

Resumen

La gran cantidad de contenidos puestos a disposición de los usuarios en Internet, ha exigido estudiar la conveniencia de aplicación de diversas técnicas para mejorar la performance de las redes de telecomunicaciones, las cuales son afectadas por retardos, variación del retardo, ancho de banda y pérdida de paquetes. Dado que, estos parámetros están presentes permanentemente, que a veces no pueden mejorarse por cuestiones físicas y que las aplicaciones poseen requerimientos para su correcto funcionamiento, estas propiedades deben ajustarse dentro de ciertos límites para garantizar a los usuarios la entrega de la información, priorizar el tráfico, minimizar y controlar la congestión, entre otras cosas. Estos límites se acuerdan entre cliente y proveedor mediante Acuerdos de Niveles de Servicio. Desde los comienzos del desarrollo de Internet, estuvo presente un servicio de entrega de datos denominado *Mejor Esfuerzo*, el cual se caracteriza por la no aplicación de técnicas orientadas a brindar calidad de servicio. Las aplicaciones envían paquetes de datos cada vez que deben hacerlo, en la cantidad que necesiten y sin ningún tipo de permiso ni informe a la red de datos sobre los requerimientos de la transmisión. Resulta innegable que un modelo de estas características no posee la mejor performance ni el mejor desempeño. Para dar soporte a este gran volumen de tráfico se han desarrollado arquitecturas de calidad de servicio que plantean modelos para mejorar la performance de las aplicaciones. El primer modelo se denomina *Arquitectura de Servicios Integrados* y se caracteriza por analizar el tráfico y aplicar reservas de ancho de banda a determinados flujos de datos asociados a sesiones individuales. En función de cuan tolerante al retardo, a su variación y a la pérdida de paquetes sea una aplicación, se utilizan los servicios Garantizados y de Carga Controlada. El primero aplica estrictos límites de retardo y el segundo es utilizado en ambientes donde las aplicaciones pueden aceptar un cierto grado de variación del retardo. El segundo modelo se denomina *Arquitectura de Servicios Diferenciados* y se caracteriza por proporcionar diferentes niveles de servicio al tráfico mediante su clasificación en grupos denominados *clases*. La aplicación de cada una de estas, otorgará al flujo de datos un tratamiento predefinido para el reenvío de paquetes. El enfoque de la arquitectura de Servicios Diferenciados se encuentra en algún punto entre el servicio de Mejor Esfuerzo y la arquitectura de Servicios Integrados, pues, trata de dar un paso más allá del modelo de mejor esfuerzo para ofrecer un servicio *mejor que el de mejor esfuerzo*. En el presente trabajo se estudiarán

Abstract

The vast quantity of content at Internet users' disposal has demanded the consideration of applying diverse techniques to improve web performance in telecommunication seriously affected by delay, delay variation (jitter), bandwidth and packet loss. As these parameters are permanently present, sometimes it is not possible to improve them both due to physical reasons and the fact that applications possess requirement for their correct functioning, those properties must be adjusted within certain limits to guarantee users' information delivery, prioritize traffic, minimize and control congestion and so on. Such limits are agreed upon between client and provider by *Service Level Agreements*. From the beginning of Internet development, a delivery service called *Best Effort* has been present characterised by not applying techniques oriented to provide quality of service. Applications send data packets each time they must, in the quantity needed and with neither permission nor report to the network of transmission requirements data. It goes without saying that such model does not perform or function well. Quality of Service Architectures has been developed to support this vast volume of traffic establishing models to improve applications performance. The first one is called *Integrated Services Architecture*, it analyses traffic and applies bandwidth reserves to determined data flows associated to individual sessions. Guaranteed and Controlled Load services are used depending on how tolerant is an application to delay, jitter and packet loss. The first one applies strict delay limits and the second one is used when applications can accept certain degree of jitter. The second architecture is called *Differentiated Services* and it provides different levels of services through sorting traffic in groups called *classes*. The use of each one of this will provide the data flow with predefined treatment for packet forwarding. The *Architecture of Differentiated Services* locates itself between the *Best Effort* service and the *Integrated Services Architecture* because it tries to go a step forward beyond the *Best Effort* model to offer a better service. The present work studies the techniques to control and avoid congestion as well as the application of policies and traffic modelling. This initial development complements the subsequent description of the service quality architectures above mentioned.

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