Cloning Oracle Applications Environments

Introduction

Cloning Oracle Applications 11i instances can be a long and boring task. Either if you are an APPS DBA in a production or development environment this task has become the most time consuming for an APPS DBA since release 11i has been released. There are many reasons for which a developer (in the case of a development environment) or a functional/technical person (for production or development) wants a clone of a particular Instance. Considering also that even in the most settled environments there are at least a couple of APPS instances in addition to the production one the DBA has to have its tools sharpen and ready to deliver what been asked. Depending upon the Release of your APPS instances you may have different options available in order to speed up and simplify the tasks. In the case that you are running Oracle Applications patch level 11.5.8 or higher, you have the facility to use Rapid Clone which is an advanced method of cloning the application tree making the DBAs life easier and the customers happier.

In spite that Release 11.5.9 is out for a while I still can find lots customer running releases older than 11.5.7. There is a mixture of reasons for which these sites are not upgrading to a more recent APPS release. One of those is because they are satisfied with the functionality of the release that they are running and have no interest in upgrading to a higher level, whereas others can't upgrade due to other problem like the amount of customizations, applications compatibilities and similar. However if you are a DBAs responsible for supporting releases 11.5.6 & 11.5.7 you can still use Rapid Clone. There is patch number 2926786 which allows you to apply Rapid Clone on your application environment without upgrading the Oracle Applications modules. Rapid Clone requires the foundation to be upgraded to patch 2942559. Please note that this patch also includes AutoConfig.

I do advise you to check Oracle Metalink for additional information and while you are there check also note 230672.1, which details how to set up and run Rapid Clone, and note 165195.1, which describe the use of AutoConfig. Should you be interested in using Rapid Clone in an APPS instance older than patch level 11.5.8 I would strongly advise you to check carefully what patch level are you running and the certification matrix before applying any patches.

AutoConfig Components

AutoConfig is a tool that came with later releases of 11i. It can be upgraded via a patch set if you are using a previous version. This tool supports the automatic configuration of Applications instances and collects all information needed to facilitate that automation into repositories (Applications Context for the application layer and Database Context for the database layer). When AutoConfig runs, it takes the information from these context files and uses them to help you to maintain the configuration of your system.

There are many benefits to migrating your system to AutoConfig enabled and one of these is the ability to clone with Rapid Clone. There is also the ability to maintain the configuration of the Application Layer, centralization of the configuration for all instances into one simple interface, and the ease of maintaining the maintenance tool itself (alterations and updates to the AutoConfig utility are delivered in the form of a patch).

Component	Description
Applications Context	The Applications Context is a XML repository that is located within in the APPL_TOP. It contains configuration information that is specific to that particular APPL_TOP in the admin directory and the file has the naming convention of <SID>.xml (VIS.xml).
Database Context	The Database Context differs from the Applications Context only in that it resides within the RDBMS's ORACLE_HOME and contains configuration information that is specific to that database tier and its components. Again, it is important not to alter any of the files

Component	Description
	in the Context directly. All editing can be done through the context editor.
AutoConfig File Templates	These template files include generically configured named tags. These named tags are later replaced with your instance-specific configuration information from whichever Context you are dealing with.
AutoConfig Driver File	Every product in the Oracle E-Business Suite maintains a driver file used by AutoConfig. The driver file lists the AutoConfig file templates and their destination locations.
AutoConfig Scripts	A set of scripts that provide a simplified interface to the AutoConfig APIs.
Context Editor	While not entirely an AutoConfig component, the Context Editor (also comes as a patch) allows you the ability to edit the information found in the Context's context files.

Types of Oracle Applications Cloning:

- Single Node Cloning
- Multi Node Cloning
- Hot Backup Cloning

Single Node Cloning

After installing the Rapid Clone and AutoConfig patches, you are ready to clone an instance. There are ten basic steps involved:

1. Run system configuration on the Application tier:
   $ $COMMON_TOP/admin/scripts/<SID>/adautocfg.sh
   Use the APPS password when prompted.
2. Run system configuration on the database tier:
   $ $ORACLE_HOME/appsutil/<SID>/scripts/adautocfg.sh
   Use the APPS password when prompted.
3. Copy AutoConfig to the RDBMS ORACLE_HOME:
   Apply patch 2952369 to acquire adchkcfg utility.
   Create appsutil.zip file by: $ perl $AD_TOP/bin/admkappsutil.pl.
   Output is located in $APPL_TOP/admin/out/appsutil.zip; copy appsutil.zip file to the $ORACLE_HOME
   unzip -o appsutil.zip
4. Generate the database context file:
   $ cd $ORACLE_HOME/appsutil/bin
   adbldxml.sh tier=database appsuser=<APPSuser> appspasswd=<APPSpwd>
   Output log is written to: *$ORACLE_HOME/appsuti/out/<SID>/cfgcheck.txt*
5. Generate and apply AutoConfig configuration file:
   cd $ORACLE_HOME/appsutil/bin
   adconfig.sh contextfile=<CONTEXT> appspass=<APPSpwd>
6. Prepare for source database clone:
   cd $ORACLE_HOME/appsutil/scrips/<SID>
   ./perl adpreclone.pl dbTier
7. Prepare for source application clone:
   cd $COMMON_TOP/admin/scripts/<SID>
   ./perl adpreclone.pl appsTier
8. Copy the application tier file system:
   Logon to the source system as APPLMGR and shut down the server processes.
   Copy the following application directories from the source to the target node/file system:

