Measure Resource Loading Times



By <u>Kayce Basques</u>
Technical Writer for Chrome DevTools



By Meggin Kearney Meggin is a Tech Writer

Warning: This page is deprecated. At the top of each section, there's a link to an up-to-date page where you can find similar information.

Measure the network performance of your site using the **Network** panel.

The **Network** panel records information about each network operation on a page, including detailed timing data, HTTP request and response headers, cookies, and more.

TL;DR

- Use the Network panel to record and analyze network activity.
- View load information in aggregate or for individual resources.
- Filter and sort how resources are displayed.
- Save, copy, and clear network recordings.
- Customize the Network panel to your needs.

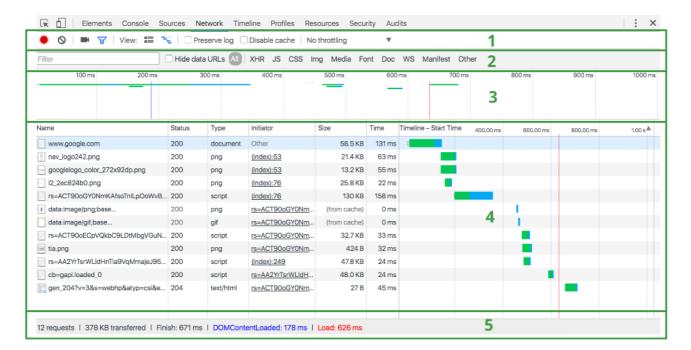
Network panel overview

Warning: This page is deprecated. See following sections for up-to-date information:

- Controls pane
- Filters pane
- Overview pane
- · Requests pane
- Summary pane

The Network panel consists of five panes:

- 1. **Controls**. Use these options to control how the **Network** panel looks and functions.
- 2. Filters. Use these options to control which resources are displayed in the Requests Table. Tip: hold Cmd (Mac) or Ctrl (Window/Linux), and then click on a filter to select multiple filters at the same time.
- 3. **Overview**. This graph shows a timeline of when resources were retrieved. If you see multiple bars stacked vertically, it means that those resources were retrieved simultaneously.
- 4. **Requests Table**. This table lists out every resource that was retrieved. By default, this table is sorted chronologically, with the earliest resources at the top. Clicking on the name of a resource yields more information about it. Tip: right-click on any of the table headers except **Timeline** to add or remove columns of information.
- 5. **Summary**. At a glance this pane tells you the total number of requests, amount of data transferred, and load times.



The **Requests Table** displays the following columns by default. You can <u>add and remove</u> <u>columns</u>.

- Name. The name of the resource.
- Status. The HTTP status code.
- **Type**. The MIME type of the requested resource.
- **Initiator**. The object or process that initiated the request. It can have one of the following values:
- Parser. Chrome's HTML parser initiated the request.

- **Redirect**. An HTTP redirect initiated the request.
- Script. A script initiated the request.
- Other. Some other process or action initiated the request, such as the user navigating to a page via a link, or by entering a URL in the address bar.
- **Size**. The combined size of the response headers (usually a few hundred bytes) plus the response body, as delivered by the server.
- **Time**. The total duration, from the start of the request to the receipt of the final byte in the response.
- **Timeline**. The Timeline column displays a visual waterfall of all network requests. Clicking the header of this column reveals a menu of additional sorting fields.

Record network activity

Warning: This page is deprecated. See Start or stop recording for up-to-date information.

When the **Network** panel is open, DevTools records all network activity by default. To record, just reload a page while the panel is open, or wait for network activity on the currently loaded page.

You can tell whether or not DevTools is recording via the **record** button. When it's red (), DevTools is recording. When it's grey (), DevTools is not recording. Click this button to start or stop recording, or press the keyboard shortcut Cmd/Ctrl+e.

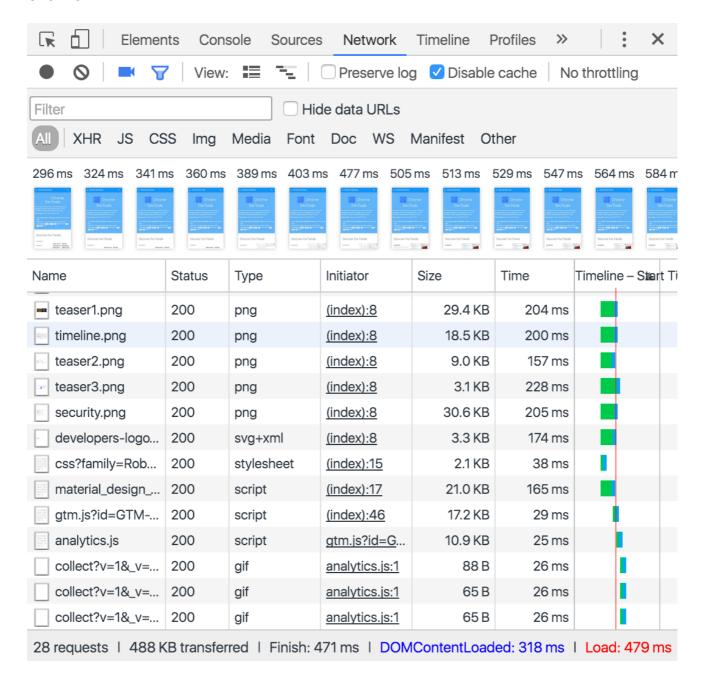
Capture screenshots during recording

Warning: This page is deprecated. See <u>Capture screenshots during recording</u> for up-to-date information.

