

Microsoft® Research

Faculty Summit 2010

Making a Open Ecosystem

Fred Wurden

Partner Product Unit Manager

Microsoft Corporation

fred.wurden@microsoft.com

Microsoft Open Protocols

Microsoft Open Protocols - Windows Internet Explorer

http://www.microsoft.com/protocols/

Microsoft Open Protocols

Click Here to Install Silverlight

United States Change | All Microsoft S

Search Microsoft Open Protocols

White Papers Case Studies e-Newsletter Contact

Interoperability Standards Open Protocols

Protocol Documentation Patent Rights Resources

Microsoft Open Protocols

MSDN Resources

- Open Specifications Developer Center
- Open Specifications Protocol Information
- Open Specifications Community Forums

News | Microsoft partners up for open-source Azure, Silverlight tools

To foster innovation and interoperability, Microsoft makes available technical specifications for protocols used to communicate with a number of its most popular products, including various versions of Windows and Windows Server, Microsoft SQL Server, Microsoft Office, Microsoft Exchange Server, and Microsoft Office SharePoint Server.

FEATURED ARTICLES

Microsoft working with Xandros responding to feedback from IEC Council member NATO

Learn more about managing multiple heterogeneous systems across a large distributed network environment from a single point of access and the need to aggregate status information and alerts to

News Highlights | Blog Highlights

October 29, 2009
Eclipse Revisited - this time Windows 7

October 28, 2009

Internet | Protected Mode: On 125%

<http://www.microsoft.com/protocols>

“BlueLine” Technical Document Testing Program of Windows (as of 03/09)

- 222 protocols/technical documents tested
- 22,847 pages studied and converted into requirements
- 36,875 testable requirements identified and converted into test assertions
 - 69% tested using **model-based testing** with Spec Explorer
 - 31% tested using traditional test automation
- 66,962 person days (250+ years)
 - Hyderabad: 250 test engineers
 - Beijing: 100 test engineers

