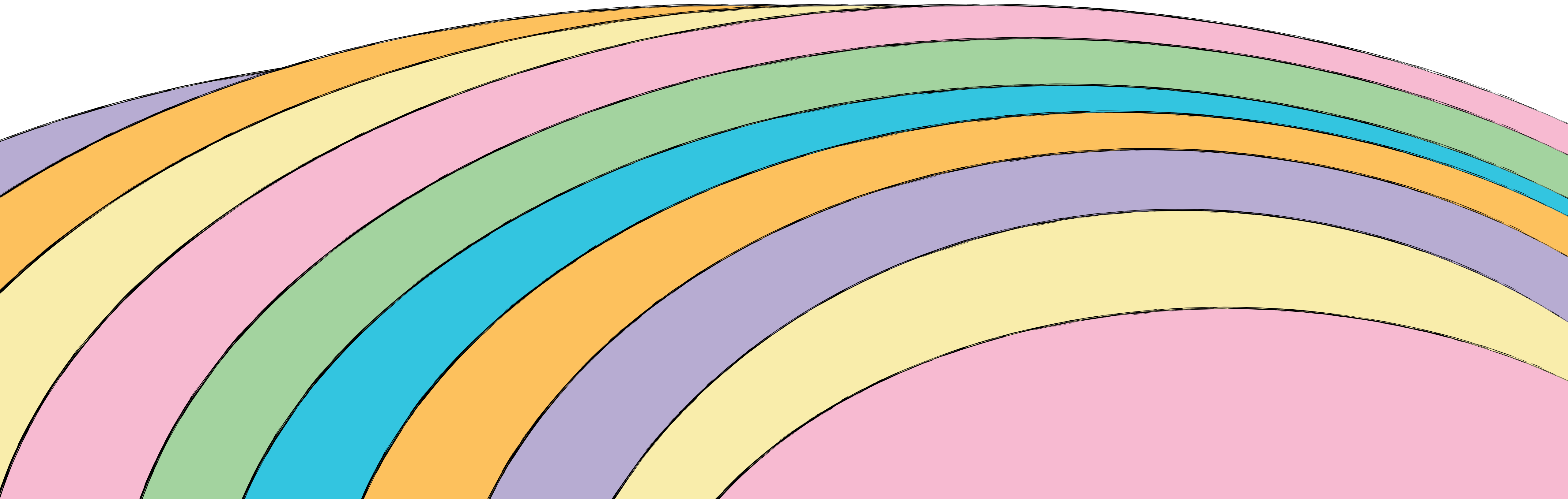


Oh, the Scripts We'll Load!

Tim Kadlec @tkadlec



How to load a script

```
<script>  
// inline script here  
</script>
```

```
<script src="/script.js" />
```

1. The Network

2. The Parser

HAWK DANCE



PLAY MUSIC

```
1 <!DOCTYPE html>
```

```
2 <html lang="en">
```

```
3 <head>
```

```
4 <meta charset="UTF-8" />
```

```
5 <meta name="viewport" content="width=device-width, initial-scale=1.0" />
```

```
6 <title>Hawk Dance</title>
```

```
7 <link rel="stylesheet" href="styles.css">
```

```
8 <script src="https://slowfil.es/file?type=js&delay=250"></script>
```

```
9 </head>
```

```
10 <body>
```

```
11 <h1>Hawk Dance</h1>
```

```
13 
```

```
18 <button>Play Sound</button>
```

```
20 <div id="player"></div>
```

```
22 <footer>
```

```
23 <a href="https://www.youtube.com/watch?v=HhSjwU8gEsI">music</a>
```

```
24 .
```

Slowfil.es

A project by [Harry Roberts](#) and [Ryan Townsend](#)

Type:

JavaScript

CSS

Delay (ms):

2500

► Advanced

▼ Usage

```
https://slowfil.es/file?type=js&delay=2500
```

Parameter	Options	Description
type	js css	What kind of file would you like us to return?
delay	<int>	A positive integer in milliseconds

Advanced











```
<script src="https://slowfil.es/  
filetype=js&delay=2500"  
></script>
```


Console Performance **⚠ Network** Application Elements Memory Sources Security >> 15 ⚙ ⋮ ✕

⊘ ⊘ 🔍 Preserve log Disable cache Online ⬇ ⬆ ⬇ ⚙

Filter Hide data URLs All XHR JS CSS Img Media Font Doc WS Manifest Other Has blocked cookies

Blocked Requests

Name	Status	Size	Time	Priority	Waterfall
 regular	200	790 B 2.0 kB	68 ms 67 ms	Highest	
 styles.css	200	688 B 1.6 kB	61 ms 60 ms	Highest	
 file?type=js&delay=2500 slowfil.es	200	429 B 33 B	2.67 s 2.67 s	High	
 iframe_api www.youtube.com	200	1.2 kB 859 B	63 ms 62 ms	Medium	
 phil-street.gif	200	1.9 MB 1.9 MB	2.14 s 73 ms	Low	

WS Manifest Other Has blocked cookies











	Priority	Waterfall
68 ms	Highest	
67 ms	Highest	
61 ms	Highest	
60 ms	Highest	
2.67 s	High	
2.67 s	High	
63 ms	Medium	
62 ms	Medium	
2.14 s	Low	
73 ms	Low	

Console Performance **⚠ Network** Application Elements Memory Sources Security >> 15 ⚙ ⋮ ✕

⊘ ⊘ 🔍 Preserve log Disable cache Online ⬇ ⬆ ⬇ ⚙

Filter Hide data URLs All XHR JS CSS Img Media Font Doc WS Manifest Other Has blocked cookies

Blocked Requests

Name	Status	Size	Time	Priority	Waterfall
 regular	200	790 B 2.0 kB	68 ms 67 ms	Highest	
 styles.css	200	688 B 1.6 kB	61 ms 60 ms	Highest	
 file?type=js&delay=2500 slowfil.es	200	429 B 33 B	2.67 s 2.67 s	High	
 iframe_api www.youtube.com	200	1.2 kB 859 B	63 ms 62 ms	Medium	
 phil-street.gif	200	1.9 MB 1.9 MB	2.14 s 73 ms	Low	

The image shows the Network tab in Chrome DevTools. The top navigation bar includes 'Elements', 'Network', 'Sources', 'Storage', and 'Graphics'. Below the navigation bar, there is a filter section with 'Filter Full URL' and tabs for 'All', 'Document', 'CSS', 'Image', 'Font', 'JS', 'XHR', and 'Other'. The main area displays a table of network requests. The 'file' request is circled in yellow.

Name	Type	Priority	Time	5.00s	10.00s	
regular	document	High	317ms			
styles.css	css	High	358ms			
file	js	High	2.97s			
phil-street.gif	gif	Low	2.18s			
iframe_api	js	High	53.8ms			
www-widgetapi.js	js	Low	47.1ms			

https://mystifying-swirles-b9e687.netlify.app/regular

https://mystifying-swirles-b9e687.netlify.app/styles.css

https://slowfil.es/file?type=js&delay=...

https://www.youtu

https://media.giph

https://mystifying-

https://s.ytimg.com

https://www.youtu

https://mystifying-

https://mystifying-

https://www.youtu

https://www.youtu

https://www.youtu

https://www.youtu

https://www.youtu

https://googleads.

https://static.doub

https://www.youtu

https://www.youtu

https://yt3.ggpht.c

https://i.ytimg.com

https://fonts.gstat

https://googleads.

3.1s Load -2147483559: https://slowfil.es/file?type=js&delay=2500

Status: Response received

URL: https://slowfil.es/file?type=js&delay=2500

Priority: Normal(0)

MIME type: application/javascript

Requested bytes: 1,132B

Thread: Web Content (3/3)

