Cloning Oracle E-Business Suite Release 12.2 with Rapid Clone (Doc ID 1383621.1)

This document describes how to create a copy of an Oracle E-Business Suite Release 12.2 system using Rapid Clone.

The most current version of this document can be obtained in My Oracle Support Knowledge Document 1383621.1, Cloning Oracle E-Business Suite Release 12.2 with Rapid Clone.

Note: This knowledge document supersedes Chapter 17 of Oracle E-Business Suite Setup Guide, Part No. E22953, and should be used instead of that chapter.

The instructions in this document are only for use with an Oracle E-Business Suite Release 12.2 system that is on the AD-TXK Delta 7 (or higher) codelevel. If your system is on AD-TXK Delta 6 or a lower codelevel, you should follow the instructions in My Oracle Support Knowledge Document 2047809.1 instead.

Note: We recommend you clone the application tier run and patch file systems in a single operation, using the 'dualfs' option. Separate cloning of the run and patch file systems will be deprecated in the future.

There is a change log at the end of this document.

In This Document

This document is divided into the following sections:

Conventions used in this document include the following:

Term or Usage	Meaning or Action
Source System	Oracle E-Business Suite system being cloned.
Target System	Oracle E-Business Suite system being created as a copy of the Source.
`applmgr`	User that owns the application tier file system (APPL_TOP and application tier technology stack).
`oracle`	User that owns the database tier file system (RDBMS ORACLE_HOME and database files).
`CONTEXT_NAME`	The `CONTEXT_NAME` variable refers to the name of the applications context file. By default, `CONTEXT_NAME` is `<SID>_<HOSTNAME>`.
`CONTEXT_FILE`	Full path to the context file.

	Default: `<INST_TOP>/appl/admin/<CONTEXT_NAME>.xml` (for application tier) `<RDBMS_ORACLE_HOME>/appsutil/<CONTEXT_NAME>.xml` (for database tier)
`Monospace text`	Represents command line, directory and file name text. Type this exactly as shown.
< >	Text enclosed in brackets represents a variable. Substitute a value for the variable text. Do not type the brackets.

Section 1: Introduction to Cloning

Cloning is the process of creating a copy of an existing Oracle E-Business Suite system. The cloning methodology described in this document covers the process used to clone an Oracle E-Business Suite Release 12.2 system.

Note: An Oracle E-Business Suite system can only be cloned to the same, or a higher, major release of a platform (operating system). For example, you can clone a system running on Oracle Solaris 10 to run on Oracle Solaris 11, but it is not supported to clone a system running on Solaris 11 to run on Solaris 10.

There are various scenarios that require cloning an Oracle E-Business Suite system:

- **Standard cloning** - Copying an existing Oracle E-Business Suite system, for example, to test updates against a duplicate of a production system.

  Note: Be aware that standard cloning is different from file system cloning. Standard cloning is creating a copy of an Oracle E-Business Suite system using Rapid Clone (for example, cloning a complete Oracle E-Business Suite system to create a test copy from your production environment). In contrast, file system cloning is copying the run file system to the patch file system in online patching, and can only be undertaken with the `adop phase=fs_clone` command.

- **System scale-up** - Adding new machines to an Oracle E-Business Suite system to provide capacity for processing increased workloads.

- **System transformations** - Altering system data or file systems, including actions such as platform migration, provisioning of high availability architectures, and data scrambling (or the preferred alternative of data masking, as described in My Oracle Support Knowledge Document 1437485.1, Using Oracle E-Business Suite Release 12.1.3 Template for the Data Masking Pack with Oracle Enterprise Manager 11g).

- **Patching and upgrading** - Delivering new versions of Oracle E-Business Suite components, and providing a mechanism to create rolling environments that minimize downtimes.

An important principle in Oracle E-Business Suite cloning is that the system is cloned, rather than the topology. Producing an exact copy of the patch level and data is much more important than creating an exact copy of topology, as a cloned system must be able to provide the same output to the end user as the Source System. However, while a cloned system does not need to have the full topology of its Source, it must have available all of the topology components that are available to the Source.

Note: When cloning, ensure that you specify the actual locations for the directories involved, so that AD utilities can properly identify the directories afterward. Do not use symbolic links to specify directory locations.

Section 2: Prerequisite Tasks

Note: If your E-Business Suite Release 12.2 Source instance is integrated with Oracle Access Manager 11gR2 (11.1.2) and Oracle E-Business Suite AccessGate, refer to My Oracle Support Knowledge Document 1614793.1, Cloning Oracle E-Business Suite Release 12.2 Environments integrated with Oracle Access Manager 11gR2 (11.1.2) and Oracle E-Business Suite AccessGate.

Note:

1. Before cloning a system with Rapid Clone, be sure to allow any active online patching cycles to run all the way through the final (cleanup) phase. In case patches are applied in hotpatch or downtime mode, then you must run `cleanup` phase of `adop`. For more information, refer to Oracle E-Business Suite Maintenance Guide.
2. Then run `fs_clone` to synchronize with the other file system, to avoid the need for synchronization to be performed in the next patching cycle. For more information, refer to Oracle E-Business Suite Maintenance Guide.

Before cloning to a new system, you must first prepare the Source System by following the below steps:

1. **Verify disk space requirements on Source System**
   Ensure the Source System has enough free disk space. Oracle Fusion Middleware cloning tools require 6GB in `/tmp` and 6GB under `$COMMON_TOP`.

2. **Verify OS requirements on Target System**
   Ensure the Target System meets all the requirements for Oracle E-Business Suite Release 12.2 as stated in My Oracle Support Knowledge Document 1320300.1, Oracle E-Business Suite Release Notes, Release 12.2, and Oracle E-Business Suite Installation and Upgrade Notes for each platform.

   If the Source and Target systems are Windows 64-bit systems, refer to Sections 'Requirements' and 'Prerequisites' of My Oracle Support Knowledge Document 1188535.1,Migrating Oracle E-Business Suite R12 to Microsoft Windows Server 2008 R2 or 2012 R2 and ensure that all requirements specified there have been met.

   Note: For Microsoft Windows, Rapid Clone is not currently certified for use from Domain User Accounts.

3. **Verify Inventory Requirements**

   A global (central) inventory is generally recommended for all Oracle E-Business Suite Release 12.2 application tier nodes and database tier nodes.

   However, starting AD/TXK.Delta.7, support for using an 'EBS Installation Central Inventory' has also been introduced for application tier. This inventory will be specific to an E-Business Suite instance and will be identified by '<s_base>/oraInventory/oraInst.loc'.

   This is useful in cases for multiple E-Business Suite installations on the same host. In such setups, having this inventory helps to avoid issues when FS_CLONE is run simultaneously on the different instances.

   Note: The 'EBS Installation Central Inventory' is supported only for the application tier and only for UNIX platforms.

   Requirements for Global Inventory:

   Following are the requirements for using a global inventory:

   - A global (central) inventory is required for all Oracle E-Business Suite Release 12.2 application tier nodes and database tier nodes.
   - The central inventory location must be identified by the value defined in oraInst.loc file.

- On a shared file system, the global inventory location must be shared and used by all participating nodes.

If you are using a UNIX platform, you should verify the existence and contents of the oraInst.loc file, which specifies the location of the global inventory file.

1. Check that oraInst.loc exists in the correct directory for your platform:

Platform	oraInst.loc Location
Oracle Solaris SPARC (64-bit)	/var/opt/oracle
Linux x86-64	/etc
IBM AIX on Power Systems (64-bit)	/etc
HP-UX Itanium	/var/opt/oracle

2. Confirm that the contents of oraInst.loc look like this:

```
inventory_loc=/oracle/oraInventory
```

where /oracle/oraInventory points to the directory where the central inventory is located. This location must be writable by the user account that is to run Rapid Clone.

Incorrect permissions on oraInventory may cause issues while cloning a system with Rapid Clone.

> Note: If your system has separate installation user accounts for the database and the applications, both users must be in the same install group (inst_group) in oraInst.loc, which will need to contain a line such as inst_group=oracle.

If the oraInst.loc file does not exist, create it in the correct directory with contents as shown above.

Requirements for EBS Installation Central Inventory:

For an E-Business Suite instance to use the 'EBS Installation Central Inventory', all application tier Oracle Home(s) registered in the global (central) inventory for the instance need to be migrated to the new inventory. Refer to My Oracle Support Knowledge Document 2033780.1, Oracle E-Business Suite Applications DBA and Technology Stack Release Notes for R12.AD.C.Delta.7 and R12.TXK.C.Delta.7 for steps to migrate to 'EBS Installation Central Inventory'.

> Note:
> - Once the inventory is migrated, any subsequently added nodes will be automatically configured to use the 'EBS Installation Central Inventory'.
> - Similarly, any new target instance cloned from this instance will automatically be configured to use the 'EBS Installation Central Inventory'.

4. **Verify Source and Target System software components and versions**
In addition to the Oracle E-Business Suite software requirements (see Oracle E-Business Suite Installation Guide: Using Rapid Install), the following software component versions in Table 1 below must exist on the Source or Target nodes, as applicable. The 'Required Location' column indicates the node where the software component must reside.

Table 1: Software Requirements

Software Component	Minimum Version	Required Location	Comments

Zip	2.3 (or higher)	All Source System nodes	Download from InfoZip. Zip must be in your `$PATH`. If using files larger than 2GB, you should use InfoZip ZIP 3.0 or higher.
Unzip	5.52 (or higher)	All Source System nodes	Download from InfoZip. Unzip must be in your `$PATH`. If using files larger than 2GB, you should use InfoZip UNZIP 5.52 or higher.
Operation system utilities	N/A	All Target System nodes	The required operating system utilities for your platform must be in your `$PATH` when running `adcfgclone.pl`. For example, make, ld, and ar are required utilities for UNIX. Refer to Oracle E-Business Suite Installation Guide: Using Rapid Install.
Perl	5.10.x (or higher)	All Target System nodes	Use the version of Perl shipped with Oracle Fusion Middleware 11g and Oracle Database 11g, or download from Perl.com. Perl must be in your `$PATH` and `$PERL5LIB` must be set correctly before cloning.

5. **Apply required patches**

    1. Apply the latest AD/TXK patches
    You are strongly encouraged to be on the latest AD/TXK codelevel. Refer to My Oracle Support Knowledge Document 1583092.1, Oracle E-Business Suite Release 12.2: Suite-Wide Rollup and AD/TXK Delta Information, and apply the most recent delta patches.

    It is important to read the release notes for those patches, since they may require other patches. Refer to My Oracle Support Knowledge Document 1617461.1, Applying the Latest AD and TXK Release Update Packs to Oracle E-Business Suite Release 12.2.

    2. Apply additional patches
    Update the Oracle E-Business Suite file system by applying other additional patches to all application tier server nodes.

    There are no additional patches at this time.

