

SE | 10
SOFTWARE ENGINEERING

 **BUSINESS**
SOFTWARE



Plux.NET

Extending Web Applications with Client and Server Plug-ins

Jahn, Wolfinger, Mössenböck

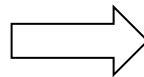
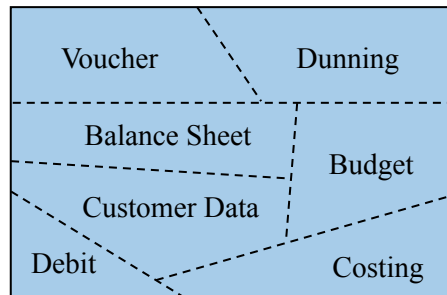
{jahn, wolfinger, moessenboeck}@ase.jku.at

Johannes Kepler Universität, Linz

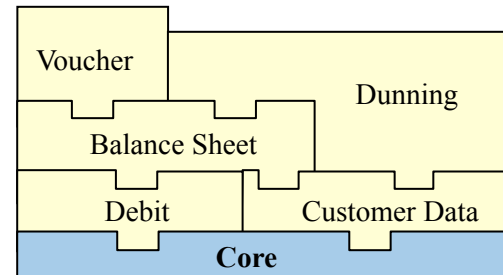
Goals



Instead of a monolith ...



*... we want a thin core
that can be extended by plugins*

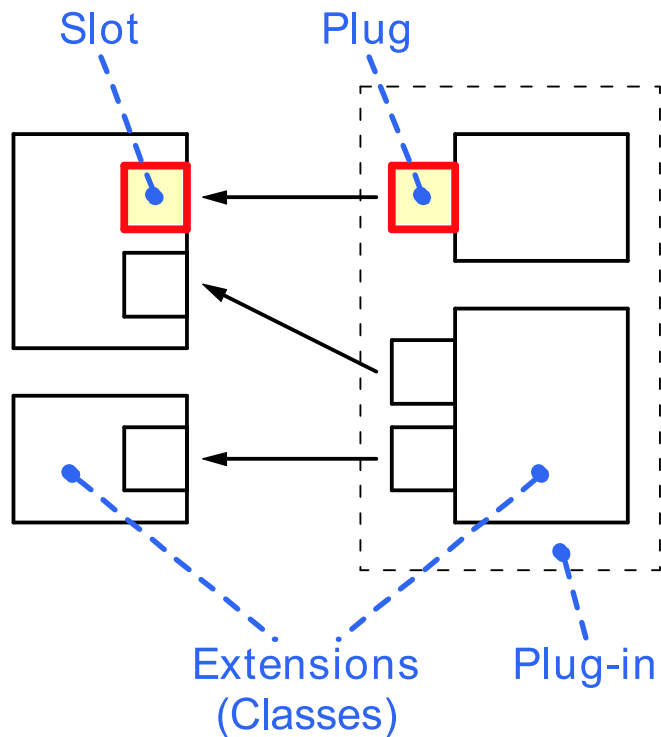


- Every user just loads what he/she needs
- Dynamic reconfiguration for different usage scenarios
- Dynamic plugging without restarting the application
- Dynamic unplugging without restarting the application
- Plug & Play extensions without programming or configuration
- **Component-based web applications**
- **Multi-user composition model**
- **User-specific web extensions**