$APPL_TOP
$OA_HTML
$OA_JAVA
$COMMON_TOP/util
$COMMON_TOP/clone
$806 ORACLE_HOME
$iAS ORACLE_HOME

Shut down the source database and copy it to the target node/file system.
Restart the source database and source application server processes.

9. Configure the target system database sever:
   cd $ORACLE_HOME/appsutil/clon/bin
   ./perl adcfgclone.pl dbTier
10. Configure the target system application tier:
    cd $COMMON_TOP/clone/bin
    ./perl adcfgclone.pl appsTier

Note: These steps are for a single node install. If you are using Oracle Workflow, you must update wf_notification_attributes and wf_item_attribute_values.

Multi Node Cloning

Pre-cloning steps (source)

1. Setup Rapid Clone `appsutil` on the Database tier

   perl $AD_TOP/bin/admkappsutil.pl

2. Output file is located in $APPL_TOP/admin/out/appsutil.zip

3. Login as ORACLE user, and copy the appsutil.zip file to the $ORACLE_HOME directory

   $ su – oracle

   (Source the RDBMS environment file)
   $DATA_TOP/<CONTEXT_NAME>.env (/u01/oracle/proddb/9.2.0/PROD_apps.env

   $ cd $ORACLE_HOME (RDBMS)
   $ cp $APPL_TOP/admin/out/appsutil.zip ./
   $ unzip -o appsutil.zip

4. Run AutoConfig on the DB tier

   $ORACLE_HOME/appsutil/scripts/<CONTEXT_NAME>/adautocfg.sh

5. Run preclone script on the DB tier

   cd $ORACLE_HOME/appsutil/script/<CONTEXT_NAME>/
   perl adpreclone.pl dbTier

   (check log file for errors:
   $ORACLE_HOME/appsutil/log/<CONTEXT_NAME>/StageDBTier_MMDDXXXX.log)

6. Run preclone script on the AppsTier (make sure all Apps services are shutdown)

   cd $COMMON_TOP/admin/scripts/<CONTEXT_NAME>/
   perl adpreclone.pl appsTier

(check log file errors:
$APPL_TOP/admin/<CONTEXT_NAME>/log/StageAppsTier_MMDDXXXX.log)

Cloning Steps

7. Copy the following application directories from the source to the target node/file system:
   $APPL_TOP
   $COMMON_TOP
   $OH806
   $OHiAS

8. Login as ORACLE user, and shutdown database and listener first
cd $ORACLE_HOME/appsutil/script/<CONTEXT_NAME>/
addbctl.sh stop immediate

addlnctl.sh stop <LISTENER_NAME>
(need to supply a listener name, even the name is just default LISTENER)

Copy $DATA_TOP from source to target
Copy $ORACLE_HOME

Cloning task – Steps to run on the target

1. Log on as ORACLE user on target, and DO NOT source the environment files
2. cd <PATH_TO_NEW_ORACLE_HOME>/appsutil/clone/bin
3. run the clone configuration script
$ perl adcfgclone.pl dbTier

(Please review the TAR if received CORE DUMP when running the perl script)
Note:262269.1: Illegal Instruction (COREDUMP) During adcfgclone.pl Dbtier

1. Please delete directories:
/app/oracle/test/testdb/9.2.0/appsutil/clone/jre/jre/lib
/app/oracle/test/testdb/9.2.0/appsutil/clone/jre/jre/bin

2. Please create directories lib and bin inside /app/oracle/test/testdb/9.2.0/appsutil/clone/jre/jre as symbolic links to

lib to /app/oracle/test/testdb/9.2.0/appsutil/clone/jre/lib
bin to /app/oracle/test/testdb/9.2.0/appsutil/clone/jre/bin

ln –s ../bin bin
ln –s ../lib lib

- virtual hostname = N
- target system database name = TEST
- RAC = N
- Target ORACLE_HOME = /app/oracle/test/testdb/9.2.0
- Target system UTL_FILE = /usr/tmp
- # of DATA_TOP = 1
- DATA_TOP directory = /app/oracle/test/testdata
- Preserve display # = Y
- Port pool number = 1