    > **Note**: After applying any new patches, `ORACLE_HOME(s)` on the Source System must be updated with the files included in those patches. To synchronize the Rapid Clone and AutoConfig files within the `RDBMS ORACLE_HOME` using the `admkappsutil.pl` utility, refer to Oracle E-Business Suite Setup Guide and follow the instructions in section Patching AutoConfig, Applying the Latest AutoConfig Updates. Failing to use the latest code may jeopardize the success of the cloning operation. If new AD, AutoConfig or Rapid Clone updates are applied to the system, prerequisite task Steps 4, 5, 6, and 7 must be performed again in order to apply the new files to the database node.

    Refer to Section 8: Known Issues of this document for up-to-date information on known problems and available workarounds.

6. **Run AutoConfig on the application tier**
Follow the steps in the section "Run AutoConfig on the Application Tier" in Using AutoConfig Tools for System Configuration of Oracle E-Business Suite Setup Guide to run AutoConfig on all application tier nodes.

7. **Synchronize appsutil on the database tier nodes**
To copy AutoConfig and Rapid Clone files to each database node with the `admkappsutil.pl` utility, follow the steps under the "Copy AutoConfig to the RDBMS ORACLE_HOME" section in Patching AutoConfig of Oracle E-Business Suite Setup Guide.

8. **Run AutoConfig on the database tier**
Follow the steps under the "Run AutoConfig on the Database Tier" section in Using AutoConfig Tools for System Configuration of Oracle E-Business Suite Setup Guide to run AutoConfig on the database tier nodes.

9. **Run EBS Technology Codelevel Checker (ETCC) on the database tier**

   On the database tier, run the EBS Technology Codelevel Checker (ETCC) described in My Oracle Support Knowledge Document 1594274.1, Oracle E-Business Suite Release 12.2: Consolidated List of Patches and Technology Bug Fixes to confirm that all required database patches have been applied.

   EBS Technology Codelevel Checker (ETCC) is available via Patch 17537119 and analyzes an Oracle Database Oracle Home, and warns of any missing database bug fixes required for Oracle E-Business Suite Release 12.2. It is run with the command checkDBpatch.sh (on UNIX) or checkDBpatch.cmd (on Windows). Further instructions are available in the patch readme. Ensure to install the latest version of ETCC into `<RDBMS_ORACLE_HOME>/appsutil/etcc` directory.

10. **Maintain snapshot information**
    Log in to each application tier node as the `applmgr` user, and run "Update current view snapshot" in AD Administration. Refer to Oracle E-Business Suite Maintenance Guide for more information.

Section 3: Standard Cloning Tasks

Use Rapid Clone to create template files for cloning on the Source System. After copying the Source System to the Target System, Rapid Clone updates these templates to include the new Target System configuration settings. Rapid Clone never changes the Source System configuration.

The cloning process consists of the following three phases, each of which is made up of several logical sections and their steps.

1. Prepare the Source System for database tier and application tier.
2. Copy both database tier and application tier nodes from the Source System to Target System.
3. Configure the Target System for both database tier and application tier.

> **Note**: Before following the steps of this section, review Section 8: Known Issues.

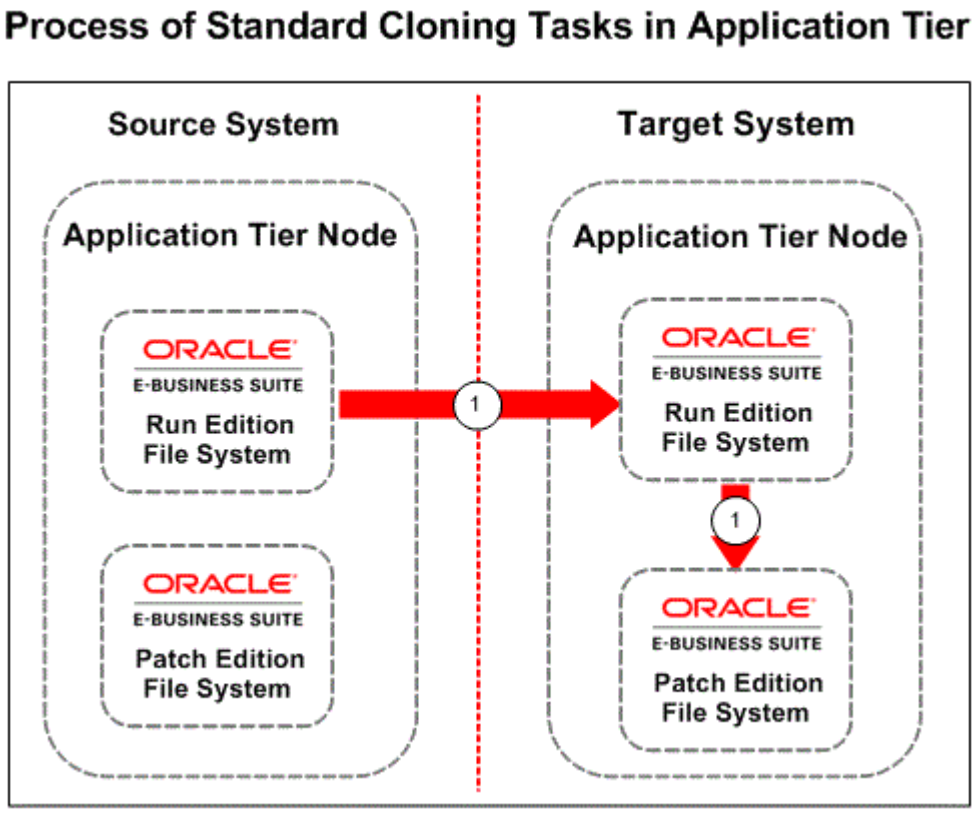
3.1 High Level Standard Cloning Process for Application Tier

In addition to cloning the database tier node, the standard cloning process for application tier basically involves the following key process:

1. Copy the application tier node from the Source Run Edition File System to the Target Run Edition File System.

This high level cloning process specific to application tier can be illustrated in the following diagram:

Diagram 1: Process of Standard Cloning Tasks in Application Tier



3.2 Standard Cloning Steps

The following steps are to perform standard cloning tasks:

1. **Prepare the Source System for database tier and application tier**

   Run the following commands to prepare the Source System for cloning:

   > **Note**: Ensure all the processes in the Source System are up before proceeding with the following two steps.

   1. **Prepare the Source System database tier for cloning**
      1. Log on to the Source System as the oracle user.
      2. Source the database tier environment file.
      3. Run the following commands:

      ```
      $ cd <RDBMS ORACLE_HOME>/appsutil/scripts/<CONTEXT_NAME>
      $ perl adpreclone.pl dbTier
      ```

   2. **Prepare the Source System application tier for cloning**

      1. Log on to the primary node of the Source System as the `applmgr` user.
      2. Source the environment file of the Run Edition File system.

         You can use the following command to confirm that the environment variable FILE_EDITION points to the Run Edition File System:

         ```
         $ echo $FILE_EDITION
         ```

         It should return the value:

```
run
```

3. Run the following commands:

```
$ cd <INST_TOP>/admin/scripts
$ perl adpreclone.pl appsTier
```

Note: If you apply a new Rapid Clone or AutoConfig update to the system, you must run `adpreclone.pl` again on the database tier and application tier to apply the new files into the clone directory structures to be used during the cloning configuration stage. Furthermore, if you patch Oracle Fusion Middleware or make configuration changes to the Oracle E-Business Suite WebLogic Domain, you must run `adpreclone.pl` again on the application tier to rebuild the Oracle Fusion Middleware home.

As of Release 12.2, the `adpreclone.pl` process on the application tier creates a complete compressed archive of the Oracle Fusion Middleware and its components as follows:

- A compressed archive of the Oracle WebLogic Server home, Oracle Web Tier Utilities home, Oracle Common Utilities home and the Oracle E-Business Suite home:
  `<COMMON_TOP>/clone/FMW/FMW_Home.jar`
- A compressed archive of the Oracle E-Business Suite WebLogic domain:
  `<COMMON_TOP>/clone/FMW/WLS/EBSdomain.jar`
- The Oracle E-Business Suite WebLogic domain's configuration template:
  `<COMMON_TOP>/clone/FMW/WLS/plan/moveplan.xml`
- A compressed archive of the Oracle Web Tier/Oracle HTTP Server configuration instance:
  `<COMMON_TOP>/clone/FMW/OHS/ohsarchive.jar`
- The Oracle HTTP Server configuration instance's configuration template:
  `<COMMON_TOP>/clone/FMW/OHS/moveplan.xml`

The adpreclone log files are created in the `<INST_TOP>/admin/log/clone` directory.

3. **Shut down the application processes (Windows platform only)**

   Log on to Run Edition File System in the Source System as the `applmgr` user, and shut down all the application processes.

2. **Copy both database tier and application tier nodes from the Source System to the Target System**

Copy the application tier file system from the Source node to the Target node by performing the following steps in the order listed. Ensure the application tier files copied to the Target System are owned by the Target `applmgr` user, and that the database node files are owned by the Target `oracle` user.

Note: In the copying tasks below, UNIX users should ensure that the symbolic links (soft links) are preserved when copying. On most UNIX platforms, you can accomplish this with the `cp -prfH` command. Consult the UNIX man page for the `cp` command to check the parameters available on your platform.

For example:

```
$ cd /Target_dest_dir/db
$ cp -prfH /Source_dir/db/
```

Alternatively, you can use the `tar` command to compress the directories into a temporary staging area. UNIX users should ensure that the symbolic links (soft links) are preserved when compressing. On most UNIX platforms, this is the

default behavior of the `tar` command. Consult the UNIX man page for the `tar` command to check the parameters available on your platform.

In addition, verify the permissions of the executables under `ORACLE_HOME/bin` that can potentially be owned by root, such as `nmo`, `nmhs`, and `nmb`.

1. **Copy the database node file system**
    1. Log on to the Source application tier node as the applmgr user, and then:
        1. Shutdown the application tier processes.
    2. Log on to the Source System database node as the `oracle` user, and then:
        1. Perform a normal shut down of the Source System database.
        2. Copy the database (.dbf) files from the Source System to the Target System.
        3. Copy the Source System database ORACLE_HOME to the Target System.
        4. Start the Source applications system database and application tier processes.
    3. Log on to the Target System database node as the `oracle` user, and then:
        1. Delete the oraInst.loc file in the Database ORACLE_HOME, if it exists.
2. **Copy the application tier file system from the Source "Run Edition File System" to the Target "Run Edition File System"**

    Log on to Run Edition File System in the Source System application tier nodes as the `applmgr` user.

    Copy the following application tier directories from the Source Node to the Target Run Edition File System application tier node:

    - `<APPL_TOP>`
    - `<COMMON_TOP>`
    - `<OracleAS Tools 10.1.2 ORACLE_HOME>`

    The same operating system user must own both the Run Edition and Patch Edition File Systems.

