Diagram editors in the web with Eclipse GLSP

(Graphical Language Server Platform)

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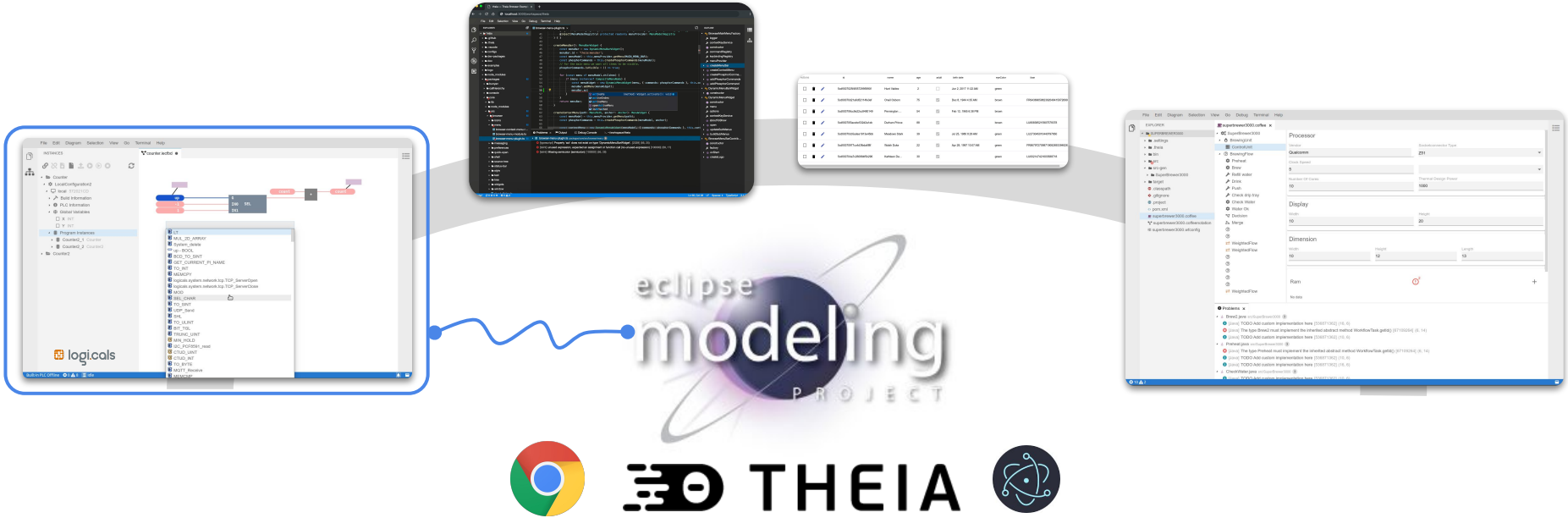
ECLIPSE INCUBATION

Building domain-specific web-based (modeling) tools



Eclipse Graphical Language Server Platform (GLSP)

Applying the architectural pattern of LSP to graphical modeling

- Enable development of web-based diagram clients
  - Or clients in any technology
  - Decouple client implementation from modeling language implementation
- Encapsulate language know-how on the server
  - Reuse of existing frameworks & diagram implementation
  - Management of large models
- Front-end focused on rendering & user interaction
  - Everything else is obtained from the server
  - With the minimum amount of rountrips

