1 Introduction

Summarize your project goals here, e.g., Our project goal is to quantify the performance improvement offered by deploying overlay networks across the wide-are Internet.

1.1 Milestones

Say something about your approach and what you plan to accomplish

2 Literature Survey on Overlay Networks

This is the most important section. By now you should have read the papers related to your project and are aready to discuss the pros and cons of existing solutions.

Widely used applications such as multicasting [1, 2], content distribution networks [3] and peer-to-peer file sharing [4] have been the targets of application-specific overlay networks. Most of the proposed approaches on application-layer multicasting adopt the idea of using strategically placed fixed nodes to support overlay multicast service. The goal of the Overcast model [5] is to provide wide-area content distribution and bandwidth sensitive multicast services while utilizing the network bandwidth efficiently. In [6], the authors focus on how to provide scalable multicast services to real-time heterogeneous receivers to reconcile the clients' differences in capabilities and network connections. In [7], the author mainly focus on how to balance the multicast traffic among multicast service nodes (MSNs) while maintaining low end-to-end latency. However, the paper did not consider balancing the traffic among the peer links or searching for overlay paths that satisfied the QoS for applications. Resilient Overlay Network (RON) [8] is also based on strategically placed nodes in the Internet domains. It is proposed to quickly detect and recover from path outages and degraded performance. However, RON is designed for applications with a small number of participating nodes and cannot scale to the number of ASes that exist today.

Our effort belongs to the second category where we propose a generalized overlay service network that can be used for a variety of application-layer services. Yoid [9] is a generic overlay architecture which is designed to support a variety of overlay applications that are as diverse as netnews, streaming broadcasts, and bulk email distribution. Another similar effort is the Planet-lab [10] experiment that aims at building a global testbed for developing and accessing new network services. The main research issues being addressed in Planet-lab include: (i) defining virtual machine running on each node and (ii) building the management services used to control the testbed. A similar approach was proposed in OPUS [11], which provides a large-scale common overlay platform and the necessary abstractions to service multiple distributed applications. It automatically configures overlays nodes to dynamically meet the performance and reliability requirements of competing applications. X-Bone [12] is a system for automated deployment of overlay networks. It operates at the IP layer and is based on IP tunnel technique. The main focus is to manage and allocate overlay links and router resources to different overlays and avoid resource contention among the overlays.

Two other recent efforts that share similar goals of building a generic overlay network are OverQoS [13] and SON [14]. Third-party providers can utilize OverQoS to provide QoS services to the customers using Controlled Loss Virtual Link (CLVL) technique, which ensures that the loss rate observed by aggregation is very small as long as the aggregate rate does not exceed a certain value. OverQoS can be employed to provide Internet QoS such as differentiated rate allocations, statistical bandwidth and loss assurance, and can enable explicit-rate congestion control algorithms. Service Overlay Networks (SON) is designed to use overlay technique to provide value-added Internet services. A SON can purchase bandwidth with certain QoS guarantees from ISPs to build a logical end-to-end service delivery overlay. The authors have formulated the problem of QoS provisioning considering various factors like SLA, service QoS, traffic demand distribution and bandwidth cost.

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