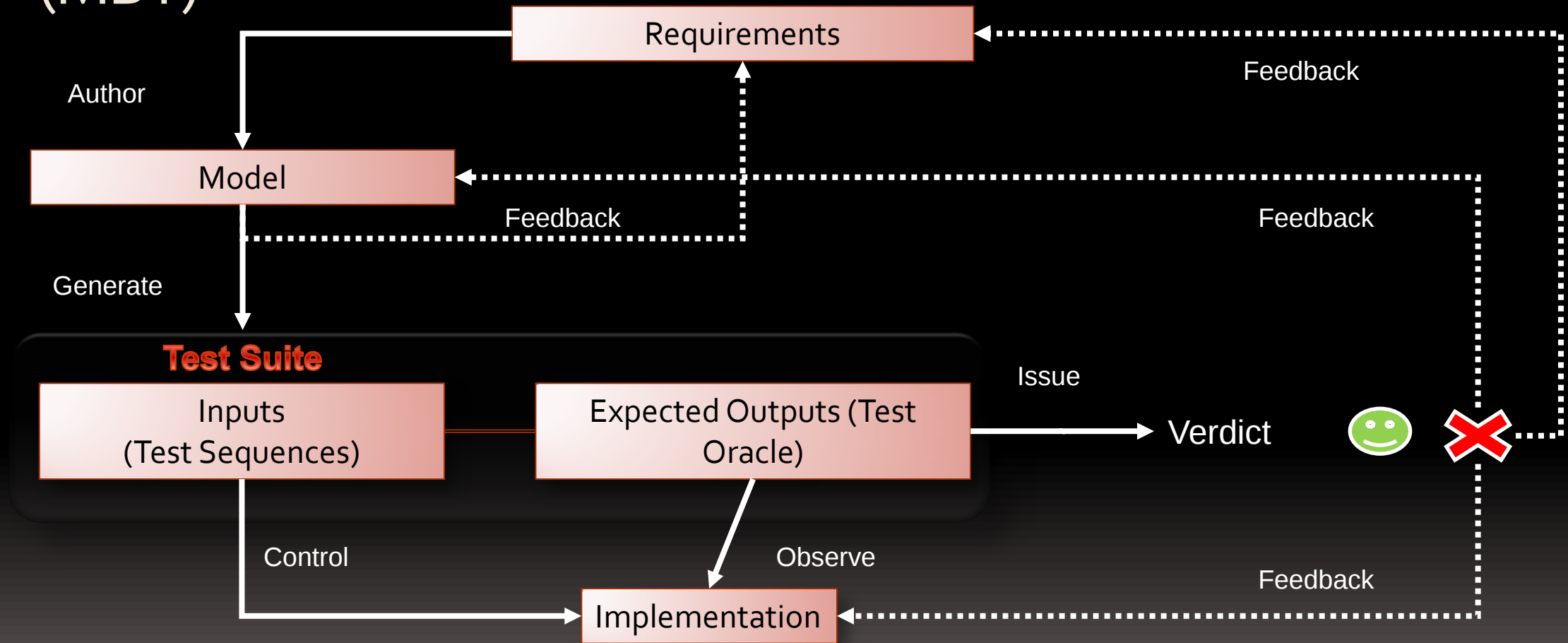
Comparison MBT vs Traditional



■ Model-Based
■ Traditional

- In % of *total* effort per requirement, normalizing individual vendor performance
- Vendor 2 modeled 85% of all test suites, performing relatively much better than Vendor 1

Model-Based Testing in a Nutshell (MBT)



