



Oracle for z/OS Clients accessing Linux/Unix/Windows Systems

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Agenda

- Oracle for z/OS Clients accessing Linux/Unix/Windows Systems
 - z/OS Batch
 - Access Manager for CICS/TS
 - Access Manager for IMS/TM
 - Findings

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Oracle for z/OS Clients accessing Linux/Unix/Windows Systems

- **z/OS Batch**
 - Precompile/Compile/Link
 - Include Stub
 - INCLUDE SQLLIB(ORASTBL)
 - SYSLMOD DD should be a PDSE dataset
 - Run
 - Address remote location due to TNSNAMES DD entry

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Oracle for z/OS Clients accessing Linux/Unix/Windows Systems

TNSNAMES on z/OS

```
//SYSMDUMP DD SYSOUT=*
//TNSNAMES DD *
ORCL      = ( DESCRIPTION =
              ( ADDRESS =
                ( PROTOCOL = TCP )
                ( HOST   = STUSUNMUC1.DE.ORACLE.COM )
                ( PORT   = 1521 )
              )
            (CONNECT_DATA = (SID=ORA10GR2))
          )
```

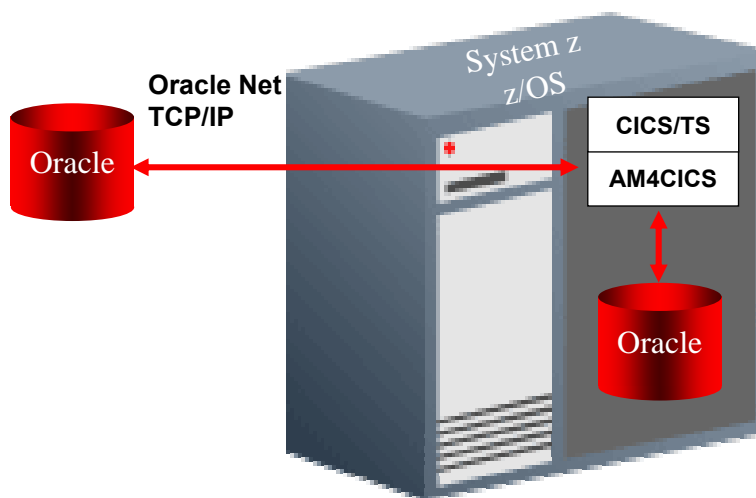
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Agenda

- **Access Manager for CICS/TS**
 - Architecture
 - Installation
 - Using multiple Access Managers for CICS/TS instances
 - Access Manager for CICS/TS in a RAC environment
 - Access Manager for CICS Findings

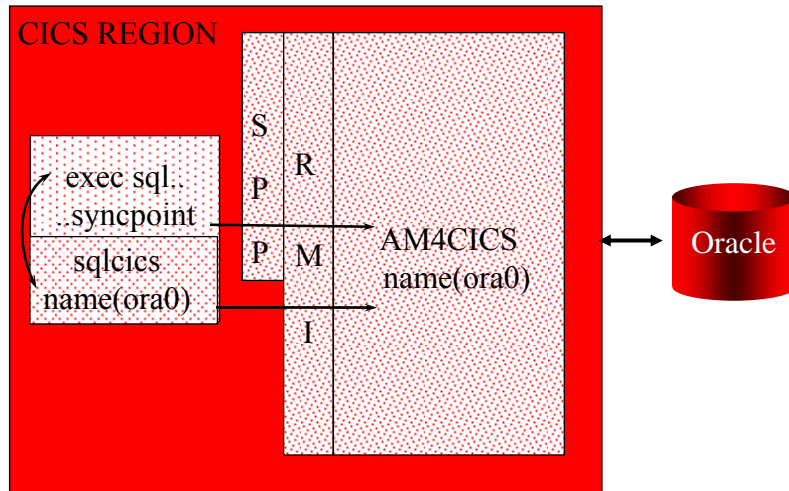
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Architecture



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Access Manager for CICS/TS Architecture



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Components

- Thread Table
 - Defines connections to a local or remote Oracle instance
 - Identifies TNSNAMES alias name
- Thread
 - Protected Threads are connected to Oracle as long as Access Manager for CICS/TS is active
 - Unprotected Threads are disconnected after being idle for 30 seconds (Default CINTERVAL)