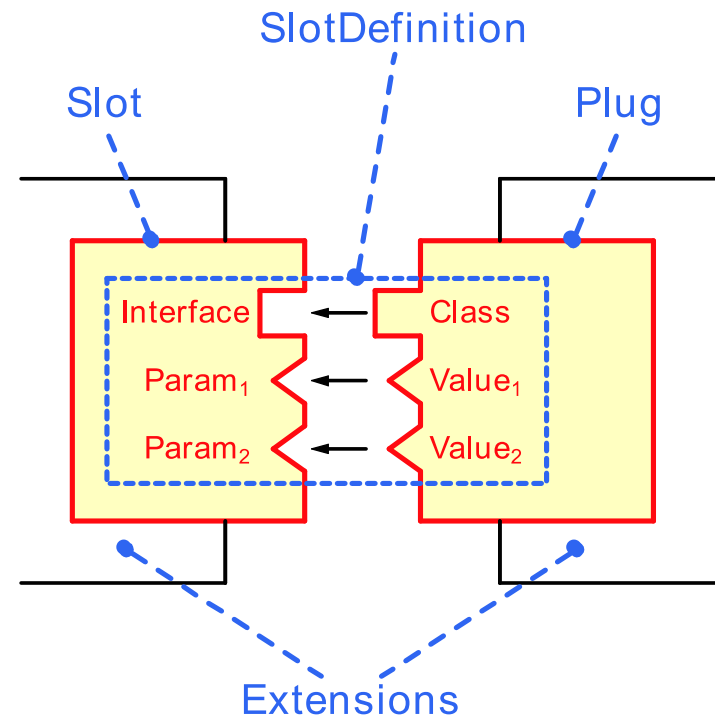
Plux.NET component model



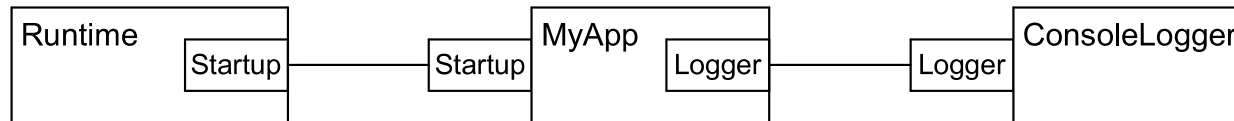
Extensions, Slots and Plugs



Slot and Plug in detail



Logger sample

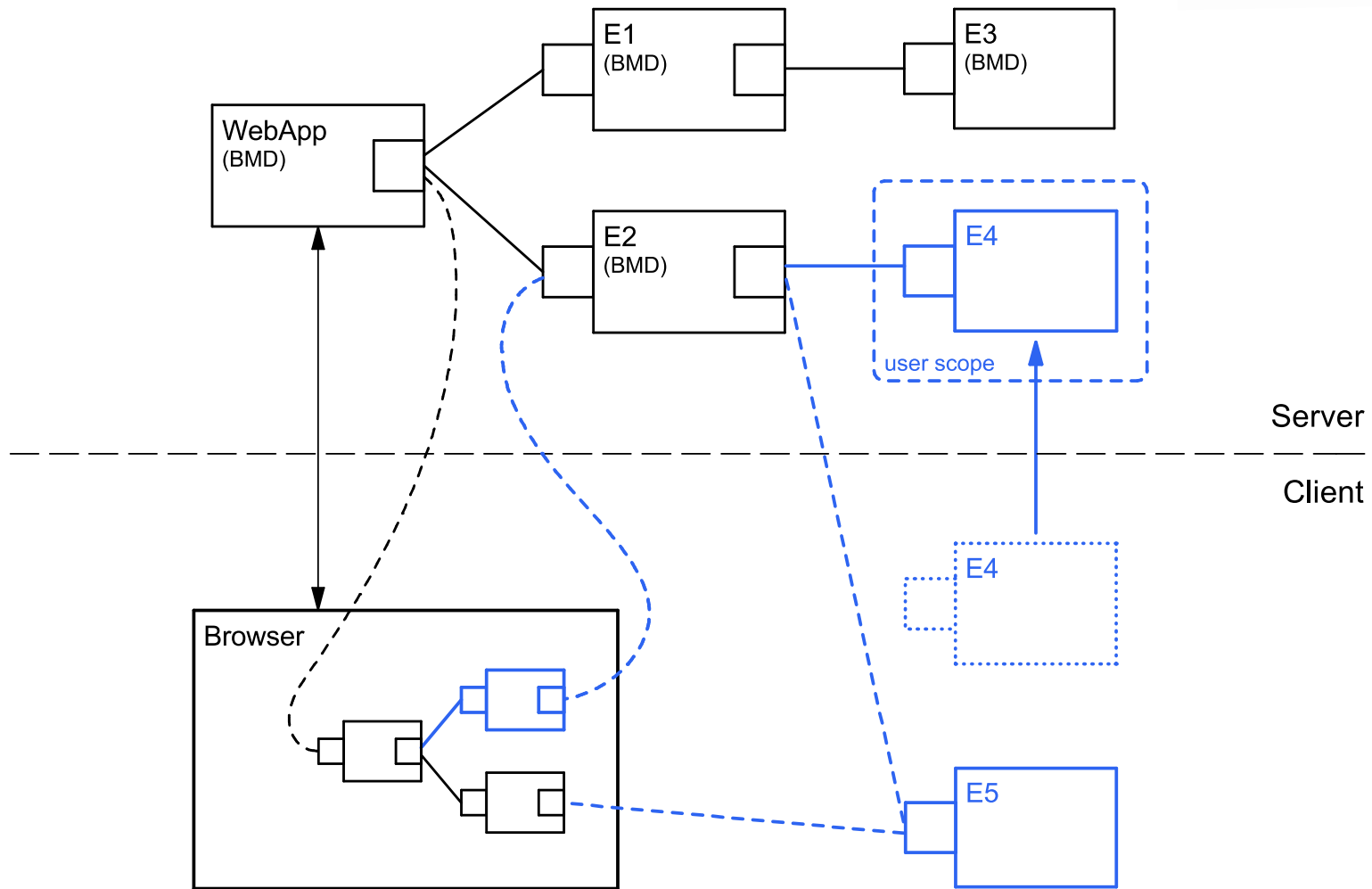


```
[Extension("MyApp")]
[Plug("Startup")]
[Slot("Logger", OnPlugged="AddLogger",
      OnUnplugged="RemoveLogger")]
public class MyApp: IStartup {
    ILogger logger = null;    // the logger extension
    string timeFormat;      // parameter of the logger extension
    public void AddLogger(object s, PlugEventArgs args) {
        logger = (ILogger) args.Extension;
        timeFormat = (string) args.GetParamValue("TimeFormat");
    }
    public void RemoveLogger(object s, PlugEventArgs args) {
        logger = null; timeFormat = null;
    }
    public void Run() {
        ...
        if (logger != null)
            logger.Print(DateTime.Now.ToString(timeFormat));
    }
}
```

