

Handling SDL Complexity

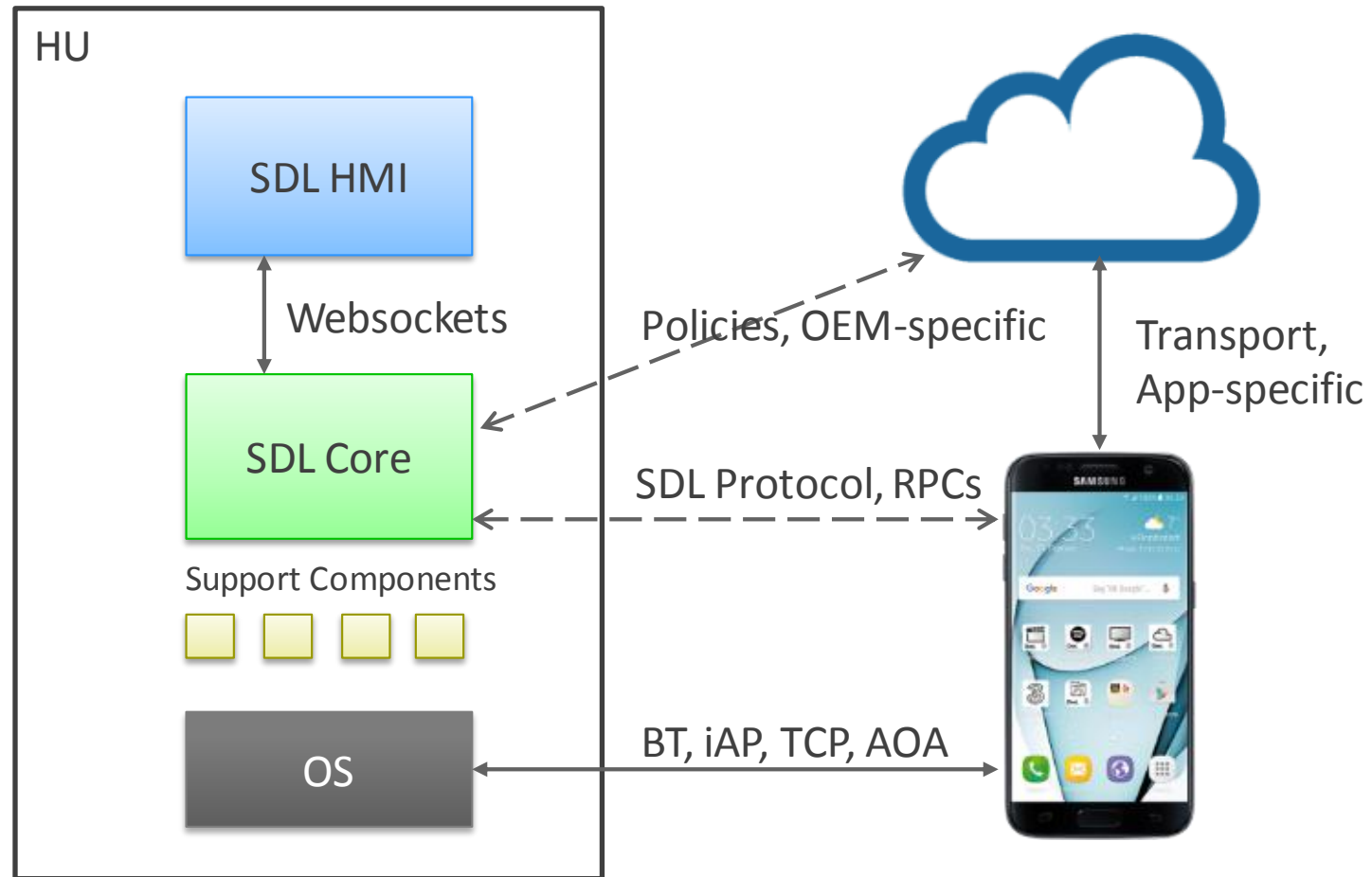
SDL Developer Conference



Mike Foedisch, Elektrobit
Sep 12, 2017

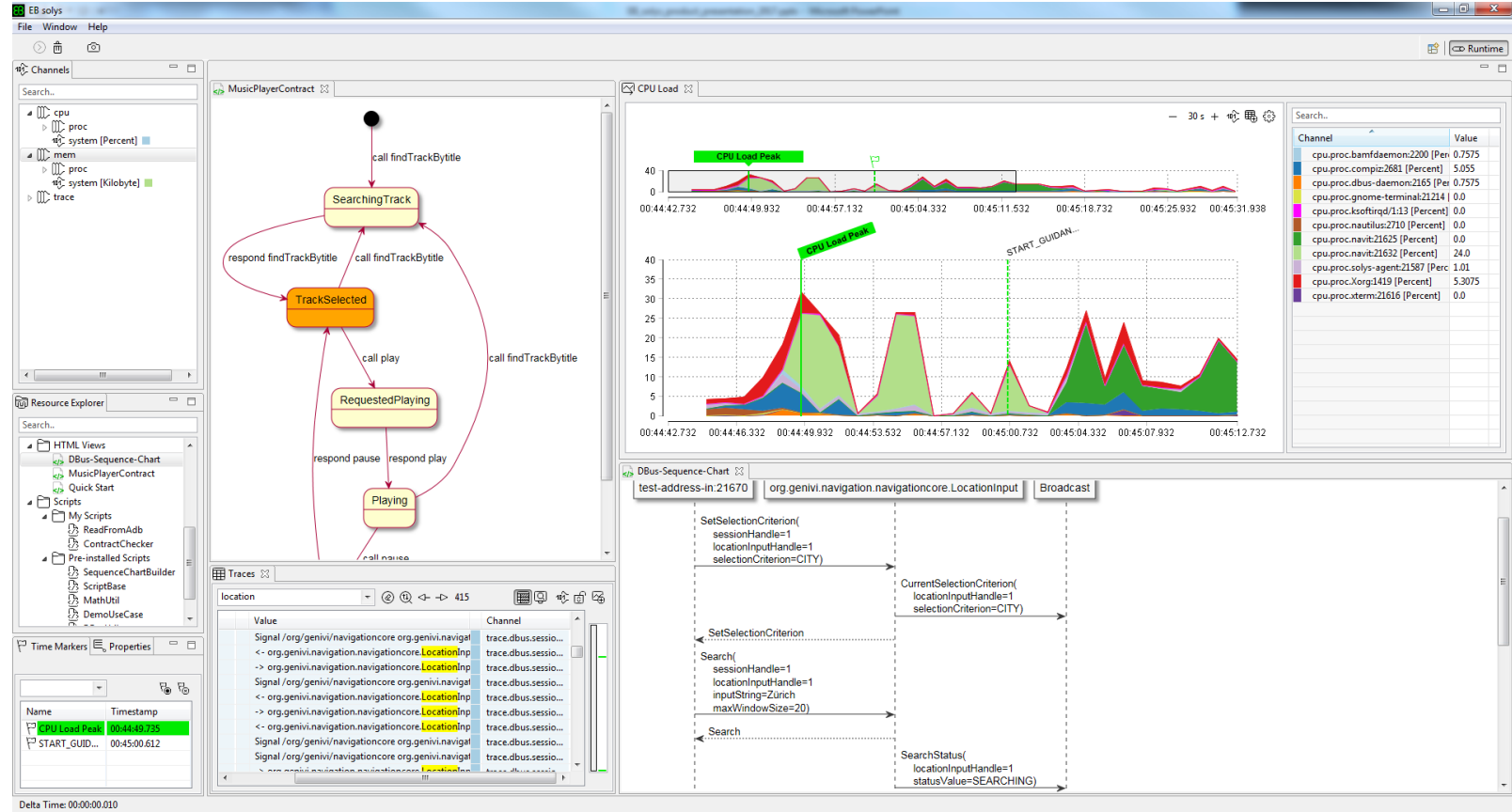