Spec Explorer Features

- Visual Studio add-in
- Multiple modeling styles and languages
 - Programs, patterns, diagrams
- Asynchronous & non-deterministic systems
- State machine extraction from model program
- Test code generation from state machine
- Model composition

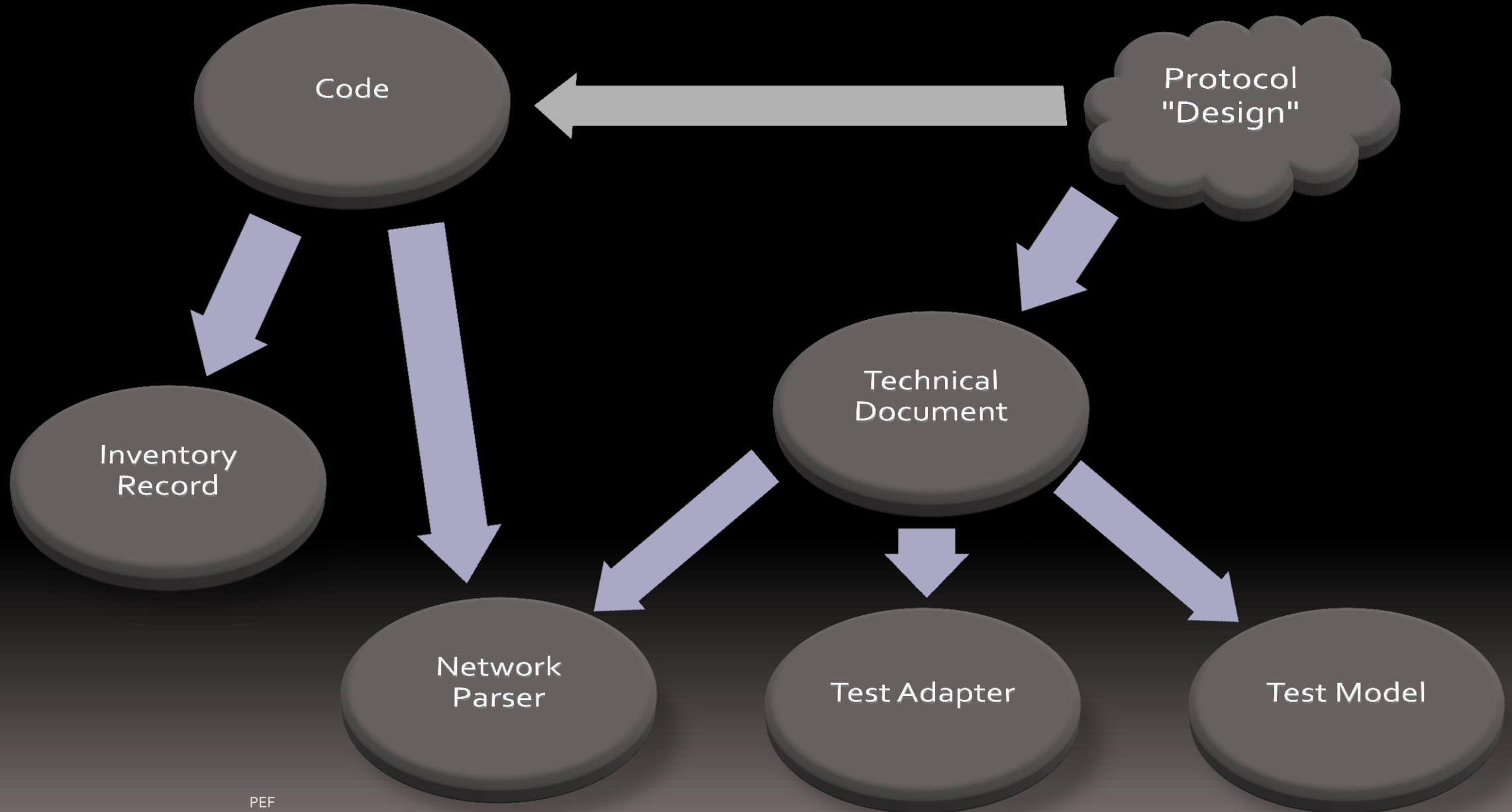
Give it a try...

