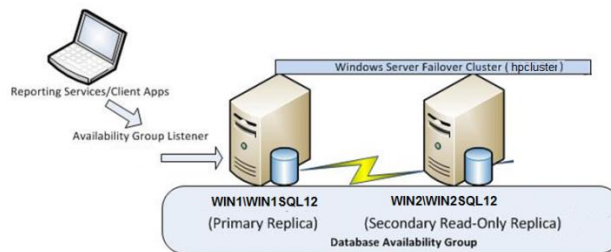


Always On Availability Groups in SQL Server 2012

Step by Step Always On Availability Groups in SQL Server 2012

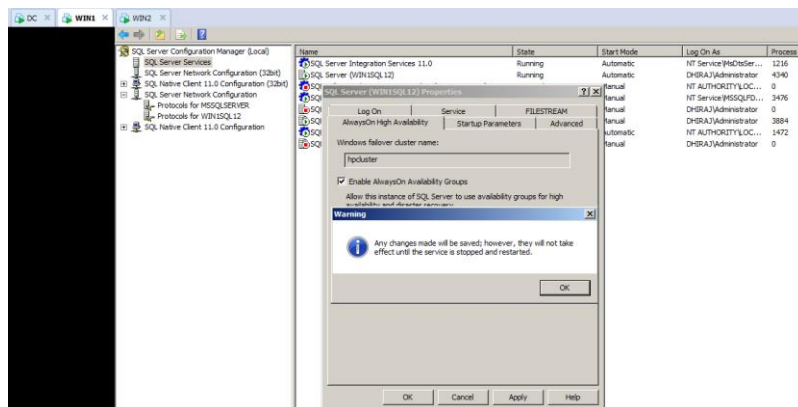
- 1) Windows Server 2008 R2 Failover Cluster with 2 Nodes. (WIN1 & Win2)
- 2) Microsoft SQL Server 2012 (Enterprise) Installed on Both the nodes. (WIN1 & WIN2)
- 3) SQL Instance on WIN1 : WIN1\WIN1SQL12
- 4) SQL Instance on WIN2 : WIN2\WIN2SQL12
- 5) Assign Service accounts with domain permissions to SQL Service.
- 6) Off the firewall Settings on both the node.
- 7) make sure that you are able to connect both SQL Server Instances from both Node.



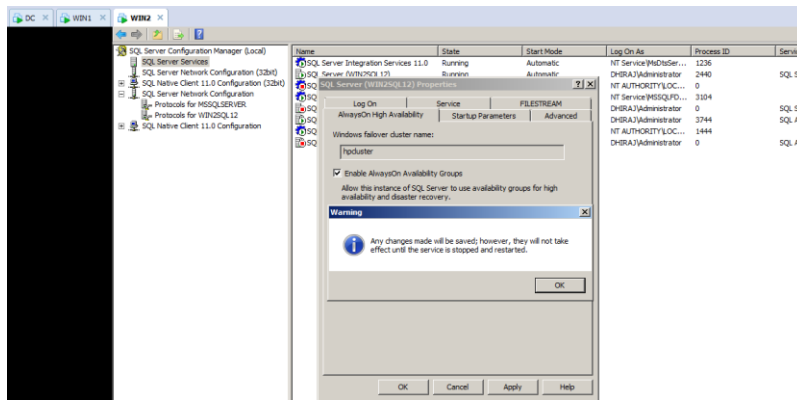
Enable Availability Groups on SQL Server

This needs to be done on all of the SQL Server instances that you will configure as replicas in your Availability Group. To enable the SQL Server 2012 AlwaysOn Availability Groups feature

1. Open SQL Server Configuration Manager
2. Select SQL Server Services
3. Right-click on your SQL Server (in our example it is named WIN1SQL12) and select Properties
4. Select the “AlwaysOn High Availability” tab and check "Enable AlwaysOn Availability Groups"
5. Restart the SQL Server service.

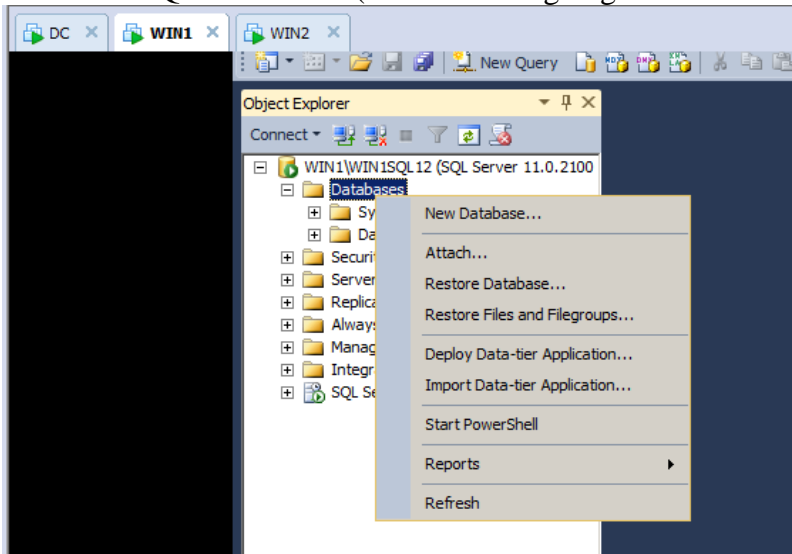


Follow the same steps on Second Instance (WIN2SQL12)

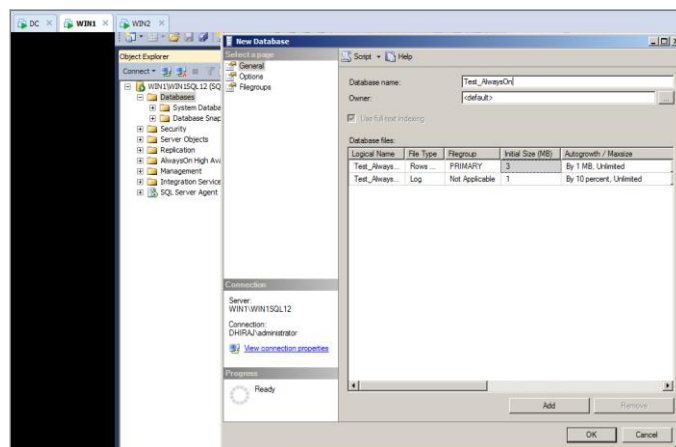


Sample DB for Always On Configuration

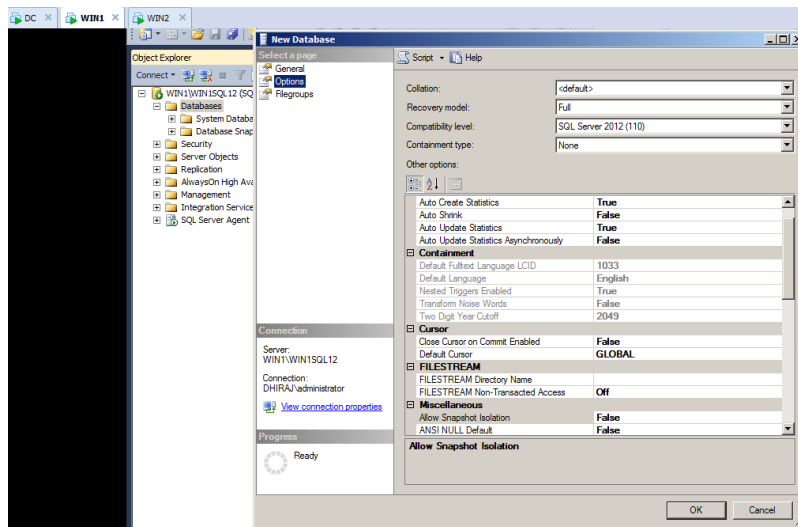
Create a sample Database on WIN1SQL12 Instance (which we are going to set as a Primary Instance)



