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Virtual Network Level of Application Composed IP Networks Connected with Systems - (NETS Peer-to-Peer)

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Abstract

Objectives: The objective is to analyze the foundation the Virtual Network Level of Application Composed IP Networks Connected with Systems. **Methods/Statistical Analysis:** In this research using the methodological foundation logical analysis attempts to give an overview of the state of the art in terms P2P and especially networks in the field of computer systems distributed along with several contributions that allow build systems High Throughput Computing. **Findings:** The network is virtual is application level made up connected to IP networks, in a nutshell systems P2P systems are distributed systems in which there are no any central control or hierarchical structure and can therefore go beyond the services offered by traditional centralized type systems Client Server at the cost of greater technical and theoretical complexity. In P2P systems, nodes that make up the system are connected together using IP networks forming a kind of virtual network application layer, also called "Overlay", which is used to route messages between nodes in order to find information. **Application/Improvements:** The recent emergence of applications that exploit the network concept Peer to-Peer or P2P in which all members have the same role has made consider its possible applications to the world of distributed computing. Although there are already similar in this field, such as those that follow the paradigm of grid computing, this new concept may be the source systems massive computer wide open to anyone with an Internet connection could use for the benefit or for solutions others, sharing their surpluses recourses.

Keywords: Massive Computing Systems, Sis Issues Connected to IP Networks, Technical Complexity, Virtual Application Level

1. Introduction

A P2P network type unstructured is regarded as a system composed of interconnected nodes each a more or less random, without any prior knowledge of the network topology. The red uses a mechanism to communicate flooding or flood not known nodes each through the overlay. When a node wants to make an inquiry, sent by broadcast a message query to its neighbors, or portion thereof as the algorithm used, which in turn forwarded the message to the rest of the network while the scope of the message does not exceed a certain limit (of hops in the network, time ...).

One can see an example of this mechanism in Figure 1, in which a network of nodes 6 shown. In the example you can see how the n0 node wants to communicate with the node n6, for it sends a message broadcast by search all its neighbors, nodes 1 to 4, in step 0; these forwarded the message in Step 1 reaching the node n6. We can observe the low efficiency of the algorithm in terms of number of messages used as in step 2 n6 again receive the message n0 search for a different route[1,2].

While techniques based on flooding are useful to find popular content on the network, i.e., highly they replicated, and are immune to changes regarding the composition of the network, have a number of failures

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imported teas: They are not suitable for search rare content, i.e., little replicated, and the workload on each node grows linearly with the number of queries and nodes in the system. Thus, clearly, we can see that is not a system that scales well, reaching saturate nodes quickly if a given instant of time the number of those that make up the system increases considerably (Figure 1).

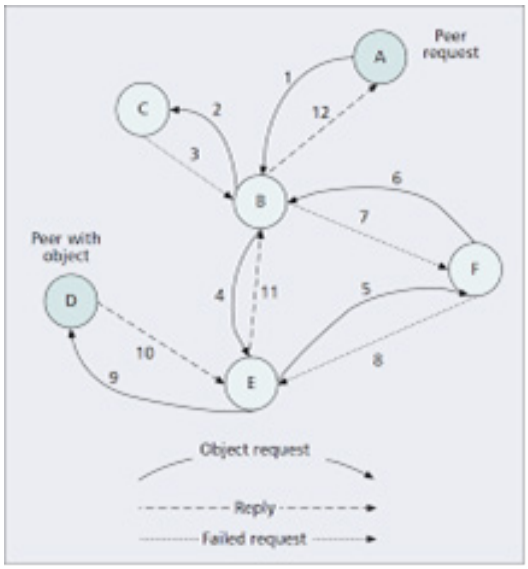

Figure 1. Network formed for 6 nodes[2].

2. Theoretical Foundations

Peer-to-peer networks have created large communities of connected computers (hereafter referred to as nodes). These networks permit the shared use of resources: content, storage, CPU cycles, and bandwidth. Unlike traditional Web-based protocols, each node can be either a provider of a resource, a consumer of a resource, or a link in the chain that enables the discovery of resources. There are several specific benefits that peer-to-peer networks have over conventional search engines like Google[3–5].

- Information is current since it is retained by the data provider and not cached by a central directory. Contrast this with search engines in wide use on the web today that index content using spiders. Their indices are only as current as the last spider visit to the information provider.
- The topology of the network can be used for learning about a node's "neighborhood" and deciding how to respond to "neighbors". An appropriately-organized network can help preserve the context of the search.
- Peer-to-peer networks are decentralized and do not possess a single centralized server which can serve as a point of failure or a bottleneck Decentralization of the administration and coordination of nodes in the network is to varying degrees a distinctive feature of these systems.

Examples of these peer-to-peer protocols and systems include Napster and Gnutella for file sharing, the SETI project at Berkeley for shared use of CPU cycles, and Freenet for secure information storage and retrieval. A complete listing of these new peer-to-peer systems may be found at http://www.oreillynet.com/pub/q/p2p_category. Given the focus of this proposal on information sharing in decentralized, virtual communities we review the principal features of the Gnutella protocol. Our objective is to present the key conceptual ideas underlying the protocol- and not the technical details of the protocol- in order to motivate the problems that need to be addressed to realize decentralized, virtual marketplaces[6,7]

Is important to determine that a virtual network application layer formed p or connected to IP network systems, which the routing protocol varies in each system, but they all meet a feature as to how to route a message to a node destination: The routing is done progressively depending on the distance to the destination. Each overlay node has a routing table in which stores information about the identifier of each of its neighbors along with their IP addresses[8].

