https://youtu.be/oRLOrgnNuaY

A3: Architectural Enhancement

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Spencer¹ Tony²

Zhangzhengyang Aidan²

Anson Brant

- ☐ Enhance proposal
- ☐ Implementation 1
- ☐ Implementation 2
- ☐ SAAM analysis
 - ☐ Client Server
 - ☐ Interpreter
- ☐ Risks
- ☐ Architecture style
- ☐ Testing Plan
- Sequence Diagram

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Enhancement proposal

☐ Hot Reload Component

Figure 1. GNUstep Terminal Information Shell par défaut Editer Vue Fenêtres Visualisateur de Fichier Applications Applications 130.10GB de libre 00T GNUstep 0 6 IMG_1165.MOV Ardour.app Banshee.app ⊞ xss 0 Exo-open.app File-roller.app Firefox.app Bass Treble Pcm JACK Audio Connection Kit [(par défaut)] Démarré. Mute Mute Mute Mute X Quitter Arrêter * Message: Unable to use GNOME Shell Réglages. builtin screenshot interface, resort (i) À propos.

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Implementation 1: Client-server style

- ☐ Server (libobjc2)
- 🗖 Client (libs-gui)

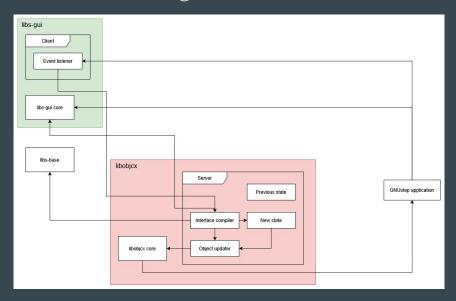


Figure 2. Low-level architecture

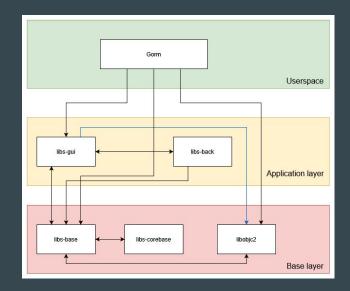


Figure 3. High level architecture

Implementation 1: Client-server style

- ☐ Stakeholders:
 - ☐ GNUstep sponsor
 - ☐ Testers
 - Developers
 - ☐ GNUstep maintainers
- Advantages:
 - Excellent modifiability
 - ☐ Minimal performance penalty
- Disadvantages:
 - ☐ Decreased reliability
 - ☐ Potential security issues

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Implementation 2: Interpreter style

- ☐ Interpreter (libs-gui)
- Object proxy (libs-gui)

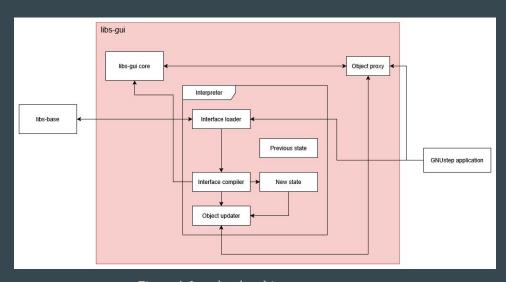


Figure 4. Low-level architecture

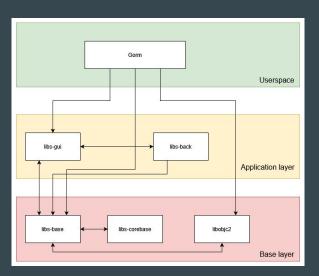


Figure 5. High level architecture

Implementation 2: Interpreter style

- ☐ Stakeholders:
 - ☐ GNUstep sponsor
 - ☐ Testers
 - Developers
 - ☐ GNUstep maintainers
- Advantages:
 - Strong modifiability
 - ☐ Minimal security issues
- Disadvantages:
 - ☐ Decreased reliability
 - □ Potential performance penalty

- ☐ Enhance proposal
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SAAM analysis