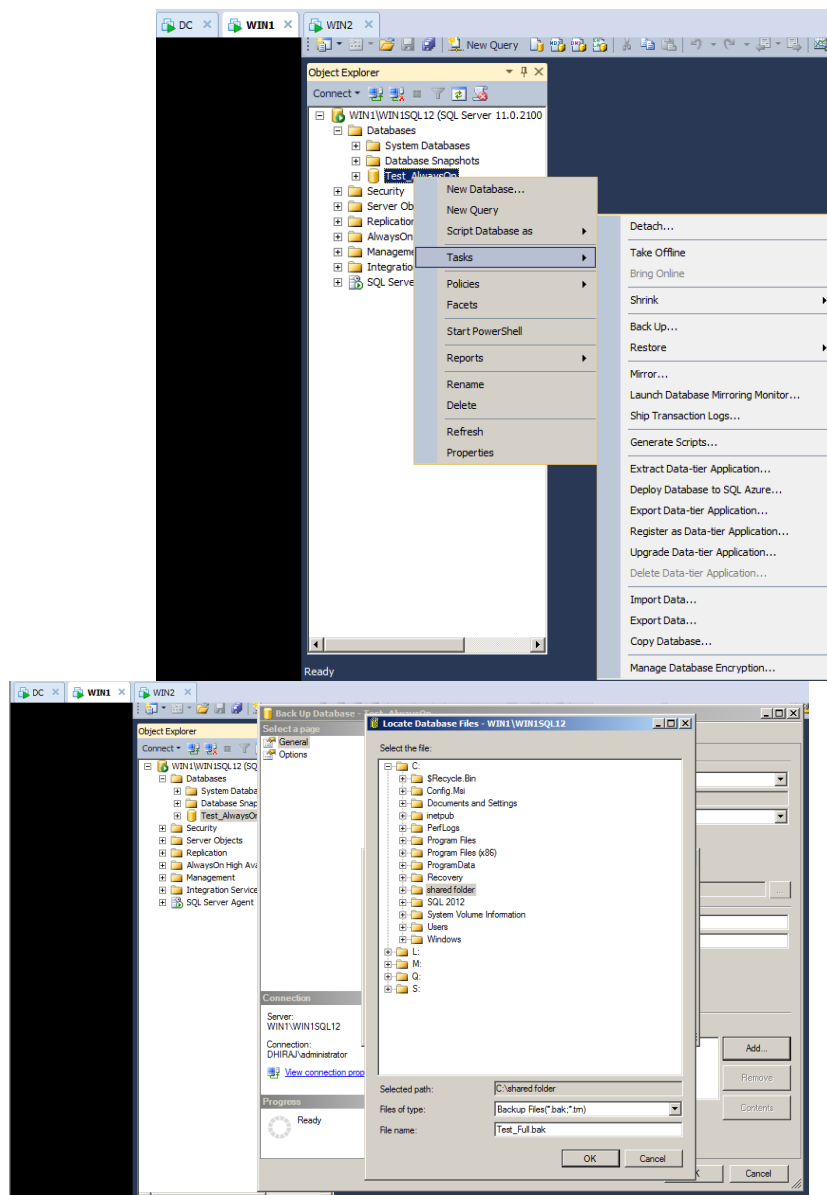
Here we are giving DB name as “Test_AlwaysOn”

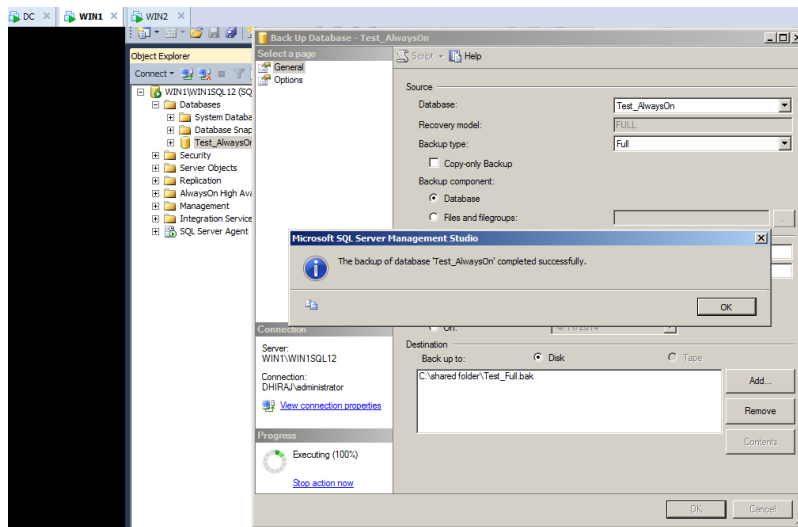


Make sure that Recovery Model for the database should be Full.

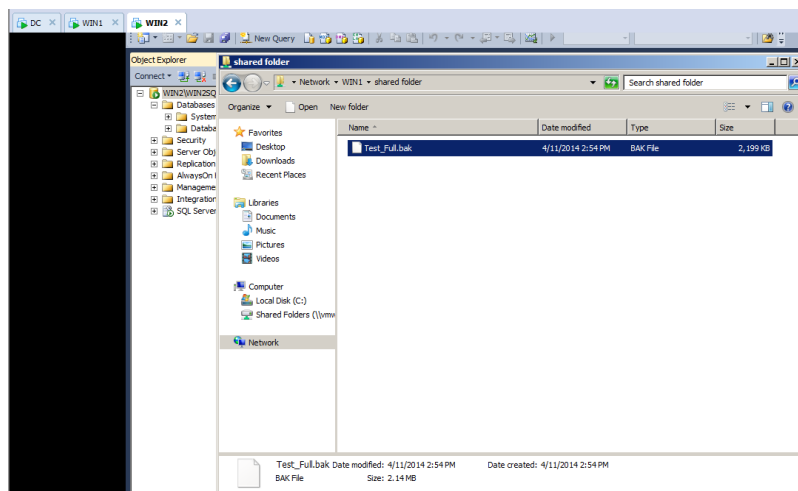


Take Backup of Test_AlwaysOn DB in a shared folder, so we can copy the backup file on secondary Server and restore there.

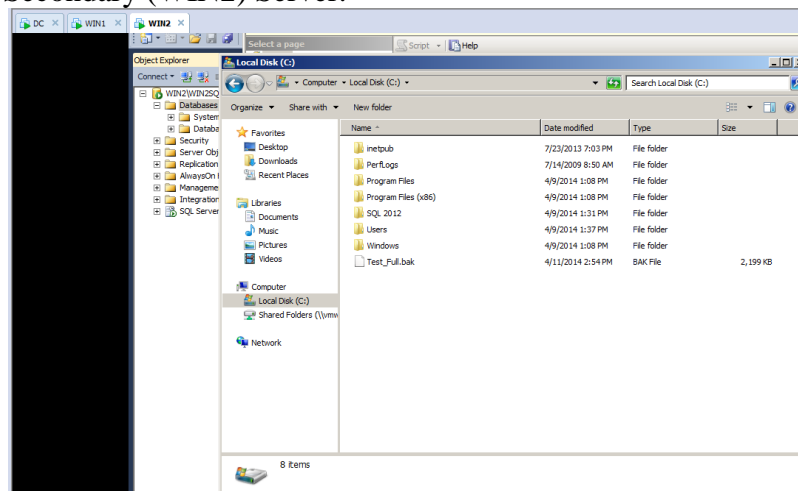




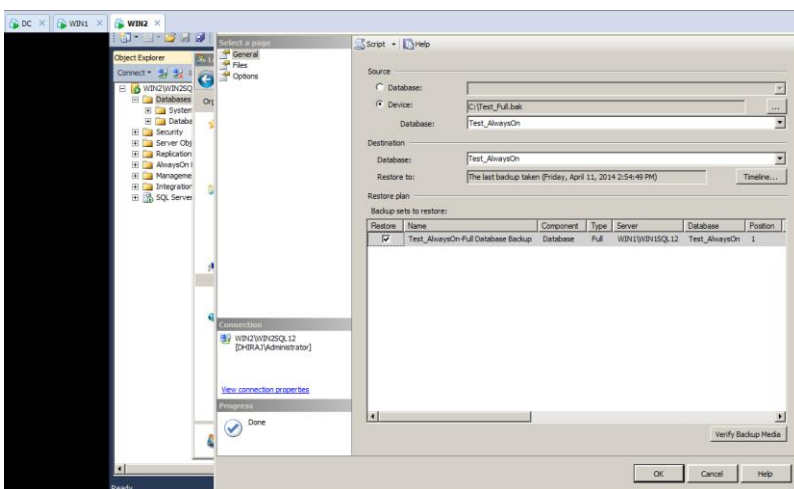
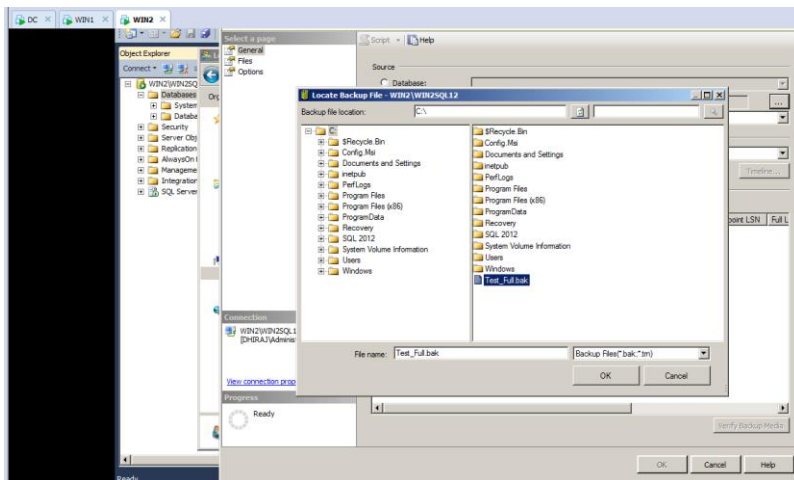
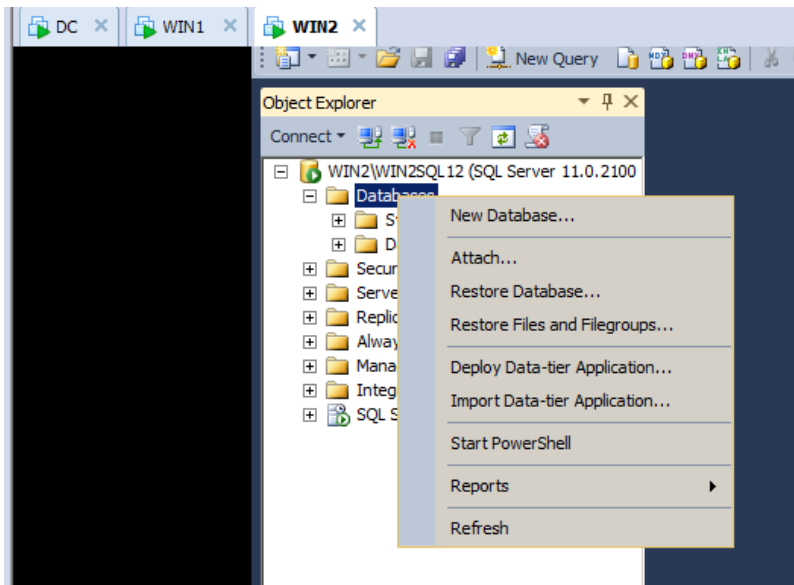
Open the shared folder on Secondary Node (WIN2) via Network Share.



