



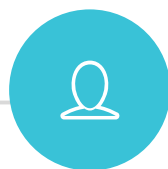
DEBUGGING TOOLS

2021

AGENDA



INTRO



CHROME
DEVTOOLS



PANELS AND
SETTINGS



FIDDLER



SUMMARY

INTRODUCTION

WHAT IS DEBUGGING



Debugging - is a process of search and elimination errors in a code and providing information on state of the system

DEBUGGING ALLOWS YOU TO SEE

1 Current call stack

2 Data of elements

3 See the errors

4 Override the data

5 Monitor variables

6 Adding breakpoints

TYPE LIST OF TOOLS FOR DEBUGGING AND PROFILING

DEV TOOLS: MOST USEFUL AND POPULAR DEVELOPER TOOLS



Chrome

Built-in debugger of Chrome



Firefox

Built-in debugger of Firefox



Internet Explorer

Built in debugger of Internet Explorer



Fiddler

Proxy which logs all HTTP(S)



Firebug

Expansion debugging for Firefox



Visual Events

Extension for visualization of events

CHROME VS IE VS FIREFOX

Instruments	Chrome	IE	Firefox
Elements	✓	✓	✓
Network	✓	✓	✓
Sources	✓	✓	✓
Console	✓ 2X	✓	✓
Emulation	✓ 2X	✓	✓

PROBLEMS VISUALLY

Debugging of the healthy person

JAVASCRIPT

maestro-ui.js x »

```
10791 };
```

```
10792 function makeWizardType(obj){
```

```
10793   var wizardType = null;
```

```
10794   switch(obj.resource + obj.right){
```

```
10795     case 'projectactivate':
```

```
10796       wizardType = 'activate';
```

```
10797       break;
```

```
10798     case 'plancreate':
```

```
10799       wizardType = 'setup';
```

```
10800       break;
```

```
10801     case 'networkcreate':
```

```
10802     case 'projectcreate':
```

```
10803       wizardType = 'run';
```

```
10804       break;
```

```
10805     case 'projectdelete':
```

```
10806       wizardType = 'stop';
```

Aa . * fu 1030 matches

{ } Line 10801, Column 38

Pause On Caught Exceptions

Watch +

Call Stack Async

Not Paused

Scope

Not Paused

Breakpoints

maestro-ui.js:10794 switch(obj.resource + obj...

DOM Breakpoints

XHR Breakpoints +

Event Listener Breakpoints

Debugging of the smoker

JAVASCRIPT

```
function makeWizardType(obj){
```

```
  var wizardType = null;
```

```
  alert(obj.resource + obj.right);
```

```
  switch(obj.resource + obj.right){
```

```
    case 'projectactivate':
```

```
      wizardType = 'activate';
```

```
      break;
```

```
    case 'plancreate':
```

```
      wizardType = 'setup';
```

```
      break;
```

```
    case 'networkcreate':
```

```
    case 'projectcreate':
```

```
      wizardType = 'run';
```

```
      break;
```

```
    case 'projectdelete':
```

```
      wizardType = 'stop';
```

```
      break;
```



chrome
DEVELOPER TOOLS

CHROME PANELS



Elements

Inspect and Edit Pages and Styles



Network

Page Load Performance



Sources

Set Up Your Workspace Debug with Breakpoints



Application

Manage Your Local Data Resources



Audits

Analyze a page as it loads



Console

Using the Console Interact from Command Line



ELEMENTS

ELEMENTS PANEL

The screenshot shows the Chrome DevTools interface with the Elements Panel open. The browser address bar shows 'www.w3schools.com/css/css3_animations.asp'. The Elements Panel displays the HTML document structure. The following HTML code is visible:

```
<!doctype html>
<html lang="en-US" style="height: 100%;" class="mdl-js">
  <head>...</head>
  <body style="position: relative; min-height: 100%; top: 0px;">
    <div class="w3-container top"> == $0
      ::before ← Pseudo element
      <a class="w3schools-logo" href="//www.w3schools.com">...</a>
      <div class="w3-right w3-hide-small w3-wide toptext" style="font-family: 'Segoe UI', Arial, sans-serif">THE WORLD'S LARGEST WEB DEVELOPER SITE</div>
      ::after
    </div>
    <div style="display:none;position:absolute;z-index:4;right:52px;height:44px;background-color:#5f5f5f;letter-spacing:normal;" id="googleSearch">...</div>
    <div style="display:none;position:absolute;z-index:3;right:111px;height:44px;background-color:#5f5f5f;text-align:right;padding-top:9px;" id="google_translate_element">...</div>
    <div class="w3-card-2 topnav" id="topnav" style="position: relative;">...</div>
    <div class="w3-sidebar w3-collapse" id="sidebar" style="top: 112px;">...</div>
  </body>
</html>
```

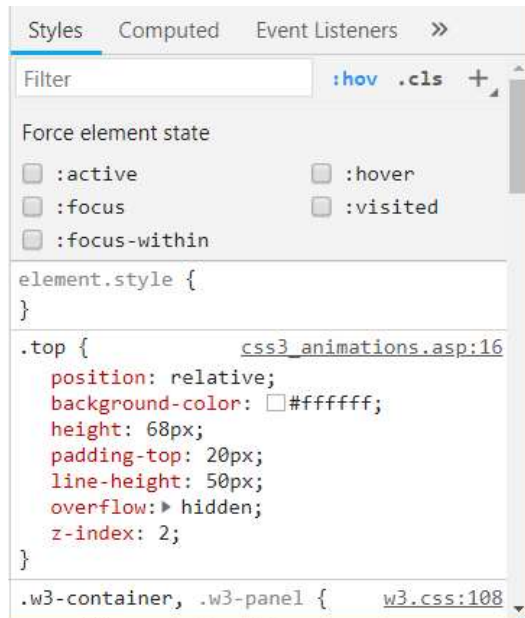
Annotations in the image include a red arrow pointing to the `::before` pseudo-element and another pointing to the `id="sidebar"` attribute. The breadcrumb at the bottom of the Elements Panel reads: `html.mdl-js > body > div.w3-container.top`.

The Styles Panel on the right shows the 'Filter' section with buttons for `:hov` and `.cls`. Below this, the 'Force element state' section contains checkboxes for `:active`, `:focus`, `:focus-within`, `:hover`, and `:visited`. The main style list shows the default `element.style { }` and a class `.top { }` defined in `css3_animations.asp:16` with the following properties:

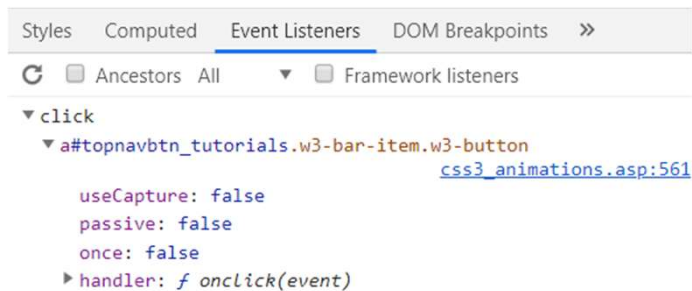
```
.top {
  position: relative;
  background-color: #ffffff;
  height: 68px;
  padding-top: 20px;
  line-height: 50px;
  overflow: hidden;
  z-index: 2;
}
```

At the bottom of the Styles Panel, a class `.w3-container, .w3-panel { }` is shown, defined in `w3.css:108`.

