HTB與CBQ在Linux上階層性頻寬分享機制實作分析和探討

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摘 要

近年來，由於網路多媒體應用的盛行，使得如何有效使用及分配有限網路頻寬成為相關研究重點之一。因應而起的是網路服務品質(Quality of Service)的開發。 QoS相關的研究已經有許多具體的成果，而IETF也相繼的提出InterServe[1]及DiffServe[2]標準。一般而言，QoS經由Admission Control，Traffic Scheduling，及 Traffic Shaping等機制，對不同資料流或封包作不同處理而達到流量的控制。 目前有關QoS實作不論是業界或是學術團體都非常少見，反倒是在Linux中有許多相關的實作。重點主要在於封包排程和頻寬控管的佇列排程機制上。而在眾多的佇列機制中，以類別為基礎的Link-Sharing[8]架構可以保證每個使用者都能使用到一定額度的頻寬，特別適用於網路邊界端的閘道器上做頻寬控管的工作。目前在Linux上實作的Link-Sharing 架構有兩種，一種是CBQ[8, 9]，另一個是HTB[10]。前者由S. Floyd 和V. Jacobson提出，存在的時間已經很久了，有很多文獻在探討，同時在這些文獻中也說明了CBQ存在的問題[8, 12, 14]；後者是這兩年才被提出來，它修改了CBQ某些缺點，精簡化了CBQ原本複雜的Link-Sharing架構，並且實作在Linux核心中。開放軟體社群中普遍的認知是，HTB整體效能比CBQ來得好。但是截自目前為止，除了HTB作者對於HTB一些簡單的模擬測試外，幾乎沒有任何有關HTB在真實網路下實驗的文獻探討，以及和CBQ比較的文獻。因此，本文將針對HTB和CBQ兩者在Linux上的實作比較兩者效能。在真實網路環境下實驗，觀察HTB整體的效能是否真的比CBQ好。

關鍵詞 : Link-Sharing ; Linux ; CBQ ; HTB

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