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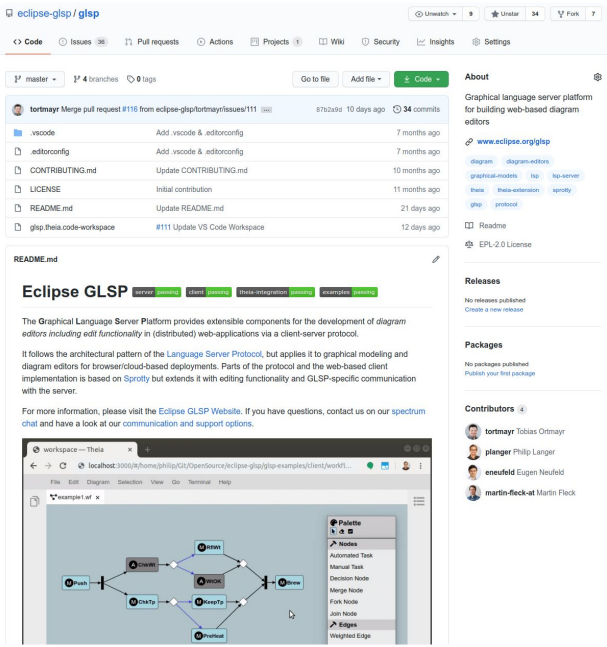
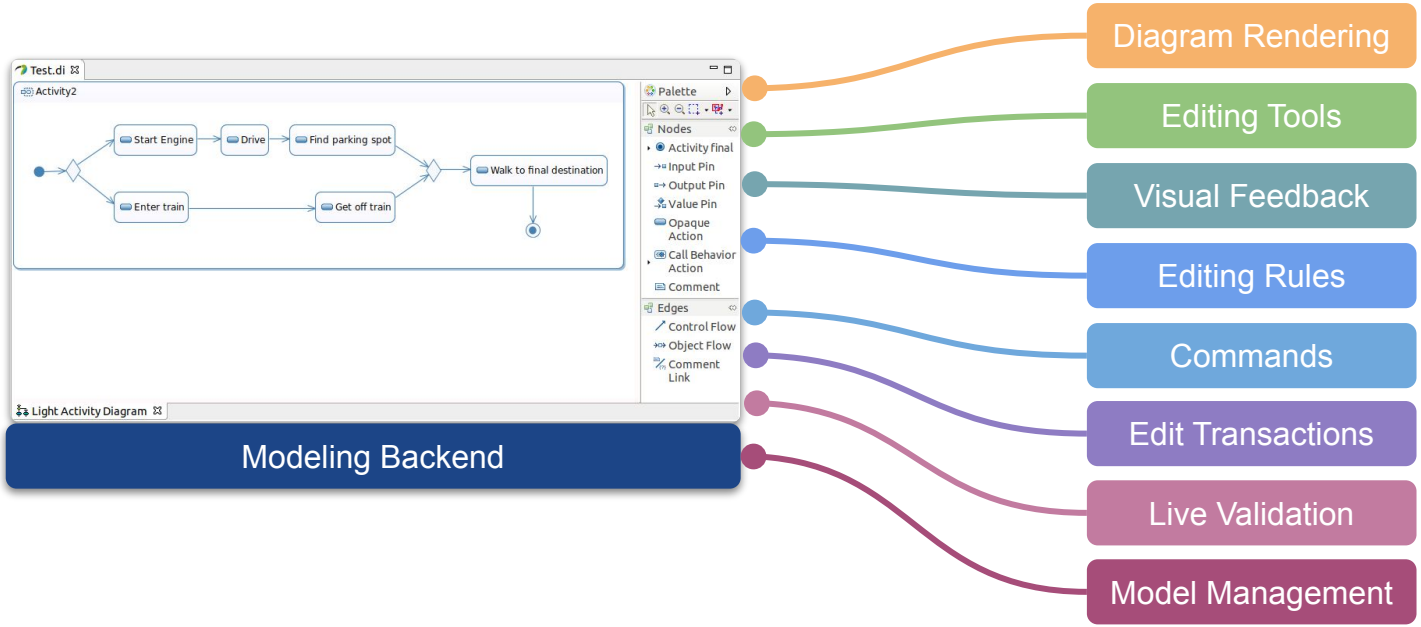


github.com/eclipse-glsp/glsp

Separation of Concerns with GLSP



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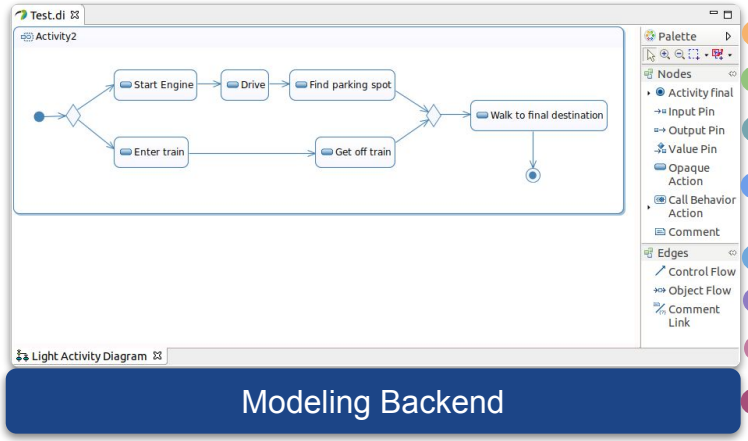