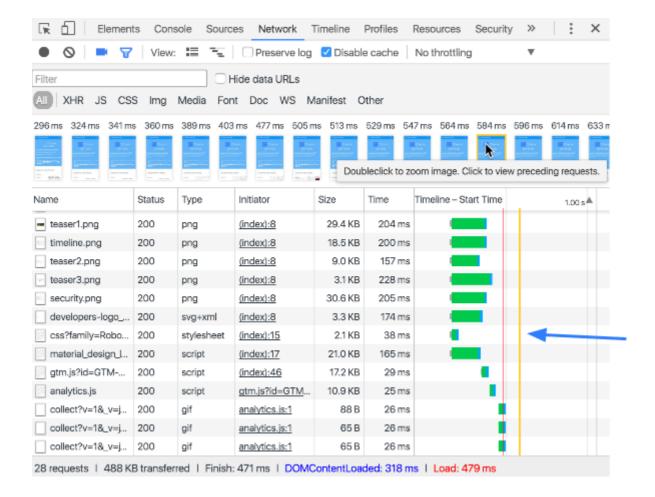
The **Network** panel can capture screenshots during a page load. This feature is known as the **Filmstrip**.

Click on the **camera** icon to enable the Filmstrip. When the icon is grey, the Filmstrip is disabled (). When the icon is blue, it is enabled ().

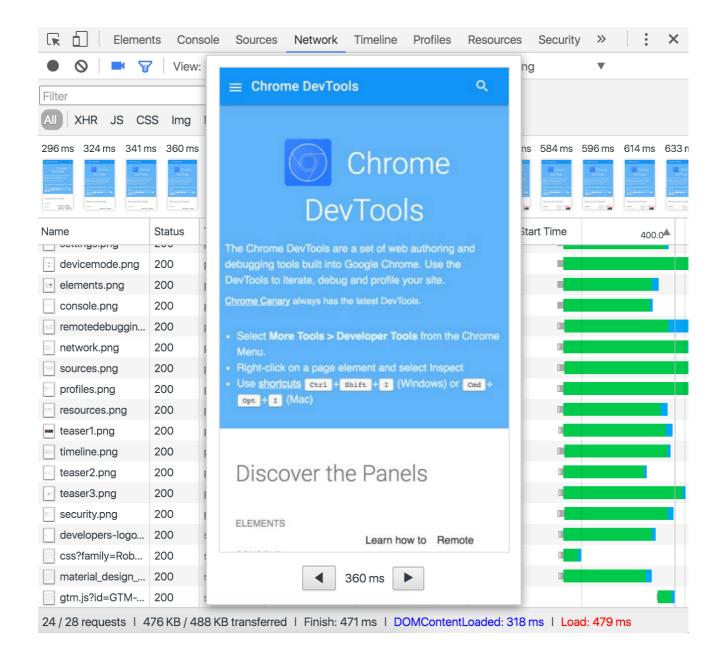
Reload the page to capture the screenshots. The screenshots are displayed above the **Overview**.



When you hover over a screenshot, the **Timeline** displays a vertical yellow line indicating when the frame was captured.



Double-click on a screenshot to view a zoomed version of the screenshot. While a screenshot is zoomed, use the left and right arrows of your keyboard to navigate between screenshots.



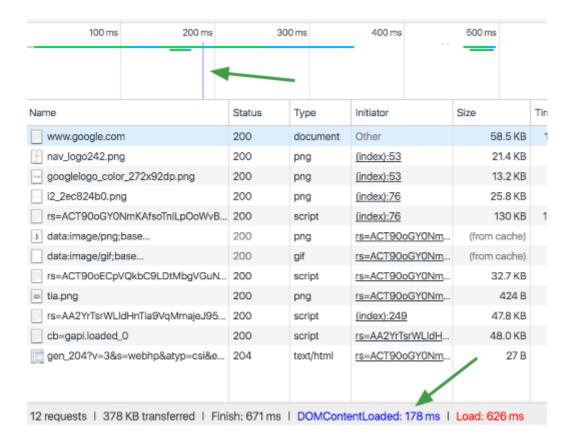
View DOMContentLoaded and load event information

Warning: This page is deprecated. See <u>View load events</u> for up-to-date information.

The **Network** panel highlights two events: <u>DOMContentLoaded</u> and <u>load</u>.

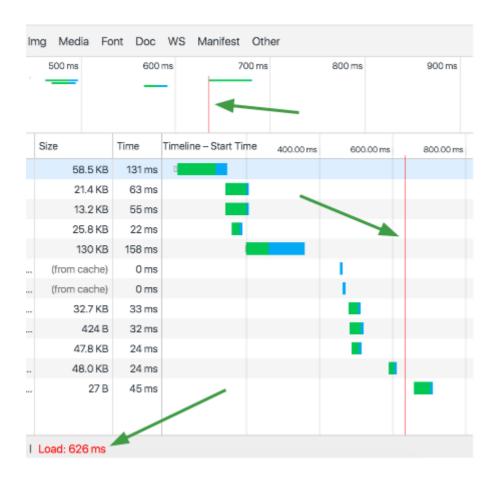
DOMContentLoaded is fired when the initial markup of a page has been parsed. It is displayed in two places on the **Network** panel:

- 1. The blue vertical bar in the **Overview** pane signifies the event.
- 2. In the **Summary** pane you can see the exact time of the event.



load is fired when a page has fully loaded. It is displayed in three places:

- 1. The red vertical bar in the **Overview** pane signifies the event.
- 2. The red vertical bar in the **Requests Table** signifies the event, too.
- 3. In the **Summary** pane you can see the exact time of the event.



