Web Push: Common Issues and Reporting Bugs

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When you hit an issue with web push, it can be difficult to debug the issue or find help. This doc outlines some of the common issues and what you should do if you've found a bug in Chrome or Firefox.

Before we dive into debugging push, you may be hitting issues with debugging service workers themselves, the file not updating, failing to register or generally just unusual behavior. There is an awesome document on debugging service workers that I strongly recommend checking out if you are new to service worker development.

There are two distinct stages to check off when developing and testing web push, each with their own set of common issues / problems.

- **Sending a Message:** Make sure that sending messages is successful. You should be getting a 201 HTTP code. If you aren't :
    - **Check for Authorization Errors:** If you receive an authorization error message see the Authorization Issues section.
    - **Other API Errors:** If you receive a non-201 status code response, see the HTTP Status Codes section for guidance on the cause of the issue.
- **Receiving a Message**: If you're able to send a message successfully, but the message is not received on the browser:
    - **Check for Encryption Issues:** See the Payload Encryption Issue Section.
    - **Check for Connection Issues:** If the problem is on Chrome, it may be a connection. See Connection Issues section for more info.

If you aren't able to send and receive a push message and the relevant sections in this doc aren't helping debug the problem then you may have found a bug in the push mechanism itself. In this case, refer to the Raising Bug Reports section to file a good bug report with all the necessary information to expedite the bug fixing process.

One thing I'd like to call out before we start is that **Firefox and the Mozilla AutoPush Service have great errors messages.** If you get stuck and are not sure what the problem is, then test in Firefox and see if you get a more helpful error message.

Authorization Issues

Authorization issues are one of the most common issues developers hit when starting out with web push. This is normally a problem with configuration of a sites Application Server Keys (a.k.a VAPID keys) .

The easiest way to support push in both Firefox and Chrome is to supply an `applicationServerKey` in the `subscribe()` call. The down side is that any discrepancy between your front end and server's keys will result in an authorization error.

On Chrome + FCM

For Chrome, which uses FCM as a push service, you'll receive an `UnauthorizedRegistration` response from FCM for a range of different errors, all involving the application server keys.

You'll receive an `UnauthorizedRegistration` error in any of the following situations:

- If you fail to define an `Authorization` header in the request to FCM.
- Your application key used to subscribe the user doesn't match the key used to sign the Authorization header.
- The expiration is invalid in your JWT, i.e. the expiration exceeds 24 hours or the JWT has expired.
- The JWT is malformed or has invalid values.

The full error response looks like this:

```
<HTML>\n<HEAD>\n<TITLE>UnauthorizedRegistration</TITLE>\n</HEAD>\n<BODY BGC
```

If you receive this error message in Chrome, consider testing in Firefox to see if it'll provide more insight to the problem.

Firefox and Mozilla AutoPush

Firefox and Mozilla AutoPush provides a friendly set of error messages for `Authorization` issues.

You'll also receive an `Unauthorized` error response from Mozilla AutoPush if the `Authorization` header is not included in your push request.

```
{
    "errno": 109,
    "message": "Request did not validate missing authorization header",
    "code": 401,
    "more_info": "http://autopush.readthedocs.io/en/latest/http.html\#error-codes
    "error": "Unauthorized"
}
```

If the expiration in your JWT has expired, you'll also receive an `Unauthorized` error with a message that explains that the token has expired.

```
{
    "code": 401,
    "errno": 109,
    "error": "Unauthorized",
    "more_info": "http://autopush.readthedocs.io/en/latest/http.html\#error-codes
    "message": "Request did not validate Invalid bearer token: Auth expired"
}
```

If the application server keys are different between when the user was subscribed and when the Authorization header was signed, a `Not Found` error will be returned:

```
{
    "errno": 102,
    "message": "Request did not validate invalid token",
    "code": 404,
    "more_info": "http://autopush.readthedocs.io/en/latest/http.html\#error-codes
    "error": "Not Found"
}
```

Lastly if you have an invalid value in your JWT (for example if the "alg" value is an unexpected value) you'll receive the following error from Mozilla AutoPush:

```
{
    "code": 401,
    "errno": 109,
    "error": "Unauthorized",
    "more_info": "http://autopush.readthedocs.io/en/latest/http.html\#error-codes
    "message": "Request did not validate Invalid Authorization Header"
}
```

HTTP Status Codes

There are a range of issues that can result in a non-201 response code from a push service. Below is a list of HTTP status codes and what they mean in relation to web push.