URL: https://mystifying-swirles-b9e687.netlify.app/regular

Waiting for socket thread: 41ms

DNS request: 0.058ms

After DNS request: 0.058ms

TCP connection: 32ms

After TCP connection: 1.7ms

Establishing TLS session: 39ms

Waiting for HTTP request: 0.12ms

HTTP request and waiting for response: 3,024ms

HTTP response: 0.35ms

Waiting to transmit the response: 2.4ms



Script: High



Script: Normal

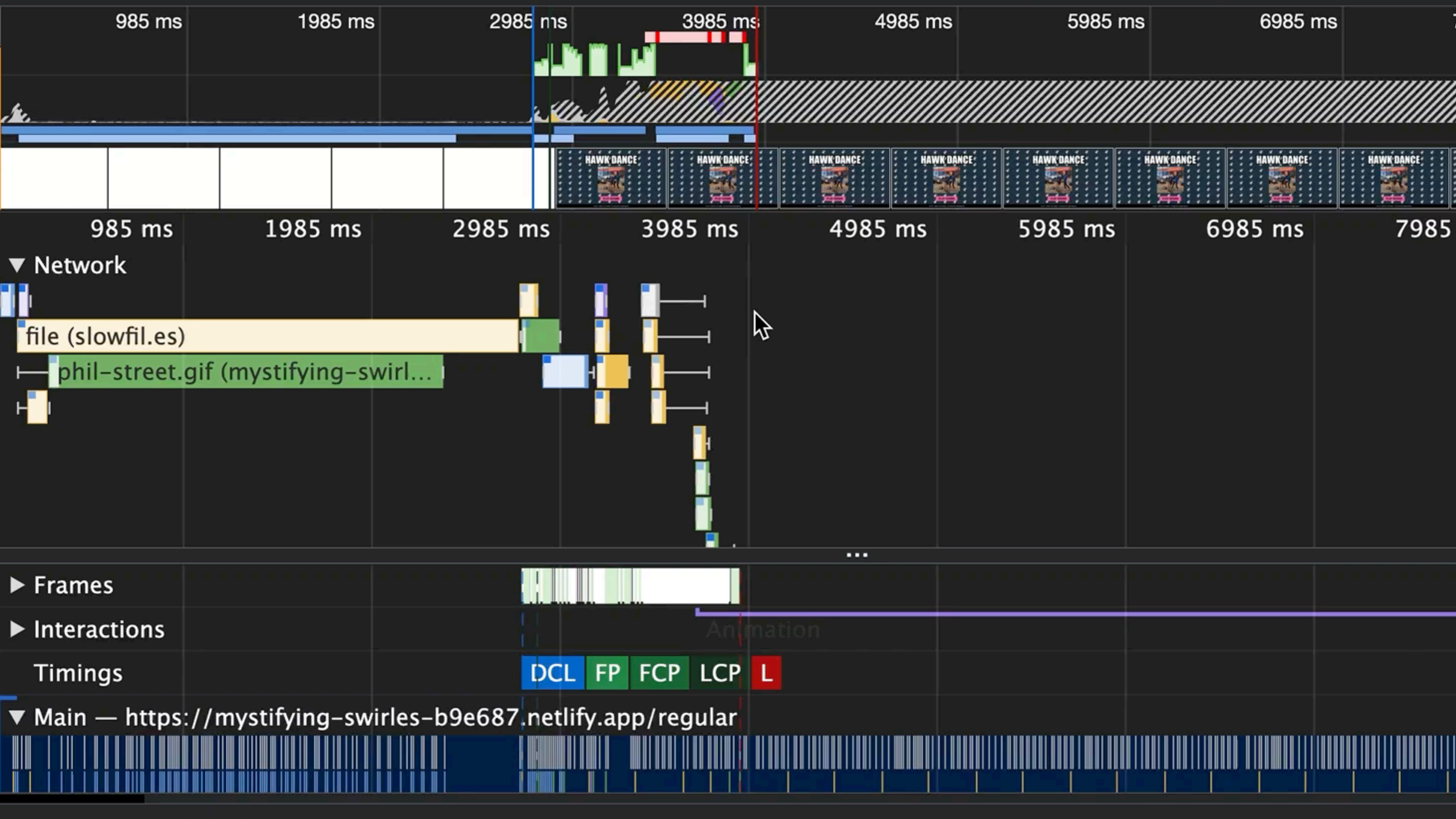


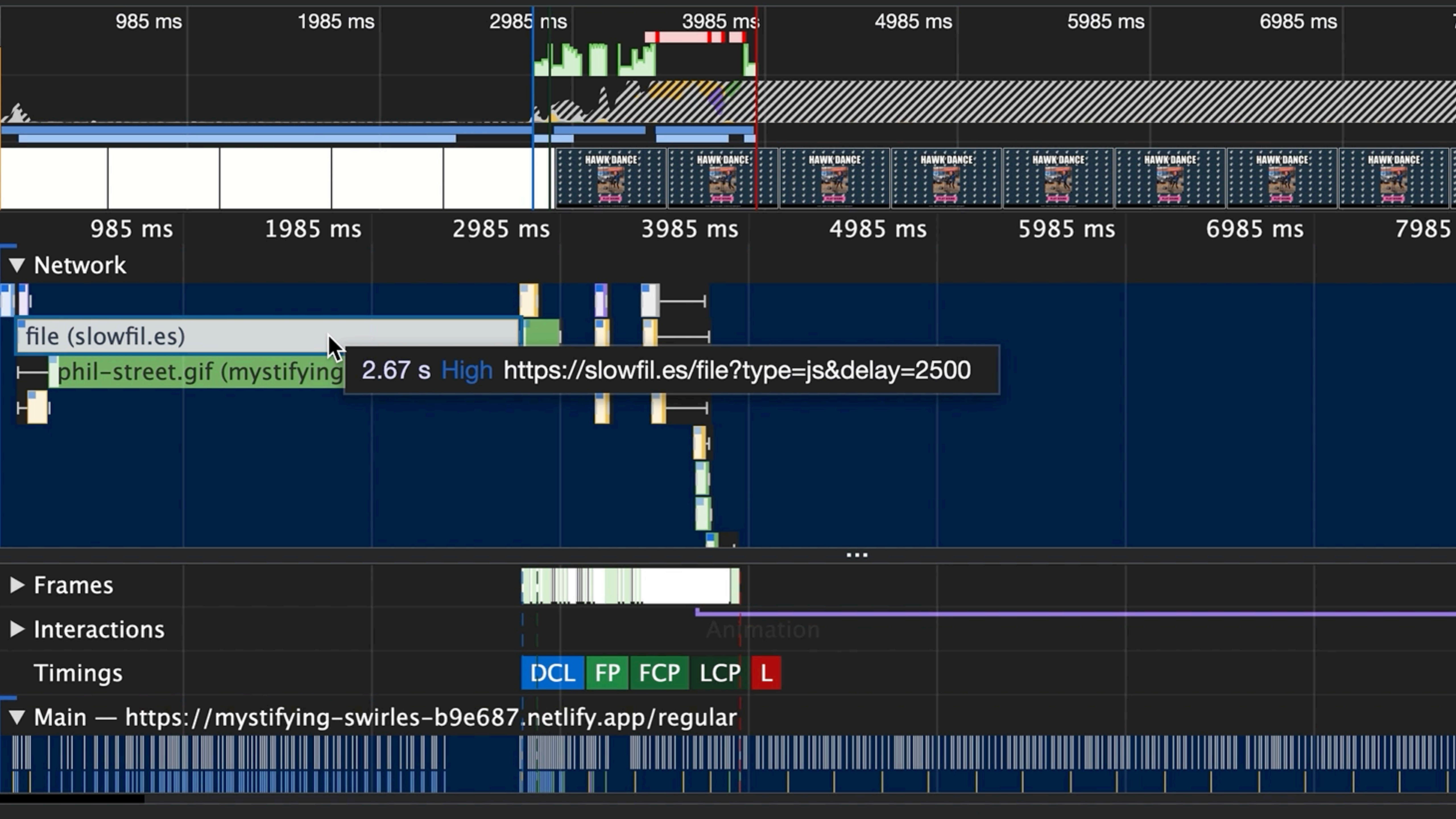
Script: High

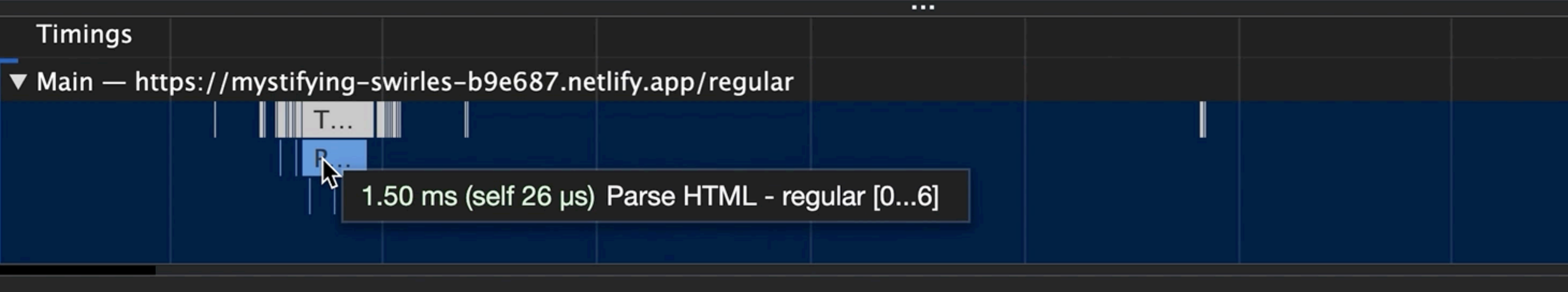
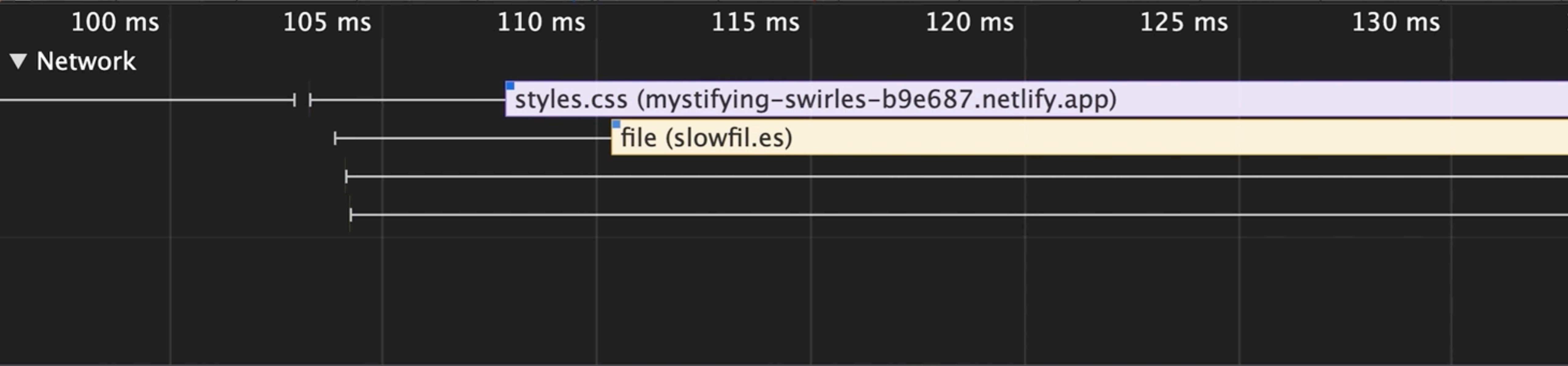
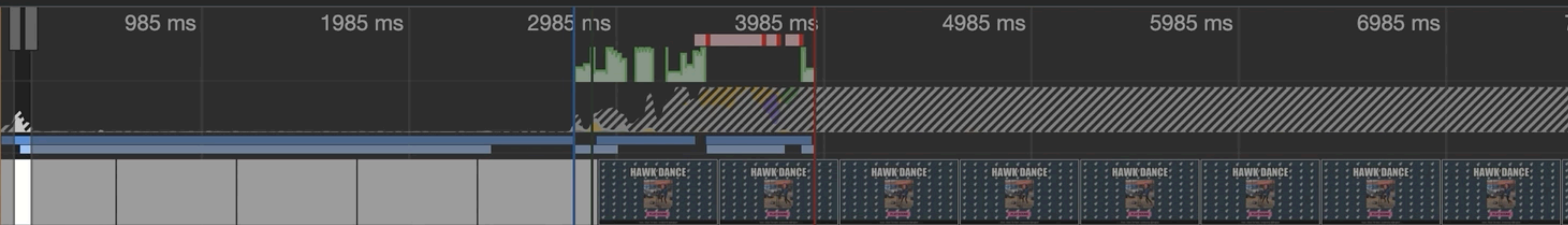


