Securing the Core J2EE Patterns

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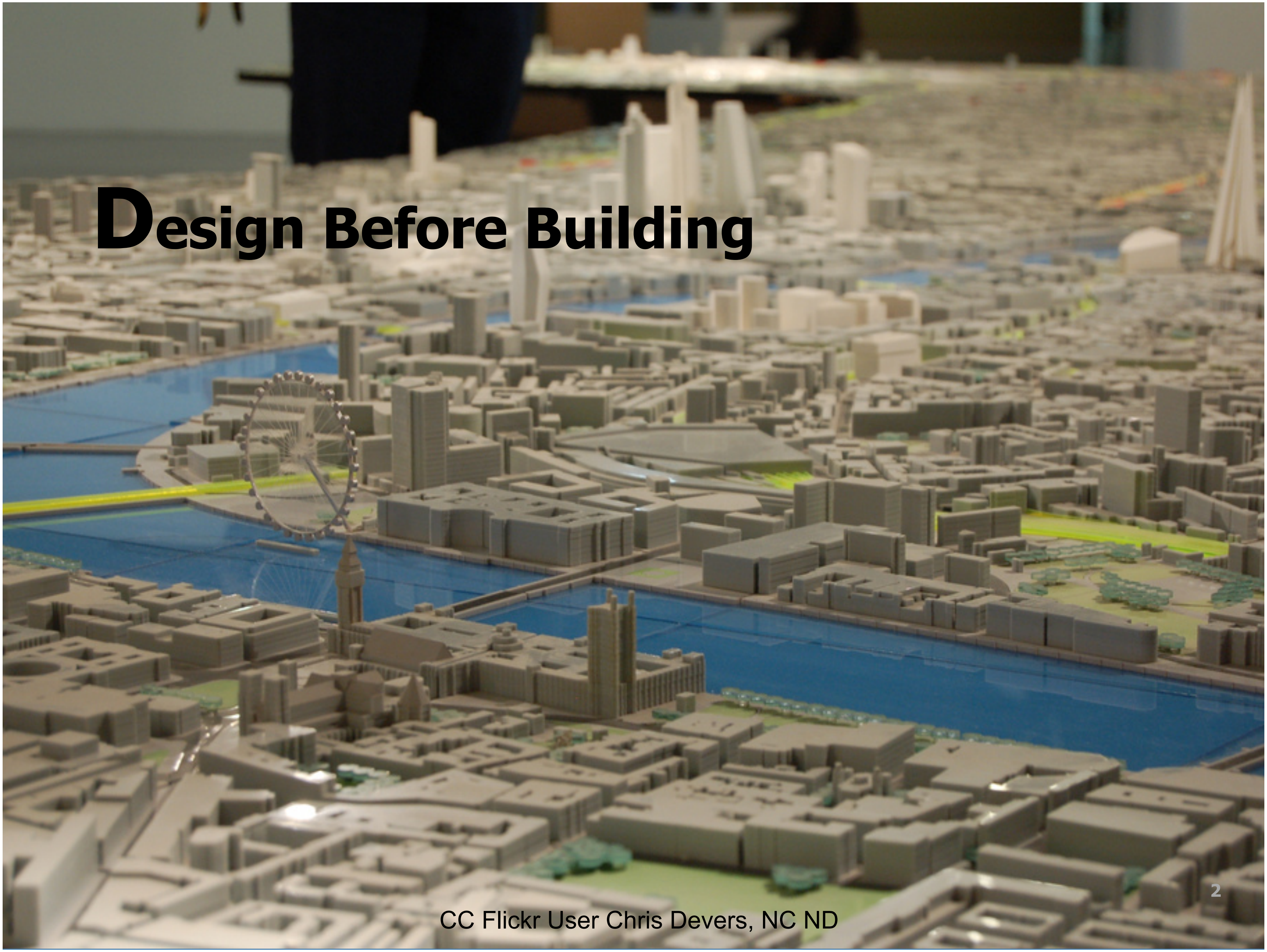
AppSec DC
Sep 21, 2009