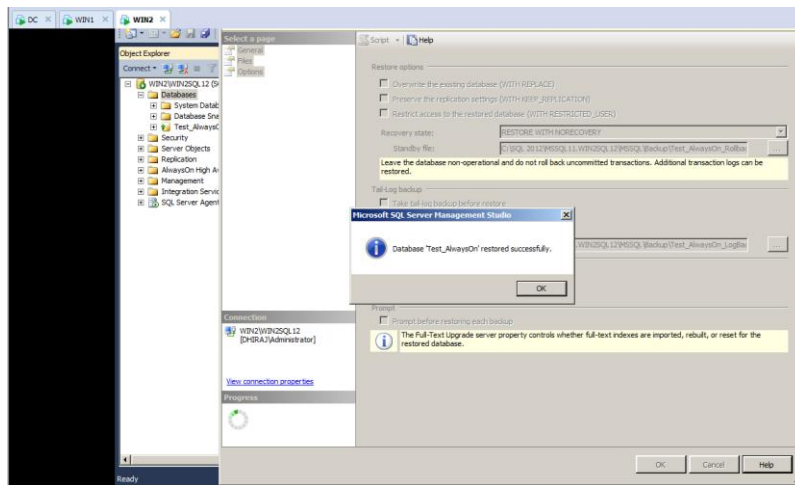
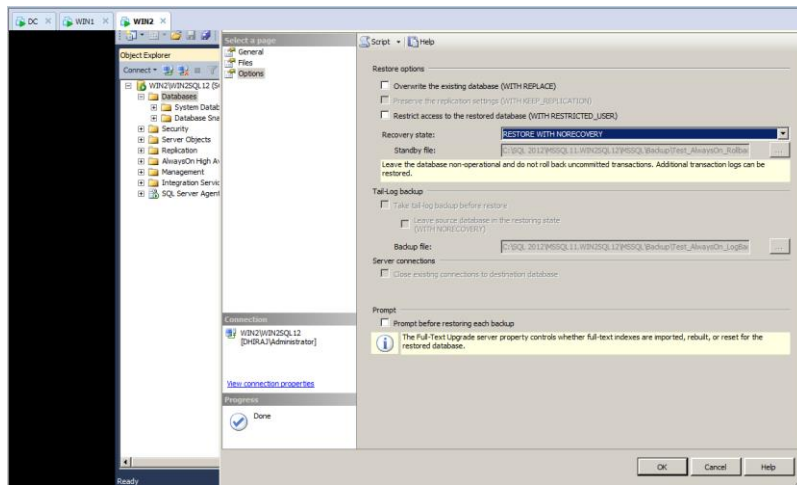
Copy the backup file on Secondary (WIN2) Server.



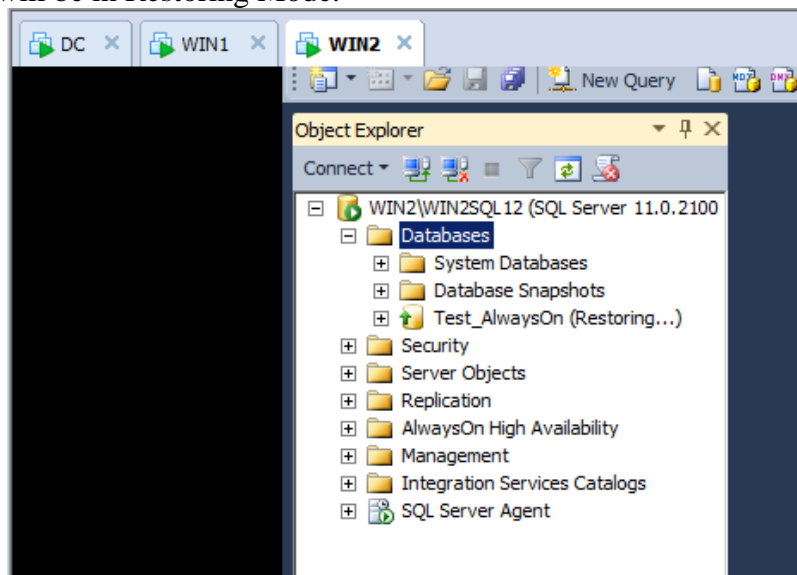
Restore Test_AlwaysOn DB on Secondary Node (WIN2) in No recovery Mode.



Make sure you select RESTORE WITH RECOVERY Option.



So Now Database State will be in Restoring Mode.

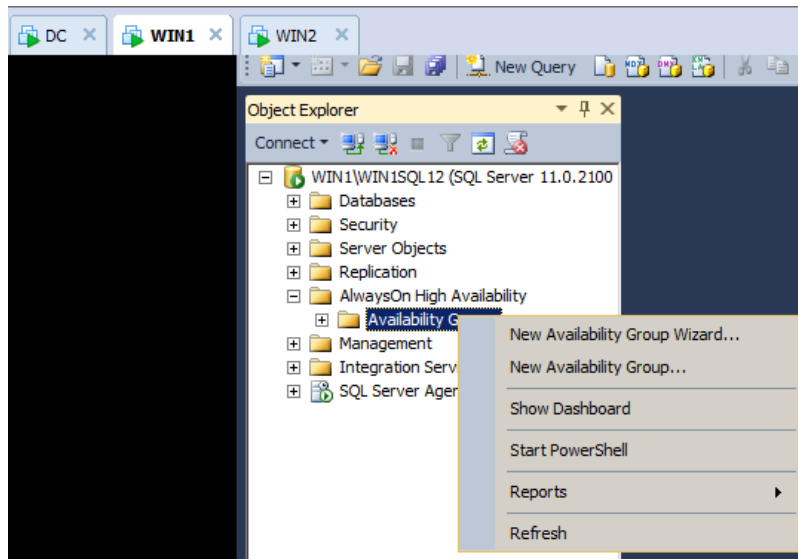


Create and Configure SQL Server 2012 AlwaysOn Availability Groups

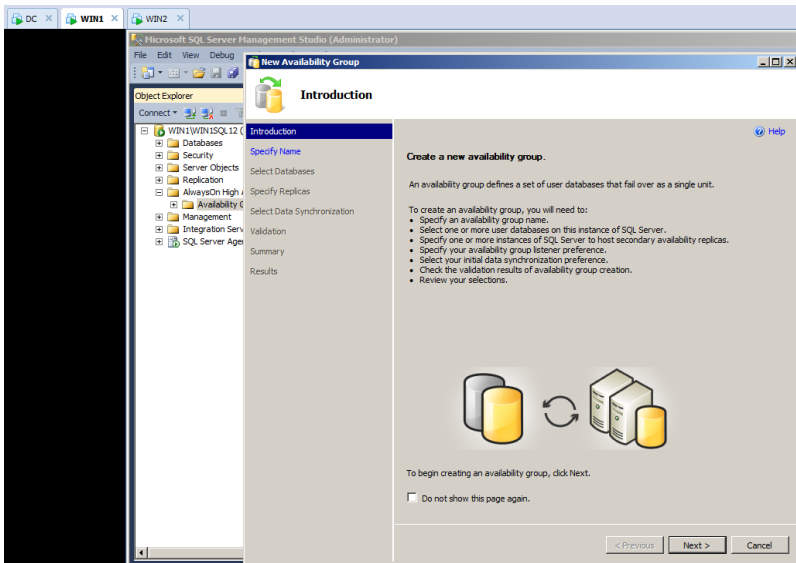
To create and configure a SQL Server 2012 AlwaysOn Availability Group,