Levels of Complexity in SDL



EB solys

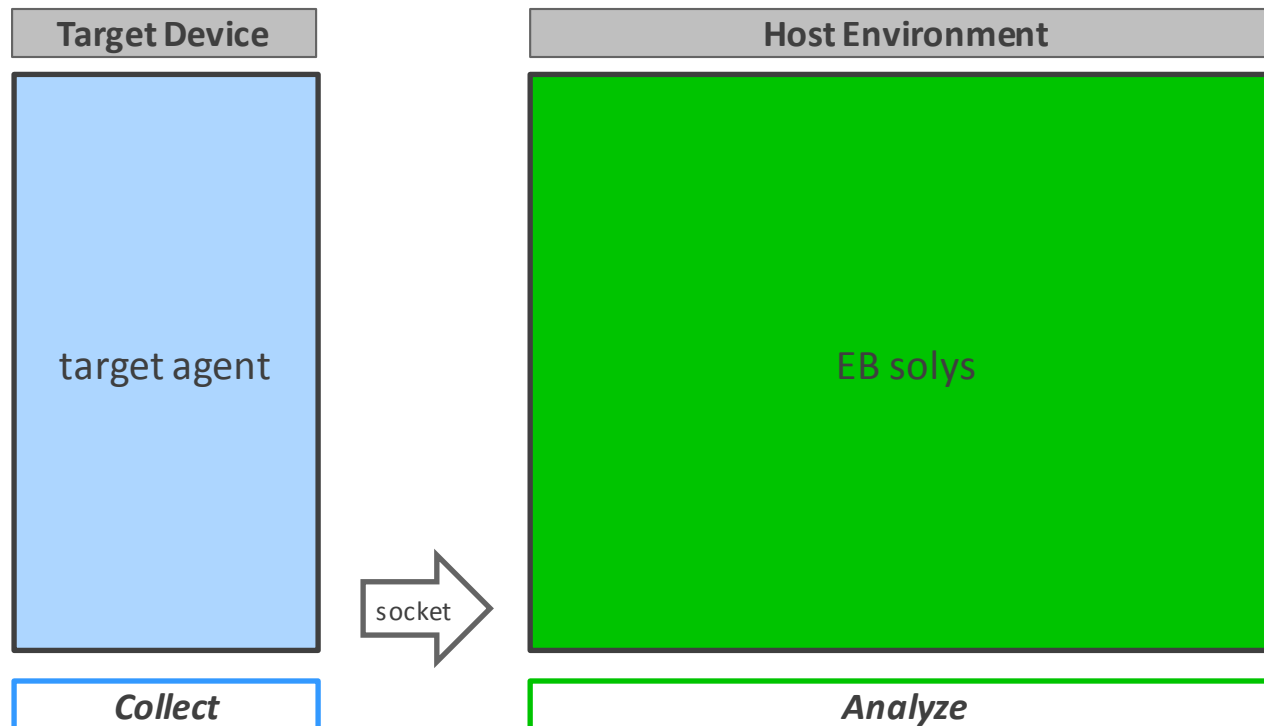
- Combine data from different sources
- Base for
 - System understanding
 - Analysis
 - Debugging
 - KPIs