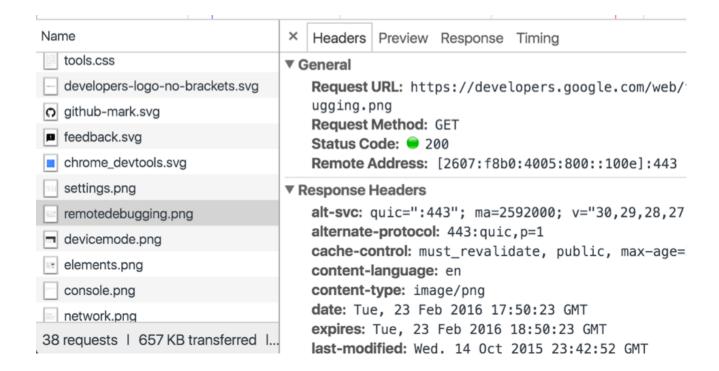
View details for a single resource

Warning: This page is deprecated. See <u>View details</u> for up-to-date information.

Click on a resource name (under the **Name** column of the **Requests Table**) to view more information about that resource.

The tabs available change depending on what type of resource you've selected, but the four tabs below are most common:

- Headers. HTTP headers associated with the resource.
- Preview. Previews of JSON, image, and text resources.
- Response. HTTP response data (if any).
- **Timing**. A granular breakdown of the request lifecycle for the resource.



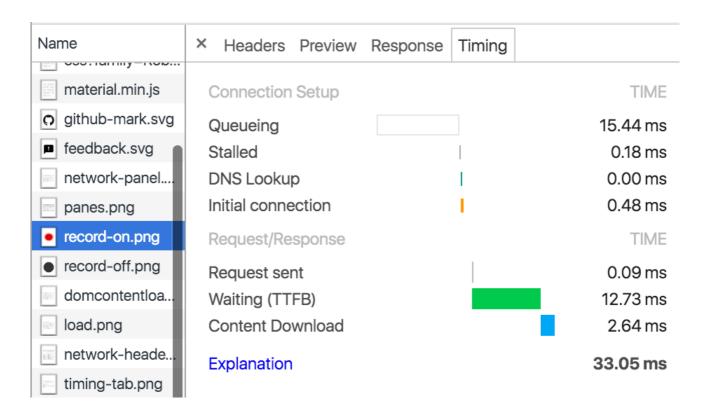
View network timing

Warning: This page is deprecated. See <u>Timing tab</u> for up-to-date information.

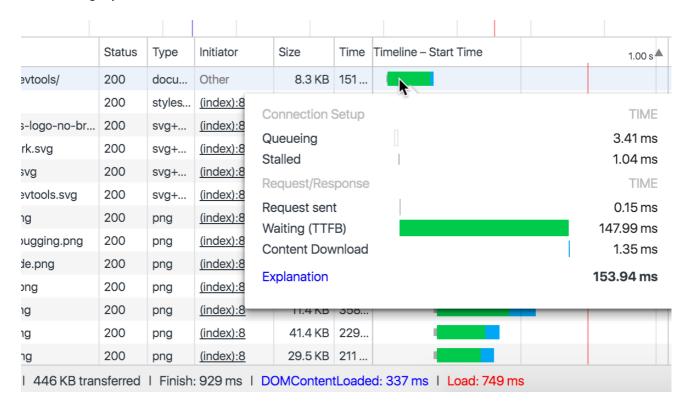
Click the **Timing** tab to view a granular breakdown of the request lifecycle for a single resource.

The lifecycle shows how much time is spent in the following categories:

- Queuing
- Stalled
- If applicable: DNS lookup, initial connection, SSL handshake
- · Request sent
- Waiting (Time to first byte (TTFB))
- Content Download



You can also view this same information by hovering your mouse over a resource within the **Timeline** graph.



Related Guides:

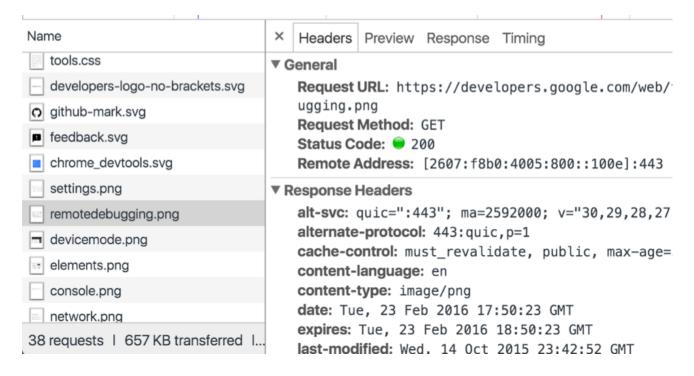
<u>Understanding Resource Timing</u>

View HTTP headers

Warning: This page is deprecated. See <u>Headers tab</u> for up-to-date information.