1. Choose any one instance to become the PRIMARY (say WIN1\WIN1SQL12)

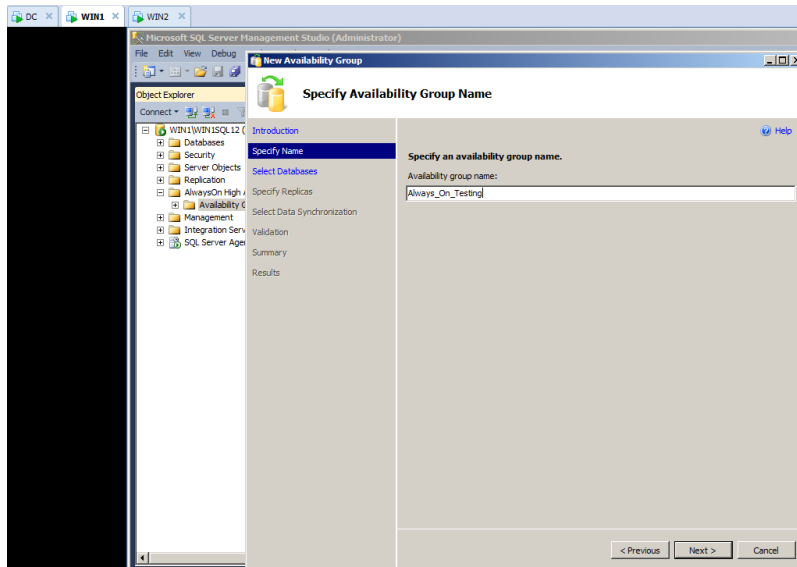
2. Open SQL Server Management Studio on WIN1\WIN1SQL12
3. Expand the Management folder
4. Right-click “Availability Groups” and select “New Availability Group Wizard...”



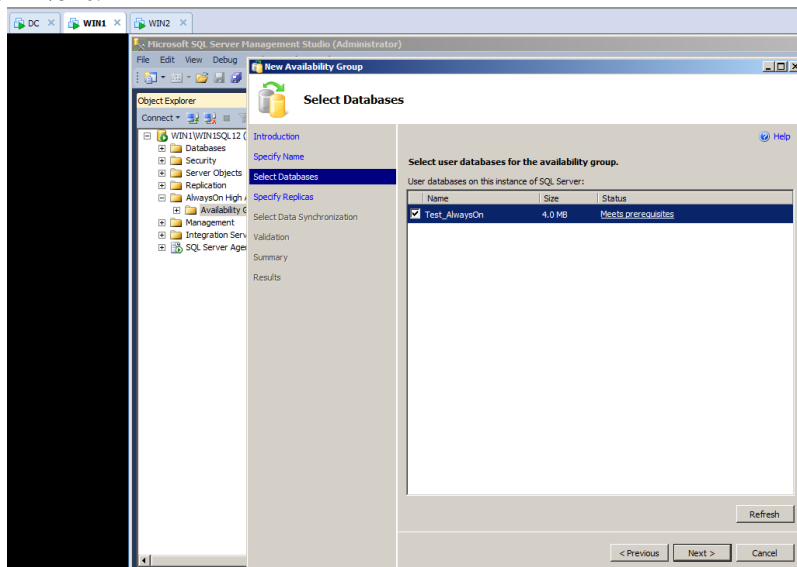
In the **Introduction** page, click **Next**.



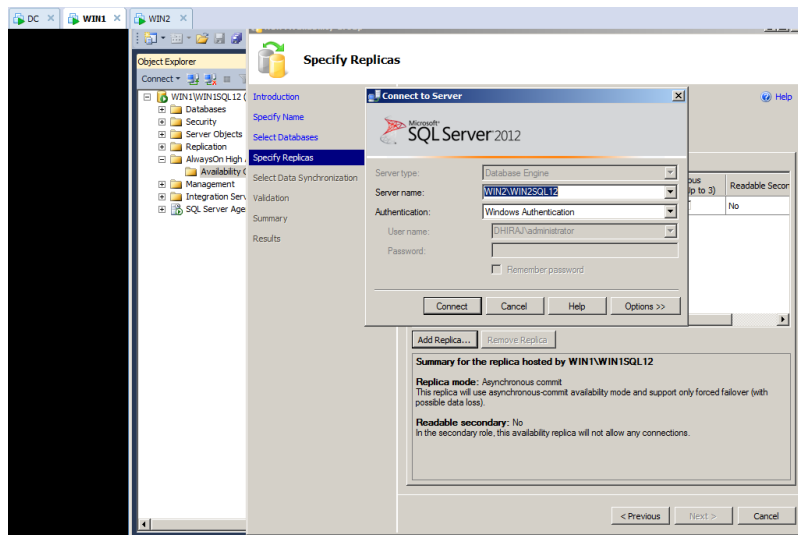
In the **Specify Availability Group Name** page, enter the name of the Availability Group in the **Availability group name:** field. Click **Next**.



In the **Select Databases** page, select the checkbox beside the database that you want to include in your Availability Group.. Click **Next**.

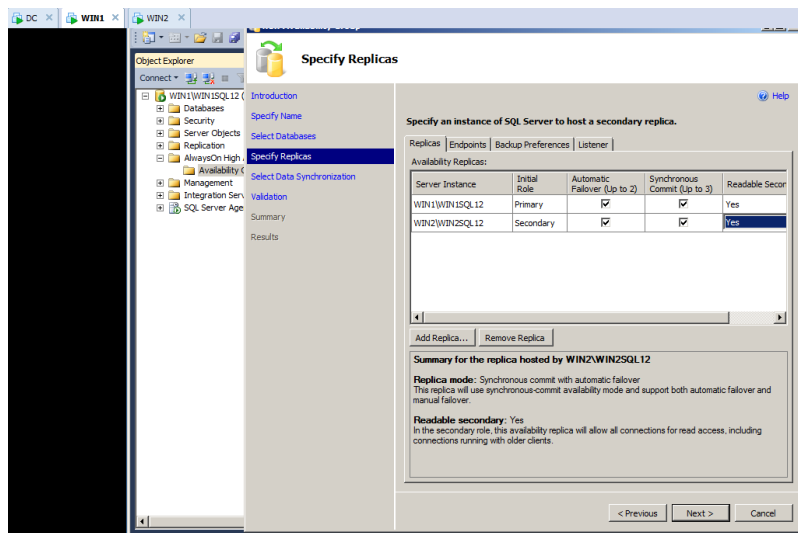


In the **Specify Replicas** page, under the Replicas tab, click the **Add Replicas** button and connect to the other SQL Server instances that you joined as nodes in your Windows Server Failover Cluster.



Configure the following options

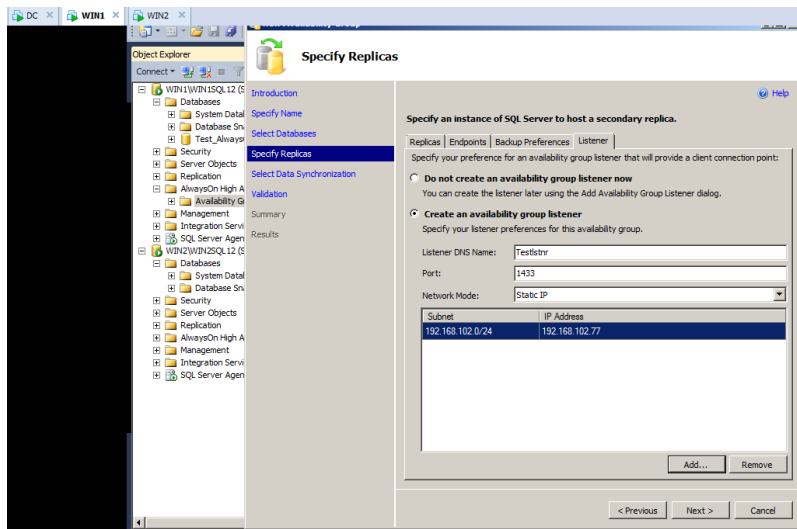
- Automatic Failover (Up to 2) : **Checked**
- Synchronous Commit (Up to 3) : **Checked**
- Readable Secondary: **Yes**



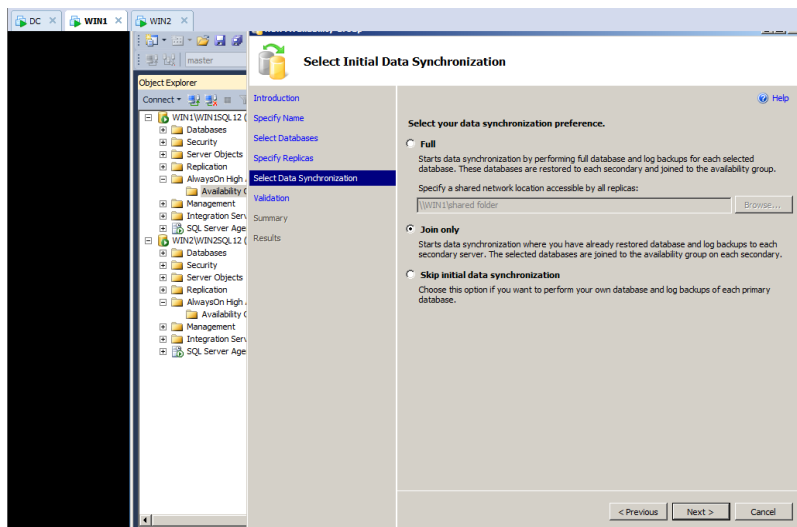
In the **Listener** tab, select the **Create an availability group listener** option. Enter the following details.

