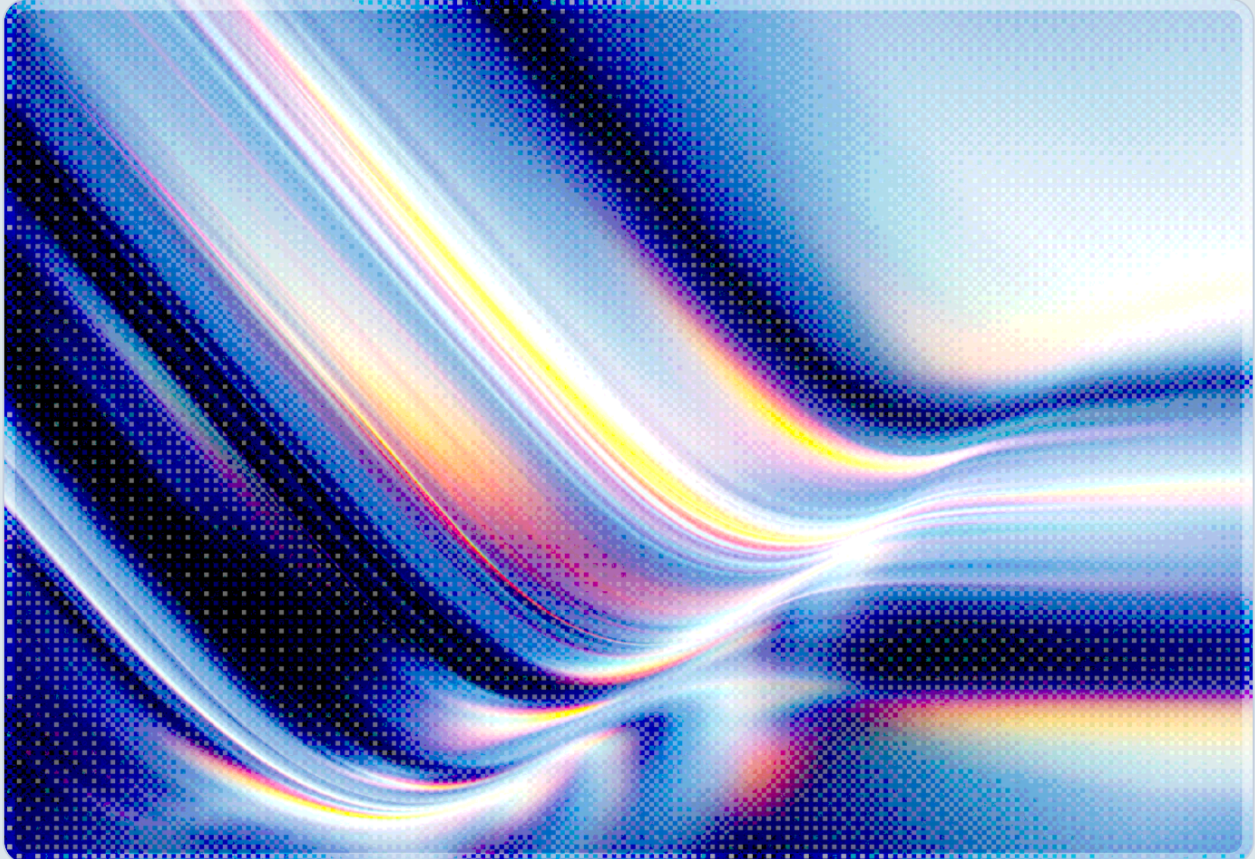


Six Days, \$40,000: AI-Assisted Chrome Full-Chain Exploit

Implications of Falling Exploit-Development Costs

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 AI-assisted Rapid Research



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Key Takeaways

XBOW, an AI-driven offensive security company, reports that its researchers directed AI agents running OpenAI's publicly available GPT-5.6 Sol model to build a working Chrome full-chain exploit in six days (August 2-7, 2026). The company puts the AI usage cost at roughly \$40,000, a figure it reconstructed from archived API logs without publishing a token count [1][2][3]. Google confirmed and fixed all three underlying bugs and paid XBOW its \$250,000 maximum reward for a full Chrome exploit [2][3]. The bugs were not used against Chrome users [3].

The central finding concerns price and time rather than novelty. XBOW says its first full Chrome chain took about two months to build earlier in 2026, while the award-winning chain took six days [3]. These may be different artifacts built from different bugs, and the second effort drew on tooling and experience accumulated during the first, so the comparison is not like-for-like. A browser exploit chain has historically been among the costliest artifacts in offensive security. A public model operated by a small, expert team has now produced one at a reported cost that is modest next to the bounty. In our assessment, it is plausibly modest next to what brokers and well-resourced adversaries pay for such capabilities, though that last comparison is our inference and XBOW does not report it.

Three implications follow for defenders. First, the "exploit cost" assumption that underpins many risk models, namely that a browser full chain is rare and reserved for state-level actors, needs to be revisited. Second, human expertise remains a material input, because XBOW's team chose targets, supplied examples, and decided how to assemble components [2]. This case suggests that the cost curve may fall for skilled operators before it falls for novices. Third, the benefit can accrue to both sides, as XBOW itself notes: "The cost and time of finding serious vulnerabilities are falling fast, for attackers and defenders alike" [1]. Whether defenders realize their share depends on patch latency, which the browser case shows can be slower than the exploit-building timeline.