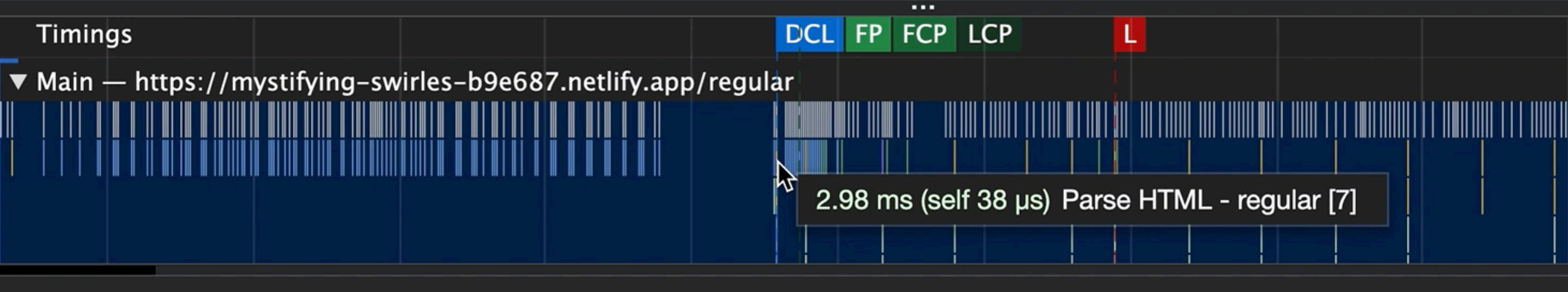
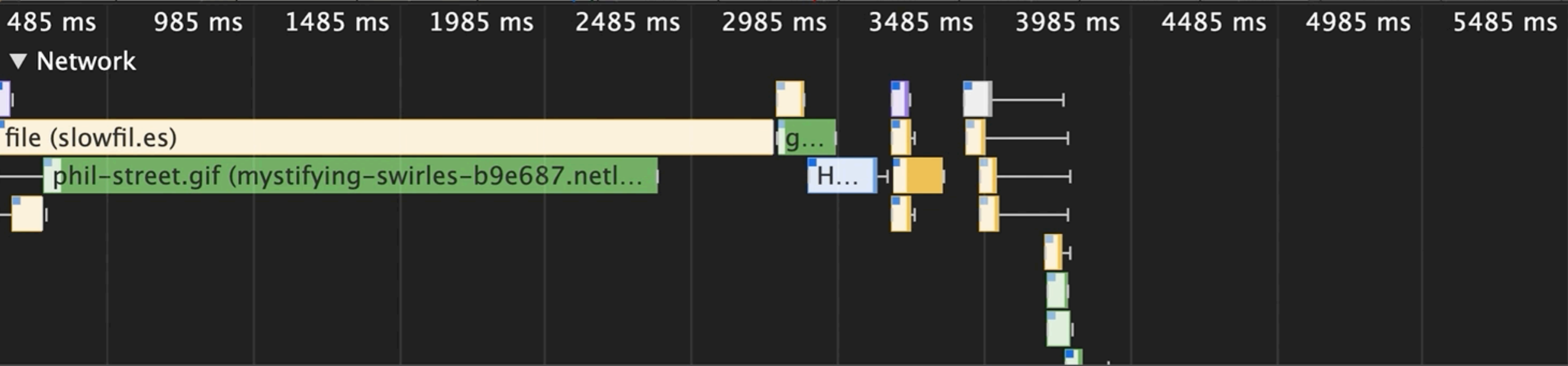
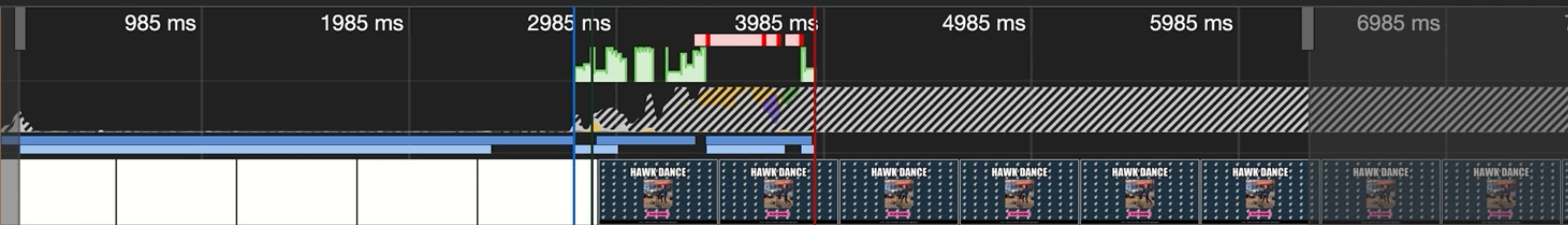
```
document.write("Sir Hawk Philsworth");
```

JavaScript is Parser Blocking









```
<script src="/script.js" />
```

✗ Blocks parser

✗ Blocks render

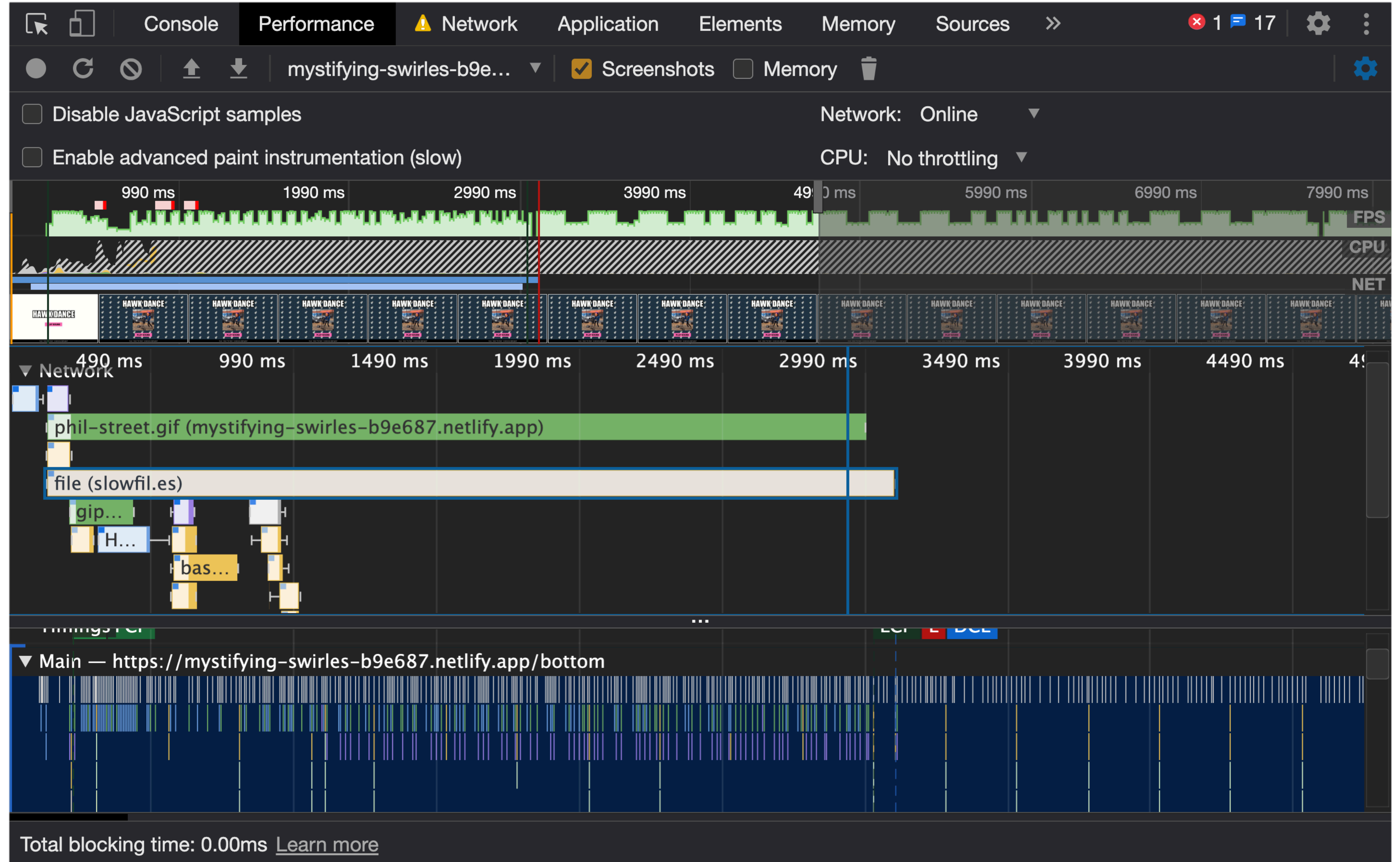
✗ Competes with critical resources

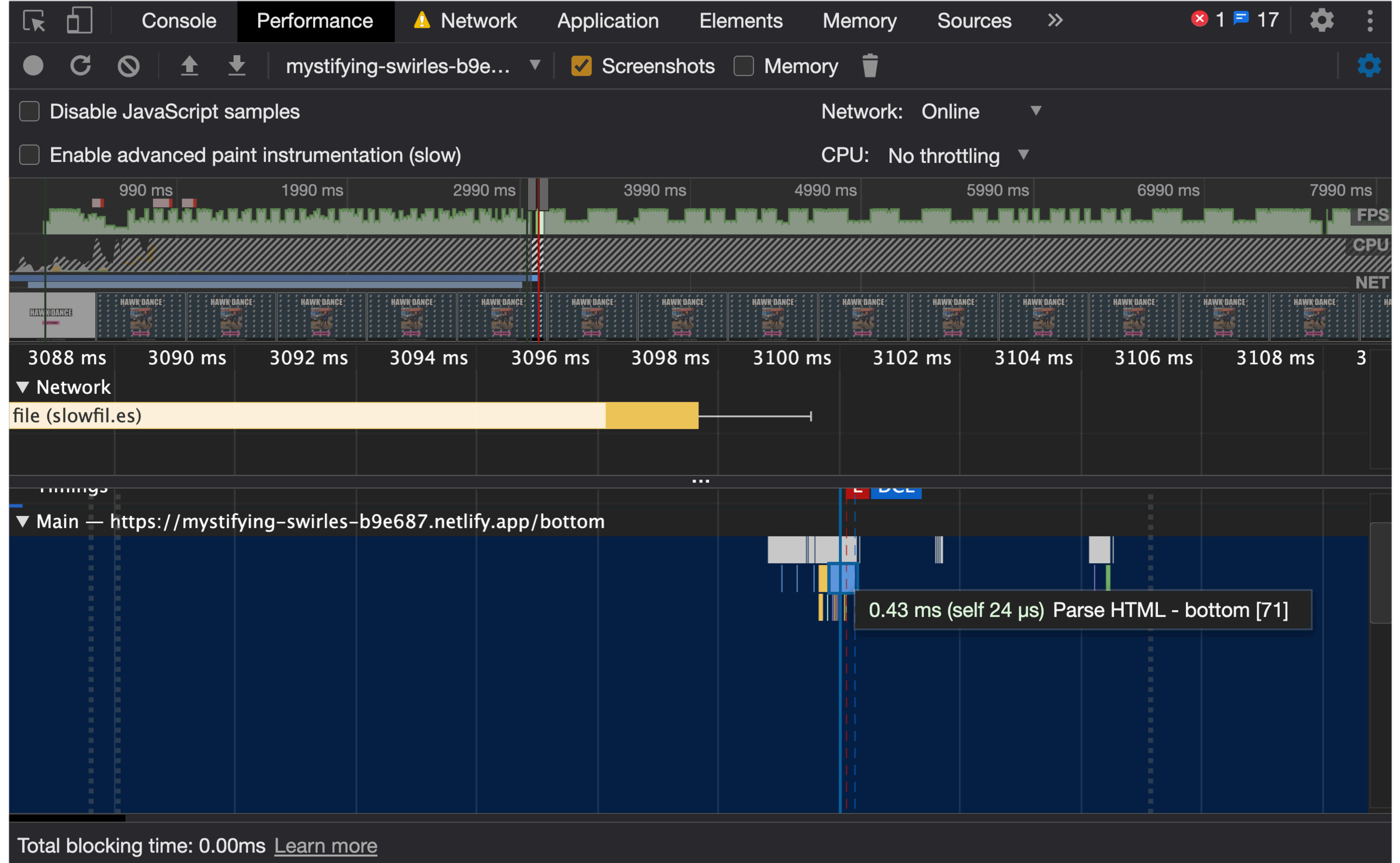
Take two!

```
</head>
```

```
<script src="https://slowfil.es/filetype=js&delay=2500"></script>
```

```
</body>
```