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Components

- ORACSTUB
 - Called by an application program to access an Oracle database
 - References the adapter name

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Components

- TNSNAMES
 - Entry defining access path to an Oracle database
 - Referenced during thread generation
- <Control Transaction ID>
 - Recommendation ORA9
 - A transaction to administer/monitor a AM4CICS Adapter
 - Can be any valid CICS transaction identifier

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Components

- Adapter
 - CICS task-related user exit
 - Provides the connection from an application to the external resource manager
- Programming environment
 - Application stub program: ORACSTUB (linked with the application program)
 - Oracle's CICS Task-related user exit program: CICADPX
 - Oracle's CICS Administrative program: ORACICS

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Installation

- Define and Assemble thread definition table
- Define the MESH library to CICS/TS
- Copy Access Manager for CICS/TS Modules to CICS Libraries (Steplib, DFHRPL)
- Define CICS/TS to Oracle and Grant Privileges
- Set INITORA Parameter and Prepare Host
- Generate the ORACSTUB Stub for CICS/TS

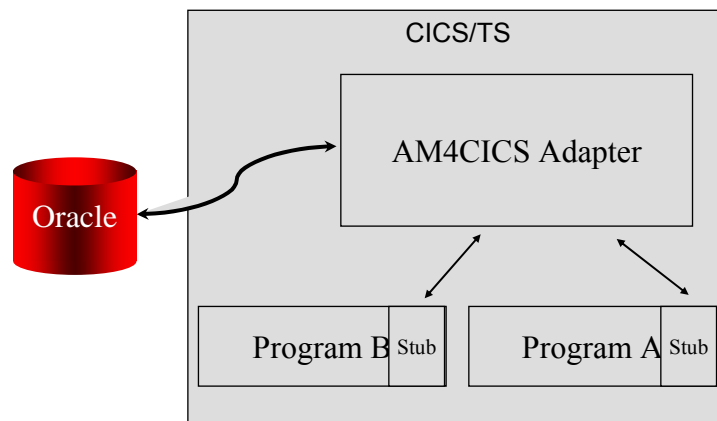
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Installation

- Update CICS/TS Tables to Include Oracle Access Manager for CICS/TS
- Start Oracle Access Manager for CICS/TS Adapter
- Set Up Automatic Initialization for Oracle Access Manager for CICS/TS
- Modify the Sample Compilation Procedures

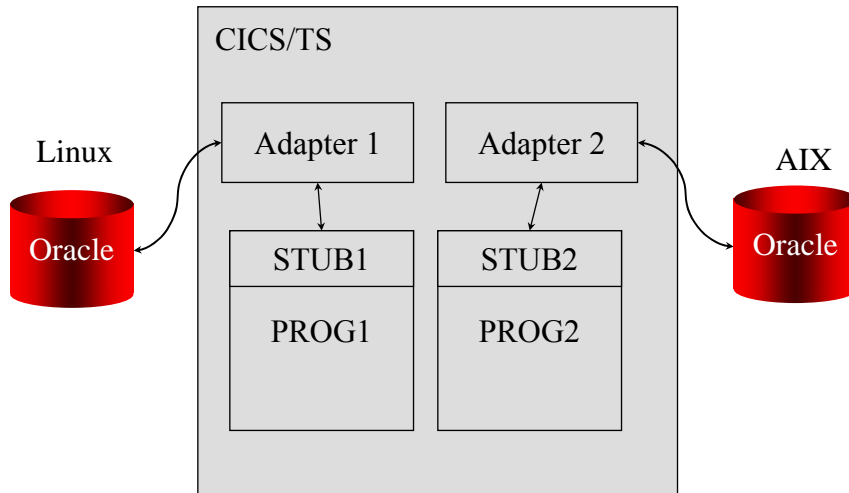
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Configuration Examples



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Configuration Examples



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Access Manager for CICS Performance Findings

- Unprotected threads may result in a number of CPU intensive connect operations

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Access Manager for CICS/TS in a RAC environment

- Access Manager for CICS/TS only supports the connection to one Oracle SID
- TNSNAMES information is part of the Thread Definition Table
- Multiple Thread Definition Tables with different TNSNAMES entries (pointing to different Nodes in the RAC Cluster) can be installed.