    > **Note**: In Release 12.2, you can set the base directory to any desired location. However, the subdirectory structure cannot be changed because of dependencies on both the WLS domain and the dual file system required for online patching. Also, the base directory must be the same across all nodes in multi-node configurations.

    Dual File System Directory Structure

    In Release 12.2, the following directory structure exists to support the Run Edition and Patch Edition File Systems:

    Note: `<s_base>` and `<sid>` are user-defined values.

    `<s_base>/<sid>/fs1` (for example, `/u01/122/prod/fs1`)

    `<s_base>/<sid>/fs2` (for example, `/u01/122/prod/fs2`)

Two environment variables, $RUN_BASE and $PATCH_BASE, store these locations. The function (run or patch) of these two file systems is not static, and their values switch every time when a cutover phase is complete.

> **Note**: As Rapid Clone will create a replica of the Source Node, if the Source Run Edition File System is the first file system (fs1), the Target Run Edition File System will also be the first file system (fs1). Similarly, if the Source Run Edition File System is the second file system (fs2), then the Target Run Edition File System will also be the second file system (fs2). Therefore, when you perform a cloning task, you always clone and copy the Source Run Edition File System to create the Target Run Edition File System, but the directory location of the Run Edition File System can be pointing either to <s_base>/<sid>/fs1 or <s_base>/<sid>/fs2 based on the Source Run Edition File System base directory.

When copying the files, use the values of $RUN_BASE and $PATCH_BASE variables to determine if the Run Edition File System should be copied to fs1 or fs2.

For example, the Source Run Edition File System has the following values:

```
$RUN_BASE=/u01/122/prod/fs2
$PATCH_BASE=/u01/122/prod/fs1
```

The Target <s_base> directory will be /d05/test. Copy the Source Run Edition File System into the Target /d05/test/fs2 directory to initially act as Run Edition File System.

3. **Configure the Target System**

   Run the following commands to configure the Target System. You will be prompted for specific Target System values such as SID, paths, and ports.

   1. **Configure the Target System database server**

      1. Log on to the Target System as the oracle user and enter the following commands:

         ```
         $ cd <RDBMS ORACLE_HOME>/appsutil/clone/bin
         $ perl adcfgclone.pl dbTier
         ```

         The log file is created in <RDBMS_ORACLE_HOME>/appsutil/log/<CONTEXT_NAME> directory.

         > **Note:** If the database version is 12c Release 1, ensure to add the following line in your sqlnet_ifile.ora after adcfgclone.pl execution completes:
         >
         > - SQLNET.ALLOWED_LOGON_VERSION_SERVER = 8 (if the initialization parameter SEC_CASE_SENSITIVE_LOGON is set to FALSE)
         > - SQLNET.ALLOWED_LOGON_VERSION_SERVER = 10 (if SEC_CASE_SENSITIVE_LOGON is set to TRUE)

   2. **Configure the Target System application tier server nodes**

      > **Note**: If adcfgclone.pl is being run again after a failure, perform the steps in Appendix A before a new cloning attempt.

      1. Log on to the Run Edition File System in the Target System as the applmgr user and enter the following commands:

         ```
         $ cd <COMMON_TOP>/clone/bin
         $ perl adcfgclone.pl appsTier dualfs
         ```

- At the prompt:
  - "Do you want to add a node (yes/no)", enter the value as **'no'**.
- At the prompt:
  - "Target System Base Directory", enter the location of the base directory. For example: `/u02/r122`.
- Provide:
  - the new port pools for the Run Edition File System and the Patch Edition File System.
- When asked the question:
  - "Do you want to startup the Application Services for <TWO_TASK>? (y/n)" you should answer '**y**' if you do not need to perform any further actions and 'n' if there are other pending actions which need the Application services to be down.

Different logs are created for Run Edition and Patch Edition Cloning. The log files are created in the following directories in the Run Edition File System:

- `<INST_TOP>/admin/log/clone/run`
- `<INST_TOP>/admin/log/clone/patch`

2. In case R12.TXK.C.DELTA.11 (Patch 28840822) or CPU patch for Apr 2019 or higher (Refer to My Oracle Knowledge Support Document 2514102.1, Oracle E-Business Suite Release 12 Critical Patch Update Knowledge Document (April 2019)) is applied on the Oracle E-Business Suite instance,
   1. Refer to Appendix B to enable access to the WebLogic Admin console from hosts other than the application tier nodes.
   2. (**Windows Platform only**) Bounce the Admin Server on the Run Edition File System of the primary node as follows:

```
C:\> <ADMIN_SCRIPTS_HOME>\adadminsrvctl.cmd stop
C:\> <ADMIN_SCRIPTS_HOME>\adadminsrvctl.cmd start
```

Section 4: Finishing Tasks

This section lists tasks that may be necessary, depending on your implementation and intended use of the cloned system.

1. **Copy the jar signing files from the source instance**
   Copy the adsign.txt and adkeystore.dat files from the `<APPL_TOP_NE>/ad/admin` directory of the source instance to the `<APPL_TOP_NE>/ad/admin` directory of the target instance.

2. **Update profile options**
   Rapid Clone updates only site level profile options. You must manually update any other profile options set to instance specific values.

3. **Update printer settings**
   If the new cloned system needs to utilize different printers, update the Target System with the new printer settings now.

4. **Update Workflow configuration settings**
   Cloning an Oracle E-Business Suite instance does not update the host and instance-specific information used by Oracle Workflow. Review the table and column names listed in Table 2 below to check for any instance-specific data in the Oracle Workflow configuration of the Target System.

   Table 2: Workflow Configuration Settings

Table Name	Column Name	Column Value Details
FND_FORM_FUNCTIONS	WEB_HOST_NAME	Update with the new web host name.
FND_FORM_FUNCTIONS	WEB_AGENT_NAME	Update to point at the new PL/SQL listener name.
FND_CONCURRENT_REQUESTS	LOGFILE_NAME	Update with the correct path to the log file directory.
FND_CONCURRENT_REQUESTS	OUTFILE_NAME	Update with the new directory path on the Target System.

5. **Verify the APPLCSF variable setting**
   Source the APPS environment and confirm that the variable APPLCSF (identifying the top-level directory for concurrent manager log and output files) points to a suitable directory. To modify, change the value of the <s_applcsf> variable in the context file and then run AutoConfig.

6. **Update the SESSION_COOKIE_DOMAIN value in ICX_PARAMETERS**
   If the Target System is in a different domain name from the Source System and SESSION_COOKIE_DOMAIN is not null in the Source System, update the value of SESSION_COOKIE_DOMAIN to reflect the new domain name.

7. **Re-Implement SSL and SSO configuration**
   If the Source System is Secure Sockets Layer (SSL) or Oracle Access Manager-enabled, and you want the Target to be SSL or Oracle Access Manager-enabled, reconfigure the Target according to the SSL or Oracle Access Manager documentation. Otherwise, if you do not want the Target to be SSL or Oracle Access Manager-enabled, follow the same SSL or Oracle Access Manager documentation to undo the SSL or Oracle Access Manager setup.

   For detailed steps, refer to the following documents:
   - My Oracle Support Knowledge Document 1367293.1, Enabling SSL in Oracle E-Business Suite Release 12.2
   - My Oracle Support Knowledge Document 1388152.1, Overview of Single Sign-On Integration Options for Oracle E-Business Suite

Section 5: Advanced Cloning Options

This section describes various advanced cloning options provided to meet particular needs.

5.1 Refreshing a Target System

You may need to refresh the Target System periodically to synchronize it with changes to the Source System.

> **Note**: Back up the Target context file on the Target System before refreshing the database or application tiers.

To refresh the Target System, perform the following steps as described in previous sections:

1. Prepare the Source System.

2. Copy the Source System to the Target System.

    1. If the application tier file system in the APPL_TOP, COMMON_TOP, or technology stack needs to be refreshed, copy the portion of the application tier file system that has been updated.

    2. If the RDBMS ORACLE_HOME or the database needs to be refreshed, copy the database node file system. If refreshing the database, be sure to refresh the ORACLE_HOME at the same time.

3. If any of the above ORACLE_HOME entries are already registered in Oracle Inventory, run the following command to de-register or detach that ORACLE_HOME:

```
$ ./runInstaller -detachhome ORACLE_HOME=<Oracle Home Location> [-invPtrLoc <s_invPtrLoc>]
```

   Here,
   `-invPtrLoc` argument needs to be specified only if the 'EBS installation central' inventory is being used.

s_invPtrLoc is the context variable that stores the inventory pointer location.

For example:

```
$ cd /u02/r122/fs1/FMW_Home/oracle_common/oui/bin
$ ./runInstaller -detachhome \
ORACLE_HOME=/s0/r122/at1/FMW_Home/oracle_common -silent
```

4. Configure the Target System.

   Specify the existing Target System context file when running adcfgclone.pl commands.

   Note: Ensure that you review additional customized WLS and OHS configuration parameters from the Fusion Middleware Console in the Target System.

   1. Configure the Target System database server as follows:

      1. Login to the Target System as the oracle user and run the following commands to clone the database tier:

         ```
         $ cd <RDBMS ORACLE_HOME>/appsutil/clone/bin
         $ perl adcfgclone.pl dbTier <Database Target context file>
         ```

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

      2. Run the following SQL command to truncate all entries in the ADOP_VALID_NODES table.

         ```
         SQL> truncate table ADOP_VALID_NODES;
         ```

   2. Configure the Target System application tier node by logging in to the Target System as the applmgr user and entering the following commands:

      ```
      $ cd <COMMON_TOP>/clone/bin
      $ perl adcfgclone.pl appsTier <APPL_TOP Target context file> dualfs
      ```

      Where APPL_TOP Target context file is <INST_TOP>/appl/admin/<Target CONTEXT_NAME>.xml.
      This will clone and configure both the Run and Patch file systems of the application tier node.

5. Perform the standard finishing tasks.

5.2 Cloning a Multi-Node System

This procedure allows the Source System or Target System to be a multi-node system. The essence of cloning a multi-node system involves the following major steps:

1. Clone the database tier node.
2. Clone the primary application tier node from the Source Run Edition File System to the Target Run Edition File System using the 'dualfs' option.
3. Add further application nodes to the secondary application tier Run Edition File System.