The OWASP Foundation
http://www.owasp.org

Design Before Building



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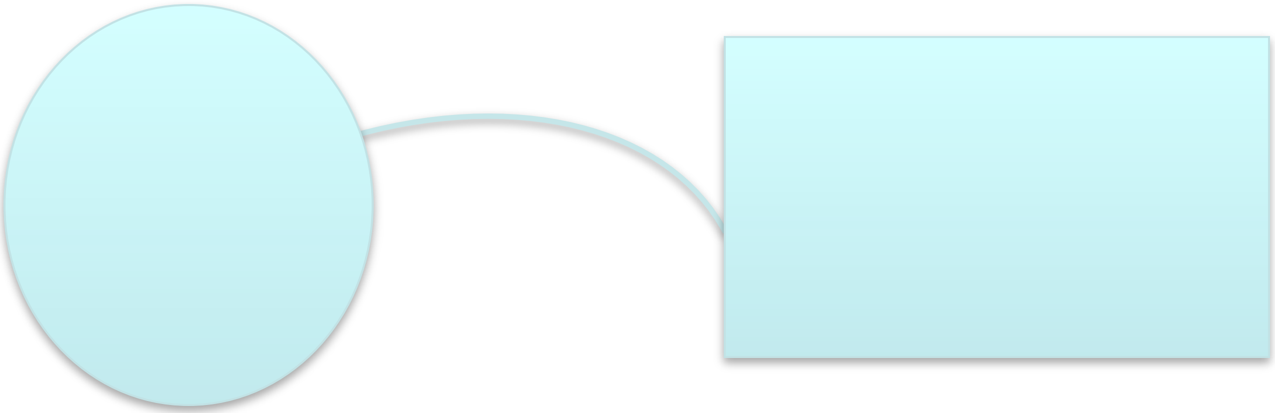
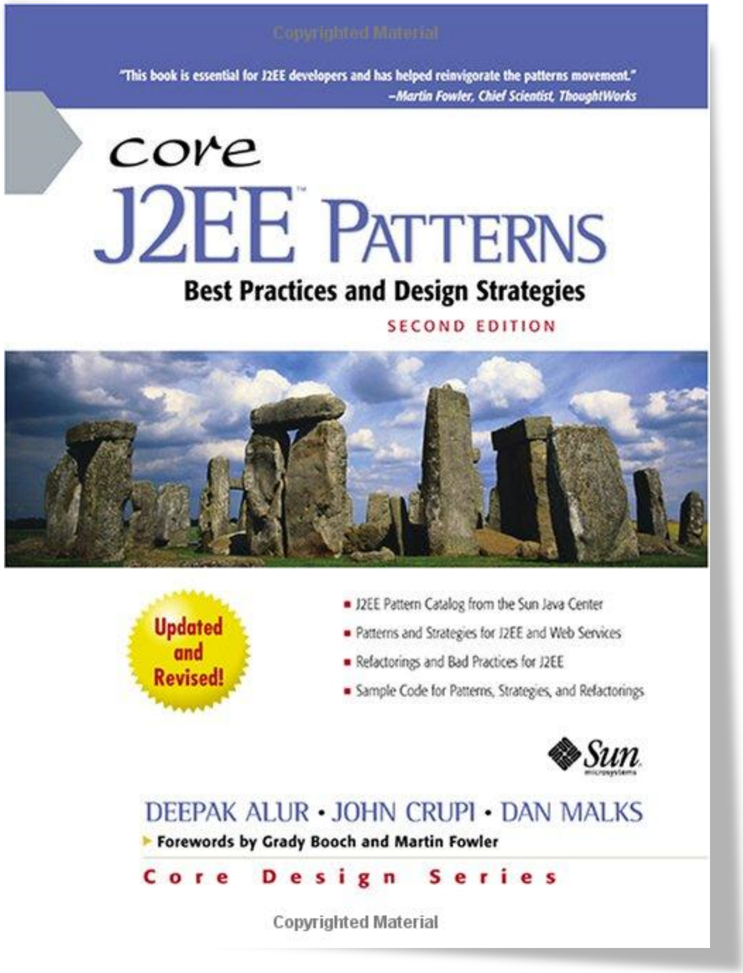
We create Threat Models on Completed Designs



