ISSN: 2320-1363

Distributed Control Flow for Balancing Content in Social Wireless Networks

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Abstract

Time and Its Constraint has given the Technology a frame of Jewelry to the Industry of Information Technology. Typically, if we consider the best software in this current era, might be none of them cannot make sure 100 % efficient. Technology has its own significance to lay the foundation for the next level of journey where component model play the important role. In this Paper, we try to put the glimpse of the traditional technology and the modern technology giving a high citation to technological advancement to the technological terminology. If we consider the typical Parallel distributed network, where three most parameter we consider Security, Speed and Accuracy; among them Load balancing is one which would be appended method, cannot be ignored. In the Content Delivery Networks, Balancing the traffic is the typical, hence in this paper we try to put forward to explore of the dynamic queue concept, where based on priority we distributer the map based status queue.

Index Terms-- Social wireless networks, cooperative caching, Content Delivery Network (CDN), control theory, request balancing.

1. Introduction

In the Social wireless networks, Content Delivery Networks (CDN) has been introduced to overcome the limitations of the aforementioned techniques, and offer the content providers with a complete solution for their problems. They are now commonly deployed, the CDN provided by Akamai is perhaps the most famous, however many different CDN providers are operational today (see for a complete list). A CDN is a

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combination of various subsystems the most important ones from our point of view are the replica infrastructure and the request distribution system. In the 2002 paper "Globally Distributed Content Delivery", the authors disclose details about the actual implementation of the systems used by Akamai. According to them, Akamai uses a network of more than 12000 servers, spread over 1000 networks (as of a more recent whitepaper from the company's website, the network now comprises 25000 servers). They also say that Akamai allocates more replicas in the locations where the load is higher, not giving further details on this topic. Note that other CDNs use a much smaller amount of servers: for instance, Mirror Image in its whitepapers claims that owning only a few servers is an advantage as configuration and content changes can be deployed faster. The procedures followed by the RRS for selecting servers are not disclosed in, but they describe the goals of their redirection system. The claim is that it aims at redirecting every client request to a server that is close (as a function of the client location, the network conditions, and the dynamic loads of the servers), available and that is likely to already retain a copy of the requested content.

2. Related Work

CDNs systems thus succeed in improving the experience of users when accessing web contents, as content is moved closer to the user, while meeting the Content Provider need for content distribution control. It is also easier to maintain statistics. The provider has full control over the replicas. Another advantage is that many non-cacheable objects can be replicated, so replicas can effectively serve more objects than caches do (see for a thorough analysis of the possible approaches to replicate dynamic contents for web applications). Finally, to ensure the freshness of the contents, content distribution sites may avoid using HTTP, and choose protocols which allow more efficient communication with the origin server. The recent work goes more in depth on the Akamai CDN. By taking accurate measurements from different hosts spread in the world, and decoupling network effects from server related effects, they were able to provide many interesting data. First, they confirm that clients in different locations are served by server sets of different size, containing different elements: during a single day, the RRS returned 20 different servers to some clients, while some other client resulted in as much as 200 different servers. Another important point is that Akamai exhibits different performance for different customers ("content providers"), some customer results in being hosted in more than 300 different servers, some other one in as few as out of the many thousands the CDN provider owns.

