

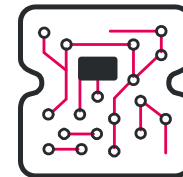
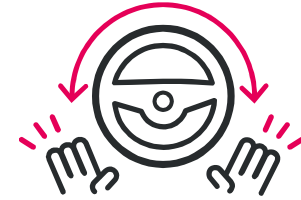


Autonomous Security

Controllers Protect Themselves

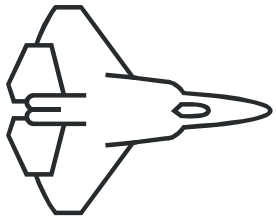
| Transportation Platforms' Characteristics

- Autonomous computing
 - System-based decisions/commands
 - Not always externally connected
- Personal-safety above all
 - Must not risk lives
- Run on Electronic Control Units (ECUs)
 - Limited computing resources
 - Real-time performance constraints



The Sheer Magnitude of Security Vulnerabilities

F22 Jet
Fighter



2M 

1,200 

100 

Boeing 787
Dreamliner



15M 

9,000 

700 

Midsize Car



10M 

6,000 

500 

Premium Car



100M 

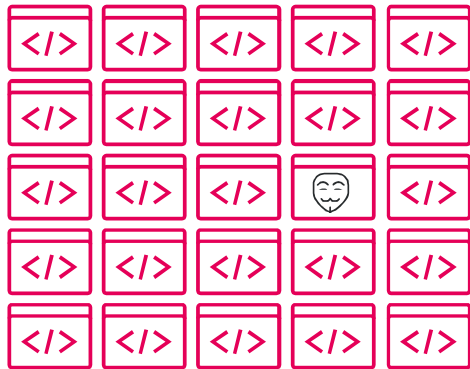
60,000 

5,000 

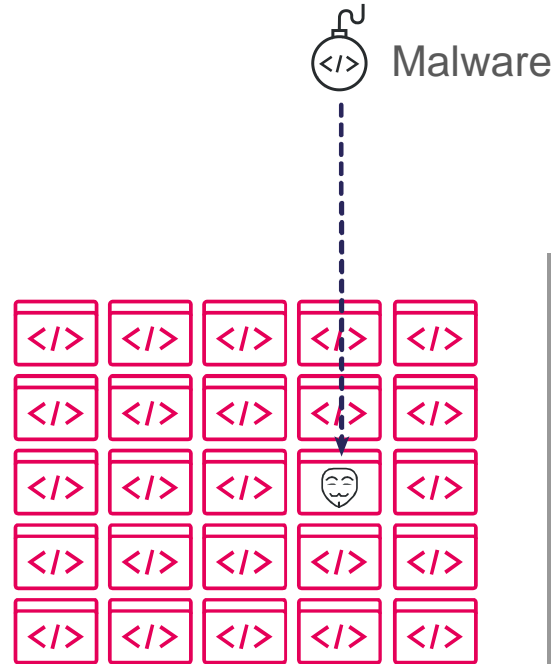
 CODE LINE  BUG  SECURITY BUG

Sources: www.securityweek.com/secure-mobile-applications-considerations-developerswww.informationisbeautiful.net/visualizations/million-lines-of-code