Script: High



Script: Normal



Script: Medium



```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8" />
<meta name="viewport" content="width=device-width, initial-scale=1.0" />
<title>Hawk Dance</title>
<link rel="stylesheet" href="styles.css">
</head>
<body>
<h1>Hawk Dance</h1>

<button>Play Sound</button>
<div id="player"></div>
<footer>
<a href="https://www.youtube.com/watch?v=HhSjwU8gEsI">music</a>
<a href="https://twitter.com/philhaworth">follow The Hawk</a>
<a href="https://twitter.com/jlengstorf">nonsense by @jlengstorf</a>
</footer>
<script src="https://www.youtube.com/iframe_api"></script>
<script>
const tag = document.createElement('script');
tag.src = 'https://www.youtube.com/iframe_api';
const firstScriptTag = document.getElementsByTagName('script')[0];
firstScriptTag.parentNode.insertBefore(tag, firstScriptTag);
let player;
function onYouTubeIframeAPIReady() {
player = new YT.Player('player', {
height: '1',
width: '1',
videoId: 'HhSjwU8gEsI',
events: {
onReady: onPlayerReady,
});
}
let isPlaying = false;
const playVideo = () => player.playVideo();
const stopVideo = () => player.stopVideo();
function onPlayerReady(event) {
const button = document.querySelector('button');
const togglePlayback = () => {
if (!isPlaying) {
playVideo();
button.innerText = 'Stop Music';
isPlaying = true;
} else {
stopVideo();
button.innerText = 'Play Music';
isPlaying = false;
}
};
button.addEventListener('click', togglePlayback);
}
</script>
<script src="https://slowfil.es/file?type=js&delay=2500"></script>
</body>
</html>
```

2.2kb

```
<!DOCTYPE html><html lang="en"><head>
<style class="bogel-font">
@font-face{font-family:BogleWeb;src:url(//i5.walmartimages.com/dfw/63fd9f59-a78c/fcfae9b6-2f69-4f89-beed-f0eeb4237946/v1/BogleWeb_subset-Bold.eot);src:url(//i5.walmartimages.com/dfw/63fd9f59-a78c/fcfae9b6-2f69-4f89-beed-f0eeb4237946/v1/BogleWeb_subset-Bold.eot?#iefix) format("embedded-opentype"),url(//i5.walmartimages.com/dfw/63fd9f59-a78c/fcfae9b6-2f69-4f89-beed-f0eeb4237946/v1/BogleWeb_subset-Bold.woff) format("woff"),url(//i5.walmartimages.com/dfw/63fd9f59-a78c/fcfae9b6-2f69-4f89-beed-f0eeb4237946/v1/BogleWeb_subset-Bold.ttf) format("truetype");font-weight:700;font-style:normal;}@font-face{font-family:BogleWeb;src:url(//i5.walmartimages.com/dfw/63fd9f59-a78c/fcfae9b6-2f69-4f89-beed-f0eeb4237946/v1/BogleWeb_subset-Bold.eot);src:url(//i5.walmartimages.com/dfw/63fd9f59-a78c/fcfae9b6-2f69-4f89-beed-f0eeb4237946/v1/BogleWeb_subset-Bold.eot?#iefix) format("embedded-opentype"),url(//i5.walmartimages.com/dfw/63fd9f59-a78c/fcfae9b6-2f69-4f89-beed-f0eeb4237946/v1/BogleWeb_subset-Bold.woff) format("woff2"),url(//i5.walmartimages.com/dfw/63fd9f59-a78c/fcfae9b6-2f69-4f89-beed-f0eeb4237946/v1/BogleWeb_subset-Bold.ttf) format("truetype");font-weight:600;font-style:normal;}@font-face{font-family:BogleWeb;src:url(//i5.walmartimages.com/dfw/63fd9f59-a78c/fcfae9b6-2f69-4f89-beed-f0eeb4237946/v1/BogleWeb_subset-Regular.eot);src:url(//i5.walmartimages.com/dfw/63fd9f59-a78c/fcfae9b6-2f69-4f89-beed-f0eeb4237946/v1/BogleWeb_subset-Regular.eot?#iefix) format("embedded-opentype"),url(//i5.walmartimages.com/dfw/63fd9f59-a78c/fcfae9b6-2f69-4f89-beed-f0eeb4237946/v1/BogleWeb_subset-Regular.woff) format("woff2"),url(//i5.walmartimages.com/dfw/63fd9f59-a78c/fcfae9b6-2f69-4f89-beed-f0eeb4237946/v1/BogleWeb_subset-Regular.woff) format("woff"),url(//i5.walmartimages.com/dfw/63fd9f59-a78c/fcfae9b6-2f69-4f89-beed-f0eeb4237946/v1/BogleWeb_subset-Regular.ttf) format("truetype");font-weight:normal;font-style:normal;}
</style>
<script>window._wml = { defaultCdnHost: "i5.walmartimages.com" };
</script>
<script>(function(a){if(!window._wml)window._wml=a||{};var b=window._wml.cdn||{};window._wml.cdn=b;b.update=function(a){var b=a.md;for(var c in b){if(this.md[c]===b[c])continue;if("map"===c){if(!b.md[c])continue;if(b.md[c]===b[c])continue;b.map=function(a){for(var b in this.md){if(b.index0f(a)>=0){return this.md[b]}}console.error("CDN map not found:".a);if(!b.md.md){}}}}};
var _perfStartTime,perf=window.performance;perf&&(perf.mark&&(perf.mark("first-script")),perf.measure&&window.addEventListener("DOMContentLoaded",function(){perf.mark("dom-content-loaded"),perf.measure("first-script to dom-content-loaded","first-script","dom-content-loaded"))},_perfStartTime=perf.timing.responseStart,(new Date).getTime());var _bcq_bcqll[[]],options={};options.start_time=_perfStartTime,options.autorun=1,options.bh="beacon.walmart.com",options.mode="release",options.mapping_identifier="HomepageSearchpage",_bcq_push(["_setOptions",options]);</script><script src="https://i5.wal.co/beacon/beacon.js-895cdd7ad7260367924364c317d2dc628725d80e-br.js?bh=beacon.walmart.com" async="async"></script><script>(function(){var f=window.performance||{};var g=window._wml=window._wml||{};var h=[];i,j;if(f.now){g.hasPerfNow=function(){return true};if(f.now.bind(f))else{g.hasPerfNow=function(){return false};i=new Date().getTime();j=function now(){return new Date().getTime()-1}}function a(a,b,c,d){return{duration:a.entryType:b.name:c.startTime:d}}function b(a,b,c){var d=[];var e=0;c=NaN(c)?h.length:c;for(var f=0;f<h.length&&c;f++){if(h[f][a]==b[d.push(h[f]);e++]}return d}function c(a,c){return b("name",a,c)}function d(a,c){return b("entryType",a,c)}function e(a){return a.mark&&a.measure&&a.getEntries&&a.getEntriesByType&&a.getEntriesByName&&a.perf=e(f)}[{}].entries:h,start:i,now:j,mark:function mark(b){h.push(a@,"mark",b,j())},measure:function measure(b,d,e){if(!b||!d||!e)return;var f=c(d,1)[0],g=c(e,1)[0];if(f&&g){h.push(a(g.start-time-f.start-time,"measure",b,f.start-time))},getEntries:function getEntries(){return h},getEntriesByType:function getEntriesByType(a){return d(a)},getEntriesByName:function getEntriesByName(a){return c(a)},_feN:c,_feT:d;g.perf.mark("index-start")})();</script>
<meta name="google-site-verification" content="64mV8ZKfoXsF0S6pY5tpQ0B7QYmXF9AZwfeBIhopMCM"/><meta name="msvalidate.01" content="AC45383F301B78F56F97C8E7276E6EA3"/><meta name="robots" content="noydir,noodp"/><meta charset="utf-8"/><meta http-equiv="X-UA-Compatible" content="IE=edge,chrome=1"/><link href="//i5.wal.co" rel="dns-prefetch"/><link href="//i5.walmartimages.com" rel="dns-prefetch"/><link href="//b.wal.co" rel="dns-prefetch"/><link href="//beacon.walmart.com" rel="dns-prefetch"/><link href="//trc.googleadservices.com" rel="dns-prefetch"/><link href="//partner.googleadservices.com" rel="dns-prefetch"/><link href="//pagead2.googlesyndication.com" rel="dns-prefetch"/><link href="//p.typekit.net" rel="dns-prefetch"/><link href="//omniture.walmart.com" rel="dns-prefetch"/><link href="//omniture-ssl.walmart.com" rel="dns-prefetch"/><link href="//pubads.g.doubleclick.net" rel="dns-prefetch"/><link href="//beam.hsserve.com" rel="dns-prefetch"/><link href="//secure-assets.rubiconproject.com" rel="dns-prefetch"/><link href="//ib.adnxs.com" rel="dns-prefetch"/><link href="//dis.criteo.com" rel="dns-prefetch"/><meta name="viewport" content="width=device-width, initial-scale=1.0"/>
<script id="tb-djs-wml-data" type="application/json">{"correlationId":"5f6740a8-007-174fe05b4e580f,5f6740a8-007-174fe05b4e5661,5f6740a8-007-174fe05b4e5661","ccm":{"home-app":{"logging":{"logIntervalUI":"2000","isLoggingAPIEnabledUI":"true","isQuimbyLoggingFetchEnabled":"true","isLoggingFetchEnabled":"true"},"features":{"enableAdsModule":"true","cacheHPINms":"0","cacheADINms":"0","cookieListDisablesments":"CID","enableLocation":"true","enableInstart":"false","enableKeepAlive":"false","speedProfileRemoveDisplayAds":"false","enableExperimentalMetrics":"true","speedProfileRemoveTealeaf":"false","enableSpeedProfile":"false","useDefaultLocation":"false"},"midasConfig":{"midasScript":"//i5.walmartimages.com/dfw/4ff9c6c9-6451/k2-_1cf91030-5b66-42d4-88af-42da1d47cf61.v1235.js","test-previous":"//i5.walmartimages.com/dfw/4ff9c6c9-29f9/k2-_c03da9e6-5786-4e97-a031-6d8ef8af50bc.v142.js","test-local":"//dev.walmart.com:8891/midas-display-light.js","midasMoatIVTScript":"//i5.walmartimages.com/dfw/4ff9c6c9-f24c/k2-_c4220cc4-236a-4d78-864f-f25e67071374.v4.js"},"profile":"PR00","test-szs-release-candidate":"//i5.walmartimages.com/dfw/4ff9c6c9-b884/k2-_48976c1f-ad5c-417a-a127-e8c6c279c44e.v47.js","test-release-candidate":"//i5.walmartimages.com/dfw/4ff9c6c9-29f9/k2-_c03da9e6-5786-4e97-a031-6d8ef8af50bc.v189.js","midasDisplayScript":"//i5.walmartimages.com/dfw/4ff9c6c9-29f9/k2-_c03da9e6-5786-4e97-a031-6d8ef8af50bc.v188.js","bookmarklet":"//i5.walmartimages.com/dfw/63fd9f59-708b/671badec-390f-4911-9cb4-8414c84e21de/v8/content.js","testszs-szs-performance":"https://i5.walmartimages.com/dfw/4ff9c6c9-690c/k2-_48976c1f-ad5c-417a-a127-e8c6c279c44e.v6.js","midasS2SScript":"//i5.walmartimages.com/dfw/4ff9c6c9-b884/k2-_48976c1f-ad5c-417a-a127-e8c6c279c44e.v47.js","test-choose-options-ads":"//i5.walmartimages.com/dfw/4ff9c6c9-29f9/k2-_c03da9e6-5786-4e97-a031-6d8ef8af50bc.v145.js","test-search-video":"//i5.walmartimages.com/dfw/4ff9c6c9-29f9/k2-_c03da9e6-5786-4e97-a031-6d8ef8af50bc.v125.js","testszs-release-candidate":"//i5.walmartimages.com/dfw/4ff9c6c9-690c/k2-_48976c1f-ad5c-417a-a127-e8c6c279c44e.v5.js","test-multilink-pov":"https://i5.walmartimages.com/dfw/4ff9c6c9-29f9/k2-_c03da9e6-5786-4e97-a031-6d8ef8af50bc.v127.js","test-shoppable-ads-atc":"//i5.walmartimages.com/dfw/4ff9c6c9-29f9/k2-_c03da9e6-5786-4e97-a031-6d8ef8af50bc.v137.js","test-skyline-ux":"//i5.walmartimages.com/dfw/4ff9c6c9-4ba9/k2-_5022fb99-dd70-4f9f-896f-9c8d9f6ecd91.v11.js","test-video-beacon":"//i5.walmartimages.com/dfw/4ff9c6c9-29f9/k2-_c03da9e6-5786-4e97-a031-6d8ef8af50bc.v138.js"},"test-list-price":"//i5.walmartimages.com/dfw/4ff9c6c9-29f9/k2-_c03da9e6-5786-4e97-a031-6d8ef8af50bc.v102.js"},"wpaAds":{"true","googleAds.category-app":"false","wpa-category":"true","wpa.topicSeo":"true","wpaBlacklist-category-539095":"false","wpaAjax-category":"true","wpa.category-page":"true","wpa.home-app":"false","wpaAjax-track-shipment":"true","wpaAjax-search":"true","wpa-item":"true","wpaAdsStatus":"true","displayAdsStatus":"true","wpaBlacklist-item-875731689":"true","wpa.default":"true","wpaAjax-item":"true","wpa.search-electrode-app":"true","wpaBlacklist-category-1077064":"false","wpaBlacklist-item-270558477":"true","wpa-track-shipment":"true","wpaBlacklist-item-826234196":"true","wpa":"true","wpaBlacklist-category-91416":"false","googleAds.product-app":"true","wpa.collection-app":"true","wpa-search":"true","wpa-topic":"true","wpa.nonConfig":"true","deferred":"true","wpaServerSide":"true","wpaBlacklist-item-303673432":"true","wpa.product":"true","wpaServerSide-item":"true","googleAdsLazyLoad.product-app":"true","wpaBlacklist-browse-gift-finder":"true","wpaAjax-browse":"true","wpa-browse":"true","accessModeEnabled":"true","wpa.product-app":"true","googleAdsLazyLoad.category-app":"false","wpaAjax-topic":"true","env":"PR00","wpa.category-app":"true","wpaAjax":"true","displayAds":"true","wpaServerSide-category":"true","wpaBlacklist-item-321737593":"true","wpa.topic-seo":"true","wpaBlacklist-category-4038":"false","home-app-trackClientEnabled":"true","turn_off_batching":"true","home-app-loadEvent":"instant","home-app-loadS2SEvent":"instant","pType":"home","enable-homepage-marquee":"true","wpaServerSideBlacklist-item-128591554":"true","no-homepage-twocolumnhp":"true","homepage-marquee1-throttle-time":"15000","bypassproxy":"true","Rightrail2-extra-sizes":"300x250,300x600","wpaServiceUrl":"http://web.midas.glob.prod.walmart.com/midas/srv","wpa.trackShipmentPage.pageType.backfill":"browse","wpa.trackShipmentPage.moduleType":"product","wpaServerSideBlacklist-category-1224908":"true","enable-category-marquee":"true","midas_show_performance_markers":"true","expose-extra-sizes":"728x90,300x250","wpaServerSideBlacklist-item-689326438":"true","lefttrail1-extra-sizes":"160x600","wpaServerSideBlacklist-category-582053":"true","wpaBlacklist-browse-brands_PepsiCo":"true","trackClientEnabled":"false","loadEvent":"instant","wpaBlacklist-browse-UnitedHealthcare":"true","wpaServerSideBlacklist-category-976780":"true","wpaServerSideBlacklist-category-4952188":"true","dfp_remap":"searchServer-searchServerSide,searchServerSide=searchServerSide","serviceUrl":"http://web.midas.glob.prod.walmart.com/midas/srv","dfp_exp_4":"","dfp_exp_5":"","s2s-fire-beacon":"false","wpaBlacklist-browse-UnitedHealthcare_HWP":"true","wpaServerSideBlacklist-category-530719":"true","enableContainerTopMobile-browse":"true","p13nABTestVariations":"yp11,1r6rc,qJ1ci","wpaClientSideTimeout":"10000","fireViewBeacon-homepage":"true","lazy-item-expose1":"800","wpaServerSideBlacklist-category-2636":"true","no-category-marquee2":"true","wpa.trackShipmentPage.pageId.backfill":"1334134_5899871_8703361","wpaServerSideBlacklist-category-491351":"true","isTwoDayDeliveryTextEnabled":"true","homepage-hppov4-short-throttle-time":"false","wpa.trackShipmentPage.moduleType.backfill":"product","lazy-item-righttrail2":"1200","s2s-3p-impressions":"false","wpaServerSideBlacklist-category-538387":"true","lazy-category-expose1":"200","p13n.allowedBuckets":"PWAV,PWUB,PWAB","dfpShowVideoAdKey":"showVideoAd","wpaServerSideBlacklist-category-4128":"true","wpaServerSideBlacklist-category-524144":"true","home.page.modules":"","wpaServerSideBlacklist-category-4096":"true","lazy-search-expose1":"800","wpa.trackShipmentPage.resizeEnabled":"true","lazy-homepage-expose1":"800","enable-homepage-twocolumn":"true","lvtBlocked":"false","loadS2SEvent":"hasS2SPayload","lvtInclusionXpa":"bgRdZ,Ue_9p","wpaServerSideBlacklist-category-86323":"true","enableContainerTop":"true","enableContainerTopMobile-search":"true","wpaServerSideBlacklist-category-486190":"true","adblockDetectionEnabled":"false","ads2s":"false","no-deals-skyline1":"true","no-homepage-hppov5":"true","browse.page.modules":"","wpaServerSideBlacklist-category-91365":"true","lazy-item-marquee2":"1200","enableVideoAds":"","wpaRuvBoxRedesign":"test-cell-1","wpaBlacklist-browse-UnitedHealthcare_HWPCard":"true","catchError":"true","wpaServerSideBlacklist-category-118134":"true","lvtScoreThreshold":"false"}
```

