognized  |
|            |                      | WAIT                 | Recognized  |

**Table 15-1 CICS Command (COBOL Support)**

| Category                  | CICS Command            | Command Parameter      | Notes |
|---------------------------|-------------------------|------------------------|-------|
| LUTYPE6.1<br>Conversation | ALLOCATE<br>(LUTYPE6.1) | SYSID(systemname)      |       |
|                           |                         |                        |       |
|                           | CONVERSE<br>(LUTYPE6.1) | FROM(data-area)        |       |
|                           |                         | FROMLENGTH(data-value) |       |
|                           |                         | FROMLENGTH(data-value) |       |
|                           |                         | INTO(data-area)        |       |
|                           |                         | MAXLENGTH(data-value)  |       |
|                           |                         | MAXLENGTH(data-value)  |       |
|                           |                         | NOTRUNCATE             |       |
|                           |                         | SESSION(name)          |       |
|                           |                         | SET(ptr-ref)           |       |
|                           |                         | TOLENGTH(data-area)    |       |
|                           | TOLENGTH(data-area)     |                        |       |
|                           | FREE<br>(LUTYPE6.1)     | SESSION(name)          |       |
|                           | RECEIVE<br>(LUTYPE6.1)  | FLNGTH(data-area)      |       |
|                           |                         | INTO(data-area)        |       |
|                           |                         | LENGTH(data-area)      |       |
|                           |                         | MAXLENGTH(data-value)  |       |
|                           |                         | MAXLENGTH(data-value)  |       |
|                           |                         | NOTRUNCATE             |       |
| SESSION(name)             |                         |                        |       |
| SET(ptr-ref)              |                         |                        |       |

**Table 15-1 CICS Command (COBOL Support)**

| Category                  | CICS Command        | Command Parameter    | Notes |
|---------------------------|---------------------|----------------------|-------|
| LUTYPE6.1<br>Conversation | SEND<br>(LUTYPE6.1) | FLENGTH (data-value) |       |
|                           |                     | FROM (data-area)     |       |
|                           |                     | INVITE               |       |
|                           |                     | LAST                 |       |
|                           |                     | LENGTH (data-value)  |       |
|                           |                     | SESSION (name)       |       |
|                           |                     | WAIT                 |       |

**Table 15-1 CICS Command (COBOL Support)**

| Category               | CICS Command   | Command Parameter       | Notes  |
|------------------------|----------------|-------------------------|--|
| NAMED COUNTER SERVICES | DEFINE COUNTER | COUNTER (name)          | Mark POOL option as “Recognized” in each command |
|                        |                | VALUE (data-value)      |  |
|                        |                | MINIMUM (data-value)    |  |
|                        |                | MAXIMUM (data-value)    |  |
|                        | GET COUNTER    | COUNTER (name)          |  |
|                        |                | VALUE (data-area)       |  |
|                        |                | INCREMENT (data-value)  |  |
|                        |                | REDUCE                  |  |
|                        |                | WRAP                    |  |
|                        |                | COMPAREMIN (data-value) |  |
|                        |                | COMPAREMAX (data-value) |  |
|                        | QUERY COUNTER  | COUNTER (name)          |  |
|                        |                | VALUE (data-area)       |  |
|                        |                | MINIMUM (data-area)     |  |
|                        |                | MAXIMUM (data-area)     |  |
|                        | UPDATE COUNTER | COUNTER (name)          |  |
|                        |                | VALUE (data-area)       |  |
|                        |                | COMPAREMIN (data-area)  |  |
|                        |                | COMPAREMAX (data-area)  |  |
|                        | DELETE COUNTER | COUNTER (name)          |  |

**Table 15-1 CICS Command (COBOL Support)**

| Category        | CICS Command | Command Parameter        | Notes      |
|-----------------|--------------|--------------------------|------------|
| Program Control | LINK         | CHANNEL (name)           |            |
|                 |              | COMMAREA (data-area)     |            |
|                 |              | DATALength (data-value)  | Recognized |
|                 |              | LENGTH (data-value)      |            |
|                 |              | PROGRAM (name)           |            |
|                 |              | SYNCONRETURN             |            |
|                 |              | SYSID (systemname)       |            |
|                 |              | TRANSID (name)           |            |
|                 | LOAD         | ENTRY (ptr-ref)          |            |
|                 |              | PROGRAM (name)           |            |
|                 | RELEASE      | PROGRAM (name)           |            |
|                 | RETURN       | CHANNEL (name)           |            |
|                 |              | COMMAREA (data-area)     |            |
|                 |              | IMMEDIATE                |            |
|                 |              | INPUTMSG (data-area)     |            |
|                 |              | INPUTMSGLEN (data-value) |            |
|                 |              | LENGTH (data-value)      |            |
|                 |              | TRANSID (name)           |            |
|                 | XCTL         | CHANNEL (name)           |            |
|                 |              | COMMAREA (data-area)     |            |
|                 |              | LENGTH (data-value)      |            |
|                 |              | PROGRAM (name)           |            |

**Table 15-1 CICS Command (COBOL Support)**

| Category              | CICS Command        | Command Parameter         | Notes   |
|-----------------------|---------------------|---------------------------|---|
| Spool Interface (JES) | SPOOLCLOSE          | DELETE                    | Recognized  |
|                       |                     | TOKEN (data-area)         |   |
|                       | SPOOLOPEN OUTPUT    | ASA                       | Recognized  |
|                       |                     | CLASS (data-value)        |   |
|                       |                     | NOCC                      |   |
|                       |                     | NODE (data-value)         | Only support for local node if there is no /*XEQ NODE line defined in JCL file for the automatic submission to JES. |
|                       |                     | PRINT                     | Recognized  |
|                       |                     | PUNCH                     | Recognized  |
|                       |                     | RECORDLENGTH (data-value) |   |
|                       |                     | TOKEN (data-area)         |   |
|                       | USERID (data-value) | Supports only INTRDR      |   |
|                       | SPOOLWRITE          | FLENGTH (data-value)      |   |
|                       |                     | FROM (data-area)          |   |
| TOKEN (data-area)     |                     |                           |   |
| Storage Control       | GETMAIN             | FLENGTH (data-value)      |   |
|                       |                     | INITIMG (data-value)      |   |
|                       |                     | SET (ptr-ref)             |   |
|                       |                     | SHARED                    | Only supports ARTSTRN/1, ARTATRN/1 and ARTDPL in SHM mode.  |
|                       | FREEMAIN            | DATA (data-area)          |   |
|                       |                     | DATAPointer (ptr-value)   |   |

**Table 15-1 CICS Command (COBOL Support)**

| Category           | CICS Command          | Command Parameter                        | Notes   |
|--------------------|-----------------------|--|---|
| Syncpoint          | SYNCPOINT             |  |   |
|                    | SYNCPOINT<br>ROLLBACK | ROLLBACK                                 |   |
| System<br>Commands | INQUIRE<br>CONNECTION | ACCESSMETHOD (cvda)                      | Only VTAM is returned.  |
|                    |                       | CONNSTATUS (cvda) (APPC and<br>MRO only) | Only ACQUIRED is returned.<br>CONNSTATUS equals to<br>ACQSTATUS.  |
|                    |                       | NETNAME (data-area)                      |   |
|                    |                       | ACQSTATUS (cvda)                         | Recognized  |
|                    |                       | SERVSTATUS (cvda)                        |   |
|                    |                       | START                                    |   |
|                    |                       | NEXT                                     |   |
|                    |                       | END                                      |   |
|                    | INQUIRE<br>DB2CONN    | CONNECTERROR (cvda                       | Recognized  |
|                    |                       | CONNECTST (cvda)                         |   |
|                    |                       | DB2GROUPID (data-area)                   |   |
|                    |                       | DB2ID (data-area)                        |   |
|                    |                       | PLAN (data-area)                         |   |
|                    | INQUIRE<br>NETNAME    |  | <ul style="list-style-type: none"> <li>For all other supported INQUIRE NETNAME options, please refer to INQUIRE TERMINAL.</li> <li>Only support for terminals in the same CICS region.</li> </ul> |

**Table 15-1 CICS Command (COBOL Support)**

| Category           | CICS Command       | Command Parameter       | Notes                                      |
|--------------------|--------------------|-------------------------|--|
| System<br>Commands | INQUIRE<br>STORAGE | ADDRESS (ptr-value)     | Recognized                                 |
|                    |                    | DSANAME (cvda)          | Recognized                                 |
|                    |                    | ELEMENT (ptr-ref)       | Recognized. CICS NULL pointer is returned. |
|                    |                    | ELEMENTLIST (ptr-ref)   | Recognized. CICS NULL pointer is returned. |
|                    |                    | FLENGTH (data-area)     | Recognized. 0 is returned.                 |
|                    |                    | LENGTHLIST (ptr-ref)    | Recognized. CICS NULL pointer is returned. |
|                    |                    | NUMELEMENTS (data-area) | Recognized. 0 is returned.                 |
|                    |                    | TASK (data-value)       | Recognized                                 |



Table 15-1 CICS Command (COBOL Support)

| Category           | CICS Command        | Command Parameter             | Notes  |
|--------------------|---------------------|-------------------------------|--|
| System Commands    | INQUIRE<br>SYSTEM   | JOBNAME (data-area)           |  |
|                    |                     | RELEASE (data-area)           | Returns the value configured in either KIX_CICS_RELEASE environment variable or CICS_RELEASE in system configuration file systems.desc.<br><br>If both of them are configured, the value in systems.desc is returned;<br>If neither of them is configured, value '0660' (corresponding to CICS 4.1) is returned. |
|                    |                     | SHUTSTATUS (cvda)             | Only NOTAPPLIC is returned.  |
|                    | INQUIRE<br>TERMINAL | ACCESSMETHOD (cvda)           | <ul style="list-style-type: none"> <li>• Partial CVDA values are supported for the following options: <ul style="list-style-type: none"> <li>– ACCESSMETHOD: VTAM</li> <li>– CREATESESS: NOCREATE</li> <li>– REMOTESYSTEM: Blank</li> </ul> </li> </ul>  |
|                    |                     | ALTSUFFIX (data-area)         |  |
|                    |                     | ACQSTATUS (cvda) (VTAM only)  |  |
|                    |                     | CREATESESS (cvda) (VTAM only) |  |
|                    |                     | NETNAME (data-area)           |  |
|                    |                     | NEXTTRANSID (data-area)       |  |
|                    |                     |                               |  |
|                    |                     | SERVSTATUS (cvda)             |  |
|                    |                     | SIGNONSTATUS (cvda)           |  |
|                    |                     | TRACING (cvda)                |  |
|                    |                     | TRANSACTION (data-area)       |  |
| USERID (data-area) |                     |                               |  |

**Table 15-1 CICS Command (COBOL Support)**

| Category              | CICS Command                  | Command Parameter  | Notes  |
|-----------------------|-------------------------------|--|--|
| System Commands       |                               | REMOTESYSTEM (data-area)   | <ul style="list-style-type: none"> <li>- SERVSTATUS: INSERVICE and OUTSERVICE</li> <li>- TRACING: STANTRACE</li> </ul> Only support for terminals in the same CICS region. |
|                       |                               | SERVSTATUS (cvda)  |  |
|                       |                               | SIGNONSTATUS (cvda)  |  |
|                       |                               | TRACING (cvda)   |  |
|                       |                               | TRANSACTION (data-area)  |  |
|                       |                               | USERID (data-area)   |  |
|                       |                               | AIDCOUNT (data-area)   | Recognized   |
|                       |                               | TERMSTATUS (cvda)  |  |
|                       |                               | TASKID (data-area)   |  |
|                       |                               | DEVICE (cvda)  |  |
|                       | INQUIRE TRANCLASS             | MAXACTIVE (data-area)  | The following parameters are not applicable in CICS Runtime environment:<br>ACTIVE<br>PURGETHRESH<br>QUEUED  |
|                       | INQUIRE TRANSACTION           | PROGRAM (data-area)  |  |
|                       |                               | STATUS (cvda)  |  |
|                       | INQUIRE TSPPOOL               | START  | Recognized   |
|                       | INQUIRE TSQNAME               | START  | Recognized   |
| POOLNAME (data-value) |                               |  |  |
| SET CONNECTION        | CONNSTATUS (cvda) (APPC only) | <ul style="list-style-type: none"> <li>• Recognized.</li> <li>• CONNSTATUS equals to ACQSTATUS.</li> </ul> |  |

