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Flooding Antivirus to Clustered Systems

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***Abstract*—Flooding algorithm is an algorithm for sending data to all the nodes in the network. Each node turns as both sender and receiver. Flooding is used in peer-to-peer file sharing and in ad-hoc wireless networks. Flooding generates redundancy, so, to avoid this, spanning tree system is to be used.**
Spanning tree system is a mechanism through which it creates loop free tree topology[5]. In a clustered network if any node fails, the other node takes ownership. This happens because of a layer of cluster software runs on the cluster nodes. In this paper we described how to flood Antivirus to Clustered Systems through network using Spanning Tree System.

***Keywords*— flooding, cluster software, clustered system, Spanning Tree System, Antivirus.**

I. CLUSTERED SYSTEM

The common predictable definition is that clustered computers share storage and is very much connected via a LAN. Clustering generally used to offer high accessibility service. The service will carry on even if one or more nodes in the cluster fail. High availability is usually obtained by counting a level of redundancy in the system. A layer of cluster software runs on the cluster nodes[2]. Each and every node can observe one or more of the others. If monitored node fails, the monitoring node can take rights of its storage in addition to restart the process that were running on the unsuccessful node.

Cluster software manages the operations of all nodes in a Cluster. Cluster software is not a distributed system but it provides various features such as computation speed, high availability and scalability[4]. Scalability is provided by sharing the load across the nodes or servers.

Clustering can be designed either asymmetrically or symmetrically. In asymmetric clustering, one node is in standby node whereas the others process the applications. The standby node does nothing but observes the active server. If the server goes down, the standby node becomes active server (both active server and standby node are shown in Fig.1.).

In symmetric clustering, two or more nodes run the tasks and also involve in monitoring each other.

A cluster-based structure is an example of distributing computing. Clusters can be several CPUs connected together in the same, single room. Another type of multiple processor system is the clustered system. Table-1 shows the comparison of multiple processors systems..

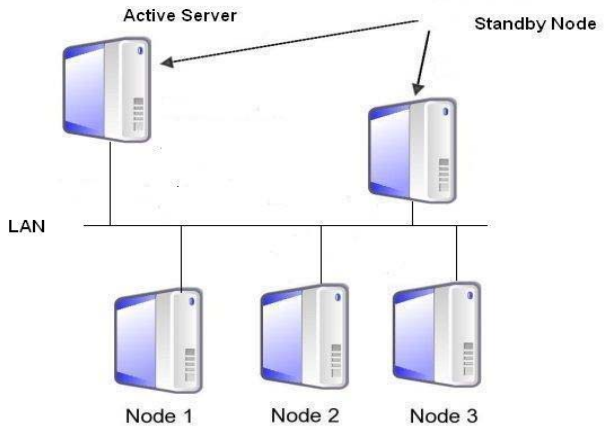

Fig 1.

TABLE 1.

Item	Multiprocessor	Cluster (Multicomputer)
Node configuration	CPU	CPU,RAM, Net Interface
Node peripherals	All Shared	Shared may be disk
Location	Same Rock	Same Room

Five basic characteristics of cloud computing are applied to cluster and grid computing. All three systems (Cluster, Grid and Cloud Computing) are distributed and share similar characteristics. Both Resource pooling and broad network access criteria's are fulfilled by all systems. Network access to cluster and grid computing systems generally takes place within a business network, while the services of a cloud

computing system can also be accessed by public network, i.e. the Internet.

Comparison of Cluster, Grid and Cloud Computing is shown in the following Table-2.

TABLE 2.

	Cluster	Grid	Cloud
On Demand self Service	NO	NO	YES
Broad network Access	YES	YES	YES
Resource pooling	YES	YES	YES
Rapid Elasticity	NO	NO	YES
Measured Service	NO	YES	YES

Resources in grid and cluster environments are normally pre-reserved, whereas cloud computing systems are demand driven.

II. SPANNING TREE SYSTEM

The spanning tree system is the mechanism through which the Local Area Network bridges or switches create a loop free tree topology. Flooding mechanisms do not perform well in mesh topologies except the nodes track the flooded frames and stop flooding when it is identified that a frame has already been flooded. Bridges do not track frames and so require to operate in a loop free topology. The bridges will never discover the destination, even though the frame will have touched the destination. If a loop occurs, the frame will be flooded over and over.

The ports on a switch with enabled Spanning Tree System are in one of the following five port states.

- Blocking
- Listening
- Learning
- Forwarding
- Disabled

A switch does not arrive any of these port states directly except the blocking state. Once the Spanning Tree System (STS) is enabled, each switch in the network starts in the blocking state and later enters to the listening and learning states.

Blocking State

The Switch Ports will drive into a blocking state at the time of selection process, when a switch receives a Bridge Protocol Data Unit on a port that indicates a better path to the Root Switch, and if a port is not a Root Port or a Designated Port.

A port in the blocking state does not play a part in frame forwarding and also rejecting frames received from the close network segment. During blocking state, the port is only listening to and processing Bridge Protocol Data Units on its interfaces. After few seconds, the switch port changes from the blocking state to the listening state.

Listening State

A Root Port or a Designated Port will move to a listening state after blocking state. All other ports will stay in a blocked state. During the listening state the port rejects frames received from the attached network segment and it also rejects frames switched from another port for forwarding. On this state, the port receives Bridge Protocol Data Units from the network segment and points them to the switch system module for processing. After seconds, the switch port moves from the listening state to the learning state.

Learning State

A port moves to learning state from listening state. During the learning state, the port is listening for and processing Bridge Protocol Data Units. In the listening state, the port begins to process user frames and start updating the MAC address table. But the user frames are not forwarded to the destination. The switch port moves from the learning state to the forwarding state after few seconds

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Forwarding State

A port in this state forwards frames across the closed network segment. In a forwarding state, the port will process Bridge Protocol Data Units, update its MAC Address table with frames that it receives, and forward user traffic through the port. Forwarding State is the normal state. Data and configuration messages are passed through the port, when it is in forwarding state.

Disabled State

A port in this state does not contribute in frame forwarding or the operation of Spanning Tree System because a port in the disabled state is considered invalid.

III. CONCLUSION

Flooding Antivirus generates redundancy where a router is given a circular route to some of the nodes on the network. Using Spanning Tree System, the router waits for the response from the certain node and forward Antivirus to all the clustered systems using rooting algorithm (like static algorithm flooding, etc.,) if does not send it already.

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