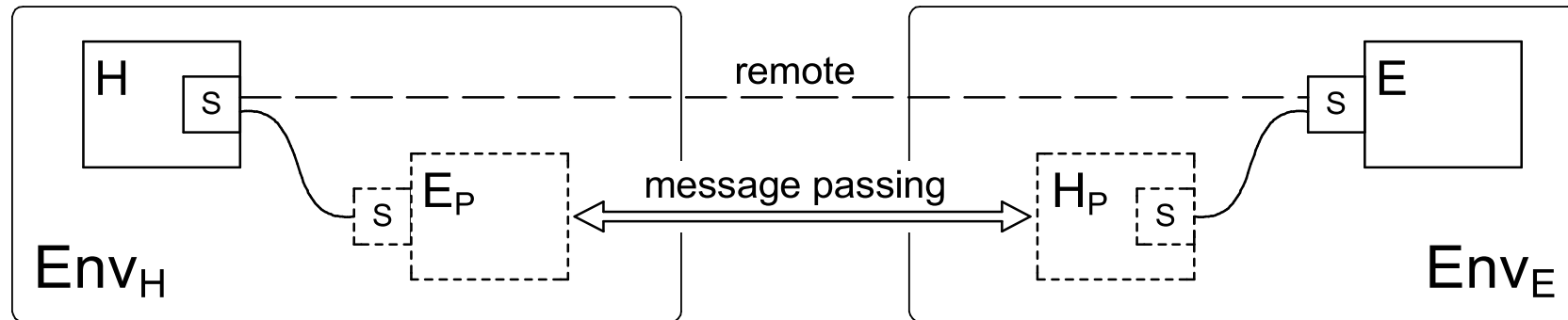
```
[SlotDefinition("Logger")]
[Param("TimeFormat", typeof(string))]
public interface ILogger {
    void Print(string msg);
}
```

```
[Extension("ConsoleLogger")]
[Plug("Logger")]
[ParamValue("TimeFormat", "hh:mm:ss")]
public class ConsoleLogger: ILogger {
    public void Print(string msg) {
        Console.WriteLine(msg);
    }
}
```

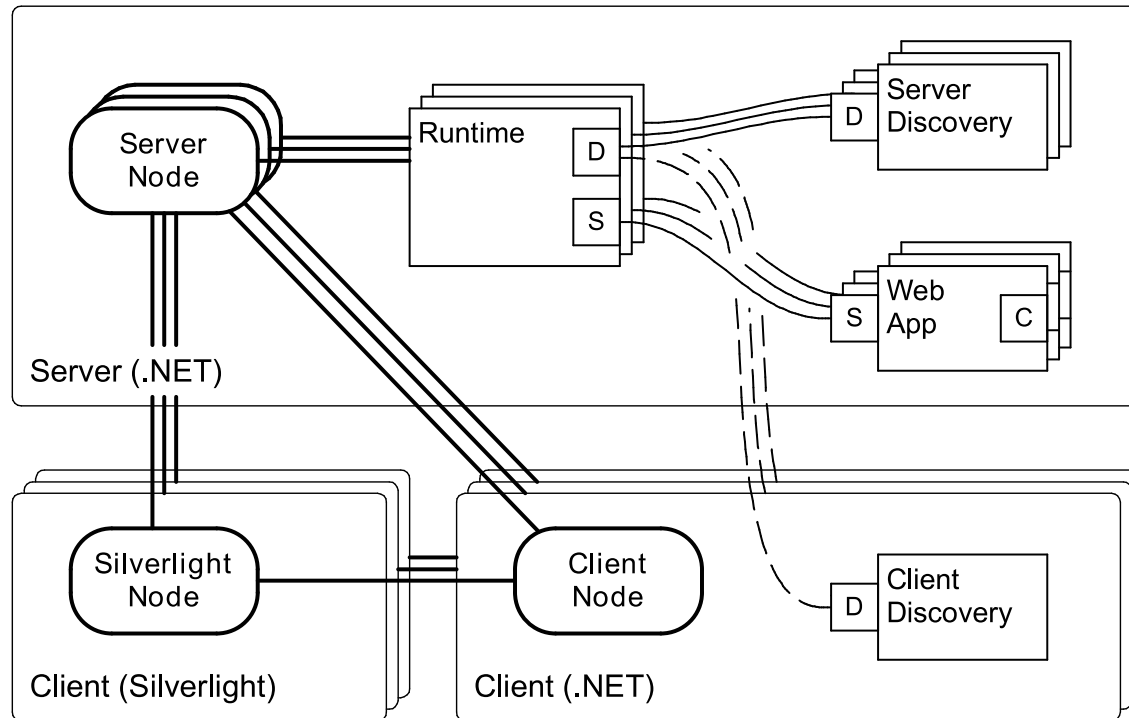
Extending Web Applications with Plux.NET



Remote Plugging



The Plux.NET web runtime



- The web-runtime... ... is distributed
- ... replicates composition state on all runtime nodes
 - ... manages multiple user sessions
 - ... persists composition state during round-trips

Case Study - Time Recorder



Time Recorder User: Markus Jahn

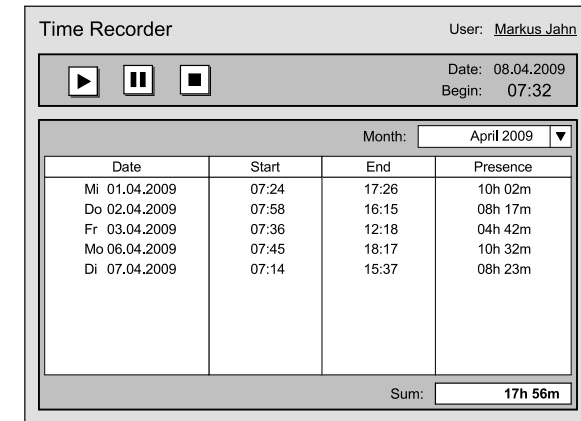
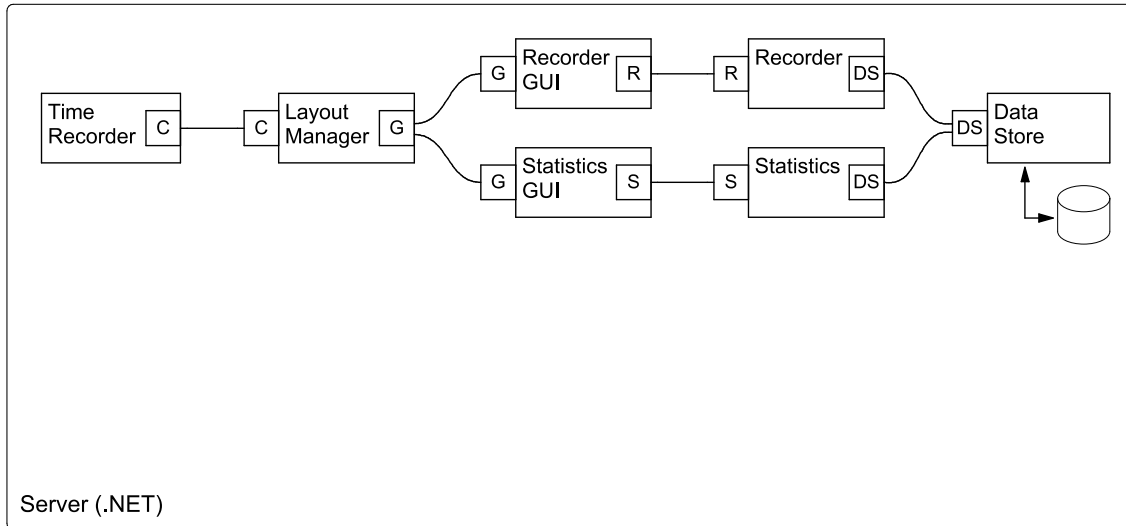
▶ ⏸ ■ Date: 08.04.2009
Begin: 07:32