Background

On October 13, 2026, XBOW published two accounts of the work: a summary post by CEO Oege de Moor and a technical write-up titled "Zero to Calc in Six Days" [1][2]. The Hacker News reported the story the next day [3]. According to these sources, XBOW's leadership set the challenge of building a Chrome full chain at a staff meeting in January 2026, the first complete chain took around two months,

and a second effort was compressed into the six days of the Black Hat and DEF CON week in Las Vegas [1][2][3]. Brendan Dolan-Gavitt built the awarded chain with the agents, working with colleagues Andres Luksenberg, Baul Lee, and Willem Pinckaers [1][3].

XBOW states that it deliberately used a publicly available model, GPT-5.6 Sol, rather than a restricted-access or purpose-built security model [1][2]. The model was run as parallel agent campaigns with narrower goals: broad vulnerability search, V8 memory corruption, a V8 sandbox escape, a renderer sandbox escape, and integration of the stages [2]. The \$40,000 figure was reconstructed from archived API usage logs [2]. Because the articles do not state a token count, the cost cannot be decomposed further from public material.

The chain targeted Chrome on Windows, and XBOW and The Hacker News describe the exposure as an estimated one billion users before patching [1][3]. Triggering it required only that a victim load a crafted web page [3]. Google's Chrome Vulnerability Reward Program has offered up to \$250,000 for demonstrated remote code execution in a non-sandboxed process since its 2024 revision [4], and XBOW describes the payout as Google's first \$250,000 Chrome award under its 2026 rules [1].

Security Analysis

The Three-Stage Chain

XBOW's technical write-up describes three distinct bugs, summarized below [2]. Each stage addresses a layer of Chrome's defense in depth, which is why a single bug does not yield machine control and why full chains have commanded high rewards.

Stage	Component	Weakness (per XBOW)	Result
1	V8 Maglev compiler	A deoptimization path produced mutable <code>HeapNumber</code> objects where the compiler assumed immutability, letting distinct JavaScript objects share one mutable number	Memory corruption inside V8's pointer-compression cage
2	Animated WebP decoder	Time-of-check/time-of-use flaw: cached frame geometry persisted while the backing buffer was replaced through <code>ImageDecoder</code> transfer	Heap overflow and one chosen native write outside the V8 sandbox

Stage	Component	Weakness (per XBOW)	Result
3	Crashpad (crash handler)	Assumption that a suspended renderer could not alter page protections between a failed read and its retry	Out-of-bounds write and code execution outside the renderer sandbox

Public vulnerability records exist for at least the Crashpad stage. CVE-2026-78952 is recorded as an out-of-bounds write in Crashpad on Windows, fixed in Chrome 152.0.7977.65 [3][5]. The Hacker News additionally attributes a further CVE to the V8 stage and reports that the WebP bug has no CVE identifier [3]. We have not independently confirmed these details, so we do not reproduce the V8 identifier or its reported fix date here.

What the Agents Did and What the Humans Did

It would be a misreading to treat the result as autonomous exploitation. XBOW says its researchers "chose targets, supplied context, challenged results, redirected searches, and decided which components to join" [2]. They maintained modular stage interfaces so components could be swapped, and provided high-quality examples such as a previously authored "island hopping" loader technique [2]. The loader itself, roughly 70 bytes encoded across 13 Wasm code immediates while respecting control-flow and shadow-stack protections, is the sort of work XBOW lists among the hardest parts [2]. XBOW's own conclusion is that human judgment remained indispensable despite extensive automation [2].

One human decision XBOW singles out was designing the exploit with backup alternatives for each stage [1]. This mattered in practice. XBOW reports that a candidate chain was abandoned after colliding with a bug Google already tracked internally, and the animated-WebP stage was developed as its replacement [1][2]. The two XBOW accounts may describe the same event, and we treat it as a single collision. Duplicate findings are a real cost in heavily audited codebases. This episode may indicate that AI-generated search converges on the same vulnerability-rich areas that internal Google teams and other researchers already cover, although a single collision is thin evidence for that pattern.

Exploit Economics

The more durable lesson concerns cost structure. Before this class of tooling, the main expenses of a browser chain were scarce expert time and long iteration cycles. Here, the dominant reported expense was API spend over six days, though the figure excludes salaries and the months of prior experience, tooling, and example material XBOW brought to the effort [1][2]. Dolan-Gavitt's own characterization,

"Six days and \$40k is not a lot of time or money when the payoff is a Chrome chain," states the economic point directly [3]. This is a statement by the researcher about a bounty payoff, not a measurement of underground market prices, and we have not found a public source that would allow a rigorous comparison between the two.

Three caveats bound the claim. The result is a single case reported by a company that benefits commercially from it, and independent replication has not been published. The team was an experienced exploit-development group, so the figure should not be read as the cost for an unskilled actor. And the first chain still took about two months [3], so the six-day figure reflects accumulated tooling and know-how as well as model capability. These caveats weaken a claim that exploitation is now trivial, but they do not weaken the narrower claim that the marginal cost and time of a serious chain dropped sharply within a single year at one organization.

