GlassTube:
A Lightweight Approach to Web Application Integrity

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The HTTP and HTTPS protocols are the main corner stones of the modern web. From a security point of view, they offer an all-or-nothing choice to web applications: either no security guarantees with HTTP or both confidentiality and integrity with HTTPS. However, in many scenarios confidentiality is not necessary and even undesired, while integrity is essential to prevent attackers from compromising the data stream.

We propose GlassTube, a lightweight approach to web application integrity. GlassTube guarantees integrity at application level, without resorting to the heavyweight HTTPS protocol. GlassTube provides a general method for integrity in web applications and smartphone apps. GlassTube is easily deployed in the form of a library on the server side, and offers flexible deployment options on the client side: from dynamic code distribution, which requires no modification of the browser, to browser plugin and smartphone app, which allow smooth key predistribution. The results of a case study with a web-based chat indicate a boost in the performance compared to HTTPS, achieved with no optimization efforts.