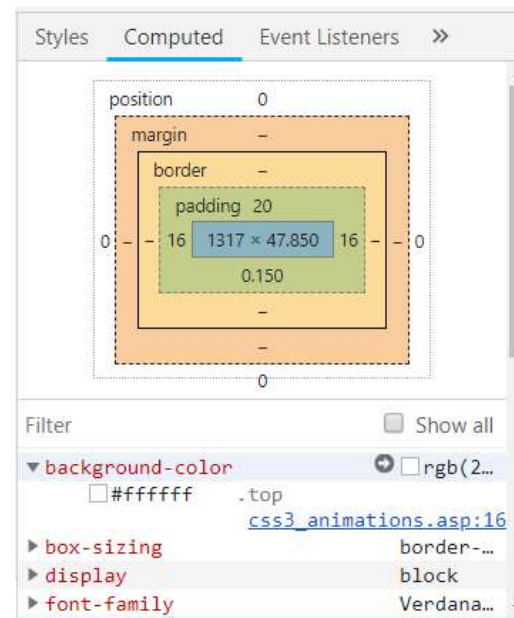
Styles



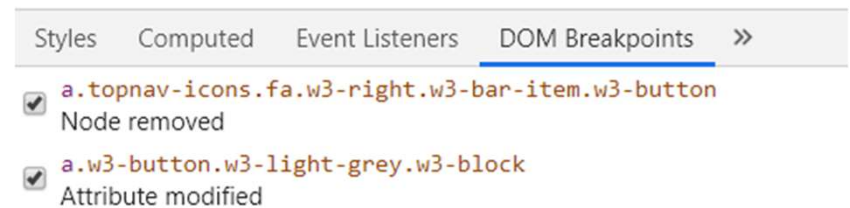
Event Listeners



Computed



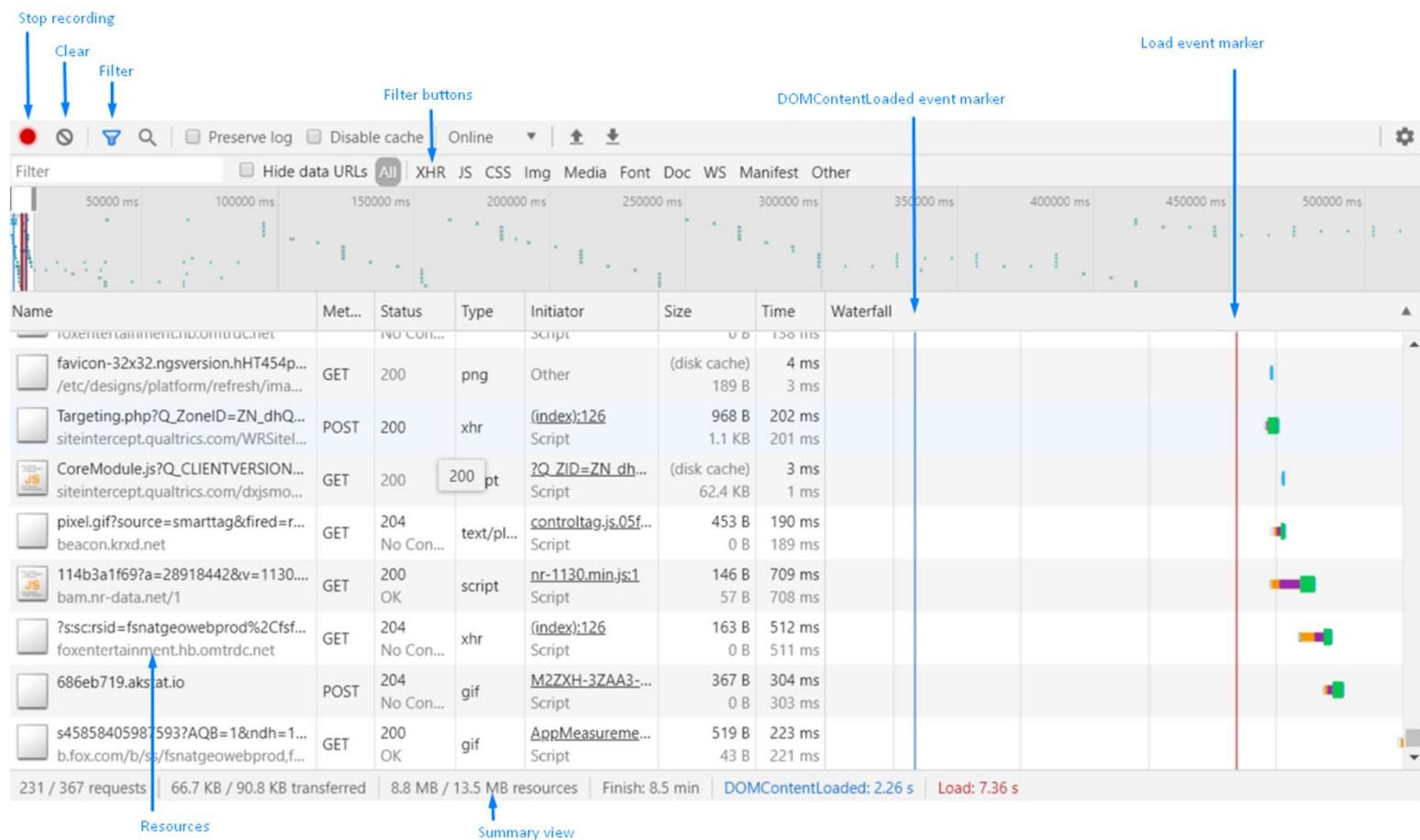
DOM Breakpoints



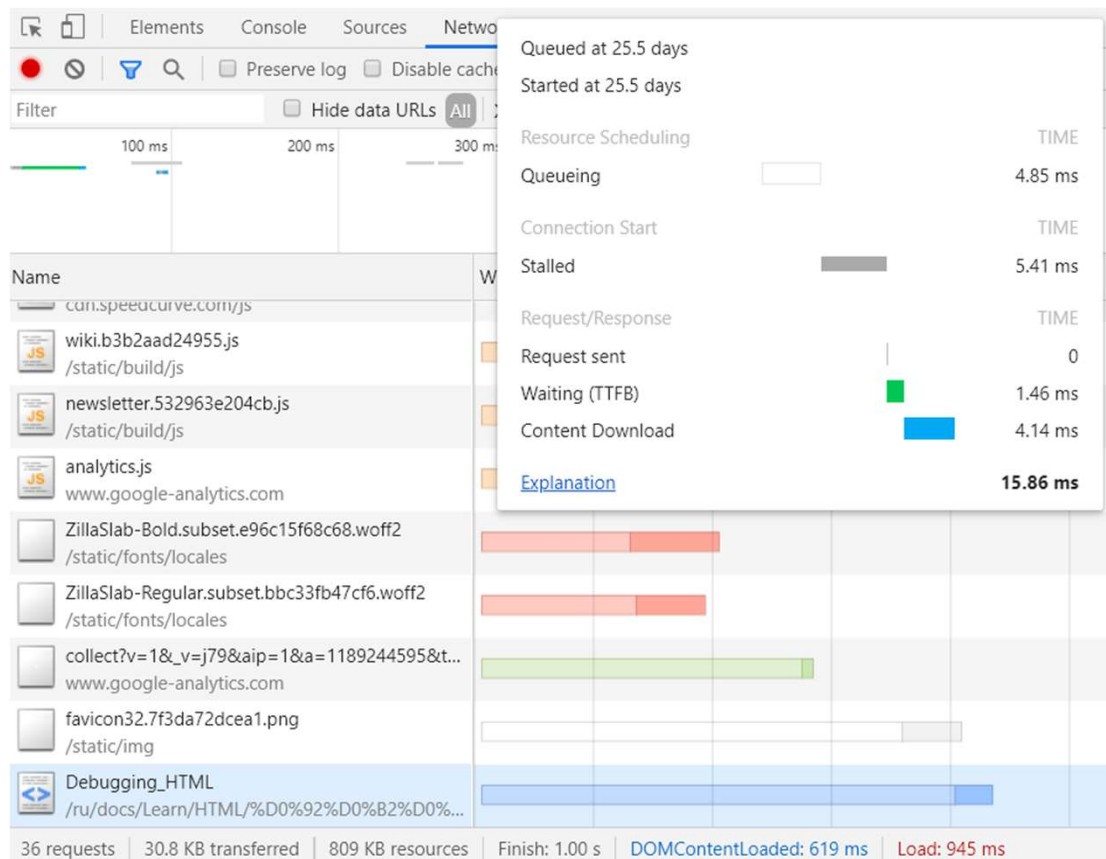


NETWORK

NETWORK PANEL



DATA VISUALIZATION



- Timing details visualization
- Load event markers
- Different sorting options:

Start Time, Duration, Latency etc.