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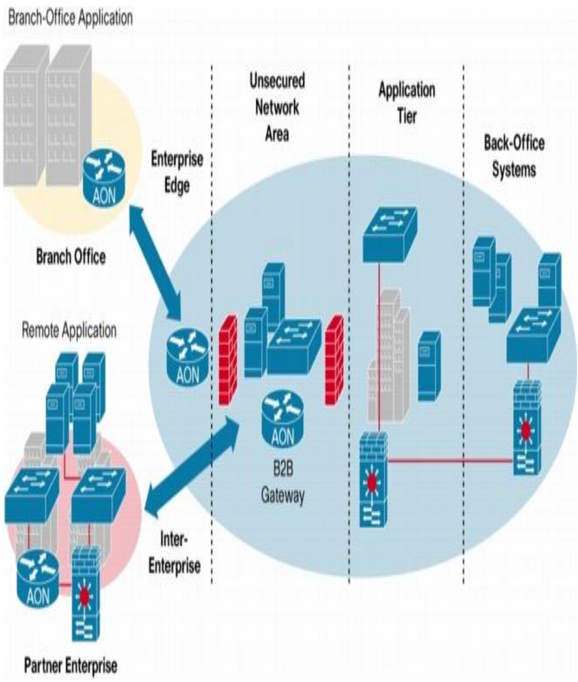

Fig.2.1 Illustration of CDN

The time delay before the RRS changes the selected server for a client varies for different geographic areas. For some client located in the United States, 80% of the redirections are shorter than 100 seconds; very long redirection times indeed occur, but these events are very rare and their occurrence is strongly related to the time-of-the-day. For nodes located in Brazil redirection times are much longer. The last important finding is that the RRS usually routes the requests through a path that is less congested than the average (from the experiments, this is untrue only for requests coming from Brazil), thus supporting Akamai's claim of being able to make decisions based on both the network conditions and the server health.

3. Methodology

The request distribution system is in charge of intercepting user requests, selecting the replica most appropriate for serving the request, and directing the user request to it. This service should locate a replica that is as close as possible to the user, while avoiding replica performance degradation - e.g., by balancing the load among replicas. The interception and delivery of the requests can be done by means of a variety of mechanisms, the most commonly used ones being DNS redirection and URL rewriting, that are sometimes used in combination. In DNS redirection, the CDN provider manages the DNS for some domains (ADNS, Authoritative DNS), and when the user requests for a domain name managed by the CDN provider, the system translates the name to the IP address of the chosen replica.

