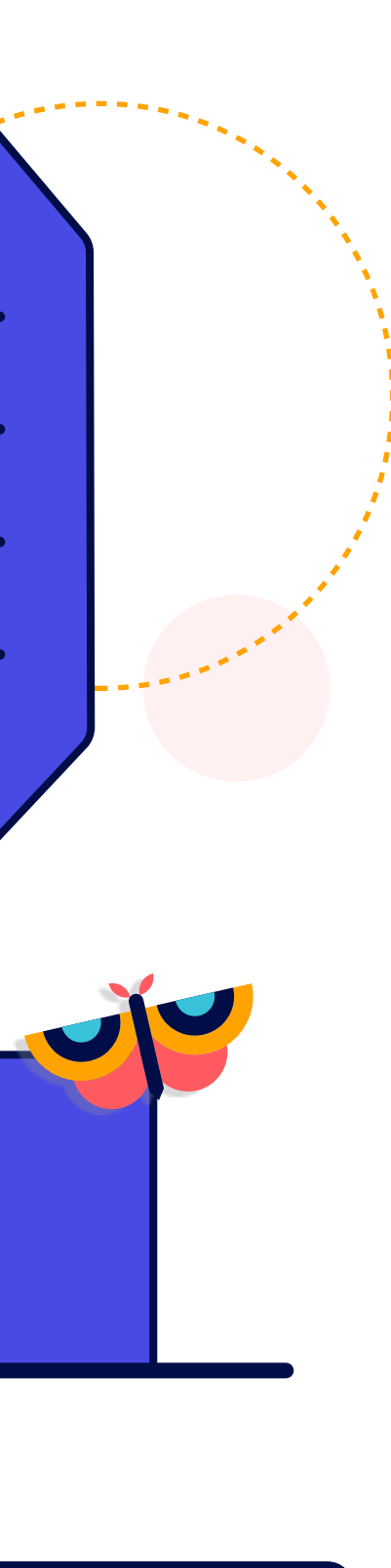


## Part 1: What We've Learned From 140 Years of Dealing With Software Bugs

# A BRIEF HISTORY OF BUGS

bugsnag

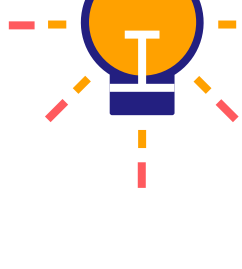


Ever wonder where the term "bug" comes from?

1878

### Lightbulb

Thomas Edison uses "bug" to describe engineering defects in his invention



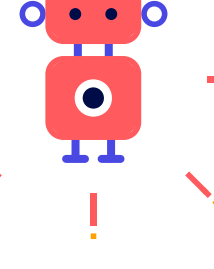
### The "Manhattan" Project

Oppenheimer writes "debugging" in a letter asking for additional technical staff

1944

### "Catch That Rabbit"

Author Isaac Asimov uses "bug" to describe issues with a robot in a short story



### Harvard Mark II

A real moth is discovered in an early electromechanical computer's relay switch

1947

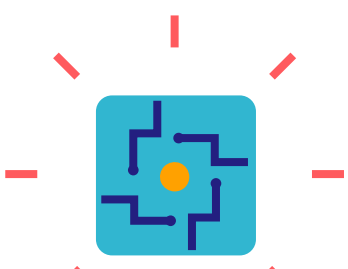
Documented as "First actual case of bug being found"



### Association for Computing Machinery

Three papers from ACM national meetings use term computer "debugging"