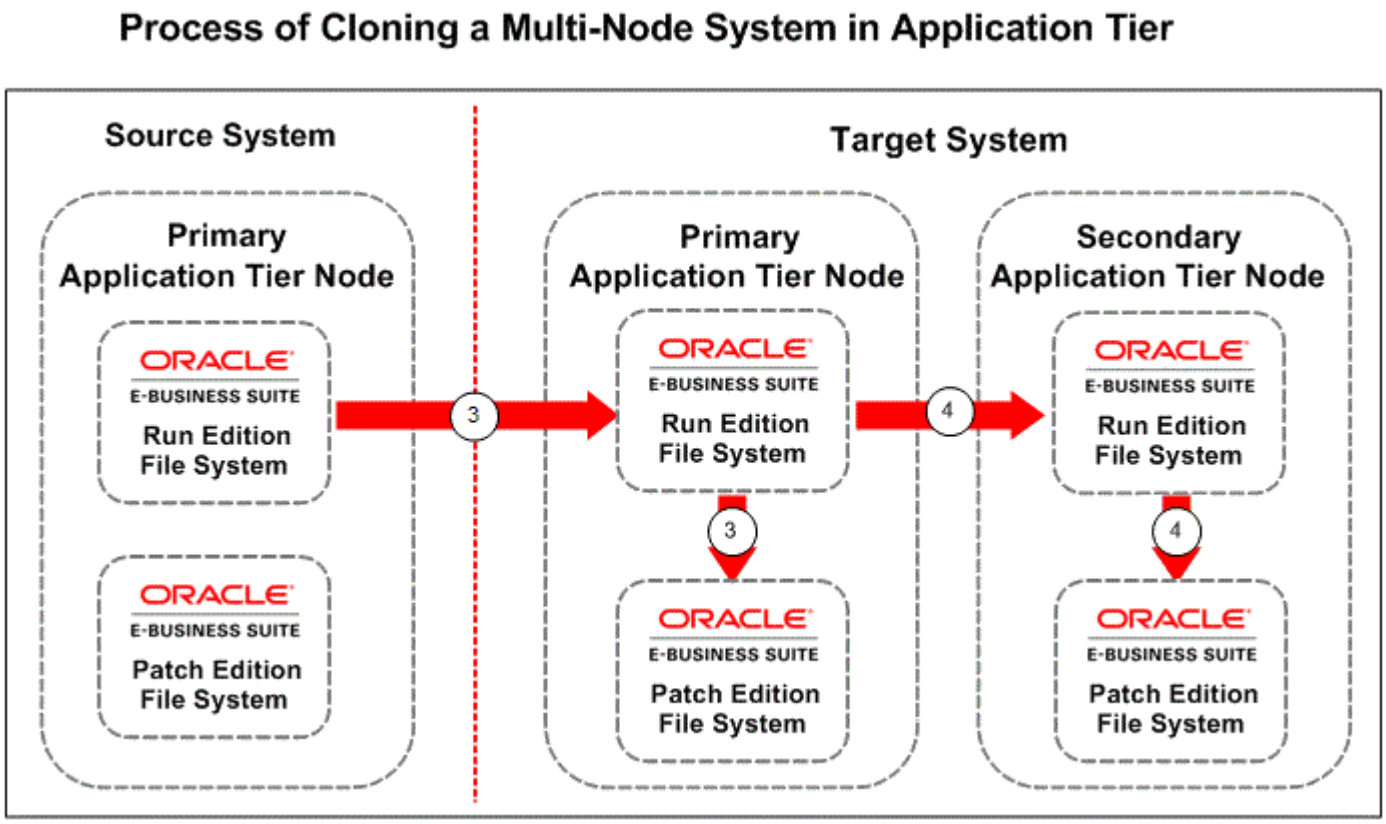
   This is achieved by cloning the primary application tier node from the Target Run Edition File System to the secondary application tier node in the Target Run Edition File System using the 'dualfs' option.

   Note: Step 3 can be repeated until all desired nodes are added to the Target System.

> **Note**: The 'dualfs' option will clone the Run and Patch file systems in a single operation.

The high level process of cloning a multi-node system in application tier as described above from Step 2 to Step 3 can be illustrated in the following diagram:

Diagram 2: Process of Cloning a Multi-Node System in Application Tier



> **Note**: Make sure Secure Shell (SSH) is set on all of your application tier nodes if the adop utility is used to handle multiple nodes. For information on how to set up Secure Shell, see the Patching Procedures chapter of Oracle E-Business Suite Maintenance Guide.

Instructions on Cloning a Multi-Node System

Detailed instructions on how to perform each task described earlier are as follows:

> **Note**: The steps mentioned below are valid for both shared and non-shared file systems.

1. Perform the standard prerequisite tasks.

   Carry out these steps on all Source and Target nodes.

2. Perform a full clone (including the prepare, copy and configure steps) of the database tier node. Refer to 3.2 Standard Cloning Steps.

3. Clone the primary application tier node from the Source Run Edition File System to the Target Run Edition File System.

1. Log on to the primary application tier node in the Source Run Edition File System, source the Run Edition File System and run the following command:

```
$ perl adpreclone.pl appsTier
```

2. Choose the Target machine. Target system should be on a new host other than any of the Source Nodes.

3. Copy the following directories from the Source Run Edition File System (fs1 or fs2) to the Target Run Edition File System (fs1 or fs2).

   - <APPL_TOP>
   - <COMMON_TOP>
   - <OracleAS Tools 10.1.2 ORACLE_HOME>

   1. To determine which file system (fs1 or fs2) is currently the Run Edition File System, run the command:

      ```
      echo $RUN_BASE
      ```

   2. If the Source Run Edition File System is under fs1, you should configure the Target Run Edition File System under fs1 as well. Similarly, if the Source Run Edition File System is under fs2, you should configure the Target Run Edition File System under fs2.

4. Configure the Target Run and Patch Edition File Systems by running:

```
$ perl adcfgclone.pl appsTier dualfs
```

> **Note**: If the Target instance is on the same host as any of the application tier nodes of the Source instance, ensure that the port pool provided for the Target Run Edition File System is different from the Run Edition File System port pool of that Source node. Also ensure that the port pool provided for Target Patch Edition File System is different from that of Target Run Edition File System.

4. Add the additional application tier secondary node.

   Follow the instructions in the next section, "5.3 Adding a New Application Tier Node to an Existing System," to add a new node in the Run and Patch Edition File Systems of the Target System.

5. Repeat Step 4 to add the desired number of secondary nodes.

> **Note**: If you are using a load balancer to distribute processing across all the application tier nodes, each node should have the value of the s_webentryhost context variable set to be that of the load balancer's hostname.

5.3 Adding a New Application Tier Node to an Existing System

You can use Rapid Clone to clone a node and add it to the existing Applications system, a process also known as scale up or scale out. The new node may run the same services as the Source node or different services.

Before adding a new node, you should update the `tcp.invited_nodes` parameter of `sqlnet.ora` on the database tier to include the host.domain of the new node being added.

> **Note**: The addition of nodes should not be done during an active adop cycle.

5.3.1 Steps for adding a node on a shared file system

Refer to Section 4 of My Oracle Support Knowledge Document 1375769.1, Sharing the Application Tier File System in Oracle E-Business Suite Release 12.2, for detailed instructions on adding nodes on a shared file system.

5.3.2 Steps for adding a node on a non-shared file system

1. Run `adpreclone.pl` on both the Run and Patch Edition File Systems in the primary application tier node of the E-Business Suite instance.

   Note: Before performing this step, ensure the AdminServer on both the Run Edition File System and the Patch Edition File System is running. The AdminServer on the Patch Edition File System can be shut down after completion of `adpreclone.pl`.

2. Copy the Run Edition File System to the Target secondary node.

   - Only the following directories should be copied:
     `<APPL_TOP>`
     `<COMMON_TOP>`
     `<OracleAS Tools 10.1.2 ORACLE_HOME>`
   - The secondary node must be on a different host.
   - If the primary node's Run Edition File System is in fs1, then the secondary node's Run Edition File System should also be in fs1. If the primary node's Run Edition File System is in fs2, then the secondary node's Run Edition File System should also be in fs2.

   Note: In Release 12.2, the base directory location needs to be set to the same value on all application tier nodes. This should be taken care of while copying the the Run and Patch Edition File Systems to the Target secondary node.

3. Configure both Run and Patch Edition File Systems in the Target secondary node.

   Note: Before performing these steps, ensure the AdminServer on both the Run Edition File System and the Patch Edition File System is running. This is required for `adcfgclone.pl` to properly register the new node on the Oracle E-Business Suite instance.

   Note:
   - Refer to Appendix A and ensure that the Oracle Homes of the Run or Patch Edition file system of the new node being added are not already registered in the Oracle inventory.
   - If addition of the node is being attempted after a failed execution of adcfgclone.pl, execute steps to first delete the node as per steps in Section 5.4.

   1. If the Oracle E-Business Suite instance has R12.TXK.C.DELTA.11 (Patch 28840822) or CPU patch for APR 2019 or higher applied (Refer My Oracle Knowledge Support Document 2514102.1, Oracle E-Business Suite Release 12 Critical Patch Update Knowledge Document (April 2019)), before adding an application tier node, a connection filter rule for the new application tier node needs to be added on the Oracle WebLogic AdminServer of both RUN and Patch file system. Refer to Appendix C for the steps.

      Note: Check the value of the context variable `s_wls_admin_console_access_nodes` on the primary node. Ensure that all hosts listed in the context variable are resolvable from the new application tier node.

2. Log in as the `applmgr` user to the Run Edition File System in the Target node and run adcfgclone.pl to clone both the Run and Patch file systems:

> **Note**: Ensure that you enter the correct password for "WebLogic AdminServer." Although Rapid Clone will not be able to validate the password at this stage, it will fail later if the password is incorrect.

The adcfgclone.pl script can be run in either the interactive mode or in the non-interactive mode for adding the node. You can choose one of the two options.

- **Running adcfgclone.pl in the interactive mode**

  Run the following command:

```
$ cd <COMMON_TOP>/clone/bin
$ perl adcfgclone.pl appsTier dualfs
```

  When asked the questions:

  - "Do you want to add a node (yes/no)" you should answer '**yes**'
  - "Do you want to startup the Application Services for <TWO_TASK>? (y/n)" you should answer '**y**' if the Application services are to be started up. Otherwise, you should answer **'n'**.

> **Note:** Ensure that the port pool provided for the Run Edition File System is different from the port pool of the Patch Edition File System of the primary node. Otherwise, it will result in errors during execution of fs_clone.
>
> As mentioned earlier, the function (run or patch) of the two file systems is not static, and their values switch every time when a cutover phase is complete. Hence, refer to the environment variables `$RUN_BASE` and `$PATCH_BASE` to determine the Run Edition File System and Patch Edition File System respectively.

- **Running adcfgclone.pl in the non-interactive mode**

  Run the following command:

```
$ cd <COMMON_TOP>/clone/bin
$ perl adcfgclone.pl component=appsTier pairsfile=<PAIRSFILE> addnode=yes dualfs=yes
```

  The sample pairsfile for application tier is delivered under `INST_TOP` of each file system in the location `<INST_TOP>/appl/admin/<CONTEXT_NAME>.txt`. It should be updated to have values corresponding to the node being added.

