

SURVEY OF CLUSTERING TECHNOLOGY IN COMPUTER NETWORK

R.MARIAMMAL

mariammal130279@gmail.com

Full Time Research Scholar

Department of Computing Science

School of Computing Science

Vels University, Pallavaram,

Chennai, Tamil Nadu, India

Dr. P.MAYILVAHANAN

mayilkadir@yahoo.com

Head and Assistant Professor

Department of MCA

School of Computing Science

Vels University, Pallavaram,

Chennai, Tamil Nadu, India

ABSTRACT:

A computer cluster is a group of nodes connected together and work together, Computer cluster can be viewed as a single node. It has each computer set to do the same job, controlled and scheduled by hardware and software. Computer Cluster are generally developed & deployed to improve availability and performance over that of a single system. The computer cluster gives high availability, fast processing speed, greater reliability, load balancing better data integrity, more storage capacity and broader availability of resources.

KEYWORD:

Computer Clustering Technology, Active-Active Cluster, Active Passive Cluster and Load Balancing Cluster.

I. INTRODUCTION

The Computer cluster are faster processing speed, cost effective for the amount of power being produced.^[1] A computer cluster are high efficient and much cheaper compared to other solutions like super computers. The Multiple high-speed computers processing together to provided unified processing and thus faster processing overall. A computer cluster is improved network architecture and an infrastructure and also Different LAN topologies are implemented to form a computer cluster.^[2]

II. LITERATURE SURVEY

This paper presents: In the computer cluster, if any single computer fails (hardware fail or software fail) in a computer clusters, the other computer continue to provide uninterrupted processing.

III. ATTRIBUTES OF CLUSTERS

Computer clusters are configured for different purposes from general purpose business needs such as Application service support, web service support and Data base service support.

A.APPLICATION SERVER CLUSTER

Application server cluster are used for application development and deployment. It all computer system has same configuration and same application. A clustered architecture of a group of application server configured and provided act in concert to deliver greater availability and scalability and then a single system. Different Application servers available such as Tomcat application server, IBM websphere server and jboss application server etc.

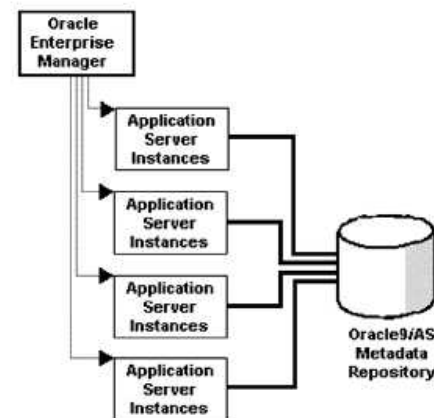


Fig: Oracle Application Cluster.

B. WEB SERVER CLUSTER

Web server cluster technology, which may use a simple round robin method by allocating each new request to a different computer system.

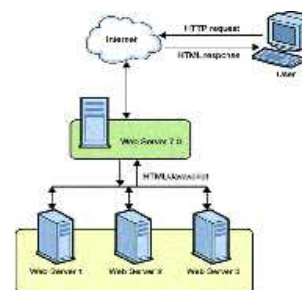


Fig: Web server Cluster.

C. DATABASE SERVER CLUSTER

The SQL database service can be changed into an highly available service with Distributed Replicated Block Device (DRBD).^[3] It is available under Linux operating system. Different Database server

cluster are available such as oracle database server, SQL database server and mySql database server etc.

IV. TYPES OF COMPUTER CLUSTER

A. ACTIVE – ACTIVE CLUSTER

Two same types of Servers are configured as primary server node and secondary server node, each servers working with independent workloads and working respectively until one fails over. Both servers works simultaneously. Mostly all clusters systems storage may be common storage.^[4]

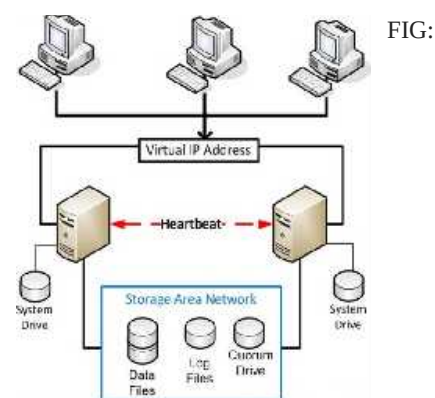
B. ACTIVE – PASSIVE CLUSTER

Two same types of Servers are configured as primary server node or secondary server node. If primary server node failure then secondary server will do the active process. Fail over and fail back process are configured in this cluster system.^[4]

B1. CONFIGURE A LINUX-HA HIGH AVAILABILIT HEARTBEAT CLUSTER

High-Availability (HA) heartbeat cluster software is available in linux server. It is used to help, to manage a set of services in the set of linux systems.^[5]

Network Topology System: Use Two Network Ethernet card per node, one Ethernet-0 connect to the Local Area Network (LAN) and another one Ethernet-1 with a cross-over cable connected both server nodes. It is working cross-over cable must be used improve performance of the computer nodes.^[6]



Heartbeat Architecture.