Clicking the **Headers** shows the headers for that resource.

The **Headers** tab displays the resource's request URL, HTTP method, and response status code. Additionally, it lists the HTTP response and request headers and their values, and any query string parameters.



You can view response headers, request headers, or query string parameters in source or parsed format by clicking the view source or view parsed link next to each section.

Headers Preview Response Cookies Timing

General

Request URL: https://github.com/Polymer/docs/issues/new?title=hello

Request Method: GET Status Code: 9 200 0K

Remote Address: 192.30.252.131:443

▼ Response Headers

view source

Cache-Control: no-cache Content-Encoding: gzip

Content-Security-Policy: default-src *; base-uri 'self'; connect-src 'sel f' live.github.com wss://live.github.com uploads.github.com status.git hub.com api.github.com www.google-analytics.com api.braintreegateway.c om client-analytics.braintreegateway.com github-cloud.s3.amazonaws.co m; font-src assets-cdn.github.com; form-action 'self' github.com gist. github.com; frame-src 'self' render.githubusercontent.com gist.github. com checkout.paypal.com; img-src 'self' data: assets-cdn.github.com id enticons.github.com www.google-analytics.com checkout.paypal.com colle ctor.githubapp.com *.githubusercontent.com *.gravatar.com *.wp.com; me dia-src 'none'; object-src assets-cdn.github.com; script-src assets-cd

You can also view query string parameters in URL-encoded or decoded format by clicking the view URL encoded or view decoded link next to that section.

Headers Preview Response Cookies Timing

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;

q = 0.8

Accept-Encoding: gzip, deflate, sdch Accept-Language: en-US, en; q=0.8

Cache-Control: max-age=0 Connection: keep-alive

Cookie: _octo=GH1.1.24403243.1454439487; logged_in=yes; dotcom_user=kaycebasq ues; _gat=1; user_session=IbIcrgQ4zcobZBigBnLxtZJ54TKLtYs2XxX98Wmfvr4nch5KVs ywz0oMAE1Sk1oiHaseiyIilYPLKBSP; _gh_sess=eyJzZXNzaW9uX2lkIjoiMjA1M2QwZDExZDA yYWQzYTI10WIxMjVhMjI4NDY4MmQiLCJzcHlfcmVwbyI6IlBvbHltZXIvZG9jcyIsInNweV9yZXB vX2F0IjoxNDU2MjU1MTgzLCJjb250ZXh0IjoiLyIsImxhc3Rfd3JpdGUi0jE0NTYyNTM3MjA5NDB 9--46b49496dde2e9830d9e192251240e6fcff4499f; _ga=GA1.2.2063248990.145443948

7; tz=America%2FLos_Angeles

Host: github.com

Upgrade-Insecure-Requests: 1

User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_11_3) AppleWebKit/537.3

6 (KHTML, like Gecko) Chrome/50.0.2656.0 Safari/537.36

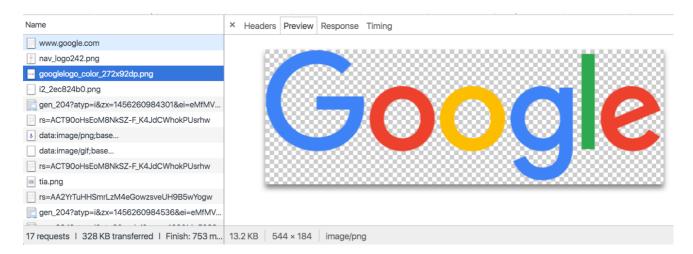
title: hello

▼ Query String Parameters view source view URL encoded <<p>■

Preview a resource

Warning: This page is deprecated. See Preview tab for up-to-date information.

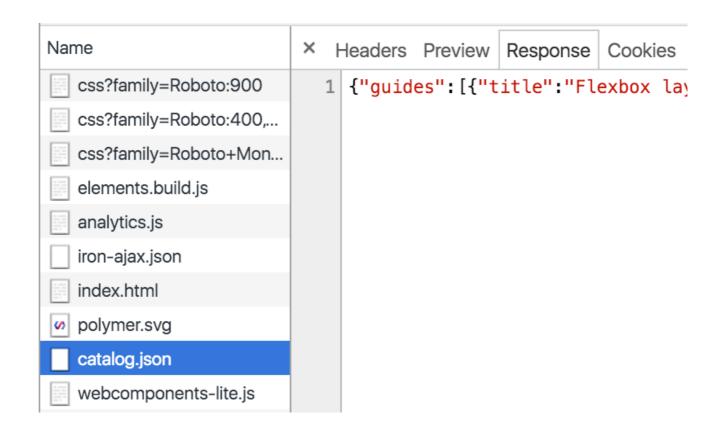
Click the **Preview** tab to view a preview of that resource. The **Preview** tab may or may not display any useful information, depending on the type of resource you've selected.



View HTTP response content

Warning: This page is deprecated. See <u>Response tab</u> for up-to-date information.

Click the **Response** tab to view the resource's unformatted HTTP response content. The **Response** tab may or may not contain any useful information, depending on the type of resource you've selected.