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Access Manager for CICS/TS in a RAC Environment

- If the database node used by Access Manager for CICS/TS fails, an emergency shutdown (indicated by CIC-00026 Message) is performed by Access Manager for CICS/TS
- Restart Access Manager for CICS/TS with a Thread Definition Table pointing to another node in the RAC environment
 - START MOD(modname) [MAX(threads) SSN(ssn) NAME(adapter) COMMIT(option)]

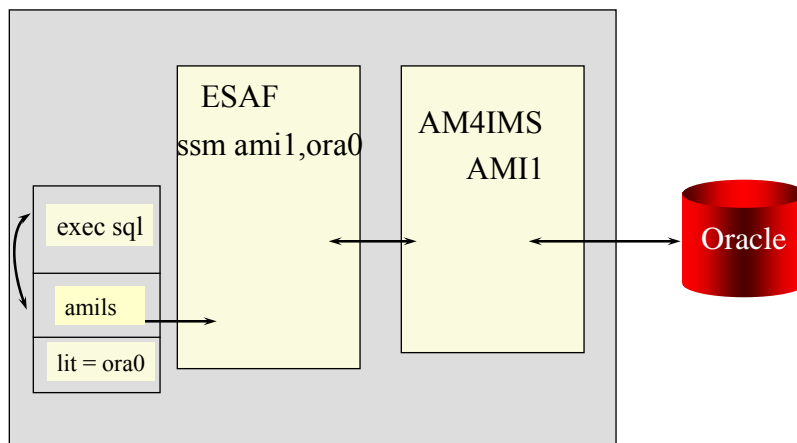
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Agenda

- **Access Manager for IMS/TM**
 - Architecture
 - Installation
 - Using multiple Access Managers for IMS/TM instances
 - Access Manager for IMS/TM in a RAC environment
 - Access Manager for IMS/TM findings

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Access Manager for IMS/TM Architecture



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Access Manager for IMS/TM

- External Subsystem Attach Facility (ESAF)
- Application connected to AM4IMS via LIT specification (ora0) and SSM
- Specified region-by-region – SSM
- CR has “master” SSM
- Defined IMS exit points
- IMS is always recovery coordinator

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Access Manager for IMS/TM SSM member

- SSM member entry in IMS Proclib

AMI1,ORA0,ORAESMT,ORARTT,R,#

AMI1 - AM4IMS subsystem name

ORA0 - Language interface token (see LIT)

ORAESMT - required

ORARTT - name of the RTT

R - Region error option - R to return error to application (default)

- subsystem recognition character

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Access Manager for IMS/TM LIT

- Code AMILI macro for application linking stub

```
AMIORA0 AMILI LIT=ORA0  
END
```

- Assemble and linkedit to include in application program
- Requires MACLIB for AMILI macro
- RENT,REFR,RMODE=ANY,AMODE=31

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Access Manager for IMS/TM RTT

- DBADDR contains Oracle information
- AMITRANS macro for application attributes (by PSB name)
- AMISESS macro for Oracle userid
- AMIENV for environment variables (not shown)

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Access Manager for IMS/TM RTT

AMIRT

```
DBADDR=(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=stusun  
muc1.de.oracle.com)(PORT=1521)CONNECT_DATA=(SID=DE23))),  
RECOID='AMIRECO1'
```

```
AMITRANS PSB=AMIDEMO,OID='SCOTT'
```

```
AMISESS OID='RECOID',AUTH=EXTERNAL
```

```
AMISESS OID='SCOTT',AUTH='TIGER'
```

```
AMISESS OID='*',AUTH='TIGER'
```

```
AMIRT END=YES
```

```
END
```

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Access Manager for IMS/TM Installation Steps

- Add AM4IMS modules to IMS regions (STEPLIB (10.2: ORAAMIDD) and DFSESL, CR and DR)
- Create or add entry to SSM member
- Chose a subsystem ID (not formal subsystem)
- Generate a LIT
- Choose/create an Oracle id for recovery

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Access Manager for IMS/TM Installation Steps

- Code and generate RTT
- Linkedit programs with LIT and AMILS
- Shutdown/restart IMS