198kb

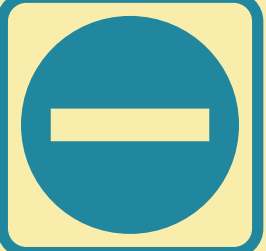
```
</head>
```

```
<script src="script.js">
```

```
</script>
```

```
</body>
```

 **Discovered Late**

 **Competes with critical resources**

Take three!

```
<script>  
  var script = document.createElement('script');  
  script.src = "https://slowfil.es/file?type=js&delay=2500";  
  document.getElementsByTagName('head')[0].appendChild(script);  
</script>
```

Dynamically Inserted Scripts are

ASync By Default

Console Performance **Network** Application Elements Memory Sources Security >> 19

Preserve log Disable cache Online ↑ ↓

Filter Hide data URLs All XHR JS CSS Img Media Font Doc WS Manifest Other Has blocked cookies

Blocked Requests

Name	Status	Size	Time	Priority	Waterfall
dynamic	200	826 B 2.2 kB	78 ms 78 ms	Highest	
styles.css	200	688 B 1.6 kB	77 ms 77 ms	Highest	
phil-street.gif	200	1.9 MB 1.9 MB	2.80 s 82 ms	High	
iframe_api www.youtube.com	200	901 B 859 B	78 ms 77 ms	Medium	
file?type=js&delay=2500 slowfil.es	200	392 B 33 B	2.98 s 2.98 s	Low	0 ms
giphy.gif media.giphy.com/media/3oG...	200	713 kB 713 kB	208 ms 29 ms	High	
www-widgetapi.js s.ytimg.com/yts/jsbin/www-...	200	37.7 kB 107 kB	124 ms 89 ms	Low	
HhSjwU8gEsl?enablejsapi=1... /embed	200	21.1 kB 52.3 kB	166 ms 161 ms	Highest	

23 / 24 requests | 3.4 MB / 3.4 MB transferred | 5.0 MB / 5.0 MB resources | Finish: 11.00 s | **DOMContentLoaded: 265 ms** | Load: 3.17 s