Month: ▼

Date	Start	End	Presence
Mi 01.04.2009	07:24	17:26	10h 02m
Do 02.04.2009	07:58	16:15	08h 17m
Fr 03.04.2009	07:36	12:18	04h 42m
Mo 06.04.2009	07:45	18:17	10h 32m
Di 07.04.2009	07:14	15:37	08h 23m

Sum:

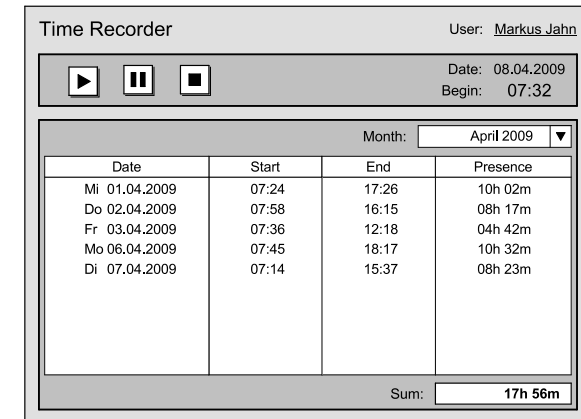
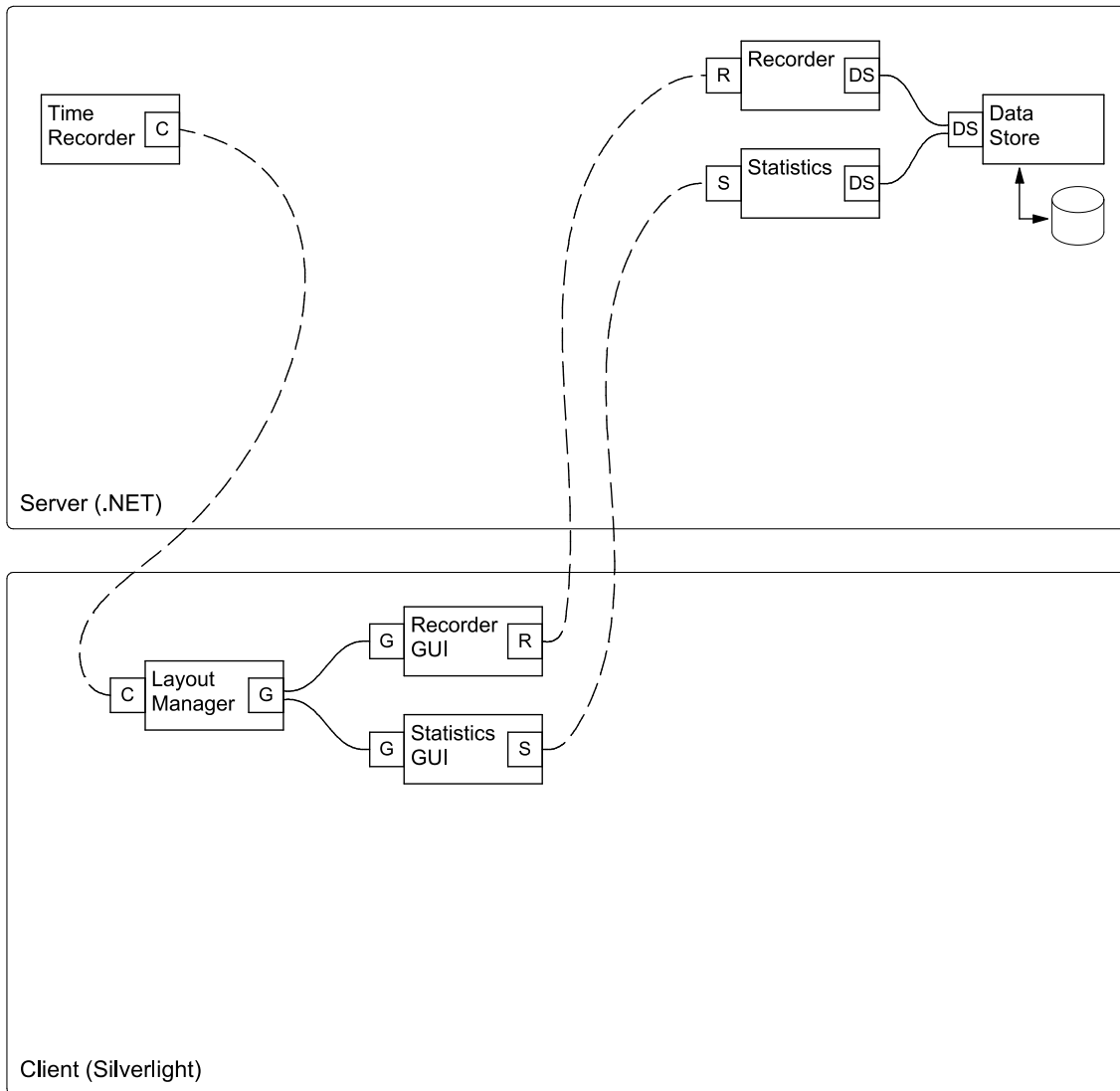
Time Recorder Architecture