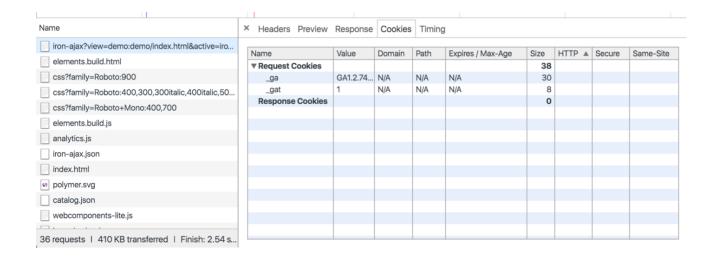
View cookies

Warning: This page is deprecated. See <u>Cookies tab</u> for up-to-date information.

Click the **Cookies** tab to view a table of cookies transmitted in the resource's HTTP request and response headers. This tab is only available when cookies are transmitted.

Below is a description of each of the columns in the table:

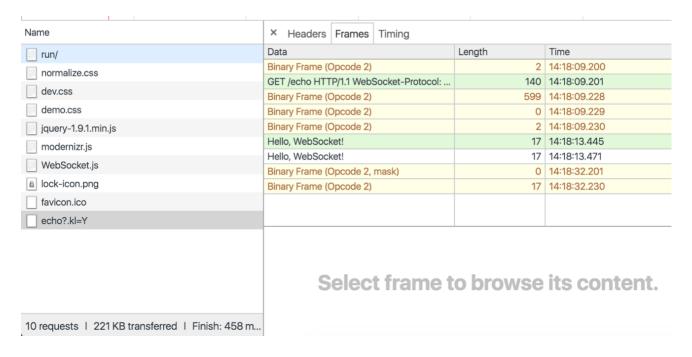
- Name. The cookie's name.
- Value. The cookie's value.
- **Domain**. The domain the cookie belongs to.
- Path. The URL path the cookie came from.
- Expires / Max-Age. The value of the cookie's expires or max-age properties.
- Size. The size of the cookie in bytes.
- **HTTP**. Indicates that the cookie should only be set by the browser in the HTTP request, and cannot be accessed with JavaScript.
- **Secure**. The presence of this attribute indicates that the cookie should only be transmitted over a secure connection.



View WebSocket frames

Warning: This page is deprecated. See Frames tab for up-to-date information.

Click the **Frames** tab to view <u>WebSocket</u> connection information. This tab is only visible when the selected resource initiated a <u>WebSocket</u> connection.



The list below describes each of the columns in the table on the **Frames** tab:

- Data. The message payload. If the message is plain text, it's displayed here. For binary opcodes, this field displays the opcode's name and code. The following opcodes are supported:
- · Continuation Frame
- Binary Frame

- Connection Close Frame
- Ping Frame
- Pong Frame
- Length. The length of the message payload in bytes.
- **Time**. The time stamp when the message was created.

Messages are color-coded according to their type:

- Outgoing text messages are color-coded light-green.
- Incoming text messages are white.
- WebSocket opcodes are light-yellow.
- Errors are light-red.

Notes about current implementation:

- To refresh the Frames table after new messages arrive, click the resource name on the left.
- Only the last 100 WebSocket messages are preserved by the Frames table.

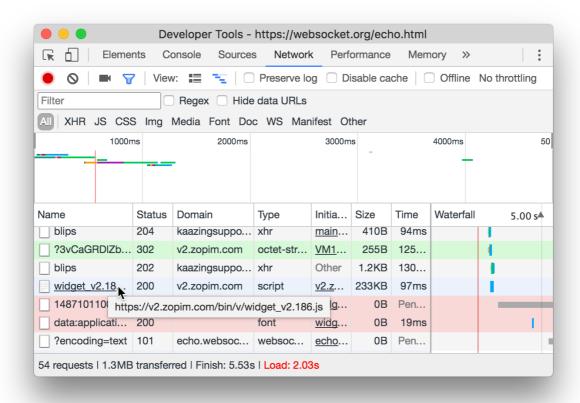
View resource initiators and dependencies

Warning: This page is deprecated. See <u>View initiators and dependencies</u> for up-to-date information.

Hold Shift and hover over a resource to view its initiators and dependencies. This section refers to the resource that you are hovering over as the **target**.

The first resource above the target that is color-coded green is the initiator of the target. If there is a second resource above that which is color-coded green, that's the initiator of the initiator. Any resources below the target that are color-coded red are dependencies of the target.

In the screenshot below, the target is dn/. The initiator of the target is the script beginning with rs=AA2Y. The initiator of the initiator (rs=AA2Y) is google.com. Last, dn.js is a dependency of the target (dn/).



Keep in mind that for pages with lots of resources it's possible that you may not be able to see all of the initiators or dependencies.

Sort requests

Warning: This page is deprecated. See <u>Sort by activity phase</u> for up-to-date information.

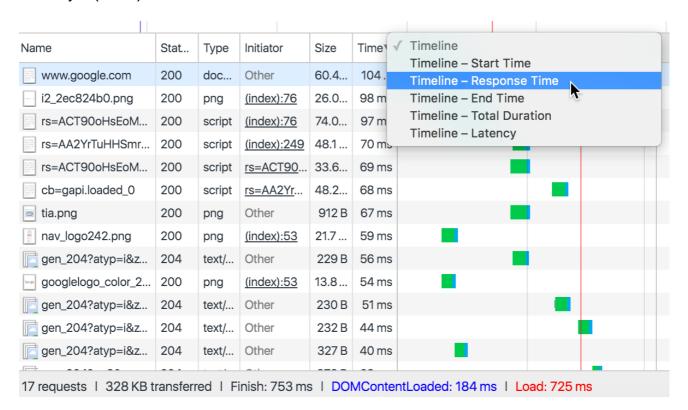
By default, the resources in the **Requests Table** are sorted by the start time of each request, starting with the earliest requests at the top.