Implications for Defenders

The sprint ended August 7, and Chrome shipped the Crashpad fix in version 152.0.7977.65 on August 25, a gap of 18 days [3]. We do not have the date on which XBOW reported the bugs to Google, so we cannot assess the disclosure timeline itself. The relevant point for enterprises is the second clock: a Chrome fix only protects users after the browser restarts, as XBOW notes in its advice to restart when updates appear [1]. Managed fleets with deferred restarts, virtual desktop images, kiosk systems, and Chromium-based embedded applications (Electron and similar) each extend exposure beyond the vendor's patch date.

For organizations that depend on browsers as the primary application runtime, including SaaS front-ends, identity flows, and AI agent browsing tools, the browser is the point where a single remote-code-execution chain converts web content into endpoint control. AI agents that browse autonomously raise exposure further because they load untrusted pages at machine speed without a user's judgment about which links to open. This is an inference from the attack model and is not something XBOW's publications address.

CSA's earlier analyses reach a consistent conclusion at the aggregate level: AI-accelerated discovery is shortening the interval between vulnerability availability and exploitation, while enterprise remediation still operates on human-paced cycles [6][7][8]. The XBOW case is a concrete data point at the exploit-construction end of that pipeline, a step that has generally been assumed to be harder to automate than discovery.

Recommendations

Immediate Actions

Confirm that every managed Chrome and Chromium-based browser is at or beyond 152.0.7977.65, and verify that the update has actually taken effect, since relaunch is required [1][3]. Report on the proportion of endpoints with pending-relaunch states and set a maximum deferral window, measured in days. Review enterprise policy settings that suppress forced relaunch. Inventory embedded Chromium runtimes (Electron applications, agent browsing frameworks, and headless browser services) that update on a separate cadence from the system browser.

Short-Term Mitigations

Reduce the value of a single browser compromise. Enforce site isolation and strict enterprise browser policies, restrict the use of high-privilege sessions in the same browser profile as general browsing, and separate administrative and cloud-console access onto hardened browsers or isolated workstations. Where AI agents browse the web on behalf of users, run them in disposable, network-restricted containers with no access to credential stores. Strengthen endpoint detection for post-exploitation behavior (anomalous child processes from browser or crash-handler processes, unexpected code loading) rather than depending on exploit signatures, since the exploit itself may well be novel at the point of use.

Update vulnerability-management service levels to reflect compressed timelines. Treat browser engine and image-decoder fixes as emergency-class changes when vendors indicate in-the-wild exploitation, and track time-to-remediate separately for internet-facing client software.

Strategic Considerations

Revise threat models that treat full-chain browser exploits as exclusively nation-state capabilities. A reasonable planning assumption, which we offer as a judgment rather than a finding, is that the number of actors able to afford such chains will grow as model capabilities and agent tooling improve. Defenders should plan for control failure at the browser layer and invest in containment (segmentation, short-lived credentials, phishing-resistant authentication bound to devices) so that one compromised renderer chain does not translate directly into enterprise-wide access.

Defenders should also use the same capability. In our view, XBOW's observation that cost reductions apply "for attackers and defenders alike" holds only to the extent that defenders invest in AI-assisted code review, fuzzing, and variant analysis in their own software, and in processes to absorb the resulting findings [1]. Vendors and open-source maintainers will need bug intake and fix capacity that can keep pace with AI-assisted reporting, an issue CSA's patch-debt work addresses [6]. Finally, bounty programs are an important channel in this case. Our inference, for which we have no market data, is that Google's reward ceiling gave a capable team a legitimate outlet for a chain that might otherwise have found value elsewhere. Organizations running their own programs should review whether their reward structures and triage speed remain competitive.

CSA Resource Alignment

CSA's whitepaper [AI-Accelerated Vulnerability Discovery and the Patch Debt Crisis](#) is the most directly applicable artifact. It argues that autonomous AI discovery tools are driving CVE volume growth and shrinking exploitation windows beyond what classical patch management can absorb [6]. The XBOW result extends that argument from discovery to full exploit construction, and its recommendations on prioritization and remediation capacity apply to browser fleet management.

CSA's [The Collapsing Exploit Window: AI-Speed Vulnerability Weaponization](#) describes the operational window between disclosure and weaponized exploitation as compressing from months to days and, increasingly, hours [7]. In this note's inference, the browser restart dependency described above is an example of a "last mile" delay that can leave patched-but-not-protected endpoints inside that window. A companion paper, [The Exploit-Before-Patch Gap](#), examines the structural problem that exploits can be available before fixes are, which parallels the 18-day period between the end of XBOW's sprint and the Crashpad fix [8].

For control mapping, the [AI Controls Matrix \(AICM\) v1.1](#) provides threat and vulnerability management (TVM) and application and interface security (AIS) controls relevant to patch service levels and to the isolation of AI agents that browse untrusted content [9]. Organizations should map the recommendations above to those domains when documenting control ownership.

References

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