- Microsoft offers Spec Explorer 2010 as preview technology free of charge via MSDN DevLabs:
<http://msdn.microsoft.com/devlabs>
- Licensing allows for commercial use
- Academic institutions can join MSDN Academic Alliance for access to Visual Studio 2010

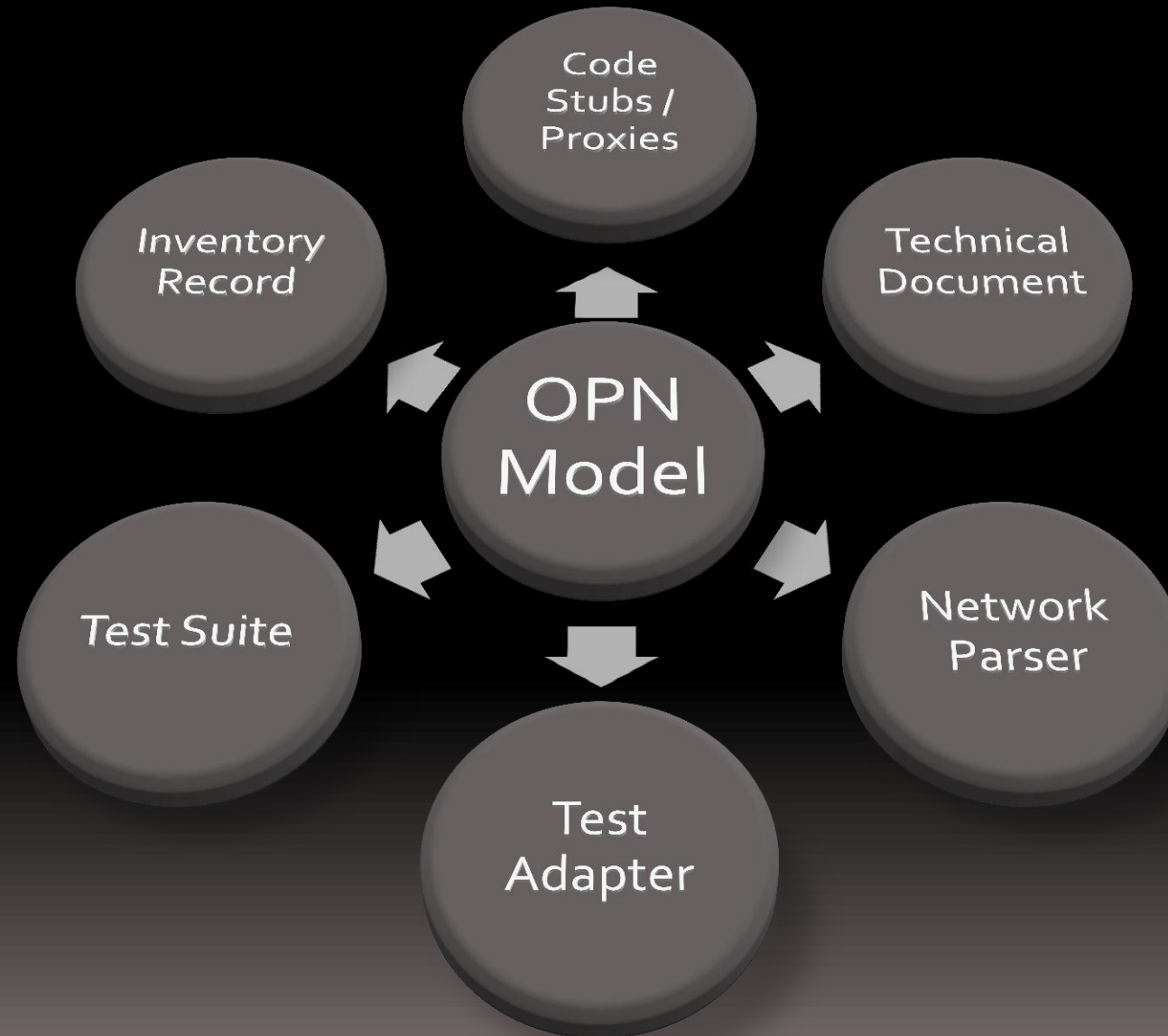
Moving Forward: The Challenges

- Multiple masters
 - Specs, Code, Parsers, Models, Test Suites, Inventory
 - Efficiency and accuracy of creation / maintenance hard
- Verification
 - Need to improve efficiency
 - Need to reduce subjectivity
- Difficulty capturing messages
 - High bandwidth
 - Compression, encryption, and fragmentation
 - Virtualization, network stack offloading