Table 15-1 CICS Command (COBOL Support)

| Category           | CICS Command           | Command Parameter                         | Notes  |
|--------------------|------------------------|---|--|
| System<br>Commands | INQUIRE FILE           | ACCESSMETHOD (cvda)                       | Only VSAM is returned.   |
|                    |                        | DSNAME (data-area)                        | The default value of DSNAME is the VSAM file name; once specified by SET FILE DSNAME, INQUIRE FILE DSNAME will return the specified value. |
|                    |                        | EMPTYSTATUS (cvda) (VSAM only)            | Only NOEMPTYREQ is returned.   |
|                    |                        | ENABLESTATUS (cvda)                       |  |
|                    |                        | LSRPOOLID (data-area) (VSAM only)         | Only 0 is returned.  |
|                    |                        | MAXNUMRECS (data-area) (data tables only) | Only 0 is returned.  |
|                    |                        | OPENSTATUS (cvda)                         |  |
|                    |                        | TABLE (cvda) (VSAM and CFDT only)         | Only NOTTABLE is returned.   |
|                    |                        | TYPE (cvda)                               |  |
|                    | INQUIRE PROGRAM        | RESCOUNT (data-area)                      | To use this option, RESCOUNT-STAT must be set to ENABLED in programs.desc.   |
|                    | INQUIRE<br>EXITPROGRAM | ENTRYNAME (data-area)                     | Recognized   |
|                    |                        | CONNECTST (cvda)                          |  |
|                    |                        | QUALIFIER (data-area)                     |  |
| STARTSTATUS (cvda) |                        |   |  |

**Table 15-1 CICS Command (COBOL Support)**

| Category        | CICS Command      | Command Parameter       | Notes   |
|-----------------|-------------------|-------------------------|---|
| System Commands | INQUIRE TASK      | ATTACHTIME (data-area)  |   |
|                 |                   | TASK (data-value)       |   |
|                 |                   | TRANSACTION (data-area) |   |
|                 |                   | RUNSTATUS (cvda)        | Recognized. Only RUNNING is returned.               |
|                 |                   | SUSPENDTYPE (data-area) | Recognized. Only NULL is returned.                  |
|                 |                   | PROGRAM (data-area)     |   |
|                 |                   | STARTCODE (data-area)   |   |
|                 |                   | TWASIZE (data-area)     |   |
|                 |                   | UOW (data-area)         |   |
|                 |                   | USERID (data-area)      |   |
|                 | INQUIRE TASK LIST | LISTSIZE (data-area)    |   |
|                 |                   | SET (ptr-ref)           |   |
|                 |                   | SETTRANSID (ptr-ref)    |   |
|                 |                   | DISPATCHABLE            | Recognized  |
|                 |                   | RUNNING                 | Recognized  |
|                 |                   | SUSPENDED               | Recognized  |
|                 | SET FILE          | DSNAME (data-value)     |   |
|                 |                   | ENABLESTATUS (cvda)     | The supported CVDA values are DISABLED and ENABLED. |
|                 |                   | OPENSTATUS (cvda)       | The supported CVDA values are CLOSED and OPEN.      |

Table 15-1 CICS Command (COBOL Support)

| Category                  | CICS Command | Command Parameter       | Notes   |
|---------------------------|--------------|-------------------------|---|
| System Commands           | SET PROGRAM  | COPY (cvda)             | ART for CICS implements the same semantics for SET PROGRAM COPY (NEWCOPY) and SET PROGRAM COPY (PHASEIN).   |
|                           |              | NEWCOPY                 | When using NEWCOPY command to reload programs, you must delete the compiled executable file before copying new compiled executable file to runtime environment. |
|                           |              | PHASEIN                 |   |
|                           | SET TDQUEUE  | ATIFACILITY (cvda)      | Recognized  |
|                           |              | NOTERMINAL              |   |
|                           |              | TERMINAL                |   |
|                           |              | ATTITERMID (data-value) |   |
|                           |              | ATTITRANID (data-value) |   |
|                           |              | ATIUSERID (data-value)  |   |
|                           |              | ENABLESTATUS (cvda)     |   |
|                           |              | DISABLED                |   |
|                           |              | ENABLED                 |   |
|                           |              | OPENSTATUS (cvda)       |   |
|                           |              | CLOSED                  |   |
| OPEN                      |              |                         |   |
| TRIGGERLEVEL (data-value) |              |                         |   |

**Table 15-1 CICS Command (COBOL Support)**

| Category        | CICS Command   | Command Parameter             | Notes  |
|-----------------|--|-------------------------------|--|
| System Commands | <b>SET TERMINAL</b><br><br><b>Note:</b> The terminals must be in the same CICS region. | ATISTATUS (cvda)              | The supported CVDA values are ATI and NOATI.   |
|                 |  | CREATESESS (cvda) (VTAM only) | The supported CVDA value is CREATE.  |
|                 |  | SERVSTATUS (cvda)             | The supported CVDA values are INSERVICE and OUTSERVICE.  |
|                 |  | TERMSTATUS (cvda) (VTAM only) | The supported CVDA values are ACQUIRED and RELEASED.   |
|                 |  | TTISTATUS (cvda)              | The supported CVDA values are NOTTI and TTI.   |
| Task Control    | DEQ  | LENGTH (data-value)           | Mandatory, only the enqueues and dequeues on data values are supported, not the enqueues on address. |
|                 |  | MAXLIFETIME (cvda)            |  |
|                 |  | RESOURCE (data-area)          |  |
|                 | ENQ  | LENGTH (data-value)           | Mandatory, only the enqueues and dequeues on data values are supported, not the enqueues on address. |
|                 |  | MAXLIFETIME (cvda)            | The supported CVDA values are TASK and UOW.  |
|                 |  | NOSUSPEND                     |  |
|                 |  | RESOURCE (data-area)          |  |
|                 | SUSPEND  |                               |  |

**Table 15-1 CICS Command (COBOL Support)**

| Category          | CICS Command | Command Parameter    | Notes      |
|-------------------|--------------|----------------------|------------|
| Temporary Storage | DELETEQ TS   | QNAME (name)         |            |
|                   |              | QUEUE (name)         |            |
|                   |              | SYSID (systemname)   | Recognized |
| Temporary Storage | READQ TS     | INTO (data-area)     |            |
|                   |              | ITEM (data-value)    |            |
|                   |              | LENGTH (data-area)   |            |
|                   |              | NEXT                 |            |
|                   |              | NUMITEMS (data-area) |            |
|                   |              | QNAME (name)         |            |
|                   |              | QUEUE (name)         |            |
|                   |              | SET (ptr-ref)        |            |
|                   |              | SYSID (systemname)   | Recognized |
|                   | WRITEQ TS    | AUXILIARY            |            |
|                   |              | FROM (data-area)     |            |
|                   |              | ITEM (data-area)     |            |
|                   |              | LENGTH (data-value)  |            |
|                   |              | MAIN                 |            |
|                   |              | NOSUSPEND            |            |
|                   |              | NUMITEMS (data-area) |            |
|                   |              | QNAME (name)         |            |
|                   |              | QUEUE (name)         |            |
|                   |              | REWRITE              |            |
|                   |              | SYSID (systemname)   | Recognized |

**Table 15-1 CICS Command (COBOL Support)**

| Category         | CICS Command           | Command Parameter       | Notes |
|------------------|------------------------|-------------------------|-------|
| Terminal Control | CONVERSE<br>(terminal) | ASIS                    |       |
|                  |                        | ALTERNATE               |       |
|                  |                        | CTLCHAR (data-value)    |       |
|                  |                        | ERASE                   |       |
|                  |                        | FROM (data-area)        |       |
|                  |                        | FROMLENGTH (data-value) |       |
|                  |                        | FROMLENGTH (data-value) |       |
|                  |                        | INTO (data-area)        |       |
|                  |                        | MAXLENGTH               |       |
|                  |                        | MAXLENGTH               |       |
|                  |                        | NOTRUNCATE              |       |
|                  |                        | STRFIELD                |       |
|                  |                        | SET (ptr-ref)           |       |
|                  |                        | TOLENGTH (data-area)    |       |
|                  | TOLENGTH (data-area)   |                         |       |
|                  | EXTRACT<br>LOGONMSG    | INTO (data-area)        |       |
|                  |                        | LENGTH (data-area)      |       |
| SET (ptr-ref)    |                        |                         |       |



Table 15-1 CICS Command (COBOL Support)

| Category         | CICS Command               | Command Parameter       | Notes                            |
|------------------|----------------------------|-------------------------|----------------------------------|
| Terminal Control | HANDLE AID                 | ANYKEY                  |                                  |
|                  |                            | CLEAR                   |                                  |
|                  |                            | ENTER                   |                                  |
|                  |                            | OPERID                  | Recognized                       |
|                  |                            | PA1-PA3                 |                                  |
|                  |                            | PF1-PF24                |                                  |
|                  | ISSUE DISCONNECT (default) |                         |                                  |
|                  | ISSUE PASS                 | FROM (data-area)        |                                  |
|                  |                            | LENGTH (data-value)     |                                  |
|                  |                            | LUNAME (name)           |                                  |
|                  | RECEIVE                    | ASIS                    |                                  |
|                  |                            | BUFFER                  | Not supported by ARTWTRN/ARTWTR1 |
|                  |                            | FLENGTH (data-value)    |                                  |
|                  |                            | INTO (data-area)        |                                  |
|                  |                            | LENGTH (data-value)     |                                  |
|                  |                            | MAXFLENGTH (data-value) | Not supported by ARTWTRN/ARTWTR1 |
|                  |                            | MAXLENGTH (data-value)  |                                  |
|                  |                            | NOTRUNCATE              | Not supported by ARTWTRN/ARTWTR1 |
|                  |                            | SET (ptr-ref)           |                                  |

**Table 15-1 CICS Command (COBOL Support)**

| Category         | CICS Command | Command Parameter                | Notes   |
|------------------|--------------|----------------------------------|---|
| Terminal Control | SEND         | ALTERNATE                        |   |
|                  |              | CTLCHAR (data-value)             | When bit 2/3 of WCC is '00' and bit 4 is '1', the LENGTH and FLENGTH must not be greater than 1896. |
|                  |              | DEFRESP                          |   |
|                  |              | ERASE                            |   |
|                  |              | FLENGTH (data-value)             | Not supported by ARTWTRN/ARTWTRI  |
|                  |              | FROM (data-area)                 |   |
|                  |              | LAST                             |   |
|                  |              | LENGTH (data-value)              |   |
|                  |              | STRFIELD                         |   |
|                  | WAIT         | Not supported by ARTWTRN/ARTWTRI |   |
| WAIT<br>TERMINAL |              |                                  |   |

