Making Application Security Part of Your SDLC!

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:~# whoami

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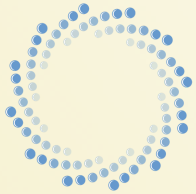


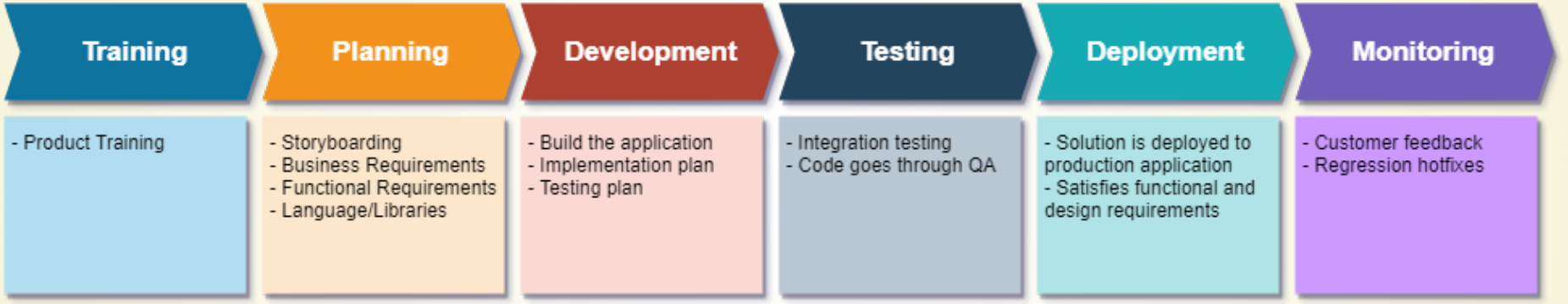
ClearCompany

bugcrowd

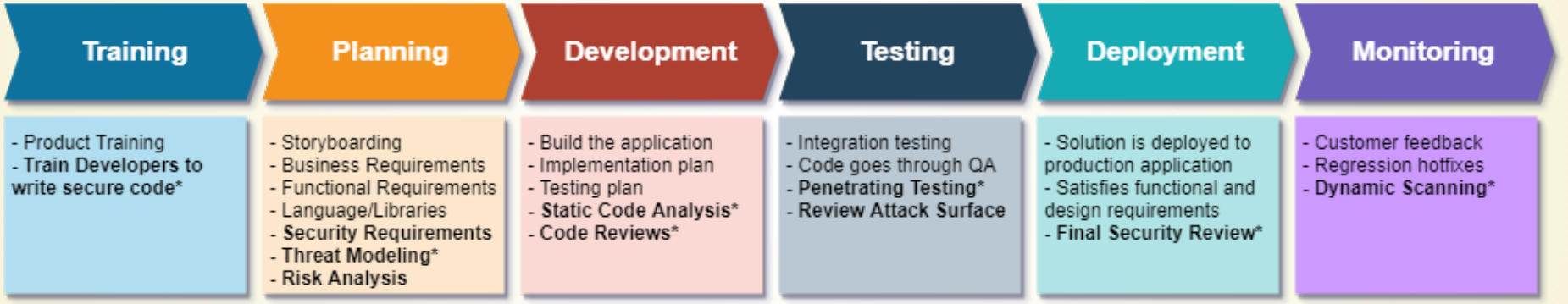
So what's this all about anyway?

- Development teams are shipping code faster than ever before!
- Data breaches and cyber attacks are happening faster than ever before...
- To mitigate these risks security considerations need to be made at every part of the SDLC

A Typical SDLC



A Secure SDLC



Training

Security Training for Developers

- Developers should be accountable for the code they produce, but they cannot do that unless they know what to look out for.
- **Much** less costly to identify and fix bugs during development than after code has already made it further along the SDLC.