NETWORK RESOURCE DETAILS

The screenshot shows the Chrome DevTools Network tab. The left sidebar lists network resources, with 'javascript.d69af44e1987.js' selected. The right pane shows the details for this resource, including the General tab with request information and the Response Headers tab with various headers.

General

- Request URL:** https://developer.mozilla.org/static/jsi18n/ru/javascript.d69af44e1987.js
- Request Method:** GET
- Status Code:** 200 (from memory cache)
- Remote Address:** 13.32.100.252:443
- Referrer Policy:** no-referrer-when-downgrade

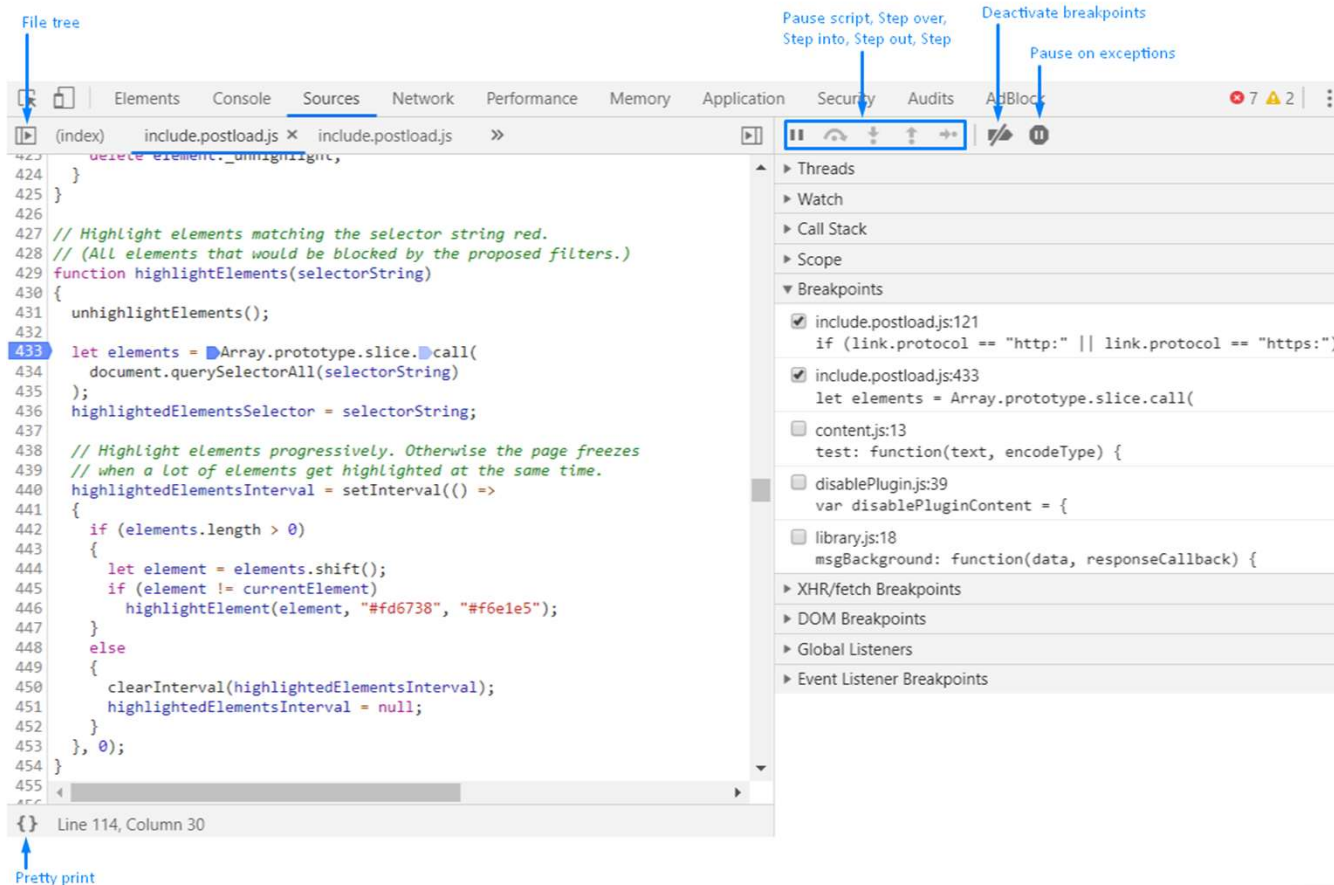
Response Headers

- access-control-allow-origin:** *
- age:** 5347450
- cache-control:** max-age=315360000, public, immutable
- content-encoding:** gzip
- content-type:** application/javascript; charset="utf-8"
- date:** Tue, 16 Jul 2019 18:04:22 GMT
- last-modified:** Mon, 15 Jul 2019 17:24:45 GMT
- server:** meinheld/0.6.1
- status:** 200
- vary:** Accept-Encoding
- via:** 1.1 2f43ce8da1e384926701eb877d7472ba.cloudfront.net (CloudFront)
- x-amz-cf-id:** HTU72b-6nPWKx7jqgexbapGHY2EztTUKYsviMiZ8f2qtzFr3ajjDCA==

- Headers and payload
- Response body
- Cookies
- Timing

SOURCES

SOURCES PANEL & DEBUGGING JAVASCRIPT





APPLICATION

APPLICATION PANEL

DevTools - developers.google.com/web/tools/chrome-devtools/console/command-line-reference

Elements Console Sources Network Performance Memory Application Security Audits Redux AdBlock

Filter

Name	Value	Domain	Path	Expire...	Size	HTTP	Secure	Same...
1P_JAR	2018-07-26-19	.gstati...	/	2018-...	19			
1P_JAR	2018-8-11-22	.googl...	/	2018-...	18			
APISID	uk4CyOxOCOewmo8Z/ATHNV5x4-0aUyQciV	.googl...	/	2020-...	40			
HSID	AkphYLLmcaL9XL0QI	.googl...	/	2020-...	21	✓		
NID	136=s1poVLvQfbwGEjQ6qvyMMD2N3UF7_...	.googl...	/	2019-...	309	✓		
OTZ	4508159_44_48_123900_44_436380	apis.g...	/	2018-...	33		✓	
S	billing-ui-v3=77V4zk1ToVBIHbVRKKnb5XYe...	.googl...	/	1969-...	98	✓	✓	
SAPISID	xS2oFdMvIPqZoAXp/Aw_6g-qP4glv-biZD	.googl...	/	2020-...	41		✓	
SID	SwZISGvZgzM8Are1nlfonaQLmGNwFpm12...	.googl...	/	2020-...	74			
SIDCC	AGIhQKS65JFADWDVbdYMNlviZCj0yBhGUL...	.googl...	/	2018-...	81			
SSID	A4QdCD6Au_Hhg0FL8	.googl...	/	2020-...	21	✓	✓	
_ga	GA1.3.321366551.1534001656	.devel...	/	2020-...	29			
_gid	GA1.3.1982362518.1534001656	.devel...	/	2018-...	31			
devsite_dark_code	off	devel...	/web/...	1969-...	20			