1952



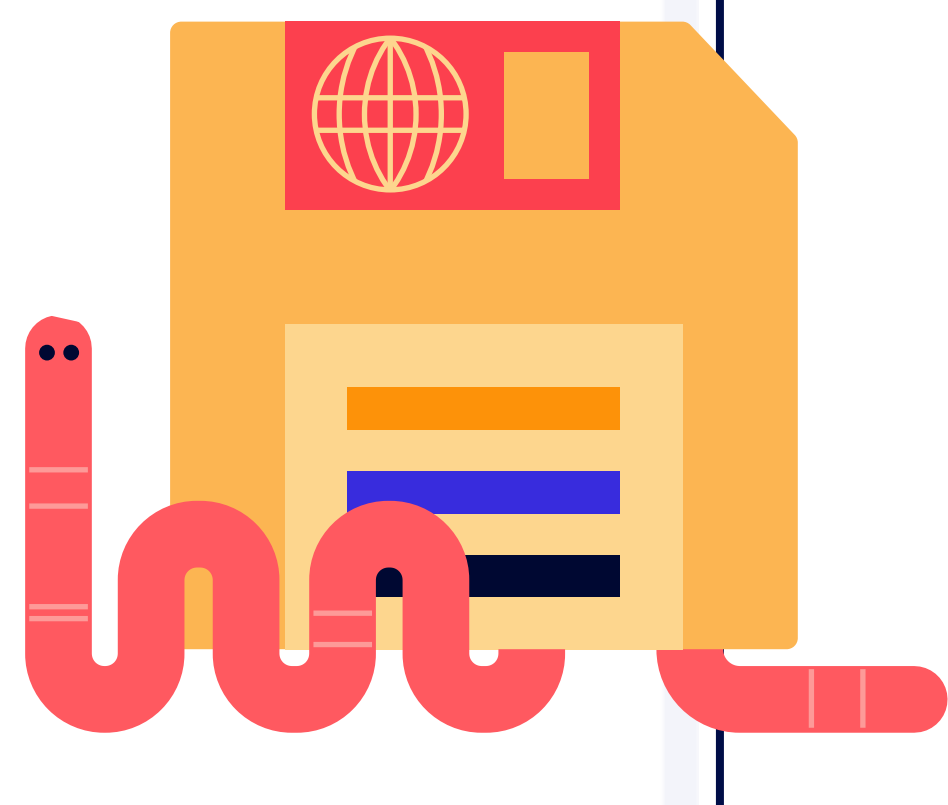
## Five (in)famous bugs in recent history

1988

### The Morris Worm

First widespread worm attack on the Internet

- Written by Cornell grad student to demonstrate security flaws
- Spread rapidly and could infect computers multiple times
- \$10M clean-up cost
- ~6K crashed computers

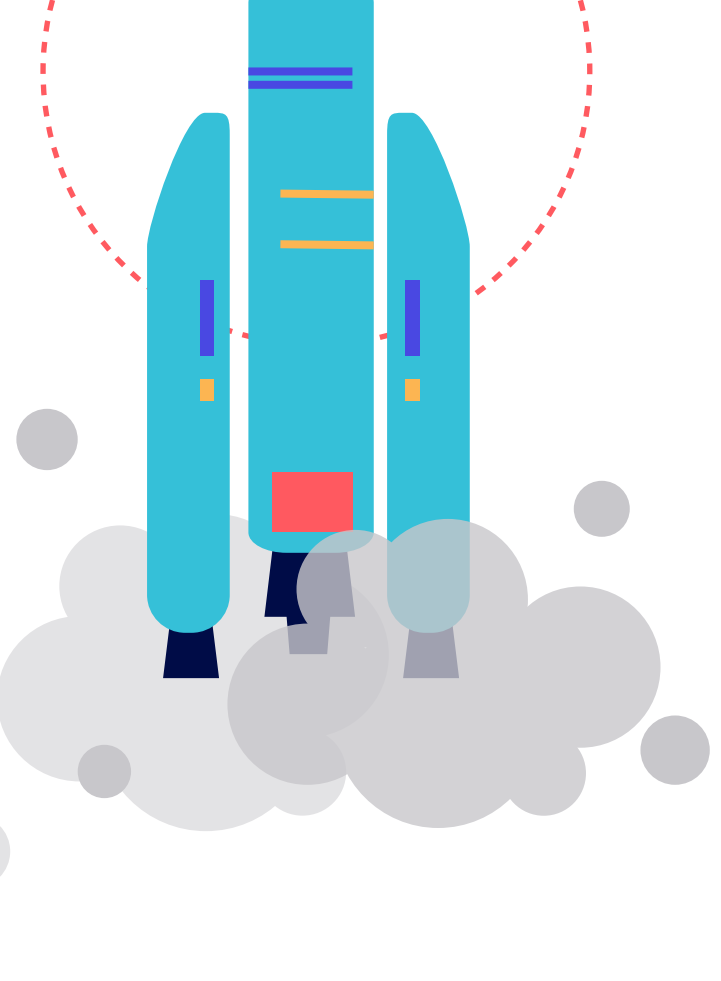


1996

### Ariane 5 Flight 501

European Space Agency's disastrous rocket launch that exploded

- Software bug in reference system
- Older codebase didn't match updated hardware
- \$7B development cost
- \$370M flight cost
- \$500M in lost satellites on board