Environment

Visibility Scope	Server	Silverlight	Client	
	Global	✓		
	Group			
	User			

Rich Internet Time Recorder

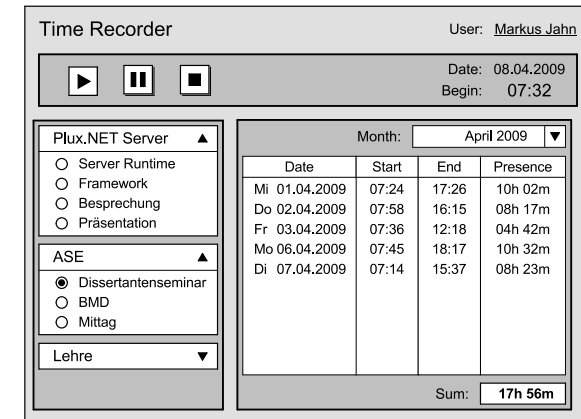
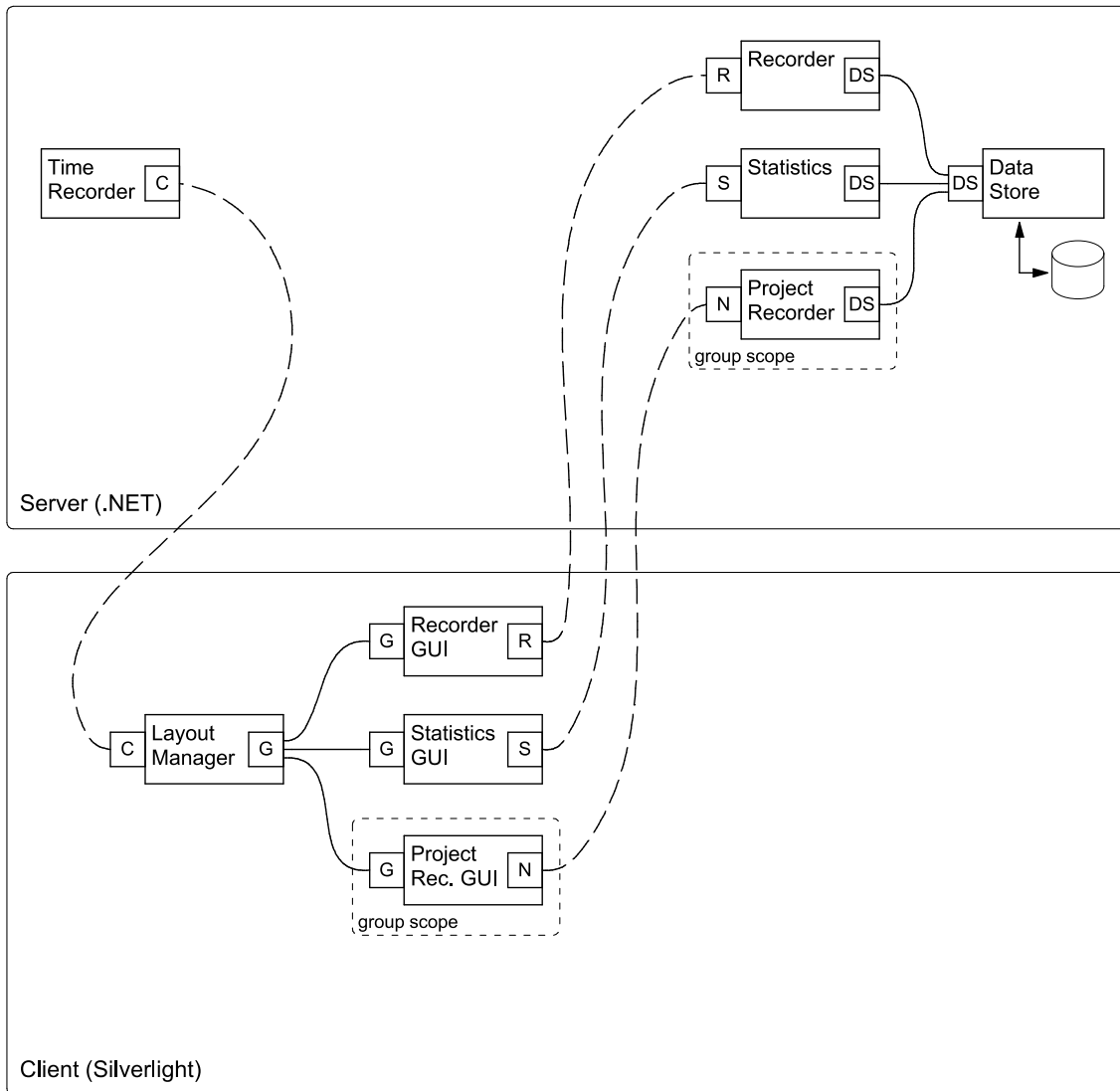