Architecture Overview

EB solys consists of a small target agent utility running on a device and an Eclipse RCP based analysis toolchain running on a host PC.

The **target agent** is a plugin-driven monitoring service for collecting run-time data.



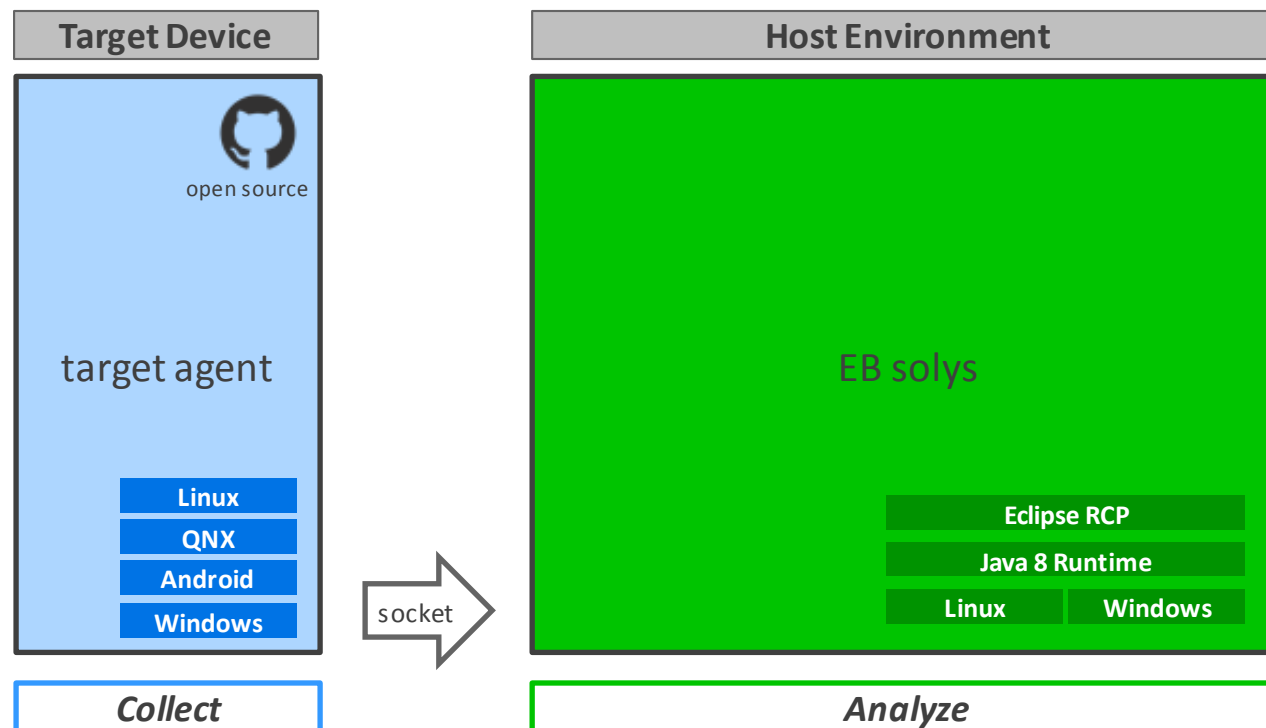
EB solys is an application running on an host environment for exploring, correlating and aggregating run-time data.

It can be used with GUI or in a batch mode.

