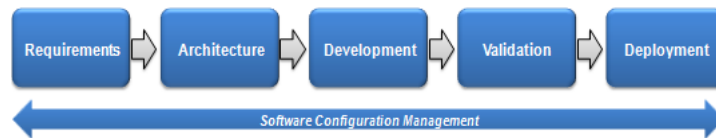


## Software Engineering with LabVIEW

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### Configuration Management Tools and Guidelines

- 1 Learn how to use tools built into the development environment in combination with third party tools such as source code control in order to manage large applications across multiple developers

#### Related Topics:

- Software Configuration Management and LabVIEW (<http://www.ni.com/product-documentation/4114/en/>)
- Best Practices for Managing NI LabVIEW Applications Using the Project Explorer (<http://www.ni.com/product-documentation/7197/en/>)
- Using TortoiseSVN (Subversion) with LabVIEW for Diff and Merge Operations (<https://forums.ni.com/t5/Example-Program-Drafts/Source-Code-Control-Using-TortoiseSVN-Subversion-with-LabVIEW/ta-p/3510829>)
- [Webcast] Application Management Best Practices in LabVIEW (<http://www.ni.com/webcast/707/en/>)
- Best Practices for Sharing and Reusing LabVIEW Code (<http://www.ni.com/tutorial/9648/en/>)

### Requirements Traceability and Mapping

- 2 Use requirements to verify the quality and completeness of your application using your existing requirements management solutions.

- An Overview of Requirements Gateway for Test, Measurement and Control Applications (<https://www.ni.com/en-us/innovations/white-papers/06/ni-requirements-gateway-for-test-measurement-and-control-appli.html>)
- Tutorial for configuring Requirements Gateway Traceability (<http://www.ni.com/tutorial/8414/en/>)
- Map Requirements Documents to LabVIEW Code with NI Requirements Gateway (<https://www.ni.com/en-us/innovations/white-papers/06/ni-requirements-gateway-for-test-measurement-and-control-appli.html>)
- NI LabVIEW and CMMI-Compliant Requirements Management (<https://learn.ni.com/center-of-excellence>)
- [Webcast] Managing Requirements and Developing Large LabVIEW Applications (<http://www.ni.com/webcast/313/en/>)

### Application Architecture

- 3 Design your LabVIEW application to ensure that it addresses the critical aspects of your application and that it scales for large application development and large numbers of developers

- State Machine Design Patterns Technical Manual and Exercises (<https://forums.ni.com/t5/LabVIEW-Development-Best/State-Machine-Design-Patterns-Technical-Manual-and-Exercises/ta-p/3490847>)
- Applying Common Object-Oriented (OO) Design Patterns to LabVIEW (<https://forums.ni.com/t5/Example-Program-Drafts/Applying-Common-Object-Oriented-OO-Design-Patterns-to-LabVIEW/ta-p/3510571>)
- Object Oriented Design Patterns Technical Manual and Exercises (<https://forums.ni.com/t5/LabVIEW-Development-Best/Object-Oriented-Design-Patterns-Technical-Manual-and-Exercises/ta-p/3507995>)
- Designing Scalable Object Oriented Systems using Actor Framework and Abstraction Layers (<https://forums.ni.com/t5/LabVIEW-Development-Best/Measurement-Abstraction-Plugin-Framework-with-Optional-TestStand/ta-p/3531389>)

### Code Re-Use and Interoperability

- 4** Learn about the practices and tools that are recommended for communication with other programming environments

- Calling LabVIEW VIs from Other Programming Languages (<http://www.ni.com/tutorial/5719/en/>)
- Writing Win32 DLLs and Calling Them from LabVIEW (<https://knowledge.ni.com/KnowledgeArticleDetails?id=kA00Z0000019Ls1SAE&l=en-US>)
- Integrating LabVIEW Code into Other Programming Languages (<http://www.ni.com/tutorial/5719/en/>)
- ActiveX and COM Article Series (<https://www.ni.com/en-us/innovations/white-papers/06/activex-and-labview.html>)
- Loading .NET Assemblies from LabVIEW ([http://zone.ni.com/reference/en-XX/help/371361R-01/lvconcepts/loading\\_assemblies/](http://zone.ni.com/reference/en-XX/help/371361R-01/lvconcepts/loading_assemblies/))

### Developing, Debugging and Reviewing Code

- 5** Learn what to look for when auditing code developed in LabVIEW. Enforce proper coding styles to improve readability and performance.

- NI LabVIEW Style Guide (<http://zone.ni.com/reference/en-XX/help/371361R-01/lvdevconcepts/checklist/>)
- Using the LabVIEW VI Analyzer Toolkit for Static Code Analysis (<http://sine.ni.com/nips/cds/view/p/lang/en/nid/209042>)
- Creating Code Modules with the LabVIEW Project Library (<http://www.ni.com/tutorial/4067/en/>)
- Memory Management in LabVIEW Using the In Place Element Structure ([http://zone.ni.com/reference/en-XX/help/371361R-01/lvconcepts/in\\_place\\_element/](http://zone.ni.com/reference/en-XX/help/371361R-01/lvconcepts/in_place_element/))
- [Wiki] Professional User Interface Examples and Resources (<https://forums.ni.com/t5/UI-Interest-Group/ct-p/7019>)

### Testing and Validation of LabVIEW Applications

- 6** Develop test frameworks to validate that your code works correctly in order to meet ISO and other regulatory standards

- Best Practices for Testing Safety Compliant Systems (<https://www.ni.com/en-us/innovations/white-papers/11/best-practices-for-embedded-software-testing-of-safety-compliant.html>)
- Using the Unit Test Framework for Software Testing and Validation (<https://www.ni.com/en-us/innovations/white-papers/09/prove-it-works--using-the-unit-test-framework-for-software-testi.html>)
- Tracing Requirements to Unit Tests for VIs (<http://www.ni.com/tutorial/8421/en/>)
- Webcast: Using the Unit Test Framework (<http://www.ni.com/webcast/1107/en/>)
- Applying Code Complexity Metrics to LabVIEW Applications (<https://www.ni.com/en-us/innovations/white-papers/06/estimating-code-complexity-in-labview.html>)

### Deployment Process

- 7** Develop repeatable deployment methods in order to distribute code amongst developers and deploy end use executables and installers

- Distributing Applications with the LabVIEW Application Builder (<http://www.ni.com/tutorial/3303/en/>)
- Replication and Deployment (RAD) Utility for Embedded Systems (<http://www.ni.com/example/30986/en/>)
- Deploying and Replicating Embedded Systems (<https://www.ni.com/en-us/shop/compactrio/compactrio-developers-guide.html>)
- Deploying Applications to CompactRIO (<https://www.ni.com/en-us/shop/compactrio/compactrio-developers-guide.html>)
- RT Application Deployment Utility Reference Application (<http://www.ni.com/example/30986/en/>)
- Programmatically Build Projects in LabVIEW (<http://www.ni.com/example/30051/en/>)
- Managing FPGA Deployments (<http://www.ni.com/product-documentation/9640/en/>)