Click on the header of a column to sort the table by each resource's value for that header. Click the same header again to change the sort order to ascending or descending.

The **Timeline** column is unique from the others. When clicked, it displays a menu of sort fields:

• **Timeline**. Sorts by the start time of each network request. This is the default sort, and is the same as sorting by the **Start Time** option.

- **Start Time**. Sorts by the start time of each network request (same as sorting by the **Timeline** option).
- **Response Time**. Sorts by each request's response time.
- **End Time**. Sorts by the time when each request completed.
- **Duration**. Sorts by the total time of each request. Select this filter to determine which resource takes the longest time to load.
- **Latency**. Sorts by the time between the start of the request and the beginning of the response. Select this filter to determine which resource takes the longest time to first byte (TTFB).



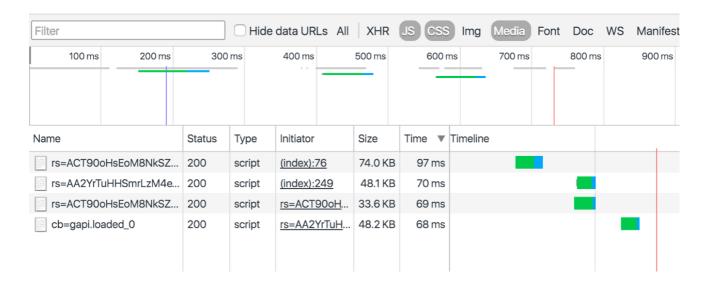
Filter requests

Warning: This page is deprecated. See <u>Filters panel</u> for up-to-date information.

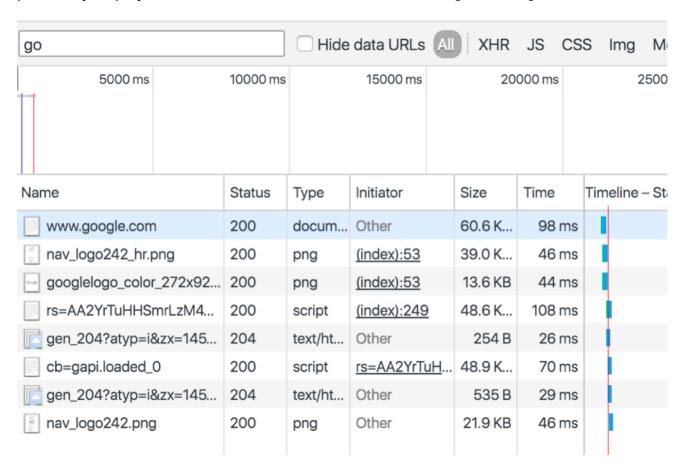
The **Network** panel provides numerous ways to filter which resources are displayed. Click the **filters** button () to hide or display the **Filters** pane.

Use the content type buttons to only display resources of the selected content type.

Note: Hold Cmd (Mac) or Ctrl (Windows/Linux) and then click to enable multiple filters simultaneously.



The **filter** text field is deceptively powerful. If you enter an arbitrary string in it, the **Network** panel only displays the resources whose filenames match the given string.



The **filter** text field also supports various keywords that let you sort resources by various properties, such as file size using the larger-than keyword.

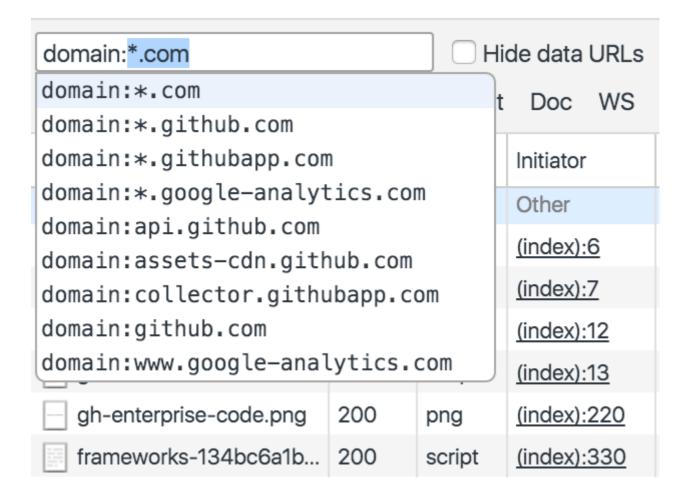
The list below describes all of the keywords.

 domain. Only display resources from the specified domain. You can use a wildcard character (*) to include multiple domains. For example, *.com displays resources from