- Listener DNS name: **Name that you will use in your application connection string**
- Port: **1433**

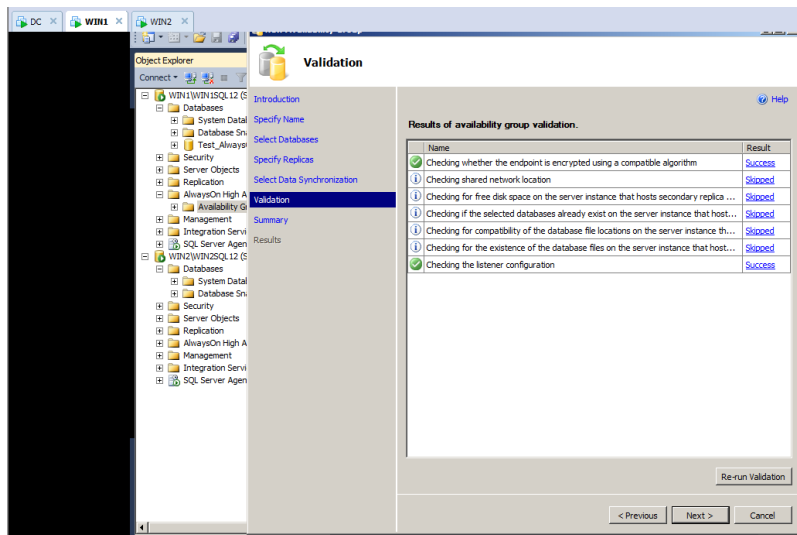
Click the **Add...** button to provide an IP address. In the **Add IP Address** dialog box, enter your preferred virtual IP address in the **IPv4 Address** field. Click **OK**. Click **Next**.



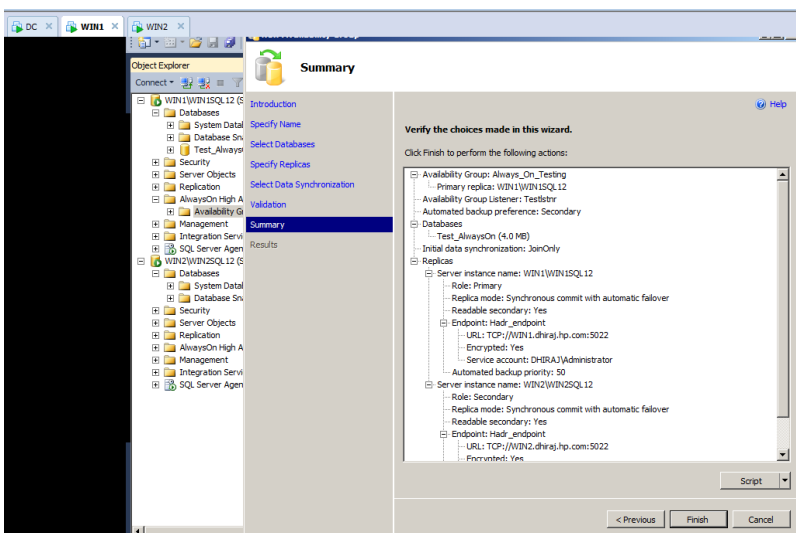
In the **Select Initial Data Synchronization** page, select the **Join** option.



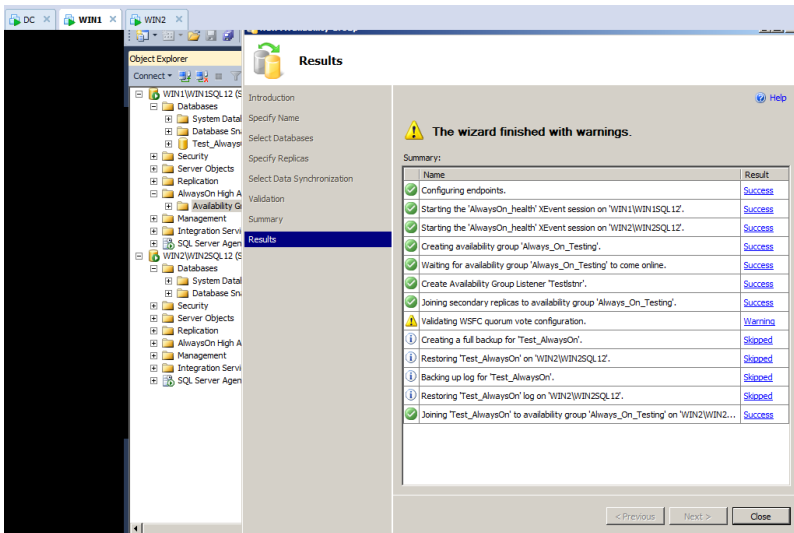
In the **Validation** page, verify that all validation checks return successful results. Click **Next**.



In the **Summary** page, verify all configuration settings and click **Finish**. This will create and configure the AlwaysOn Availability Group and join the databases.

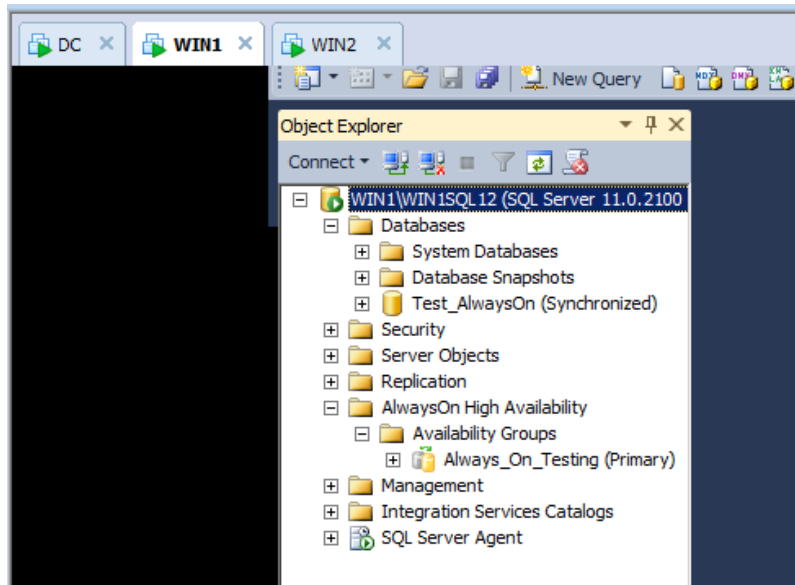


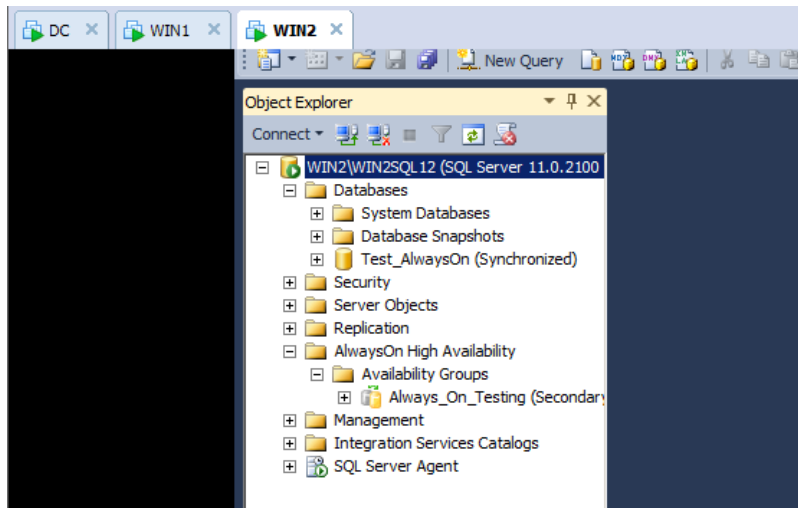
In the **Results** page, verify that all tasks have been completed successfully.