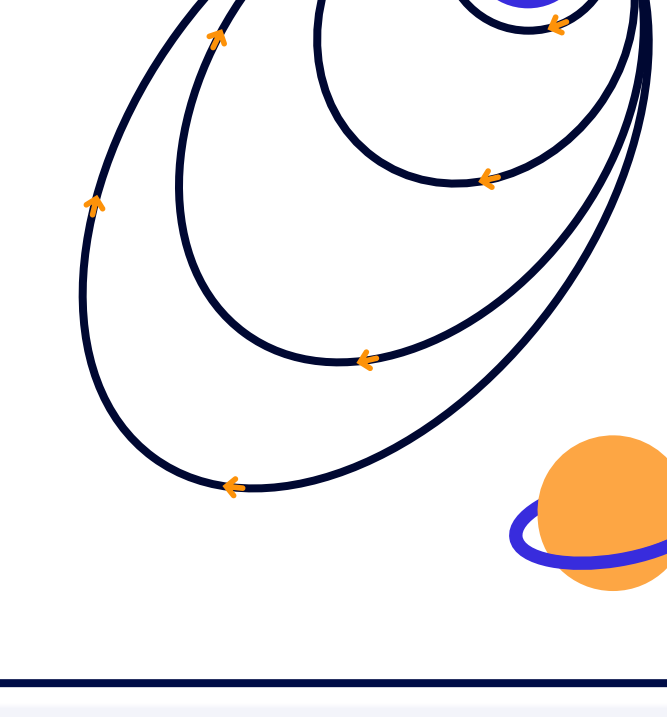


1999

### Mars Climate Orbiter

NASA spacecraft burns up in Martian atmosphere due to incorrect trajectory

- Bug in ground control software
- File format errors and software bugs
- \$235M craft destroyed



2000

### Y2K Bug

Threat of global economic collapse

- Lack of proper date coding in software worldwide
- Required proactive bug fixes to stop computers flipping to 1900
- \$150-\$225B in U.S. government and business expenditures
- \$320B worldwide expenditures

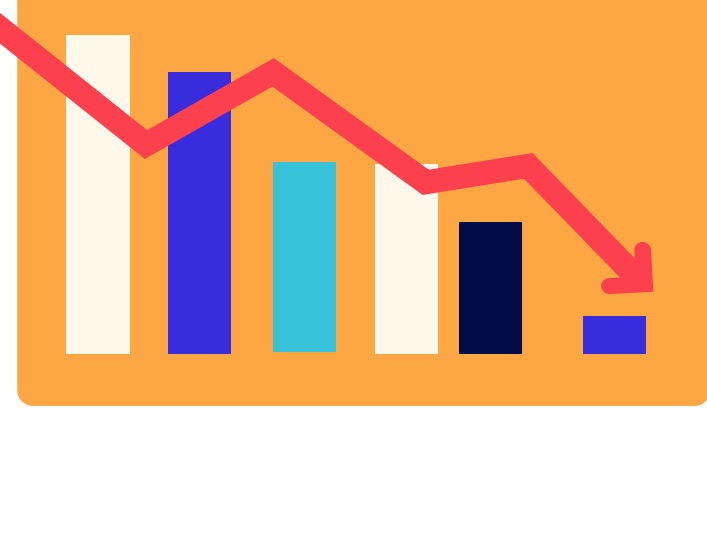


2012

### Knight Capital Group

Stock trading disruption

- Incompatibility between old and new APIs
- Lacked formal code review, QA, and deployment review processes
- \$440M pre-tax loss in 30 minutes
- 75% lost equity value
- \$12M fine by SEC



Today's bugs are even more disruptive and encroach on consumer privacy in our mobile, connected world