- all domain names ending in .com. DevTools populates the autocomplete dropdown menu with all of the domains it has encountered.
- has-response-header. Show the resources that contain the specified HTTP response header. DevTools populates the autocomplete dropdown with all of the response headers that it has encountered.
- is. Use is:running to find WebSocket resources.
- larger-than. Show resources that are larger than the specified size, in bytes. Setting a value of 1000 is equivalent to setting a value of 1k.
- method. Show resources that were retrieved over a specified HTTP method type.
 DevTools populates the dropdown with all of the HTTP methods it has encountered.
- mime-type. Show resources of a specified MIME type. DevTools populates the dropdown with all MIME types it has encountered.
- mixed-content. Show all mixed content resources (mixed-content:all) or just the ones that are currently displayed (mixed-content:displayed).
- scheme. Show resources retrieved over unprotected HTTP (scheme:http) or protected HTTPS (scheme:https).
- set-cookie-domain. Show the resources that have a Set-Cookie header with a Domain attribute that matches the specified value. DevTools populates the autocomplete with all of the cookie domains that it has encountered.
- set-cookie-name. Show the resources that have a Set-Cookie header with a name that matches the specified value. DevTools populates the autocomplete with all of the cookie names that it has encountered.
- set-cookie-value. Show the resources that have a Set-Cookie header with a value that matches the specified value. DevTools populates the autocomplete with all of the cookie values that it has encountered.
- status-code. Only show resources whose HTTP status code match the specified code.
 DevTools populates the autocomplete dropdown menu with all of the status codes it has encountered.

larger-than:20K		Hide	data URLs A	XHR	JS CS	SS	lmg M
5000 ms	10000 ms		15000 ms	20000 ms		2500	
Name	Status	Туре	Initiator	Size	Time	Tim	eline – St
www.google.com	200	docum	Other	60.6 K	98 ms		
nav_logo242_hr.png	200	png	(index):53	39.0 K	46 ms		
i2_2ec824b0.png	200	png	(index):76	26.6 KB	105 ms		
rs=ACT90oHsEoM8NkSZ	200	script	(index):76	74.0 KB	91 ms		
rs=ACT90oHsEoM8NkSZ	200	script	rs=ACT90oH	. 33.4 K	48 ms		
rs=AA2YrTuHHSmrLzM4	200	script	(index):249	48.6 K	108 ms		
cb=gapi.loaded_0	200	script	rs=AA2YrTuH.	48.9 K	70 ms		
nav_logo242.png	200	png	Other	21.9 KB	46 ms		

Some of the keywords above mention an autocomplete dropdown menu. To trigger the autocomplete menu, type in the keyword followed by a colon. For example, in the screenshot below typing domain: triggered the autocomplete dropdown.



Copy, save, and clear network information

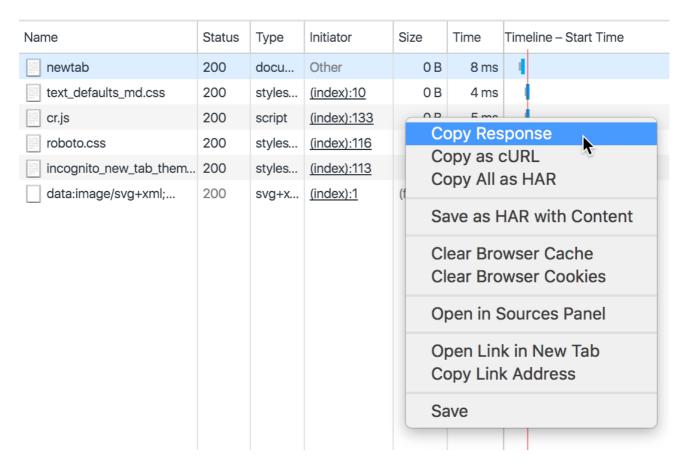
Warning: This page is deprecated. See following sections for up-to-date information:

- Copy one or all requests
- Save as HAR with content
- Clear browser cache
- Clear browser cookies

Right-click within the **Requests Table** to copy, save, or delete network information. Some of the options are context-sensitive, so if you want to operate on a single resource, you need to right-click on that resource's row. The list below describes each of the options.

- **Copy Response**. Copies the HTTP response of the selected resource to the system clipboard.
- Copy as cURL. Copies the network request of the selected resource as a <u>cURL</u> <u>C</u> command string to the system clipboard. See <u>Copying requests as cURL commands</u>.

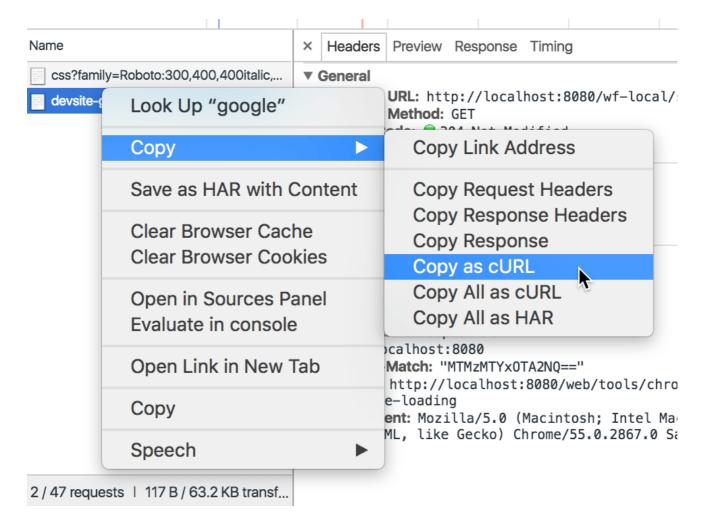
- Copy All as HAR. Copies all resources to the system clipboard as HAR data. A HAR file contains a JSON data structure that describes the network "waterfall". Several third-party dools do can reconstruct the network waterfall from the data in the HAR file. See Web Performance Power Tool: HTTP Archive (HAR) for more information.
- Save as HAR with Content. Saves all network data to an HAR file along with each
 page resource. Binary resources, including images, are encoded as Base64-encoded
 text.
- Clear Browser Cache. Clear the browser cache. Tip: You can also enable or disable the browser cache from the **Network Conditions** drawer.
- Clear Browser Cookies. Clear the browser's cookies.
- Open in Sources Panel. Open the selected resource in the Sources panel.
- **Open Link in New Tab**. Opens the selected resource in a new tab. You can also double-click the resource name in the Network table.
- **Copy Link Address**. Copies the resource URL to the system clipboard.
- Save. Save the selected text resource. Only displayed on text resources.
- Replay XHR. Re-send the selected XMLHTTPRequest. Only displayed on XHR resources.



