A Focused Approach to Software Architectural Recovery

http://sunset.usc.edu/~neno/Focus

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Why Recovery?

- Eroded architectures
  - Architectural model out of sync with the current implementation
- Reducing maintenance costs
  - Modifications should not cause other unforeseen problems
- System evolution
- Reuse
**Focusing Architectural Recovery**

**Logical Architecture**
- Propose idealized architectural model
- Identify key use cases
- Map components onto architecture
- Generate Refined Architecture

**Physical Architecture**
- Identify Components
- Analyze component interactions
Component Recovery

- Four-step process
  - Generate class diagram from implementation
  - Group related classes
    - Isolated classes
    - Aggregation, generalization, composition
    - Two-way associations
  - Package grouped classes into architectural elements
  - Determine partial system configuration
Example Application: ShareDraw
Component Recovery - Isolated Classes
Component Recovery –
Generalization, Aggregation, Composition
Component Recovery – Two-Way Associations
Component Recovery – Partial Configuration

Summary_Mgr

+ m_pSummInfo

DrawDocument_Mgr

FrameWindows_Mgr

DrawObj_Mgr

Dialog_Mgr

Server

DrawTool_Mgr

View_Mgr
Architecture – C2

- DrawObj Manager
- Summary Manager
  - DrawDoc Manager
  - Dialog Manager
  - View Manager
  - FrameWindows Manager
  - Windows GUI

<<Connector>>

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Jigsaw Web Server – from ~300 Classes...
Jigsaw Web Server – ... to Partial Configuration

- ProtocolFrame (from resources)
- IncomingFilters
- OutgoingFilters
- Resources (from resources)
- Daemon (from daemon)
- Utilities
Further enhancements

- More precise architectural models can be obtained by:
  - Discovering the effective architectural style(s) for the system
  - Recovering connectors using the taxonomy of software connectors
  - Other sources of information
    - Domain knowledge
    - Dynamic behavior of a system