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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

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

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

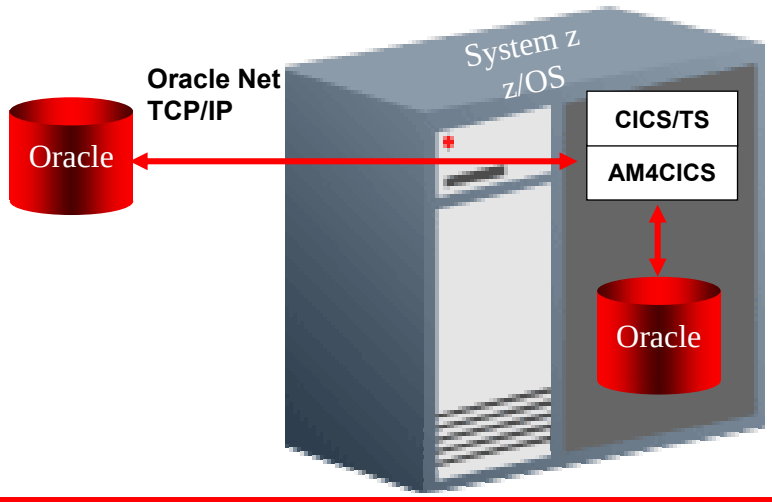
TNSNAMES on z/OS

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

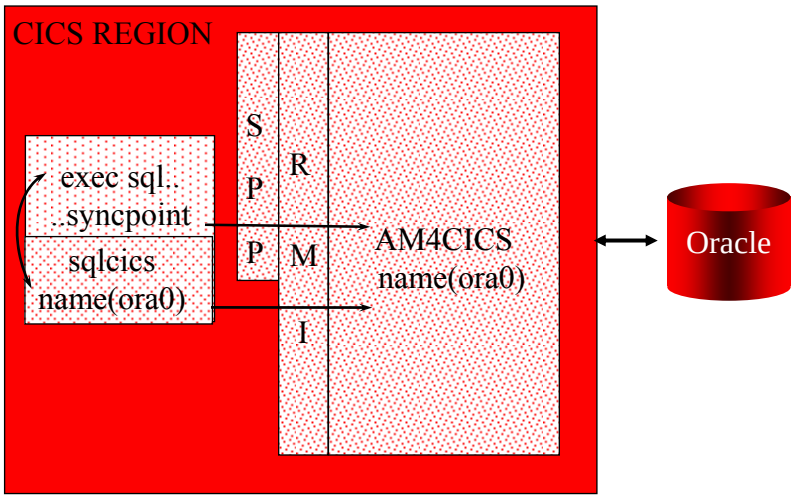
Agenda

- 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

Architecture



Access Manager for CICS/TS Architecture



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)

Components

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

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

Components

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

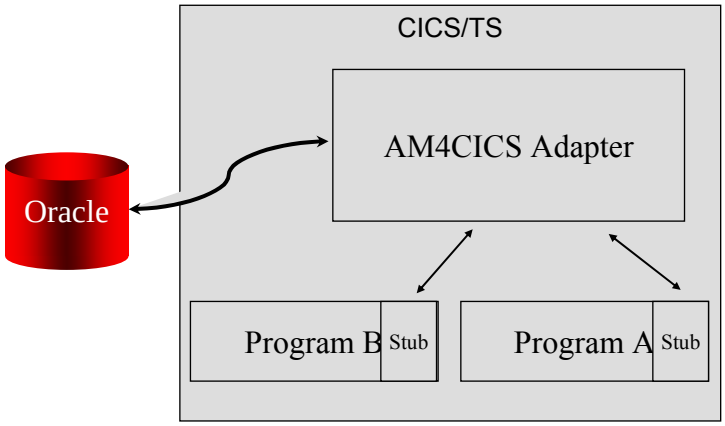
Installation

- Define and Assemble thread definition table
- Define the MESG 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