Focus On

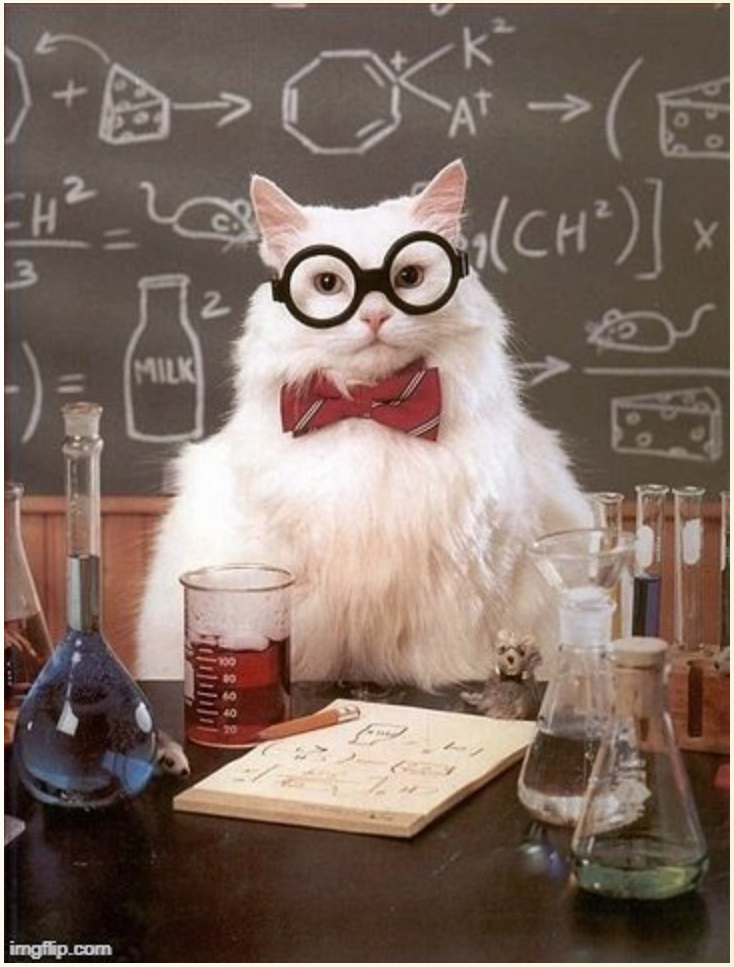
- High-level overview of the most common vulnerabilities
- Safeguards that **YOUR** application is using to defend against them
- Most common security decisions that developers need to be making while they are writing their code.

Avoid

- Deep dives into every vulnerability class
- Assumptions that your development team is already familiar with the risks.

Approaches

- In-person training is valuable.
- Online, interactive training is great for learning basics
- Typically fits well into new engineer onboarding process.



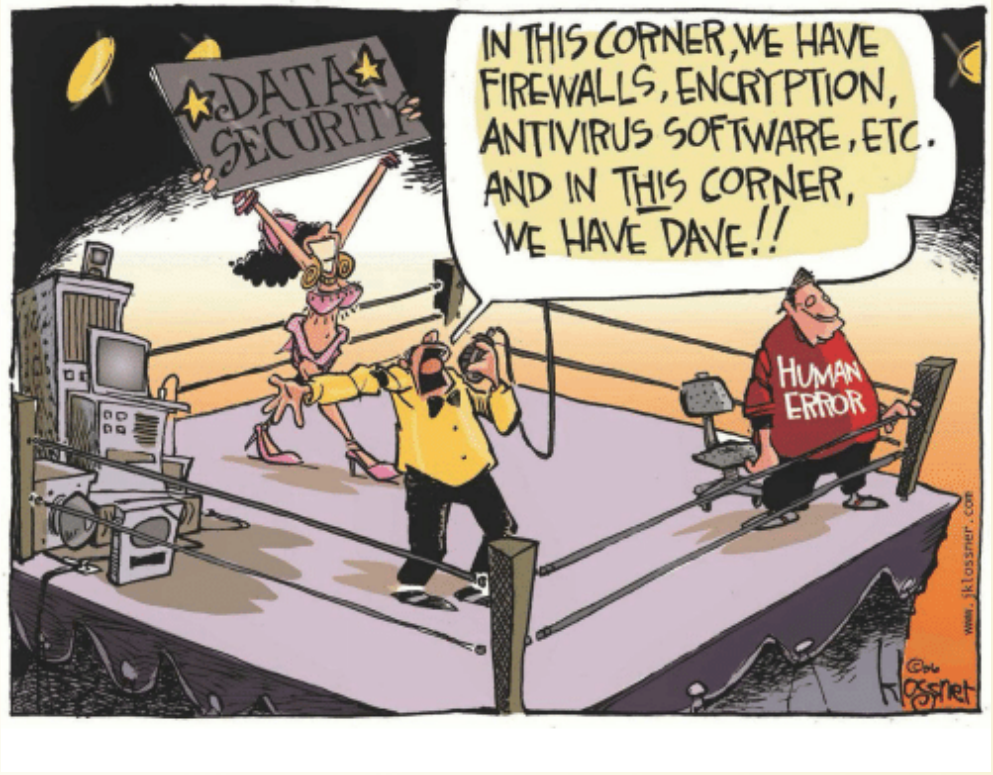
Training Resources

- Pager Duty: Security Training for Engineers
- Hacksplaining.com
- OWASP Documentation && Cheat Sheets
- Paid training platforms

Planning

Threat Modeling

- Be realistic
- Include key stakeholders
- Ideally should be done early - findings can influence design
- Walk away understanding the controls required



~~4~~ 3 Questions

1. What are we building?
2. What can go wrong?
3. What are we going to do about it?
4. ~~Did we do a good enough job?*~~

Example: Bank Web App

Wants to build a web app where users can log in, manage their accounts, view statements, etc.