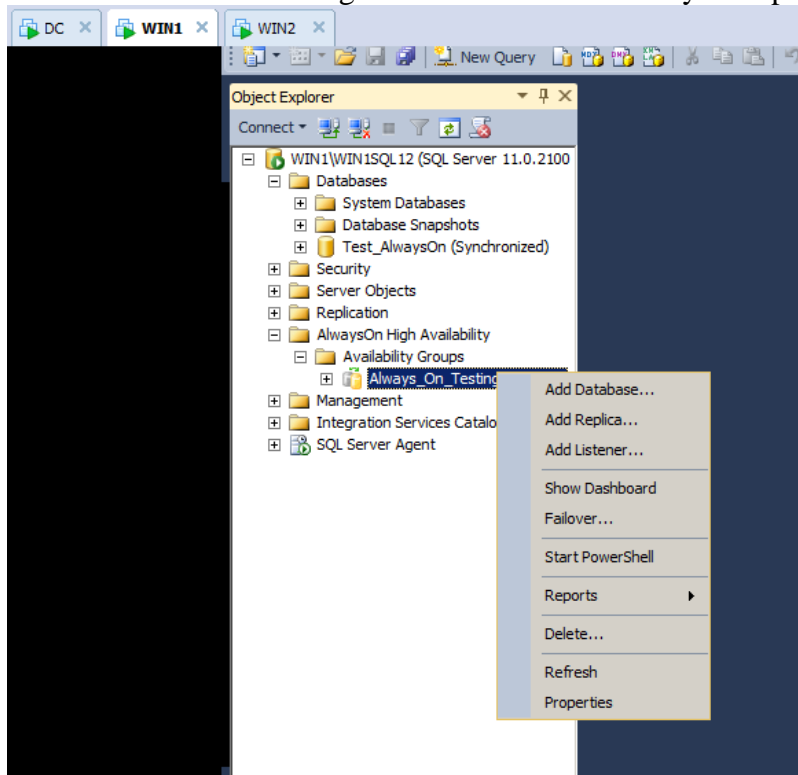
View the Availability Group in SSMS

In SSMS, drill down to Management and Availability Groups. Here you will see your Availability Group. Drill down one farther and you'll see Availability Replicas, Databases, and Group Listeners.

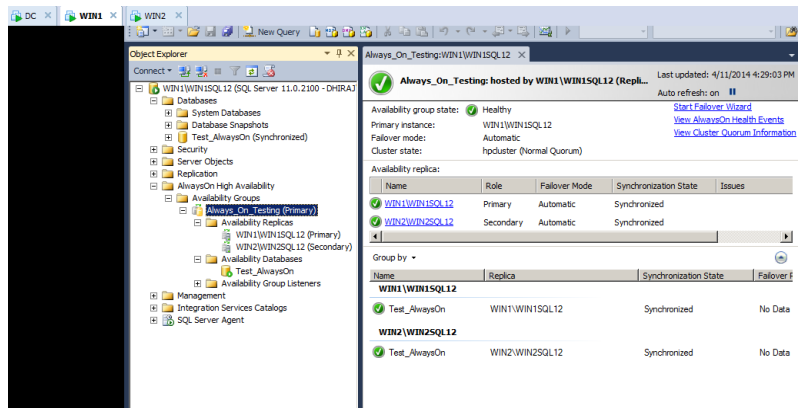




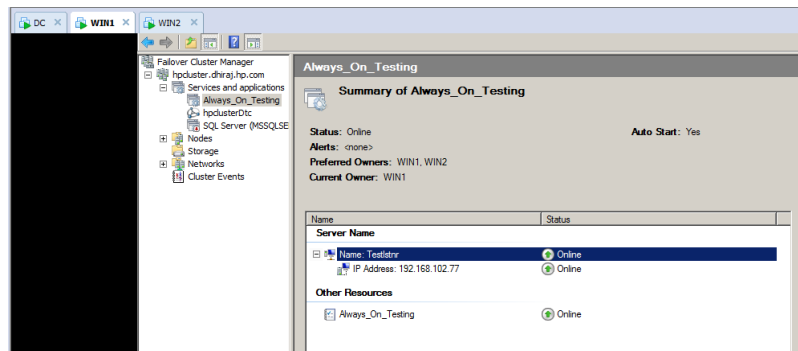
To add a database, replica or view the dashboard right click on the Availability Group Name.



The dashboard will help you determine if your databases are Synchronized and Healthy



You can also check the Availability Group from Failover Cluster Manager.



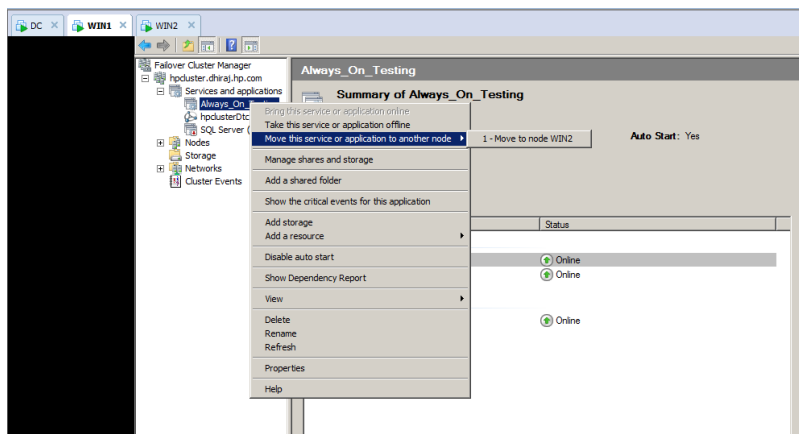
Failover Testing

There are 2 ways via you can test your Always On Availability Failover.

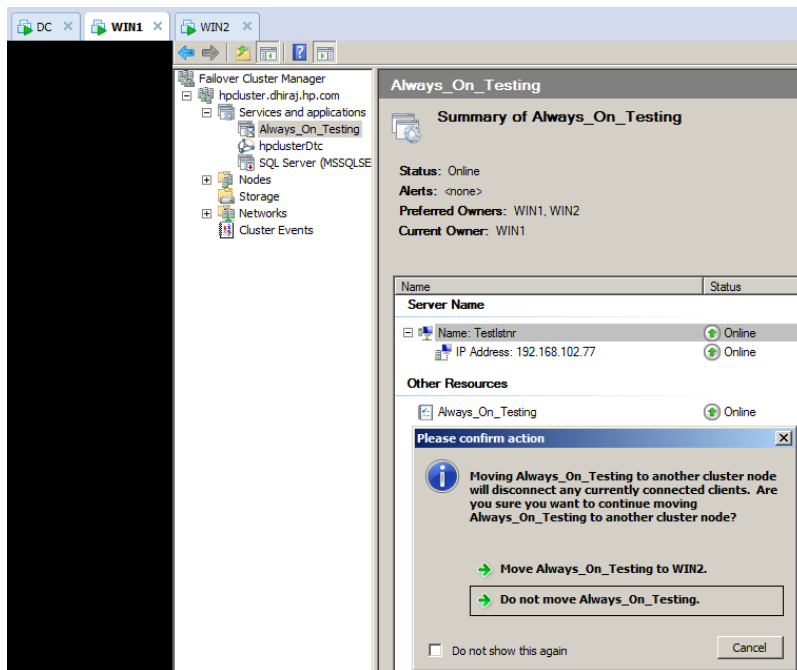
- 1) Via Failover Cluster Manager.
- 2) Via SSMS.