ISSN: 2320-1363

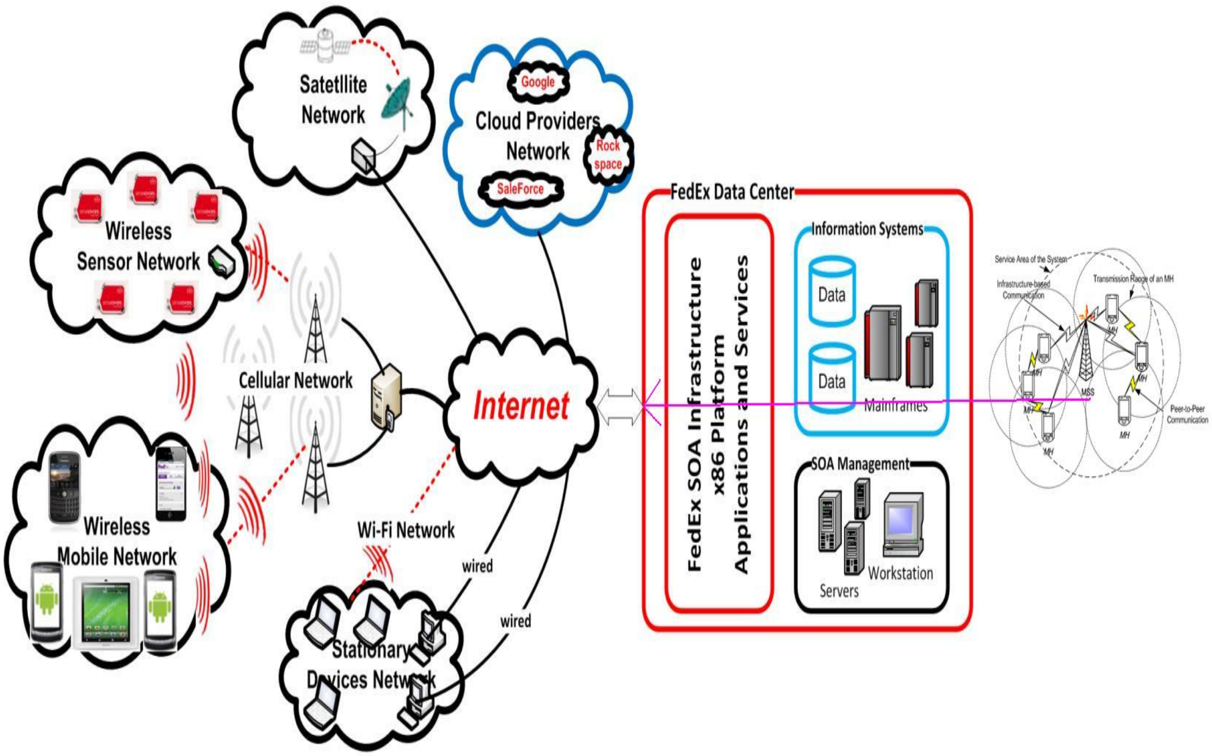

Fig.3.1 CDN Peering Flow in the Context Dynamic Acknowledgement

Remember that when making a DNS resolution the client usually contacts its primary DNS server, that in turn contacts other DNS servers traversing the DNS hierarchy, and that DNS queries are usually cached by the DNS servers traversed by resolutions. The main drawbacks of this technique depend on the hierarchic structure of the DNS, and limit the capability of the DNS to perform different decisions for each different request: Despite this problem may at first seem very similar to the problem of filling up caches in the proxy scenario, it has some important differences. In caching the available disk/memory space is usually filled with contents until the storage limit is reached: it is not important to minimize the number of copies, it is more important to use all the available disk space in order to maximize the probability of retaining the requested contents. In CDNs instead, it is better to limit the number of different copies of the same object in order to save bandwidth (the more replicas the more updates) and CDN costs. Having many servers also negatively influences other processes, such as statistics collection, server maintenance, server software configuration

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3.1 Evaluation and Analysis

In a distributed system, if some hosts remain idle while others are very busy, system performance can be affected drastically. To prevent this, a load balancing policy can be employed, that balances the workload of the nodes in proportion to their capacity, thus supporting the effort to minimize the user perceived latency. Our heuristic strongly relies on the RR system. The RRS provides load balancing among the available replicas redirecting requests only to close-by replicas.

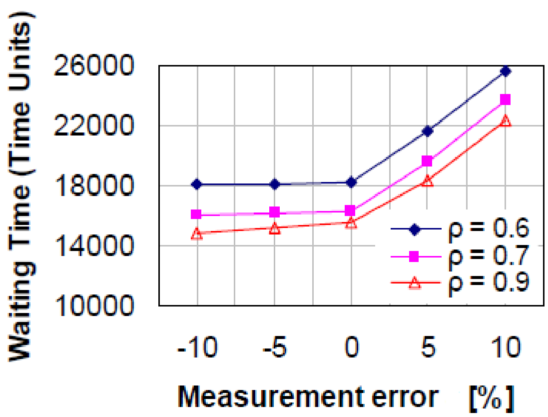

Fig.3.1.1 Compression of the Error to Idle Time

A replica can give the RRS a false feedback on its load (providing an inflated value) in order to give the information that it wants its load to be reduced, if this does not impair the system capability in serving requests.

4. Conclusion and Future work

Building on this new formulation, we have provided a framework for the design of replica allocation schemes dynamically placing and removing replicas in response to changing users demand. By assuming the users requests dynamics to obey to a Markova model we saw how to formulate the dynamic replica placement problem as a Markova decision process. This allowed identifying which can be used as a benchmark for heuristics evaluation and provides insights on how allocation and de allocation should be proactively performed. Based on the findings obtained through the analytical model we derived a centralized heuristic which allocates and de allocates replicas to reflect the requests traffic maximum distance of the users from the "best replica".

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ISSN: 2320-1363

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