WINDOWS CLUSTERING

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GROUP OF SERVERS DOING COMMON TASK IS CALLED CLUESTERING.

FOR CLUSTER DOMAIN IS COMPULSORY. CLUSTERING IS AN INSTANCE LEVEL FAILOVER OPTION.

A CLUSTER IS A GROUP OF INDEPENDENT COMPUTER SYSTEMS, REFERRED TO AS NODES, WORKING TOGETHER AS A UNIFIED COMPUTING RESOURCE. A CLUSTER PROVIDES A SINGLE NAME FOR CLIENTS TO USE AND A SINGLE ADMINISTRATIVE INTERFACE, AND IT GUARANTEES THAT DATA IS CONSISTENT ACROSS NODES.

3 TYPES OF CLUSTERS

NETWORK LOAD BALANCING (NLB)

COMPONENT LOAD BALANCING (CLB)

MICROSOFT CLUSTER SERVICE(MSCS)-FAILOVER CLUSTER

NLB

NORMALLY WEB SERVER WILL WORK ON NLB. IN NLB ALL SERVERS WILL WORK TO BALANCE THE LOAD. NLB ACTS AS A FRONT-END CLUSTER, DISTRUBUTING INCOMING IP TRAFFIC ACROSS A CLUSTER OF SERVERS.

IT WILL WORK WITH INTERCONNECT BY MAC ADDRESS SHARING.

CLB

COMPONENT LOAD BALANCING DISTRUBUTES WORK LOADS ACROSS MULTIPLE SERVERS RUNNING A SITE'S BUSINESS LOGIC. DYNAMIC BALANCING OF COM+ COMPONENTS. (APPLICATION SERVERS WILL WORK ON CLB, CREDIT CARDS, DEBIT CARDS TRANSACTIONS INVOLVED ON APPLICATION SERVERS)

FAILOVER CLUSTERING

THERE ARE 3 NETWORKS IN A SYSTEM

ONE FOR PUBLIC NETWORK

ONE FOR HEART BEAT(ACKNOWLEDGING EACH OTHER)

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ONE FOR SHARED STORAGE (WILL SHARE THE FOLDERS)
IN FAILOVER CLUSTERING ONLY ONE NODE CAN TAKE THE OWNERSHIP ON INSTANCE.
THERE IS NO CONDITION THAT ALL THE NODES IN THE CLUSTERING WITH SAME HARDWARE.
EVERY THING ON A CLUSTER IS A RESOURCE.
EACH NODE HAS ITS OWN MEMORY(RAM IS NOT A RESOURCE IN THE CLUSTERING, C DRIVE IS ALSO NOT A RESOURCE IN CLUSTERING) , HARDISK , APLLICATIONS… IF THIS NODE FAILS THEN ANTOTHER NODE WILL TAKE THE OWNERSHIP ON ALL THOSE RESOURCES .
FAILOVER IS NOT A LOAD BALANCING, ONLY ONE NODE WILL WORK AT A TIME.
FAILOVER CLUSTERING COMPRISED OF THREE COMPONENTS
1. THE CLUSTER SERVICE
2. RESOURCE MONITOR
3. RESOURCE DLLS
CLUSTER SERVICE
CLUSTER SERVICE IS THE CORE COMPONENT AND RUNS AS A HIGH PRIORITY SYSTEM SERVICE.THE CLUSTER SERVICE CONTROLS CLUSTER ACTIVITIES AND PERFORMS SUCH TASKS AS CORRDINATING (COMMUNICATING WITH ANOTHER NODE) EVENT. IF ANY ANY NODE GOES DOWN, FAILOVER IS DONE BY CLUESTER SERVICE.
MANAGING THE CONFIG SETTINGS. IT WILL PRESENT BOTH THE NODES WHICH ARE PARTICIPATING IN FAILOVER CLUSTERING.
RESOURCE MONITOR
THE RESOURCE MONITOR IS AN INTERFACE BETWEEN THE CLUSTER SERVICE AND THE CLUSTER RESOUECES, AND RUNS AS AN IDPENDENT PROCESS.
RESOURCE DLL
DLL IS A CODE TO HANDLE RESOURCES. CLUSTER SERVICE WILL TAKE THE HELP OF RESOURCE MONITOR TO TAKE OWNERSHIP ON RESOURCES OF OTHER NODES.
RESOURCE MONITOR WILL EXECUTE RESOURCE DLL TO CHANGE THE OWNERSHIP. THERE MAY BE MULTIPLE RESOURCE MONITORS FOR DIFFERENT RESOURCES.
THE RESOURCE MONITOR AND RESOURCE DLL COMMUNICATE BY USING