What About *During* Design?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Updated and Revised!
J2EE Pattern Catalog from the Sun Java Center
Patterns and Strategies for J2EE and Web Services
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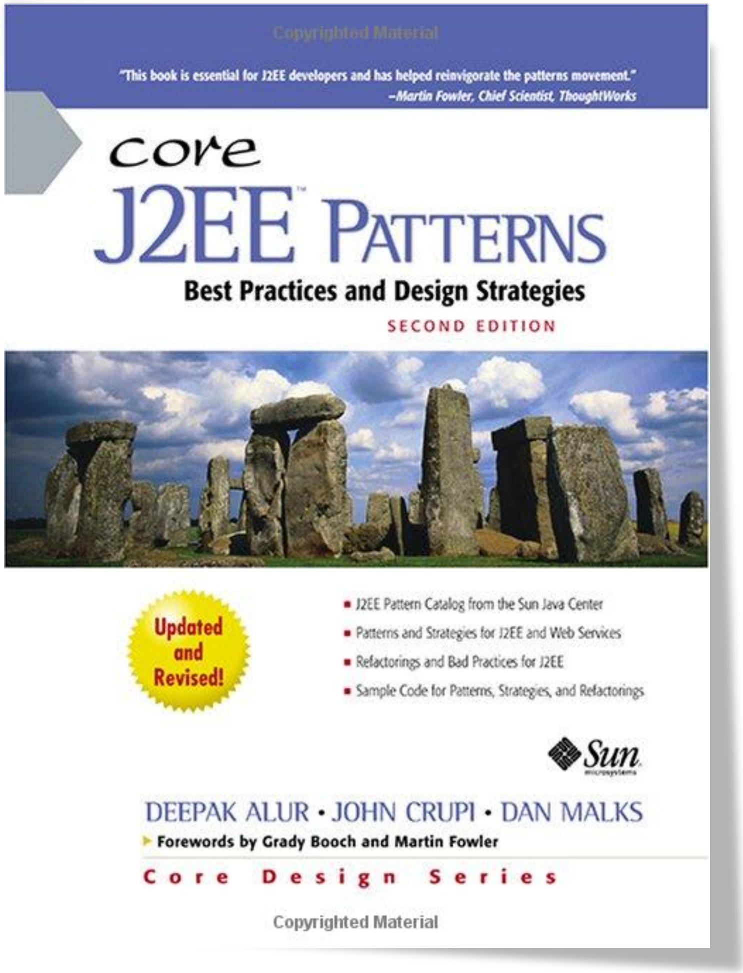
Design Patterns are Used During Design



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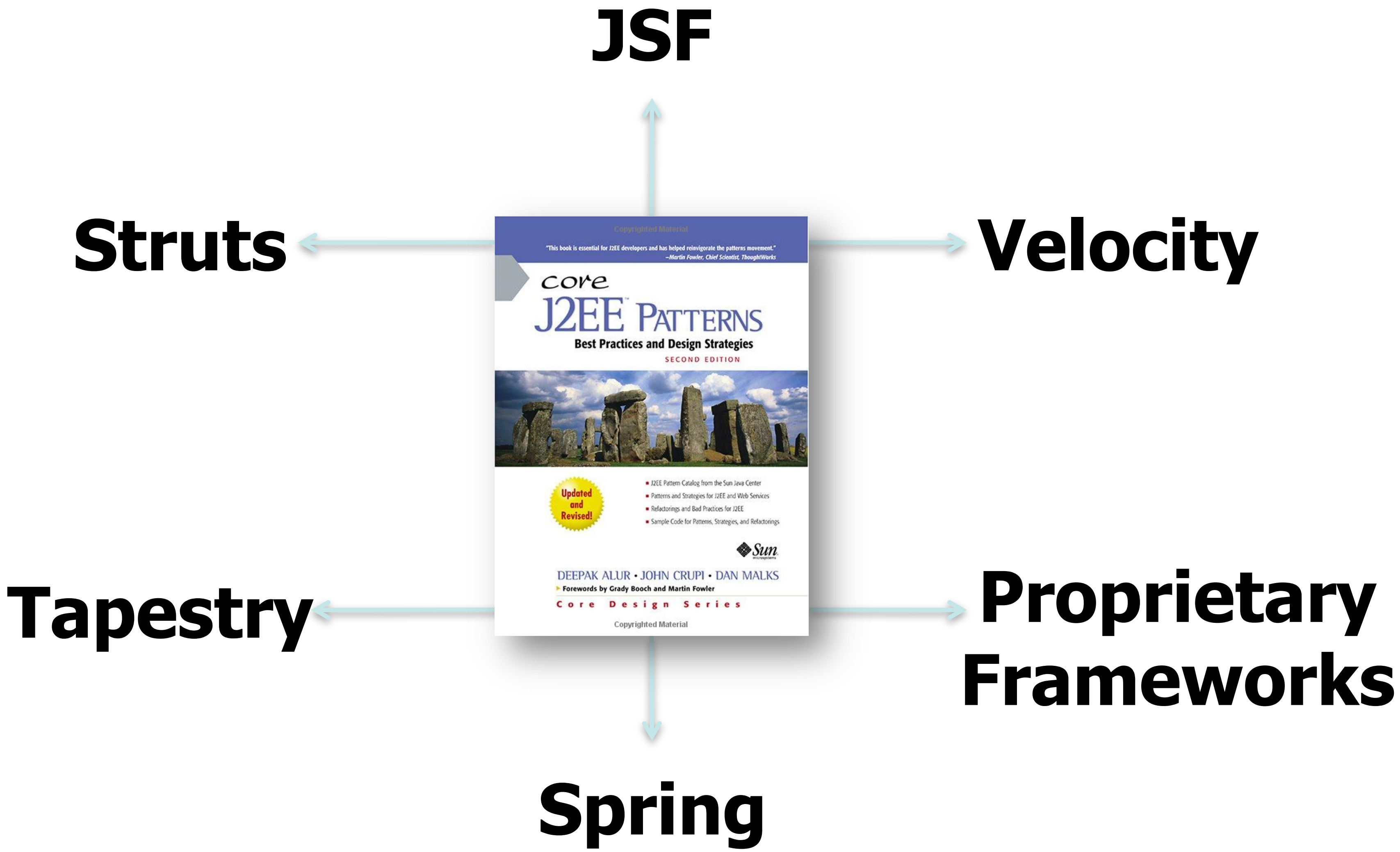
Core J2EE Patterns are Used Extensively