Diagram Rendering

Editing Tools

Visual Feedback

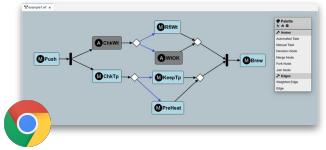
Editing Rules

Commands

Edit Transactions

Live Validation

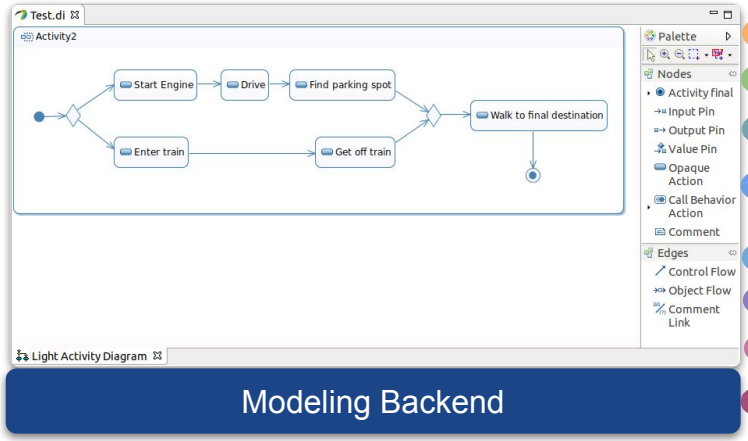
Model Management



Client

Server

Separation of Concerns with GLSP



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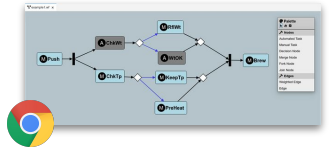

Client

Protocol

Server

eclipse modeling PROJECT

Eclipse Graphical Language Server Platform (GLSP)

1. Java-based server framework
   - Standalone server implementation
2. Graphical Language Server Protocol
   - Language config, executing operations, ...
3. Web-based Client framework
   - Diagram editing, visual feedback, server communication, ...
4. IDE / Tool platform integration
   - Theia, VSCode, and Eclipse

- Based on ...
  - Eclipse LSP4J
  - Eclipse Sprotty
    - Rendering & Sprotty's client-server protocol for model transfer