Decision is made that they are going to start out by building authentication first...

4 3 Questions Applied

1. **What are we building?**
   - The authentication piece & login experience of a banking web app
2. **What can go wrong**
   - Broken Authentication / Session Management
   - Data Breach / Credential Dumping
3. **What are we going to do about that?**
   - Store passwords using a strong 1-way hashing algorithm
   - Generic authentication error messages
   - Login failure attempt account lockout

Threat Modeling Resources

- OWASP Threat Modeling Cheat Sheet
- OWASP Application Threat Modeling
- Dan Tentler Talk @LayerOne 2017
- Checkmarx Threat Modeling Cheat Sheet

Development

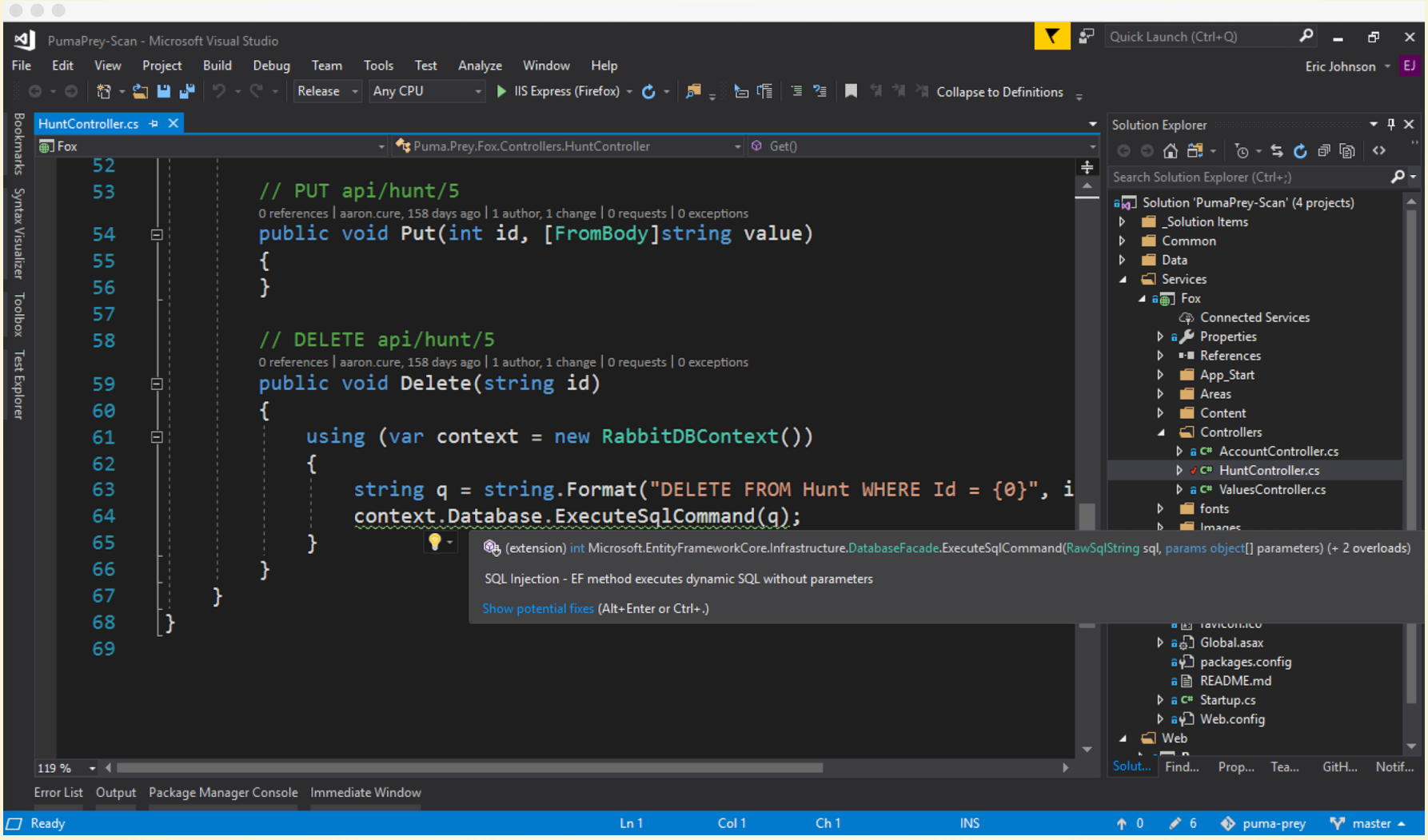
Static Analyzers

- Incredibly good at catching low-hanging fruit
  - Insecure function calls
  - Code smells
- IDE plugin && CI integration most of the time
- Save development time by catching bugs before a branch is even merged