HTML 5 Database

Local Storage

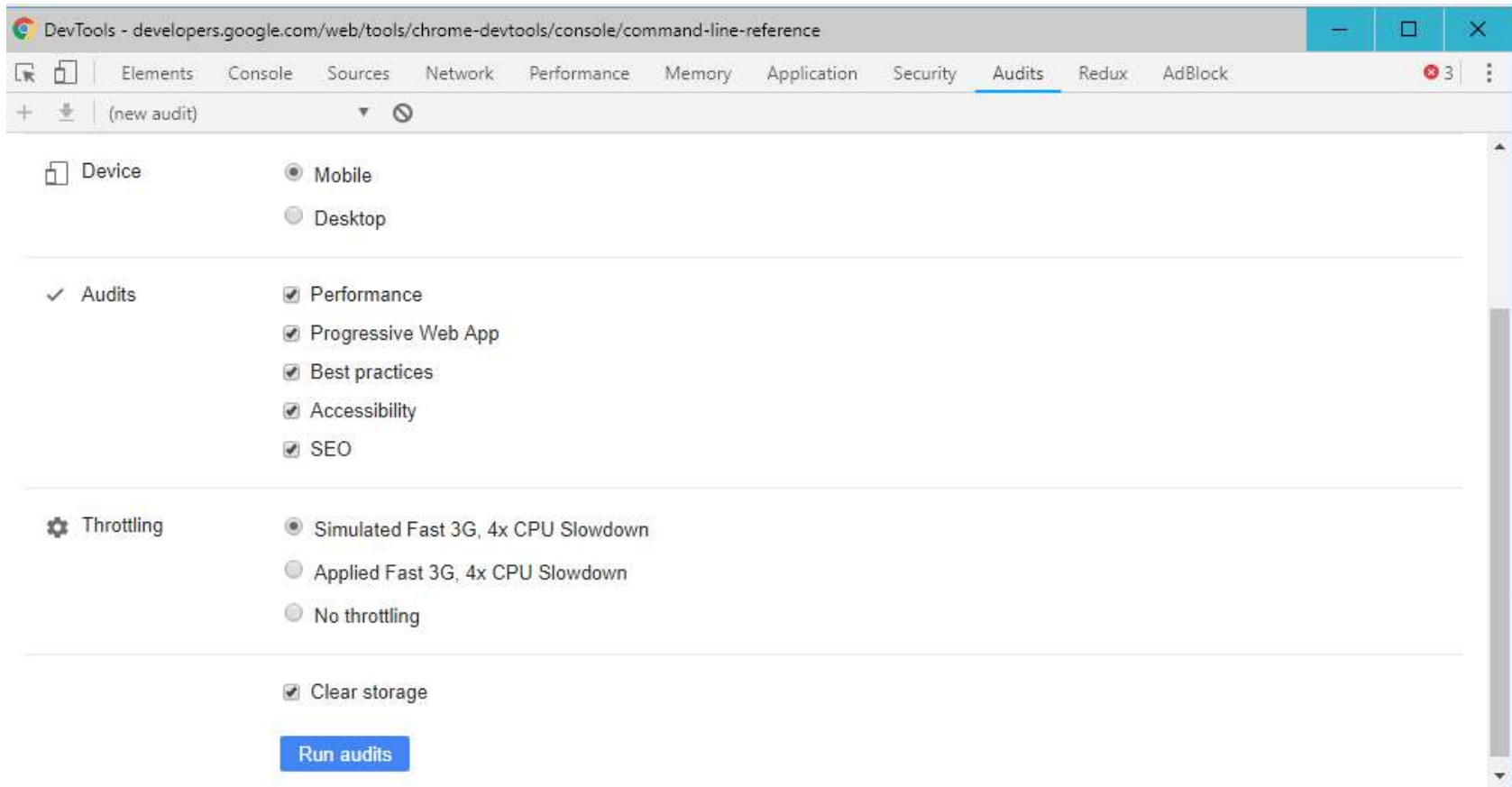
Cookies

AppCache



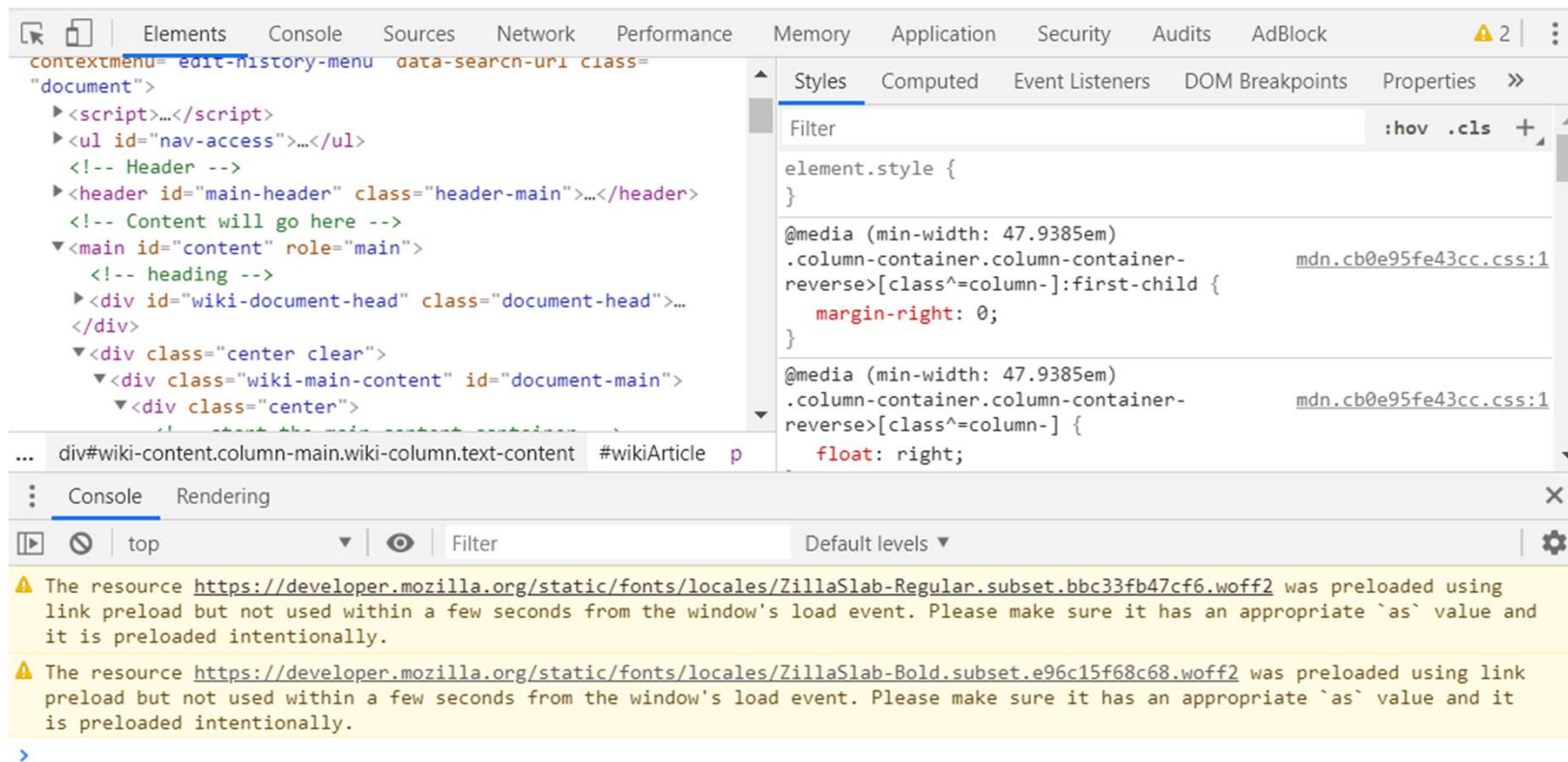
AUDITS

AUDITS PANEL



CONSOLE

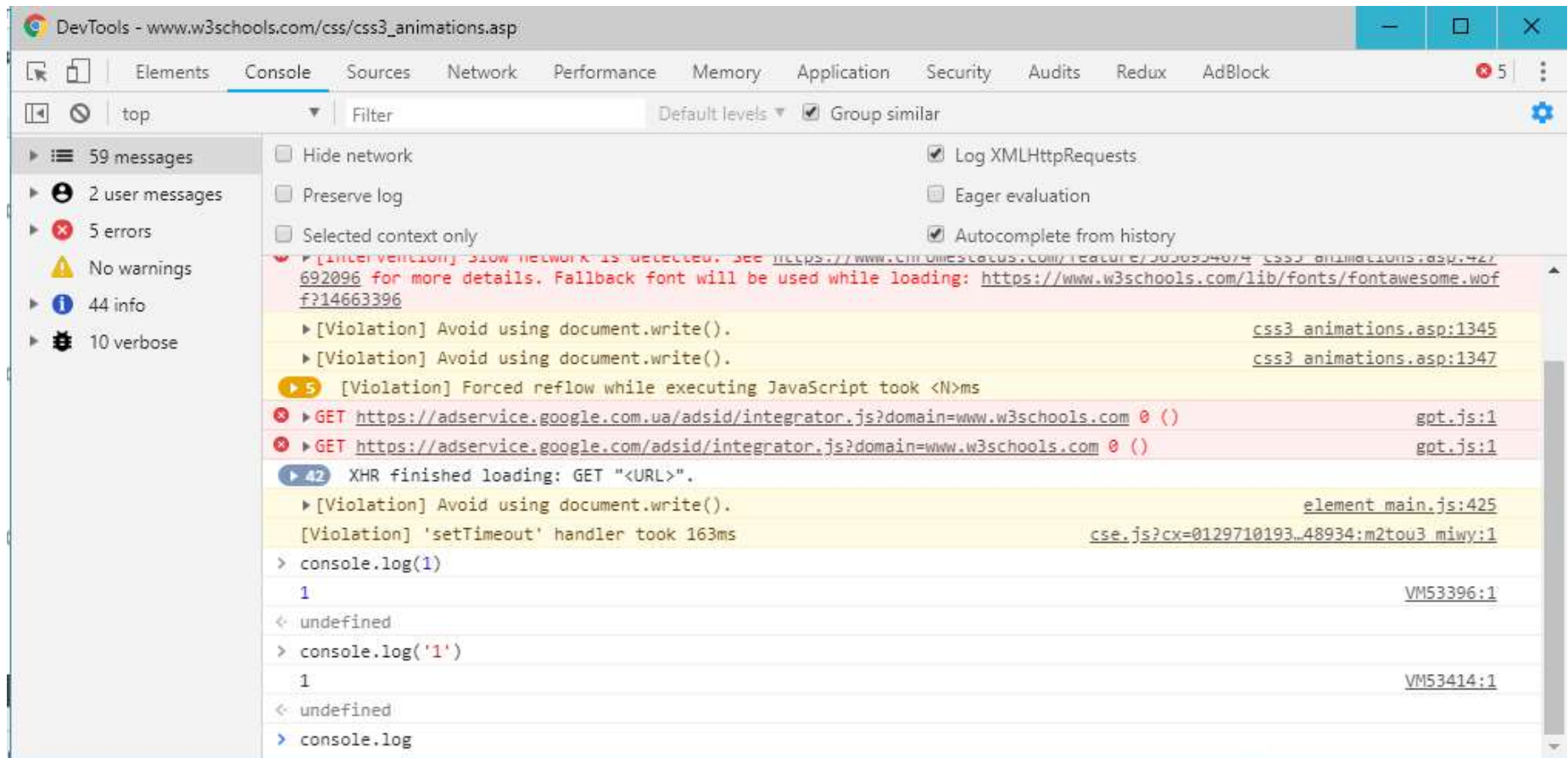
CONSOLE



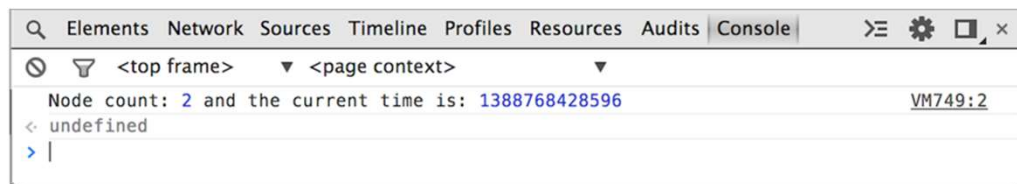
Console API