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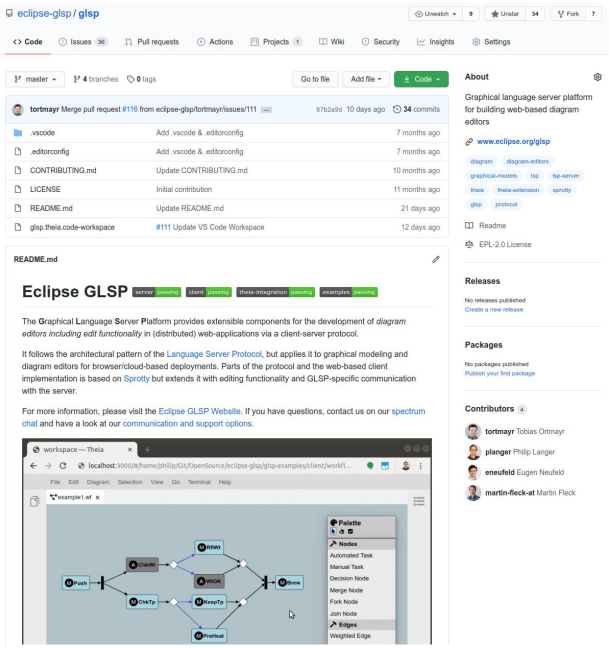