Environment

Visibility Scope

	Server	Silverlight	Client
Global	✓	✓	
Group			
User			

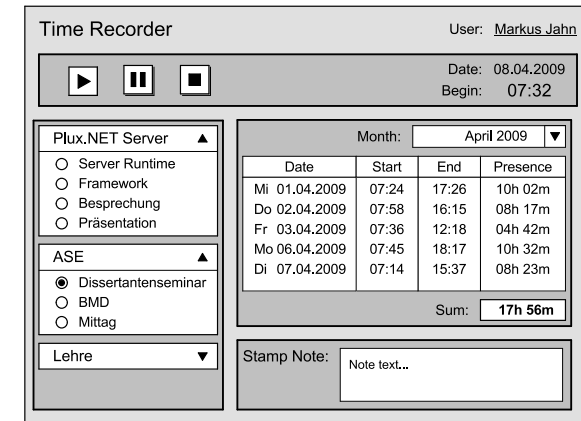
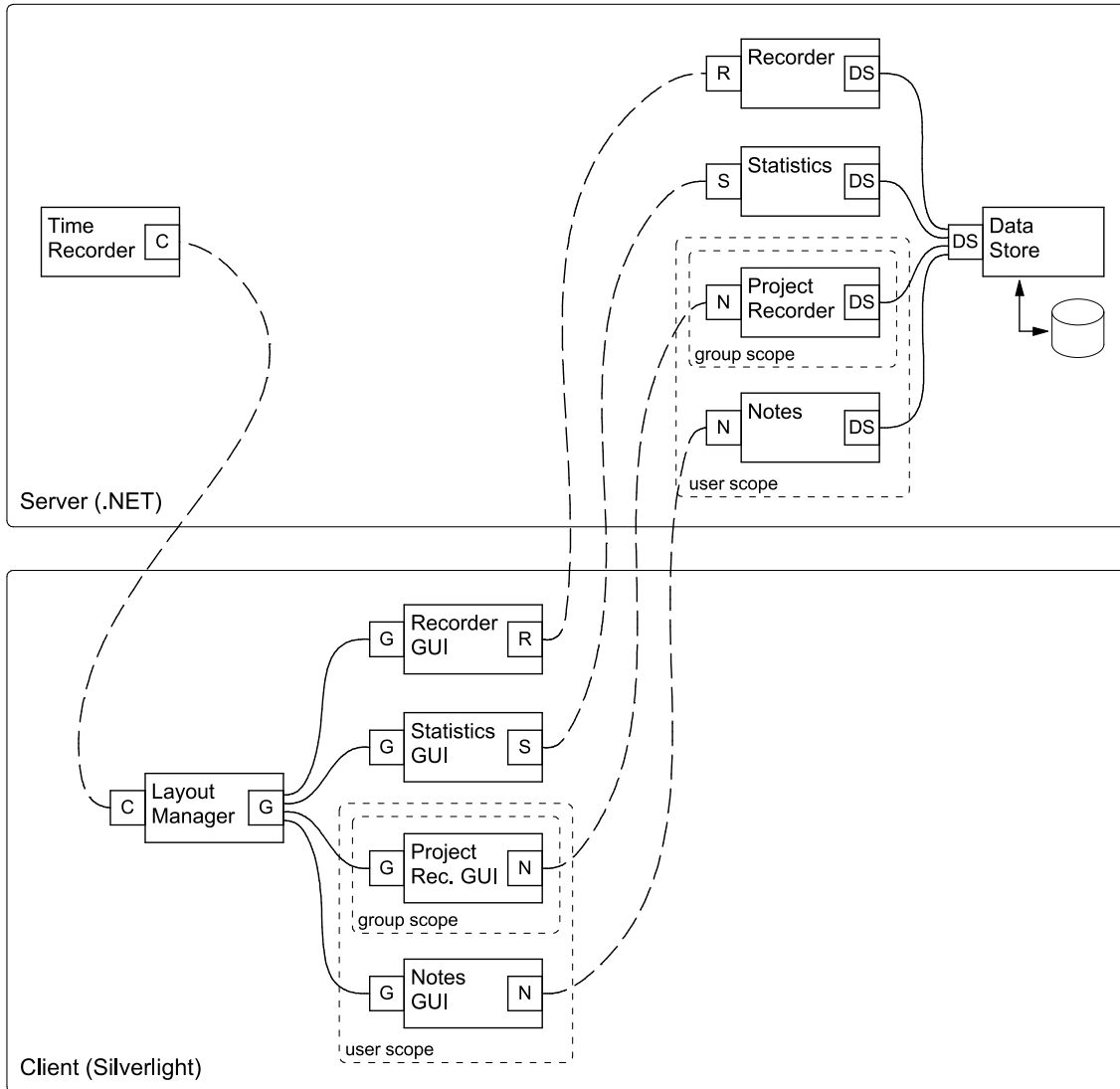
Server-side Extensions



Environment

Visibility Scope	Environment		
	Server	Silverlight	Client
Global	✓	✓	
Group	✓	✓	
User			