> **Note:**
> Ensure the following while setting values in the pairs file:
> - The value of `'s_shared_file_system'` should be set to `'false'` and the value of `'s_atName'` should be set to the hostname of the node being added.
> - The port pool provided for the Run Edition File System is different from the port pool of the Patch Edition File System of the primary node. Otherwise, it will result in errors during execution of fs_clone. As mentioned earlier, the function (run or patch) of the two file systems is not static, and their values switch every time when a cutover phase is complete. Hence, refer to the environment variables `$RUN_BASE` and `$PATCH_BASE` to determine the Run Edition File System and Patch Edition File System respectively.

- The value of `'patch_s_port_pool'` for the port pool of the Patch Edition File System is provided correctly.

Different logs are created for Run Edition and Patch Edition node addition. The log files are created in the following directories in the Run Edition File System:

- `<INST_TOP>/admin/log/clone/run`
- `<INST_TOP>/admin/log/clone/patch`

4. Register the new topology from the newly added application tier node.

    1. If OHS is enabled on the newly added node, perform the following steps on that node:

        1. Source the Run Edition File System.

        2. The OHS configuration files mod_wl_ohs.conf and apps.conf will contain entries of managed servers from all application tier nodes. If any of these managed servers are not desired to be part of the cluster configuration on the current node, run the following command to delete details of these managed servers from the OHS configuration files mod_wl_ohs.conf and apps.conf on the current node:

```
$ perl <FND_TOP>/patch/115/bin/txkSetAppsConf.pl \
  -contextfile=<CONTEXT_FILE> \
  -configoption=removeMS \
  -oacore=<host>.<domain>:<port>  \
  -oafm=<host>.<domain>:<port> \
  -forms=<host>.<domain>:<port> \
  -formsc4ws=<host>.<domain>:<port> \
  -ekanban=<host>.<domain>:<port> \
  -accessgate=<host>.<domain>:<port> \
  -yms=<host>.<domain>:<port>

where
    ▪ The argument contextfile accepts the complete path to the context file.
    ▪ The arguments oacore, oafm, forms, formsc4ws, ekanban, accessgate and yms accept a
      comma-separated list of managed server details in the following format:
      <host>.<domain>:<port>
          ▪ host, domain and port are the hostname, domain and port of the managed server
            whose reference is to be deleted.
```

            For example, to delete references of managed servers oacore_server1 on 'testserver1' and forms_server2 on host 'testserver2' on the domain 'example.com' with ports 7201 and 7601 respectively, the following command should be run:

```
$ perl <FND_TOP>/patch/115/bin/txkSetAppsConf.pl -contextfile=<CONTEXT_FILE> \
  -configoption=removeMS -oacore=testserver1.example.com:7201 -forms=testserver2.example.com:760
```

    2. Perform the following steps on the other application tier nodes participating in the same cluster where this node is added:

        1. Source the Run Edition File System.

        2. If any of the managed servers from the newly added node are desired to be part of the cluster configuration on the current node, run the following command to add details of these managed servers into the OHS configuration files mod_wl_ohs.conf and apps.conf on the current node:

```
$ perl <FND_TOP>/patch/115/bin/txkSetAppsConf.pl \
  -contextfile=<CONTEXT_FILE> \
  -configoption=addMS \
  -oacore=<host>.<domain>:<port> \
```

```
  -oafm=<host>.<domain>:<port> \
  -forms=<host>.<domain>:<port> \
  -formsc4ws=<host>.<domain>:<port>

where
    ▪ The argument contextfile accepts the complete path to the context file.
    ▪ The arguments oacore, oafm, forms, formsc4ws accept a comma-separated list of
      managed server details in the following format:
      <host>.<domain>:<port>
          ▪ host and domain are the hostname and domain name of the newly added node
          ▪ port is the port of the new managed server whose reference is to be added
```

For example, if the newly added node on host 'testserver1' and domain 'example.com' contains managed servers oacore_server3 and oafm_server3 with ports 7205 and 7605 respectively, the following command should be run:

```
$ perl <FND_TOP>/patch/115/bin/txkSetAppsConf.pl -contextfile=<CONTEXT_FILE> \
-configoption=addMS -oacore=testserver1.example.com:7205 -
oafm=testserver1.example.com:7605
```

3. On all application tier nodes, perform the following steps to register the newly added application tier node with the application tier TNS Listener (FNDFS listener) on each node:

    1. Source the Run Edition file system.

    2. Run AutoConfig.
    On Unix:

    ```
    $ sh <ADMIN_SCRIPTS_HOME>/adautocfg.sh
    ```

    On Windows:

    ```
    C:\> <ADMIN_SCRIPTS_HOME>\adautocfg.cmd
    ```

    3. Reload the application tier TNS Listener (FNDFS listener) as follows:

    ```
    $ lsnrctl reload APPS_<TWO_TASK>
    ```

5. If the Node Manager service is up on the Patch Edition File System of the newly added application tier node, shut it down as follows:

    On UNIX:

    ```
    $ sh <ADMIN_SCRIPTS_HOME>/adnodemgrctl.sh stop
    ```

    On Windows:

    ```
    C:\> <ADMIN_SCRIPTS_HOME>\adnodemgrctl.cmd stop
    ```

6. Shut down the Admin Server and the Node Manager on the Patch Edition File System of the primary node as follows:

    On UNIX:

    ```
    $ <ADMIN_SCRIPTS_HOME>/adadminsrvctl.sh stop
    $ <ADMIN_SCRIPTS_HOME>/adnodemgrctl.sh stop
    ```

    On Windows:

    ```
    C:\> <ADMIN_SCRIPTS_HOME>\adadminsrvctl.cmd stop
    C:\> <ADMIN_SCRIPTS_HOME>\adnodemgrctl.cmd stop
    ```

7. Perform the following steps on all database tier nodes to add the newly added node to the Access Control List.
    1. Source the database environment file.
    2. Run AutoConfig as follows:

        On UNIX:

        ```
        $ <RDBMS_OH>/appsutil/scripts/<CONTEXT_NAME>/adautocfg.sh
        ```

        On WIndows:

        ```
        C:\> <RDBMS_OH>\appsutil\scripts\<CONTEXT_NAME>\adautocfg.cmd
        ```

    3. Reload the Database listener as follows:

        ```
        C:\> lsnrctl reload <ORACLE_SID>
        ```

After adding new nodes, refer to My Oracle Support Knowledge Document 1375686.1, Using Load-Balancers with Oracle E-Business Suite Release 12.2, for details on how to set up load balancing.

Note: If SQL*Net access security is enabled in the existing system, you first need to authorize the new node to access the database through SQL*Net. Refer to the Oracle Applications Manager online help for instructions on how to accomplish this.

5.4 Deleting an Application Tier Node

Note: These steps are ONLY for deletion of secondary application tier nodes. The primary application tier node cannot be deleted using these steps.

The following steps should be performed to delete a secondary application tier node from an existing Oracle E-Business Suite Release 12.2 multi-node instance. The steps described in this section are applicable to secondary application tier nodes with shared and non-shared file systems.

Note: In case OHS is enabled only on the secondary node being deleted, OHS needs to first be enabled on some other node before starting with deletion of the node.

Before performing the following steps, ensure that the WebLogic administration server is running from both the Run and Patch Edition File Systems of the primary application tier node.

Note: Do not perform a 'delete node' operation when a patching cycle is active.

1. Delete the run file system and patch file system configuration of the secondary application tier node.

    Note: Deletion of nodes may need to be performed in two scenarios - when the node is still accessible (users are able to login to the node) and in the remote case when the node is not accessible due to some issues (the node may not be physically present and/or login to the node is not possible).

    In the first scenario, all information related to the node has to be cleaned up altogether (including removal of references from the WebLogic domain and EBS topology as well as removal of the file system and inventory references). **Case 1** describes the steps to be performed in this scenario.

    In the second scenario, references to the node can be cleaned up only from the WebLogic domain and the EBS topology. The steps for deletion of secondary nodes in this scenario are described in **Case 2** below. Please note that this option has been introduced in R12.TXK.C.DELTA.6 and is not available in the earlier releases.

In order to keep the E-Business Suite instance in a consistent state, steps should be followed **strictly** based on the scenario.

Case 1: If the secondary node to be deleted is accessible, perform the following steps:

1. Login to the secondary node to be deleted.
2. Source the run file system.
3. Ensure that all application tier services from the run and patch file system for the node to be deleted are shut down.
4. Execute the ebs-delete-node option of the `adProvisionEBS.pl` script as follows:

```
$ perl <AD_TOP>/patch/115/bin/adProvisionEBS.pl ebs-delete-node \
-contextfile=<CONTEXT_FILE> -logfile=<LOG_FILE>
```

   This will delete the managed servers, OHS instances and Node Manager on the current node from the run file system WebLogic domain.

5. If the node is a non-shared node, verify and remove the following Oracle Home entries of both the Run and Patch file systems from the Oracle Inventory:

   - `<FMW_HOME>/webtier`
   - `<FMW_HOME>/oracle_common`
   - `<FMW_HOME>/Oracle_EBS-app1`

   If any of the above Oracle Home entries are already registered in Oracle Inventory, you can run the following command to de-register or detach that Oracle Home:

```
$ cd <Oracle Home>/oui/bin
$ ./runInstaller -detachhome ORACLE_HOME=<Oracle Home Location> [-invPtrLoc <s_invPtrLoc>]
```

   Here,
   `-invPtrLoc` argument needs to be specified only if the 'EBS installation central' inventory is being used.
   `s_invPtrLoc` is the context variable that stores the inventory pointer location.

   For example:

```
$ cd /u02/r122/fs1/FMW_Home/oracle_common/oui/bin
$ ./runInstaller -detachhome \
ORACLE_HOME=/u02/r122/fs1/FMW_Home/oracle_common -silent
```

   Note: The Oracle Home <FMW_HOME>/webtier should be de-registered from the Oracle Inventory before trying to remove the Oracle Home <FMW_HOME>/oracle_common.

6. If the node is a non-shared node, verify and remove the following Oracle Home entry from the Oracle Inventory:

   `<OracleAS Tools 10.1.2 ORACLE_HOME>`

   If the above Oracle Home entry is registered in Oracle Inventory, you can run the following command to de-register the Oracle Home:

```
$ ./runInstaller -removeHome ORACLE_HOME=<s_tools_oh> -silent
```

   Here,
   `-invPtrLoc` argument needs to be specified only if the 'EBS installation central' inventory is being used.
   `s_invPtrLoc` is the context variable that stores the inventory pointer location.

