

Handling SDL Complexity

SDL Developer Conference

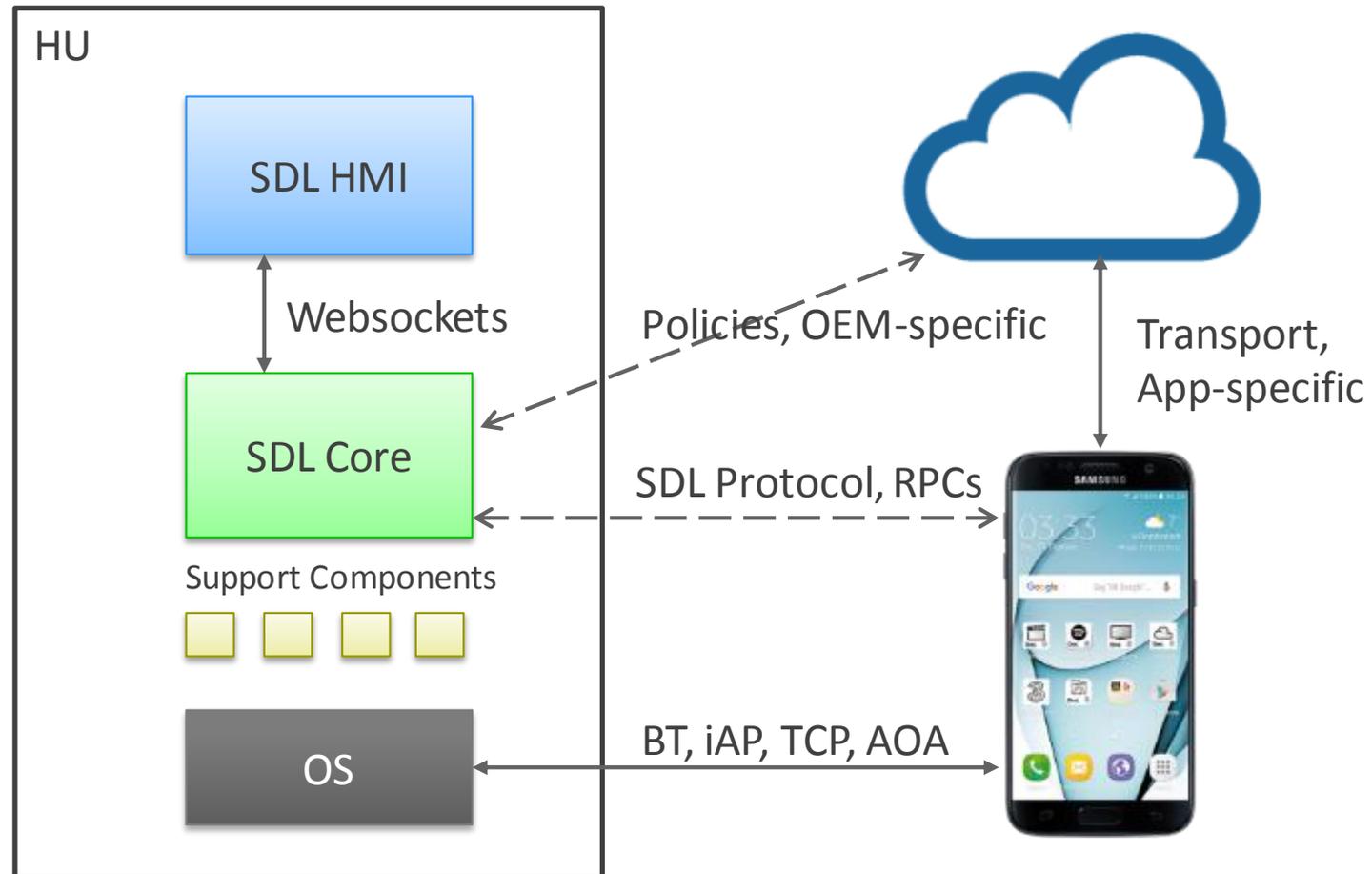


Elektrobit

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Sep 12, 2017

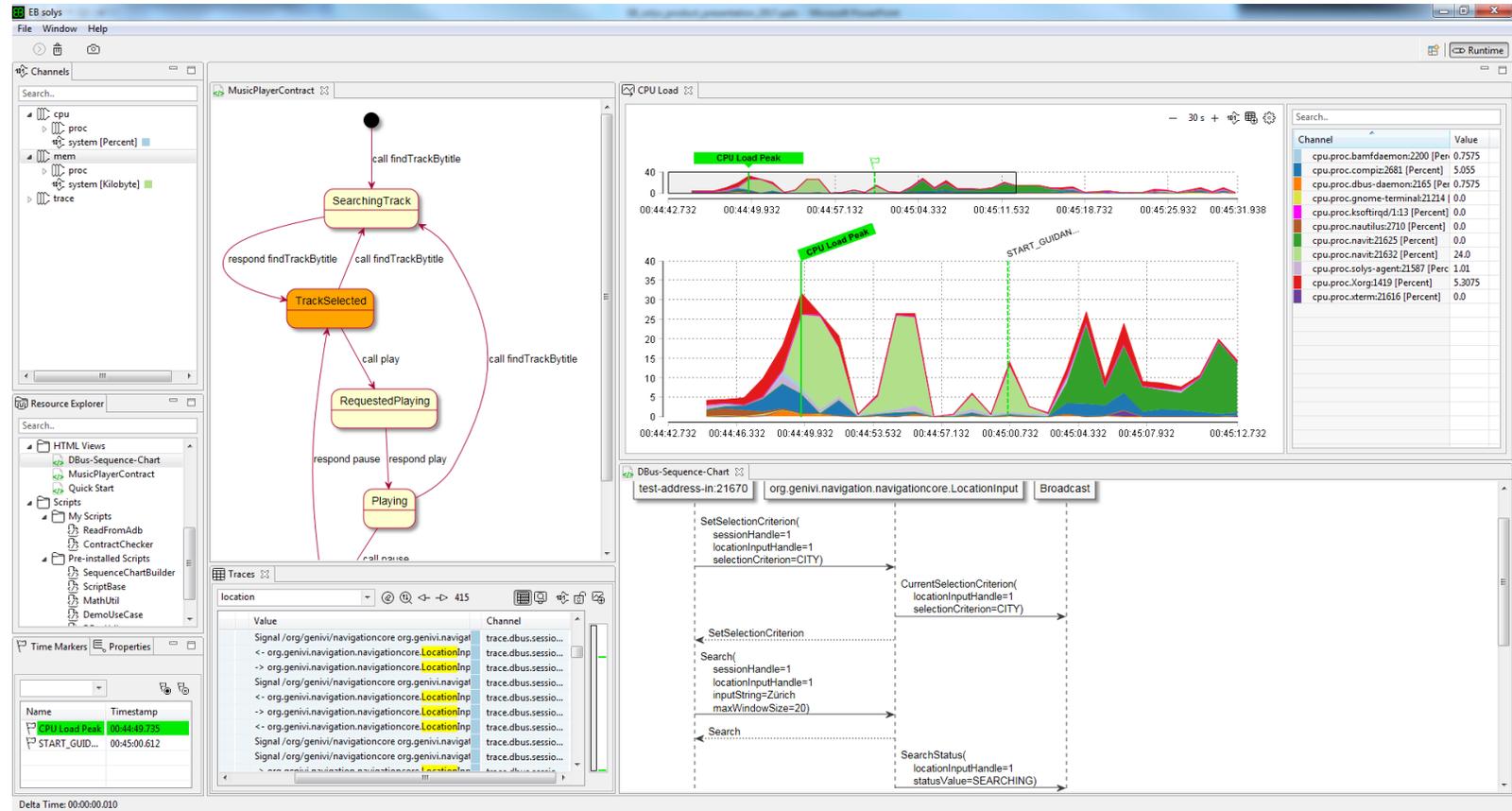