Use the two physical nodes and configured given method for heartbeat high availability node1.clusterbr.int and node2.clusterbr.int: node1.clusterbr.int: Uses IP 10.11.10.101 (LAN) and IP 192.168.10.1(cross-over) node2.clusterbr.int: Uses IP 10.11.10.102 (LAN) and IP 192.168.10.2 (cross-over) dbip.clusterbr.int: It's the Cluster IP, 10.11.10.100. This is the IP that all the applications need to be pointed to access.^[7]

NODE 1 CONFIGURATION:**STEP 1: NETWORK****CONFIGURATION:**

NETWORKING=yes

NETWORKING_IPV6=no

HOSTNAME=node1.clusterbr.int

GATEWAY=10.11.10.1

STEP 2: LAN INTERFACE**CONFIGURATION ETH0:**

DEVICE=eth0

BOOTPROTO=static

IPADDR=10.11.10.101

NETMASK=255.255.255.0

ONBOOT=yes

HWADDR=a7:3e:2d:76:63:87

STEP 3: LAN INTERFACE**CONFIGURATION ETH1:**

DEVICE=eth1

BOOTPROTO=static

IPADDR=192.168.10.1

NETMASK=255.255.255.0

ONBOOT=yes

HWADDR=ea: fe: fa: 99:98:57

NODE 2 CONFIGURATION:**STEP 1: NETWORK****CONFIGURATION:**

NETWORKING=yes

NETWORKING_IPV6=no

HOSTNAME=node2.clusterbr.int

GATEWAY=10.11.10.1

STEP 2: LAN INTERFACE**CONFIGURATION ETH0:**

DEVICE=eth0

BOOTPROTO=static

IPADDR=10.11.10.102

NETMASK=255.255.255.0

ONBOOT=yes

HWADDR=52:55:a2:4a:52:63

STEP 3: LAN INTERFACE**CONFIGURATION ETH1:**

DEVICE=eth1

BOOTPROTO=static

IPADDR=192.168.10.2

NETMASK=255.255.255.0

ONBOOT=yes

HWADDR=5a:85:BS: 51:68:4e

NODE 1 & 2: HOSTNAME**CONFIGURATION:**

127.0.0.1 localhost.localdomain localhost

10.11.10.101 node1.clusterbr.int node1

10.11.10.102 node2.clusterbr.int node2

10.11.10.100 dbip.clusterbr.int node2

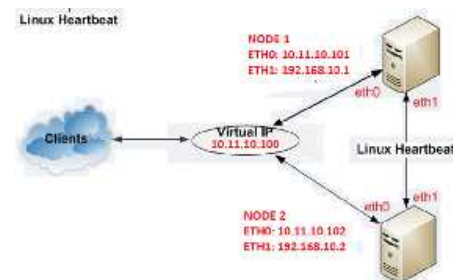


FIG: Active / Passive Configuration.

[8]

C. LOAD BALANCING CLUSTER

Load balancing software typically works with the clustering software to manage the server workload within the cluster so that it is evenly distributed among the nodes.^[9] It monitors the operation of each node and divides the streaming workload according to a predetermined formula or algorithm. It also ensures that, even though the stream may originate from any of several different nodes, the content is represented by a single IP address.^[10]

There are two primary load balancing strategies:

Hardware based load balancing:

Also known as reverse proxy, this method relies on a proxy server that is placed in the network between the server cluster and the clients.^[11] The reverse proxy server receives stream requests from the client and either redirects the client to the appropriate server or proxies content from that server to the client. To avoid creating a single point of failure, you can use two or more reverse proxy machines in parallel.

Software based load balancing:

Software-based load balancing features such as Network Load Balancing (NLB) assign a

percentage of the total server load to each node in the cluster. The load balancing software runs on each node of the cluster and calculates which node will be the next to accept a new request based on each server's percentage of the total workload. The advantages of this load balancing method include speed, configurability, reliability, and reduced cost. NLB uses a fully distributed filtering algorithm. Every second, each node in the cluster emits a "heartbeat" signal which contains information about its status.^[12] NLB monitors these signals for changes in the cluster status and changes the service request distribution appropriately.

CONCLUSION

Computer cluster management support to give continuous service in any situation because both nodes configured same. If primary server fail then secondary server and do the process or both servers will work together and its support failover and fallback process.

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