Bypassing Chrome's Anti-XSS filter

Bypassing Chrome's Anti-XSS filter - Nick Nikiforakis, blog.securitee.org.

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Content

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Bypassing Chrome’s Anti-XSS filter

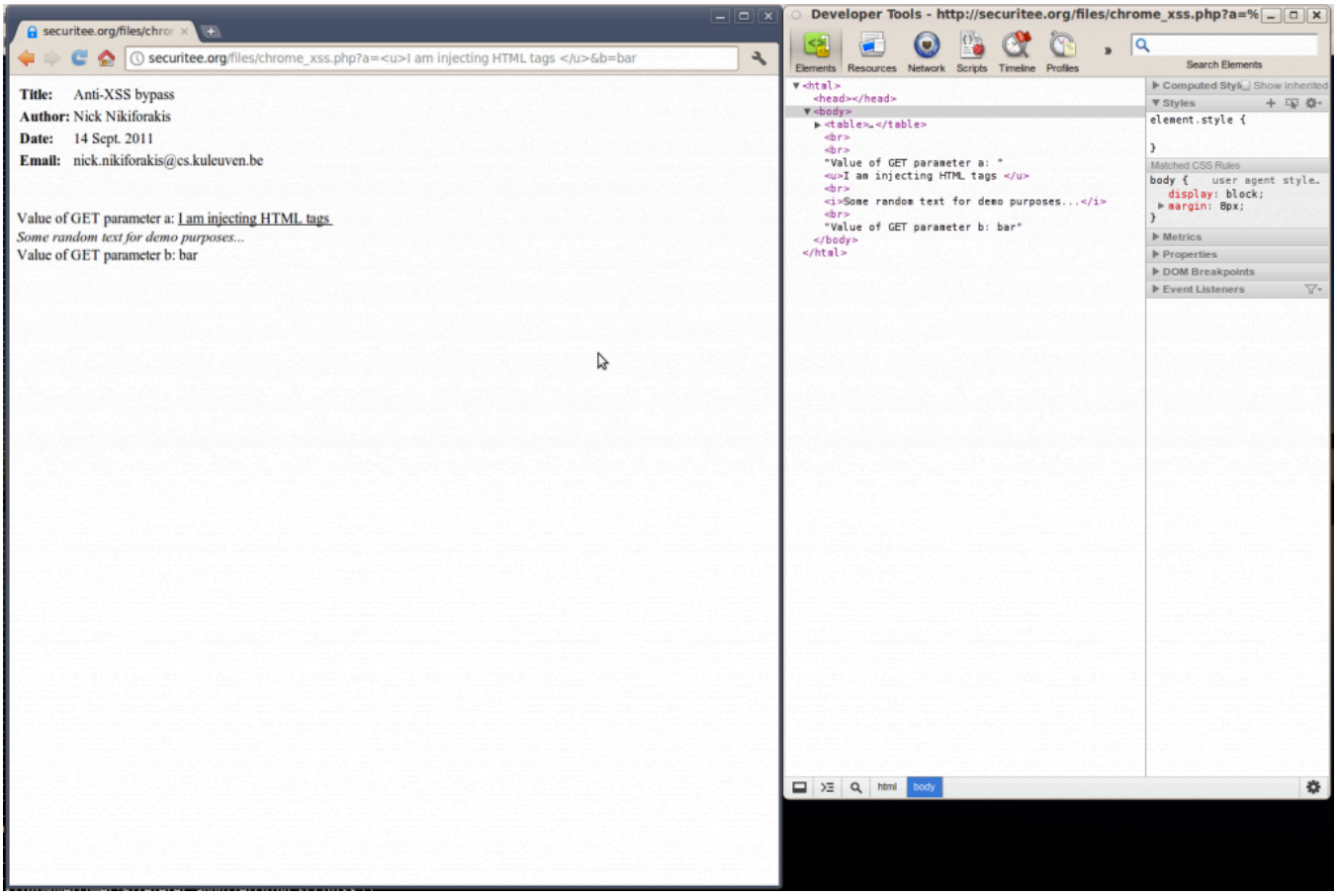
Posted on September 15, 2011 by nikifor

Its been a while since my last post so I decided to make it worthwhile :) . I was recently checking a friend’s site for the classic Web application vulnerabilities, when I found a reflected XSS attack. While I was investigating the bug, I noticed that while the bug worked on Mozilla’s Firefox, it didn’t work on Google’s Chrome. As it turns out, Chrome uses an Anti-XSS filter, based on static analysis, which attempts to detect XSS. If it detects such an attempt, it filters out the injected code, and effectively stops the on-going attack.

