

Reliable and Accurate Bandwidth Measurement of Asymmetric Network Paths

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Capacity and available bandwidth (or residual capacity) determine the best quality a network connection could provide. Network capacity is usually a static quality, whereas available bandwidth, a dynamic quality, is the actual capacity available to end users. Measuring capacity and available bandwidth is very useful for service level agreement (SLA) compliance verification, tuning application performance, context-aware communication, choosing the best available peer in peer-to-peer networks, and many others. Quite a few methods have been proposed for the capacity and available bandwidth measurement. However, they suffer from several problems, such as unreliable probing method, inaccurate measurement, a lack of support for asymmetric bandwidth measurement, slowness, and restrictions on measurement locations. In this project, we will propose new capacity and available bandwidth measurement methods to overcome the aforementioned problems. These new methods can be executed from an end user without other network and system support, and incur minimal measurement overhead. We will produce the method specifications, implementation prototypes, and extensive experiment validation results as project deliverables. We will also use the prototype to evaluate the SLAs for various network services currently offered in Hong Kong, such as different residential ADSL plans and wireless access services.