Copy one or all requests as cURL commands

Warning: This page is deprecated. See <u>Copy one or all requests</u> for up-to-date information.

Right-click on a resource within the Requests Table, hover over **Copy** and then select **Copy as cURL** to copy a string of cURL requests for all resources that have been detected by the Network panel.



Select **Copy All as cURL** to copy a string of cURL requests for all resources that have been detected by the Network panel.

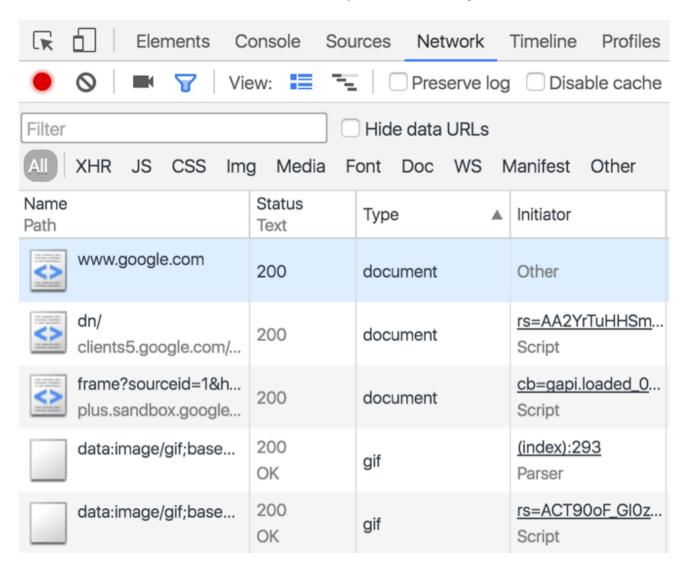
When you copy all, filtering is ignored (e.g. if you filter the Network panel to only display CSS resources and then press **Copy All as cURL**, you'll get all the detected resources, not just the CSS).

Customize the Network panel

Warning: This page is deprecated. See <u>Use large or small requests rows</u> for up-to-date information.

By default the **Requests Table** displays resources with small rows. Click the **Use large** resource rows button (to increase the size of each row.

Large rows enable some columns to display two text fields: a primary field and a secondary field. The column header indicates the meaning of the secondary field.



Add and remove table columns

Warning: This page is deprecated. See following sections for up-to-date information:

- Show or hide columns
- Add custom columns

Right-click on any of the headers in the **Requests Table** to add or remove columns.

Name	Status	Туре	Cache-Control 2
www.google.com	200	document	Connection
dn/	200	document	Connection Id
frame?sourceid=1&hl=en	200	document	Content-Encoding
data:image/gif;base	200	gif	Content-Length T
data:image/gif;base	200	gif	Cookies
o spinner_64_b6a3129c34	200	gif	Domain
csi?v=3&s=oz&action=&	204	gif	ETag ✓ Initiator
csi?v=3&s=oz&action=n	204	gif	Keep-Alive
photo.jpg	200	jpeg	Last-Modified
nav_logo242_hr.png	200	png	Method
googlelogo_color_272x9	200	png	Priority
i2_2ec824b0.png	200	png	Protocol
tia.png	200	png	Remote Address
data:image/png;base	200	png	Scheme
nav_logo242.png	200	png	Server
rs=ACT90oF_Gl0zc8miq	200	script	Set-Cookies
rs=ACT90oF_GI0zc8miq	200	script	✓ Size ✓ Status
rs=AA2YrTuHHSmrLzM4	200	script	✓ Time
cb=gapi.loaded_0	200	script	✓ Type
dn.js	200	script	Vary

Preserve the network log upon navigation

Warning: This page is deprecated. See <u>Preserve log</u> for up-to-date information.

By default, the network activity recording is discarded whenever you reload the current page or load a different page. Enable the **Preserve log** checkbox to save the network log across these scenarios. New records are appended to the bottom of the **Requests Table**.

Additional resources

To learn more optimizing the network performance of your application, see the following resources:

- Use <u>PageSpeed Insights</u> to identify performance best practices that can be applied to your site, and <u>PageSpeed optimization tools</u> to automate the process of applying those best practices.
- <u>High Performance Networking in Google Chrome</u> discusses Chrome network internals and how you can take advantage of them to make your site faster.
- <u>How gzip compression works</u> provides a high-level overview gzip compression and why it's a good idea.
- <u>Web Performance Best Practices</u> provides additional tips for optimizing the network performance of your web page or application.

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