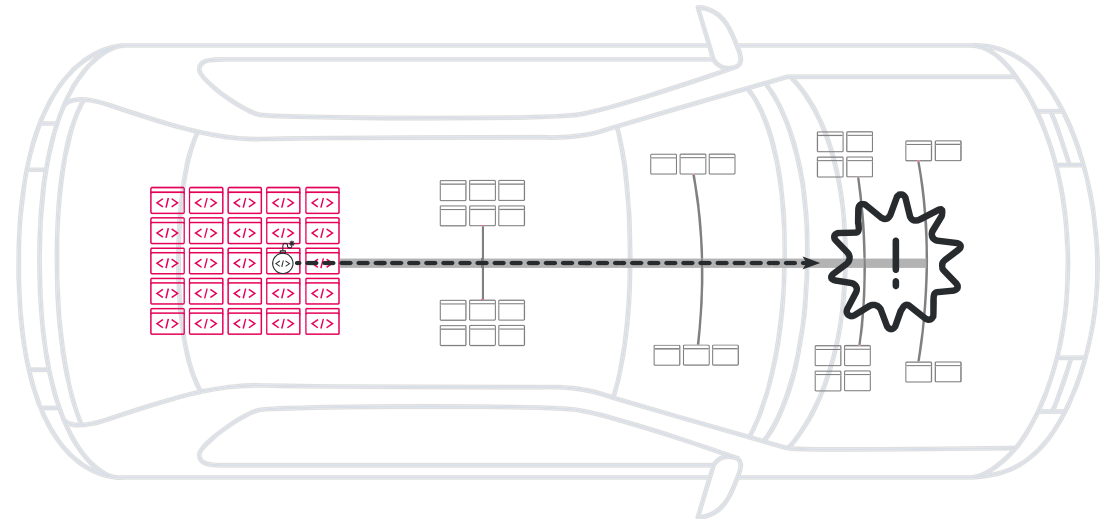
Hackers Exploit Security Bugs



1 Hidden security software bug



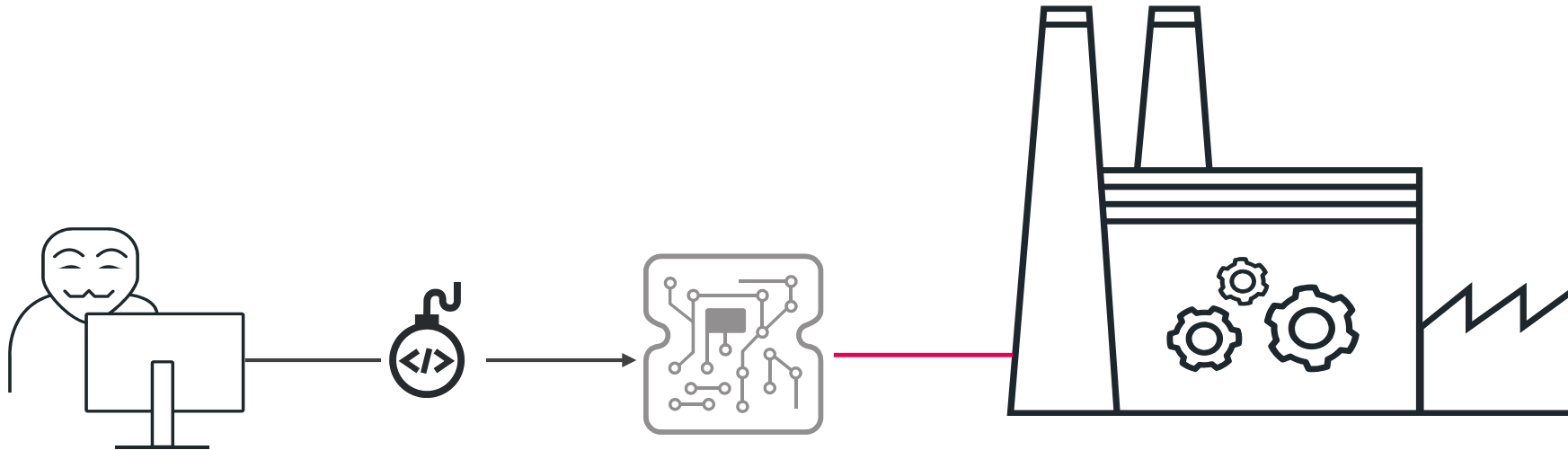
2 Bug exploited to run malware



3 Malware compromises the system

Automotive Cybersecurity Enabler

- Unauthorized change to factory settings \Leftrightarrow malware
- Designated “gates” in the car



Autonomous Security

- Standalone security
 - Host based: does not require external connectivity
 - No malware signature updates required
- Zero false positives
 - Deterministic algorithms
- Any ECU support
 - Hardware and OS agnostic