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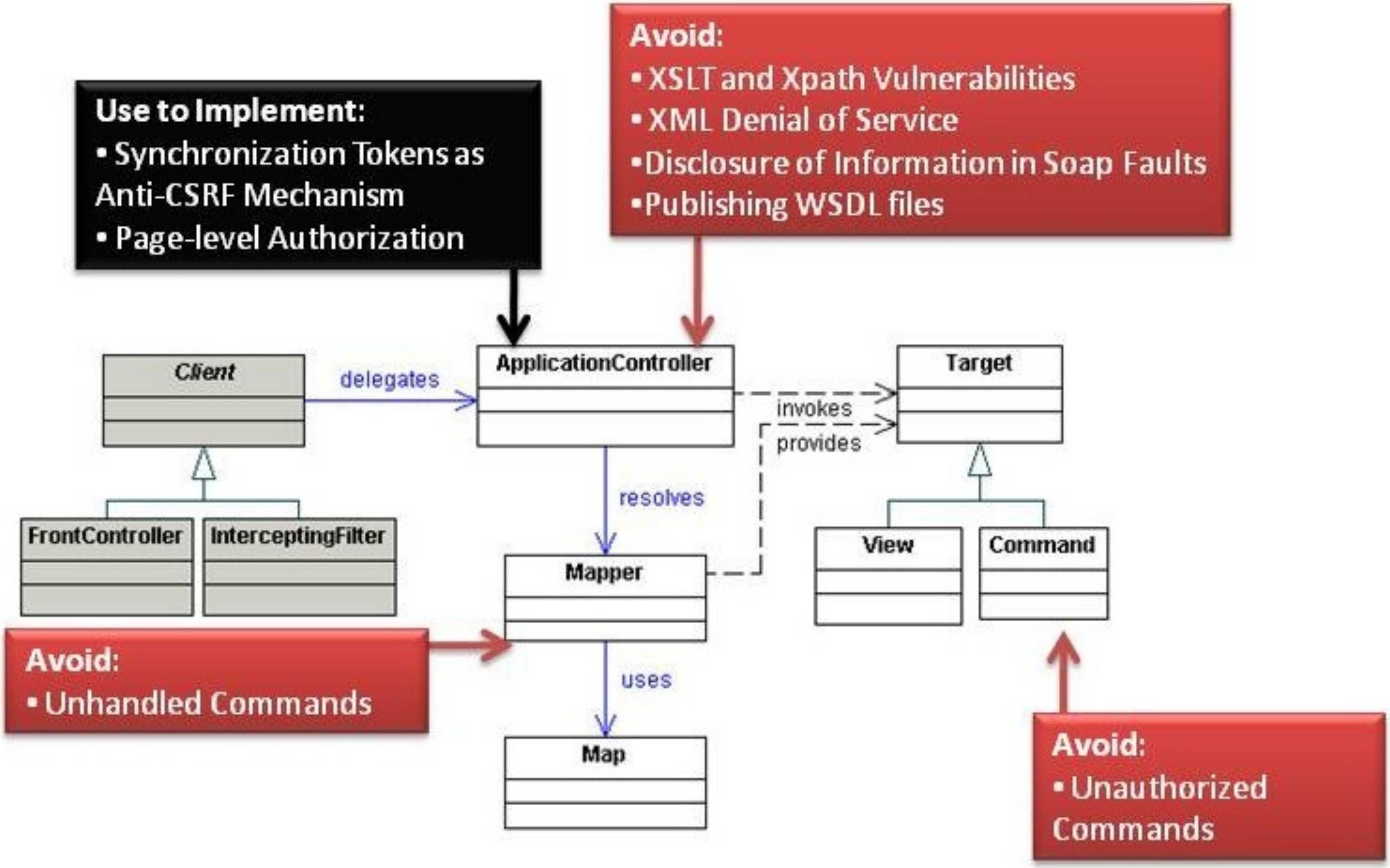
Tapestry

