

Timing-Based Browsing Privacy Vulnerabilities Via Site Isolation

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Chromium's site isolation ensures that different sites are rendered by different processes, which is a vision that academic researchers set forth over a decade ago. The journey from academic prototypes to the commercial availability represents a holistic rethinking about the security architecture for modern browsers. In this paper, we emphasize that the timing issues under site isolation need a thorough study. Specifically, we show that site isolation enables a realistic timing attack, which allows the attacker to identify which websites in a given target-sites set are loaded into the browser, as well as the website the user is currently interacting with. Through these vulnerabilities, the user's site-visit behavior is leaked to the attacker. Our evaluation using Alexa Top 3000 websites gives very high vulnerability percentages – 99%, 99% and 95% for our three key metrics of vulnerabilities. Moreover, the attack is very robust without any special assumption, so

will be effective if deployed in the field. The main challenge revealed by our work is the tension between the scarcity of processes and the obligation to isolate cross-site frames in different processes. We are working with the Google Chrome team and Microsoft Edge team to propose and evaluate mitigation options.

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