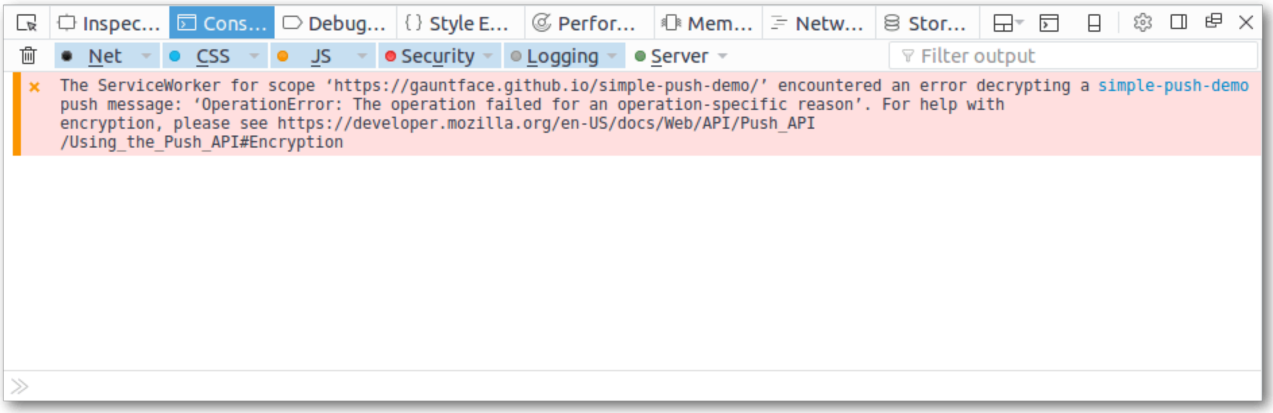
Status Code	Description
429	Too many requests. Your application server has reached a rate limit with a push service. The response from the service should include a 'Retry-After' header to indicate how long before another request can be made.
400	Invalid request. One of your headers is invalid or poorly formatted.
404	Not Found. The subscription has expired. In this case you should delete the PushSubscription from your back end and wait for an opportunity to resubscribe the user.
410	Gone. The subscription is no longer valid and should be removed from your back end. This can be reproduced by calling `unsubscribe()` on a `PushSubscription`.
413	Payload size too large. The minimum size payload a push service must support is 4096 bytes (or 4kb). Anything larger can result in this error.

If the http status code is not in this list and the error message is not helpful, check the Web Push Protocol spec to see if the status code is referenced along with a scenario of when that status code can be used.

Payload Encryption Issue

If you can successfully trigger a push message (i.e. send a message to a web push service and receive a 201 response code) but the push event never fires in your service worker, this normally indicates that the browser failed to decrypt the message it received.

