TCP OPTIMIZATION

PROBLEM

The TCP protocol was created in the mid-1970s with the aim of providing connection-oriented communications and thus to guarantee that data packages would be delivered without errors and in the same order they were transmitted. Mechanisms of congestion control and flow control are an essential feature of TCP and their goal is to maximize the rate of data transfer and to avoid network congestion. In wired networks, TCP identifies packet loss through network congestion.

The wireless data networks (2G, GPRS, 3G, 4G, etc.) have a very high rate of package loss (compared to the wired networks), which has nothing to do with network congestion, and also have highly-variable latency (300ms on 3G and 50ms on 4G). These two features mean that navigating the web from mobile devices can be unsatisfactory for users.

ALTERNATIVES

- The increase in mobile devices, and the intensive use made of them, makes it necessary to improve the users' web-browsing experience (HTTP / HTTPS) through these devices.
- Applying generic optimization profiles to all users/subscribers and to all types of data networks (fibre, cable, 3G, 4G, etc.) is not a real option, due to the very different characteristics of these networks. Sometimes the cure is worse than the disease.

F5 | LTM + PEM SOLUTION

Thanks to its Full-Proxy technology, BIG-IP LTM (Local Traffic Manager) is the ideal platform for implementing TCP optimization. LTM can apply specific optimization to profiles depending on the type of wireless data network (2G, 3G, 4G, etc.) to which users connect, in order to maximize the experience of those using mobile devices. These profiles can be applied at the subscriber level and change dynamically (for example, when subscribers roam between 3G and 4G networks), thanks to the PEM (Policy Enforcement Manager) module.

In addition to supporting the most common TCP-optimization algorithms (Vegas, Westood, Illinois, H-tcp), F5 has developed its own algorithm called Woodside.

Optimizing TCP (L4) also optimizes the protocols used in the superior layers (for example HTTP, HTTPS and SPDY) without having to make modifications at the application layer.

REFERENCE ARCHITECTURE | TOP OPTIMIZATION