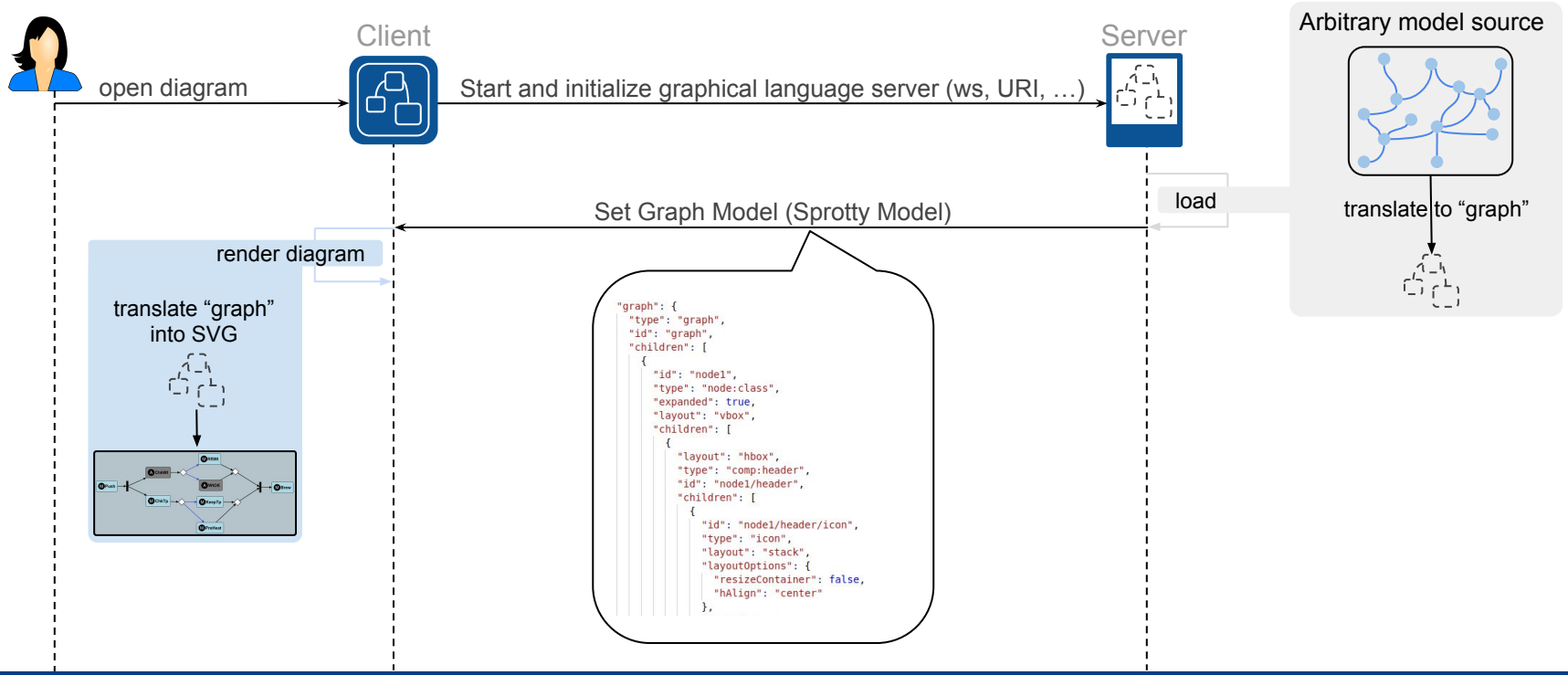
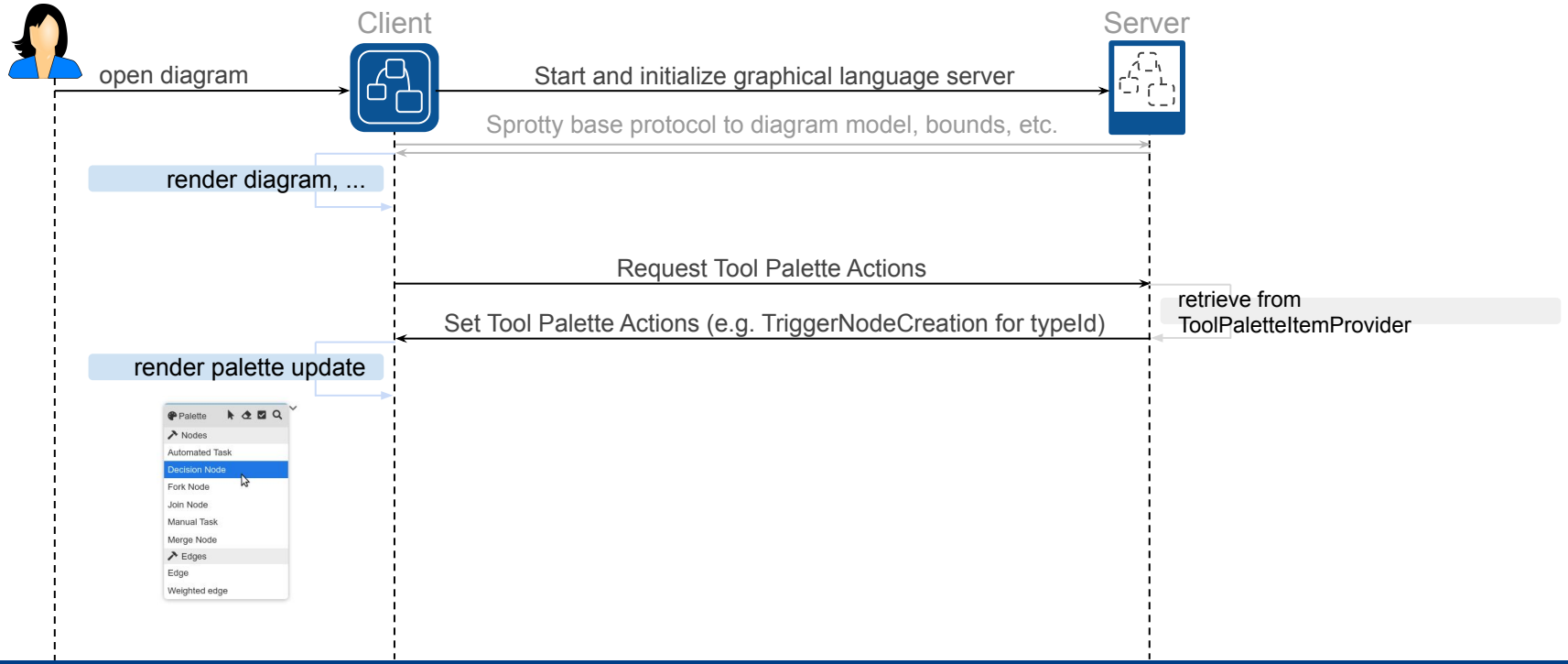