Server-side Extensions

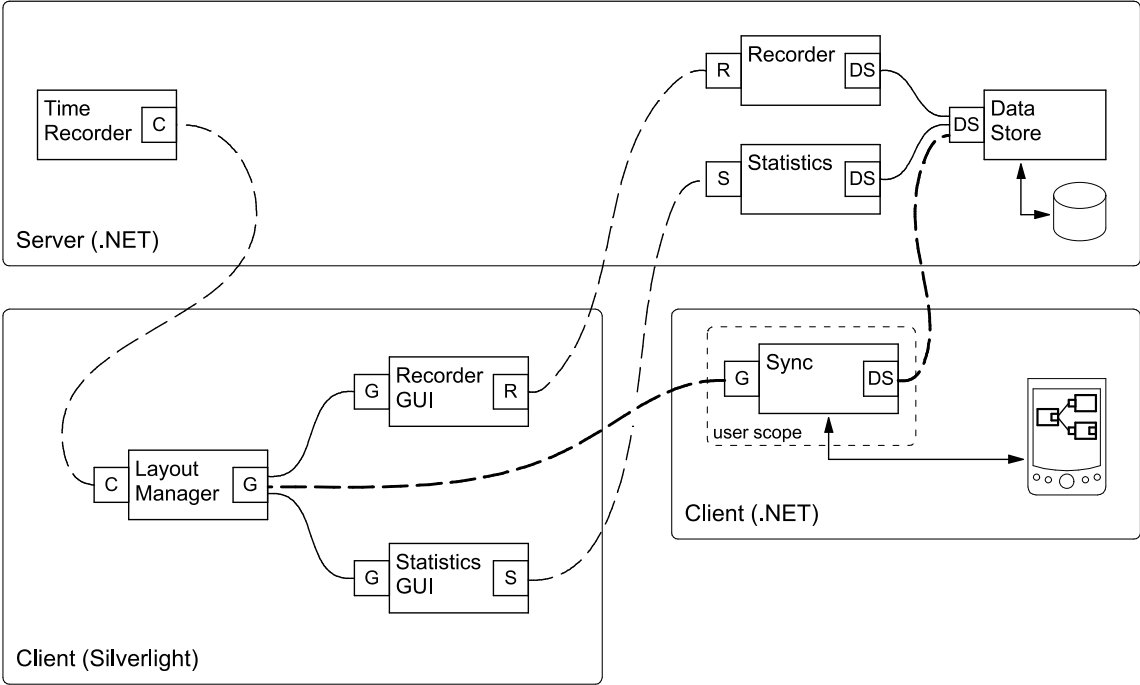


Environment

Visibility Scope

	Server	Silverlight	Client
Global	✓	✓	
Group	✓	✓	
User	✓	✓	

Client-side Extensions



Time Recorder User: Markus Jahn

Date: 08.04.2009
Begin: 07:32

Month:

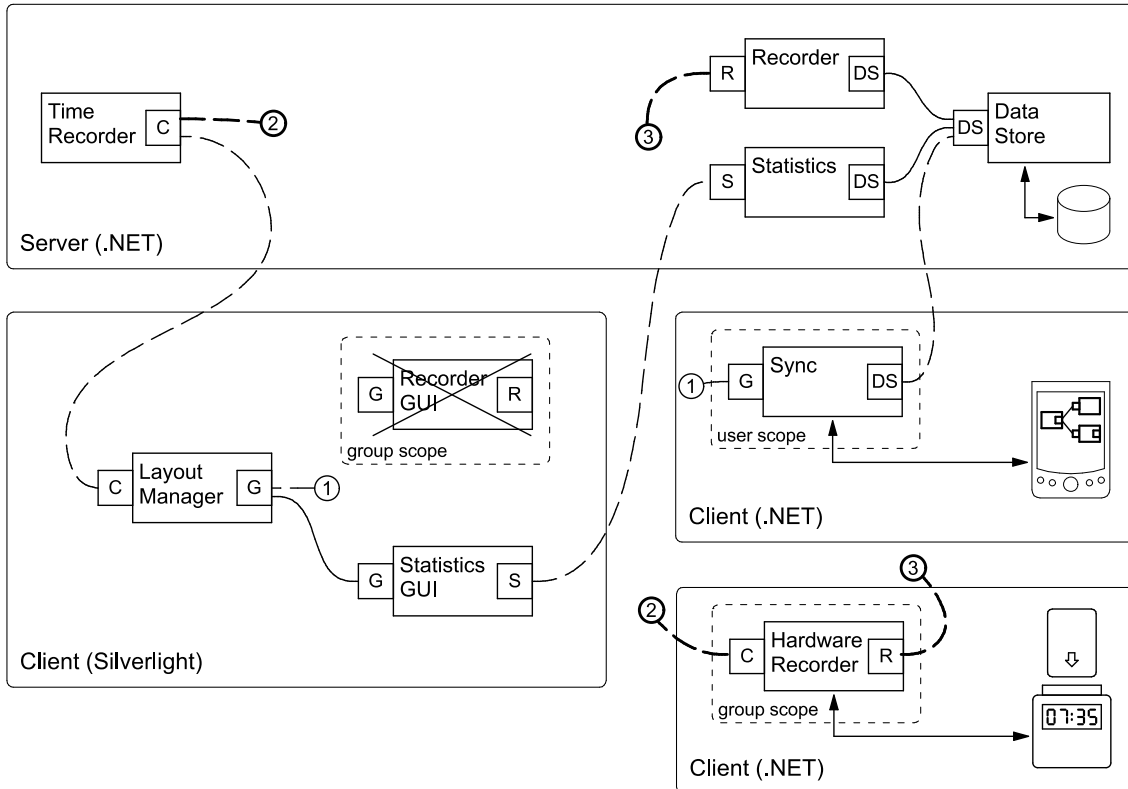
Date	Start	End	Presence
Mi 01.04.2009	07:24	17:26	10h 02m
Do 02.04.2009	07:58	16:15	08h 17m
Fr 03.04.2009	07:36	12:18	04h 42m
Mo 06.04.2009	07:45	18:17	10h 32m
Di 07.04.2009	07:14	15:37	08h 23m
Sum:			17h 56m

