Cache Timing Attacks Revisited: Efficient and Repeatable Browser History, OS and Network Sniffing

Content

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Abstract

Cache Timing Attacks (CTAs) have been shown to leak Web browsing history. Until recently, they were deemed a limited threat to individuals' privacy because of their narrow attack surface and vectors, and a lack of robustness and efficiency. Our attack implementation exploits the Web Worker APIs to parallelise cache probing (300 requests/second) and applies time-outs on cache requests to prevent cache pollution. We demonstrate robust cache attacks at the browser, operating system and Web proxy level. Private browsing sessions, HTTPS and corporate intranets are vulnerable. Through case studies of (1) anti-phishing protection in online banking, (2) Web search using the address bar in browsers, (3) publishing of personal images in social media, and (4) use of desktop search, we show that CTAs can seriously compromise privacy and security of individuals and organisations. Options for protection from CTAs are limited. The lack of effective defence, and the ability to mount attacks without cooperation of other websites, makes the improved CTAs serious contenders for cyber-espionage and a broad consumer and corporate surveillance.

Chapter PDF

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