github.com/eclipse-glsp/glsp

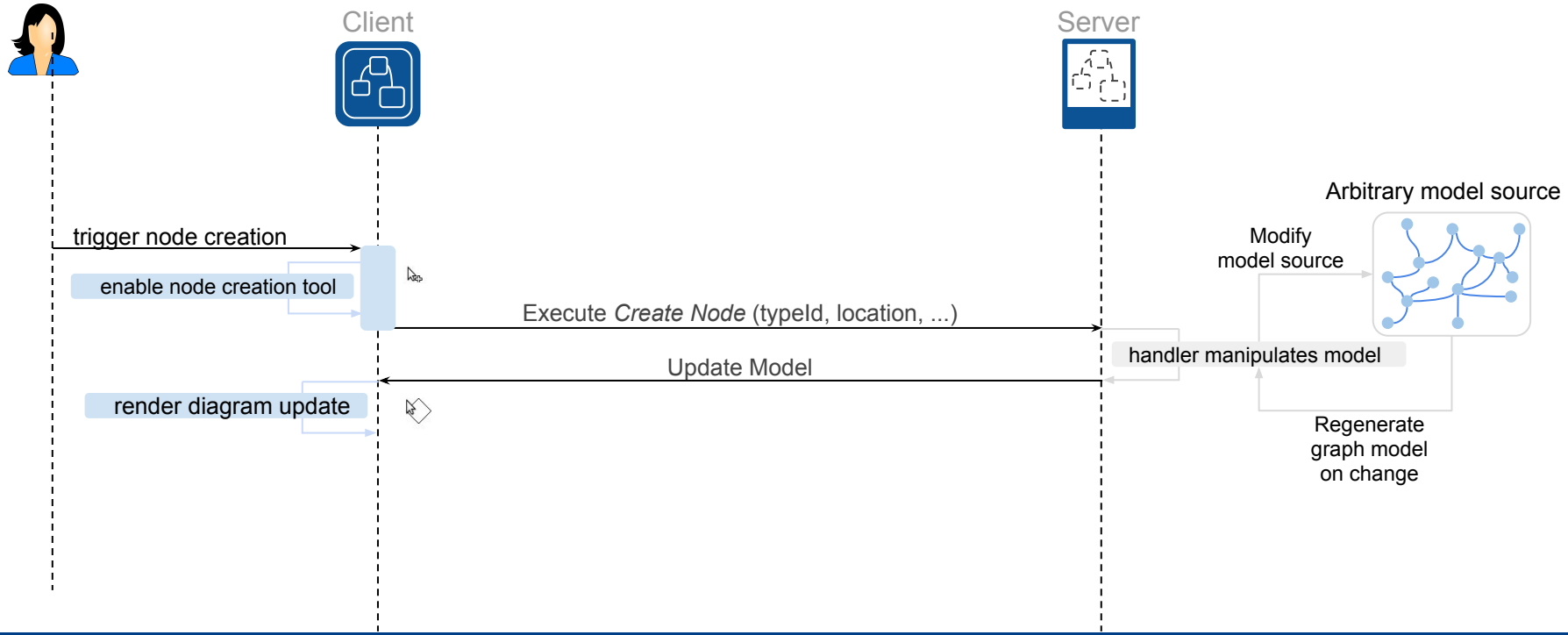
Initialization and Rendering with Eclipse Sprotty



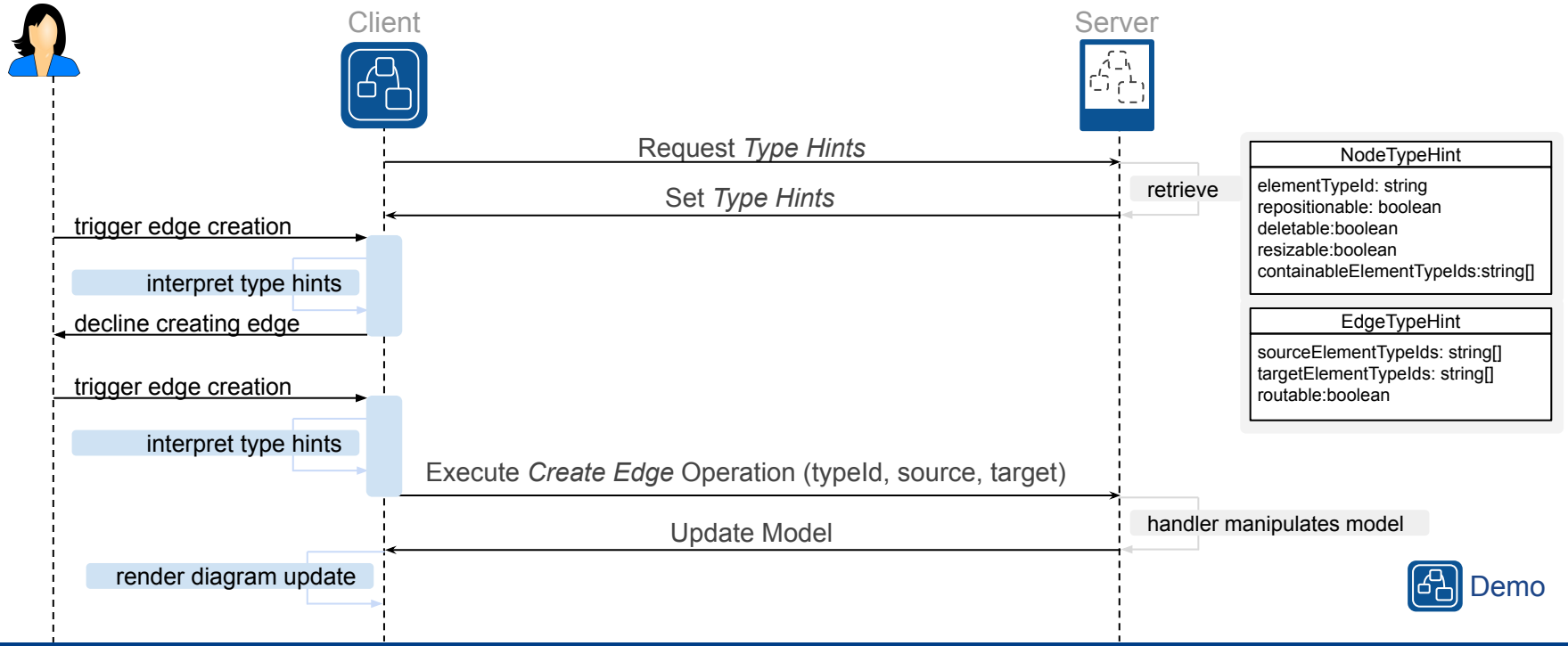
Client-Server Interaction: Initialization and Editing Tools