Proprietary Frameworks

Spring

Project: Analyze Patterns



Use to Implement:

- Synchronization Tokens as Anti-CSRF Mechanism
- Page-level Authorization

Avoid:

- XSLT and Xpath Vulnerabilities
- XML Denial of Service
- Disclosure of Information in Soap Faults
- Publishing WSDL files

Avoid:

- Unhandled Commands

Avoid:

- Unauthorized Commands

Project Goals

- Analyze patterns for security pitfalls to avoid
- Determine how patterns can implement security controls
- Provide advice portable to most frameworks

Not Overlapping

"From the ground up, the Java platform was designed for security. Read this book to learn how to apply patterns and proven technologies to secure your J2EE applications and beyond."

—James Gosling, father of the Java™ Programming Language

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SECURITY PATTERNS

Best Practices and Strategies for J2EE™, Web Services, and Identity Management

- A patterns catalog that includes twenty-three new patterns for building end-to-end security
- Security design methodology, patterns, best practices, reality checks, and defensive strategies
- Applied techniques for Web Services security, Identity Management, Service Provisioning, and Personal Identification
- Comprehensive security guide to using J2SE™, J2EE™, J2ME™, and Java Card™

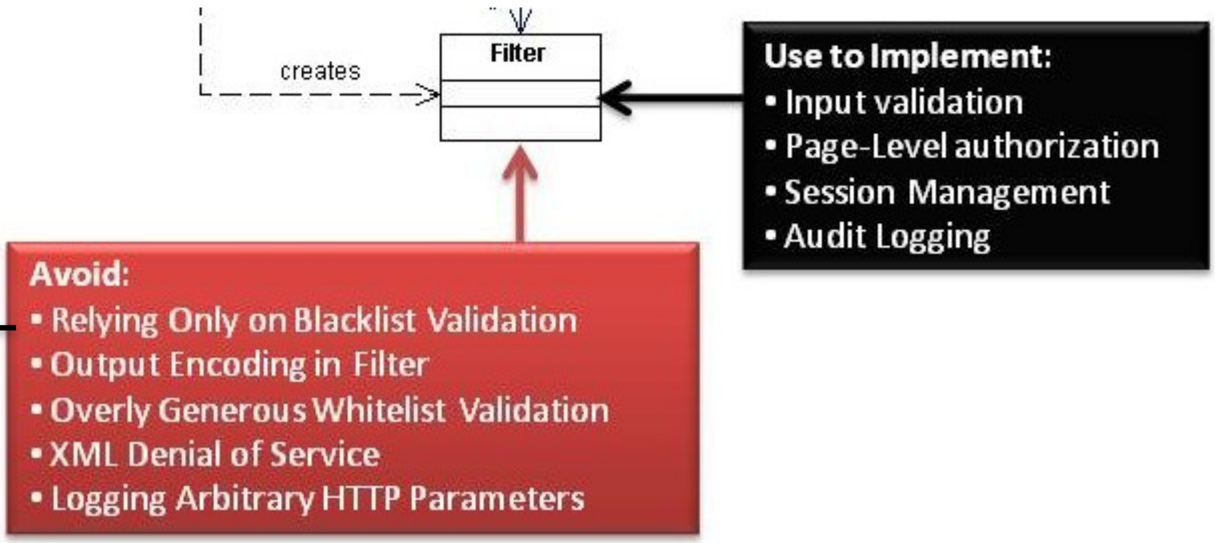
Sun microsystems

CHRISTOPHER STEEL · RAMESH NAGAPPAN · RAY LAI

Forewords by Judy Lin, Executive Vice President, VeriSign, and Joseph Uniejewski, Chief Technology Officer, RSA Security