2018

May

Bug in Facebook made 14M user's posts public without consent for 10 days

Bug in Twitter saved user passwords in plain text, affecting all 330M users



Jul

Samsung Galaxy bug sent out random photos in messaging app

Sep

Facebook triple-bug led to stolen access tokens, impacting 30M users

Twitter API bug shared PMs, tweets with app developers for 16 months

Bug in Facebook let third-party developers view photos of 6.8M users

Oct

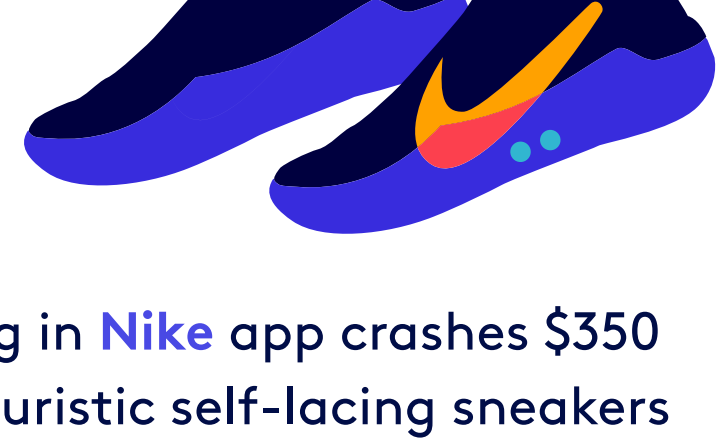
Google bug exposed account information of 500K users of Google Plus



2019

Feb

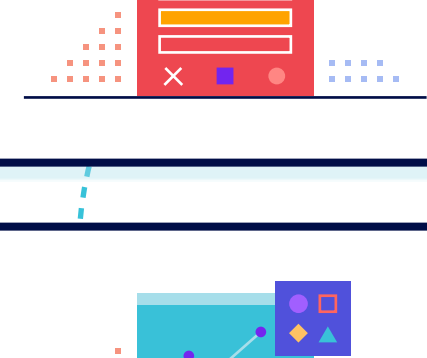
Bug in Nike app crashes \$350 futuristic self-lacing sneakers



## How have software bugs been dealt with over time?

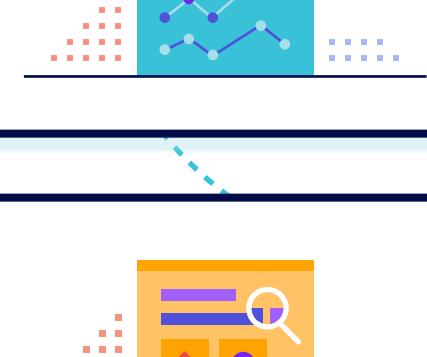
First

Logging files



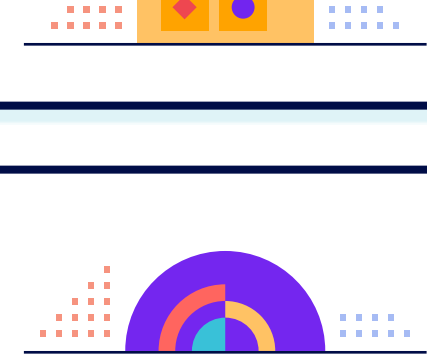
Then

Error reporting and monitoring libraries



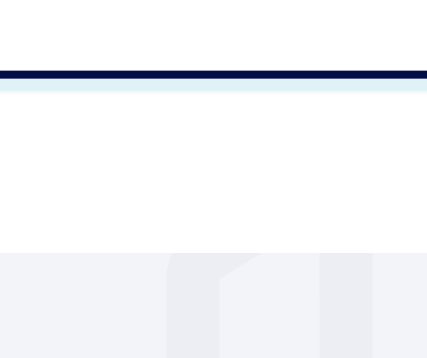
Next

Cross-platform error monitoring tools



Now

Stability monitoring



Invest in delivering high quality and stable app experiences to entice, delight, and retain customers.

www.bugsnag.com

Source:

- <https://www.computerworld.com/article/2515435/app-development/math-in-the-machine--debugging-the-origins-of--bug-.html>
- <http://bancroft.berkeley.edu/Exhibits/physics/bigscience03.html>
- [https://en.wikipedia.org/wiki/Debugging#cite\\_note-4](https://en.wikipedia.org/wiki/Debugging#cite_note-4)
- <https://www.wired.com/2005/11/history-worst-software-bugs/>
- <https://www.computerworld.com/article/2593290/it-management/senate--y2k-fixes-worth-the-billions-spent.html>
- <https://www.bbvaopenmind.com/en/the-5-most-infamous-software-bugs-in-history/>
- <https://medium.com/@ryancohan/financial-cost-of-software-bugs-51b4d193f107>
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- <https://it-cisq.org/wp-content/uploads/2018/10/The-Cost-of-Poor-Quality-Software-in-the-US-2018-Report.pdf>
- [https://www.theregister.co.uk/2018/12/11/software\\_bugs\\_that\\_ate\\_the\\_world/](https://www.theregister.co.uk/2018/12/11/software_bugs_that_ate_the_world/)