Client-Server Interaction: Model Manipulation



Client-Server Interaction: Type Hints



Let's Look Into the Code

- Minimal example available

Client-side Rendering in Sprotty

```
const minimalDiagramModule = new ContainerModule((bind, unbind, isBound, rebind) => {
    rebind(TYPES.ILogger).to(ConsoleLogger).inSingletonScope();
    rebind(TYPES.LogLevel).toConstantValue(LogLevel.warn);
    const context = { bind, unbind, isBound, rebind };
    configureModelElement(context, 'graph', GLSPGraph, SGraphView);
    configureModelElement(context, 'node', RectangularNode, RectangularNodeView);
});
```

Server Module Configuration

```
public class MinimalGLSPModule extends DefaultGLSPModule {

    @Override
    protected void configureDiagramConfigurations(final MultiBindConfig<DiagramConfiguration> config) {
        config.add(MinimalDiagramConfiguration.class);
    }

    @Override
    protected void configureOperationHandlers(final MultiBindConfig<OperationHandler> config) {
        super.configureOperationHandlers(config);
        config.add(MinimalCreateNodeOperationHandler.class);
    }

    @Override
    protected Class<? extends ModelFactory> bindModelFactory() {
        return JsonFileModelFactory.class;
    }

}
```

Demo

Tool Platform Integrations of GLSP

- A good modeling tool is not just a diagram editor!
  - Seamless integration with an tool / application platform of your choice
  - Flexibly combined with other capabilities of the tool

Tool Platform Integrations of GLSP

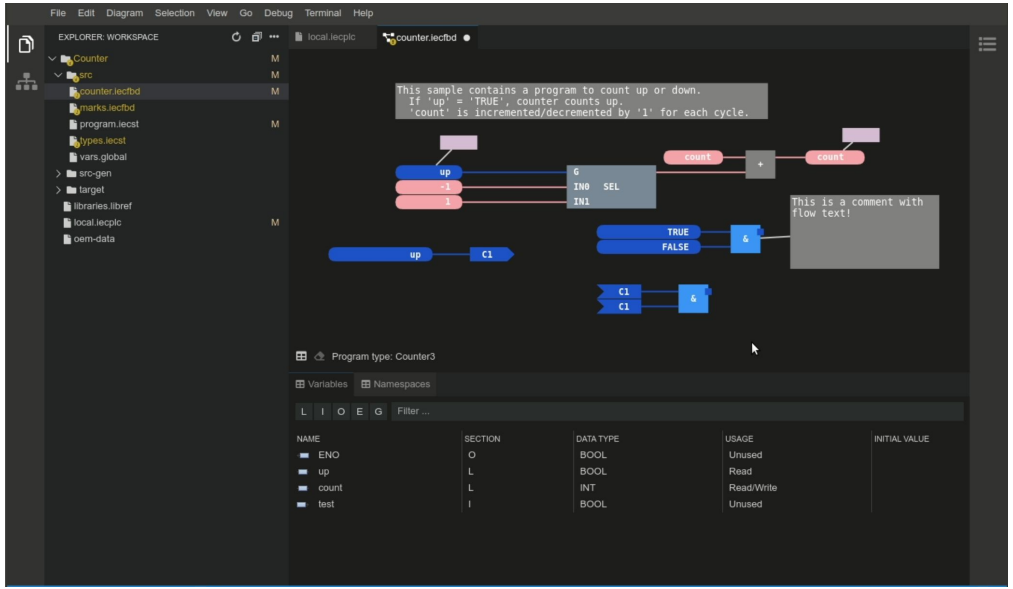
- Beyond just showing the diagram editor in a tool!
  - Styling, commands, menus, keyboard shortcuts, other views, ...
  - Navigation across editors (diagram and non-diagram)
  - Problem markers
  - Copy & Paste