Command Line API

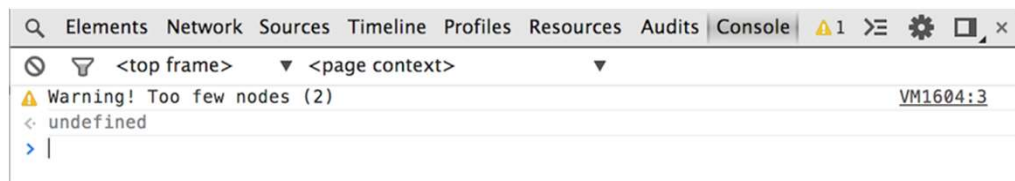
CONSOLE SETTINGS



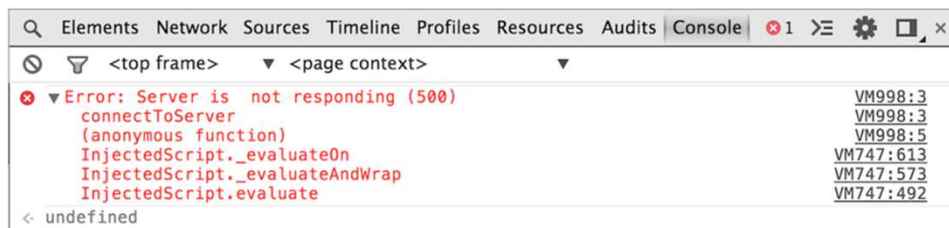
CONSOLE API



console.log()



console.warn()



console.assert()

console.error()



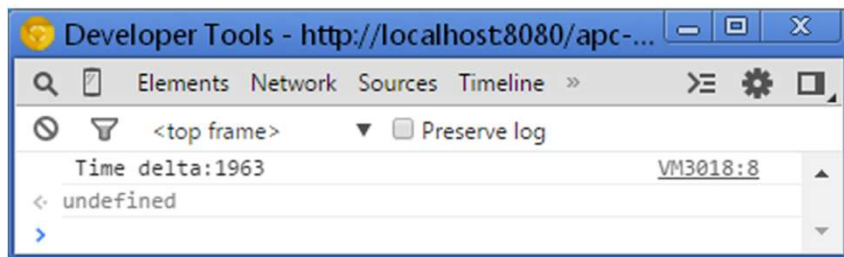
console.trace()