Script: High

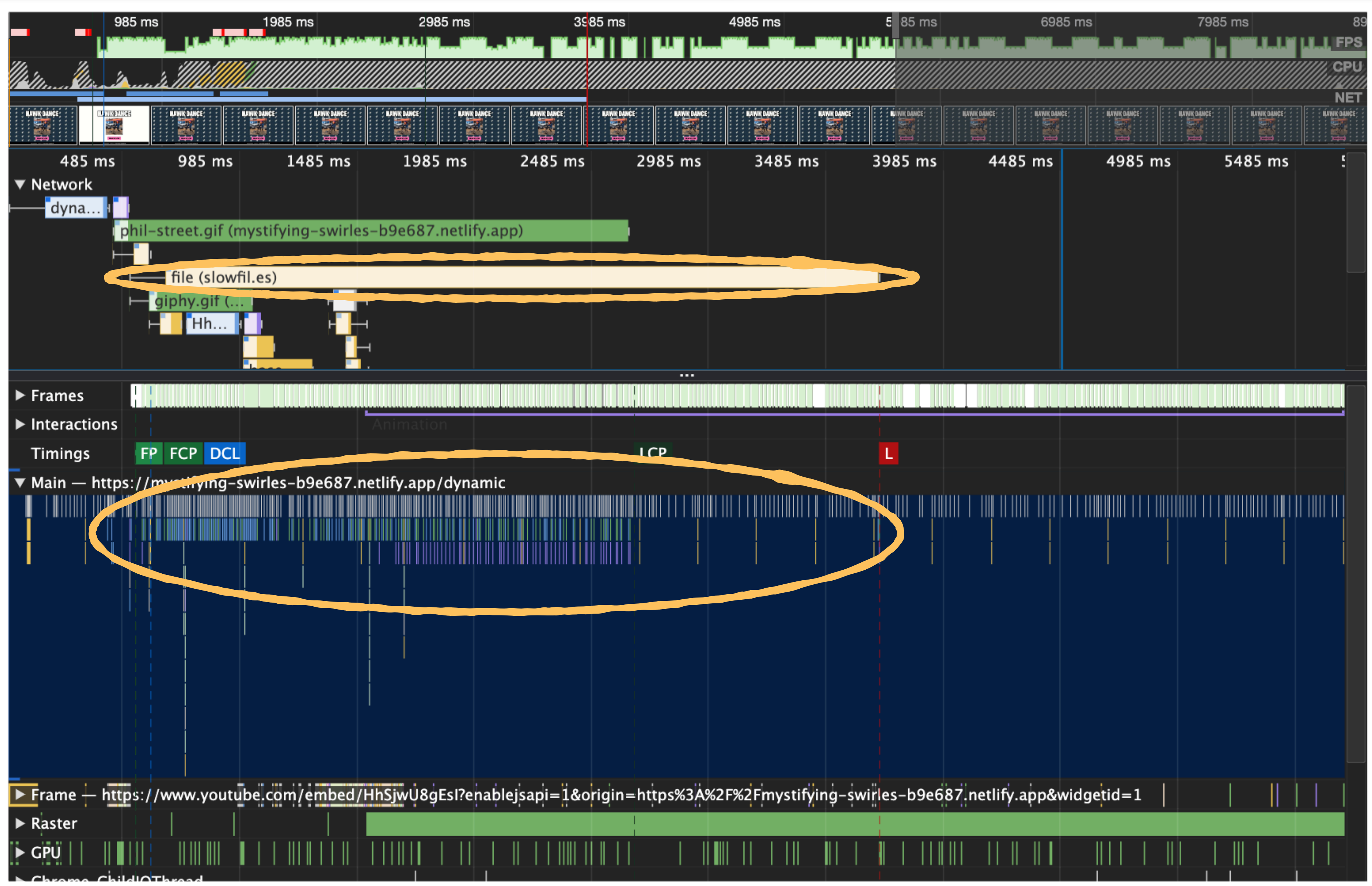


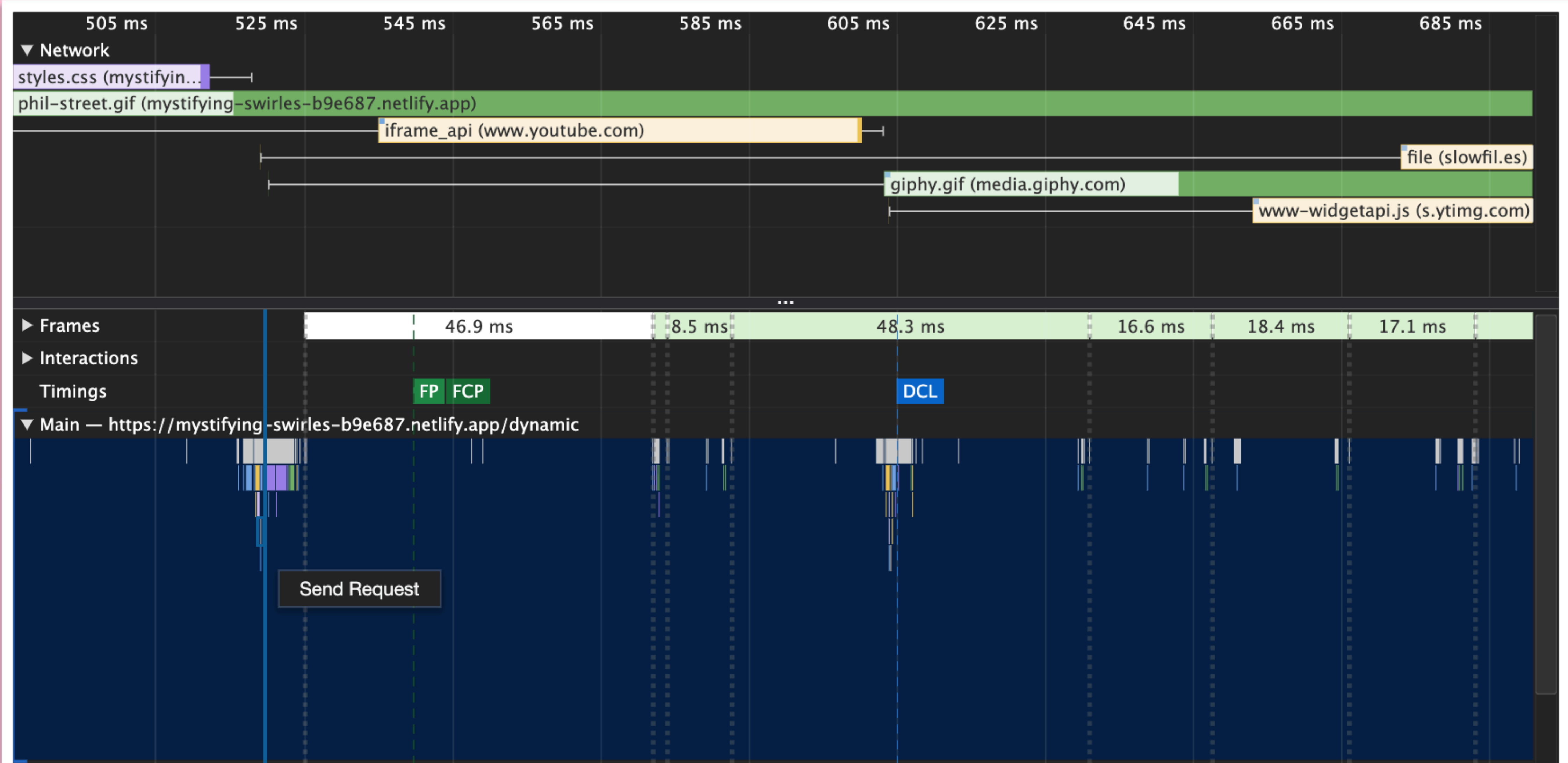
Script: Normal



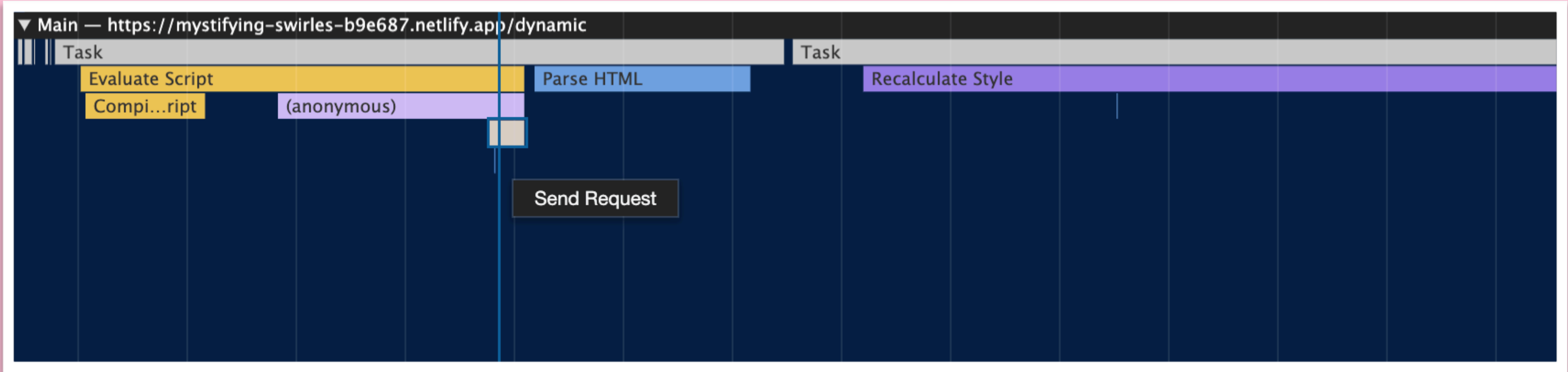
Script: Low







```
9 <script>
10   var script = document.createElement('script');
11   script.src = "https://slowfil.es/file?type=js&delay=2500";
12   document.getElementsByTagName('head')[0].appendChild(script);
13 </script>
14
15 </head>
16 <body>
17   <h1>Hawk Dance</h1>
18
19   
23
24   <button>Play Sound</button>
25
26   <div id="player"></div>
27
28   <footer>
29     <a href="https://www.youtube.com/watch?v=HhSjwU8gEsI">music</a>
30     .
31     <a href="https://twitter.com/philhawksworth">follow The Hawk</a>
32     .
33     <a href="https://twitter.com/jlengstorf">nonsense by @jlengstorf</a>
34   </footer>
35
36   <script src="https://www.youtube.com/iframe_api"></script>
```



▼ Network

styles.css (mystifying-swirle...)

phil-street.gif (mystifying-swirles-9e687.netlify.app)

iframe_api (www.youtube.com)

file (slowfil.es)

giphy.gif (media.giphy.com)

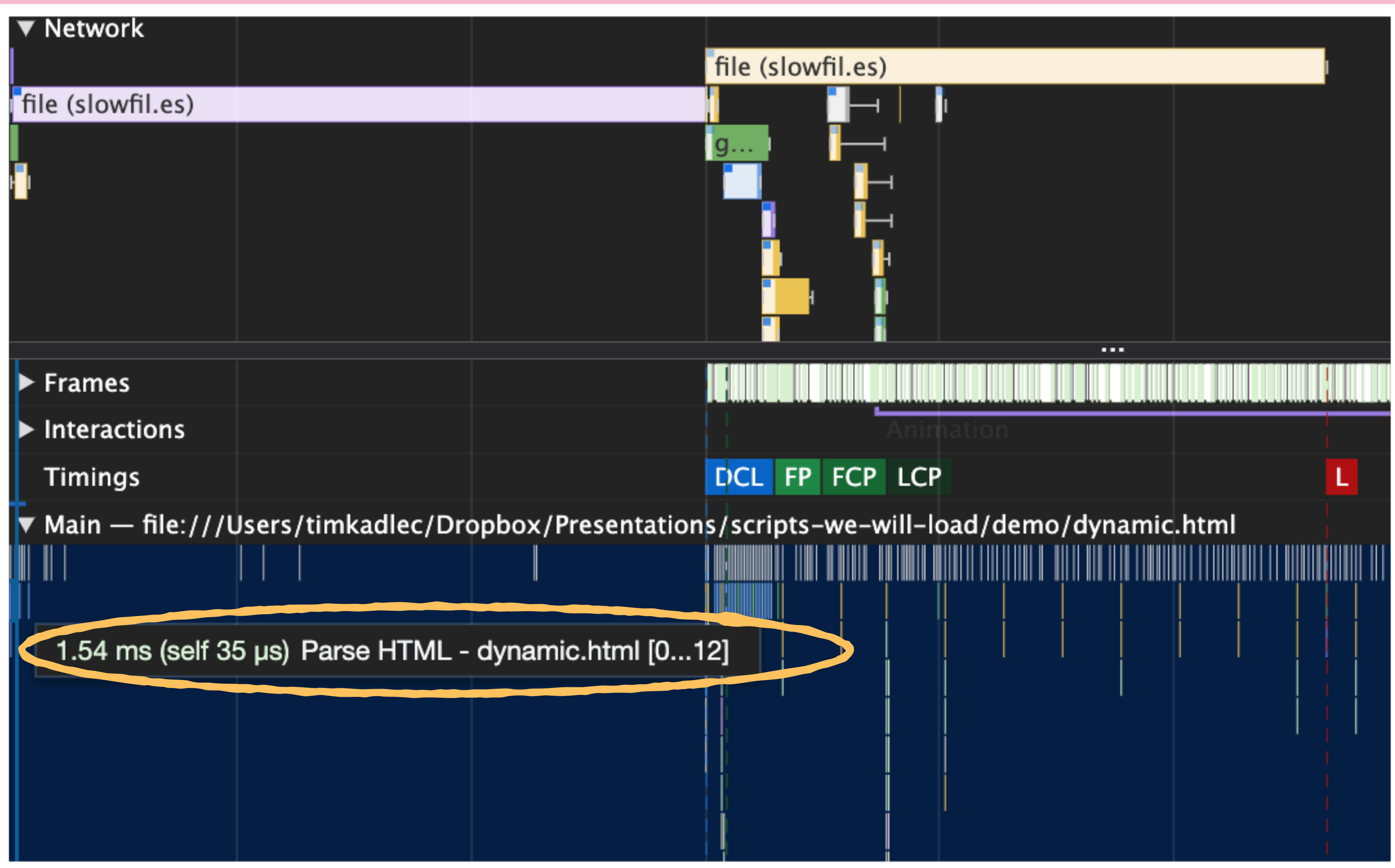
www-widgetapi.js (s.yimg.com)



```
document.getElementById("#main").style.height =  
"100px";
```