For example:

```
$ cd /u02/r122/fs1/EBSapps/10.1.2/oui/bin
$ ./runInstaller -removeHome \
ORACLE_HOME=/u02/r122/fs1/EBSapps/10.1.2 -silent
```

Case 2: If the secondary node to be deleted is not accessible, perform the following steps to remove the node from the FND topology and the EBS domain:

1. Login to the primary node.

2. Source the run file system.

3. Execute the ebs-delete-node option of the `adProvisionEBS.pl` script as follows:

```
$ perl <AD_TOP>/patch/115/bin/adProvisionEBS.pl ebs-delete-node \
-contextfile=<CONTEXT_FILE> -hostname=<HOSTNAME OF NODE TO BE DELETED> -logfile=<LOG_FILE>
```

This will delete all information corresponding to the specified node from the Weblogic domain like the managed servers, OHS instances and Node Manager of the specified node from both the run and patch file system WebLogic domain. In addition, it will also remove the node from the list of active nodes registered in the topology.

> **Note**: Since the steps mentioned in Case 2 take care of only partial cleanup of the node, these steps should be performed **only** in case the node to be deleted is not accessible due to some issues. In all other scenarios, the nodes should be deleted by following steps mentioned in Case1. Otherwise, this may lead to the E-Business Suite instance being in an inconsistent state.

2. Sync the OHS configuration on the other nodes to remove references of the deleted node.

Perform the following steps on the other nodes:

1. Source the run file system.

2. If any of the managed servers from the deleted node are part of the cluster configuration defined on the current node, run the following command to delete details of these managed servers from the OHS configuration files mod_wl_ohs.conf and apps.conf on the current node:

```
$ perl <FND_TOP>/patch/115/bin/txkSetAppsConf.pl \
  -contextfile=<CONTEXT_FILE> \
  -configoption=removeMS \
  -oacore=<host>.<domain>:<port> \
  -oafm=<host>.<domain>:<port> \
  -forms=<host>.<domain>:<port> \
  -formsc4ws=<host>.<domain>:<port> \
  -ekanban=<host>.<domain>:<port> \
  -accessgate=<host>.<domain>:<port> \
  -yms=<host>.<domain>:<port>

where
    ▪ The argument contextfile accepts the complete path to the context file.
    ▪ The arguments oacore, oafm, forms, formsc4ws, ekanban, accessgate and yms accept a comma-
      separated list of managed server details in the following format:
      <host>.<domain>:<port>
          ▪ host, domain and port are the hostname, domain and port of the managed server whose
            reference is to be deleted.
```

For example, if the deleted node was on host 'testserver1' and domain 'example.com' and it contained managed

servers oacore_server3 and oafm_server3 with ports 7205 and 7605 respectively, the following command should be run to remove references to these managed servers:

```
$ perl <FND_TOP>/patch/115/bin/txkSetAppsConf.pl -contextfile=<CONTEXT_FILE>
-configoption=removeMS -oacore=testserver1.example.com:7205 -oafm=testserver1.example.com:7605
```

3. Review and update the value of the context variable 's_shared_file_system' on the master node (required only while deleting a shared file system node).

   If the deleted node was the **only** node sharing the file system with a 'master' application tier node, perform the following steps on the 'master' node:

   1. Set the value of the context variable 's_shared_file_system' in the run context file of the master node to 'false' via the Oracle Applications Manager.

   2. Login to the master node.

   3. Source the run file system.

   4. Run AutoConfig as follows:

      On Unix:

      ```
      $ sh <ADMIN_SCRIPTS_HOME>/adautocfg.sh
      ```

      On Windows:

      ```
      C:\> <ADMIN_SCRIPTS_HOME>\adautocfg.cmd
      ```

4. Run AutoConfig on the database tier.

   1. Log into the database tier node.

   2. Run AutoConfig on the database tier by running the following command:

      For UNIX:

      ```
      $ <RDBMS_OH>/appsutil/scripts/<CONTEXT_NAME>/adautocfg.sh
      ```

      For Windows:

      ```
      C:>\ <RDBMS_OH>\appsutil\scripts\<CONTEXT_NAME>\adautocfg.cmd
      ```

      This step is required to sync-up the tcp.invited_nodes attribute in `sqlnet.ora` to remove the deleted node from the value of this attribute.

   3. Bounce the database listener by running the following command:

      For UNIX:

      ```
      $ sh <RDBMS_OH>/appsutil/scripts/<CONTEXT_NAME>/addlnctl.sh stop <ORACLE_SID>
      $ sh <RDBMS_OH>/appsutil/scripts/<CONTEXT_NAME>/addlnctl.sh start <ORACLE_SID>
      ```

      For Windows:

      ```
      C:\> <RDBMS_OH>\appsutil\scripts\<CONTEXT_NAME>\addlnctl.cmd stop <ORACLE_SID>
      C:\> <RDBMS_OH>\appsutil\scripts\<CONTEXT_NAME>\addlnctl.cmd start <ORACLE_SID>
      ```

Notes:

- Execution of ebs-delete-node option as mentioned above will not delete the contents of the file system. This has to be done manually by the customer once the above steps to delete the node are completed successfully.

  For non-shared node, the following directories can be deleted:

  - `<NE_BASE>`
  - `<RUN_BASE>`
  - `<PATCH_BASE>`
  - `EBSapps.env`

  For a shared file system node, only the `<INST_TOP>` directory of the Run Edition File System and the Patch Edition File System should be deleted.

- On all OHS enabled nodes, patch file system OHS configuration will automatically be synced up during next adop prepare phase.

5.5 Cloning an Oracle RAC System

For details on RAC cloning, please refer to My Oracle Support Knowledge Document 1679270.1, Cloning Oracle E-Business Suite Release 12.2 RAC Enabled Systems with Rapid Clone.

5.6 Adding/Deleting a Node from an Existing Oracle RAC Cluster

As of Release 12, Rapid Clone no longer supports the migration of a database tier to Oracle RAC. Refer to My Oracle Support Knowledge Document 1570554.1, Adding and Deleting Oracle RAC Nodes for Oracle E-Business Suite Release 12.2.x on Oracle Database 11gR2, for instructions on how to perform this task.

5.7 Cloning the Database Separately

Some situations require the database to be recreated separately, without using Rapid Clone. A typical scenario may be when system downtime is not feasible, or an advanced database replication tool such as RMAN is being used to copy the database in hot backup mode.

This section documents the steps that allow manual creation of the Target database control files within the Rapid Clone process. You should use this method for databases located on raw partitions, or when cloning a hot backup. Follow all the steps in Section 3: Standard Cloning Tasks, but replace Step 1 of steps to configure the Target System database server with the following steps:

1. Log in as `oracle` to the Target System.

2. Configure the database Oracle Home.

```
$ cd <RDBMS ORACLE_HOME>/appsutil/clone/bin
$ perl adcfgclone.pl dbTechStack
```

3. Create the Target database control files manually.

   In this step, you copy and recreate the database using your preferred method, such as RMAN restore, Flash Copy, Snap View, or Mirror View.

4. Start the Target database in open mode.

5. Run AutoConfig in the `INSTE8_SETUP` mode on the database tier as follows:

   On UNIX:

```
$ sh <RDBMS_ORACLE_HOME>/appsutil/bin/adconfig.sh contextfile=<CONTEXT_FILE> run=INSTE8_SETUP
```

On Windows:

```
C:\> <RDBMS_ORACLE_HOME>\appsutil\bin\adconfig.cmd contextfile=<CONTEXT_FILE> run=INSTE8_SETUP
```

6. Run the library update script against the database.

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

Where <libext> should be set to `sl` for `HP-UX`, so for any other UNIX platform, or dll for Windows.

7. Configure the Target database.

The database must be running and open before performing this step.

```
$ cd <RDBMS ORACLE_HOME>/appsutil/clone/bin
$ perl adcfgclone.pl dbconfig <Database Target Context File>
```

Where "Database Target Context File" is: `<RDBMS ORACLE_HOME>/appsutil/<Target CONTEXT_NAME>.xml`.

> **Note**: The dbconfig option will configure the database with the required settings for the new Target, but it will not recreate the control files.

5.8 Application Tier Fast Cloning

With the Consolidated Patch on top of TXK Delta 10 (Patch 27294892:R12.TXK.C), the Database SID dependency of the Weblogic domain and the Oracle HTTP Server instance has been removed. With this, the new application tier fast cloning feature has been introduced that drastically cuts down the time and efforts for cloning the application tier. For example, if Rapid Clone of the application tier used to take around 1 hour, with fast cloning approach, the time taken would be around 15 mins or less.

Prerequisites:

The application tier fast cloning process can be used only if the source application tier and the target application tier have identical:

- underlying hardware and operating system
- logical hostname
- directory structure
- port pool
- number of application tier nodes

> **Note**: Other prerequisites mentioned in Section 2 should also be met.

Following are the steps to clone an Oracle E-Business Suite instance using the Fast Cloning approach:

1. Ensure that Patch 27294892:R12.TXK.C is already applied on the source application tier and that both Run and Patch file system Weblogic domain name and OHS instance names on the source application tier are independent of the database SID. Before application of Patch 27294892:R12.TXK.C, the weblogic domain name is of the form EBS_domain_<DB SID>. But with this patch, the weblogic domain name is set to 'EBS_domain'.

2. Clone the database tier. This can be done either using the Rapid Clone scripts as described in Section 3.2 or the database can be cloned separately as described in Section 5.7.

3. Prepare the Source application tier for cloning.

    a. Log on to the primary node of the Source Oracle E-Business Suite instance as the `applmgr` user.

b. Source the environment file of the Run Edition File system.

c. Run the following commands:

```
$ cd <ADMIN_SCRIPTS_HOME>
$ perl adpreclone.pl appsTier
```

d. Shut down the application processes on all Source application tier nodes.

Log on to Run Edition File System of all the application tier nodes of the Source E-Business Suite instance as the `applmgr` user, and shut down all the application processes.

e. Copy the application tier file system of the Oracle E-Business Suite source instance to the respective application tier nodes of the Target.

Perform the following steps for each of the Source application tier nodes, starting with the primary application tier node first:

i. Log on to the Source System application tier node as the applmgr user.

ii. Copy the entire `<s_base>` directory from the Source application tier node to the Target application tier node.

> **Note**: While copying from the source to the target application tier node, ensure that the logical hostname of the two nodes is the same.

The same operating system user must own both the Run Edition and Patch Edition File Systems.

When copying the files, use the values of `$RUN_BASE` and `$PATCH_BASE` variables to determine the values for the Run Edition and Patch Edition of the file system on the Target.

For example, if the Source Run Edition File System has the following values:

```
$RUN_BASE=/u01/122/prod/fs2 $PATCH_BASE=/u01/122/prod/fs1
```

The Target `<s_base>` directory will be `/u01/122/prod`. The Target Run Edition File system will be `/u01/122/prod/fs2` and the Target Patch Edition File System will be `/u01/122/prod/fs1`.

iii. Copy the source application tier inventory to the target application tier node.

f. After the copy is complete, startup the application tier services on the source application tier nodes.

g. Configure the Run file system on the Target application tier node

i. Clone the context file on the Run file system of the target application tier node.