In order to demonstrate this, I made a vulnerable page at http://securitee.org/files/chrome_xss.php. This page simply reads two GET parameters, namely **a** and **b**, which it then prints out in the resulting page.

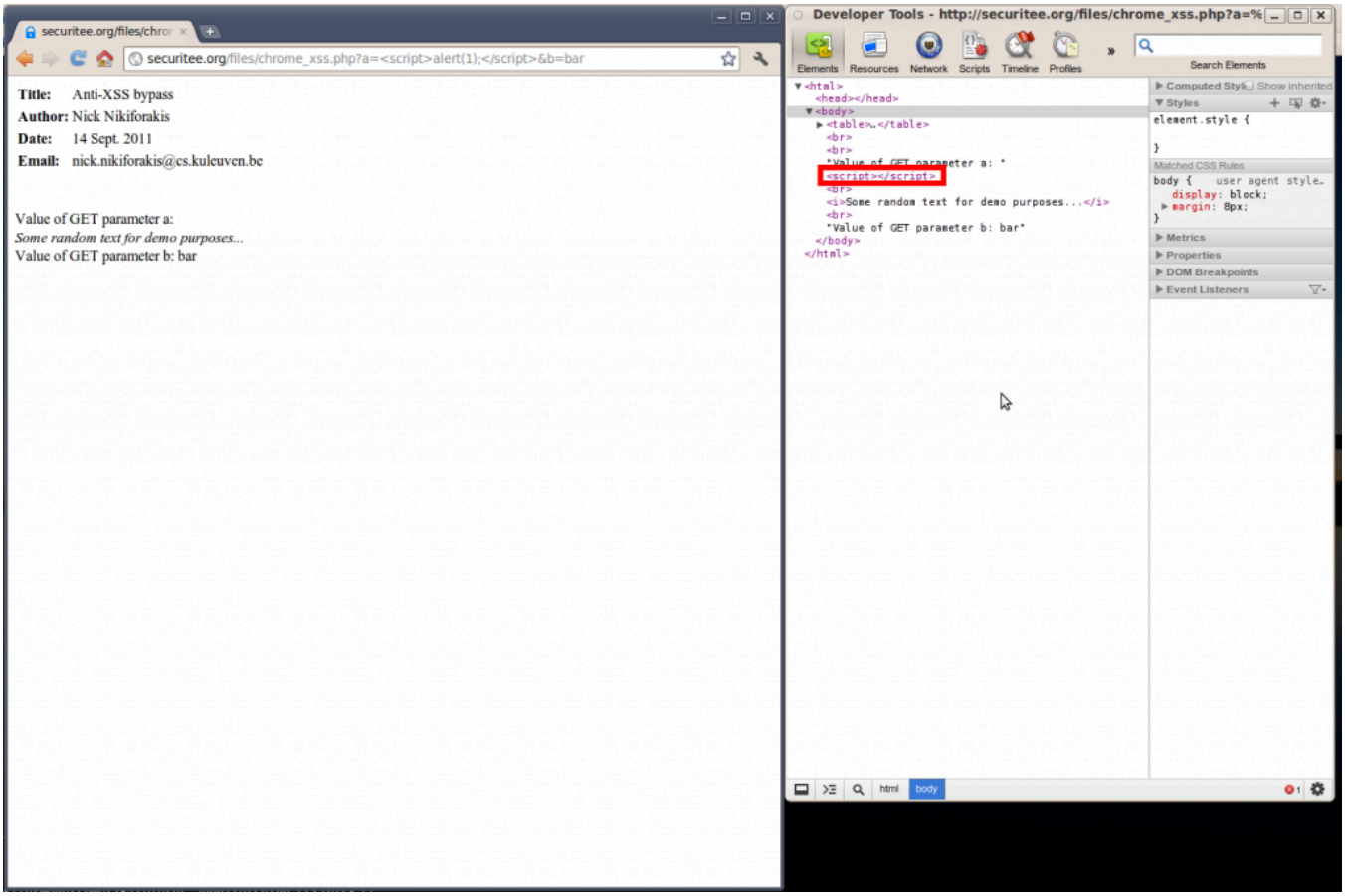
To show that injection is possible, I start by injecting some HTML which is indeed rendered as part of the HTML page.

```
http://securitee.org/files/chrome_xss.php?a=<u>HTML_INJECTION</u>
&b=bar
```



Now if you try to replace these tags by the standard alert function of JavaScript you will see that it doesn't work.