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Access Manager for IMS/TM

- Transaction are controlled by
 - IMS SYNC/ROLL/ROLB/etc
 - Oracle CONNECT/COMMIT/ROLLBACK not supported
- Userid/password is configured in RTT

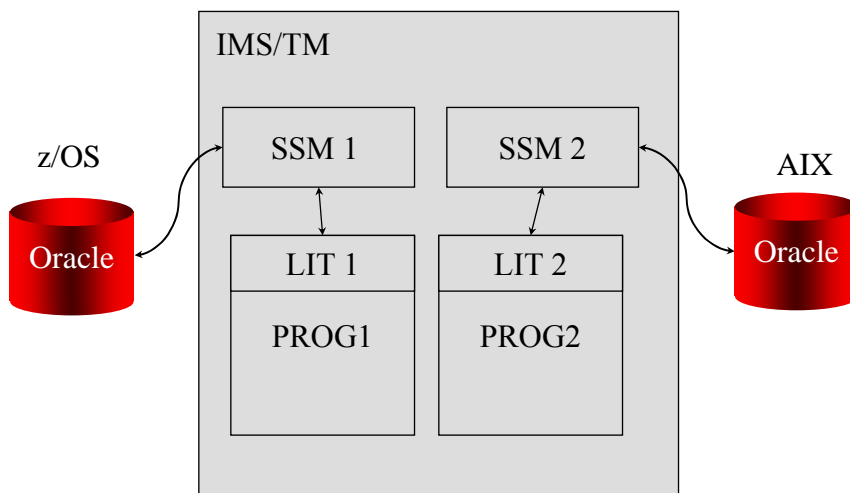
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Access Manager for IMS/TM

- Using multiple Access Managers for IMS/TM instances to access different Oracle Databases
 - Define n ESAF-Subsystems in Parmlib
 - Modify Control- and Dependant Regions
 - Generate/use different LIT's to access multiple Access Manager for IMS Systems

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Access Manager for IMS/TM Configuration Examples



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Access Manager for IMS/TM in a RAC Environment

- Access Manager for IMS/TM Version < 10.2.0.3
 - Use multiple Access Managers for IMS/TM instances.
 - Failover has to be performed by the application programs
- Access Manager for IMS/TM Version >= 10.2.0.3
 - Access to Database Services is supported
 - Failover/ Load-balancing supported

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Access Manager for IMS/TM in a RAC Environment

```
AMIRT DBADDR= (DESCRIPTION= (ADDRESS_LIST= (ADDRESS= (PROTOCOL=TC *
P) (HOST=stuofteronhh1-vip.de.oracle.com) (PORT=1521)) (ADD *
RESS= (PROTOCOL=TCP) (HOST=stuofteronhh2-vip.de.oracle.com *
) (PORT=1521)) (LOAD_BALANCE=YES)) (CONNECT_DATA= (SERVICE_N *
AME=HURZ)) ) , NET=YES , RECOID='AMIRM' , CONNECT=START , *
AMITRANS PSB=AMITEST0 , OID='SCOTT
ENV1 AMIENV (NLS_LANG, 'AMERICAN_AMERICA.WE8EBCDIC1047' , *
NLS_DATE_FORMAT, DD-MON-RR)
AMIRT END=YES
END
```

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Access Manager for IMS – Performance Findings

- The number of dependant regions and the time used by each transaction determines the degree of parallelism

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Access Manager for IMS – Findings

- MPP Regions
 - Try to separate the Transactions using Oracle in dedicated MPP Regions
- Connection Management
 - Determined by OID in AMITRANS and AMISESS
 - IF PSB changes diconnect/connect will be performed

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Other Findings

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Other Findings

- Use Precompiler Options
 - HOLD_CURSOR=YES
 - RELEASE_CURSOR=NO
 - PREFETCH=nnn

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Other Findings

- Network Latency
 - XM : < 50ns
 - LAN: < 1ms
 - WAN: < 10ms - 500ms
- Design of Programs
 - A large number of atomic operations results in a large number of Network Roundtrips. Working with result sets improves performance

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Other Findings

- z/OS is an EBCDIC Platform
- Linux, Unix, Windows are ASCII platforms
- Be careful when migrating an Oracle database from z/OS to an ASCII platform
 - Sort Order
 - Order By and Group By will show a different ordering sequence
 - Ranges in Where conditions

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