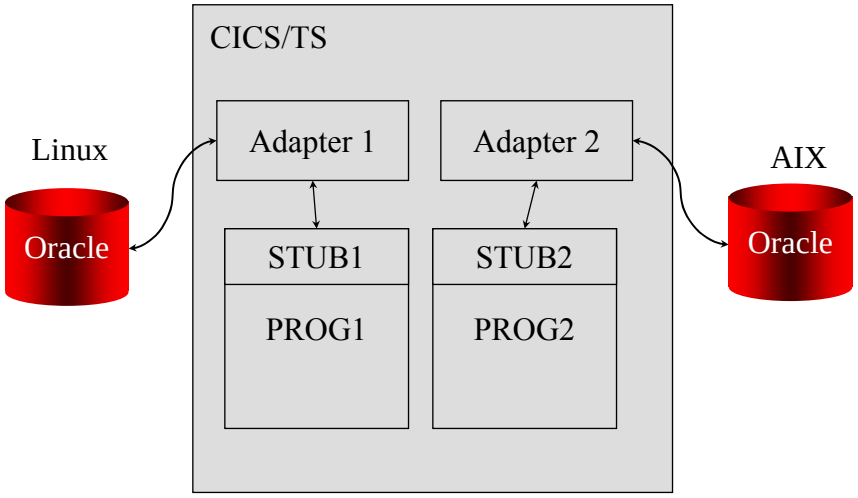
Installation

- 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

Configuration Examples



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.

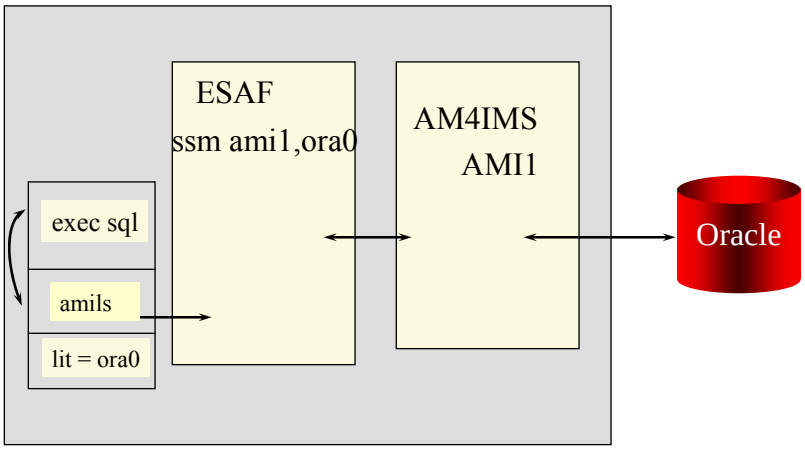
Access Manager for CICS/TS in a RAC Environment

- 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)]

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

Access Manager for IMS/TM Architecture



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

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)

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
```


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

Access Manager for IMS/TM Installation Steps

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

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

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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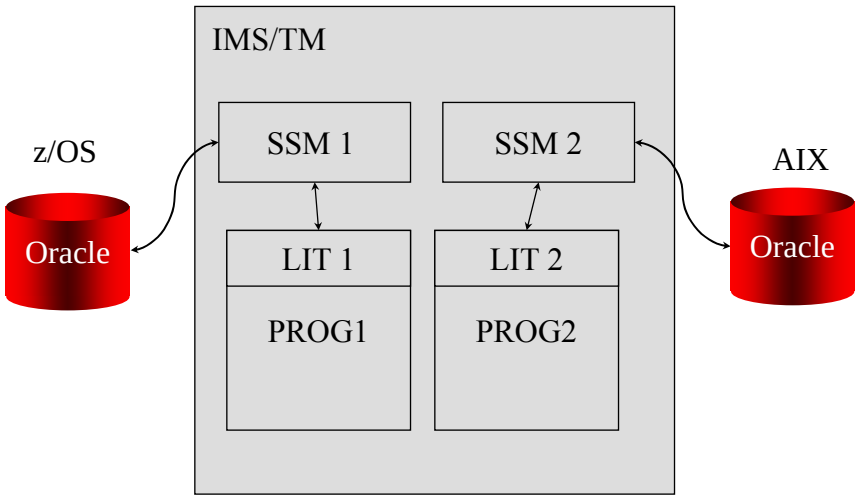
Access Manager for IMS/TM Configuration Examples



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Access Manager for IMS/TM in a RAC Environment

- Acccess 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
- Acccess Manager for IMS/TM Version >= 10.2.0.3
  - Access to Database Services is supported
  - Failover/ Load-balancing supported

Access Manager for IMS/TM in a RAC Environment

```
     AMIRT DBADDR='(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TC *
           P)(HOST=stuopteronhh1-vip.de.oracle.com)(PORT=1521))(ADD *
           RESS=(PROTOCOL=TCP)(HOST=stuopteronhh2-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
```

Access Manager for IMS – Performance Findings

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

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

Other Findings

Other Findings

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

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

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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