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RESOURCE API(CODE), WHICH IS A COLLECTION OF ENTRY POINTS, CALLBACKFUNCITONS AND RELATED STRUCTURES AND MACROS USED TO MANAGE RESOURCES.

DEMO
OPEN VIRTUAL BOX HOME PAGE.
SHUTDOWN NODE1 FIRST TO ADD NETWORK CARDS
SETITNGS, NETWORK CLICK ON ADAPTER2 , ATTACHED TO 'INTERNAL NETWORK' KEEP THE SAME NAME, PROMISCUOUS MODE ALLOW ALL
(THIS IS FOR HEART BEAT COMMUNICATION)

DO THE SAME THING FOR 2ND NODE. DON'T CHANGE THE NAME OF NETWORK CARD SAME AS NODE 1 (INTNET)
AD IS NOT PART OF CLUSTER , IT ACTS AS A DOMAIN FOR LOGINS. AD SHOULD BE RUNNING
CHECK IS EVERY THING OK LIKE DOMAIN NAME, GROUP IS ADDED OR NOT LIKE THAT IN AD. CREATE GROUPS
CREATE 3 USERS AND ADD THEM INTO A GROUP.(IT IS FOR SQL SERVER PURPOSE NOT USED IN THIS SCENARIO.)
GO TO NODE1
CHECK EVERYTHING PING, DOMAINNAME
FIRST INSTALL CLUSTERING COMPONENTS FROM SERVERMANAGER
SHOULD BE LOGGED IN AS DOMAIN ADMINISTRATOR
OPEN SERVER MANAGER
ADD ROLES, NEXT, SELECT ROLE BASED OR FEATURE BASED, NEXT, NODE1.KDSSG.COM, NEXT, AS CLUSTER IS A FEATURE, HIT NEXT, SELECT FAILOVER CLUSTERING, ALONG WITH .NET 3.5 (IF IT IS NOT THERE), CLICK ON INSTALL.
GOTO NODE 2 AND DO THE SAME THING
CHECK THE IPADDRESS, FIREWALL STOPPED OR NOT.(DISABLE FIREWALL, ADD RULES, AS TO THE FIREWALL WE DON'T KNOW ABOUT ADDING RULES TO FIREWALL, SO BETTER DISABLE FIREWALL)
AFTER INSTALLATION RESTART ALL THE NODES

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GOTO SERVICES.MSC THEN WE CAN SEE CLUSTER SERVICE. BUT IT IS DISABLE.
ONCE WE HAVE CONFIGURED CLUSTERING THEN IT WILL ENABLE.
GO TO IPV4, (NCPA.CPL), RENAME THE ETHERNET CARDS AS PUBLIC AND HEARTBEAT
FOR PRIVATE (HEART BEAT) IP ADD -192.168.1.1(THIS IS FOR NODE 1)
DO THE SAME THING FOR NODE 2, IP ADD – 192.168.1.2(FOR NODE2)
FOR NODE 1 PUBLIC IP ADD 10.10.10.1, HEARTBEAT IP ADD 192.168.1.1
FOR NODE 1 PUBLIC IP ADD 10.10.10.2, HEARTBEAT IP ADD 192.168.1.2
FOR AD PUBLIC IP ADD 10.10.10.0(DO PING TEST FOR EVERY IP)
CONFIGURE CLUSTERING IN NODE1 OR NODE2.
NODE1
GOTO ADMINISTRATIVE TOOLS : FAIL OVER CLUSTER MANAGER.
START—ADMINISTRATIVE TOOLS. U CAN SEE FAIL OVER CLUSTER MANAGER.
OR OPEN RUN CLUADMIN.MSC

WE CAN CONFIGURE CLUSTERING WITH THIS TOOL
RIGHT HAND SIDE CLICK CREATE CLUSTER.