Table 15-1 CICS Command (COBOL Support)

| Category              | CICS Command | Command Parameter         | Notes  |
|-----------------------|--------------|---------------------------|--|
| Transient Data        | DELETEQ TD   | QUEUE (name)              |  |
|                       |              | SYSID (systemname)        |  |
|                       | READQ TD     | INTO (data-area)          |  |
|                       |              | LENGTH (data-area)        |  |
|                       |              | QUEUE (name)              |  |
|                       | WRITEQ TD    | FROM (data-area)          |  |
|                       |              | LENGTH (data-value)       |  |
|                       |              | QUEUE (name)              |  |
|                       |              | SYSID (systemname)        |  |
|                       | Web Service  | INVOKE<br>WEBSERVICE      | CHANNEL (name)   |
| OPERATION (data-area) |              |                           |  |
| URI (data-area)       |              |                           |  |
| WEBSERVICE (name)     |              |                           |  |
| SOAPFAULT<br>CREATE   |              | FAULTCODE (cvda)          | Recognized<br><br><b>Note:</b> All CVDA values are recognized, including CLIENT, SENDER, SERVER, and RECEIVER. |
|                       |              | FAULTSTRING (data-value)  | Recognized   |
|                       |              | FAULTSTRLEN (data-value)  | Recognized   |
| WEB Support           | WEB CLOSE    | SESSTOKEN (data-value)    |  |
|                       | WEB CONVERSE | ACTION (cvda)             | Recognized   |
|                       |              | CHARACTERSET (data-value) | Recognized   |
|                       |              | CLIENTCONV (cvda)         | Recognized   |

**Table 15-1 CICS Command (COBOL Support)**

| Category    | CICS Command                  | Command Parameter        | Notes   |
|-------------|-------------------------------|--------------------------|---|
| WEB Support | WEB CONVERSE                  | CLOSESTATUS (cvda)       | Recognized  |
|             |                               | DOCTOKEN (data-value)    | Recognized  |
|             |                               | FROM (data-area)         |   |
|             |                               | FROMLENGTH (data-area)   |   |
|             |                               | INTO (data-area)         |   |
|             |                               | MAXLENGTH (data-value)   |   |
|             |                               | MEDIATYPE (data-area)    | Recognized  |
|             |                               | METHOD (cvda)            | Recognized  |
|             |                               | NOTRUNCATE               | Recognized  |
|             |                               | QUERYSTRING (data-area)  | While a query string is specified, the message body is ignored. |
|             |                               | QUERYSTRLEN (data-value) |   |
|             |                               | PATH (data-area)         | Recognized  |
|             |                               | PATHLENGTH (data-value)  | Recognized  |
|             |                               | SESSTOKEN (data-value)   |   |
|             |                               | SET (ptr-ref)            |   |
|             |                               | STATUSCODE (data-area)   |   |
|             |                               | STATUSLEN (data-value)   |   |
|             |                               | STATUSTEXT (data-area)   |   |
|             |                               | TOLength (data-area)     |   |
|             |                               | URIMAP (data-value)      | Recognized  |
|             | WEB<br>ENDBROWSE<br>FORMFIELD |                          |   |

Table 15-1 CICS Command (COBOL Support)

| Category               | CICS Command                                   | Command Parameter        | Notes  |
|------------------------|--|--------------------------|--|
| WEB Support            | WEB EXTRACT<br>(Server)                        | HOST (data-area)         |  |
|                        |  | HOSTLENGTH (data-area)   |  |
|                        |  | HTTPMETHOD (data-area)   | Enable SALT Property:<br>enableHTTPRequestLine |
|                        |  | HTTPVERSION (data-area)  | Enable SALT Property:<br>enableHTTPRequestLine |
|                        |  | METHODLENGTH (data-area) | Enable SALT Property:<br>enableHTTPRequestLine |
|                        |  | PATH (data-area)         | Enable SALT Property:<br>enableHTTPRequestLine |
|                        |  | PATHLENGTH (data-area)   | Enable SALT Property:<br>enableHTTPRequestLine |
|                        |  | PORTNUMBER (data-area)   |  |
|                        |  | QUERYSTRING (data-area)  | Enable SALT Property:<br>enableHTTPRequestLine |
|                        |  | QUERYSTRLEN (data-area)  | Enable SALT Property:<br>enableHTTPRequestLine |
|                        |  | REQUESTTYPE (cvda)       | Recognized<br>Always returns HTTPYES.          |
|                        |  | SCHEME (cvda)            | Enable SALT Property:<br>enableHTTPRequestLine |
| VERSIONLEN (data-area) | Enable SALT Property:<br>enableHTTPRequestLine |                          |  |

**Table 15-1 CICS Command (COBOL Support)**

| Category    | CICS Command              | Command Parameter        | Notes                   |  |
|-------------|---------------------------|--------------------------|-------------------------|--|
| WEB Support | WEB OPEN                  | CERTIFICATE (data-value) | Recognized              |  |
|             |                           | CIPHERS (data-value)     | Recognized              |  |
|             |                           | CODEPAGE (data-value)    | Recognized              |  |
|             |                           | HOST (data-value)        |                         |  |
|             |                           | HOSTLENGTH (data-value)  |                         |  |
|             |                           | HTTPRNUM (data-area)     | Recognized              |  |
|             |                           | HTTPVNUM (data-area)     | Recognized              |  |
|             |                           | NUMCIPHERS (data-value)  | Recognized              |  |
|             |                           | PORTNUMBER (data-value)  |                         |  |
|             |                           | SCHEME (cvda)            | Recognized              |  |
|             |                           | SESSTOKEN (data-area)    |                         |  |
|             | URIMAP (data-value)       |                          |                         |  |
|             | WEB READ<br>HTTPHEADER    | HTTPHEADER               | HTTPHEADER (data-area)  | Enable SALT Property:<br>enableCustomHTTPHeaders |
|             |                           |                          | NAMELENGTH (data-value) |  |
|             |                           |                          | VALUE (data-area)       |  |
|             |                           |                          | VALUELENGTH (data-area) |  |
|             | WEB READNEXT<br>FORMFIELD | FORMFIELD                | FORMFIELD (data-area)   | Enable SALT Property:<br>enableHTTPRequestLine   |
|             |                           |                          | NAMELENGTH (data-area)  |  |
|             |                           |                          | VALUE (data-area)       |  |
|             |                           |                          | VALUELENGTH (data-area) |  |

Table 15-1 CICS Command (COBOL Support)

| Category    | CICS Command                    | Command Parameter         | Notes  |
|-------------|---------------------------------|---------------------------|--|
| WEB Support | WEB RECEIVE<br>(Server)         | CHARACTERSET (data-value) | Recognized                                     |
|             |                                 | CLNTCODEPAGE (data-value) | Recognized                                     |
|             |                                 | HOSTCODEPAGE (data-value) | Recognized                                     |
|             |                                 | INTO (data-area)          |  |
|             |                                 | LENGTH (data-area)        |  |
|             |                                 | MAXLENGTH (data-value)    |  |
|             |                                 | NOTTRUNCATE               |  |
|             |                                 | SERVERCONV (cvda)         | Recognized                                     |
|             |                                 | SET (ptr-ref)             |  |
|             |                                 | TYPE (cvda)               | Recognized<br>Always returns HTTPYES.          |
|             | WEB SEND<br>(Server)            | CHARACTERSET (data-value) | Recognized                                     |
|             |                                 | FROM (data-area)          |  |
|             |                                 | FROMLENGTH (data-value)   |  |
|             |                                 | SERVERCONV (cvda)         | Recognized                                     |
|             | WEB<br>STARTBROWSE<br>FORMFIELD | CLNTCODEPAGE (data-value) | Recognized                                     |
|             |                                 | FORMFIELD (data-area)     | Enable SALT Property:<br>enableHTTPRequestLine |
|             |                                 | HOSTCODEPAGE (data-value) | Recognized                                     |
|             |                                 | NAMELENGTH (data-area)    |  |

**Table 15-1 CICS Command (COBOL Support)**

| Category    | CICS Command            | Command Parameter        | Notes  |
|-------------|-------------------------|--------------------------|--|
| WEB Support | WEB WRITE<br>HTTPHEADER | HTTPHEADER (data-area)   | Enable SALT Property:<br>enableCustomHTTPHead<br>ers |
|             |                         | NAMELENGTH (data-value)  |  |
|             |                         | SESSTOKEN (data-value)   | Recognized   |
|             |                         | VALUE (data-area)        |  |
|             |                         | VALUELENGTH (data-value) |  |

**Note:**

- For each command, if none of its listed "command parameters" is mandatory to set originally, ART CICS supports users to code none of them.
- RESP, RESP2, and NOHANDLE are supported on all commands.
- Recognized parameters are processed by the pre-processor and have no effect on the behavior of CICS Runtime.
- Some CICS commands require ARTSRM server. See [ARTSRM Configuration](#) for the complete set of those CICS commands.
- INQUIRE TERMINAL, SET TERMINAL, ISSUE PASS, and EXTRACT LOGONMSG require ARTLOGN server.

**Table 15-2 CICS Command (C Support)**

| Category | CICS Command | Command Parameter | Notes |
|----------|--------------|-------------------|-------|
| ABEND    | ABEND        | ABCODE (name)     |       |
|          |              | NODUMP            |       |



Table 15-2 CICS Command (C Support)

| Category                     | CICS Command               | Command Parameter     | Notes         |
|------------------------------|----------------------------|-----------------------|---------------|
| Channel commands             | GET CONTAINER<br>(CHANNEL) | CHANNEL (data-value)  |               |
|                              |                            | FLENGTH (data-area)   |               |
|                              |                            | INTO (data-area)      |               |
|                              |                            | NODATA                |               |
|                              |                            | SET (ptr-ref)         |               |
|                              | PUT CONTAINER<br>(CHANNEL) | CHANNEL (data-value)  |               |
|                              |                            | FLENGTH (data-value)  |               |
|                              |                            | FROM (data-area)      |               |
|                              | Environment<br>services    | ADDRESS               | EIB (ptr-ref) |
| COMMAREA (ptr-ref)           |                            |                       |               |
| CWA (ptr-ref)                |                            |                       |               |
| ASSIGN                       |                            | APPLID (data-area)    |               |
|                              |                            | LANGINUSE (data-area) |               |
|                              |                            | USERID (data-area)    |               |
| Interval Control<br>Services | ASKTIME                    | ABSTIME (data-area)   |               |
|                              | FORMATTIME                 | ABSTIME (data-area)   |               |
|                              |                            | DATESEP (data-value)  |               |
|                              |                            | TIME (data-area)      |               |
|                              |                            | TIMSEP (data-value)   |               |
|                              |                            | YYYYMMDD (data-area)  |               |
|                              | RETRIEVE                   | INTO (data-area)      |               |
|                              |                            | LENGTH (data-value)   |               |
|                              |                            | SET (ptr-ref)         |               |

**Table 15-2 CICS Command (C Support)**

| Category         | CICS Command          | Command Parameter        | Notes |
|------------------|-----------------------|--------------------------|-------|
| Program Control  | LINK                  | COMMAREA (data-area)     |       |
|                  |                       | DATALLENGTH (data-value) |       |
|                  |                       | LENGTH (data-value)      |       |
|                  |                       | PROGRAM (name)           |       |
|                  |                       | SYNCONRETURN             |       |
|                  |                       | SYSID (systemname)       |       |
|                  | TRANSID (name)        |                          |       |
|                  | RETURN                |                          |       |
| Syncpoint        | SYNCPOINT             |                          |       |
|                  | SYNCPOINT<br>ROLLBACK |                          |       |
| Terminal Control | RECEIVE               | INTO (data-area)         |       |
|                  |                       | LENGTH (data-value)      |       |
| Transient Data   | WRITEQ TD             | FROM (data-area)         |       |
|                  |                       | LENGTH (data-value)      |       |
|                  |                       | QUEUE (name)             |       |
| Storage Control  | GETMAIN               | FLENGTH (data-value)     |       |
|                  |                       | INITIMG (data-value)     |       |
|                  |                       | SET (ptr-ref)            |       |
|                  |                       | SHARED                   |       |
|                  | FREEMAIN              | DATA (data-area)         |       |
|                  |                       | DATAPointer (ptr-value)  |       |

## External Interface for Write Operator

The "WRITE OPERATOR" function calls a "stub" named `ExternWriteOperator`.