Supported platforms

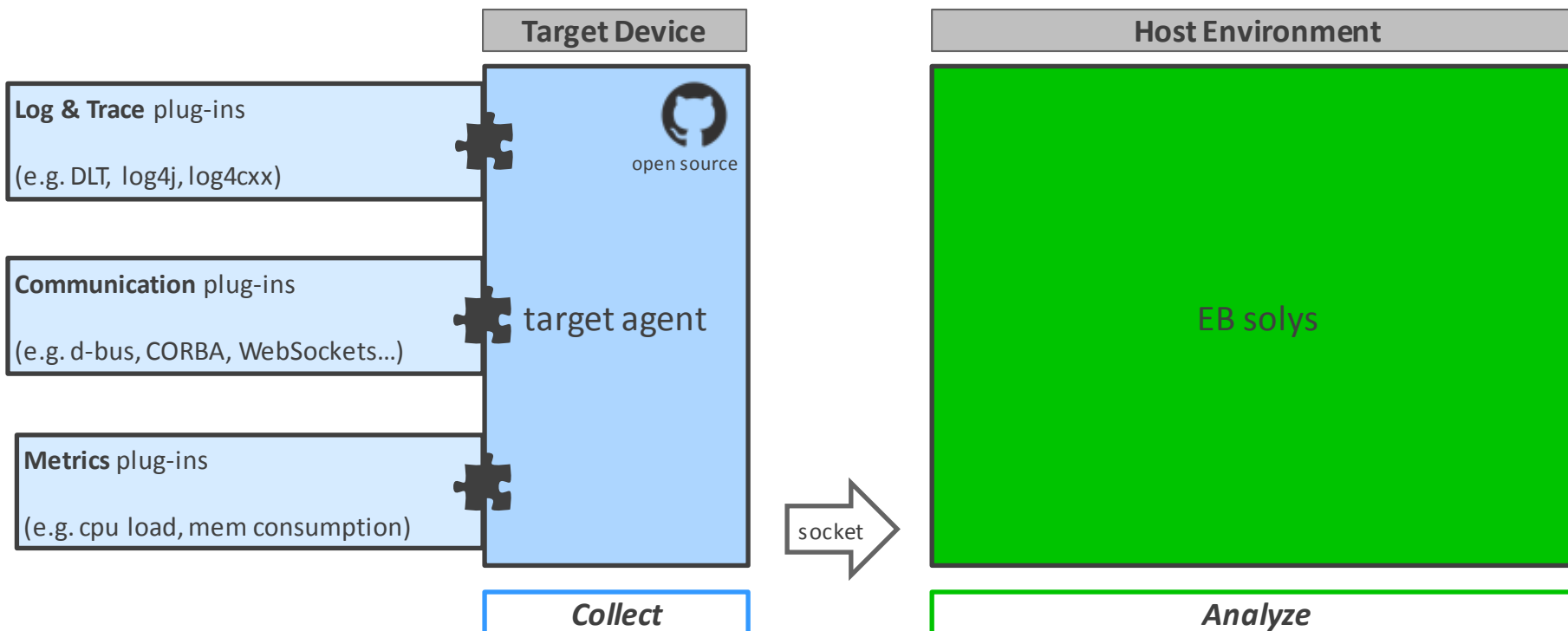
The **target agent** is open source and runs under Linux, QNX, Android and Windows.

EB solys is an Eclipse RCP application, requires Java 8 and runs under Windows and Linux



EB solys target agent

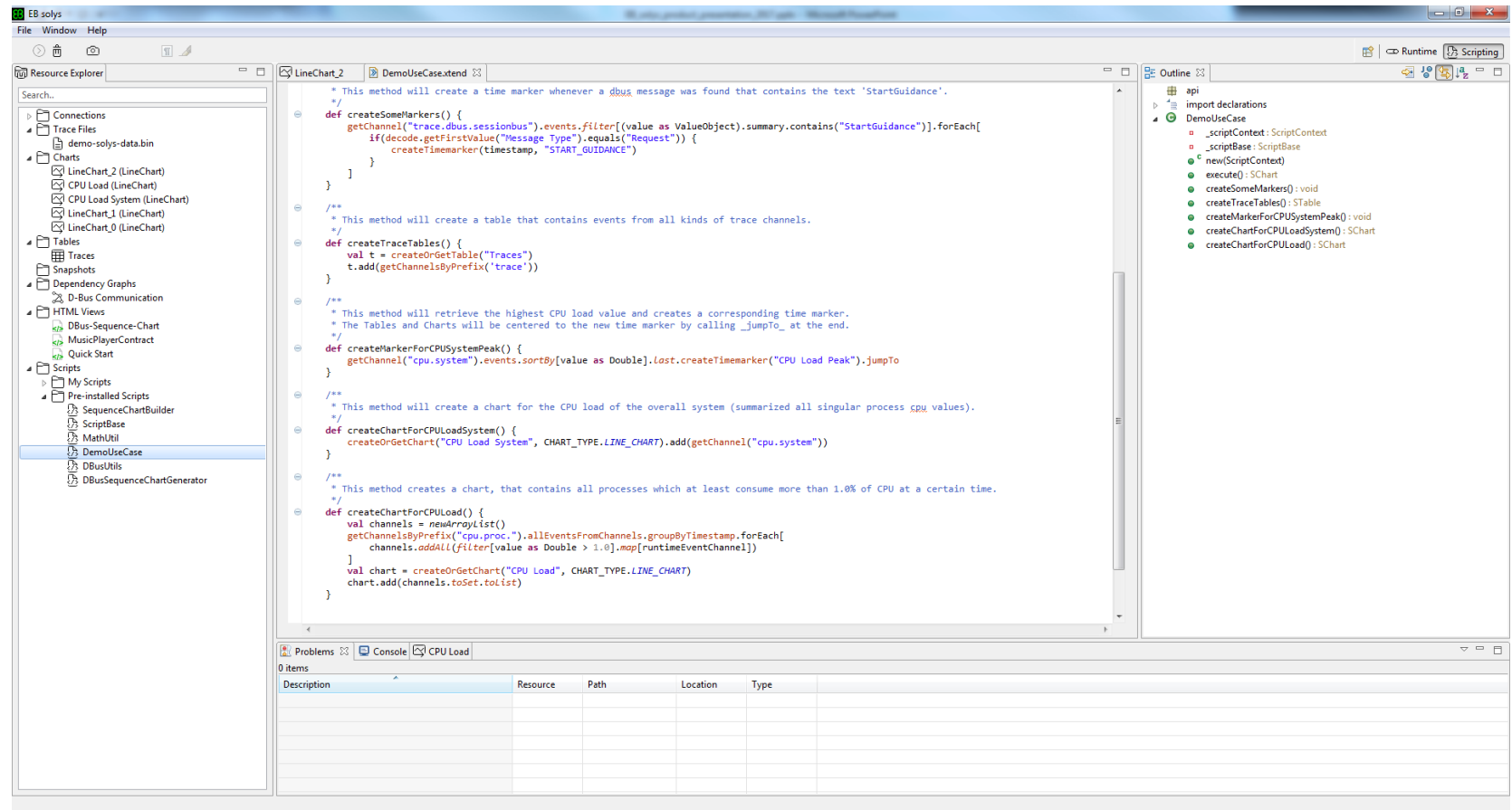
Use existing **target agent plug-ins** or **extend** the target agent with your own plug-ins, that retrieves project/system specific data.