1) Failover Always On Availability Group via Windows Failover Cluster Manger:

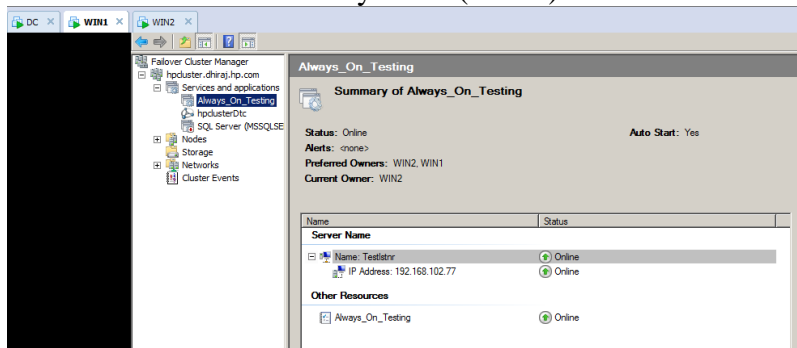
- Open Failover Cluster Manager
- Right Click on Always on Group. Currently Primary Node is WIN1.
- Move the Service or Application on Secondary Node
- Click on your Secondary Node (WIN2)



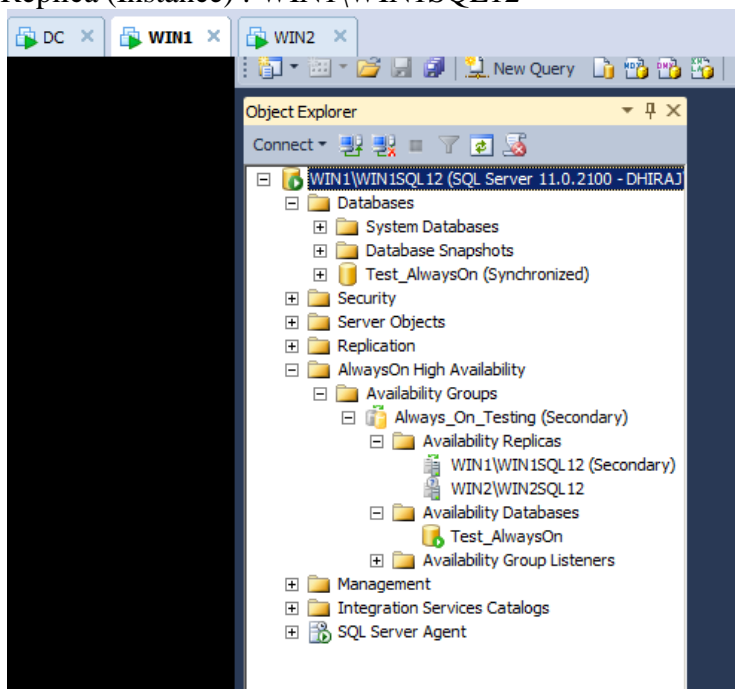
- Confirm Movement of Always on Group on Secondary Node. (WIN2)



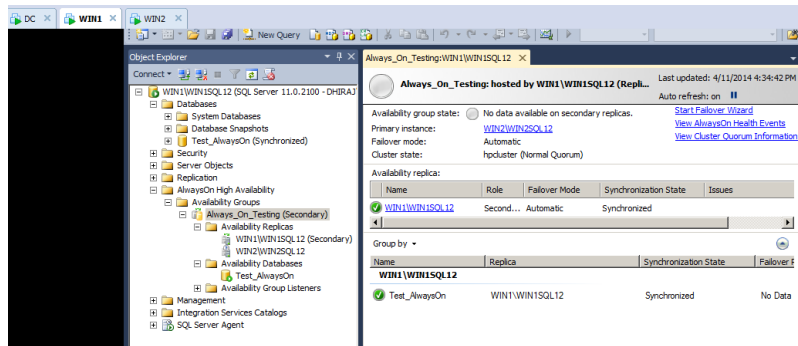
-
- Confirm Successful Failover of Cluster on Secondary Node (WIN2)



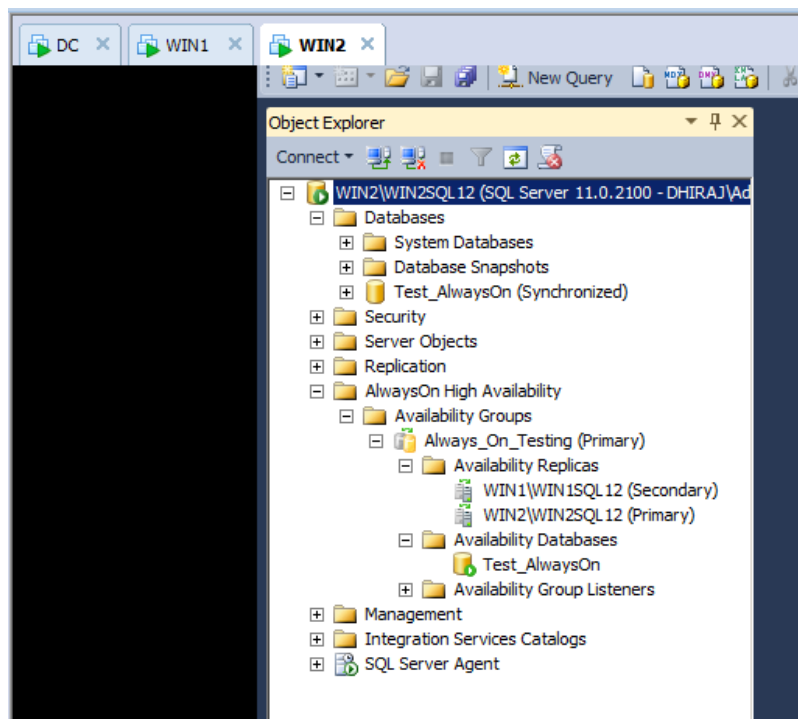
- Confirm the Failover from SSMS.
- Check Availability Group on Primary and Secondary SQL Instance.
- Current Secondary Replica (Instance) : WIN1\WIN1SQL12



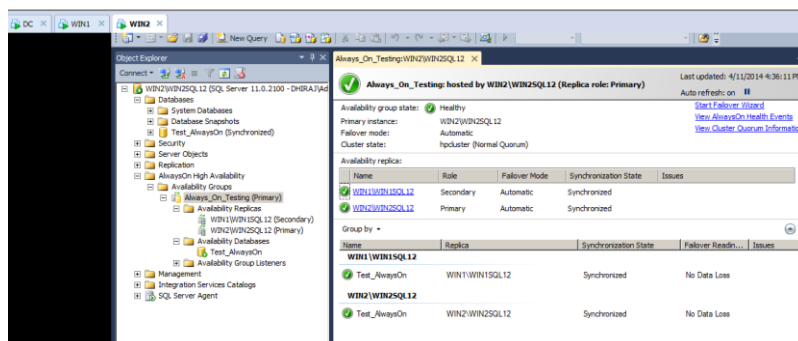
- The dashboard will help you determine if your databases are Synchronized and Healthy



- Current Primary Replica (Instance) : WIN2\WIN2SQL12

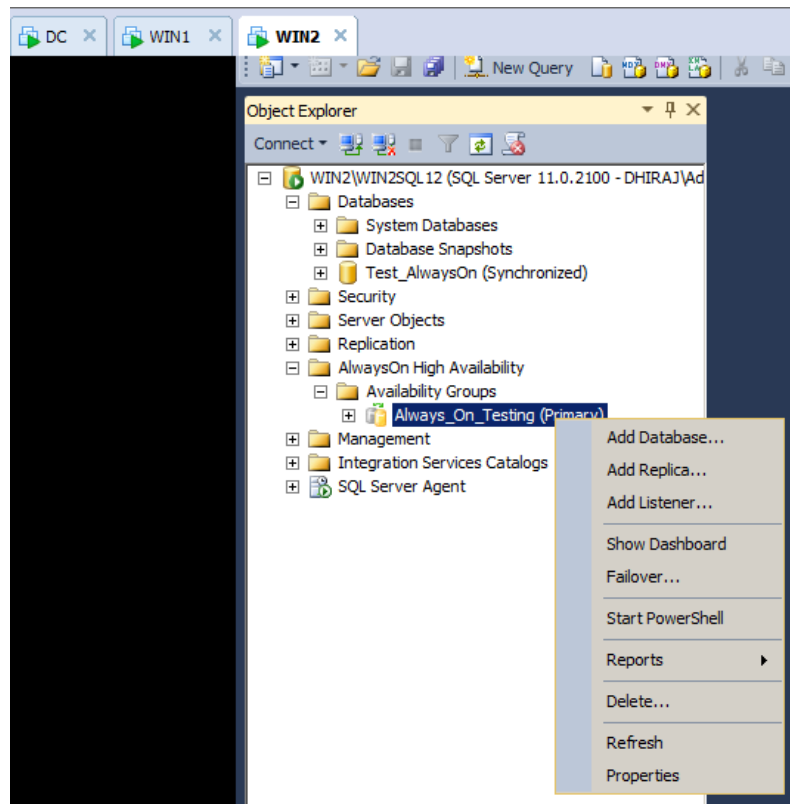


- The dashboard will help you determine if your databases are Synchronized and Healthy