`ExternWriteOperator` receives all parameters of the `WRITE OPERATOR` and simply returns zero in the return code and nothing else.

It can be replaced by a customer function that respects the interface described below. The `WRITE OPERATOR` passes the following parameters and expects a return code in signed int format.

### Listing 15-1 WRITE OPERATOR Parameters

---

|             |                   |
|-------------|-------------------|
| TEXT        | pic x(1024).      |
| TEXTLENGTH  | PIC S9(9) COMP-5. |
| ROUTECODES  | pic x(1024).      |
| NUMROUTES   | PIC S9(9) COMP-5. |
| ACTION      | PIC X(2).         |
| REPLY       | pic x(1024).      |
| MAXLENGTH   | PIC S9(9) COMP-5. |
| REPLYLENGTH | PIC S9(9) COMP-5. |
| TIMEOUT     | PIC S9(9) COMP-5. |

---

S9(9) COMP-5 is equivalent to a signed int.

The parameters `REPLY` and `REPLYLENGTH` may be returned to the `WRITE OPERATOR` function if requested, that is to say, if `MAXLENGTH > zero`.

### Example COBOL Code for ExternWriteOperator

#### Listing 15-2 Example ExternWriteOperator.cbl Code

---

```
IDENTIFICATION DIVISION.

PROGRAM-ID. "ExternWriteOperator".
```

## CICS Commands and Parameters Coverage

DATA DIVISION.

WORKING-STORAGE SECTION.

copy "ctypes".

01 ret-code                   usage int.

LINKAGE SECTION.

01 LK-TEXT                   pic x(1024).

01 LK-TEXTLENGTH           PIC S9(9) COMP-5.

01 LK-ROUTECD               pic x(1024).

01 LK-NUMROUTES           PIC S9(9) COMP-5.

01 LK-ACTION               PIC X(2).

01 LK-REPLY               pic x(1024).

01 LK-MAXLENGTH           PIC S9(9) COMP-5.

01 LK-REPLYLENGTH         PIC S9(9) COMP-5.

01 LK-TIMEOUT             PIC S9(9) COMP-5.

PROCEDURE DIVISION USING LK-TEXT LK-TEXTLENGTH LK-ROUTECD

                          LK-NUMROUTES LK-ACTION LK-REPLY

                          LK-MAXLENGTH LK-REPLYLENGTH LK-TIMEOUT.

```
*   * display "ExternWriteOperator : LK-TEXT           =<" LK-TEXT ">"
*   * display "ExternWriteOperator : LK-TEXTLENGTH   =<" LK-TEXTLENGTH ">"
*   * display "ExternWriteOperator : LK-ROUTECD       =<" LK-ROUTECD   ">"
*   * display "ExternWriteOperator : LK-NUMROUTES     =<" LK-NUMROUTES ">"
*   * display "ExternWriteOperator : LK-ACTION        =<" LK-ACTION   ">"
*   * display "ExternWriteOperator : LK-REPLY         =<" LK-REPLY   ">"
*   * display "ExternWriteOperator : LK-MAXLENGTH     =<" LK-MAXLENGTH ">"
```

```

*      * display "ExternWriteOperator : LK-REPLYLENGTH =<" LK-REPLYLENGTH ">"
*      * display "ExternWriteOperator : LK-TIMEOUT      =<" LK-TIMEOUT ">"

*      *   in case of REPLY
*          if LK-MAXLENGTH > zero
*      *       move "....." to LK-REPLY
*      *       move 15          to LK-REPLYLENGTH
*          end-if

*          move zero to ret-code

*      *   return code
*      *   0 = OK
*      *   -1 = operation failed (INVREC wil returned to the user program)
*      *   -9 = time out ocurred before the operators's reply was received

```

GOBACK returning ret-code.

## External Interface for Query Security

The "QUERY SECURITY" function calls a "stub" named `ExternQuerySecurity`.

The delivered `ExternQuerySecurity` stub receives all parameters of the `QUERY SECURITY`, it always allows access to the resources and returns zero in the return code. It can be replaced by a customer function that respects the interface described below.

The `QUERY SECURITY` passes the following parameters:

### Listing 15-3 Query Security Extern Inteface

---

```

restype                pic x(7).
restype-data-value     pic x(12).

```

## CICS Commands and Parameters Coverage

|                        |                   |
|------------------------|-------------------|
| resclass               | pic x(8).         |
| resclass-data-value    | pic x(8).         |
| residlength            | pic x(11).        |
| residlength-data-value | pic s9(8) comp-5. |
| resid                  | pic x(5).         |
| resid-data-value       | pic x(246).       |
| logmessage             | pic x(10).        |
| logmessage-cvda        | pic s9(8) comp-5. |
| read                   | pic x(10).        |
| read-cvda              | pic s9(8) comp-5. |
| update                 | pic x(10).        |
| update-cvda            | pic s9(8) comp-5. |
| control                | pic x(10).        |
| control-cvda           | pic s9(8) comp-5. |
| alter                  | pic x(10).        |
| alter-cvda             | pic s9(8) comp-5. |
| resp                   | pic s9(8) comp-5. |
| resp2                  | pic s9(8) comp-5. |
| userid                 | pic x(8).         |

All parameters are passed to ExternQuerySecurity, only the following parameters are expected in return:

|              |                   |
|--------------|-------------------|
| read-cvda    | pic s9(8) comp-5. |
| update-cvda  | pic s9(8) comp-5. |
| control-cvda | pic s9(8) comp-5. |
| alter-cvda   | pic s9(8) comp-5. |
| resp         | pic s9(8) comp-5. |
| resp2        | pic s9(8) comp-5. |

If "read" is fulfilled with "READ", read-cvda is expected.

If "update" is fulfilled with "READ", update-cvda is expected.

If "control" is fulfilled with "READ", control-cvda is expected.

If "alter" is fulfilled with "READ", alter-cvda is expected.

"resp" and "resp2" are always expected.

**Note:**

Each interface field is ended by a binary zero, it easier if you want write the "ExternQuerySecurity" in C.

The cvda values for "read" are:

READABLE            35 .

NOTREADABLE        36 .

The cvda values for "update" are:

UPDATABLE           37 .

NOTUPDATABLE       38 .

The cvda values for "control" are:

CTRLABLE            56 .

NOTCTRLABLE        57 .

The cvda values for "alter" are:

ALTERABLE           52 .

NOTALTERABLE       53 .

For more details, see cvda values in IBM documentation.

S9(9) COMP-5 is equivalent to a signed int.

## Example COBOL Code for ExternQuerySecurity

### Listing 15-4 Example COBOL Code for ExternQuerySecurity

---

```
IDENTIFICATION DIVISION.
    PROGRAM-ID. "ExternQuerySecurity".
    DATA DIVISION.
```

## CICS Commands and Parameters Coverage

WORKING-STORAGE SECTION.

copy "ctypes".

|                    |                   |
|--------------------|-------------------|
| 01 ret-code        | usage int.        |
| 01 cvda-logmessage | pic s9(8) comp-5. |
| 88 LOG             | value 54.         |
| 88 NOLOG           | value 55.         |
| 01 cvda-read       | pic s9(8) comp-5. |
| 88 READABLE        | value 35.         |
| 88 NOTREADABLE     | value 36.         |
| 01 cvda-update     | pic s9(8) comp-5. |
| 88 UPDATABLE       | value 37.         |
| 88 NOTUPDATABLE    | value 38.         |
| 01 cvda-control    | pic s9(8) comp-5. |
| 88 CTRLABLE        | value 56.         |
| 88 NOTCTRLABLE     | value 57.         |
| 01 cvda-alter      | pic s9(8) comp-5. |
| 88 ALTERABLE       | value 52.         |
| 88 NOTALTERABLE    | value 53.         |

LINKAGE SECTION.

|                              |                   |
|------------------------------|-------------------|
| 01 LK-restype                | pic x(7).         |
| 01 LK-restype-data-value     | pic x(12).        |
| 01 LK-resclass               | pic x(8).         |
| 01 LK-resclass-data-value    | pic x(8).         |
| 01 LK-residlength            | pic x(11).        |
| 01 LK-residlength-data-value | pic s9(8) comp-5. |
| 01 LK-resid                  | pic x(5).         |
| 01 LK-resid-data-value       | pic x(246).       |



```

01 LK-logmessage           pic x(10).
01 LK-logmessage-cvda     pic s9(8) comp-5.
01 LK-read                pic x(10).
01 LK-read-cvda           pic s9(8) comp-5.
01 LK-update              pic x(10).
01 LK-update-cvda        pic s9(8) comp-5.
01 LK-control             pic x(10).
01 LK-control-cvda       pic s9(8) comp-5.
01 LK-alter               pic x(10).
01 LK-alter-cvda         pic s9(8) comp-5.
01 LK-resp                pic s9(8) comp-5.
01 LK-resp2               pic s9(8) comp-5.
01 LK-userid              pic x(8).

```

PROCEDURE DIVISION USING LK-restype

```

LK-restype-data-value
LK-resclass
LK-resclass-data-value
LK-residlength
LK-residlength-data-value
LK-resid
LK-resid-data-value
LK-logmessage
LK-logmessage-cvda
LK-read
LK-read-cvda
LK-update
LK-update-cvda

```

## CICS Commands and Parameters Coverage

LK-control  
LK-control-cvda  
LK-alter  
LK-alter-cvda  
LK-resp  
LK-resp2  
LK-userid

.

```
*      *      display "ExternQuerySecurity : LK-restype          =" LK-restype
*      *      display "ExternQuerySecurity : LK-restype-data-value  ="
LK-restype-data-value
*      *      display "ExternQuerySecurity : LK-resclass          ="
LK-resclass
*      *      display "ExternQuerySecurity : LK-resclass-data-value ="
LK-resclass-data-value
*      *      display "ExternQuerySecurity : LK-residlength       ="
LK-residlength
*      *      display "ExternQuerySecurity : LK-residlength-data-value="
LK-residlength-data-value
*      *      display "ExternQuerySecurity : LK-resid            =" LK-resid
*      *      display "ExternQuerySecurity : LK-resid-data-value   ="
LK-resid-data-value
*      *      display "ExternQuerySecurity : LK-logmessage        ="
LK-logmessage
*      *      display "ExternQuerySecurity : LK-logmessage-cvda   ="
LK-logmessage-cvda
*      *      display "ExternQuerySecurity : LK-read              =" LK-read
*      *      display "ExternQuerySecurity : LK-read-cvda         ="
LK-read-cvda
*      *      display "ExternQuerySecurity : LK-update            =" LK-update
```

```

*      *      display "ExternQuerySecurity : LK-update-cvda      ="
LK-update-cvda
*      *      display "ExternQuerySecurity : LK-control      =" LK-control
*      *      display "ExternQuerySecurity : LK-control-cvda      ="
LK-control-cvda
*      *      display "ExternQuerySecurity : LK-alter      =" LK-alter
*      *      display "ExternQuerySecurity : LK-alter-cvda      ="
LK-alter-cvda
*      *      display "ExternQuerySecurity : LK-resp      =" LK-resp
*      *      display "ExternQuerySecurity : LK-resp2      =" LK-resp2