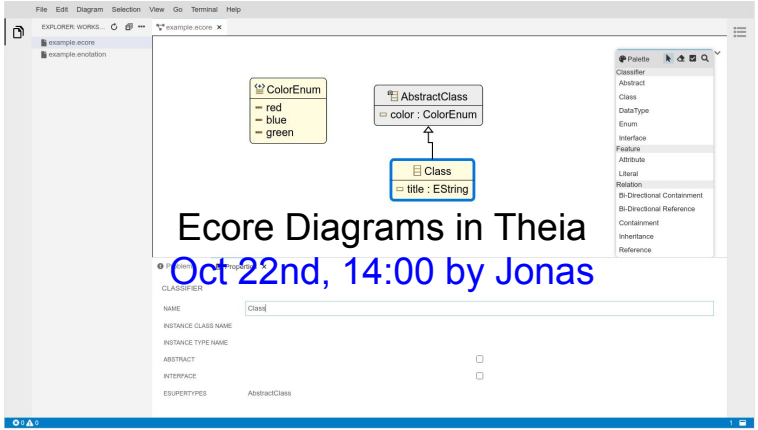

Demo

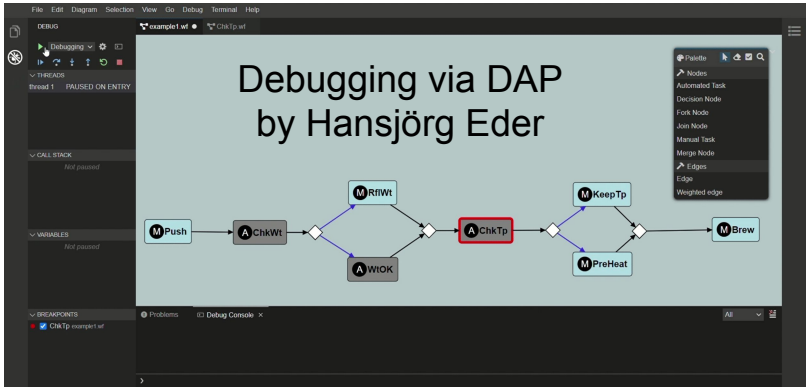
- Status
  - Full support in Eclipse Theia
  - VSCode: basic integration, but growing functionality
  - Eclipse RCP: basic integration, further features on demand

Other Cool Stuff

Commercial IEC FBD Editor by logi.cals







Conclusion

- Eclipse Sprotty: flexible & modern rendering
- GLSP unlocks very high reuse on the server
  - Migrating existing diagram editors
  - Hooking up EMF models
- Integratable with tool platforms and domain-specific tools
  - Integration with Theia, VSCode, or Eclipse
  - Avoiding lock-in effect with specific tool / app platform
- Get in contact with us to tell us about your use cases!
  - planger@eclipsesource.com
  - mkoegel@eclipsesource.com

eclipse.org/glsp

github.com/eclipse-glsp/glsp

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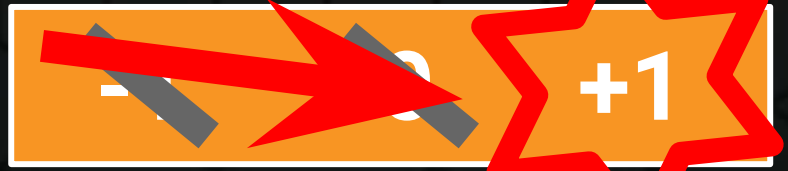

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