CSS Blocks JS Execution

JS Execution Blocks Parser



1.54 ms (self 35 μs) Parse HTML - dynamic.html [0...12]


```
<script>  
  var script = document.createElement('script');  
  script.src = "https://slowfil.es/file?type=js&delay=2500";  
  document.getElementsByTagName('head')[0].appendChild(script);  
</script>
```

X Blocks parser

X Discovered Late






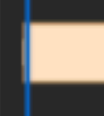



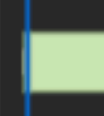
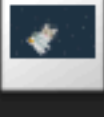







Take four!

```
<script async src="https://slowfil.es/file?  
type=js&delay=2500"></script>
```

Console Performance ⚠ Network Application Elements Memory Sources Security Lighthouse >> 17

Preserve log Disable cache Online ⬆ ⬇ ⚙

Filter Hide data URLs All ⌘ Click to select multiple types
Doc WS Manifest Other Has blocked cookies Blocked Requests

Name	Status	Size	Time	Priority	Waterfall
 async	200	794 B 2.0 kB	61 ms 60 ms	Highest	
 styles.css	200	693 B 1.6 kB	215 ms 213 ms	Highest	
 file?type=js&delay=2500 slowfil.es	200	392 B 33 B	3.03 s 3.03 s	Low	
 iframe_api www.youtube.com	200	901 B 859 B	58 ms 58 ms	Medium	
 phil-street.gif	200	1.9 MB 1.9 MB	2.51 s 217 ms	High	
 giphy.gif media.giphy.com/media/3oGRFkmoq...	200	713 kB 713 kB	342 ms 31 ms	High	
 www-widgetapi.js s.ytimg.com/yts/jsbin/www-widgetapi...	200	37.7 kB 107 kB	103 ms 37 ms	Low	
 HhSjwU8gEsl?enablejsapi=1&origin=... /embed	200	20.8 kB 52.0 kB	179 ms 172 ms	Highest	
 www-player-webp.css /s/player/4c375770	200	48.8 kB 328 kB	49 ms 34 ms	Highest	

Name	Type	Priority	Time	5.00s	10.00s
async	document	High	386ms		
styles.css	css	High	59.7ms		
file	js	Low	2.72s		
phil-street.gif	gif	Low	2.26s		
iframe_api	js	High	57.7ms		
www-widgetapi.js	js	Low	71.2ms		
giphy.gif	gif	Low	295ms		
HhSjwU8gEsl	document	High	164ms		
HhSjwU8gEsl	document	—	—		
www-player.css	css	High	113ms		
www-embed-player.js	js	High	99.6ms		
base.js	js	High	267ms		
fetch-polyfill.js	js	High	61.8ms		
id	xhr	Medium	165ms		



Script: **Low**

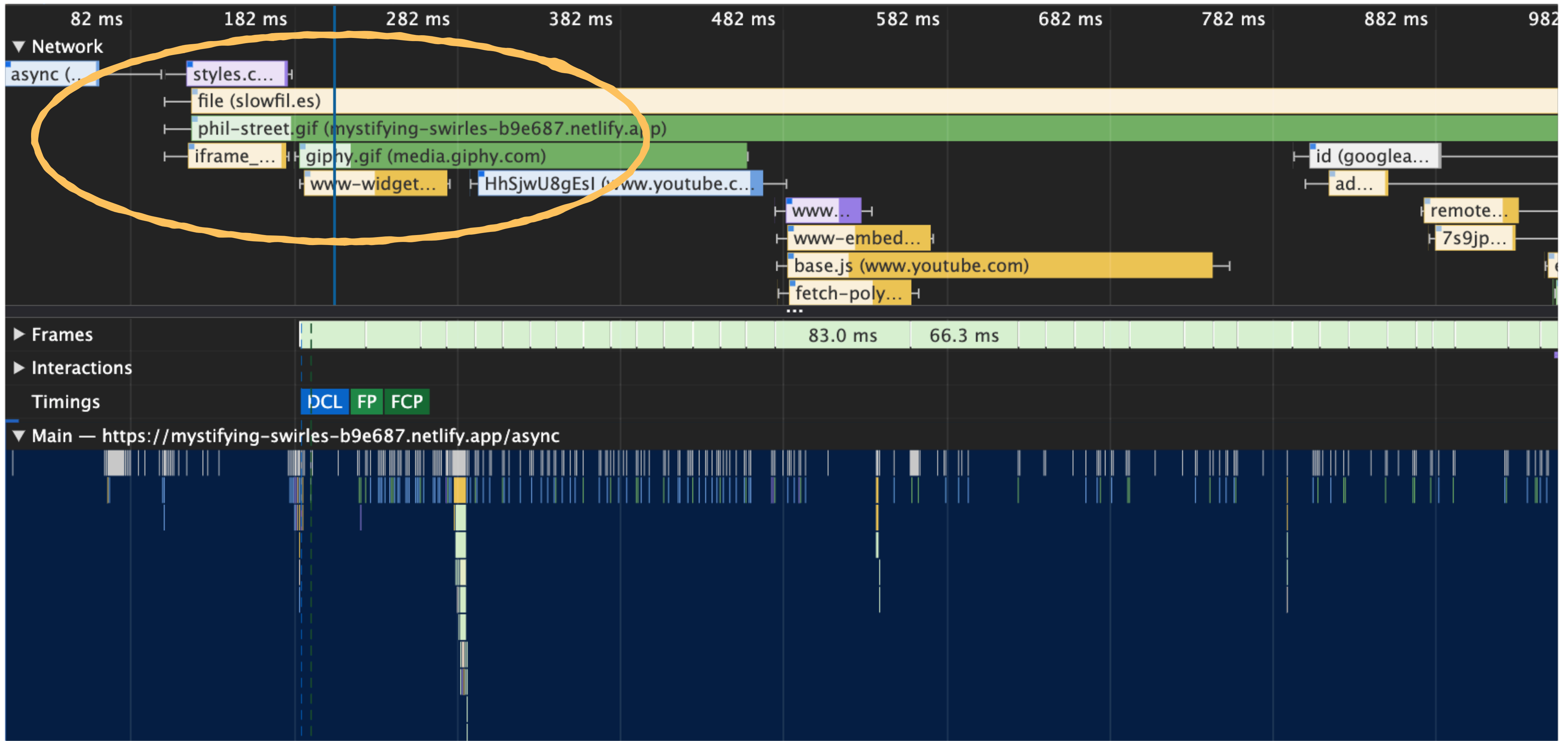


Script: **Normal**



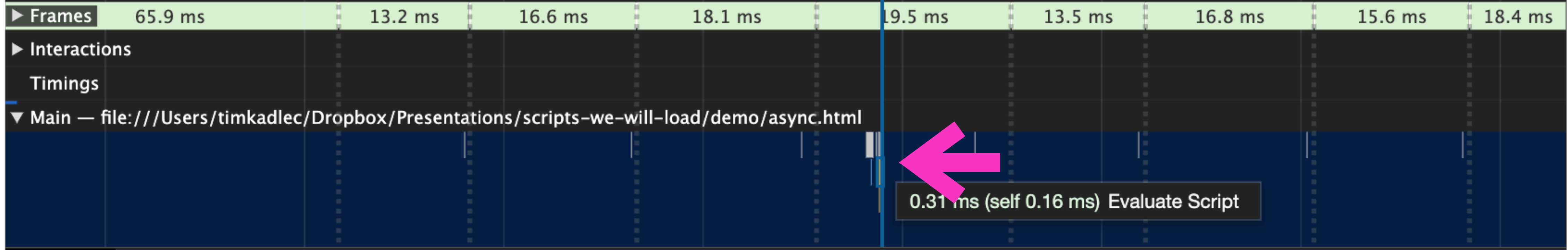
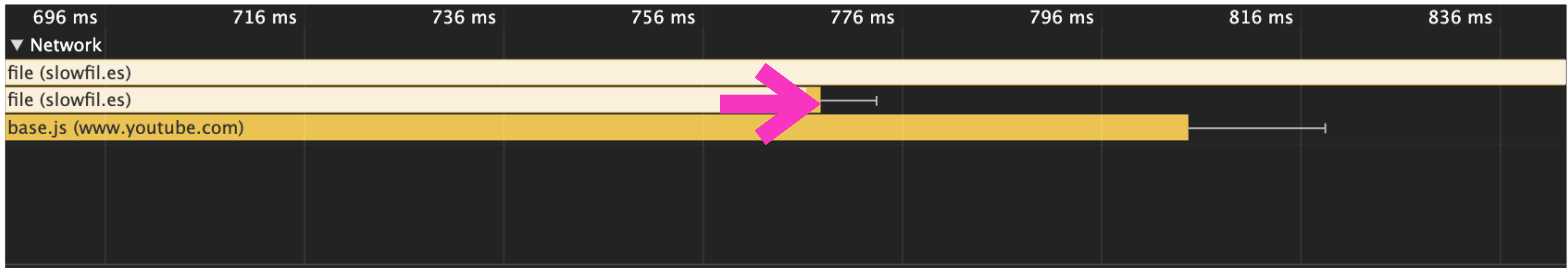
Script: **Low**





```
<script async src="https://slowfil.es/file?type=js&delay=2500"></script>
```

```
<script async src="https://slowfil.es/file?type=js&delay=200"></script>
```



Summary Bottom-Up Call Tree Event Log

■ Evaluate Script

Total Time 0.31 ms

Self Time 0.16 ms

Script <file?type=js&delay=200:1>

**Async Does Not
Guarantee Order**

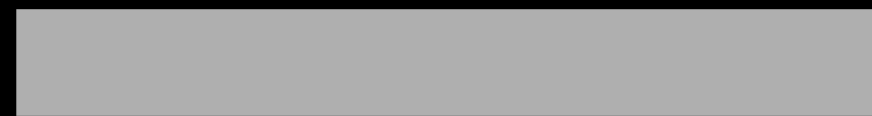
```
<script async>
```



<script async>



<script async>



Async Blocks Parser
When Script Arrives

```
<script async src="https://slowfil.es/file?type=js&delay=2500"></script>
```

✗ No Guarantee of Order

✗ Blocks Parser (and potentially render) when script arrives

Take five!

```
<script defer src="https://slowfil.es/file?  
type=js&delay=2500"></script>
```

```
<script defer>
```

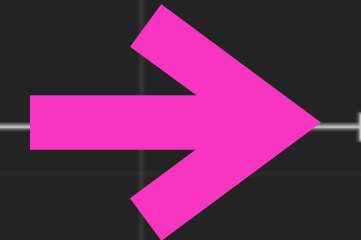


<script defer>



▼ Network

file (slowfil.es)



► Frames

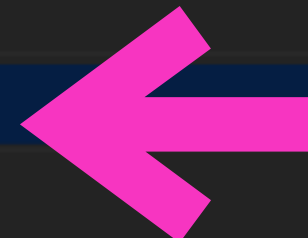
34.6 ms

► Interactions

Timings

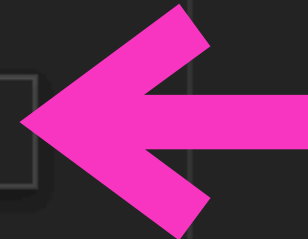
▼ Main — file:///Users/timkadlec/Dropbox/Presentations/scripts-we-will-load/demo/defer.html

L DCL



T... T...