- Client-server:
 - ☐ Violation of security requirement
 - ☐ Potential stability issues
- ☐ Interpreter:
 - Violation of performance requirement
 - ☐ Less modifiable

Reliability > Performance

Security > Modifiability

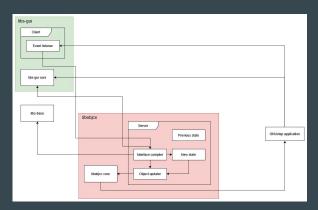


Figure 6. Client-server architecture

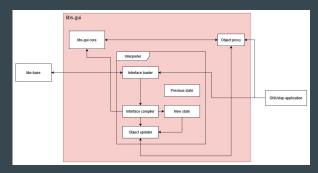


Figure 7. Interpreter architecture

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Risks

- ☐ Testability Risk
- ☐ Security Risk
- ☐ Performance Risk

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Architecture style

☐ Layered + implicit invocation architecture

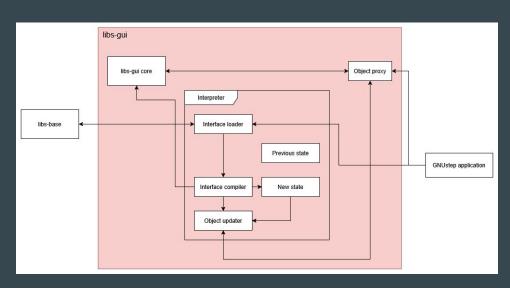


Figure 8. Hot reloader architecture

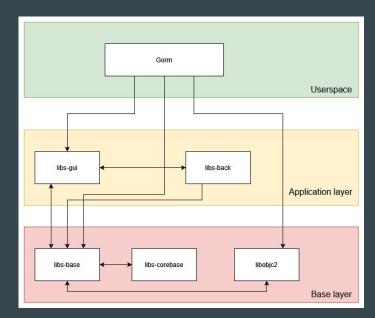


Figure 9. Concrete architecture

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Testing Plan

- ☐ Unit testing
- ☐ Integration testing
- Performance Benchmarking
- ☐ Compatibility testing

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Sequence Diagram: Legend

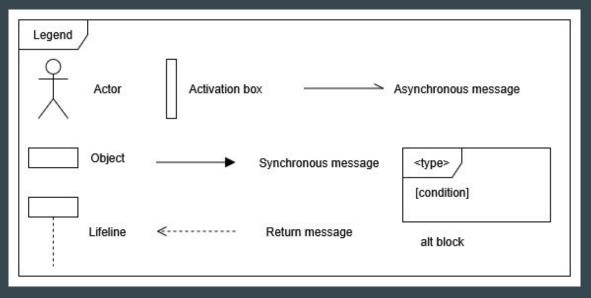


Figure 10. Sequence diagram legend

Sequence diagram

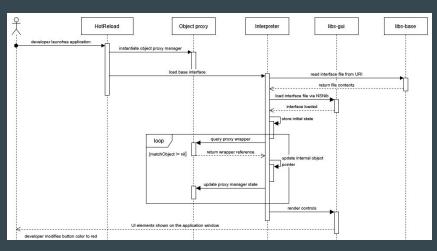


Figure 11. Sequence diagram 1a

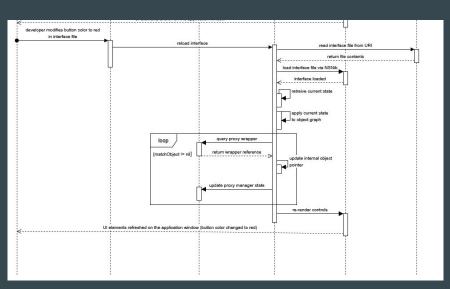


Figure 12. Sequence diagram 1b

Lessons learned

☐ Lack of awareness of the full scope of GNUstep's features

Limitations

- Derived implementation architecture is conceptual in nature
- Possible nuances in concrete implementation that are overlooked
- Analysis conducted mainly from a theoretical perspective

Image credits

1. https://www.gnustep.org/carousel/nesedah.png

Thank You