Uses

- Designing new web application frameworks
- Designing new apps that use the patterns
- Source code review of existing apps
- Runtime assessment of existing apps
- Integrate with threat modeling of new or existing apps

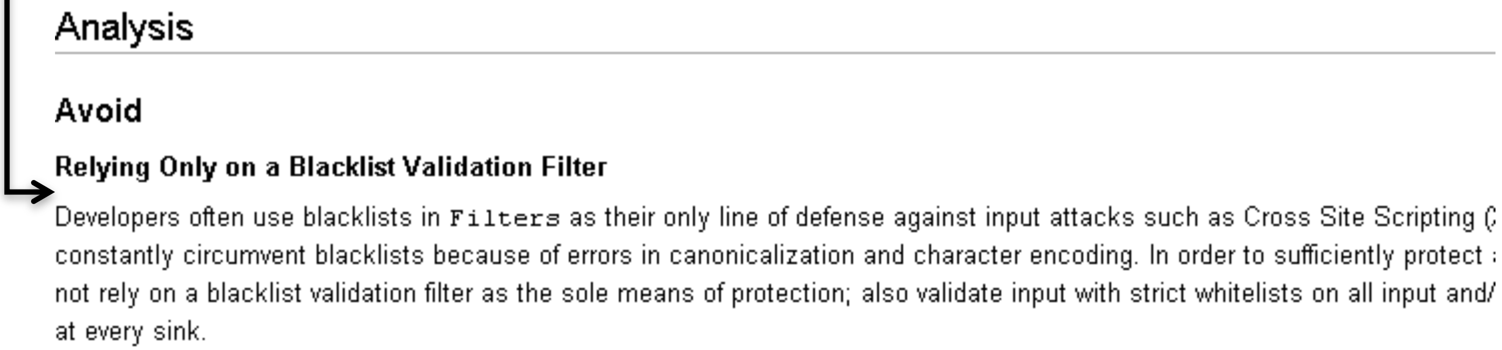


Use to Implement:

- Input validation
- Page-Level authorization
- Session Management
- Audit Logging

Avoid:

- Relying Only on Blacklist Validation
- Output Encoding in Filter
- Overly Generous Whitelist Validation
- XML Denial of Service
- Logging Arbitrary HTTP Parameters