Thus, when a node wishes to send, or route, a message to a node identified by the k key, it will send the message to one of his neighbors that the closer you are to the destination of the message. Such property of closeness between a node and a key DHT varies between systems, and it will depend on l a way to organize the space key and the routing strategy. In theory, based on DHTs systems ensure that any object can be located in a number of hops O (log N) medium, where N is the number of nodes that form the system. One of the weaknesses of DHTs systems is based on their behavior in massive income and output nodes in the network at a given time[9].

Latency can vary considerably in these cases and that is why proposals have been made for minimize these effects, such as where an algorithm is shown to achieve near optimal latency graph showing laws of potential, such as P2P networks before us, and while still preserving scalable routing properties possessed by DHTs; or where a solution to maintain a certain load balancing specified

under adverse conditions. It also shows how to avoid problems arising from changes in the system by choosing the appropriate subset of nodes with which to work[10].

Despite that behavior a P2P system based in DHT from the view the application level is the same for any implementation, the underlying network nodes could follow very different topologies. For this reason it is explained that the Content Addressable Network (CAN); It is a system P2P what provides features from table hash so distributed. CAN was designed to be scalable, fault - tolerant and self-organized. The basic design of its architecture is a multidimensional space Cartesian coordinates on a bull, being d-dimensional logical space on the system keys are mapped and n ll that compose it. According to the number of dimensions is d log N, where N is the number of nodes in the system, we can consider that CAN follows a hypercube topology log N-dimensional[11,12].

In this coordinate space to each node is assigned a space partition, so that each node corresponds to a single, distinct area. CAN, a node maintain a routing table with the IP addresses and the area of virtual coordinates that correspond to their neighbors in the coordinate space. Using these coordinates, a node is able to route a message to your destination using a simple greedy algorithm that forwards the message to one of his neighbors is closer to the destination in the coordinate system.

When a new node to want to access the system, you must run the algorithm boot, or bootstrapping, accordingly. CAN there is a mechanism for locating DNS system nodes using a DNS name. Once the node has regained some IP node in the system, it gets in touch with him indicating his desire to become part of the system. For this to choose a random point P of space coordinates and transmits it to node system, it uses the routing protocol to send the message to the point P of the network. Once you reach your destination, the node q in charge of that point coordinate their space divided on 2 leaving him with a half and giving the other to the new node. Once you're connected to q, the latter tells his neighbor table so that to build the list of neighboring nodes of the regions adjacent to his[13].

3. Methodology

In this research study the non-experimental design, given that the variable was not under the control or intervention by the researcher, but his diagnosis and evaluation was applied. Guzman (2011, p.156) also states that "the non-experimental research design is one that is performed without deliberately manipulate the variable, observed phenomena as occur in their natural context and then analyze their reality". Also, it is transeccional, because the data is collected at one time and only time, analyzing their impact and interaction at a given moment, taking direct data from reality in order to make a description of aspects the variable under study.

Similarly Hernandez, Fernandez and Baptista (2011), presented the non-experimental design as the study performed by the observation of phenomena in their natural environment to be analyzed later. In a non - experimental study existing situations which are not caused by the researcher observed. Therefore, the studies a non-experimental design will be used under the variables under study without intervention mediate or interfere occasional change of its natural habitat manipulation[14].

As is done at a specific time and in a given time is considered transeccional or transverse since the researcher studied the event in a single moment of time. For its size, it is based more on statistical data than on direct observation. It shows how the interaction born social relationships, ranging structuring the different roles, about Sierra (2009) refers to this type of study refers to the variable and its rotations in small and medium groups.

The study also typified as transactional, because the variables are measured at a given moment, as presented at the time of collecting information, which according to Chavez (2010, p.134) considers that in this type study only "measuring characteristics of one or more groups of units in a given, without trying to assess the evolution of these units now"[15].

4. Research Results

Since the rise of P2P networks has been much debate about the possibility of using this paradigm as a basis for distributed system mounted r a computer system. A distributed computing system can define as a set of interconnected computers together by a communications network trying to pool their resources to carry out some kind of computational task. Every computer connected to the system has its own independent computing resources, however, from the point of view of the user, the system is perceived as a single system.

In such a system a user would access resources in the same way they access local resources. However, the fact that the system is distributed across multiple entities gives

characteristics in terms of scalability and support fault that few possess. Systems that meet these conditions are many, from clusters to grid computing systems, through Desktop Grid systems. Among all these systems we can highlight some solutions as Globus Grid systems, Condor Clustering systems or Boinc regarding Desktop Grid systems. All of these systems, however, agree on one point: all are centralized at some point[16,17].

This centralization either to facilitate administration tasks and maintenance or either by corporate issues deprived the system of some of its most prized characteristics in terms of support failures or scalability because it is precisely this central point the weakest link in the chain and where the entire system can fail. A computer system through P2P networks overcomes this disadvantage by giving to their members the work administrative Y to the give them equal rights to the other nodes on the network. However must solve a series of technical problems so over those that are working today[18,19].

5. Conclusion

This report has given an overview of the state of the art in terms of Peer-to-Peer and especially in what refers distributed computing systems sob re such systems. They have shown their characteristics and defects. They have also provided a number of ideas to improve these systems. Finally, we have shown a number of tools in the form of simulators and libraries that may be useful for the study of P2P networks

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