IMPROVEMENT OF SERVICE DELIVERY BY DUAL-STACK CLOUD FILE SERVICE

P. MURALI KRISHNA, K. SENTHIL KUMAR

Abstract: Cloud Services have attracted much attention in recent years as networking systems for the information connection devices of organizations or enterprises around the world have become increasingly sophisticated. Cloud services also provide a variety of services for users, including virtual hosting services, storage services, and web application services. Distributed computing and the peer-to-peer (P2P) network are two important elements in cloud computing. However, the huge numbers of information devices currently in use present some new problems, such as lack of IPV4 protocol addresses. Therefore, the IPV6 protocol was proposed. During the transition period from pure IPV4 to pure IPV6, IPV4 and IPV6 will coexist on the Internet. To link independent dual-stack P2P networks around the world, we herein propose a mechanism to improve the service discovery in dual-stack cloud file service, thus decreasing the amount of protocol translation and improving the efficiency of the bandwidth and load balance. From the simulation results, we conclude that the proposed mechanism can achieve higher connection success rate, efficient bandwidth, and a lower connection build time.

Keywords : Cloud computing, DHT, IPV6, peer-to-peer(P2P), service discovery.

Introduction: The advancement of Internet technology has expanded data storage function to network services that allow multiuser interactions and remote administrations. However such network services require high computing power large bandwidth and sufficient backup systems. A cluster system or other distributed systems are an effective means to support the network services that demand high throughout and load balancing. Cloud service has therefore emerged. Cloud computing provides user authentication, service discovery, database service, and file service, allowing users to quickly access high computing power and storage space, such as converting graphics format from tiff to pdf. Cloud service systems also provide security protection to avoid unauthorized access to users files. Currently cloud file services along with the traditional server farm structure global distributed server farm and peer to peer(P2P) file sharing.P2P technology is currently perhaps the most used infrastructure for cloud computing and P2Pfile sharing mechanism protocol [1] ,[2] P2P overlay networks into one global P2P file sharing network. Because of the great number of information devices issues related to the lack of IPV4 network address have to be resolved. Network address translator (NAT) is technology for solution. It uses private addresses, many P2P software programs cannot directly connect with each other. Solving this problems using a dual stack IPV4/IPV6 [3] coexist network and support P2P system. As shown in Fig. 1, the dual stack mechanism includes two protocol stacks that operate in parallel and allow network nodes to communicate via IPV4 or IPV6 [4]; they can be implemented in both end systems and network nodes. In end systems they enable both IPV4 and IPV6 applications to operate at the same time. The dual-stack capabilities of network nodes at the same time. The dual-stack capabilities of network nodes support the transport of both IPV4 and IPV6 packets.

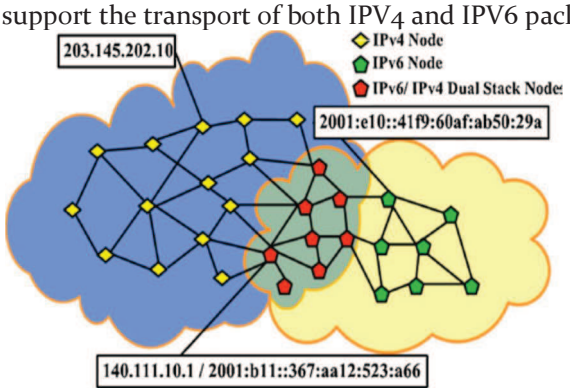

Fig. 1. IPV4/IPV6 hybrid P2P network.

Related Work**:** Cloud computing. Cloud computing provides resources such as storage computing as a service; users can then choose the contents they want and the ways to use the contents. Cloud computing services can be assigned as follows.

1) Infrastructure as a service: Users rent virtual servers for their needs instead of buying real machines and software, and thus save the cost required for both equipment and maintenance.

2) Platform as a service: Service providers support an environment in which all software and runtime are ready for use; program developers then simply upload their data, such as Web application codes and database data.

3) Software as a service: Instead of buying software and installing it on a local machine, the software-as-a-service model provides users with software-on-demand. When users need to use applications, they use Web interface applications or a providers program, and pay only for the cost of the time they

use it.

P2P File Share:P2P is a service model whereby the participants share resources with one another. Most P2P protocols have some common features, with every peer having a unique identifier and supporting some type of message-routing capability. A P2P network is also called a P2P overlay, which means it is on top of another network, such as the Internet.P2P services and applications have become very popular in recent years. P2P networks are classified as structured or unstructured by their topology. Structured P2P networks use a consistent protocol so their peers only record the link of specific peers by their protocol, and they can confirm their discovery results in an efficient route path. Unstructured P2Pnetworks record their route table arbitrarily; they usually start a discovery using message flooding, so they must limit the discovery duration time and may not find scarce resources.