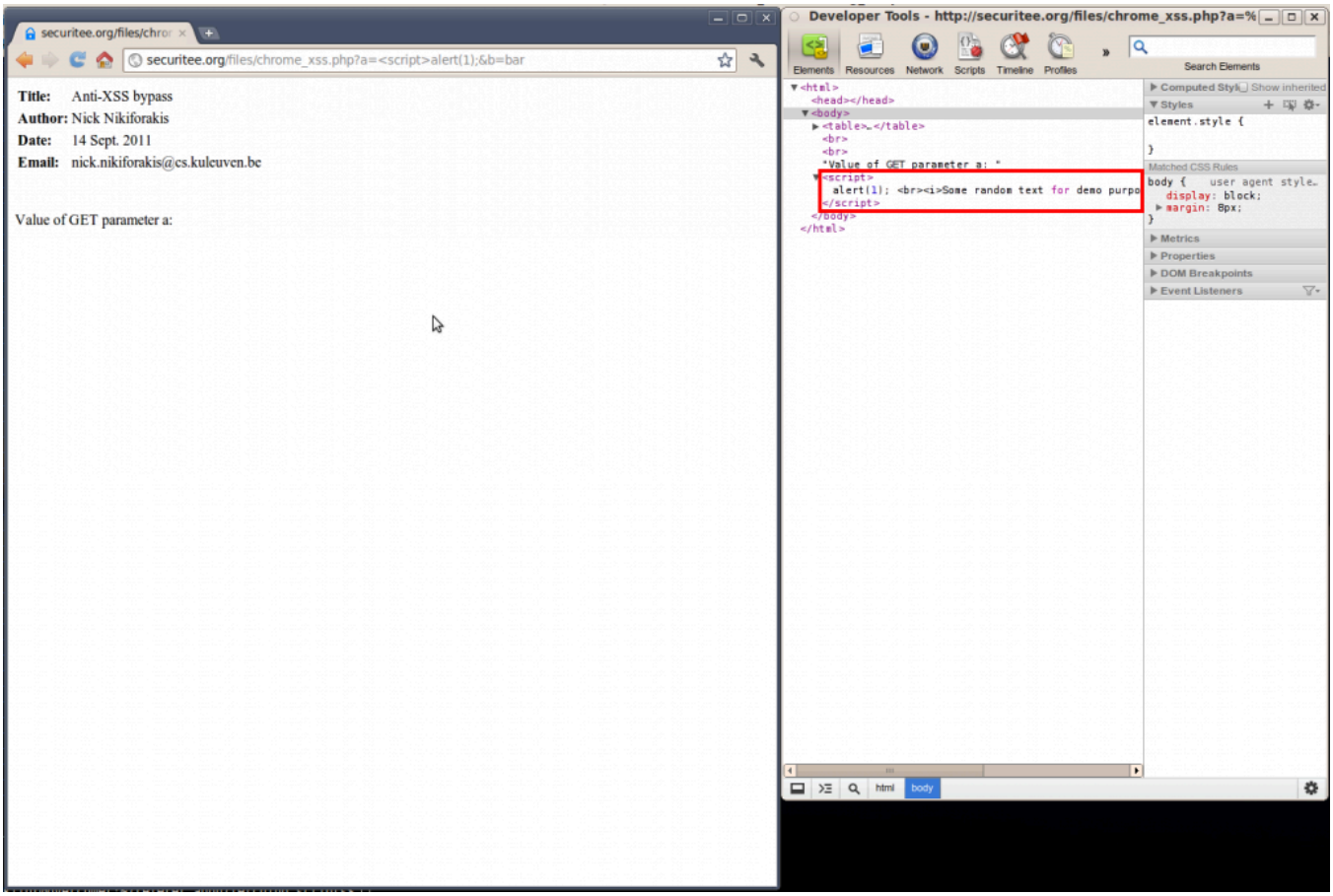
> http://*securitee.org/files/chrome_xss.php?a=<script>alert(1);*
> </script>&b=bar



Attempting (and failing) to inject JavaScript

If you pay attention to the part that I have placed in the red box on the right of the screen, you will notice that Chrome detected my injected JavaScript and filtered out the alert function, leaving me with an empty script. The next thing I tried, was to omit the closing script tag and see how the browser would react to that:

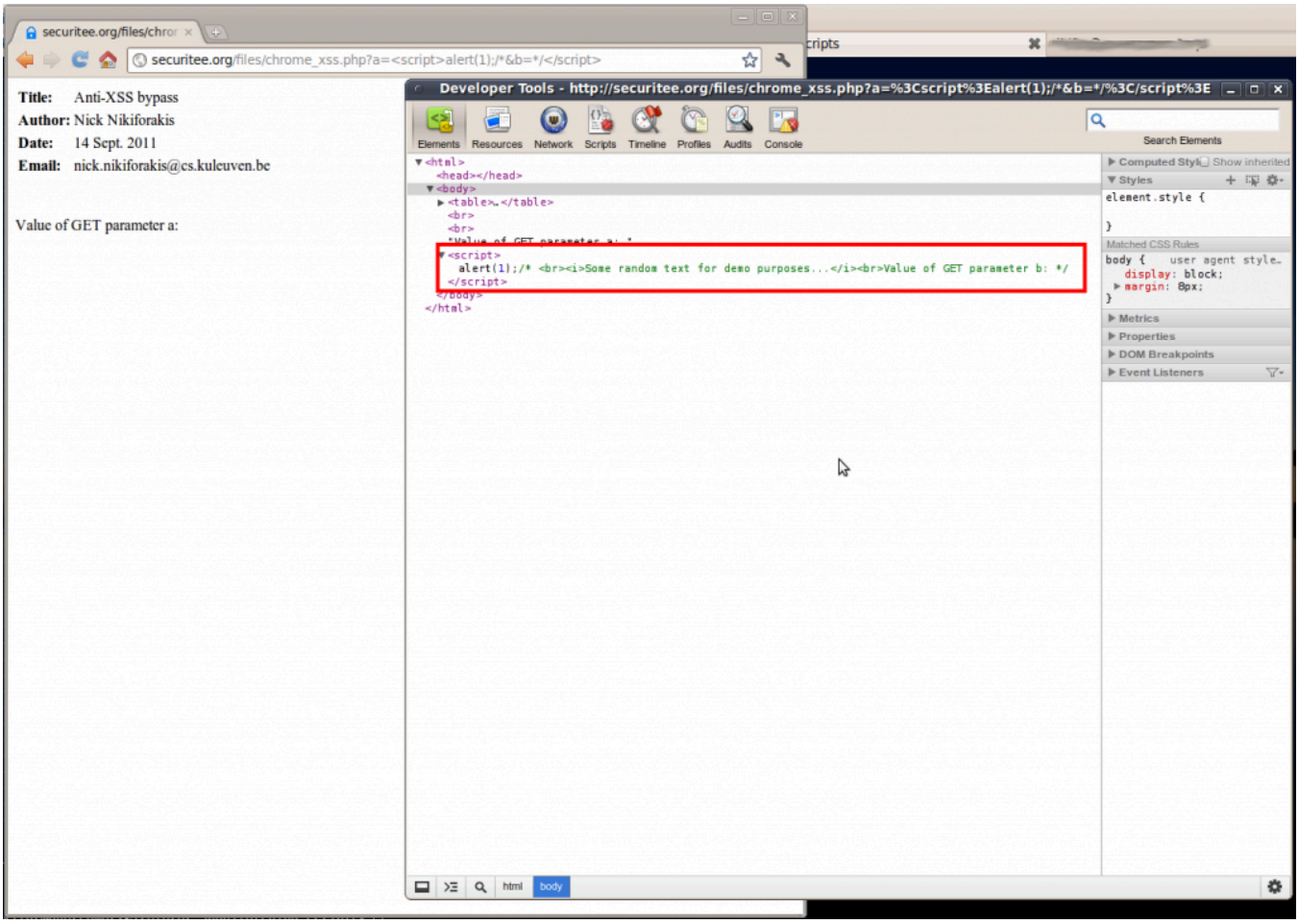
> http://*securitee.org/files/chrome_xss.php?a=<script>alert(1);*
> &b=bar



Ommiting the closing script tag

In this case, Chrome didn't remove my script (actually it tried to finish it by including a closing script tag of its own, right before the end of the body tag) but it didn't work since all the normal text and HTML is now in the script environment. Given the fact that HTML is not valid JavaScript, the interpreter fails and still we don't get the alert box. All that needs to be done is to somehow make the JavaScript engine ignore the HTML and text between our two controlled variables. This can be easily achieved by using JavaScript multi-line comment delimiters.

```
http://securitee.org/files/chrome_xss.php?a=<script>alert(1);/*
&b=*/</script>
```



At last… success!

And indeed, it worked!!! The multi-line comments mean nothing to the HTML but mean the world when they are placed in a script environment :) In summary, all you need to bypass the XSS filter is to have at least two variables under your control, and break up your injected script, with the help of multi-line comments, to use both.

Till next time Nick Nikiforakis

P.S. I have already told the Chrome folks about this, but their answer was that their filter is not meant to protect against this attack… I don't know why… you can ask them ;)

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