4. After the DB cloning is completed, check the ApplyDBTier_MMDDXXXX.log located in the *$NEW_ORACLE_HOME/appsutil/log/<CONTEXT_NAME>/*

5. Open a clean shell, and login as appltest to Steverogers
6. cd <PATH_TO_NEW_COMMON_TOP>/clone/bin

7. Run cloning script

$ perl adcfgclone.pl appsTier

APPS password = apps
Virtual hostname = N
Target system SID = ORCL
Target system database node = <nodename>
Target system domain name = <company>.com
More than 1 apps tier = N
APPL_TOP divided into multiple mount points = N
APPL_TOP mount point = /app/oracle/test/testappl
COMMON_TOP mount point = /app/oracle/test/testcomn
8.0.6 ORACLE_HOME = /app/oracle/test/testora/8.0.6
iAS home = /app/oracle/test/testora/iAS
Port pool number = 0
UTL_FILE directory for APPLTMP = 1

Post-installation tasks

- Purge and flush queues - list of programs for purging, initiate data purge programs from the Concurrent Request
- Update profile options – only site level profile options will be cloned, user level needs to be adjusted – Change Site Name profile value
- Must manually set the node name as this is a single node to multi-node clone
- Must run **Relink Application Programs** after clone – shutdown all services first, then start all services after relinking. Otherwise, concurrent manager will not start

Hot Backup Cloning

Source System (PROD):

(a) System with 4GB RAM and 200 GB HDD (RedHat Linux AS 4)

/u01 ——- 40 GB (Application Tier Files)
/u02 ——- 10 GB (10g Oracle Home)
/u03 ——- 80 GB (Data Files)
/backup —- 100 GB (NFS mount point Shared)

Hostname: **prodserver**
Application Version: **11.5.10.2**
Database Version: **10.2.0.2 Target System (TEST):**

(b) System with 2 GB RAM with 300 GB HDD (Redhat Linux AS 4)

/u01 ——- 40 GB (Application Tier Files)
/u02 ——- 10 GB (10g Oracle Home)
/u03 ——- 80 GB (Data Files)
/backup —- 100GB (NFS Share Directory)

Hostname: **testserver**

Application Version: **11.5.10.2**
Database Version: **10.2.0.2**

Stage1: Prerequisites:

➔ Apply OUI22 Patch, 5035661 to every IAS Oracle Home and RDBMS Oracle Home to be cloned.
If Oracle Database ($ORACLE_HOME) is upgraded to 10g, there is no need of applying this patch.

A. Applying the patch on the iAS $ORACLE_HOME:

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(a) Unzip the patch into the <iAS ORACLE_HOME> directory:
$unzip -od /u01/prodora/iAS p5035661_11i_LINUX.zip

(b) Source the Apps environment file :
$. $APPL_TOP/APPSORA.env

(c) Change directory to the <IAS ORACLE_HOME>/appsoui/setup
$ cd $IAS_ORACLE_HOME/appsoui/setup

(d) Execute the perl script OUIsetup.pl:
$ perl OUIsetup.pl

NOTE:
In the case of a Multi-Node instance, the above process should be repeated on the <iAS ORACLE_HOME> of each Node.
(B) Applying the patch on the RDBMS $ORACLE_HOME:

(a) Unzip the patch into the <RDBMS ORACLE_HOME> directory:
$ unzip -od /u01/proddb/9.2.0 p5035661_11i_LINUX.zip

(b) Source the DB environment file :
$. $ORACLE_HOME/PROD_prodserver.env

(c) Change directory to the <RDBMS ORACLE_HOME>/appsoui/setup
$ cd $ORACLE_HOME/appsoui/setup

(d) Execute the perl script OUIsetup.pl:
$ perl OUIsetup.pl

➔ Check all other Requirements as Perl, JRE, JDK, ZIP utilities on Source and Target Nodes as per Metalink Note “Cloning Oracle Applications Release 11i with Rapid Clone”
➔ Apply the Latest AD Minipack on Application Tier (Latest One is AD.I.6)
➔ Apply the Latest Autoconfig Template Patch and Latest RapidClone Patches to Application Tier (Check Metalink for These Patches)

Stage2: Prepare the Source System (PRODSERVER)

(a) Login into Database Tier as **ORACLE** user and run the preclone
$cd $ORACLE_HOME/appsutil/scripts/PROD_prodserver
$perl adpreclone.pl dbTier

(b) Login into the Application Tier as **APPLMGR** User and run the preclone
$cd $COMMON_TOP/admin/scripts/PROD_prodserver
$perl adpreclone.pl appsTier

Stage3: Place Database in Begin Backup Mode and copy the Database Files

(a) Login into database as sysdba user
$sqlplus “/as sysdba”
SQL> alter database begin backup;

(b) Copy Archive log files created during hot backup to /backup directory.