If the target application tier node is the primary node, run the following command:

```
perl adclonectx.pl contextfile=<Source Run file system context file> pairsfile=<Complete path to the pairs file>
```

Otherwise, run the following command:

```
perl adclonectx.pl addnode contextfile=<Target primary node Run file system context file> pairsfile=<Complete path to the pairs file>
```

> **Note**: The sample pairsfile for application tier is delivered under INST_TOP of each file system in the location <INST_TOP>/appl/admin/<CONTEXT_NAME>.txt. It should be updated to have values

corresponding to the node being added.
Ensure that the pairs file also has below entry:
- s_ohs_installed=generateEBSOHSConfigFiles

ii. Update OHS Configuration files on RUN file system
Edit httpd.conf and ssl.conf files to
- replace all references to source context name with target context name.
- update the `ServerName` directive to have the correct web entry value (This is required only if load balancer is configured).

iii. Run AutoConfig on the Run file system as follows:

```
$ cd <AD_TOP>/bin
$ perl adconfig.sh contextfile=<Target Run context file>
```

h. Configure the Patch file system on the Target application tier node

i. Clone the context file on the Patch file system of the target application tier by running the following commands:

If the target application tier node is the primary node, run the following command:

```
perl adclonectx.pl contextfile=<Source Patch file system context file> pairsfile=<Complete
path to the pairs file>
```

Otherwise, run the following command:

```
perl adclonectx.pl addnode contextfile=<Target primary node Patch file system context file>
pairsfile=<Complete path to the pairs file>
```

Note: The sample pairsfile for application tier is delivered under INST_TOP of each file system in the location <INST_TOP>/appl/admin/<CONTEXT_NAME>.txt. It should be updated to have values corresponding to the node being added.
Ensure that the pairs file also has below entry:
- s_ohs_installed=generateEBSOHSConfigFiles

ii. Update OHS Configuration files on PATCH file system

Edit httpd.conf and ssl.conf files to
- replace all references to source context name with target context name.
- update the `ServerName` directive to have the correct web entry value (This is required only if load balancer is configured).

iii. Run AutoConfig on the Patch file system
1. Run AutoConfig to upload the patch context file as follows:

```
$ cd <AD_TOP>/bin
$ perl adconfig.sh contextfile=<Target Run context file> syncctx
```

2. Run AutoConfig to instantiate the AutoConfig templates as follows:

```
$ cd <AD_TOP>/bin
$ perl adconfig.sh contextfile=<Target Run context file> run=INSTE8
```

4. Once all target application tier nodes are configured, startup the Application services on the Run file system of all the target application tier nodes.

Section 6: Automating Rapid Clone

This section describes various cloning procedures that can be automated while cloning Oracle E-Business Suite with Rapid Clone. These procedures include:

Note that directory names `/u04/SOURCE` and `/u04/TARGET` used in the command lines later in each procedure are given as examples. You should run the commands with directory names suitable to your business.

6.1 Cloning the Context File Only

Run the following commands to automate the context file cloning procedure. These commands will not affect the Source System.

- Database tier

```
$ perl adclonectx.pl \
contextfile=/u04/SOURCE/db/tech_st/11.2.0/appsutil/SOURCE_testserver.xml \
outfile=/u04/TARGET/db/tech_st/11.2.0/appsutil/TARGET_testserver.xml
```

  This command will create `/u04/TARGET/db/tech_st/11.2.0/appsutil/TARGET_testserver.xml`.

- Application tier

```
$ perl adclonectx.pl \
contextfile=/u04/SOURCE/inst/apps/SOURCE_testserver/appl/admin/SOURCE_testserver.xml \
outfile=/u04/TARGET/inst/apps/TARGET_testserver/appl/admin/TARGET_testserver.xml
```

  This command will create `/u04/TARGET/inst/apps/TARGET_testserver/appl/admin/TARGET_testserver.xml`.

6.2 Cloning the Context File in Non-Interactive Mode

You can automate context file cloning in non-interactive mode by running the following commands:

> **Note**: Ensure that you use a normal interactive session to supply all the variables prompted. You might need to run the commands several times until there are no issues.

- Database tier

```
$ perl adclonectx.pl \
contextfile=/u04/SOURCE/db/tech_st/11.2.0/appsutil/SOURCE_testserver.xml \
outfile=/u04/TARGET/db/tech_st/11.2.0/appsutil/TARGET_testserver.xml \
pairsfile=/d01/stage/pairsfile.txt noprompt
```

- Application tier

```
$ perl adclonectx.pl \
contextfile=/u04/SOURCE/inst/apps/SOURCE_testserver/appl/admin/SOURCE_testserver.xml \
outfile=/u04/TARGET/inst/apps/TARGET_testserver/appl/admin/TARGET_testserver.xml \
pairsfile=/u04/TARGET/pairsfile.txt noprompt
```

  The pairsfile is a text file only contains variables and values.

  For example:
  - `s_base=/u04/TARGET`
  - `s_at=/u04/TARGET/apps/apps_st/appl`

  The sample pairsfile for application tier is delivered under `INST_TOP` of each file system in the below location:

<INST_TOP>/appl/admin/<CONTEXT_NAME>_run.txt

6.3 Running adcfgclone.pl in Non-Interactive Mode

Run the following commands to execute `adcfgclone.pl` non-interactively:

- On Database tier:

  Run the following command on the database tier passing a pre-created context file:

  ```
  $ perl adcfgclone.pl dbTier \
  /u04/TARGET/db/tech_st/11.2.0/appsutil/TARGET_testserver.xml
  ```

- On application tier:

  Run the following command on the Run Edition File System passing the pairsfile:

  ```
  $ perl adcfgclone.pl component=appsTier \
  pairsfile=/u04/TARGET/pairsfile.txt dualfs=yes
  ```

  This will clone and configure both the Run Edition File System as well as the patch Edition File System.

  The sample pairsfile for application tier is delivered under `INST_TOP` of each file system in the location `<INST_TOP>/appl/admin/<CONTEXT_NAME>.txt`.

> **Note**: Ensure that the value of patch_s_port_pool for the port pool of the Patch Edition File System is provided correctly in the pairs file.

Section 7: Other Cloning Procedures

This section describes the cloning procedures that can be executed separately. All cloning procedures described here can also be run in non-interactive mode.

> **Note**: If you have installed Oracle E-Business Suite Extensions for Oracle Endeca, see My Oracle Support Knowledge Document 1574273.1, Installing Oracle E-Business Suite Extensions for Oracle Endeca, for information about cloning the integrated Oracle Endeca instance.

Cloning Procedures

Available cloning procedures can be summarized as follows:

- **Database tier**
  - Cloning the technology stack on the database tier (dbTechStack)
    See: Cloning the Technology Stacks Only
  - Cloning the database (database)
    See: Cloning the Database Only
  - Configuring the database only
    See: Configuring the Database Only
- **Application tier**
  - Cloning and configuring the APPL_TOP (appltop)
    See: Cloning the APPL_TOP Only

7.1 Cloning the Technology Stacks Only

Run the following commands to clone and configure the relevant technology stack components:

- **Database tier**

  Run this command to clone the database tier technology stack:

```
$ perl adcfgclone.pl dbTechStack
```

7.2 Cloning the Database Only

Run the following command to re-create the control file and configure the database. This command will not reconfigure the database Oracle Home.

```
$ perl adcfgclone.pl database
```

7.3 Configuring the Database Only

Run the following command to clean the topology data model and nodes, as well as to reconfigure the Oracle E-Business Suite data for the new Target. Ensure that the database is running and open before running this command.

```
$ perl adcfgclone.pl dbconfig
```

7.4 Cloning the APPL_TOP Only

Run the following command to only clone and configure the APPL_TOP only. This command will not clone or configure the application tier technology stack.

```
$ perl adcfgclone.pl appltop
```

Section 8: Known Issues

- **Doc 20812601 - Port conflicts reported by T2P domain clone during cloning of multinode source instance**
  When the source is a multi-node Oracle E-Business instance, Rapid Clone may fail on the primary node of the target Oracle E-Business instance due to port conflicts reported during domain cloning.

  In that case, you should check if the port conficts are being reported for the managed servers which were part of the secondary node(s) of the source Oracle E-Business instance. If so, the environment variable `T2P_JAVA_OPTIONS` should be set with the `-Dt2p.temporary.port.range` parameter as follows before running adcfgclone.

```
$ T2P_JAVA_OPTIONS="-Dt2p.temporary.port.range=5001-5050"
$ export T2P_JAVA_OPTIONS
```

  Note: The `-Dt2p.temporary.port.range` parameter should be set to point to any free port range. This port range would be used by the T2P domain cloning code to assign temporary ports to the managed servers from the source Oracle E-Business Suite instance's secondary nodes. The references to the managed servers of the secondary nodes would be removed once Rapid Clone completes on the primary node of the target Oracle E-Business Suite instance. So the ports specified for the `-Dt2p.temporary.port.range` parameter would be used on the target instance only temporarily.

- **Bug 22580358 - Dualfs option does not honour pairsfile entries for patch file system cloning**
  With the 'dualfs' option of Cloning, there is currently no way to customize context variables in patch file system. This is the behavior for both standard cloning as well as for addition of an application tier node.

Refer to the following sections of My Oracle Support Knowledge Document 2047809.1 if you want to customize any context variables on the patch file system during cloning:

- For Standard Cloning, refer to Section 3.
- For setting up a multi-node instance, refer to Section 5.2.
- For addition of an application tier node, refer to Section 5.3.

- **Bug 23343062 - Incorrect Patch file system context file with Dualfs option when hostname is in uppercase**
  On a host with uppercase name, the 'dualfs' option of Cloning may result in the context name and context file name being out of sync between the Run and Patch file system.

  This can happen if the context name or other context variables containing hostname are specified in the pairsfile with the host value in upper case.

  For example, on host `TESTSERVER` with database SID `prod`, if the pairsfile contains the entry '`s_contextname=prod_TESTSERVER`', the Run file system context name and context file name will be set to `prod_TESTSERVER` and `prod_TESTSERVER.xml` respectively while the Patch file system context name and context file name will be set to `prod_testserver` and `prod_testserver.xml` respectively.

  This will lead to validation errors during adop execution.

  To avoid this issue, in case the s_contextname or other context variables containing the hostname are specified in the pairsfile, the specified value should always have the host in lower case.

- **Bug 12960775: Force usage of passing ignorediskwarning option to FMW cloning tool**
  T2P tools cloning copyBinary/pasteBinary had constraints performing disk space calculations when Source or Target Systems are NFS mounted on a different file system such as Data ONTAP (Bug 12680165) which causes Fusion Middleware cloning to fail. As a workaround, before cloning, set the environment variable IGNORE_FMW_DISK_WARNING to "true".