MEASURING HOW LONG SOMETHING TAKES

Old school

JAVASCRIPT

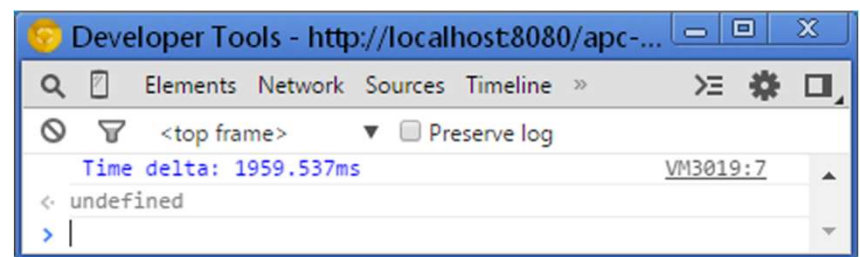
```
var t = new Date();
var array = new Array(1000000);
for(var i=array.length-1; i >=0; i--){
    array[i] = {}
}
t = new Date() - t;
console.log('Time delta:' + t);
```



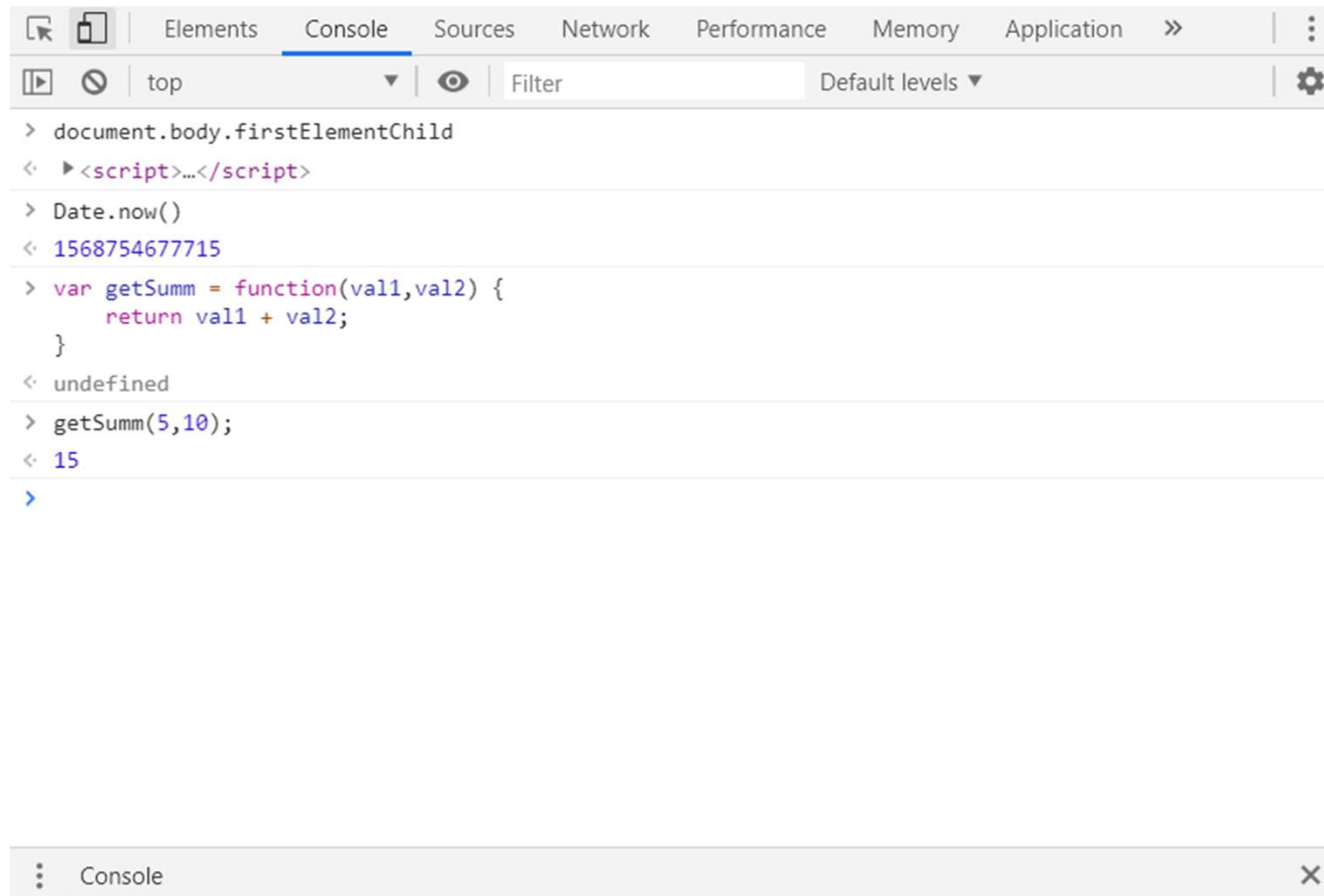
Console API

JAVASCRIPT

```
console.time('Time delta')
var array = new Array(1000000);
for(var i=array.length-1; i >=0; i--){
    array[i] = {}
}
t = new Date() - t;
console.timeEnd('Time delta');
```



