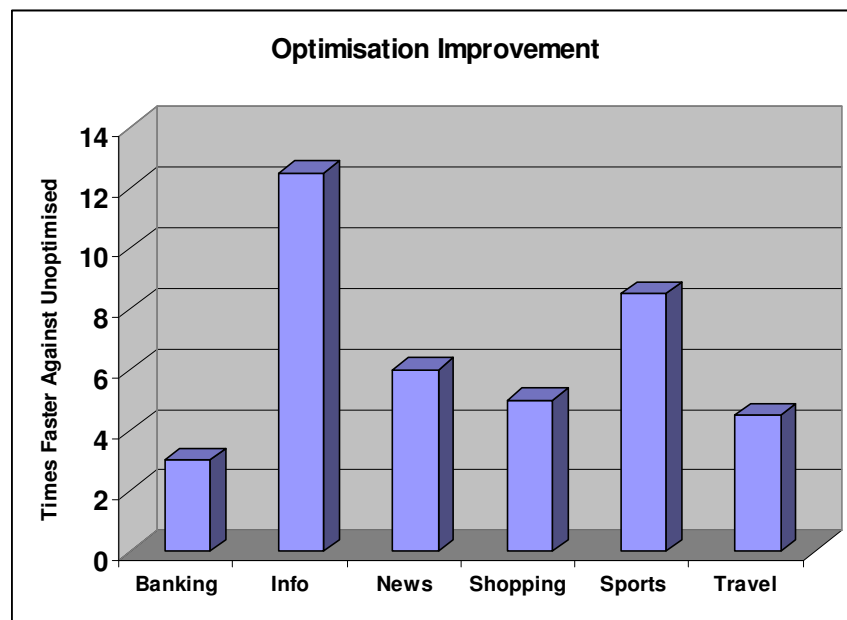# IP Optimisation

In data services, advantage always begins with speed. As data traffic grows exponentially with new service deployment and subscriber consumption, it's essential that network bandwidth is managed and latency is controlled. As speed is boosted, close management of the return of investment is required. More data traffic means increased operating and capital equipment costs.

This calls for dynamic optimization. Without it, even networks powered by the fastest technologies can become burdened with applications that move progressively larger data, web and multimedia files. Conversely, the faster the network, the more subscribers will benefit from optimization. This will fuel their demand for new services and drive revenue growth.

At the same time, data reduction will reduce OPEX and CAPEX – measurably lowering the total cost of ownership. It is a real benefit to the business with faster speed and higher Return On Investment.

Dynamic IP Optimisation is applicable for all networks, fixed, GPRS, EDGE, UMTS, HSDPA, HSUPA, EVDO, Wi-Fi, WiMax, Satellite, …

Eliminate Redundant WAN Traffic

IP Optimisation works across all WAN traffic, typically reducing bandwidth consumption by two-thirds and maybe more depending on the application in use and information being processed. IP Optimisation works by reducing the transmission of redundant bytes and by optionally prioritizing data based on bandwidth and latency requirements. IP Optimisation works across the key applications that subscribers care about most, for a business this is Windows and UNIX file sharing (including MS Office), Email (including MS Exchange and Lotus Notes), CAD/PDM applications, ERP, databases and performing data reduction on all applications that rely on TCP.

No matter what application generates the data, IP Optimisation removes most redundancy from the WAN traffic running over TCP. It even works across different applications. For example, a file could be emailed from someone in head office to a colleague in a branch. Then it might be written back to a file share in the data center, backed up across the WAN using a completely different application, and entered into a data management system or SharePoint server. In any of these subsequent transactions, IP Optimisation is intelligent enough to avoid sending the data during the subsequent transactions across the WAN.

IP Optimisation appliances (or software product if you have it installed on your laptop or server) transparently intercept and analyze WAN traffic. TCP traffic is segmented, indexed and stored as "blocks" of data, and the "key" representing that data is stored on disks on both sides of the WAN. Once the data has been indexed, it is compared to data already on the disk. Segments of data that have been seen before are not transferred again across the WAN again; instead a key is sent in its place that can index arbitrarily large amounts of data, thereby massively reducing the amount of data that needs to be transmitted. One small key can refer to megabytes of existing data that has been transferred over the WAN before.

IP Optmisation is highly scalable, with peak data reduction ratios that can be a couple of orders of magnitude. At the same time IP Optimisation can detect very small-grained changes because the average size of a segment is approximately 100 bytes, or about the same as a sentence of text.

In addition to eliminating redundant WAN traffic, advanced quality-of-service (QoS) functionality ensures sufficient bandwidth for applications that need to be cherished such as VoIP, live Video and thin clients. QoS implementation within IP Optimisation accounts for the impact of latency, rather than having to overcompensate by allocating more bandwidth per application than what is really needed.

For high bandwidth WAN links TCP acceleration maybe performed which enables greater bandwidth utilization, providing capability to fill the high bandwidth WAN link more effectively. TCP acceleration is designed to adapt to network conditions on the fly, responding to events such as congestion or packet loss without giving up the reliability and scalability that make TCP the de facto standard. This allows businesses to be optimally transferring data.

Well known Enterprise Application throughput is further improved by reducing application protocol chattiness and minimizing application overhead. The result being improvements of an order of magnitude is seen over the WAN as if the application operates locally on a LAN.