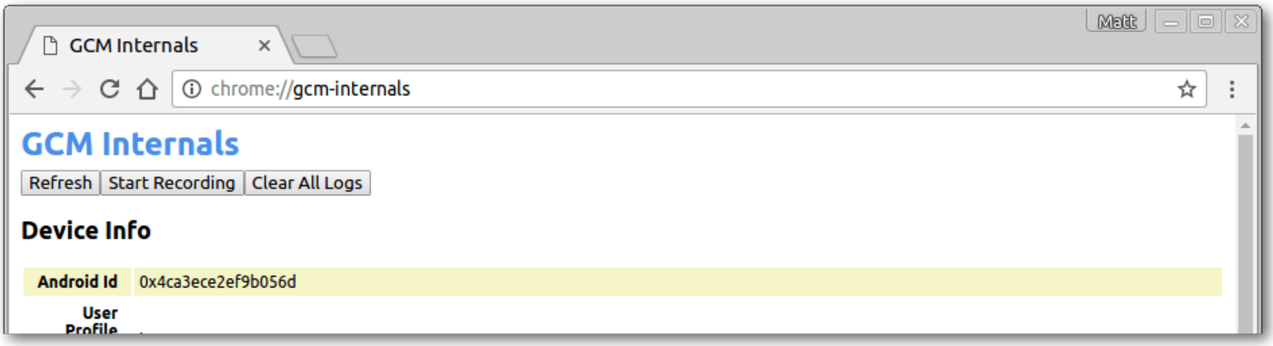
If this is the case, you should see an error message in Firefox's DevTools console like so:



```
The ServiceWorker for scope 'https://gauntface.github.io/simple-push-demo/' encountered an error decrypting a simple-push-demo
push message: 'OperationError: The operation failed for an operation-specific reason'. For help with
encryption, please see https://developer.mozilla.org/en-US/docs/Web/API/Push_API
/Using_the_Push_API#Encryption
```

To check if this is the issue in Chrome, do the following:

1. Go to chrome://gcm-internals and click the "Start Recording" button.

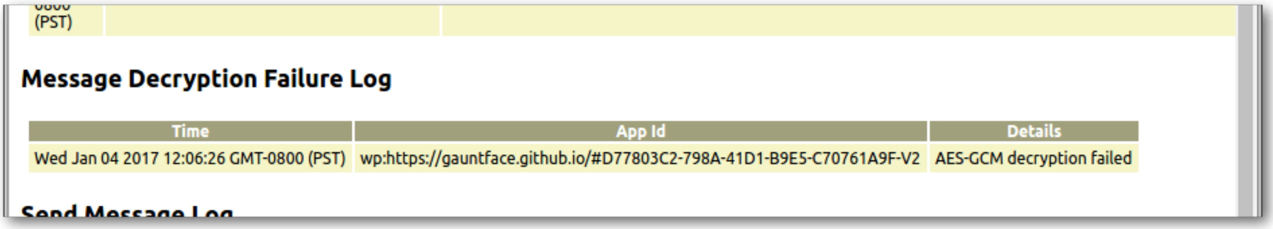


GCM Internals

Device Info

Android Id	0x4ca3ece2ef9b056d
User Profile	

1. Trigger a push message, and look under the "Message Decryption Failure Log".


(PST)

Message Decryption Failure Log

Time	App Id	Details
Wed Jan 04 2017 12:06:26 GMT-0800 (PST)	wp:https://gauntface.github.io/#D77803C2-798A-41D1-B9E5-C70761A9F-V2	AES-GCM decryption failed

Send Message Log

If there was an issue with the decryption of the payload, you'll see an error similar to the one displayed above. (Notice the `AES-GCM decryption failed` message in the details column.)

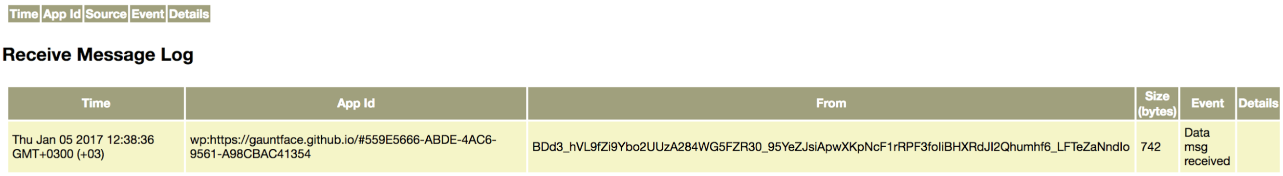
There are a few tools which may help debug encryption if this is your issue:

- Push Encryption Verifier tool by Peter Beverloo.
- Web Push: Data Encryption Test Page by Mozilla

Connection Issue

If you aren't receiving a push event in your service worker and you aren't seeing any decryption errors, then the browser may be failing to connect to a push service.