```

```

if address of LK-read not = null
  if LK-read = "READ"
    set READABLE      to true
    move cvda-read    to LK-read-cvda
  end-if
end-if

if address of LK-update not = null
  if LK-update = "UPDATE"
    set UPDATABLE      to true
    move cvda-update   to LK-update-cvda
  end-if
end-if

if address of LK-control not = null
  if LK-control = "CONTROL"
    set CTRLABLE      to true
    move cvda-control  to LK-control-cvda
  end-if
end-if

```

```
        end-if
end-if
if address of LK-alter not = null
    if LK-alter = "ALTER"
        set ALTERABLE          to true
        move cvda-alter        to LK-alter-cvda
    end-if
end-if

move zero to LK- resp LK- resp2

move zero to ret-code
*      *      return code
*      *      0 = OK
*      *      -1 = operation failed (INVREC wil returned to the user program)

GOBACK returning ret-code.
```

---

## Developing the ExternQuerySecurity in C

1. Use this interface:

```
int ExternQuerySecurity(char *restype, char *restype_data_value, char *resclass, char
*resclass_data_value, char *residlength, int *residlength_data_value, char *resid, char
*resid_data_value, char *logmessage, int *logmessage_cvda, char *read, int *read_cvda,
char *update, int *update_cvda, char *control, int *control_cvda, char *alter, int
*alter_cvda, int *resp, int *resp2, char *userid);
```

2. Generate an "ExternQuerySecurity.o", and link it in ART servers (STRN, STR1, ATRN, ATR1, CTRN, CTR1).

3. In the makefile\_intg (Cics\_Rt/tools), add the "ExternQuerySecurity.o" in object variables for each server (STRN\_OBJS, STR1\_OBJS, ATRN\_OBJS, ATR1\_OBJS, CTRN\_OBJS, CTR1\_OBJS)
4. Execute the makefile to rebuild these servers.

## Supported EIB Fields

The following table describes the EIB fields that are supported by Oracle Tuxedo ART for CICS.

**Table 15-3 Supported EIB Fields**

| <b>EIB fields</b> | <b>Notes</b> |
|-------------------|--------------|
| EIBAID            |              |
| EIBATT            | Recognized   |
| EIBCALEN          |              |
| EIBCOMPL          | Recognized   |
| EIBCONF           | Recognized   |
| EIBCPOSN          |              |
| EIBDATE           |              |
| EIBDS             |              |
| EIBEOC            | Recognized   |
| EIBERR            | Recognized   |
| EIBERRCD          | Recognized   |
| EIBFMH            | Recognized   |
| EIBFN             |              |
| EIBFREE           | Recognized   |
| EIBNODAT          | Recognized   |
| EIBRCODE          |              |

**Table 15-3 Supported EIB Fields**

| <b>EIB fields</b> | <b>Notes</b> |
|-------------------|--------------|
| EIBRECV           |              |
| EIBREQID          |              |
| EIBRESP           |              |
| EIBRESP2          |              |
| EIBRLDBK          | Recognized   |
| EIBRSRCE          |              |
| EIBSIG            | Recognized   |
| EIBSYNC           | Recognized   |
| EIBSYNRB          | Recognized   |
| EIBTASKN          |              |
| EIBTIME           |              |
| EIBTRMID          |              |
| EIBTRNID          |              |

## Supported BMS Macros

The following describes the BMS Macros that are supported by Oracle Tuxedo ART for CICS.

- [Mapset DFHMSD](#)
- [Map DFHMDI](#)
- [Field DFHMDF](#)

### Mapset DFHMSD

**TYPE=(Choose only one from list)**

SYSPARM (recognized)  
DSECT (recognized)  
MAP (recognized)

FINAL

**Note:** recognized means function is not achieved, but there are no errors when doing MAPGEN compilation.

**MODE=(Choose only one from list)**

OUT  
IN  
INOUT

**LANG=(Choose only one from list)**

COBOL  
PLI  
C

**STORAGE=AUTO**

**BASE=NAME**

**CTRL=(Choose any combination from the list, separate with a comma)**

FREKKB  
ALARM  
FRSET

**EXTATT=(Choose only one from list)**

NO  
MAPONLY  
YES

**COLOR=(Choose only one from list)**

DEFAULT  
Color

**HILIGH=(Choose only one from list)**

OFF  
BLINK  
REVERSE  
UNDERLINE

**PS=(Choose only one from list)**

Psid

**TERM=3270-2**

**SUFFIX=(One alphanumeric character or blank)**

**MAPATTS=(Choose any combination from list, separate with a comma)**

COLOR

HIGHLIGHT  
OUTLINE  
PS  
SOSI

**DSATTS=(Choose any combination from list, separate with a comma)**

COLOR  
HIGHLIGHT  
OUTLINE  
PS  
SOSI

**OUTLINE=(Choose only one from list)**

BOX  
LEFT  
LEFT, RIGHT  
LEFT, OVER  
LEFT, UNDER  
LEFT, RIGHT, OVER  
LEFT, RIGHT, UNDER  
LEFT, RIGHT, OVER, UNDER  
RIGHT  
RIGHT, OVER  
RIGHT, UNDER  
RIGHT, OVER, UNDER  
OVER  
OVER, UNDER  
UNDER

**SOSI=(Choose only one from list)**

YES  
NO

## Map DFHMDI

**SIZE=(line,column)**

**CTRL=(Choose any combination from the list, separate with a comma)**

FREEKB  
ALARM  
FRSET

**EXTATT=(Choose only one from list)**

NO  
MAPONLY  
YES



**COLOR=(Choose only one from list)**

DEFAULT  
Color

**HIGHLIGHT=(Choose only one from list)**

OFF  
BLINK  
REVERSE  
UNDERLINE

**PS=(Choose only one from list)**

psid

**MAPATTS=(Choose any combination from list, separate with a comma)**

COLOR  
HIGHLIGHT  
OUTLINE  
PS  
SOSI

**DSATTS=(Choose any combination from list, separate with a comma)**

COLOR  
HIGHLIGHT  
OUTLINE  
PS  
SOSI

**OUTLINE=(Choose only one from list)**

BOX  
LEFT  
LEFT, RIGHT  
LEFT, OVER  
LEFT, UNDER  
LEFT, RIGHT, OVER  
LEFT, RIGHT, UNDER  
LEFT, RIGHT, OVER, UNDER  
RIGHT  
RIGHT, OVER  
RIGHT, UNDER  
RIGHT, OVER, UNDER  
OVER  
OVER, UNDER  
UNDER

**SOSI=(Choose only one from list)**

YES

NO

**COLUMN=(Choose only one from list)**

SAME

Number

NEXT

**LINE=(Choose only one from list)**

SAME

Number

NEXT

**JUSTIFY=(Choose only one from list)**

LEFT

LEFT, FIRST

LEFT, LAST

RIGHT

RIGHT, FIRST

RIGHT, LAST

BOTTOM

**HEADER=YES**

**TRAILER=YES**

## Field DFHMDF

**CASE=MIXED**

**POS=(Choose only one from list)**

Number

Line, Column

**LENGTH=number**

**JUSTIFY=(Choose only one from list)**

LEFT

LEFT, BLANK

LEFT, ZERO

RIGHT

RIGHT, BLANK

RIGHT, ZERO

**INITIAL='char-data'**

**XINIT='hex-data'**

**GINIT='DBCS-characters'**

**ATTRB=(parameter group A, parameter B, parameter group C)**

Choose exactly one from parameter group A:

ASKIP  
 PROT  
 UNPROT  
 UNPROT , NUM

Choose zero or one from parameter group B:

BRT  
 NORM  
 DRK

Choose any combination (0 to all) from parameter group C; this group is allowed only if parameter from group B is also used:

IC  
 FSET

**COLOR=(Choose only one from list)**

DEFAULT  
 Color

**PS=(Choose only one from list)**

Psid

**HIGHLIGHT=(Choose only one from list)**

OFF  
 BLINK  
 REVERSE  
 UNDERLINE

**GRPNAME=group-name**

**OCCURS=number**

**PICIN='value'**

**PICOUT='value'**

**OUTLINE=(Choose only one from list)**

BOX  
 LEFT

## CICS Commands and Parameters Coverage

LEFT, RIGHT  
LEFT, OVER  
LEFT, UNDER  
LEFT, RIGHT, OVER  
LEFT, RIGHT, UNDER  
LEFT, RIGHT, OVER, UNDER  
RIGHT  
RIGHT, OVER  
RIGHT, UNDER  
RIGHT, OVER, UNDER  
OVER  
OVER, UNDER  
UNDER

**SOSI=(Choose only one from list)**

YES  
NO

## Supported ECI C API Parameters

The following table describes the ECI C API parameters that are supported by Oracle Tuxedo ART for CICS.

**Notes:** Only ECI v1 API CICS\_ExternalCall (ECI\_Parms) is supported.

**Table 15-4 ECI C API Parameters**

| Call Type | Parameter           | Notes   |
|-----------|---------------------|---|
| ECI_SYNC  | eci_call_type       |   |
| /         |                     |   |
| ECI_ASYNC | eci_program_name    | eci_program_name is the program name defined in programs.desc in ART CICS.                |
|           | eci_userid          | If security is not enabled on ART CICS side, eci_userid is not checked on ECI Emulator.   |
|           | eci_password        | If security is not enabled on ART CICS side, eci_password is not checked on ECI Emulator. |
|           | eci_extend_mode     |   |
|           | eci_luw_token       |   |
|           | eci_version         |   |
|           | eci_commarea        |   |
|           | eci_commarea_length |   |
|           | eci_system_name     | It cannot be NULL since no default system name is allowed.                                |
|           | eci_userid2         |   |
|           | eci_password2       |   |
|           | eci_timeout         |   |
| ECI_GET_R | eci_call_type       |   |
| EPLY      |                     |   |
|           | eci_commarea        |   |
|           | eci_commarea_length |   |
|           | eci_version         |   |

## Supported CPIC API Parameters

The following table describes the CPIC APIs parameters that are supported by Oracle Tuxedo ART for CICS.