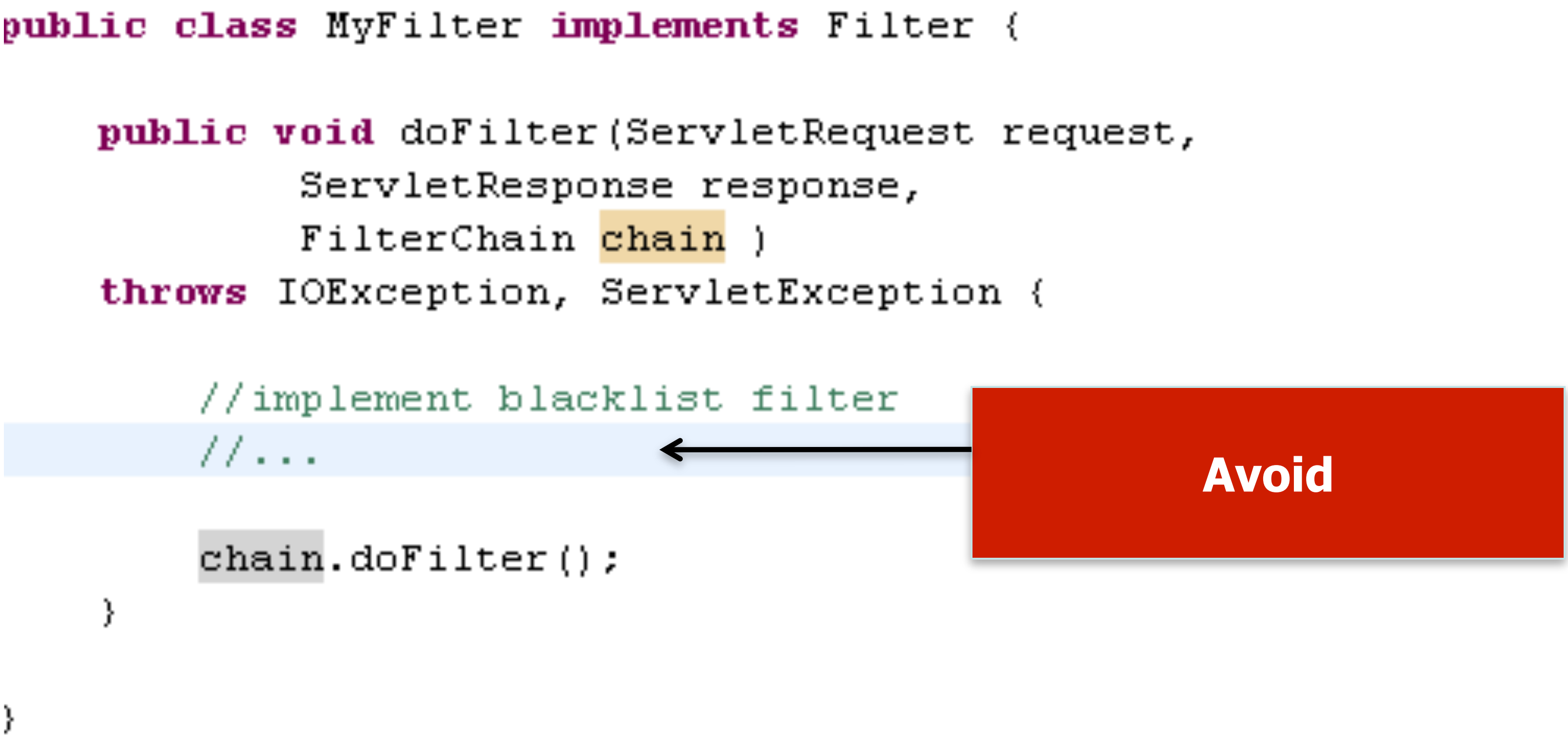


Analysis

Avoid

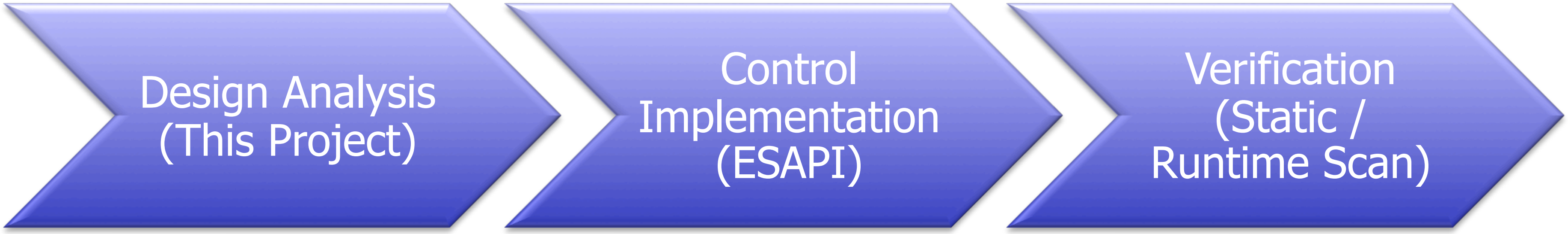
Relying Only on a Blacklist Validation Filter

Developers often use blacklists in `Filters` as their only line of defense against input attacks such as Cross Site Scripting (constantly circumvent blacklists because of errors in canonicalization and character encoding. In order to sufficiently protect not rely on a blacklist validation filter as the sole means of protection; also validate input with strict whitelists on all input and/ at every sink.



```
public class MyFilter implements Filter {

    public void doFilter(ServletRequest request,
            ServletResponse response,
            FilterChain chain )
    throws IOException, ServletException {

        //implement blacklist filter
        //...

        chain.doFilter();
    }

}
```

Avoid


Design Analysis (This Project)
Control Implementation (ESAPI)
Verification (Static / Runtime Scan)

You Can Help ...