CREATE CLUSTER WIZARD—NEXT,
ENTER SERVERNAME : ADD THE FIRST PERSON WHO WE WANT TO BE OWNER
THEN ADD ANOTHER NODE WHICH WE WANT TO BE PARTICIPATE IN CLUSTER.
NODE1.KDSSG.COM
NODE2.KDSSG.COM
NEXT
VALIDATION TESTS, YES(BEST PRACTICE IS RUN VALIDATION)
RUN ALL TESTS.
CHECK WARNINGS.(IN REAL TIME WINDOWS ADMINS WILL NOT CONFIGURE EVEN IF WARNINGS CAME IN THIS SCREEN)
CLUSTER NAME : KDSSGB24WINCLUS, NEXT
UNCHECK 192.168.1.0/24
GIVE CLUSTER IP :10.10.10.143(ANY THING U WANT), CHECK ADD ALL ELIGIBLE….
NEXT, CREATE CLUSTER.FINISH.
CLUESTER NAME IS ALSO ONE RESOURCE

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--SINGLE NODE CLUSTER IS ALSO POSSIBLE BUT TECHNICALLY IT IS NOT USEFULL, ONCE WE HAVE CONFIGURED CLUSTERING ON SINGLE NODE WE CAN EASILY ADD ANOTHOER NODE TO THE CLUSTERING.
IF WE INSTALL ANYTHING ON CLUSTERING WE CAN SEE THAT APPLICATIONS IN ROLES IN CLUSTERING WINDOW.
GOTO NETWORKS AND CHANGE THE NEWTORK NAME
DOUBLE CLICK ON FIRST NODE NETWORK AND GOTO PROPERTIES THERE U CAN CHAGE THE NAME CLUSTERNETWORK1.(FOR HEART BEAT UNCHECK "ALLOW…"
GOTO ANOTHER CLUSTER NETWORK , PROPERTIES , CHANGE NAME AS PUBLIC AND CHECK"ALLOW…."
RIGHT CLICK ON CLUSTERNAME GOTO PROPERTIES
GOTO RESOURCES , THERE U CAN SEE THE RESOURCES WHICH CLUSTERING SUPPORTS.
CLUSTER PERMISSIONS, WE CAN SEE WHO CAN HAVE THE PERMISSION ON THE CLUSTER.
CLICK 'MORE ACTIONS' ON 'ACTIONS' TAB IN FAILOVER CLUSTER MANAGER
GOTO QUORUM SETTINGS.
SELECT QUORUM CONFIG SCREEN WILL COME.
QUORUM
QUORUM CONTAINS ALL THE CLUSTER SETTINGS, LIKE WHO IS THE OWNER. IT'S A CLUSTER'S CONFIG DATABASE.IT WILL RESIDE IN SHARED DISK. IN THAT SHARED FOLDER 'QUOLOG.LOG' FILE WILL BE THERE. ONLY ONE QUORUM IN A CLUSTER.
IT WILL DO 2 THINGS.
1. FIRST IT TELLS WHICH NODE SHOULD BE ACTIVE. IT WILL ALSO TELLS WHO IS THE NEXT OWNER IF MY OWNER FAILS.
2. WHEN COMMUNICATION BETWEEN TWO NODES FAILS THEN QUORUM WILL HELP FOR COMMUNICATION BETWEEN TWO NODES (THAT MEANS IF HEART BEAT COMMUNICATION BREAKS QUORUM WILL HELP TO COMMUNICATE WITH ANOTHER NODE)
2008R2 QUORUM SETTINGS
1.NODE MAJORITY
2.NODE AND DISK MAJORITY
3.NODE AND FILE SHARE MAJORITY

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4.NO MAJORITY

1.NODE MAJORITY:WHEN WE HAVE ODD NUMBER NODES THIS OPTION WILL SUITABLE.