**Table 15-5 CPIC Client C APIs to Support**

| CPI-C API         | CPI-C Client          |              | CPI-C Server | Note  |
|-------------------|-----------------------|--------------|--------------|---|
|                   | Windows Server 32-bit | Linux 64-bit |              |   |
| cmalloc           | Yes                   | Yes          |              |   |
| cmcanc            | Yes                   | Yes          |              |   |
| cmcfmd            | Yes                   | Yes          |              |   |
| cmdeal            | Yes                   | Yes          | Yes          |   |
| cmect             | Yes                   | Yes          |              |   |
| cmemn             | Yes                   | Yes          |              |   |
| cmepln            | Yes                   | Yes          |              |   |
| cmesl             | Yes                   | Yes          |              |   |
| cmunit            | Yes                   | Yes          |              | ART CICS CPI-C client use symbolic destination name set by cmunit to specify remote CICS system ID. |
| cmrcv             | Yes                   | Yes          | Yes          |   |
| cmscsp/x<br>cscsp | Yes                   | Yes          |              |   |
| cmscst/x<br>cscst | Yes                   | Yes          |              | Only two types CM_SECURITY_PROGRAM and CM_SECURITY_NONE are supported.                              |
| cmscsu/x<br>cscsu | Yes                   | Yes          |              |   |

Table 15-5 CPIC Client C APIs to Support

| CPI-C API         | CPI-C Client          |              | CPI-C Server                             | Note  |
|-------------------|-----------------------|--------------|--|---|
|                   | Windows Server 32-bit | Linux 64-bit | ART CICS Server 64-bit Linux/Solaris/AIX |   |
| cmsdt             | Yes                   | Yes          | Yes                                      |   |
| cmsend            | Yes                   | Yes          | Yes                                      |   |
| cmsmn             | Yes                   | Yes          |  |   |
| cmspln            | Yes                   | Yes          |  | cmspln is a dummy function implemented in ART CICS CPI-C support. To specify remote CICS, please use cminit to set symbolic destination name. |
| cmspm             | Yes                   | Yes          |  |   |
| cmssl             | Yes                   | Yes          |  |   |
| cmstp             | Yes                   | Yes          |  |   |
| cmwait            | Yes                   | Yes          |  |   |
| cmaccp            |                       |              | Yes                                      |   |
| cmflus            | Yes                   | Yes          | Yes                                      |   |
| cmserr            | Yes                   | Yes          | Yes                                      |   |
| WinCPI-C SetEvent | Yes                   |              |  |   |

**Table 15-6 CPIC Client JAVA APIs to Support**

| <b>CPI-C API</b>     | <b>CPI-C Client</b> | <b>CPI-C Server</b>                                     | <b>Note</b>  |
|----------------------|---------------------|---|--|
|                      |                     | <b>ART CICS<br/>Server 64-bit<br/>Linux/Solaris/AIX</b> |  |
| <code>cminit</code>  | Yes                 |   | ART CICS CPI-C client use symbolic destination name set by <code>cminit</code> to specify remote CICS system ID. |
| <code>cmstpn</code>  | Yes                 |   |  |
| <code>cmalloc</code> | Yes                 |   |  |
| <code>cmsst</code>   | Yes                 |   |  |
| <code>cmsend</code>  | Yes                 | Yes   |  |
| <code>cmflus</code>  | Yes                 | Yes   |  |
| <code>cmrcv</code>   | Yes                 | Yes   |  |
| <code>cmdeal</code>  | Yes                 | Yes   |  |
| <code>cmsdt</code>   |                     | Yes   |  |
| <code>cmaccp</code>  |                     | Yes   |  |
| <code>cmserr</code>  |                     | Yes   |  |



# CICS Runtime Messages

## Messages

CICS Runtime Messages provide the following information:

- Description: The meaning and context of the message.
- Action: What steps you can take to correct any problems identified.
- See Also: A pointer to related information (not specified for all messages).

## Preprocessor Messages

### Error Messages

#### Invalid CICS Messages

Error messages are printed whenever an invalid CICS instruction is found use the following format:

- Error summary.
- Text of the CICS statement (without margins).
- More detailed explanations, if necessary.

Summaries may contain "Instruction invalid" (in the case of IGNORE and HANDLE instructions), "No rules matching the following instruction", "Several rules matching the following instruction".

IGNORE and HANDLE instructions messages are quite straightforward:

"IGNORE should be constructed with `CONDITION`"

When no rules match a CICS instruction, the error message lists, for all commands starting by the same keyword, why this command does not fit.

- `<command>` expects one of `<keyword list>`, but none is present.

- `<command>` expects `<keyword>`, but could not find it.
- `<command>` does not know about `<keyword>`.
- In `<command>`, `<keyword>` expects either: ... `<keyword>` (one of `<keyword list>`), ... but none of them were found.
- In `<command>`, `<keyword>` is present and not `<keyword>` even if they must be used at the same time.
- In `<command>`, `<keyword>` and `<keyword>` cannot be used at the same time.
- Default value of `<keyword>` is supposed to be computed with value of `<keyword>`, but its value (`<value>`) is not a charstring.

If several commands match, the preprocessor lists them all. This will not actually happen, as the preprocessor checks the commands for ambiguity before translation.

### Other Error Messages

The following error messages occur naturally if the preprocessor is used with the wrong options:

- Cannot open file `<file name>` means that the CICS instruction file is not present or not readable.
- Cannot open `$dir/KIX--***.cpy` means that the preprocessor was asked to generate copies in a wrong place (nonexistent or read-only directory...).

### Maintenance Messages

These messages are encountered if your CICS instruction file is corrupted.

- `<keyword>` defined as `<Pic clause 1>` and `<Pic clause 2>` in same group.
- `<keyword>` defined twice in same rule.
- A part of a `()` construct has no required keyword.
- Instruction `<instruction name>` uses `<nb1>` keyword(s) but describes `<nb2>` keyword(s).
- Keyword `<keyword>` in instruction `<instruction name>` is not described.
- Instructions `<instruction name 1>` and `<instruction name 2>` share all their required keywords.
- Line not recognized.

## ARTDPL Messages

### Abend messages

When abend occurs, following message is logged:

```
Abend <abend code> detected in transaction <transaction name> program  
<program name>
```

The abend code is assigned to `URCODE`. The first character of abend code is assigned to highest byte of `URCODE`, the second character is assigned to the second high byte, the third character is assigned to the third byte, and the last character of abend code is assigned to least byte of `URCODE`. The abend code is also filled in the field `CX_ABENDCODE` of FML buffer.

## CICS Runtime Messages

# CICS Runtime Preprocessor

This chapter contains the following sections:

- [Overview](#)
- [prepro-cics.pl](#)
- [prepro-cics-C.pl](#)

## Overview

The CICS Runtime Preprocessor prepares COBOL and C programs to execute under Oracle Tuxedo Application Runtime for CICS.

## prepro-cics.pl

### Pre-Requisites

The programs handled by the CICS preprocessor must respect the following conditions, or else run the risk of producing errors at compile- or -run-time.

**Note:** These conditions are ensured by the COBOL translator for programs migrated from the original source platform, but you have to enforce them yourself for maintained or newly-developed programs.

1. CICS Runtime must be installed. Some technical copy files used by `prepro-cics.pl` are delivered under `cpylib` CICS Runtime module.
2. The environment variable `COBCPY`, which indicates to the Micro Focus COBOL Compiler-or COBOL-IT compiler where copybooks are stored, must be correctly set to include CICS Runtime copy files (`cpylib`) during compilation time.
3. The following copy files must be inserted in the Working-Storage Section or the Local-Storage Section:
  - `KIX--INDICS` and `KIX--ALL-ARGS`, always;

- KIX--CONDITIONS, always;
  - KIX--DFHRESP, always;
  - KIX--DFHVALUE, if the DFHVALUE pseudo-function is used in the program or one of the copy files it includes;
4. The following copy files must be inserted in the Linkage Section:
    - DFHEIBLK
  5. The program must take exactly two parameters, DFHEIBLK (defined by the copy file of the same name) and DFHCOMMAREA, defined as suitable for the application PROCEDURE DIVISION. In other words, the program must look like this:

```
LINKAGE SECTION.  
    COPY  DFHEIBLK.  
    01  DFHCOMMAREA.  
    . . . .  
PROCEDURE DIVISION USING DFHEIBLK DFHCOMMAREA.
```

The case of programs compiled with the NOLINKAGE option of the IBM CICS preprocessor is not (yet) supported by ART and the CICS Runtime preprocessor.

## Name

`prepro-cics.pl` — A function that reads a COBOL program file from standard input, and outputs it with CICS instructions translated on standard output.

## Synopsis

```
prepro-cics.pl [-type_output <output type>] [-notrec <notrec behavior>]  
[-B]
```

## Description

`prepro-cics.pl` takes a COBOL program as input, reads it line by line, and output a file with CICS instructions translated.

`prepro-cics.pl` performs only one pass and processes lines one by one. That is, it reads a line from the standard input, outputs one or several lines (it may output none depending on the output type), and then reads the next input line. This behavior enables it to be compatible for use as a

preprocessor inside a compiler, but prohibits using the same file as input and output. Note that it will output lines at the end of the input file.

The preprocessor expects the input COBOL program to have a 6-column left-margin. The output is in fixed format, or an error message should appear.

## Options

### B

B indicates that the source is an EXCI program.

### MQ\_wrapper

`MQ_wrapper` helps you migrate WebSphere MQ programs from mainframe to ART for CICS smoothly. On mainframe, programs explicitly do `MQOPEN` and `MQCLOSE` while mainframe implicitly does `MQCONN` and `MQDISC`. ART for CICS supports this way by enabling `MQ_wrapper`. ART for CICS can translate WebSphere MQ four APIs (`MQCONN`/`MQOPEN`/`MQCLOSE`/`MQDISC`) to its internal MQ API wrappers. Enabling `MQ_wrapper` allows you to

- Migrate MQ programs from mainframe to run unchanged (except for a syntactic adaptation)
- Implicitly call `MQCLOSE` and `MQDISC` when an application transaction ABEND due to ERROR condition

You should use `-m queue_manager_name` to specify the WebSphere MQ queue manager to be used by ART for CICS implicit MQ operation. For more information, see [WebSphere MQ Queue Manager Name](#).

If you do not specify `MQ_wrapper`, programs need to explicitly do all of the four APIs (`MQCONN`/`MQOPEN`/`MQCLOSE`/`MQDISC`) to operate MQ.

For more information, see [Implementing Integration with WebSphere MQ](#).

### notrec

`notrec` specifies the way instructions that are not fully supported are processed. (Some options of the instruction are not recognized, hence the "notrec"). There are two possibilities:

- Stop – (default) means that if the instruction contains non-supported options, then the whole instruction is considered as not supported and translation will fail.
- Warn – means that the instruction is processed normally, but the generated call sets up a flag to signal some options may not be supported.

In both cases, a message is displayed on the error output.

**tsam**

`tsam` determines whether the feature "TSAM call path for CICS and DB" is supported; recognized values are:

1 (default)

Supports `tsam`.

0

Does not support `tsam`.

**type\_output**

`type_output` determines the way that output is printed; recognized values are:

`debug`

Prints every line with its status (untouched, modified, deleted, created). Always outputs at least one line for every line read.

`orig`

Prints every line, deleted lines are printed as comments. Always outputs at least one line for every line read.

`normal` (default)

Prints every line, except deleted ones. Does not always output at least one line for every line read.

Any other value will be considered as "normal".

## Restrictions

- The preprocessor expects the input COBOL program to be in fixed format.
- The preprocessor ignores copies. Any CICS inside a copy will not be translated.
- The two words `EXEC` and `CICS` must be on the same line for a CICS instruction to be recognized.

In order to support the feature "TSAM call path for CICS and DB", the preprocessor is asked to be executed ahead of "`procob`" (for Oracle DB) or "`db2 prep`" (for IBM UDB) commands when compiling CICS programs containing "`EXEC SQL`" statements.



## Error Messages

### Invalid CICS Messages

Error messages printed whenever an Invalid CICS instruction is found use the following format:

- Error summary
- Text of the CICS statement (without margins)
- More detailed explanations, if necessary

Summaries may be:

- `Instruction invalid (IGNORE and HANDLE instructions),`
- `No rules matching the following instruction,`
- `Several rules matching the following instruction.`

IGNORE and HANDLE instructions messages are quite straightforward:

IGNORE should be constructed with CONDITION.

When no rules match a CICS instruction, the error message explains, for all commands starting by the same keyword, why this command does not fit.

- `<command> expects one of <keyword list>, but none is present.`
- `<command> expects <keyword>, but couldn't find it.`
- `<command> does not know about <keyword>.`
- `In <command>, <keyword> expects either: ... <keyword> (one of <keyword list>), ... but none of them was found.`
- `In <command>, <keyword> is present and not <keyword> even if they must be used at the same time.`
- `In <command>, <keyword> and <keyword> cannot be used at the same time.`
- `Default value of <keyword> is supposed to be computed with value of <keyword>, but its value (<value>) is not a charstring.`

If several commands match, the preprocessor lists them all. This will not actually happen, as the preprocessor checks the commands for ambiguity before translation.

## Non Supported Error Messages

If a CICS instruction is unknown, or registered as "non supported", or "obsolete", an error message:

```
Instruction non supported
```

is generated.