Puma Scan

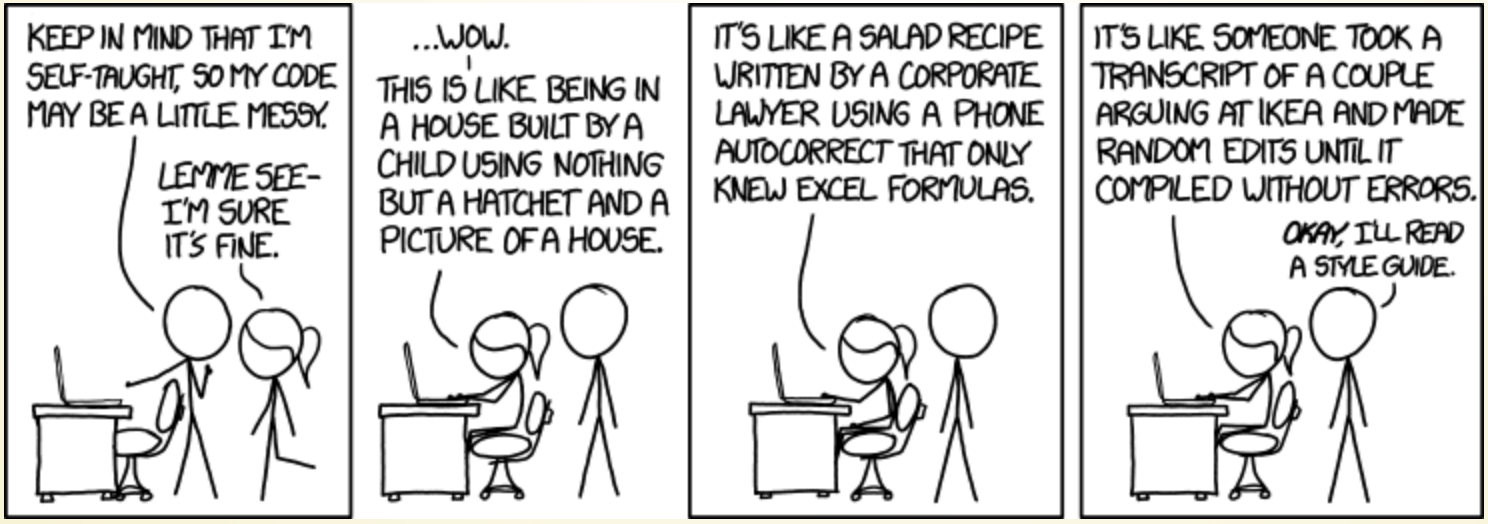
- C# code analysis tool built on top of the Roslyn .NET compiler platform
  - very extensible
- IDE Plugin available from Visual Studio Marketplace
- Analyzes source code and displays warnings as you type
- Pro and Enterprise versions available to integrate into CI pipeline

Puma Scan in Action



Code Reviews

- 2 approvers
  - 1 subject matter expert
- Ensure code is complete, does what is is designed for.
- Look for logic bugs
- Insecure function calls (though these should be caught be static analyzers)



Testing

Penetration Testing

- Specifically internal, white box, penetration testing
- Fits well into Agile - test a release before it goes out to production
- Scope should be small
  - Testing focus' on code changes being released in a given sprint

Penetration Testing Goals

- Using an attacker's mindset
- Attempt to exploit vulnerabilities in the **new** features of the application that are up for release
- Findings should be actionable for the developers, ideally accompanied with a fix for the issue
  - No blame towards the developers
  - Feeds back into developer training

Deployment

Final Security Review

- Does the code satisfy both functional and security requirements?
- Has any new code been introduced that could affect the security of the code to be released?
- Do not want to reduce release velocity - only stop if a serious problem is discovered.

Monitoring

Dynamic Scanning (DAST)

- Constantly scans your application looking for vulnerabilities
- Often does a good job of regression testing new code
- Expedites the creation of hotfixes || rollback if a vulnerability made it out this far.

Dynamic Scanning Resources

- Netsparker
- Veracode
- AppSpider

Questions?