How I Accessed 1,800 Company Livestreams and Uncovered a New Web Exploit Class: RRE

How I Accessed 1,800 Company Livestreams and Uncovered a New Web Exploit Class: RRE - Farzan Karimi, Medium.

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Content

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How I Accessed 1,800 Company Livestreams and Uncovered a New Web Exploit Class: RRE

[[image: Farzan Karimi]](https://jumpycastle.dev/?source=post_page---byline--f74b7ef996e7----------------------------)

Farzan Karimi

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Capture from an Internal company all-hands

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Note: This research was presented at *[*DEFCON 33 **in August 2025.]***

Back in 2020, I uncovered a vulnerability in a major enterprise streaming provider that let me access over **1,800 corporate livestreams** — investor calls, internal town halls, and other private events — all without logging in. The issue was recently covered by *WIRED** *in August 2025, after I built a security tool to help automate discovery of similar bad patterns.

At the time, I found the flaw manually. It required stepping through a chain of loosely connected web APIs *backwards*, following how public metadata requests could indirectly trigger access to a private video stream.

Fast-forward to 2025. I ran the same approach against a sports streaming platform once again. I chained public metadata calls into a private, authenticated stream to retrieve fully playable media content for free.

This wasn't a one-off. It was a pattern.

Recursive Request Exploits (RRE)

This work led to the development of a broader technique I call **Recursive Request Exploits (RRE)** — a methodology for recursively tracing interdependent web requests to discover how entitlements (e.g. digital assets e.g., video streams) are generated.

RRE is akin to tracing a supply chain backward. The final product looks secure, but one unverified supplier upstream (an API leaking sensitive data in this case) can compromise everything downstream.

And the **first reference **where a sensitive value appeared is exactly where you should be validating.

*(This approach is covered in the presentation between **5:40–6:55)*

RRE Definition

AppSec Principle of First Reference

Most applications validate access at the end of a workflow: the final entitlement check or the stream load. By then it can be too late.

The AppSec Principle of First Reference, which states that in any user flow, we must identify the first point where a sensitive value is introduced upstream. This is often where the trust assumptions are strongest, and where authN/Z is weakest.

*(Also covered in the presentation from **5:40–6:55)*

DEFCON Example: search actor episode stream

In my DEFCON talk I walked through a canonical example that shows exactly how RRE works: a public **Search API** returns movie slugs, an **Actor API** references those slugs and includes episode IDs tied to that actor, an **Episode API** references that actor and returns a `video_stream_id` tied to that episode, and the **Video Stream API** references the a `video_stream_id` and then finally serves the `.m3u8` manifest. If any of those upstream APIs (search, actor, episode) return the

`video_stream_id` or related tokens without enforcing authentication, the attacker gets to streaming content for free. You can reconstruct the entire entitlement chain and reach the protected stream.

*(This flow is covered between **6:56–8:40)*

Finding the Recursive Dependencies Using Entropy

When tracing requests backward, the hardest part is deciding which parameters actually matter.

To surface those, I used a simple **entropy heuristic (**see **RRE: Burp Extension ***section for more information***)***. High-entropy strings (tokens that look random, like `4b9a7f2e8b`) tend to represent opaque or signed identifiers, while low-entropy ones (`episode-3`) are harmless metadata.

By ranking all observed values by **Shannon entropy + length + character variety**, the tool prioritizes which tokens to trace first. This makes the recursive crawl efficient. It focuses on values that *look like secrets* and ignores the noise.

This is configurable in the tool by choosing an entropy threshold as shown in block 3 below (on a 1–5 scale). The default threshold is set to 3.0.

*(This flow is covered between **12:35–14:09)*

Why RRE Evades Detections

What makes RRE unique, and hard to detect, is that it *follows the business logic* of the app. Instead of attacking one endpoint or API, you recursively walk the entire stream of requests that led to a sensitive output. If *any* request in that chain isn't authenticated, the entire workflow can be compromised and an entitlement can be spoofed

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Practically, RREs are low-noise… only a few legitimate calls are made, no exploit payloads are thrown. You're exploiting API relationships, not malformed inputs, which makes detection harder.

RRE: Burp Suite Extension

To demonstrate how Recursive Request Exploits (RREs) work in practice, I built a Burp Suite extension (Github Link: https://github.com/jumpycastle/rre-burp) that traces web request chains backward, starting from a known sensitive target (like a stream ID) and recursively walking upstream to find where that value first entered the system.

Below is a screenshot of the tool in action on an actual streaming provider. The extension starts from a known video stream identifier and automatically traces each step of the chain back to its original source — the technique highlights the fact that each hop in the API chain is unauthenticated.

RRE Extension: Full Trace Discovery (Static)

The chain shows:

`vod_...` (stream id) — final target

`/v2/game_or_event/...` (metadata referencing stream id)

`/v2/highlights/...` (references metadata)

`/api/search?q=...` (**no auth**) first unauthenticated reference

RRE Demo

Watch the full trace in this short demo. GIF below, **full RRE Demo POC** is covered between 14:09–15:25.

RRE Extension: Full Trace Discovery (Video)

And here's what happens when you apply this technique at scale. A single unauthenticated metadata endpoint can enable mass access to thousands of streams or premium resources. You can watch the RRE-at-scale POC between 15:35–16:45.

RRE at Scale (Static)

RRE at Scale (Video)

Remediation Checklist

- **Enforce Strong Authentication at Every Step**

Every API that contributes to an entitlement should enforce authN/Z. If one hop skips validation, the entire chain can be reconstructed.

- **Don't Expose Sensitive Parameters via Low-Trust Inputs**

Public metadata (episode slugs, titles) should never generate access grants or leak identifiers like `video_stream_id`. Treat upstream APIs that return sensitive values as high-trust boundaries.

- **Use Short-Lived, Scoped Tokens**

Entitlement tokens should expire quickly and bind to a session or device. Rotate or reissue tokens per session to limit replay.

- **Enforce DRM + Session Binding for Streams**

Token-only access is often bypassable. Combine DRM with secure authentication (cookies/tokens) and encrypted manifests to raise the bar.

- **Always On, Always Leaks**

Idle or pre-live streams expand your attack surface. Gate or disable endpoints until showtime — and log access attempts outside live windows..

Responsible Disclosure & Final Notes

All findings were responsibly disclosed to affected vendors.

The full DEFCON 33 video for ”Paywall Optional: Stream for Free with a New Technique: RRE” can be watched below. Slides are available here.

— Farzan (jumpycastle)

Repo: https://github.com/jumpycastle/rre-burp

Recovery notes

Source evidence recovered on 2026-09-14. The earlier source capture (SHA-256 `9e63451d0c87f95149f482b264c16b25926711c244fba3296d87b99302a9962e`) is no longer available. This publication uses a separately preserved capture of the same document recorded on 2026-08-06 (SHA-256 `ba9df6b34eeb776894a839da23e60f7cbc11d1ada3445300c1e66ace75a6d2fc`). The existing article text is retained. The archive journal ties this replacement source to the same extracted content; differences in the published copy are documented formatting and footer cleanup. The missing earlier capture remains documented in the archive history.