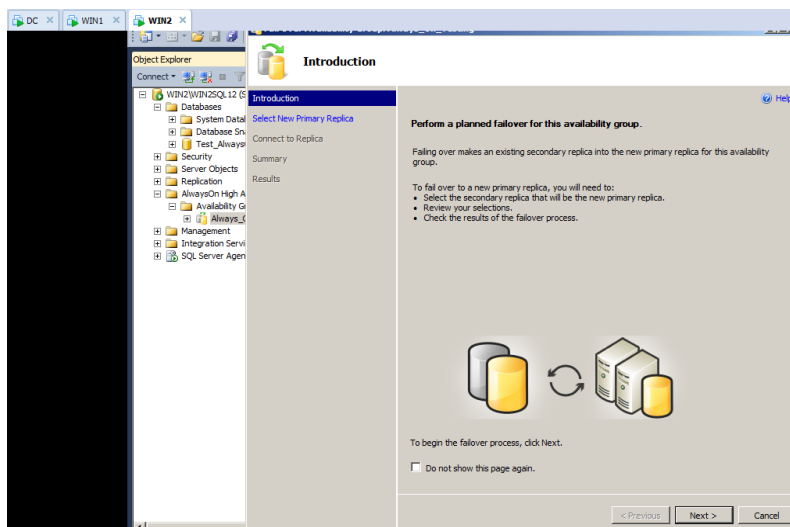


2) Failover from SSMS:

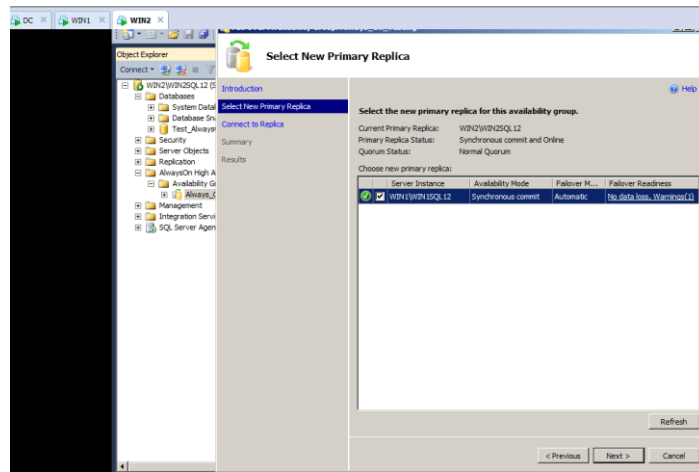
- Go to the primary Instance
- Right click on your Availability Group
- Click on Failover



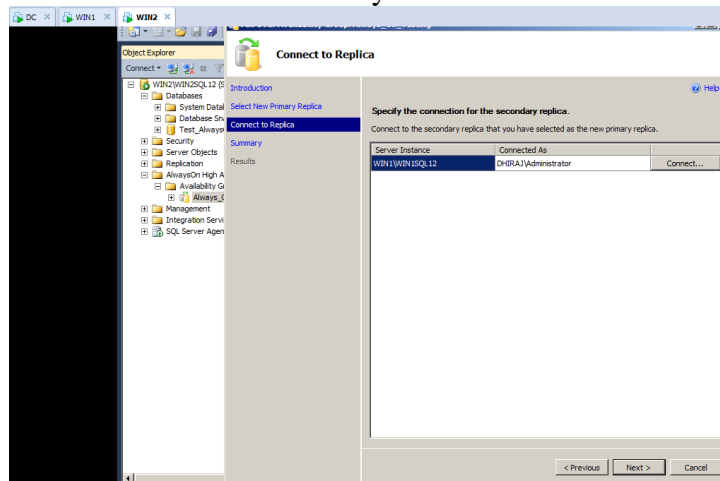
- Click on next on the Introduction Window.



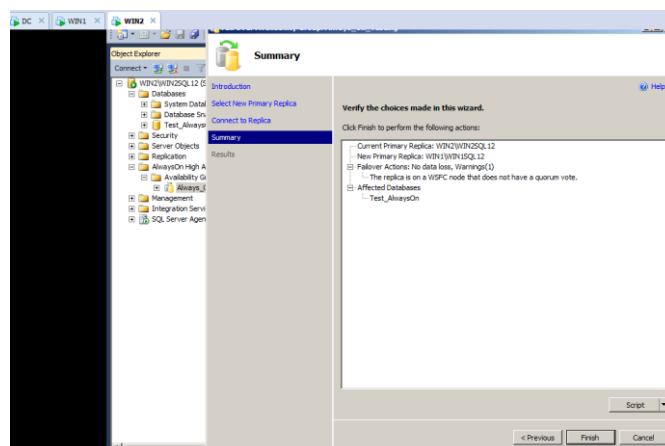
- Select the primary Replica (Instance) on Which you want to failover your Always On Database.



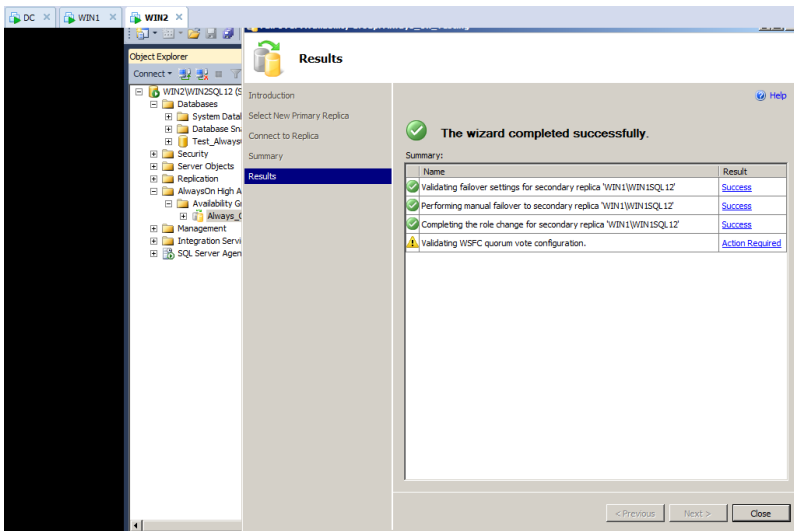
- Provide the Credential and connect to the Primary Instance.



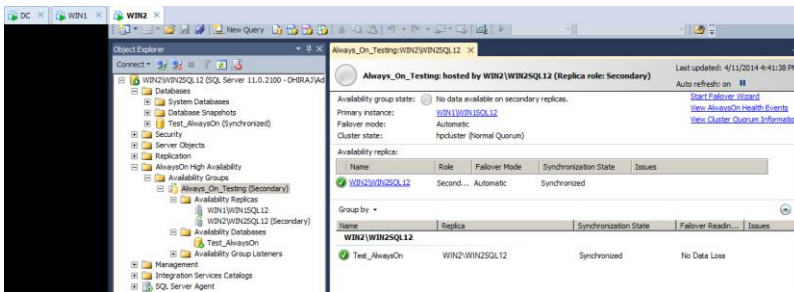
- Click on Finish.



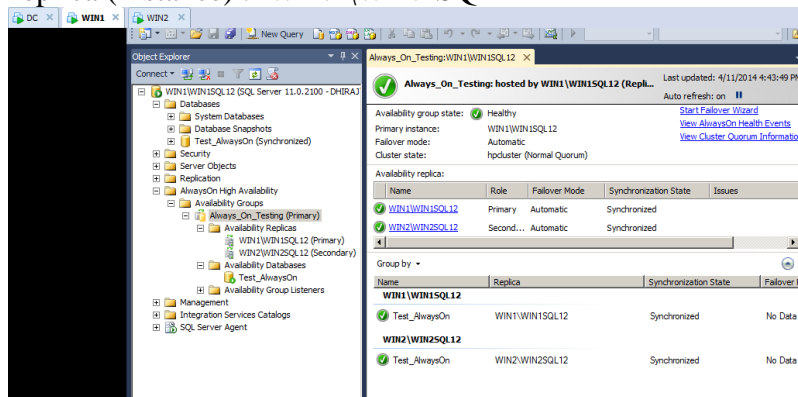
- Check the result for Successful Failover and click on Close.



- Check the Availability Group configuration after successful failover on both primary and secondary Replica (Instance)
- The dashboard will help you determine if your databases are Synchronized and Healthy
- Current Secondary Replica (Instance): WIN2\WIN2SQL12



- The dashboard will help you determine if your databases are Synchronized and Healthy
- Current Primary Replica (Instance) : WIN1\WIN1SQL12



Differences between Database Mirroring and AlwaysOn Availability Groups:

Feature	Database Mirroring	AlwaysOn Availability Groups
Maximum number of secondary databases	1 Mirror	4 Secondaries
Requires Windows Clustering	No	Yes, however the SQL Servers can be stand-alone

Automatic failover	Yes, requires witness server and high-safety mode	Yes, one
HA or DR	Choose one	Each secondary independently configurable
Groups of databases	No, each database is configured separately	Multiple databases can be grouped to failover together
Can be used for reporting	Only against a database snapshot of the mirror	Yes
Offload backups	No	Yes
Active database is called	Principal	Primary
Connection to active database	Requires special connection string for failover	Redirection handled by Windows Clustering with a virtual name. Special connection string not required
Connection string to mirror or secondary database	N/A	Can be configured with an ApplicationIntent connection string to automatically redirect or can use traditional connection string with server name.