The same error message is printed if there are some non-recognized keywords in an instruction, when the option `notrec` is set with value `stop`.

# prepro-cics-C.pl

## Pre-Requisites

The programs handled by the CICS preprocessor must respect the following conditions, or else run the risk of producing errors at compile or Runtime.

1. CICS Runtime must be installed. Some technical header files used by `prepro-cics-C.pl` are delivered under `include` directory in CICS Runtime module.
2. `prepro-cics-C.pl` does not support "TSAM call path for CICS and DB" functions.
3. If the program contains "EXEC SQL" statements, the preprocessor is asked to be executed ahead of db pre-compiler commands (db2 prep for IBM UDB or pro\*C for Oracle DB).

## Name

`prepro-cics-C.pl` — A function that reads a C program file specified by `source_file`, and outputs the C program file with CICS instructions translated on `output file`.

## Synopsis

```
prepro-cics-C.pl [-help] [-source_format <fixed>] [-o <output file name>]
[-B] [-enable_pragma] source_file
```

## Description

`prepro-cics-C.pl` takes a C program as input, reads it line by line, and outputs a file with CICS instructions translated.

`prepro-cics-C.pl` performs only one pass and processes lines one by one. That is, it reads a line from `source_file`, outputs one or several lines, and then reads the next input line. This behavior enables it to be compatible for use as a preprocessor inside a compiler, but prohibits using the same file as input and output.

## Options

### **-help**

`help` shows the usage of `prepro-cics-C.pl`.

### **-source\_format**

`source_format` specifies the source format of C program. There are two possibilities:

- `fixed` - (default) means that each line of a C program should be in fixed format.
- `free` - specifies free style of C program.

**Note:** Only `fixed` format is supported currently.

### **-o**

o specifies output file name and path.

### **-B**

B specifies that the source is an EXCI program.

### **-enable\_pragma**

`enable_pragma` specifies to enable pragma.

### **source\_file**

`source_file` specifies input file name and path.

## Restrictions

- `/**/` is used for single line comments. Do not put a comment in the middle of an `EXEC CICS` command.
- Keep `EXEC CICS` as a whole in one line.
- Keep multiple `CICS` commands in one line is not support.
- `#pragma` will be automatically translated to comments.

- The preprocessor expects the inputted C program to be in fixed format.
- Keep C `main()` function, its parameter list, and parenthesis in one line. For example,  

```
void main(int argc, char **argv)
```

## Error Messages

`prepro-cics-C.pl` may print the following error messages:

- Cannot open `source_file`
- Errors occurred while CICS C code is translated
- PROGRAM should be constructed with EXCI LINK
- LENGTH should be constructed with COMMAREA in EXCI LINK
- DATALENGTH should be constructed with COMMAREA in EXCI LINK
- RETCODE should be constructed with EXCI LINK
- No rules match the following instructions:
  - Instruction `rulename` non supported
  - Instruction `rulename` is obsolete

# CICS Runtime Statistics

COBOL-IT provides you a profiling utility to analyze where your COBOL programs are spending time. This utility provides output (in Excel format) about the number of times a paragraph is to be executed, CPU time spent in each paragraph, and the elapsed time spent in each paragraph. ART for CICS integrates this profiling utility into CICS runtime.

## Prerequisite

- The COBOL runtime must be COBOL-IT.
- Set environment variable `KIX_PROFILING` to `YES`. For more information, see [KIX\\_PROFILING](#).
- Compile CICS program with compiler flag `-fprofiling` when using COBOL compiler.

## Statistics Data

When each CICS program exits, CICS runtime generates a file named `[module]_[PID]_profile.xls`. `[module]` is the CICS program name; `[PID]` is the process ID of the CICS runtime server in which the program is executed. This file is a tab-separated text file; you can directly open this file with a spreadsheet like Microsoft Excel.

If there are some subprogram calls, `XCTL`, or `LINK` commands inside CICS program, CICS runtime can also generate the statistics file for each subprogram or `LINKED` program.

All statistics files are generated in `$APPDIR`.

## Disabling Profiling Function

There is a possibility of performance reduction for CICS runtime when profiling function is used; therefore, it is highly recommended to disable this profiling function in the productive environment after finishing the statistics analysis.

Do the followings to disable this profiling function.

- Unset the environment variable `KIX_PROFILING`.

## CICS Runtime Statistics

- Re-compile the CICS program without setting `-profiling` flag.

# Configuring Oracle Tuxedo XA Connection to DB2 Using DB2 Connect

This chapter contains the following topics:

- [Prerequisite](#)
- [DB2 Connect Configuration](#)
- [Oracle Tuxedo Configuration](#)
- [Summary](#)
- [Trouble Shooting](#)

## Prerequisite

Before you start to configure Tuxedo XA connection to DB2 running on mainframe using DB2 Connect, you need to:

- Install DB2 Connect for Universal System on the machine running Tuxedo.
- Configure TCP/IP communication on both mainframe and the machine running Tuxedo.

## DB2 Connect Configuration

This section describes the steps required to configure DB2 Connect on open system to connect to DB2 server running on mainframe. These steps must be performed by users who have the necessary system privileges and special expertise, such as your network or system administrator, or your DB2 administrator.

## DB2 Instance Creation

This chapter describes how to use `db2icrt` to create DB2 instance which will be used to connect to database residing on mainframe. The `db2icrt` command creates DB2 instances in the instance owner's home directory.

**Note:** The `DB2 DB2ICRT` command is not available for a non-root installation of DB2 database products on Linux and UNIX operating system.

On Linux or UNIX operating systems, this utility is located in the `DB2DIR/instance` directory, where `DB2DIR` represents the location where the DB2 Connect is installed. On Windows operating system, this utility is located under the `DB2PATH\bin` directory where `DB2PATH` is the location where the DB2 Connect is installed.

- Command Syntax:

```
db2icrt -[ h, d, p, a, s, u ] Instname
```

Example:

```
$DB2DIR/instance/db2icrt -u db2art db2art
```

The `db2icrt` command takes the following parameters:

`-h | -?`

Displays the usage information.

`-d`

Turns debug mode on. Use this option only when instructed by DB2 database support.

`-a AuthType`

Specifies the authentication type (`SERVER`, `CLIENT` or `SERVER_ENCRYPT`) for the instance. The default is `SERVER`.

`-p PortName`

Specifies the port name or number used by the instance. This option does not apply to client instances.

`-s InstType`

Specifies the type of instance to create. Use the `-s` option only when you are creating an instance other than the default associated with the installed product from which you are running `db2icrt`. Valid values are: `Client`, `standalone`, `ese` or `wse`.

`-u Fenced ID`

Specifies the name of the user ID under which fenced user-defined functions and fenced stored procedures will run. The `-u` option is required if you are not creating a client instance.



InstName

Specifies the name of the instance which is also the name of an existing user in the operating system. This has to be the last argument of the db2icrt command.

## DB2 Instance Configuration

This section describes how to use CATALOG command to setup the connection to DB2 server residing on mainframe. You can also use DB2 Client Configuration Assistant (CCA), a graphic user interface tool instead, but it is not covered in this section

### DB2 CATALOG

DB2 maintains a set of tables that contain information about the data that DB2 controls. These tables are collectively known as the catalog.

The catalog tables contain information about DB2 objects such as tables, views, and indexes. When you create, alter, or drop an object, DB2 inserts, updates, or deletes rows of the catalog that describe the object.

The DB2 catalog consists of tables of data about everything defined to the DB2 system, including table spaces, indexes, tables, copies of table spaces and indexes, and storage groups. The system database DSNDB06 contains the DB2 catalog.

Before starting this step, you need to check:

- Whether the DB2 server on mainframe is started, and TCP/IP communication is up or not.
- Assign an unused TCP port for the DB2 instance listener and add it into your local configuration "/etc/services" like this:

```
db2c_db2art 60000/tcp
```

Next, use CATALOG TCP/IP NODE, CATALOG DCS DATABASE and CATALOG DATABASE step by step to finish the connection setup.

### CATALOG TCP/IP NODE

The CATALOG TCP/IP NODE command syntax is as follows:

```
catalog [ ADMIN ] [ TCP/IP protocol ] node [ Node-name ] remote [
Hostname ] server [ Service-name ] with [ comment-string ]
```

Example:

```
db2 catalog tcpip node wasa-host remote wasa server 4001 with "catalog
remote host wasa:4001 to local alias wasa-host"
```

## Configuring Oracle Tuxedo XA Connection to DB2 Using DB2 Connect

CATALOG TCP/IP NODE takes the following parameters:

### ADMIN

Specifies that a TCP/IP administration server node is to be cataloged. This parameter cannot be specified if the SECURITY SOCKS parameter is specified.

### TCP/IP Protocol

Specifies TCP/IP protocol used, could be: TCPIP, TCPIP4, TCPIP6

### Node-name

The nodename of the TCPIP, TCPIP4, or TCPIP6 node represents a local nickname you can set for the machine that contains the database you want to catalog. Only specify TCPIP4 when specifying an IPv4 IP address, and only specify TCPIP6 when specifying an IPv6 IP address.

### Hostname

The hostname or the IP address of the node where the target database resides. IP address can be an IPv4 or IPv6 address. The hostname is the name of the node that is known to the TCP/IP network. The maximum length of the hostname is 255 characters.

### Service-name

Specifies the service name or the port number of the server database manager instance. The maximum length is 14 characters. This parameter is case sensitive.

If a service name is specified, the services file on the client is used to map the service name to a port number. A service name is specified in the server's database manager configuration file, and the services file on the server is used to map this service name to a port number. The port number on the client and the server must match.

A port number, instead of a service name, can be specified in the database manager configuration file on the server, but this is not recommended. If a port number is specified, no service name needs to be specified in the local services file.

## CATALOG DCS DATABASE

This command stores information about remote host (z/OS or OS/390) or iSeries (OS/400) databases in the Database Connection Services (DCS) directory. These databases are accessed through an Application Requester (AR), such as DB2 Connect. Having a DCS directory entry with a database name matching a database name in the system database directory invokes the specified AR to forward SQL requests to the remote server where the database resides.

**Note:** If you just need access the data residing on universal system, such as UNIX, Linux, you could use CATALOG DATABASE only.

The CATALOG DCS DATABASE command syntax is as follows:

```
catalog dcs database [ Database-name ] as [ Target-database-name ] with
[comment-string ]
```

**Example:**

```
db2 catalog dcs database db2wasa as qwa1 with "catalog the remote host
database qwa1 to local db2wasa"
```

CATALOG DCS DATABASE takes the following parameters:

**Database-name**

Specifies the alias of the target database to catalog. This name should match the name of an entry in the database directory that is associated with the remote node.

**Target-database-name**

Specifies the name of the target host or iSeries database to catalog.

**DB2 CATALOG DATABASE**

This command stores database location information in the system database directory. The database can be located either on the local workstation or on a remote database partition server.

**Note:** If you need access the data residing on local or remote universal system, such as UNIX, Linux, you could use it.

The DB2 CATALOG DATABASE command syntax is as follows:

```
catalog database [ Database-name ] as [ Alias ] at node [ Node-name ]
authentication [ Authentication-type ] with [ comment-string ]
```

**Example:**

```
db2 catalog database db2wasa at node wasa-host authentication dcs with
"catalog the local db2wasa with dcs authentication type"
```

DB2 CATALOG DATABASE takes the following parameters:

Database-name

Specifies the name of the database to catalog.

Alias

Specifies an alias as an alternate name for the database being cataloged. If an alias is not specified, the database manager uses database-name as the alias.