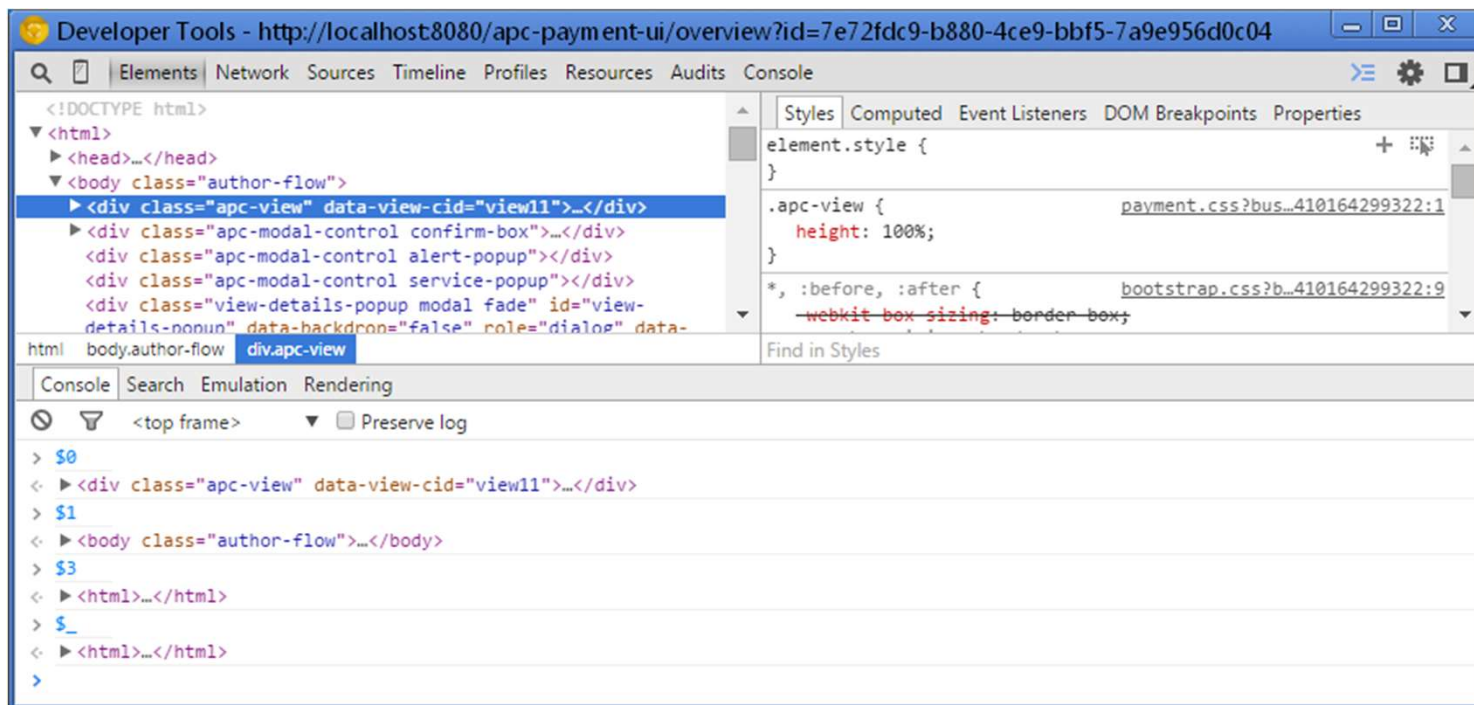
EVALUATING EXPRESSIONS



SELECTING ELEMENTS

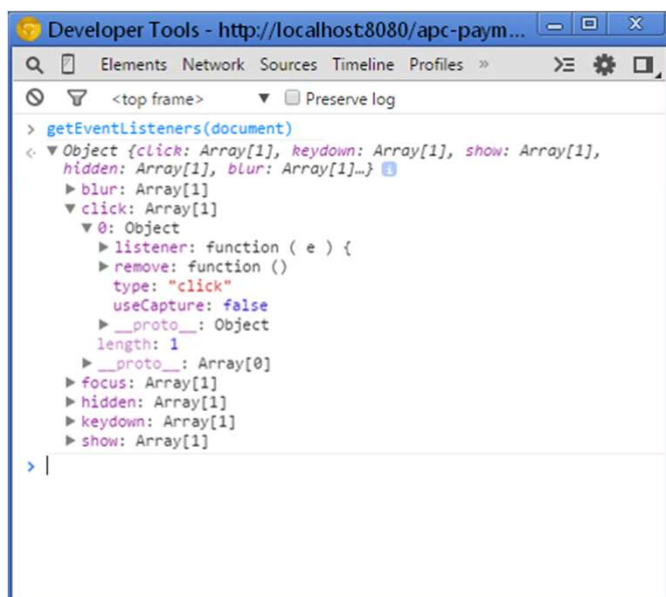
\$0, \$1, \$2, \$3, \$4
\$_

\$(\$('.article'))
\$\$(\$('.article'))

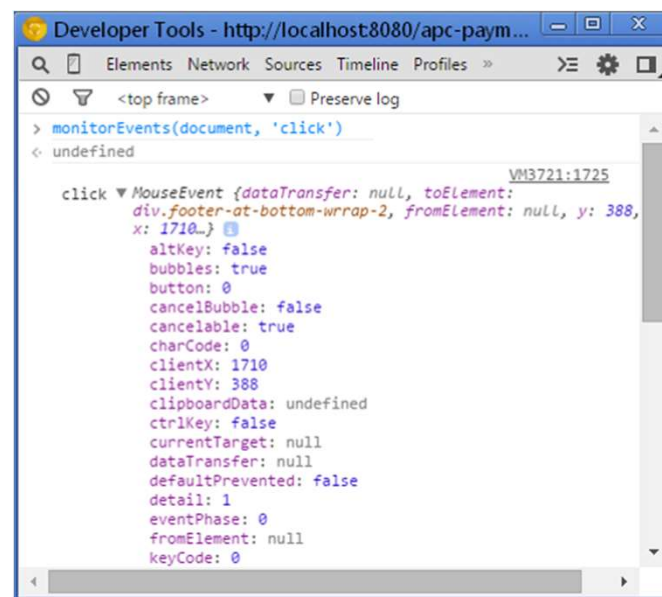


MONITORING EVENTS

getEventListeners(object)



```
monitorEvents(window, "resize")
unmonitorEvents(object[, events])
```



CONSOLE UTILITIES API

Monitoring events

View event listeners registered
on objects

Aliases for a number of
Console API methods

Evaluating JavaScript
expressions

Convenience functions for
selecting DOM elements





EMULATION

EMULATION

iPhone 6/7/... 414 x 736 79% DPR: 3.0 Mobile

▼ Debugging isn't scary

When writing code of some kind, everything is usually fine, until that dreaded moment when an error occurs — you've done something wrong, so your code doesn't work — either not at all, or not quite how you wanted it to. For example, the following shows an error reported when trying to compile a simple program written in the Rust language.

```
To learn more, run the command again with --verbose.
error: unterminated double quote string
  --> src/main.rs:2:27
   |
2  | println!(Hello, world!);
   |               ^^^^^^
   |
   = note: this error originates in a macro (in Nightly builds, run with -Z macro-backtrace for more)

To learn more, run the command again with --verbose.
error: unterminated double quote string
```

Here, the error message is relatively easy to understand — "unterminated double quote string". If you look at the listing, you can probably see how `println!(Hello, world!);` might logically be missing a double quote. However, error messages can