--WHEN WE HAVE 4 NODES IN THAT 2 NODES FIALED THEN ONLY 2 IS ACTIVE. HERE MAJORITY WILL NOT WORK, IN 4, MAJORITY IS GREATER THAN HALF+1 THAT MEANS IN 4 NODE IF 3 IS ACTIVE THENONLY CLUSTERING IS SURVIVE.

2.NODE AND DISK MAJORITY

DISK MAJORITY ALSO COUNTS IN THIS SCENARIO. WORK FOR EVEN NO. OF NODES.

3. NODE AND FILE SHARE MAJORITY

FILE SHARE IS AN APPLICATION IN CLUSTER. FILE SHARE ALSO COUNTS IN THIS OPTION AS A MAJORITY.

4. NO MAJORITY(MS NEVER RECOMMENDS)

IT WILL NOT COUNT MAJORITY, IT WILL COUNT ONLY DISK, MEANS QUORUM IS THERE IN SHARED SO IT WILL SURVIVE EVEN MAX NODES CRASHED IN A CLUSTER. THAT MEANS IF 10 NODES ARE THERE IN CLUSTER IT WILL SURVIVE UPTO 9 NODES FAILURE , WHY BECAUSE MY SHARED DISK IS STILL ACTIVE. IF MY DISK FAILS ENTIRE CLUSTER WILL GOES DOWN. THIS FEATURE IS NOT THERE IN WINDOWS SERVER 2012.

--WHERE EVER WE HAVE VOTING LOCAL QUORUM WILL PRESENT FOR EACH NODE.

CONFIGURE QUORUM SETTINGS

MORE ACTIONS , GOTO CLUSTER QUORUM SETTINGS

USE DEFAULT QUORUM…

SELECT 2ND OPTION.

CONFIGURE

BEFORE THAT INSTALL SAN

ISCSI WHICH WILL HELP TO CONNECT TO THE TARGET, USING STARWIND WE CAN CREATE TARGETS

GOTO AD

INSTALL START WIND

CHOOSE DISK IMAGE AS STARWIND IN SETTINGS

RIGHT CLICK ON STARWIND RUN AS ADMIN

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NEXT, NEXT, NEXT, INSTALL. BEFORE THAT GOTO SERVICES.MSC START MICROSOFT ISCSI SERVICES. . DON'T LAUNCH, GOTO STARTWIND SERVICE IN THE SEVICES.MSC STOP THAT SERVICE, NOW GOTO CRACK FOLDER, GOTO X64, AND GOTO C:PROGRMA FILES\STARWIND , U CAN SEE STARWIND SERVICE PASTE IT FROM CRACK FOLDER.

NOW OPEN STARWIND APPLICATION.

ON THE TOP WE CAN SEE ADD HOST.

CLICK ON IT. GIVE THE IP ADDRESS OF AD. OR WE CAN LEAVE 127.0.0.1, SAN WORKS 3261 PORT., OK, NOW AD.KDSSG.COM WILL CREATE. CEATE TARGET IN THAT,RIGHT CLICK, CONNECT, USER ROOT, PWD STARWIND

CLICK ON TARGETS. RIGHT CLICK ADD TARGET, TARGET ALIAS : QUORUM TARGET NAME U CAN SEE. At the END U CAN SEE THE TARGET NAME, AD.KDSSG.COM-QUORUM

SELECT STORAGE TYPE.