DHT and Chord Protocol :A distributed hash table (DHT) [5] is one class of a distributed system which separates the key/hashed value pair information to distributed peers. When a peer queries the value of one specific key, DHT sends the query message to some peers; peers receive the message based on the DHT routing algorithm.

Chord [6] uses consistent hashing [21] to assign keys to its peers as shown in Fig. 2. Consistent hashing is designed to let peers enter and leave the network with minimal interruption. In a steady state, for N peers in the system, each peer maintains routing state information for only O(log N) other peers (N number of peers in the system). This can be efficient, but the performance degrades greatly when the information is out-of-date.

IPv6 :Due to the lack of IPv4 addresses, the IPv6 protocol was proposed as a solution. As the address range of IPv6 is 2128, address requirements could be met for a long time. Nevertheless, given the large amount of network devices and software supporting only IPv4, IPv4 and IPv6 will likely coexist for about ten more years.

Dual-Stack P2P :Some studies have attempted to design a P2P system that would enable IPv4 peers and IPv6 peers to connect with each other. When a peer needs to connect with another peer using a different IP version, it can use a P2P application gateway(ALG) or other transition mechanism.

Mechanism Improvement For Dual-Stack Cloud File Service Discovery :For the dual-stack cloud computing architecture, a single area P2P overlay network can be built in an office or laboratory as a single-area dual-stack P2P network model, or between multiareas, such as between different companies or server clusters, as multiarea dual-stack P2P network model.

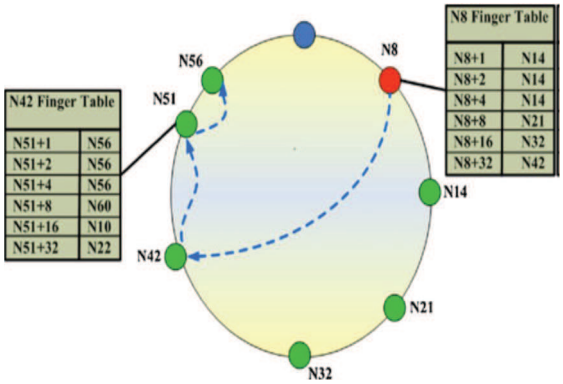

Fig. 2. Illustration of IMS policy decision function

1)dual-stack peer IPV6/IPV4 registers twice and has two node id's and double loading.

2)finding a way to choose a super peer

3)finding a way to choose a data translation path.

Sytem Architecture:

1) Single-Area Network Model: In an office IPV4 and IPV6 networks can coexist in a local area. Some devices only support the IPV4 protocol, some only support the IPV6 protocol, while others support the dual-stack(IPV4 and IPV6) protocol. A peer is a device which joins a P2P overlay network and simply addresses IPV4 peer and IPV6 peer. After joins peer gets a node-ID hashed by its IP address. When a device supports a dual-stack, it is called a dual-stack peer. It can join an IPV4 overlay network and an IPV6 overlay network as shown in Fig. 3.

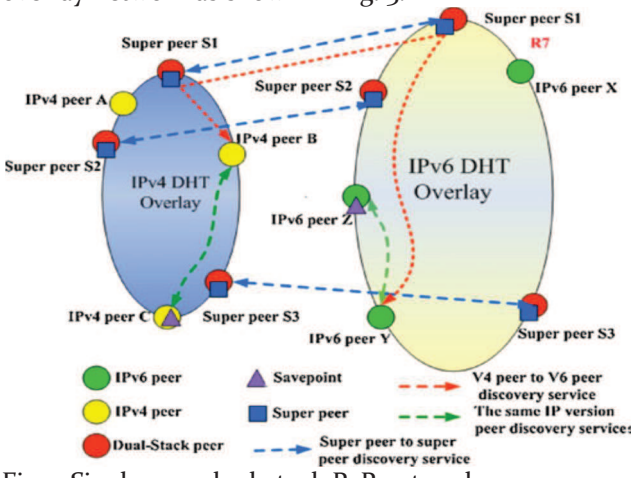

Fig. 3.Single-area dual-stack P2P network.

