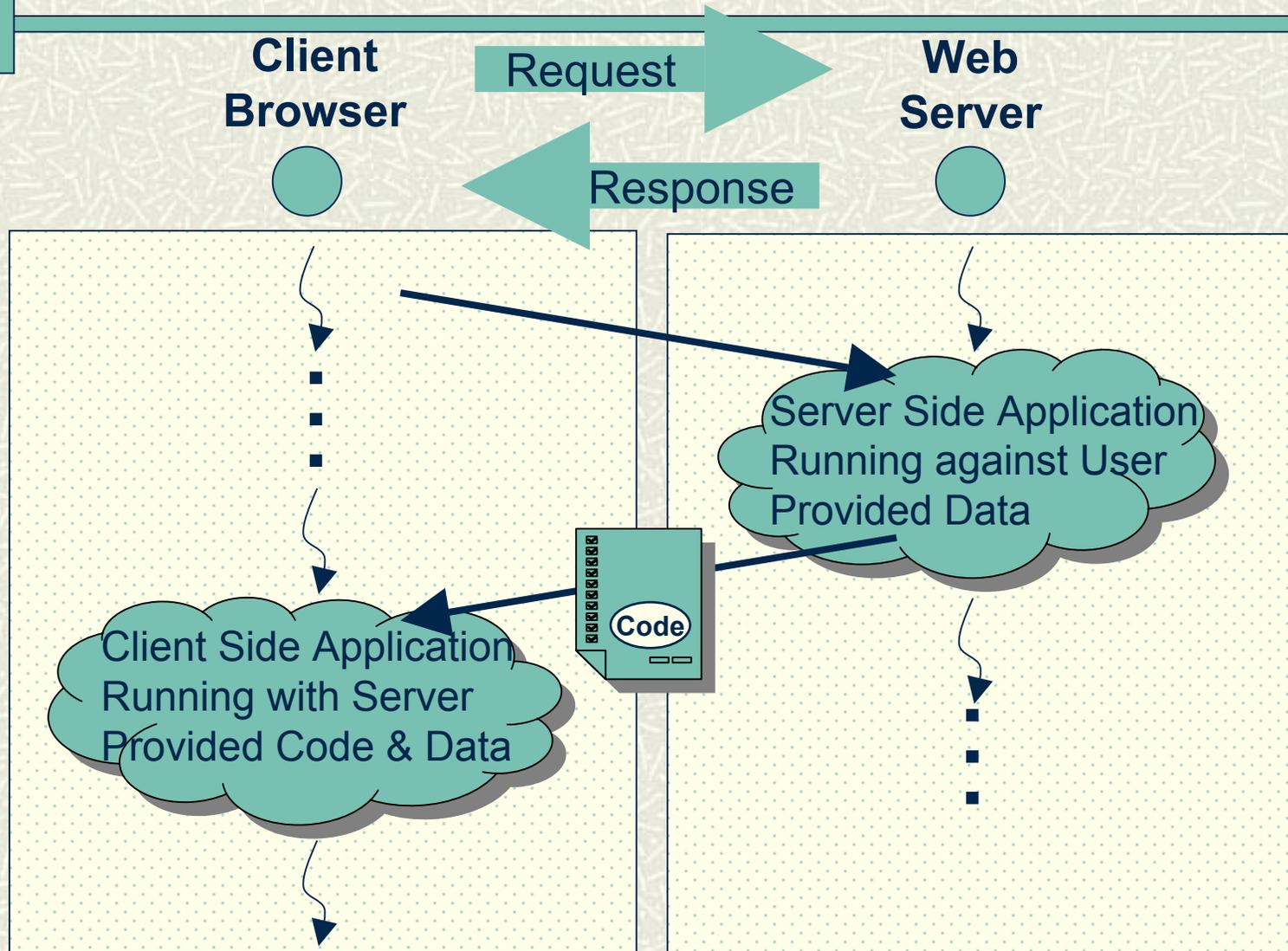


Browser Extensions & Security