HARD DISK, NEXT, SELECT BASIC VIRTUAL, NEXT, SELECT IMAGE FILE DEVICE, NEXT, CREATE A NEW VIRTUAL DISK IMAGE , NEW VIRTUAL DISK LOCATION AND NAME BROWSE AND PUT IT C, CREATE FOLDER SAN, SELECT IT, NAME IS QUORUM.IMG, FILE NAME IS LIKE THIS… MYCOMP\C\SAN\QUORUM.IMG

SIZE IN MBS: 1O24MB IS ENOUGH. (INCREASE HARD DISK OF AD SIZE LIKE 35GB)

NEVER COMPRESS

NEVER ENCRYPT

UNCHECK FILL WITH ZERO MEANS DYNAMICALLY ALOCCATED, NEXT

LEAVE THE DEFAULT OPTIONS.

CHECK "ALLOW MULTIPLE CONCURRENT ISCSI CONNECTIONS(CLUSTERING)"

NEXT—CACHE MODE – (CACHE IMPROVE PERFORMANCE) PUT NORMAL, NEXT, NEXT FINISH.

QUORUM IS CREATED.

NOW WE HAVE TO TELL ABOUT TO THESE QUORUM TO ALL THE NODES.

GOTO NODES.

WITH OUT ISCSI INITIATOR WE CAN NOT CONNECT TO TARGET. OPEN INITIATOR IN NODE 1, GOTO SERVICES.MSC , MICROSOFT ISCSI INITIATOR SERVICE , START IT,

GOTO ADMINISTRATIVE TOOLS ISCSI INITIAOR, OPEN

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ISCSI INITIATOR PROPERTIES
TARGET : TYPE AD IP ADDRESS(HERE QUORUM IS THERE IN AD SO WE HAVE TO SELECT AD IP ADDRESS HERE), QUICK START, U CAN SEE QUORUM, OR GOTO DISCOVERED TARGETS TAB, IT WILL SHOW THE TARGETS.
NEXT. FINISH.
GOTO RUN , DISKMGMT.MSC
RIGHT CLICK ON DISK1 CONNECT ONLINE, AGAIN R.CLICK , INITIALIZE, SELECT MBR, (MBR FOR SMALLER DISKS, GPT FOR LARGER DISKS),
RICHT CLICK ON 1024 BAR, SELECT NEW SIMPLE VOLUME, GIVE THE LETTER OF DRIVE AND NAME OF THE DRIVE AT VOLUME LABEL.
DO THE SAME THING FOR NODE 2, IN NODE2 NO NEED TO INITIALIZE THE DISK 1, JUST BRING IT ONLINE., RIGHT CLICK CHANGE DRIVE LETTER, GIVE THE LETTER OF DRIVE AS Q.
NOW ADD THIS QUORUM DISK AS A RESOURCE IN CLUSTER IN NODE1.
GOTO NODE 1
OPEN FAIL OVER CLUSTER MANAGER, (CLUADMIN.MSC)
GOTO STORAGE , RIGHT CLICK ON IT, ADD DISK.
IT WILL DIRECTLY ADD THE QUORUM DISK, (ONLY OWNER CAN SEE THIS DRIVE,) OK,
GOTO ACTIONS , MORE ACITON, QUORUM SETTINGS,
SELECT QUORUM WITNESS(SECOND OPTIONS)
NEXT, CONFIGURE A DISK WITNES, NEXT, CHECK THE QUORUM, NEXT, NEXT, WELCOME TO THE CLUSTER WORLD.

summary
1. Configured ad and two nodes
2. Two network Adapters(for Node1 and Node 2public, heartbeat)
3. Install fail over clustering features from server manager in both the nodes.
4. Configured clustering on Node1(which Node to be active we need configured in that node)
5. Configured Virtual San from startwind in AD(if u have capacity to buy 3rd Node create virtual san in that machine)for configuring shared disk between both nodes. Its Based on iSCSI Initiator and targets.

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6. After shared disk was created, we made it clustered
7. We configured quorum for the cluster.

Once we created cluster if U Look in to the Quorum disk we can see cluster folder.
there we can see 2 container files, one hive file, one blf file.
In C drive windows, cluster folder we can see the same above files.

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