Synchronizer
Connected to Pocket PC: XY-321

Environment

Visibility Scope	Global	Server ✓	Silverlight ✓	Client
	Group	Server ✓	Silverlight ✓	Client
	User	Server ✓	Silverlight ✓	Client ✓

Client-side Extensions



Time Recorder User: Markus Jahn

Month: April 2009

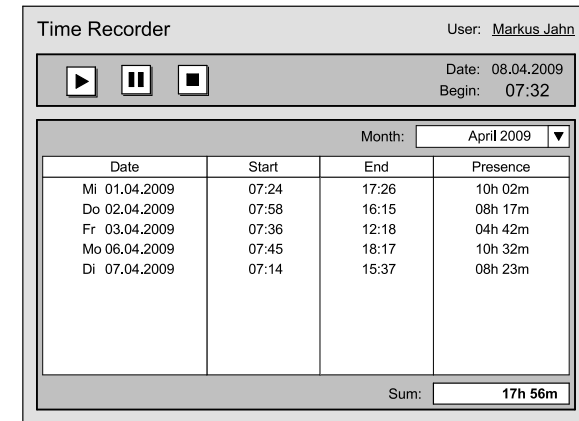
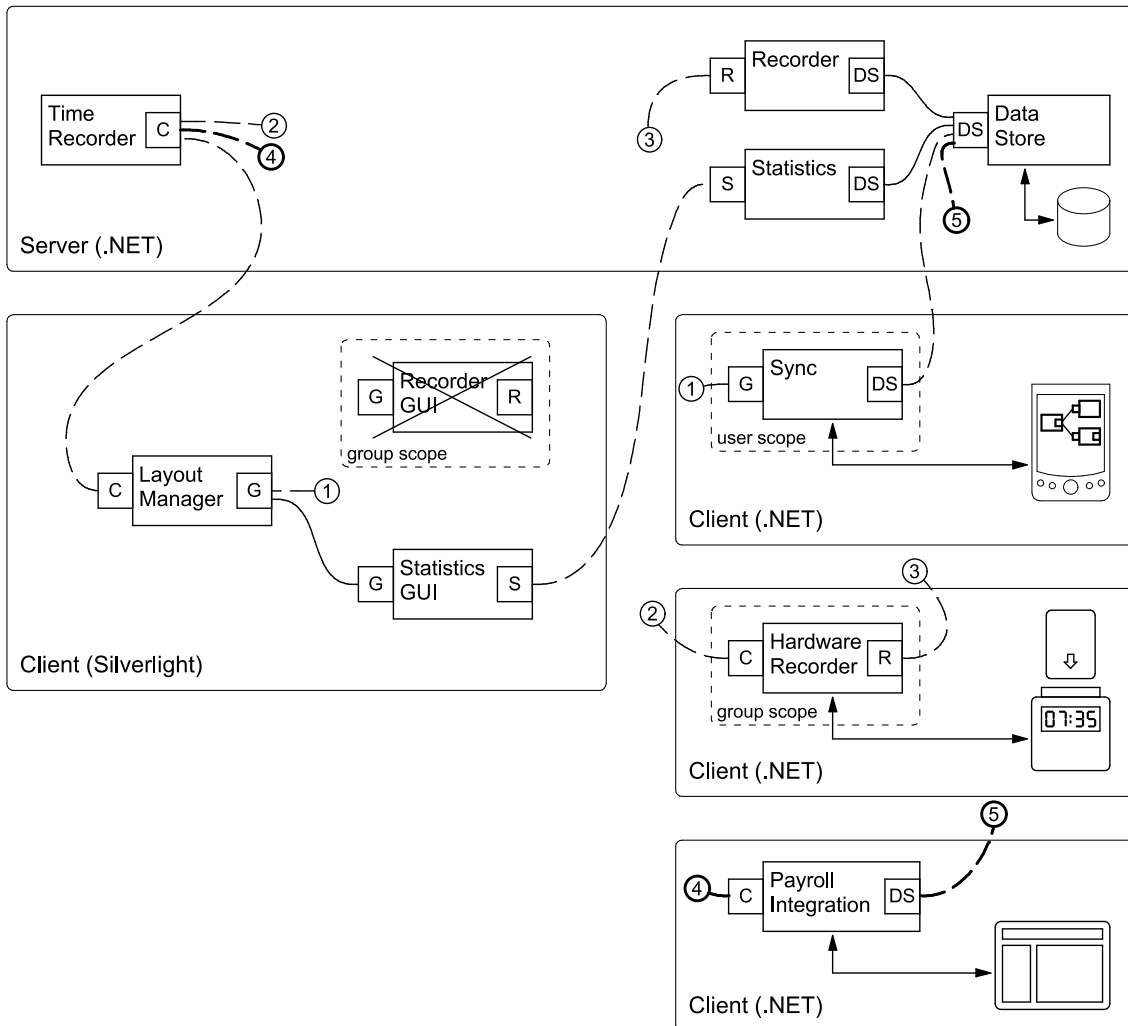
Date	Start	End	Presence
Mi 01.04.2009	07:24	17:26	10h 02m
Do 02.04.2009	07:58	16:15	08h 17m
Fr 03.04.2009	07:36	12:18	04h 42m
Mo 06.04.2009	07:45	18:17	10h 32m
Di 07.04.2009	07:14	15:37	08h 23m
Sum:			17h 56m

Environment

Visibility Scope

	Server	Silverlight	Client
Global	✓	✓	
Group	✓	✓	✓
User	✓	✓	✓

Client-side Extensions



Environment

Visibility Scope

	Server	Silverlight	Client
Global	✓	✓	✓
Group	✓	✓	✓
User	✓	✓	✓



<http://ase.jku.at/plux>