  For example:

  ```
  $ IGNORE_FMW_DISK_WARNING=true
  $ export IGNORE_FMW_DISK_WARNING
  ```

- **Bug 12680165 - T2P close is not checking the space correctly**
  In Release 12.2, it is not supported to have symbolic links in the Oracle E-Business Suite file system. The system temporary directory (typically, `/tmp`) must also be on a local file system and must not be a symbolic (soft) link.

- **Bug 20069296 - unable to find appltop_id for the host**
  If the application tier of the target instance is on the same host (say 'testserver1') as the application tier of the source instance, the following error may be reported while running adop.

  ```
  [UNEXPECTED]Unable to find appltop_id for the host testserver1 from database
  [UNEXPECTED]Invalid appltop id:
  ```

  If this issue is encountered, verify the `AD_APPL_TOPS` table to ensure that the entry for application tier node is correct. The `AD_APPL_TOPS` table contains the column `NAME` and `APPLICATIONS_SYSTEM_NAME` for each non-shared Application node. The value of `NAME` is derived from the value of the context variable `'s_atName'` while the `APPLICATIONS_SYSTEM_NAME` is the value of the context variable `'s_dbSid'`.

  If the entry for the application tier of the target instance is not correct, delete the entry for node by running the following SQL commands:

  ```
  SQL> delete from ad_appl_tops where name='<s_atName>';
  SQL> commit;
  ```

  Thereafter, run AutoConfig on the Run edition file system of the application tier node as follows:

  - On UNIX:

    ```
    $> sh <ADMIN_SCRIPTS_HOME>/adautocfg.sh
    ```

- On Windows:

```
C:\> <ADMIN_SCRIPTS_HOME>\adautocfg.cmd
```

Appendix A: Steps to be performed before restarting a failed RapidClone execution on Application tier

In the event of failure of Rapid Clone during execution of adcfgclone, the following steps need to be performed before restarting adcfgclone execution on the application tier:

On application tier:

1. De-register the Oracle Homes on both Run Edition and Patch Edition file system:

   - Verify if Oracle Inventory contains the following Oracle Home entries for the Run Edition or Patch Edition file system:

     ```
     <FMW_HOME>/oracle_common
     <FMW_HOME>/webtier
     <FMW_HOME>/Oracle_EBS-app1
     ```

     If any of the above Oracle Home entries are already registered in Oracle Inventory, you can run the following command to de-register or detach that Oracle Home:

     ```
     $ ./runInstaller -detachhome \
     ORACLE_HOME=<Oracle Home Location> [-invPtrLoc <s_invPtrLoc>]
     ```

     Here,
     `-invPtrLoc` argument needs to be specified only if an 'EBS Installation Central' inventory is being used.
     `s_invPtrLoc` is the context variable that stores the inventory pointer location.

     For example:

     ```
     $ cd /u02/r122/fs1/FMW_Home/oracle_common/oui/bin
     $ ./runInstaller -detachhome \
     ORACLE_HOME=/s0/r122/at1/FMW_Home/oracle_common
     ```

2. If the FMW_HOME directory structure exists, delete it as follows:

   ```
   $ rm -rf <FMW_HOME>
   ```

Appendix B: Enabling access to the Oracle WebLogic AdminServer console when Connection Filter is enabled

Note: This appendix is applicable only for Oracle E-Business Suite instances which have R12.TXK.C.DELTA.11 (Patch 28840822) or CPU patch for APR 2019 or higher applied (Refer to My Oracle Knowledge Support Document 2514102.1, Oracle E-Business Suite Release 12 Critical Patch Update Knowledge Document (April 2019)) .

If the R12.TXK.C.DELTA.11 (Patch 28840822) or CPU patch for Apr 2019 or higher is applied on an Oracle E-Business Suite instance, Oracle WebLogic Server network connection filters will be enabled by default. Hence, access to the WebLogic AdminServer console will be restricted. In order to allow access from hosts other than the application tier nodes of the Oracle E-Business Suite instance, the following steps need to be performed:

1. Login to the primary node of the Oracle E-Business Suite instance.
2. Startup the WebLogic AdminServer from the RUN file system, if it is not already running.

3. Edit the context variable `s_wls_admin_console_access_nodes` via Oracle Application Manager and set the value to the list of external hosts that are allowed to access the Admin Server. For each host, specify either the fully qualified domain name or the IP address. Use commas to separate the hosts in the list.

   For example, s_wls_admin_console_access_nodes can be set to '`<FQDN_HOST1>,<FQDN_HOST2>`' or '`<IP_HOST1>,<FQDN_HOST2>`' where `FQDN_HOST1` and `FQDN_HOST2` are the fully qualified hostnames of Host1 and Host2 respectively and `IP_HOST1` is the IP address of Host1.

   Note: While adding an IP address of a host or its fully qualified hostname to the `s_wls_admin_console_access_nodes` context variable, it should be ensured that the hostname is resolvable from all application tier nodes of the Oracle E-Business Suite instance.

4. Run AutoConfig on the Run File system as follows:
   For UNIX:

   ```
   $ sh <ADMIN_SCRIPTS_HOME>/adautocfg.sh
   ```

   For Windows:

   ```
   C:\> <ADMIN_SCRIPTS_HOME>\adautocfg.cmd
   ```

5. Bounce the Oracle WebLogic AdminServer as follows:
   For UNIX:

   ```
   $ sh <ADMIN_SCRIPTS_HOME>/adadminsrvctl.sh stop
   $ sh <ADMIN_SCRIPTS_HOME>/adadminsrvctl.sh start
   ```

   For Windows:

   ```
   C:\> <ADMIN_SCRIPTS_HOME>\adadminsrvctl.cmd stop
   C:\> <ADMIN_SCRIPTS_HOME>\adadminsrvctl.cmd start
   ```

6. Run adop fs_clone to sync up this setting on the Patch file system.

Appendix C: Adding Connection Filter Rule for a new Application tier node

Note: This appendix is applicable only for Oracle E-Business Suite instances which have R12.TXK.C.DELTA.11 (Patch 28840822) or CPU patch for APR 2019 or higher applied (Refer to My Oracle Knowledge Support Document 2514102.1, Oracle E-Business Suite Release 12 Critical Patch Update Knowledge Document (April 2019)).

Before adding an application tier node to an Oracle E-Business Suite instance, a connection filter rule needs to be added for this node on both Run File system Oracle WebLogic server as well as the Patch file system Oracle WebLogic server.

If this rule is not added, Rapid Clone code for adding the node will not be able to establish a connection to the Oracle WebLogic AdminServer running on the primary node and will fail.

Following are the steps to be performed for adding the connection filter rule for the new application tier node:

1. Login to the primary node of the Oracle E-Business Suite instance.

2. Source the Run file system environment file.

3. Startup the Run file system AdminServer if not already up.

4. Run the following command to add a connection filter rule on the Run file system Oracle WebLogic server:

   On Oracle E-Business Suite instances having CPU Patch for Jan 2020 or higher (Refer to My Oracle Knowledge Support Document 2613782.1, Oracle E-Business Suite Release 12 Critical Patch Update Knowledge Document (January 2020)):

   ```
   $ perl <AD_TOP>/patch/115/bin/txkWLSConnectionFilterManager.pl -contextfile=<CONTEXT_FILE> -option=add-
   filter-rule -hostname=<Fully Qualified Domain Name of new node>
   ```

   Otherwise, the following command should be used:

   For UNIX:

   ```
   $ java -cp $CLASSPATH:<FMW_HOME>/wlserver_10.3/server/lib/weblogic.jar
   oracle.apps.ad.tools.configuration.RegisterNodePreReq add-filter-rule
   -contextfile <CONTEXT_FILE> -hostname <Fully Qualified Domain Name of new node>
   ```

   For Windows:

   ```
   $ java -cp $CLASSPATH;<FMW_HOME>/wlserver_10.3/server/lib/weblogic.jar
   oracle.apps.ad.tools.configuration.RegisterNodePreReq add-filter-rule
   -contextfile <CONTEXT_FILE> -hostname <Fully Qualified Domain Name of new node>
   ```

5. Bounce the Run file system AdminServer as follows:

   For UNIX:

   ```
   $ sh <ADMIN_SCRIPTS_HOME>/adadminsrvctl.sh stop
   $ sh <ADMIN_SCRIPTS_HOME>/adadminsrvctl.sh start
   ```

   For Windows:

   ```
   C:\> <ADMIN_SCRIPTS_HOME>\adadminsrvctl.cmd stop
   C:\> <ADMIN_SCRIPTS_HOME>\adadminsrvctl.cmd start
   ```

6. Source the Patch file system environment file.

7. Startup the Patch file system AdminServer.

8. Add the connection filter rule in the Patch file system Oracle WebLogic server by running the command mentioned in Step 4, passing the Patch context file.

9. Bounce the Patch file system AdminServer following the commands mentioned in Step 5.

Change Log

Date	Description
07 Aug 2020	• Updated the usage for a script in Appendix C.
03 Feb 2020	• Corrected usage of a script in Appendix C.
27 Jan 2020	• Added new command for adding connection filter rules in Appendix C. • Corrected typos in Section 5.8.
28 Jun 2019	• Added Windows-specific commands for adding connection filter rules.

03 May 2019	• Added a step to Appendix B.
16 Apr 2019	• Added connection filter related changes.
08 Apr 2019	• Add a known issue.
18 Oct 2018	• Added Section 5.8 for the new feature of application tier Fast Cloning.
23 Nov 2017	• Added the finishing task to copy jar signing files from source.
01 Aug 2016	• Added a known issue.
25 Apr 2016	• Added a known issue. • Added a restriction with the port pool settings • Updated information related to pairsfile on Windows platform. • Updated Global Inventory requirements section.
14 Oct 2015	• Updated the cloning steps to correspond to the steps specific to TXK Delta 7. • Added information about using EBS Installation Central inventory. • Added information about log files. • Created Appendix A. • Updated Section 5.1. • Added requirement for ETCC execution in Section 1. • Updated Section 3.2 with a required step for cloning 12c database.
10 Apr 2015	• Modified the content in Section 3.2 and Section 5.2.
18 Mar 2015	• Added changes to Section 5.4 as per new features introduced in TXK Delta 6.
03 Dec 2014	• Rephrased the section containing instructions for running ETCC.
02 Dec 2014	• Added the step to run ETCC after database tier clone. • Added Global Inventory Requirements in Section 2. • Added known issues and updated the content to have more clarity.
15 Jul 2014	• Modified the content in Section 5.3. • Updated the title of Note 1617461.1.
18 Jun 2014	• Corrected prompts referenced in Section 5.3 • Added information to Bug 12680165 in Section 8
17 Jun 2014	

	• Updated Section 8 bug information
04 Jun 2014	• Inserted updated content from Cloning chapter in Oracle E-Business Suite Setup Guide
28 Feb 2014	• Added new required patches AD/TXK.DELTA.3

My Oracle Support Knowledge Document 1383621.1 by Oracle E-Business Suite Development.