...Tell Developers

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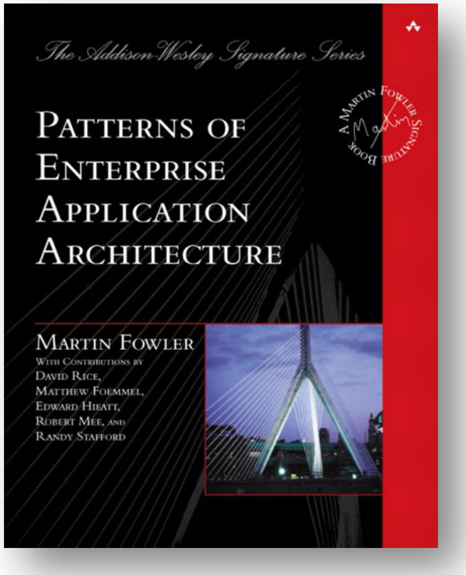
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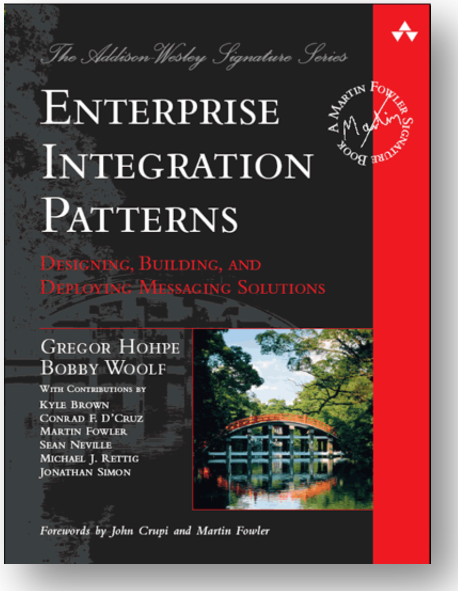
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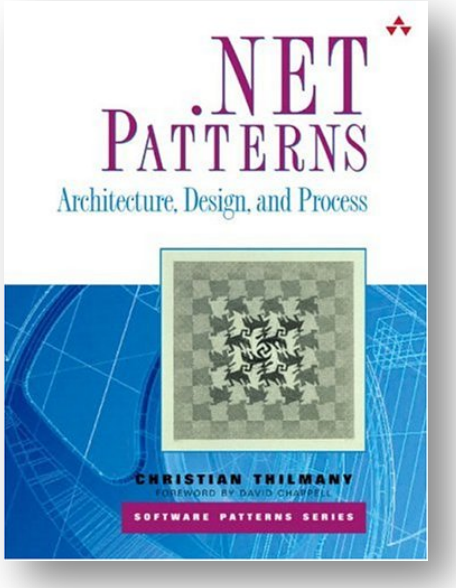
Next?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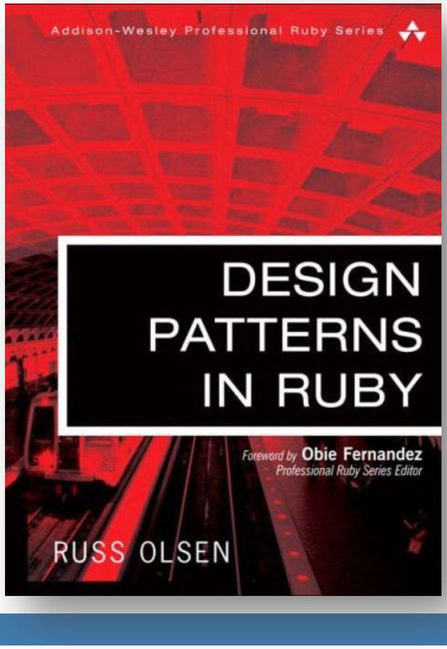
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Foreword by Obie Fernandez
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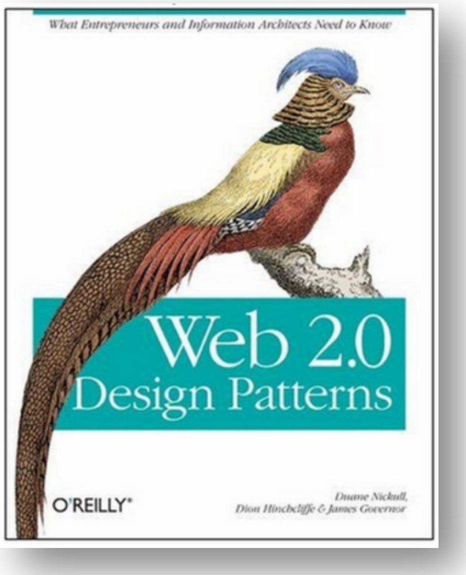
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New web application framework idea

Design-time security analysis

Secure-by-default web application framework

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