2) Multiarea Network Model: Fig. 4 shows a multiarea dual-stack P2P network model. In this figure, every circular area represents a single-area P2P overlay network with an IPV4 or IPV6 protocol. Networks near one another can use dual-stack peers for communication.

P2P File Share:

1) Normal peer**:** a)the normal peer must record the

routing information of neighbor nodes

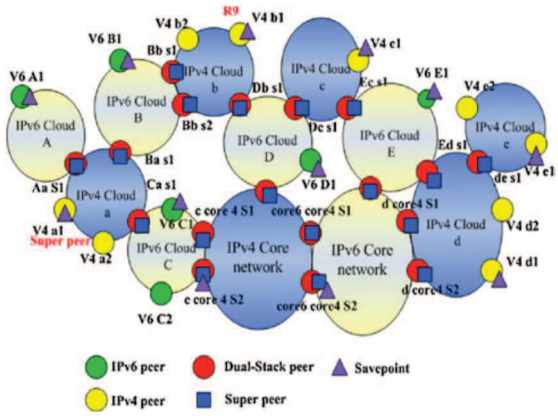

Fig. 4. Multiarea dual-stack P2P network

b)the normal peer must share the information and resources to other peers

c)the normal peer maybe only has low computing power and low bandwidth.

d)if the normal peer need connect with other peer of network,it must via super peer.

2) Super peer**:**

a)the support peer must support the basic functions of normal peer

b)the super peer must support the function which can connect to other groups super peers and exchanges data

c)the support peer must support higher bandwidth and computing power;

d)the super peer must support the function which can connect between hybrid networks.

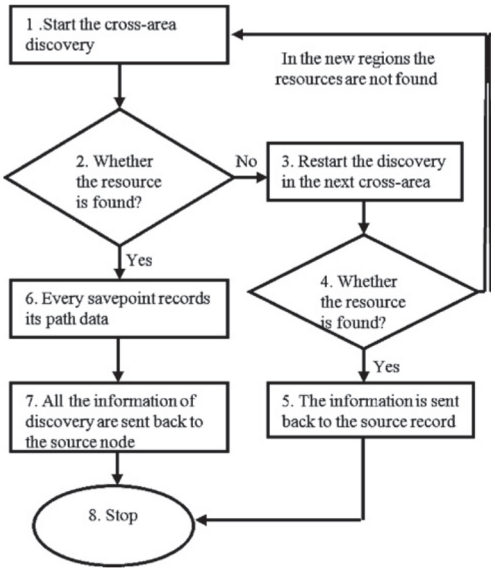

Fig. 5. Flowchart of resources discovery in multiarea

C. Resources Discovery in Single-Group Network

1) IPV4 peer A discovers resource R7 in IPv4 network but cannot find target resource

2) IPV4 peer a request super peer s1 starting a resource discovery in IPV6 network

3) super peer s1 starts a discovery in IPV6 overlay network and then finds the v6 peer X that has the target resource R9.

5) super peer s1 returns the result to ILPV4 peer A.

6) because the upload bandwidth of super peer s2 from IPV6 to IPV4 network is higher than other super peers, so v6 peer X chooses super peer s2 for uploading data to IPV4 network

Resources Discovery in Multiarea Networks:

At the beginning the start peer explores the path state at its cross area. These save point records its path data for every return value. In the next step the start peer begins by sending requests to the cross area in order of node number precedence to avoid collisions with reports being sent back from the cross area. when are port is received, the source peer accordingly updates the route table of the group. Once the last report is received the source peer compares every peer with the bandwidth. This bandwidth is then computed by adding a return value to there score which is acceptable for the application

Choosing Relay peers in Multi area Network:

The key to the cross-area protocol mechanism is that each cross area measures the channel protocol and feeds back the information to the source peer. In the initial phase all cross area peers which are participating in multigroups estimate their channel route by measuring the different source protocol (IPV4 to IPV6 or IPV6 to IPV4) and the same source protocol (IPV4 to IPV4 or IPV6 to IPV6) of periodically explores through a cross area peer the inference mechanism estimates the peer protocol by means of a decision peer involving two peers the start peer and the resource peer.

Conclusion : This paper proposed a dual stack cloud file service discovery scheme that allowed peers to communicate between different protocols with the service discovery starting from a single area and expanding to a multiarea. The proposed service discovery scheme recorded the super peer information in the process and used this information to determine the best super peer for relay peer in a connection. When choosing the relay peers the scheme first considered the bandwidth and load balancing of the super peer and then tried to provide a strong and reliable connection for data communication in order to enhance the efficiency of the dual stack cloud file service discovery.

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