Levels of Complexity in SDL



EB solys

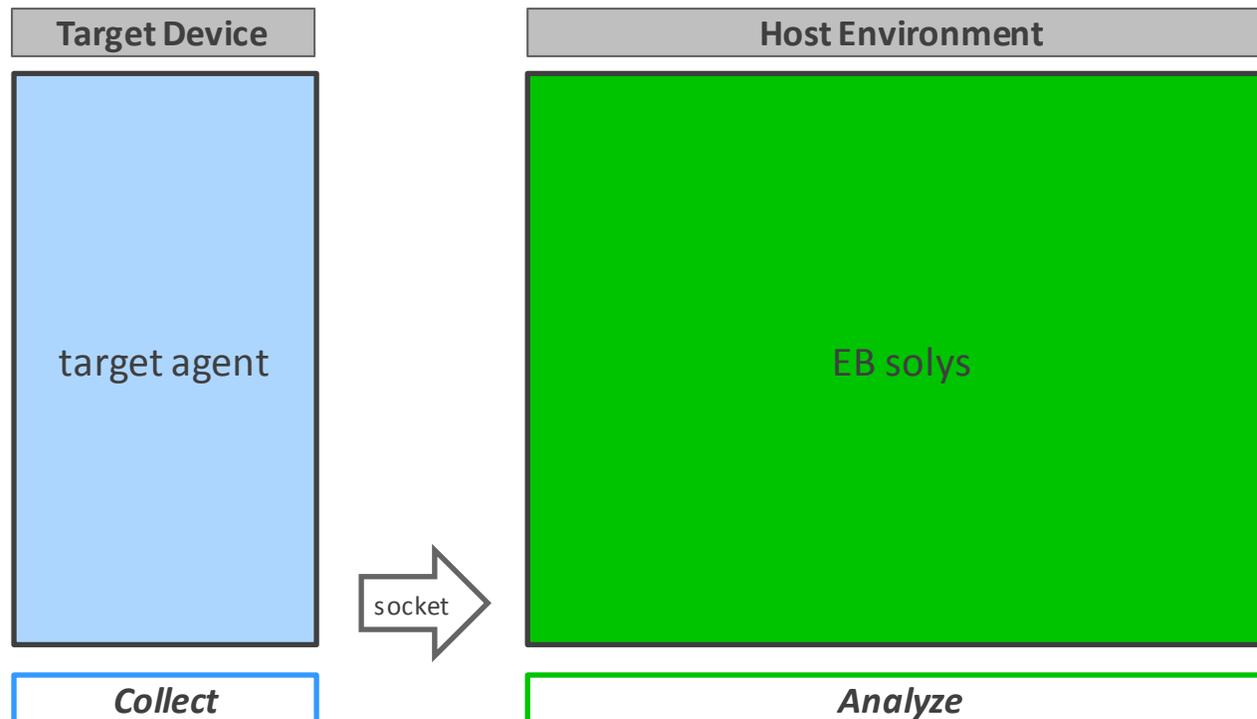
- Combine data from different sources
- Base for
 - System understanding
 - Analysis
 - Debugging
 - KPIs