Node-name

Specifies the name of the database partition server where the database being cataloged resides. This name should match the name of an entry in the node directory. If the node name specified does not exist in the node directory, a warning is returned, but the database

is cataloged in the system database directory. The node name should be cataloged in the node directory if a connection to the cataloged database is desired.

### Authentication-type

The authentication value is stored for remote databases (it appears in the output from the `LIST DATABASE DIRECTORY` command) but it is not stored for local databases

## DB2 START UP

After all the steps of CATALOG, you need to update some database manager configuration and start DB2 Connect.

- Update the SVCENAME of your DB2 instance to the listener added into "/etc/services" before.

```
db2 update dbm cfg using SVCENAME db2c_db2art
```

Example of "/etc/services":

```
db2c_db2art      4001/tcp                # wasa DB2 connection
```

- Set the communication protocol to TCP/IP.

```
db2set DB2COMM=tcPIP
```

- Configure the auto start and start DB2.

```
db2set DB2AUTOSTART=yes
db2start
```

## Oracle Tuxedo Configuration

What follows is the description of the process to configure Oracle Tuxedo for accessing the database residing on mainframe with DB2 Connect. There are some differences based on whether Tuxedo is working with a 64-bit instance of DB2 Database or a 32-bit instance of DB2.

- Set the `DB2INSTANCE` environment variable to reference the instance that contains the databases that you want Tuxedo to use. Set the `PATH` variable to include the DB2 Connect directories. Confirm the User ID and Password that can connect to the DB2 databases, you could find some example below:

```
export DB2INSTANCE=db2art
export DB2DIR=/opt/ibm/db2_connect/V9.1
```

- Update some database manager configuration parameters accordingly.

- Update the `tp_mon_name` database manager configuration parameter with the value `TUXEDO`. This parameter identifies the name of the transaction processing (TP) monitor product being used.

Valid value includes `CICS`, `MQ`, `CB`, `SF`, `TUXDEO`, `TOPEND`, `WAS`, blank or some other value.

```
db2 update dbm cfg using tp_mon_name TUXEDO
```

- Update the `spm_name` database manager configuration parameter with the hostname of the machine has DB2 Connect installed. This parameter identifies the name of the sync point manager (SPM) instance to the database manager.

Valid value applies to:

- Database server with local and remote clients
- Database server with local clients
- Partitioned database server with local and remote clients

```
db2 update dbm cfg using spm_name bjaix ("bjaix" is the hostname of
the machine which installs and configures DB2 Connect)
```

**Note:** "bjaix" is an alias name. It has a maximum length of eight characters. If your hostname is more than eight characters, define a short name for it in `/etc/hosts`. For example, `10.182.73.205 bej301359.cn.oracle.com bj59`. In this example, `bj59` is an alias of hostname.

- Update the `max_connections` to be greater than `max_coordagents` to activate the XA Concentrator. DB2 Connect's connection concentrator technology allows DB2 Connect Enterprise Edition servers to provide support to thousands of users simultaneously executing business transactions, while drastically reducing resources required on the S/390 host or AS/400 database servers.

**Note:** If the application is accessing data residing on DB2 for z/OS and OS/390(R), DB2 for iSeries, or DB2 for VM&VSE, the DB2 Connect XA concentrator should be required.

You can activate the concentrator feature by setting the value of `MAX_CONNECTIONS` to any number greater than the default. The default value for `MAX_CONNECTIONS` is equivalent to the value of `MAX_COORDAGENTS`. Because each application will have one logical agent, `MAX_CONNECTIONS` actually controls the number of applications that can be connected to the database instance, while `MAX_COORDAGENTS` controls the number of inbound connections that can be active at any time. `MAX_CONNECTIONS` will take a numeric range from `MAX_COORDAGENTS` up to 64,000. The default number of logical agents is equal to `MAX_COORDAGENTS`.

## Configuring Oracle Tuxedo XA Connection to DB2 Using DB2 Connect

```
db2 update dbm cfg using max_connections 500 AUTOMATIC
db2 update dbm cfg using max_coordagents 200 AUTOMATIC
```

- Add a definition for DB2 Connect to the Tuxedo resource manager definition file (`$(TUXDIR)/uataobj/RM`). In the Example(s) that follow, `UDB_XA` is the locally-defined Tuxedo resource manager name for DB2 Connect, and `db2xa_switch_std` is the DB2-defined name for a structure of type `xa_switch_t`.

```
# DB2 UDB
UDB_XA:db2xa_switch_std:-L${DB2DIR}/lib -ldb2
```

- Build the Tuxedo transaction monitor server (TMS) for DB2:

```
$(TUXDIR)/bin/buildtms -r UDB_XA -o $(TUXDIR)/bin/TMS_UDB
```

- Write your own application servers which accesses the DB2 database residing on mainframe, and you can follow the Example(s) below. The `-r` option specifies the resource manager name, the `-f` option specifies the files that contain the application business logic, the `-s` option specifies the application service names for this server, and the `-o` option specifies the output server file name.

```
$(TUXDIR)/bin/buildserver -r UDB_XA -f svcfile.o -s SVC1,SVC2 -o
UDBserver
```

- Set up the Tuxedo configuration file to reference the DB2 server. In the `*GROUPS` section of the `UBBCONFIG` file, add an entry similar to:

```
UDB_GRP    LMID=simp GRPNO=3
TMSNAME=TMS_UDB TMSCOUNT=2
OPENINFO="UDB_XA:db=sample,uid=username,pwd=password,tpm=tuxedo"
```

Where the `TMSNAME` parameter specifies the transaction monitor server that you built previously, and the `OPENINFO` parameter specifies the resource manager name. This is followed by the database name, and the DB2 database user ID and password, which are used for authentication.

The application servers that you built previously are referenced in the `*SERVERS` section of the Tuxedo configuration file.

- Start Tuxedo application.

```
tmboot -y
```

## Summary

This chapter summarizes all the steps needed and provides methods to check the connection and error detection.

1. Firstly, let's recap the step-by-step procedures:

```
db2icrt -a server -u db2art db2art
db2 catalog tcpip node wasa-host remote wasa server 4001
db2 catalog dcs database db2wasa as qwa1
db2 catalog database db2wasa at node wasa-host authentication dcs
db2 update dbm cfg using SVCENAME db2c_db2art
db2set DB2COMM=tcpip
db2set DB2AUTOSTART=yes
db2stop & db2start
```

2. And then, let's check whether the connection is reachable:

```
export DB2INSTANCE=db2art
export DB2BASE=db2wasa
db2 connect to $DB2BASE user user-name using password
```

3. And check the output, if the screen shows some database connection information as below, it means you are able to access the database residing on mainframe, and you can create table or insert data as you required. If screen shows some errors with error code, maybe there are some failures there. Please find the most common errors and its correction in the APPENDIX.

```
Database Connection Information
Database server= DB2 OS/390 9.1.5
SQL authorization ID= BEAUSR1
Local database alias= DB2QWA1
```

4. Finally, let's configure the Tuxedo application and start it up.

```
export TUXDIR=/home/db2art/tuxedo11gR1
export DB2INSTANCE=db2art
export DB2DIR=/opt/ibm/db2_connect/V9.1
db2 update dbm cfg using tp_mon_name TUXEDO
db2 update dbm cfg using spm_name bjaix
db2 update dbm cfg using max_connections 500 AUTOMATIC
db2 update dbm cfg using max_coordagents 200 AUTOMATIC
db2stop & db2start
```

## Configuring Oracle Tuxedo XA Connection to DB2 Using DB2 Connect

```
Add "UDB_XA:db2xa_switch_std:-L${DB2DIR}/lib -ldb2" into
${TUXDIR}/udataobj/RM

${TUXDIR}/bin/buildtms -r UDB_XA -o ${TUXDIR}/bin/TMS_UDB

${TUXDIR}/bin/buildserver -r UDB_XA -f svcfile.o -s SVC1,SVC2 -o
UDBserver

Configure OPENINFO in ubbconfig:
OPENINFO="UDB_XA:db=sample,uid=username,pwd=password,tpm=tuxedo"

tmbboot -y
```

## Trouble Shooting

This section lists the most common symptoms of connection problems encountered when using DB2 Connect. In each case, you are provided with:

- A combination of a message number and a return code (or protocol specific return code) associated with that message. Each message and return code combination has a separate heading, and the headings are ordered by message number, and then by return code.
- A symptom is provided, usually in the form of a sample message listing.
- A suggested solution is provided, indicating the probable cause of the error. In some cases more than one suggested solution may be provided.

### SQL1403N

Symptom: SQL1403N The username and/or password supplied is incorrect.

Solution: User fails to authenticate at the DB2 Connect workstation. Determine whether the user is supposed to be authenticated at the DB2 Connect workstation.

If yes, make sure that the correct password is provided on the `CONNECT` statement if necessary.

If no, the system database directory entry must have been incorrectly cataloged using `AUTHENTICATION SERVER` (this is the default if `AUTHENTICATION` is not specified explicitly). If this is the case, then re-catalog the entry using `AUTHENTICATION DCS` or `CLIENT`.

Password is not available to send to the target server database. If the system database directory entry is cataloged using `AUTHENTICATION DCS`, then a password has to be flowed from the DB2 Client to the target server database. On certain platforms, for example AIX, the password can only be obtained if it is provided on the `CONNECT` statement.



## SQL5043N

Symptom: Support for one or more communications protocols failed to start successfully. However, core database manager functionality started successfully.

Perhaps the TCP/IP protocol is not started on the DB2 Connect gateway. There may have been a successful client connection previously

Solution: This warning is a symptom which signals that DB2 Connect, acting as a gateway for remote clients, is having trouble handling one or more client communication protocols. These protocols can be TCP/IP, APPC and others, and usually the message indicates that one of the communications protocols defined to DB2 Connect is not configured properly.

Often the cause may be that the DB2COMM profile variable is not defined, or is defined incorrectly. Generally, the problem is the result of a mismatch between the DB2COMM variable and names defined in the database manager configuration (for example, svcname or tpname).

One possible scenario is having a previously successful connection, then getting the SQL5043 error message, while none of the configuration has changed. This could occur using the TCP/IP protocol, when the remote system abnormally terminates the connection for some reason. When this happens, a connection may still appear to exist on the client, and it may become possible to restore the connection without further intervention by issuing the commands shown below.

Most likely, one of the clients connecting to the gateway still has a handle on the TCP/IP port. On each client machine that is connected to the gateway.

## SQL30061

Symptom: Connecting to the wrong host or AS/400 database server location - no target database can be found.

Solution: The wrong server database name may be specified in the DCS directory entry. When this occurs, SQLCODE -30061 is returned to the application.

Check the DB2 node, database, and DCS directory entries. The target database name field in the DCS directory entry must correspond to the name of the database based on the platform.

## SQL30081 with Return Code 79

Symptom: SQL30081N A communication error has been detected.

Communication protocol being used: "TCP/IP". Communication API being used: "SOCKETS".

Location where the error was detected: "". Communication function detecting the error:

## Configuring Oracle Tuxedo XA Connection to DB2 Using DB2 Connect

```
"connect". Protocol specific error code(s): "79", "*", "*".  
SQLSTATE=08001
```

**Solution:** This error can occur in the case of a remote client failing to connect to a DB2 Connect gateway. It can also occur when connecting from the DB2 Connect gateway to a host.

The DB2COMM profile variable may set incorrectly on the DB2 Connect gateway. Check this. For example, the command `db2set db2comm=tcPIP` should appear in `sqllib/db2profile` when running DB2 Extended Enterprise Edition on AIX.

There may be a mismatch between the TCP/IP service name and/or port number specifications at the DB2 client and the DB2 Connect gateway. Verify the entries in the TCP/IP services files on both machines.