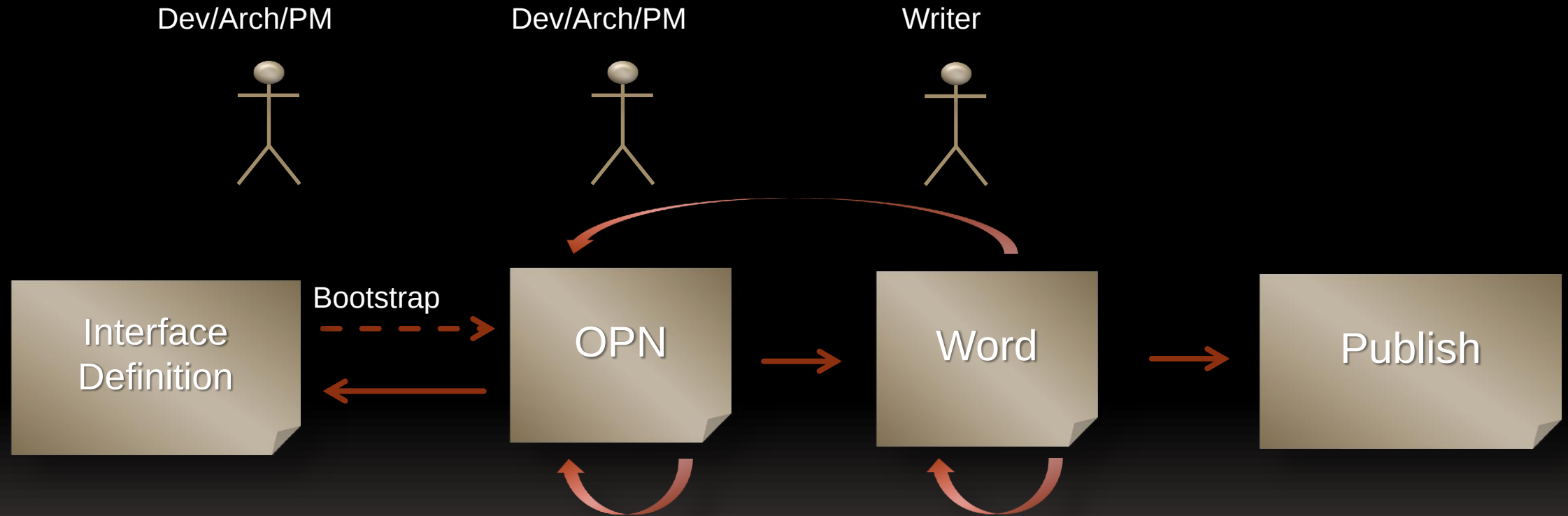
Present



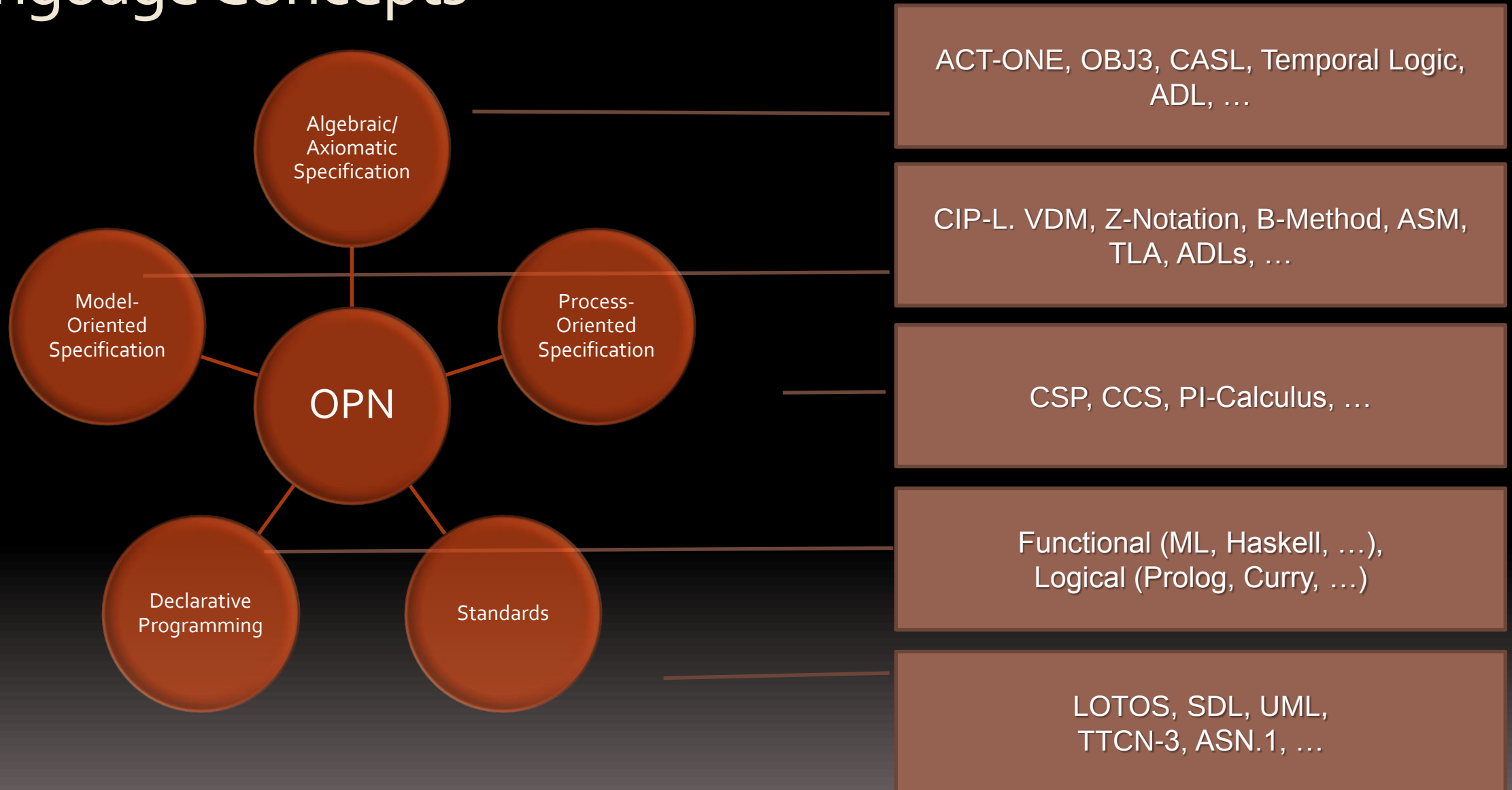
Future – Open Protocol Notation (OPN)