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.



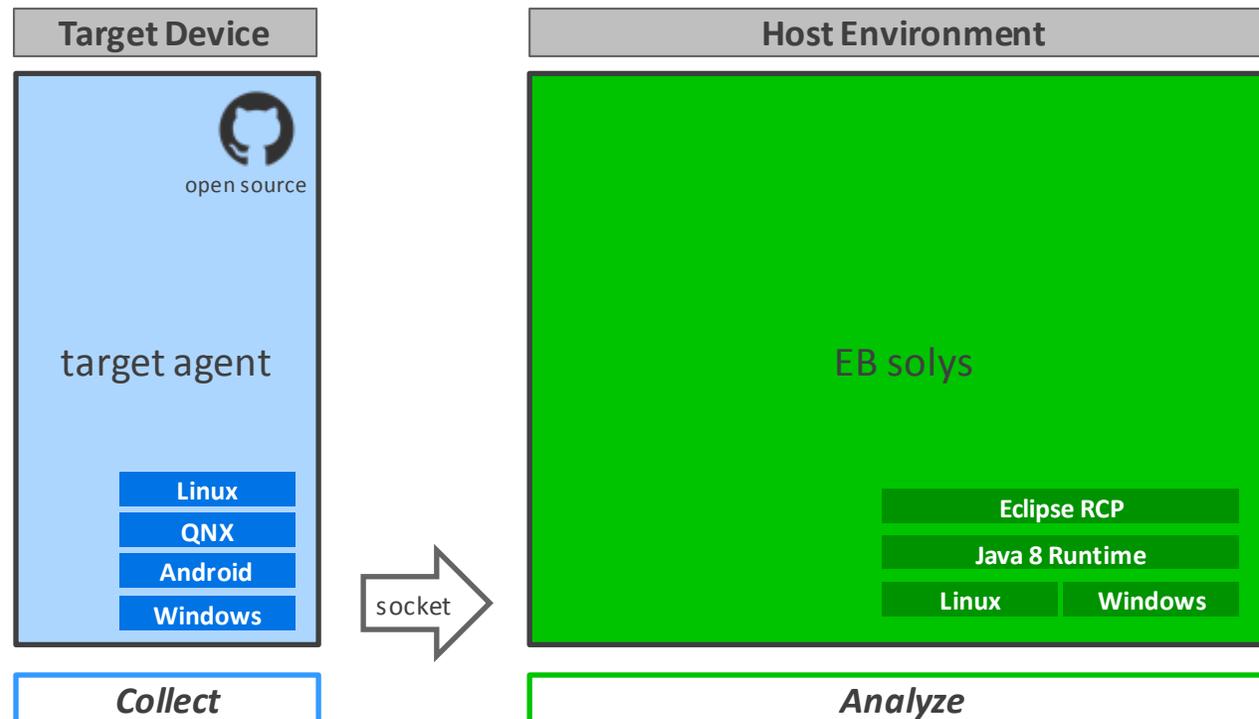
EB solys is an application running on an host environment for exploring, correlating and aggregating run-time data.