Programmatic analysis

Built-in Script Engine

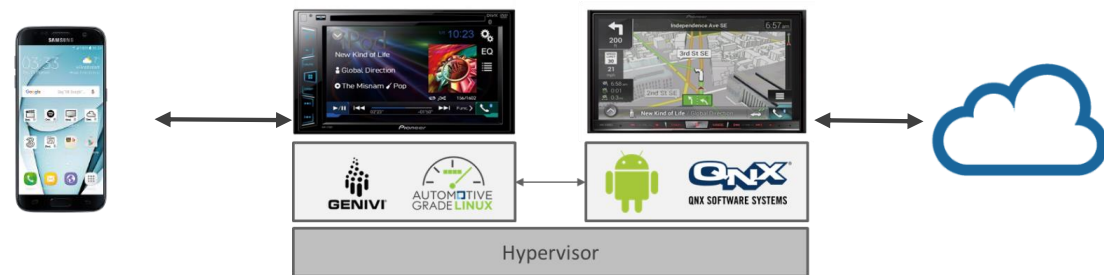
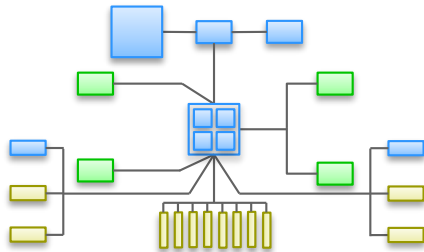
- Based on the programming language Xtend
- Powerful API to access all runtime events and UI resources
- Includes editor with syntax highlighting, code completion, outline, etc.
- Compiles executable scripts in the background on-the-fly
- Integrated into UI widgets by special annotations
- Special filter scripts to be used for complex search in tables
- Executable live and post-mortem



Distributed systems

Rationale

Market trends show that automotive software systems are moving into the direction of **service-oriented architecture** on distributed systems over **multiple ECUs** and devices. Observable functionality for the driver will then doubtlessly be implemented as a **distributed software stack**, which is cross-cutting several layers, nodes and technologies by **multiple suppliers**.