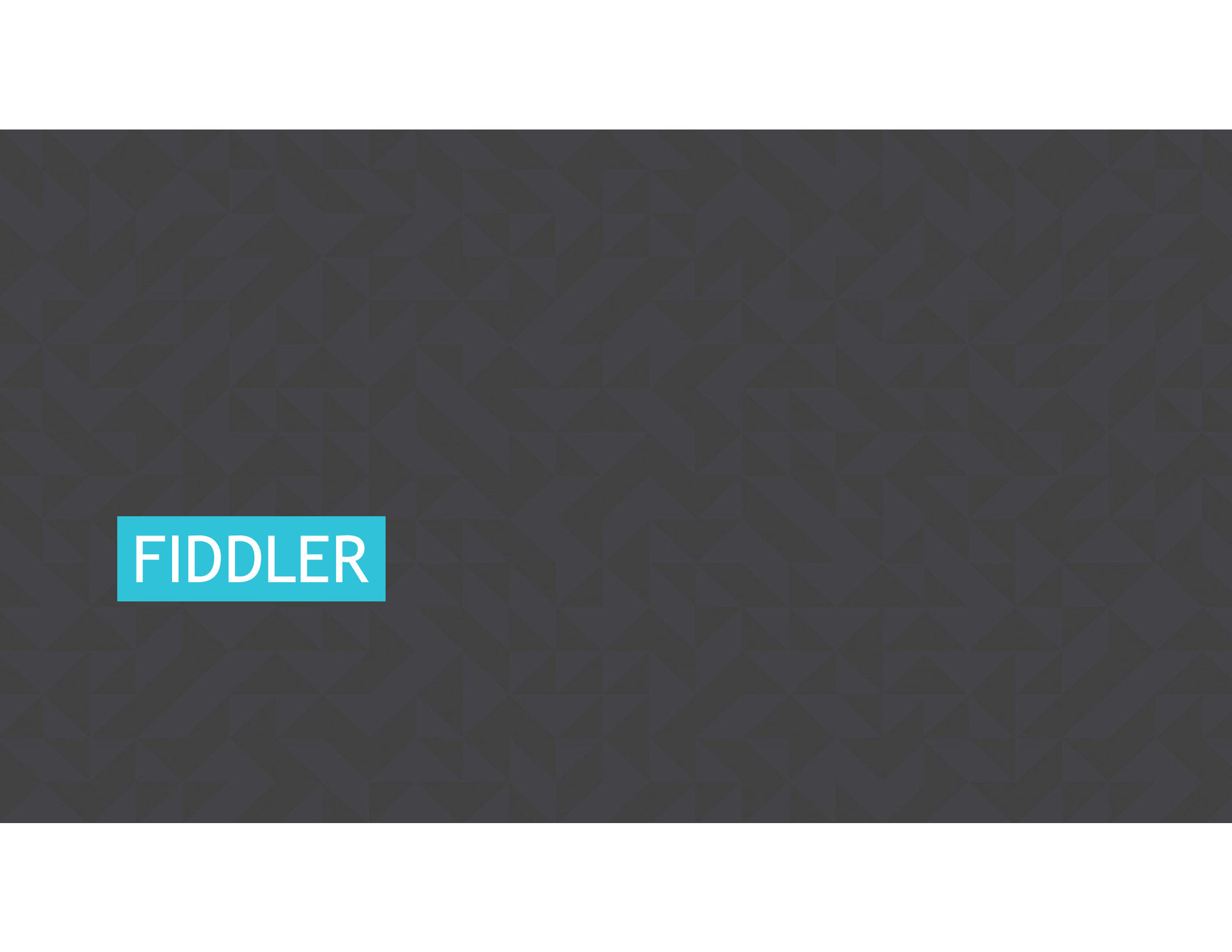
Elements Console Sources Network Performance

```
<!doctype html>
<html lang="en" dir="ltr" class>
  <head prefix="og: http://ogp.me/ns#">...</head>
  <body data-slug="Learn/HTML/Introduction_to_HTML/
Debugging_HTML" contextmenu="edit-history-menu" data-search-
url class="document">
  <script>...</script>
  <ul id="nav-access">...</ul>
  <!-- Header -->
  <header id="main-header" class="header-main">...</header>
  <!-- Content will go here -->
  <main id="content" role="main"> == $0
    <!-- heading -->
    <div id="wiki-document-head" class="document-head">...
    </div>
    <div class="center clear">...</div>
  </main>
  <div id="developer_needs" class="mdn-cta-container hidden"
aria-expanded="false" aria-hidden="true" data-banner="
"developer_needs">...</div>
  <!-- Footer -->
  <footer id="nav-footer" class="nav-footer">...</footer>
  <!-- site js -->
  <!-- [if lte IE 8]><script type="text/javascript"
src="/static/build/js/selectivizr.8bb9e662e963.js"
charset="utf-8"></script><![endif]>-->
  <script src="/static/js/18n/en-US/
javascript.414b87adc480.js"></script>
  <script type="text/javascript" src="/static/build/js/
main.b0f831aaddf5.js" charset="utf-8"></script>
  <div class="notification-tray" role="status" aria-live=
"polite">...</div>
```

html body.document main#content

Console

top Filter

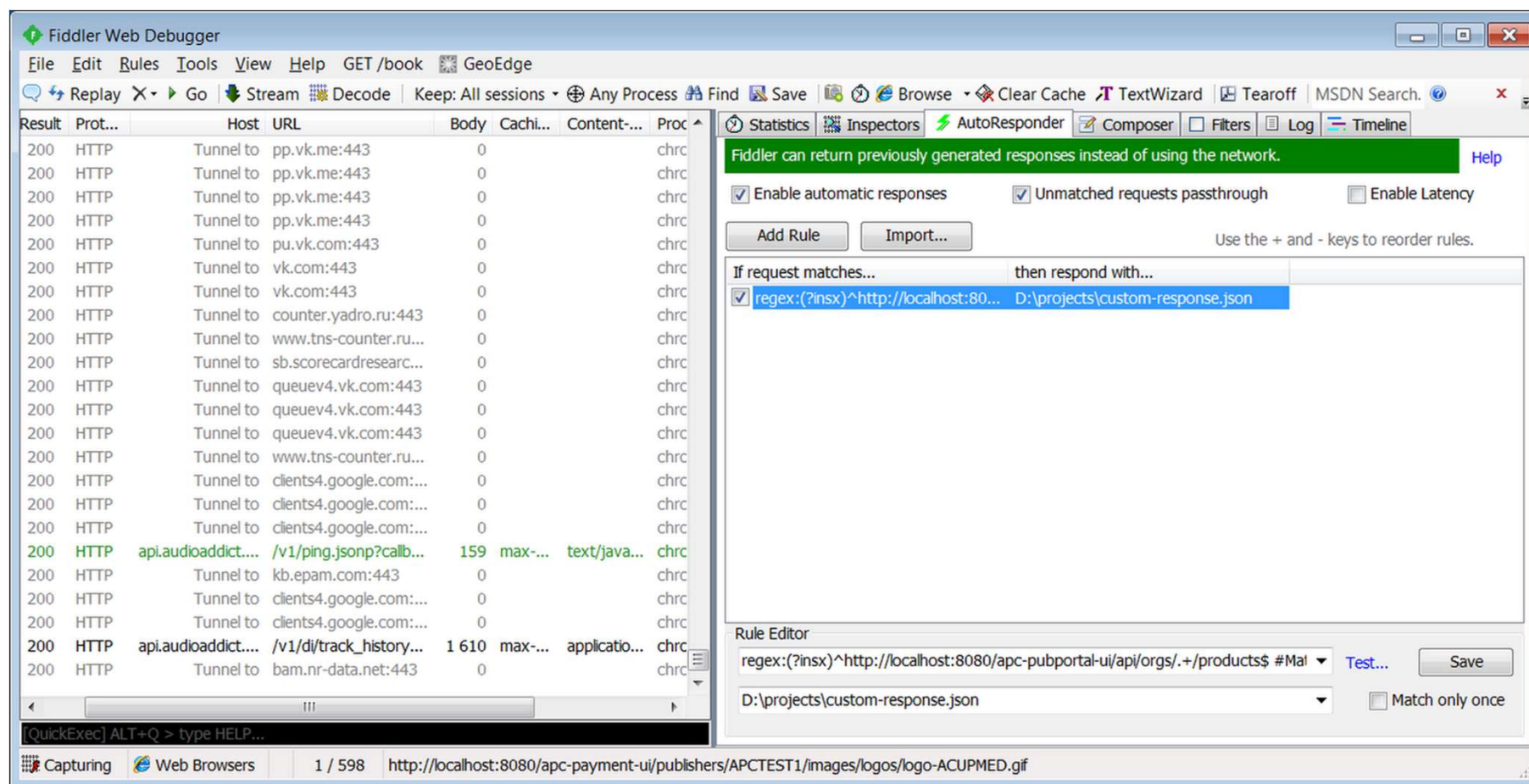
The image features a dark, textured background composed of a repeating pattern of small, interlocking triangles in various shades of dark blue and grey. In the lower-left quadrant, the word "FIDDLER" is displayed in a clean, white, sans-serif font. The text is contained within a solid, light blue rectangular box that provides a strong contrast against the dark background.

FIDDLER

FIDDLER



FIDDLER – AUTO RESPONDER



FIDDLER – LIST OF FEATURES

1

We can see all requests, their titles, cookie, parameters transferred to the server.

2

We can test the site on slow connection with the Internet

3

Substitution of data in case of the response of the server

CONCLUSION

DEBUGGING TOOLS



RESOURCES



ANY QUESTIONS?



A dark blue silhouette of a city skyline with various buildings and a tower on the left. The skyline is positioned in the upper half of the image.

Get in Touch



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THANKS FOR ATTENTION!!!