(c) Copy the All Data files to /backup directory.

(d) Backup the control file to trace.
SQL> *alter database backup control file to trace;*
Copy this trace file to /backup directory

(e) Copy the current init.ora file to /backup directory

(f) End the Begin Backup Mode.
SQL> alter database end backup;

Stage4: Copy the Application Tier File System Files

(a) Login into the Application Tier as APPLMGR user and copy the APPL_TOP, COMMON_TOP, IAS ORACLE HOME and 8.0.6 Oracle Home to /backup directory

Stage5: Copy the Source Database files and Application Files to Target server

Copy the parameter file, backup control file and archive log files from /backup directory to /u01, /u02 and /u03 in target server.

Stage 6: Configure the Target Database (TESTSERVER)

Log on to the target system as the ORACLE user

(1) Configure the <RDBMS ORACLE_HOME>

$cd <RDBMS ORACLE_HOME>/appsutil/clone/bin

$perl adcfgclone.pl dbTechStack

(2) Create the target database control file manually

Open the backed up control file

a. Remove all lines before the startup nomount statement
b. Modify the REUSE to SET
c. Modify Source DB SID to Target SID (Here PROD to TEST)
d. Modify NORESETLOGS TO RESETLOGS
e. delete all lines after the CHARACTER SET statement

CREATE CONTROLFILE SET DATABASE "TEST" NORESETLOGS ARCHIVELOG…
LOGFILEGROUP 1
'/u03/log01.log' SIZE 50M,
…
DATAFILE
'/u03/system01.dbf',
'/u03/undotbs01.dbf',
…
CHARACTER SET UTF8;

On the target system, modify the init.ora to use the target SID and location of the control files and set init.ora parameters for archive log mode. On the target system, startup the database in nomount stage:

SQL> startup nomount pfile=< Target init.ora path>

SQL> @clone.ctl (here clone.ctl is the control file which we have modified above)

Once control file is created, database will be in mount stage

execute recover command using backup control file after the database is mounted

SQL> RECOVER DATABASE USING BACKUP CONTROLFILE UNTIL CANCEL;

After the last archive log has been applied, issue the following command

SQL> alter database open resetlogs;

After opening the database, add temp files to target database

(3) Run the library update script against the database

$cd <RDBMS ORACLE_HOME>/appsutil/install/<CONTEXT NAME
sqlplus "/ as sysdba" @adupdlib.sql <libext>

Where <libext> is "sl" for HP-UX, "so" for any other UNIX platform and not required for Windows.

(4)Configure the target database (the database must be open)

$cd <RDBMS ORACLE_HOME>/appsutil/clone/bin
$perl adcfgclone.pl dbconfig <target context file>

Where target context file is: <RDBMS ORACLE_HOME>/appsutil/<Target CONTEXT_NAME>.xml

Stage 7 : Configure the Target Application Tier

Logon to the target system as the APPLMGR user and type the following commands
$Cd $COMMON_TOP/clone/bin
$Perl adcfgclone.pl appsTier

Finishing tasks:

(1) Update Profile options
(2) Update Printer Settings
(3) Update the workflow configuration settings
(4) Verify the APPLCSF variable setting
(5) Update the session_cookie_domain value in icx_parameters

For additional finishing tasks, check the finishing tasks section of the following document

Cloning Oracle Applications Release 11i with rapid clone Note: 230672.1

About JAGGY / Corporate Profile

Jaggy Inc is a leading provider of information technology and management consulting services for Federal, State and Local Government organizations and Private Entities. Founded in 1999, Jaggy relies on a solid foundation of experience in the information technology industry to provide quality, efficient, and cost effective solutions for our business associates.

In today's marketplace, we realize that your business depends on information to survive. We work as your partner to provide comprehensive information technology solutions. As a result, our goal is not only to provide the solutions to keep your business running smoothly, but to develop a business relationship that will lead to your overall success.

Our strength is the ability to supply a complete line of technology products and services to fulfill the needs of Federal government and Private sector. As a full-service technology provider, our driving force is to respond to your business requirements and tailor solutions for your organization.

We pride ourselves on being your **one-stop technology provider**

Core competency

- Enterprise-wide IT solutions (*Focus: Oracle ERP, Oracle E-Business Suite, Oracle DBA and Database Support, Oracle Application Server / Fusion Middleware Support, Business Intelligence, Data Warehousing, Identity Management, CRM, HRMS, Supply Chain Management, Siebel, SAP, MS SQL Server DBA, and Systems Administration – AIX, Solaris, Linux)*

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517110	IT services, Telecommunications	561320	Help services
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541512	System Integration design services	541511	Custom programming/Software development