Document Generation

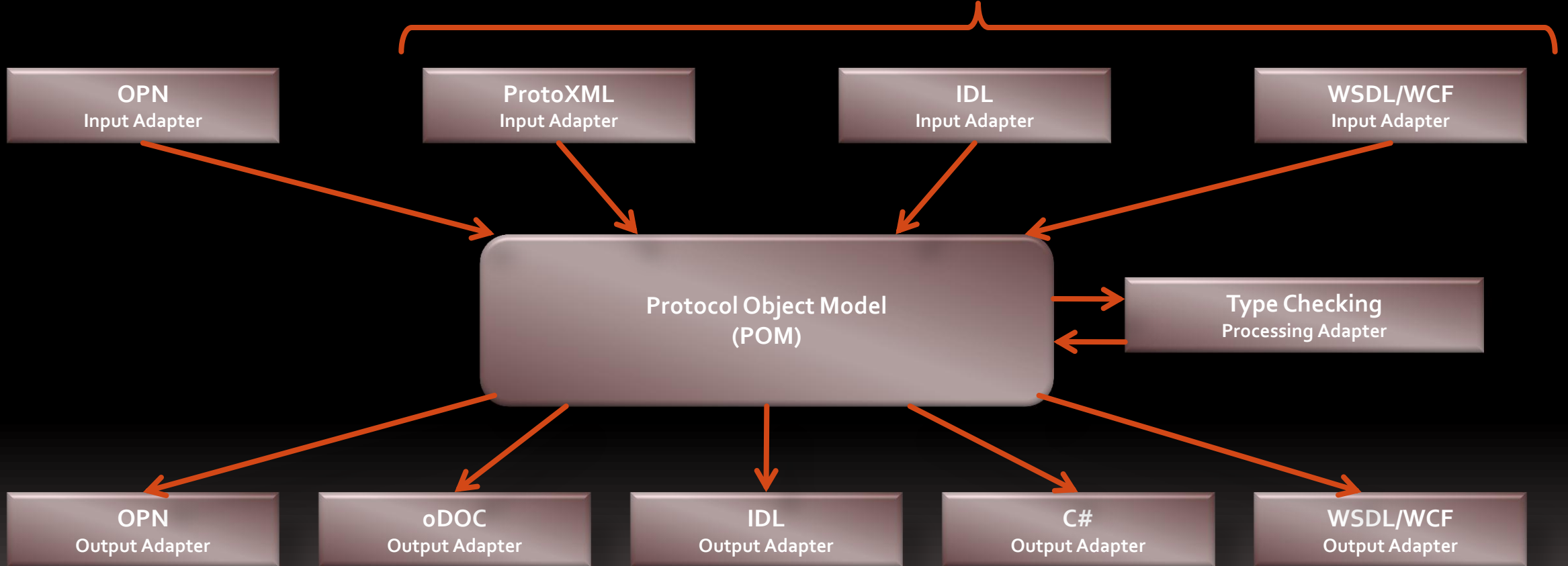


Language Concepts



The Protocol Object Model (POM)

Bootstrapping



Down the road

- Extended Consistency Checking
 - Matching analysis
 - Architecture checking
- Model-Checking and Simulation
 - Symbolic state space exploration (as in Spec Explorer)
- Test generation
 - Traversals on the result of state space exploration
- Architecture exploration
 - Enumeration of valid configurations
- Code-Stub generation and contract injection
 - Get assertions from the model into the code

Microsoft® Research

Faculty Summit 2010