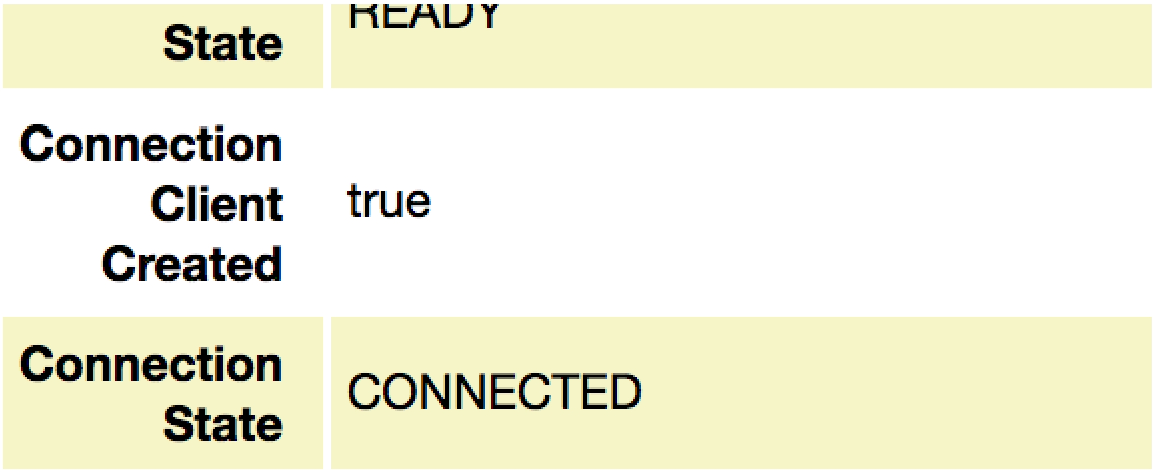
In Chrome you can check whether the browser is receiving messages by examining the 'Receive Message Log' (sic) in `chrome://gcm-internals`.



Receive Message Log

Time	App Id	From	Size (bytes)	Event	Details
Thu Jan 05 2017 12:38:36 GMT+0300 (+03)	wp:https://gauntface.github.io/#559E5666-ABDE-4AC6-9561-A98CBAC41354	BDd3_hVL9fZi9Ybo2UUzA284WG5FZR30_95YeZJsiApwXKpNcF1rRPF3foliBHXRdJI2Qhumhf6_LFTeZaNndlo	742	Data msg received	

If you aren't seeing the message arrive in a timely fashion then make sure that the connection status of your browser is `CONNECTED`:



State	READY
Connection Client Created	true
Connection State	CONNECTED

If it's **not** 'CONNECTED', you may need to delete your current profile and create a new one. If that still doesn't solve the issue, please raise a bug report as suggested below.

Raising Bug Reports

If none of the above helps with your issue and there is no sign of what the problem could be, please raise an issue against the browser you are having an issue with:

For Chrome, you'd raise the issue here: https://bugs.chromium.org/p/chromium/issues/list
For Firefox, you should raise the issue on: https://bugzilla.mozilla.org/

To provide a good bug report you should provide the following details:

- Browsers you've tested in (i.e. Chrome version 50, Chrome version 51, Firefox version 50, Firefox version 51).
- An example `PushSubscription` that demonstrates the problem.

- Include any example requests (i.e. content of network requests to a push service, including headers).
- Include any example responses from network requests as well.

If you can provide a reproducible example, either source code or a hosted web site, it often speeds up diagnosing and solving the problem.

Previous

← FAQ

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