0.15 ms (self 87 μs) Evaluate Script



Console Performance **Network** Application Elements Memory Sources Security Lighthouse >> 17

Preserve log Disable cache Online Filter Hide data URLs All XHR JS CSS Img Media Font Doc WS Manifest Other Has blocked cookies Blocked Requests

| Name | Status | Size | Time | Priority | Waterfall |
|------------------------------------------------------------|--------|--------------------|------------------|----------|-----------|
| defer | 200 | 799 B
2.0 kB | 60 ms
59 ms | Highest | |
| styles.css | 200 | 745 B
1.6 kB | 56 ms
56 ms | Highest | |
| file?type=js&delay=2500
slowfil.es | 200 | 435 B
33 B | 3.01 s
3.01 s | Low | |
| iframe_api
www.youtube.com | 200 | 901 B
859 B | 52 ms
52 ms | Medium | |
| phil-street.gif | 200 | 1.9 MB
1.9 MB | 2.18 s
62 ms | High | |
| giphy.gif
media.giphy.com/media/3oGRFkmoq... | 200 | 713 kB
713 kB | 304 ms
32 ms | High | |
| www-widgetapi.js
s.ytimg.com/yts/jsbin/www-widgetapi... | 200 | 38.1 kB
107 kB | 74 ms
51 ms | Low | |
| HhSjwU8gEsl?enablejsapi=1&origin=...
/embed | 200 | 20.9 kB
52.1 kB | 217 ms
207 ms | Highest | |
| www-player-webp.css
/s/player/4c375770 | 200 | 48.9 kB
328 kB | 53 ms
32 ms | Highest | |

| Name | Type | Priority | Time | | 5.00s | 10.00s |
|------------------------|----------|----------|--------|---|-------|--------|
| <> defer | document | High | 71.8ms | | | |
| css styles.css | css | High | 57.7ms | | | |
| js file | js | High | 2.73s | █ | | |
| phil-street.gif | gif | Low | 2.24s | █ | | |
| js iframe_api | js | High | 66.0ms | | | |
| giphy.gif | gif | Low | 275ms | █ | | |
| js www-widgetapi.js | js | Low | 60.9ms | | | |
| <> HhSjwU8gEsl | document | High | 206ms | █ | | |
| <> HhSjwU8gEsl | document | — | — | █ | | |
| css www-player.css | css | High | 85.4ms | | | |
| js www-embed-player.js | js | High | 65.5ms | | | |
| js base.js | js | High | 234ms | █ | | |
| js fetch-polyfill.js | js | High | 85.6ms | | | |
| id | xhr | Medium | 159ms | | | |





Script: High



Script: Normal



Script: Low



```
<script defer src="https://slowfil.es/file?type=js&delay=2500"></script>
```

```
<script defer src="https://slowfil.es/file?type=js&delay=200"></script>
```

file (slowfil.es)

716.06 ms Low <https://slowfil.es/file?type=js&delay=200>

default.jpg (i.ytimg.com)

Interactions

Timings

Main — <file:///Users/timkadlec/Dropbox/Presentations/scripts-we-will-load/demo/defer.html>

Task T...


```
<script defer src="https://slowfil.es/file?type=js&delay=2500"></script>
```

- ✓ **Guarantee Order**
- ✓ **Doesn't Block Parser or Render**
- ✓ **Discovered Early**
- ✓ **Doesn't Compete with Other Critical Resources**

**But what if we want both network
priority and parser benefits?**

Take seven!






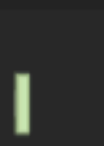




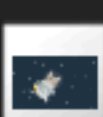
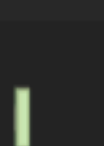



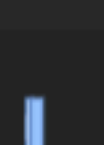


```
<link rel="preload" href="https://slowfil.es/file?  
type=js&delay=2500" as="script">
```

```
<script defer src="https://slowfil.es/file?  
type=js&delay=2500"></script>
```

Console Performance **Network** Application Elements Memory Sources Security Lighthouse >> 17

Preserve log Disable cache Online

Filter Hide data URLs All XHR JS CSS Img Media Font Doc WS Manifest Other Has blocked cookies Blocked Requests

Name	Status	Size	Time	Priority	Waterfall
 defer.html /Users/timkadlec/Dropbox/Presentati...	Finished	2.1 kB	4 ms	Highest	
 styles.css /Users/timkadlec/Dropbox/Presentati...	Finished	1.6 kB	13 ms	Highest	
 phil-street.gif /Users/timkadlec/Dropbox/Presentati...	Finished	1.9 MB	28 ms	High	
 file?type=js&delay=2500 slowfil.es	200	391 B 33 B	2.97 s 2.97 s	High	
 iframe_api www.youtube.com	200	1.2 kB 859 B	93 ms 93 ms	Medium	
 giphy.gif media.giphy.com/media/3oGRFkmoq...	200	713 kB 713 kB	241 ms 29 ms	High	
 www-widgetapi.js s.ytimg.com/yts/jsbin/www-widgetapi...	200	38.1 kB 107 kB	172 ms 155 ms	Low	
 HhSjwU8gEsl?enablejsapi=1&widgeti... /embed	200	20.8 kB 51.9 kB	114 ms 108 ms	Highest	
 www-player-webp.css /s/player/4c375770	200	48.9 kB 328 kB	51 ms 34 ms	Highest	



Script: **High**

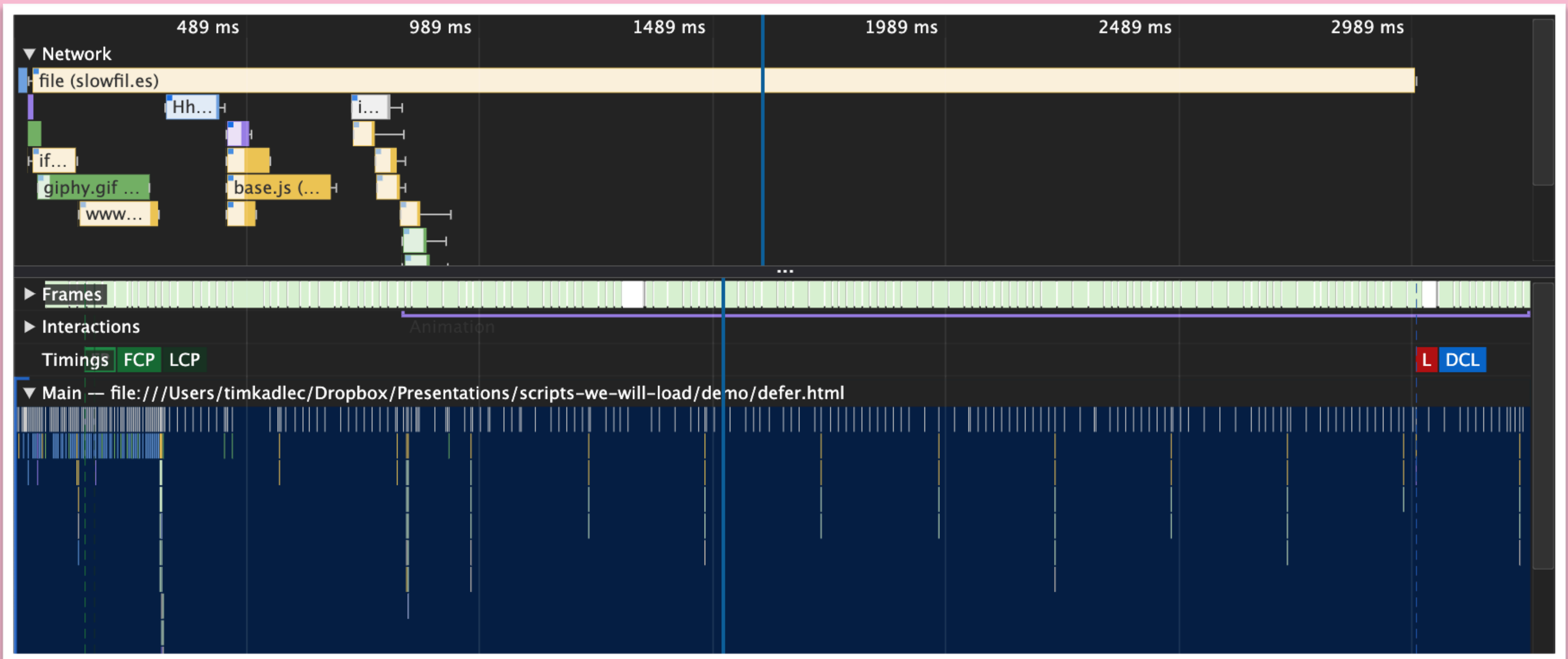


Script: **Normal**



Script: **High**





Understanding the Trade-offs

JavaScript Loading Priorities in Chrome

FEBRUARY 18, 2019

How browsers [schedule](#) and execute scripts can impact the performance of web pages. While techniques like `<script defer>`, `<link rel=preload>` (and others) influence script loading, knowing how browsers interpret them can also be helpful. Thanks to [Kouhei Ueno](#), we now have an up to date summary of [script scheduling](#) in Chrome.

	Loading priority (network/Blink)	Execution priority	Where should this be used?
<code><script></code> in <code><head></code>	Medium/High	VeryHigh - Blocks parser	<ul style="list-style-type: none"> Scripts that affect layout of First Meaningful Paint (FMP) / First Contentful Paint (FCP) content Scripts that must be run before other scripts <p>Examples:</p> <ul style="list-style-type: none"> Framework runtime (if not static-rendered) Polyfills A/B testing that affects DOM structure of the entire page
<code><link rel=preload></code> + <code><script src></code> hook	Medium/High	High - Interrupts parser	<ul style="list-style-type: none"> Scripts that generate critical content (needed for FMP) But shouldn't affect above-the-fold layout of the page

Experiment

Measure

Iterate

Thank You!

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