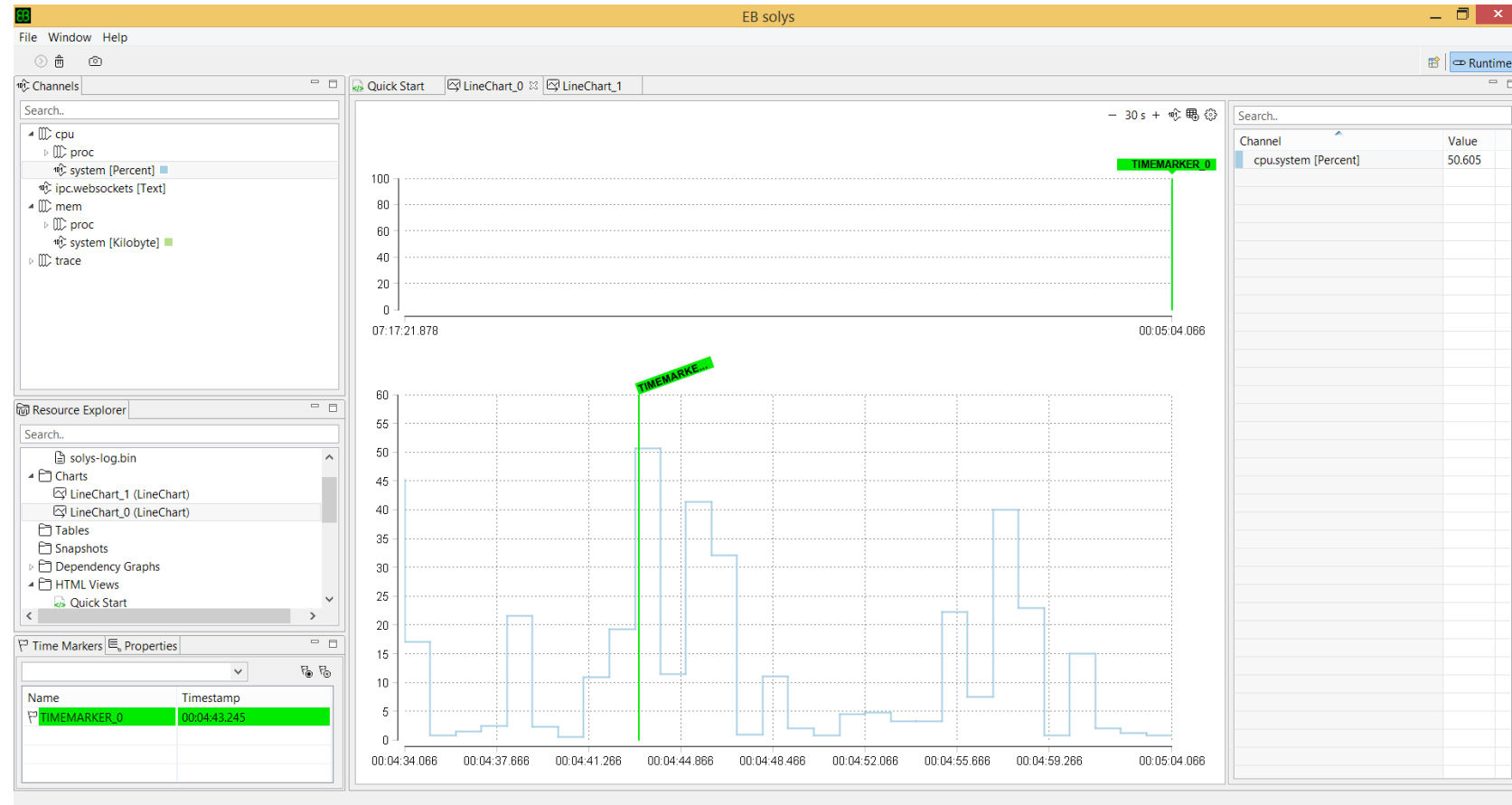
Feature Description

EB solys is being extended in a way to be able to **follow the data and communication flow through the entire distributed software system**, in order to identify hot spots and difficult to find bugs.

EB solys & SDL Example 1/3

Set TimeMarker at
interesting data point,
e.g. peak in CPU load

What happened at this
moment in time?



TimeMarker corresponds to communication between SDL Core and HMI

The screenshot displays the EB solys application interface, which is used for analyzing system logs. The main window is titled "EB solys" and features a menu bar with "File", "Window", and "Help". Below the menu bar, there are tabs for "Channels", "Quick Start", "LineChart_0", "LineChart_1", and "Table_0". The "Channels" tab is active, showing a list of channels on the left and a detailed log of messages in the center.

The left sidebar contains two panels: "Channels" and "Resource Explorer". The "Channels" panel shows a tree view of system resources, including "cpu", "proc", "system [Percent]", "ipc.websockets [Text]", "mem", "proc", "system [Kilobyte]", and "trace". The "Resource Explorer" panel shows a tree view of system files, including "solys-log.bin", "Charts", "LineChart_1 (LineChart)", "LineChart_0 (LineChart)", "Tables", "Table_0", "Snapshots", "Dependency Graphs", and "HTML Views".

