

the string doesn't match.

From there, the number of steps the engine must use to validate a string just continues to grow.

String	Number of C's	Number of steps
ACCCX	3	38
ACCCCX	4	71
ACCCCCX	5	136
ACCCCCCCCCCCCCX	14	65,553

By the time the string includes 14 C's, the engine has to take over 65,000 steps just to see if the string is valid. These extreme situations can cause them to work very slowly (exponentially related to input size, as shown above), allowing an attacker to exploit this and can cause the service to excessively consume CPU, resulting in a Denial of Service.

References

- [ReDoS vulnerability in websocket-extensions](#)
- [Snyk Security Blog](#)
- [websocket-extensions-node GitHub Commit](#)
- [websocket-extensions-ruby GitHub Commit](#)

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