hi everyone,

In this lecture we will discuss about adding a node to an Oracle RAC and deleting a node from Oracle RAC.

In this short lecture, you will learn how to perform the following:
Delete a node from an Oracle RAC
And add a node to an Oracle RAC

Oracle RAC database support online scaling up and online scaling down its cluster. In other words, you can delete a node from a RAC cluster or add a node to a RAC cluster online... without having to shutdown the database service.

First, we will discuss about deleting a node... then we will discuss about adding a node.

Luckily there is no complications in their procedures... they are systematic and sequential.

The table in the slide is demonstrating the steps that we should follow to delete a node from an administrator-managed RAC database cluster.

Before getting into the details, you have to be careful about two points about the procedure.

First, it is sequential. You must run the procedure steps in sequential order. First step number 1, then step number 2, then step number 3, and finally step number 4.

You should not skip a step, and you should not run the steps in parallel.

The second point is that each step must be run either in one of the nodes that you want to keep in the cluster OR in the node that you want to delete.

All the procedure steps are destructive. So, please be careful when

you implement them. If you implement a step in a wrong node, you can easily end up with losing a node that you want to keep.

Let's discuss now the details of the procedure.

First, we should delete the Oracle database instance that is running in the node to delete.

The easiest tool to delete an Oracle database instance from a node is the dbca. In the practice lecture, we will see the options in this utility which allows us to delete a database instance.

The dbca should be run from one of the nodes that will remain in the cluster, not from node that you want to delete.

Second, we have to remove the Oracle database software home from the node that we want to delete.

To perform this step, we should run a script named as deinstall as oracle. This script is located in the directory $ORACLE_HOME/deinstall. And it must be run from the node that we want to delete.

Third, we have to remove the Oracle clusterware software home from the node that we want to delete. To achieve this task, we use a script with the same name: deinstall.

The script is also located in $ORACLE_HOME/deinstall, but pay your attention please. We are talking over here about removing the clusterware, not the database software. Database software was removed in step number 2.

When removing the clusterware, we are logged on to the node as

grid. So, the Oracle home in this step is the clusterware software, not the database.

We deleted the database instance, the Oracle database software home, and the Clusterware home.

We are not done yet.

After deleting all those components, we have to delete the node from the OCR. To achieve this task, we have to run the command crsctl delete node as root. This command should be executed in on of the nodes that will remain in the cluster.

Before finishing with the node deletion procedure, I should mention one point.

When we execute this procedure, we usually run some commands before executing each step. Those commands are pre-requisties for each step.

For example, before deleting the database instance, we should verify that there is a backup of the OCR. If there is no OCR backup, we have to take.

Another example: before removing Oracle database software home, we have to stop and disable the listener in the node that we want to delete.

Those actions will be mentioned and demonstrated in the next practice lecture.

Finally, after we implement this procedure, it is recommended to use the CVU utility verify that the node was successfully deleted from the

cluster. We will also demonstrate this step in the practice lecture.

Before I finish with this slide, I need to raise a point. This procedure is applicable on an administrator-managed RAC database. For policy-managed databases, the procedure is slightly different. Refer to the documentation for details about removing a node from a policy-managed RAC database.

We've discussed the procedure to delete a node, let's discuss now the procedure to add a node.

This is actually one of the major advantage of Oracle RAC. It allows us to scale up the service, if the business growth needs it.

When we want to add a node to the cluster, we have to perform all the prerequisite actions on it before we can add the database instance on it.

We have to perform all the preparation actions that we performed when we prepared the nodes for the RAC the first time we create the system.

We have to make and configure the network connections, connect the node to the storage, create the directories and the operating system users and groups, configure the operating system itself the same way we configured all the other nodes in the cluster, and so on.

And as we have learnt in the course, the node must have the same operating system as all the other nodes in the cluster and it is highly recommended to have the same hardware specifications as the other nodes.

But we should not install Oracle clusterware or Oracle database software in the new node. This will be done from the cluster itself.

After the node is connected and prepared for the cluster, we are ready to perform the node addition procedure as described in the

slide.

First, we should extend Oracle clusterware software home into the new node. That's why we should not install Oracle clusterware in the new node. Oracle clsuterware will be installed and configured by one of the existing RAC nodes... and that's what we call it "oracle home extension".

Performing the step is easy. We just have to login as grid to one of the existing nodes and run a script named as addnode.sh. This script is located in $ORACLE_HOME/addnode directory.

When we run this script, we will see an installer wizard that will guide us on the procedure to extend the clusterware software into the new node.

You will practically experience implementing all this procedure in a separate practice lecture.

After the Clsuterware is successful extended to the new node, we need to extend the Oracle database home.

Again, we just have to login as oracle to an existing node and run the script addnode. Another wizard will pop up and guide us on the rest of the task.

Because steps numbered 1 and 2 involve copying and configuring homes, they will take some time to finish.

After the homes are extended, we can create the database instance in the new node. To do so, we need to login to the new node as oracle and run the dbca utility. The utility will guide us on the steps to create the instance.

Once the instance is created, the job is done. The database is running with an extra node added to it.

Some actions should be performed before and after each step in this procedure. You will learn about them in the practice lecture.

And that's it for this lecture.

In this lecture, we have discussed the procedures to delete a node from an Oracle RAC and add a node to an Oracle RAC.

There are some actions involved in the procedures that were not shown in this lecture. You will learn and practice those actions in the practice lectures.

In the incoming two practice lectures, you will implement the procedures to delete a node from a RAC cluster and then add a node to a RAC cluster.

See you guys over there. Till then, thank you very much!