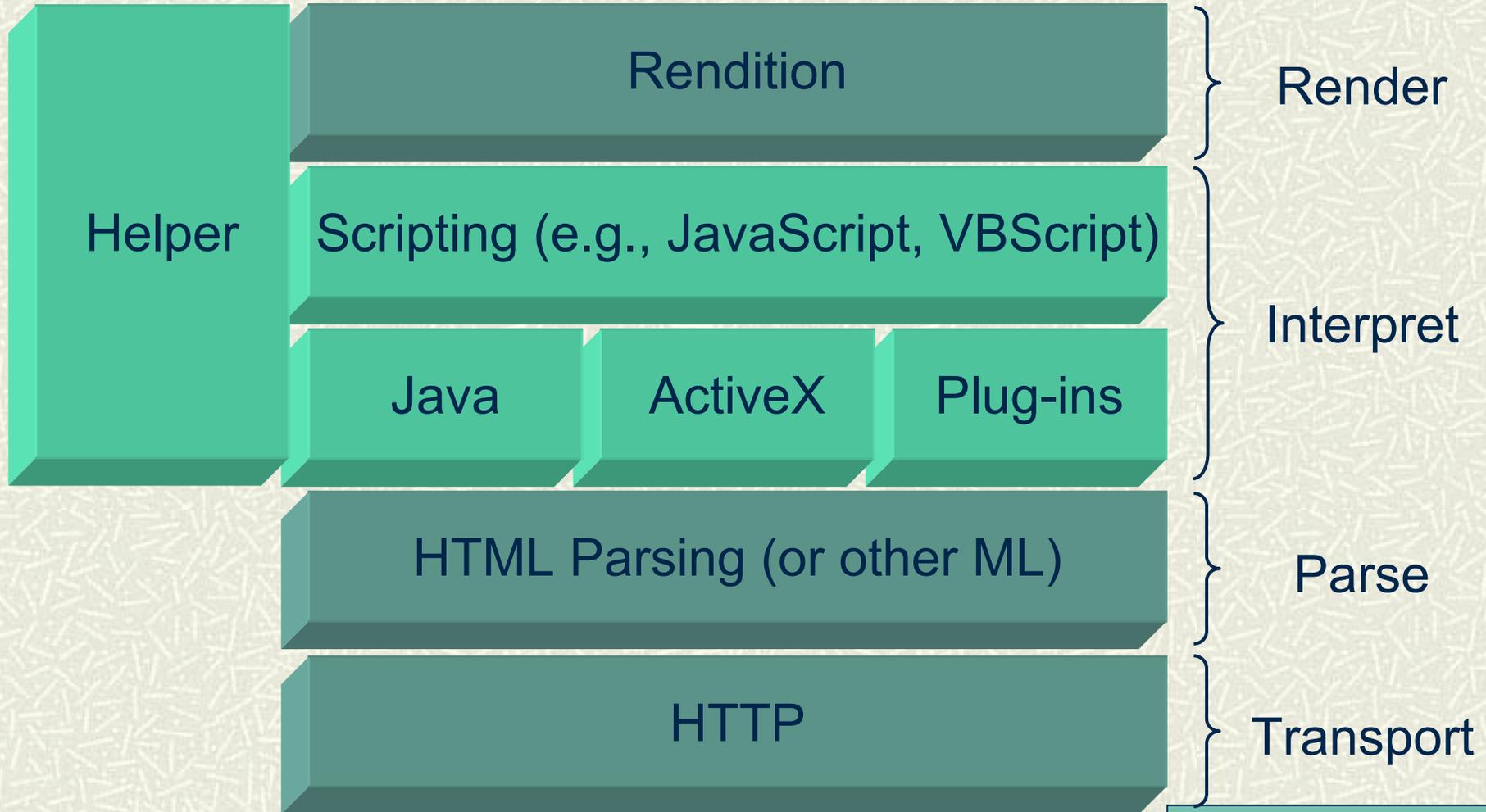
Wayne A. Jansen
National Institute of Standards
and Technology