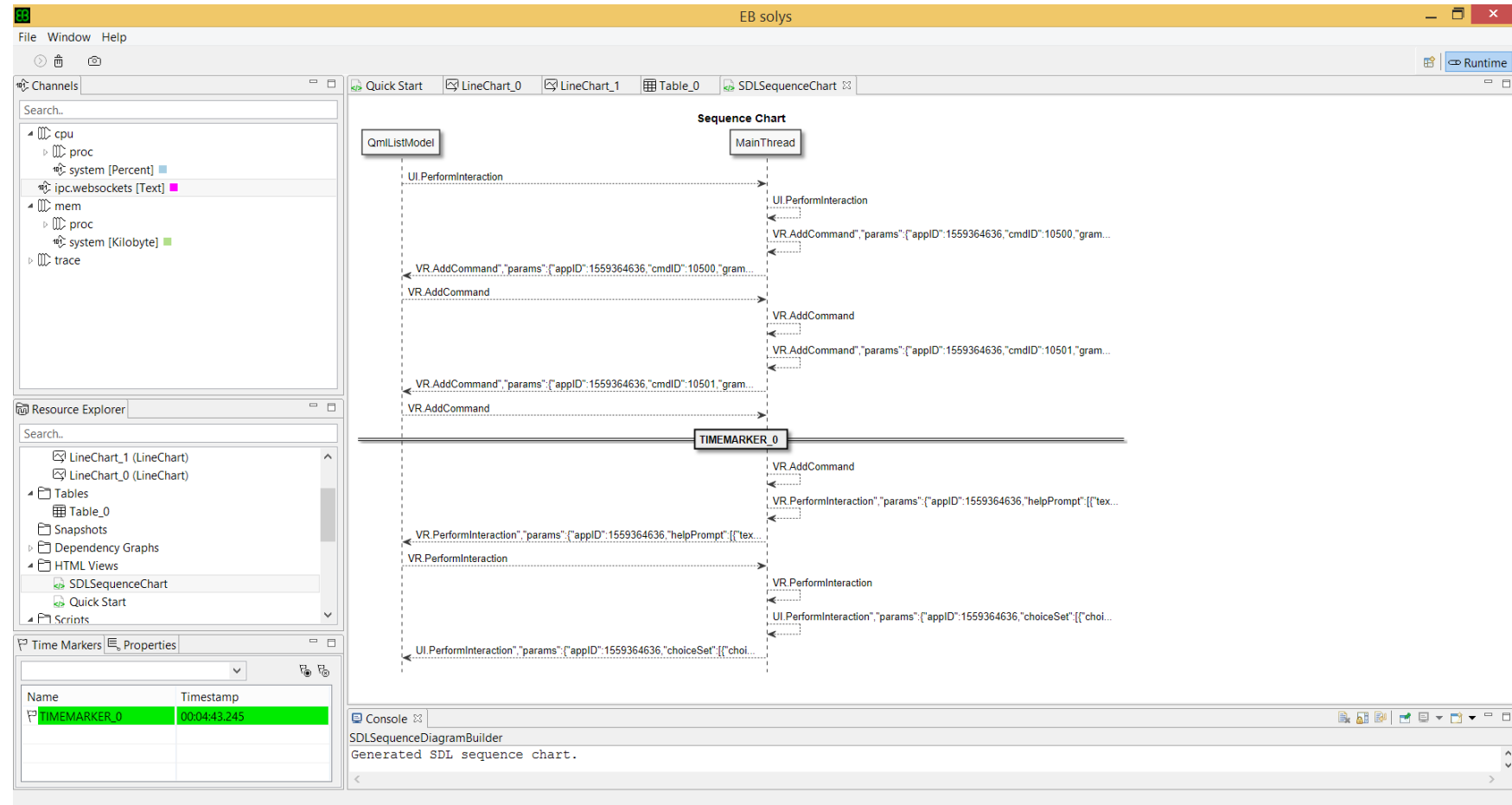
The main window displays a log of messages in a table with columns "Timestamp", "Value", and "Channel". The log shows a series of IPC messages between a CPU and a system, including commands, responses, and status updates. The messages are color-coded: blue for commands, green for responses, and red for status updates. The log is filtered to show only messages from the "ipc.websockets" channel.

The "Time Markers" panel at the bottom left shows a list of time markers, including "TIMEMARKER_0" at timestamp "00:04:43.245".