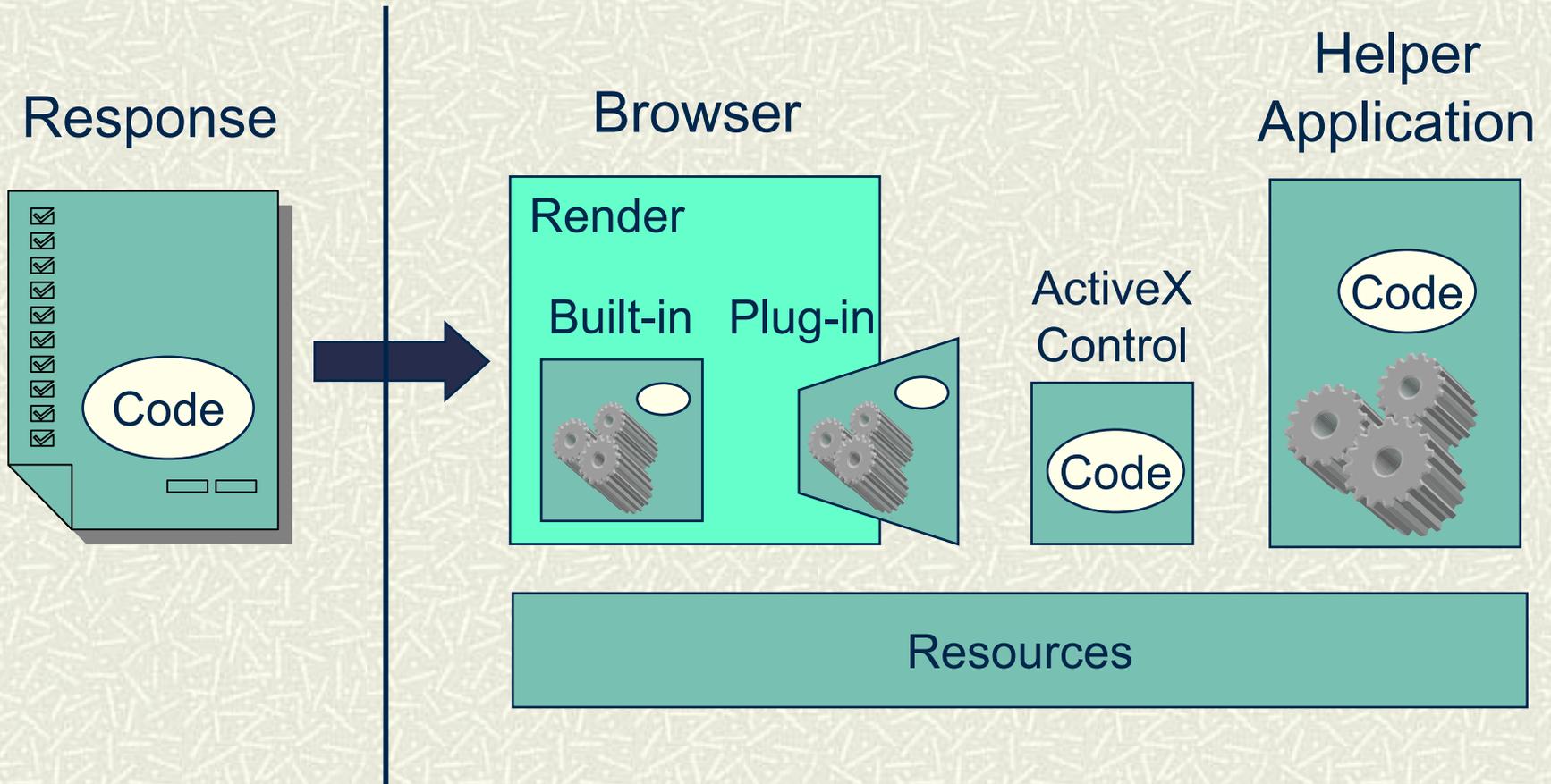
Simplified Web Transaction



Browser Anatomy



Execution Environment



Risks of Mobile Code

- # Execution environments are designed to offer mobile code access to local resources: windows, files, network sockets, etc.
 - # Environments are often set up to run mobile code automatically, malicious code may:
 - gain unauthorized access to resources
 - manipulate resources covertly
 - ignore local security policies/procedures
 - perform malicious actions using the user's identity
 - # Different mobile code technologies have:
 - widely varying degrees of access to resources
 - different kinds of security controls
-

Classes of Technical Controls

- # Cage - constrain the code's behavior (e.g., privilege or function) during execution
- # Filter - examine code at an entry point and block or disable if deemed harmful
- # Signature - execute code only if it is digitally signed by some trusted authority
- # Proof - before executing the code, verify that the proof of its properties, conveyed with it, satisfies policy
- # Hybrid - some combination of the controls above

Assessing Risk

- # Assessing the risk imposed by a particular mobile code technology begins with examining the code's context:
 - access to resources: display, files, network, etc.
 - security controls: how and when controls are imposed, how effective they are, how well they can be configured
 - other countermeasures: effectiveness of external technical or policy countermeasures
 - # Choosing whether to support and accept a particular mobile code technology must involve balancing its risks against the benefits it can provide
-

Example Risk Categories

- # High - Conveyed mobile code has broad functionality with unmediated access to computational resources
- # Medium - Conveyed mobile code has broad functionality with controlled access to computational resources
- # Low - Conveyed mobile code has limited functionality with controlled access to computational resources
- # Plus accounting for the presence or absence of code signing

Technology Related Risks

- # Portable Document Format (PDF)
 - # JavaScript and VBScript
 - # New Media Plug-ins
 - # Java
 - # PostScript
 - # ActiveX
- Low
- Medium
- High

Guidance Overview

- # NIST guides have been concerned with accessing public as opposed to private or sensitive information
 - # Focus has been on protecting government systems from mobile code threats
 - Deploy the lowest risk mobile code technology on Websites
 - Disable risky mobile code technologies on browser
 - Apply technical and other controls to mitigate risks
-

Summary

- # “Touching the browser” is a bit of a misnomer – we regularly affect the client side by serving acrobat, word, and other content
 - # Different technologies affect the browser differently and new technologies are continually on the horizon, making it difficult to pick a winner
 - # Ultimately, agencies are left with the decision as to how best to interface technologically with citizens
-

Further Information

Computer Security Resource Center Guides:

Guidelines on Active Content & Mobile Code

<http://csrc.nist.gov/publications/nistpubs/800-28/sp800-28.pdf>

Guidelines on Securing Public Web Servers

<http://csrc.nist.gov/publications/nistpubs/800-44/sp800-44.pdf>

Security for Telecommuting & Broadband
Communications

<http://csrc.nist.gov/publications/nistpubs/800-46/sp800-46.pdf>

Email: Jansen@NIST.Gov