Timestamp	Value	Channel
00:04:38.802	("websocket":{"payload":{"id":461,"jsonrpc":"2.0","method":"UI.OnCommand","params":{"appId":"1559364636","cmdID":"1005"},"meta	ipc.websockets
00:04:38.846	("websocket":{"payload":{"id":461,"jsonrpc":"2.0","method":"VR.PerformInteraction","params":{"appId":"1559364636","helpProm	ipc.websockets
00:04:38.891	("websocket":{"payload":{"id":461,"jsonrpc":"2.0","method":"VR.PerformInteraction","params":{"appId":"1559364636","helpProm	ipc.websockets
00:04:38.935	("websocket":{"payload":{"id":461,"jsonrpc":"2.0","result":{"code":0,"method":"VR.PerformInteraction"},"metadata":{"sender	ipc.websockets
00:04:38.977	("websocket":{"payload":{"id":461,"jsonrpc":"2.0","result":{"code":0,"method":"VR.PerformInteraction"},"metadata":{"sender	ipc.websockets
00:04:39.024	("websocket":{"payload":{"id":462,"jsonrpc":"2.0","method":"UI.PerformInteraction","params":{"appId":"1559364636","choiceSet	ipc.websockets
00:04:39.071	("websocket":{"payload":{"id":462,"jsonrpc":"2.0","method":"UI.PerformInteraction","params":{"appId":"1559364636","choiceSet	ipc.websockets
00:04:42.755	("websocket":{"payload":{"id":462,"jsonrpc":"2.0","result":{"choiceID":"10412","code":0,"method":"UI.PerformInteraction"},"meta	ipc.websockets
00:04:42.801	("websocket":{"payload":{"id":462,"jsonrpc":"2.0","result":{"choiceID":"10412","code":0,"method":"UI.PerformInteraction"},"meta	ipc.websockets
00:04:42.847	("websocket":{"payload":{"id":463,"jsonrpc":"2.0","method":"VR.AddCommand","params":{"appId":"1559364636","cmdID":"10500	ipc.websockets
00:04:42.904	("websocket":{"payload":{"id":463,"jsonrpc":"2.0","method":"VR.AddCommand","params":{"appId":"1559364636","cmdID":"10500	ipc.websockets
00:04:42.966	("websocket":{"payload":{"id":463,"jsonrpc":"2.0","result":{"code":0,"method":"VR.AddCommand"},"metadata":{"sender":{"n	ipc.websockets
00:04:43.071	("websocket":{"payload":{"id":463,"jsonrpc":"2.0","result":{"code":0,"method":"VR.AddCommand"},"metadata":{"sender":{"n	ipc.websockets
00:04:43.137	("websocket":{"payload":{"id":464,"jsonrpc":"2.0","method":"VR.AddCommand","params":{"appId":"1559364636","cmdID":"10501	ipc.websockets
00:04:43.187	("websocket":{"payload":{"id":464,"jsonrpc":"2.0","method":"VR.AddCommand","params":{"appId":"1559364636","cmdID":"10501	ipc.websockets
00:04:43.231	("websocket":{"payload":{"id":464,"jsonrpc":"2.0","result":{"code":0,"method":"VR.AddCommand"},"metadata":{"sender":{"n	ipc.websockets
00:04:43.245	TIMEMARKER_0	
00:04:43.274	("websocket":{"payload":{"id":464,"jsonrpc":"2.0","result":{"code":0,"method":"VR.AddCommand"},"metadata":{"sender":{"n	ipc.websockets
00:04:43.318	("websocket":{"payload":{"id":465,"jsonrpc":"2.0","method":"VR.PerformInteraction","params":{"appId":"1559364636","helpProm	ipc.websockets
00:04:43.362	("websocket":{"payload":{"id":465,"jsonrpc":"2.0","method":"VR.PerformInteraction","params":{"appId":"1559364636","helpProm	ipc.websockets
00:04:43.448	("websocket":{"payload":{"id":465,"jsonrpc":"2.0","result":{"code":0,"method":"VR.PerformInteraction"},"metadata":{"sender	ipc.websockets
00:04:43.526	("websocket":{"payload":{"id":465,"jsonrpc":"2.0","result":{"code":0,"method":"VR.PerformInteraction"},"metadata":{"sender	ipc.websockets
00:04:43.586	("websocket":{"payload":{"id":466,"jsonrpc":"2.0","method":"UI.PerformInteraction","params":{"appId":"1559364636","choiceSet	ipc.websockets
00:04:43.632	("websocket":{"payload":{"id":466,"jsonrpc":"2.0","method":"UI.PerformInteraction","params":{"appId":"1559364636","choiceSet	ipc.websockets
00:04:43.754	("websocket":{"payload":{"id":466,"jsonrpc":"2.0","result":{"choiceID":"10500","code":0,"method":"UI.PerformInteraction"},"meta	ipc.websockets
00:04:43.798	("websocket":{"payload":{"id":466,"jsonrpc":"2.0","result":{"choiceID":"10500","code":0,"method":"UI.PerformInteraction"},"meta	ipc.websockets
00:04:43.842	("websocket":{"payload":{"id":467,"jsonrpc":"2.0","method":"UI.Show","params":{"alignment":"CENTERED","appId":"1559364636	ipc.websockets
00:04:43.884	("websocket":{"payload":{"id":467,"jsonrpc":"2.0","method":"UI.Show","params":{"alignment":"CENTERED","appId":"1559364636	ipc.websockets
00:04:43.926	("websocket":{"payload":{"id":467,"jsonrpc":"2.0","result":{"code":0,"method":"UI.Show"},"metadata":{"sender":{"name":"Qr	ipc.websockets
00:04:43.968	("websocket":{"payload":{"id":467,"jsonrpc":"2.0","result":{"code":0,"method":"UI.Show"},"metadata":{"sender":{"name":"M	ipc.websockets
00:04:44.010	("websocket":{"payload":{"id":468,"jsonrpc":"2.0","method":"UI.Show","params":{"alignment":"CENTERED","appId":"1559364636	ipc.websockets
00:04:44.052	("websocket":{"payload":{"id":468,"jsonrpc":"2.0","method":"UI.Show","params":{"alignment":"CENTERED","appId":"1559364636	ipc.websockets
00:04:44.094	("websocket":{"payload":{"id":468,"jsonrpc":"2.0","result":{"code":0,"method":"UI.Show"},"metadata":{"sender":{"name":"Or	ipc.websockets

EB solys & SDL Example 3/3

Sequence diagram is showing communication flow at high CPU load



Summary

EB solys product homepage:

<https://www.elektrobit.com/products/software-engineering/software-integration-and-engineering-services/eb-solys/>

Target agent source code repository:

<https://github.com/Elektrobit/eb-solys-target-agent>

Support forum:

<https://groups.google.com/forum/#!forum/eb-solys-support>

- EB solys combines data from different (distributed) sources
- EB is providing an EB solys package for SDL, including
 - ✓ Target Agent
 - ✓ + Plugins for typical SDL use cases (e.g. WebSockets, DLT,...)
 - ✓ EB solys Essentials Desktop application
 - ✓ + SDL-specific scripts for analysis and visualization
 - ✓ Documentation / Tutorials

Get in touch!



mike.foedisch@elektrobit.com
www.elektrobit.com