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

Supported platforms

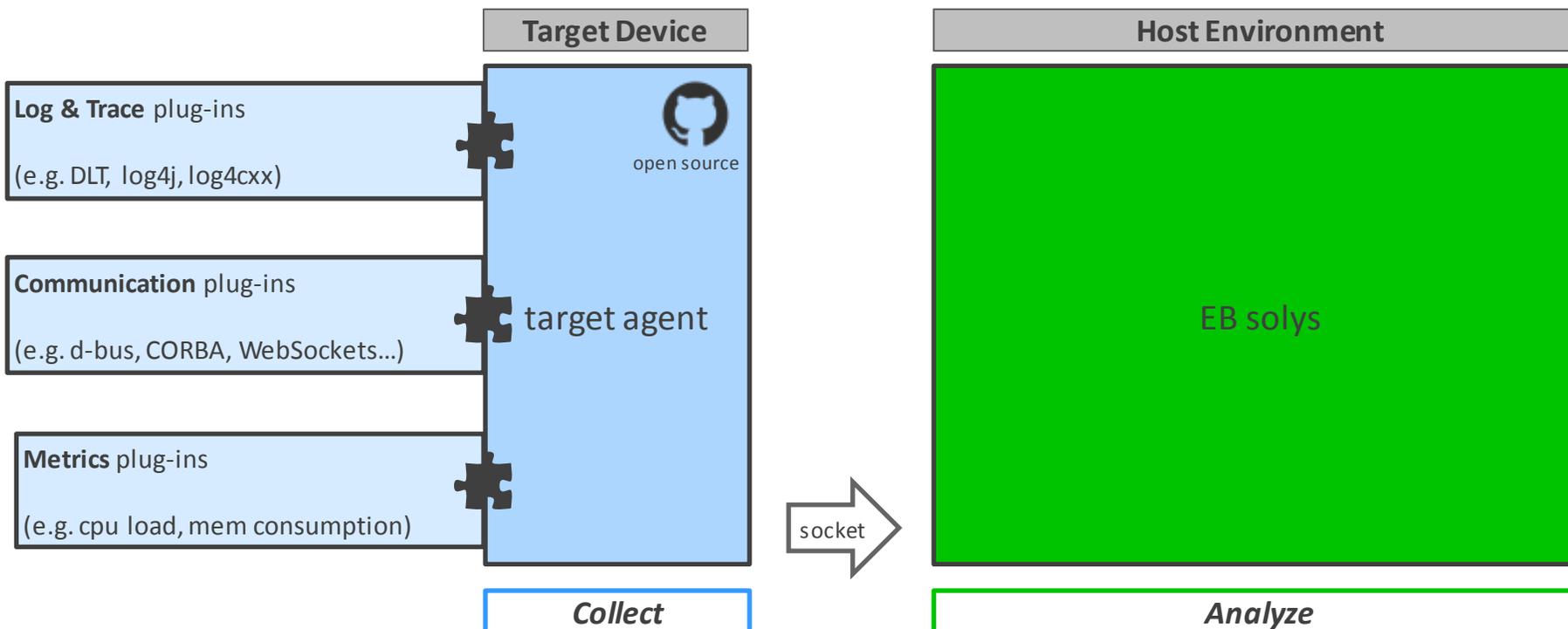
The **target agent** is open source and runs under Linux, QNX, Android and Windows.

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



EB solys target agent

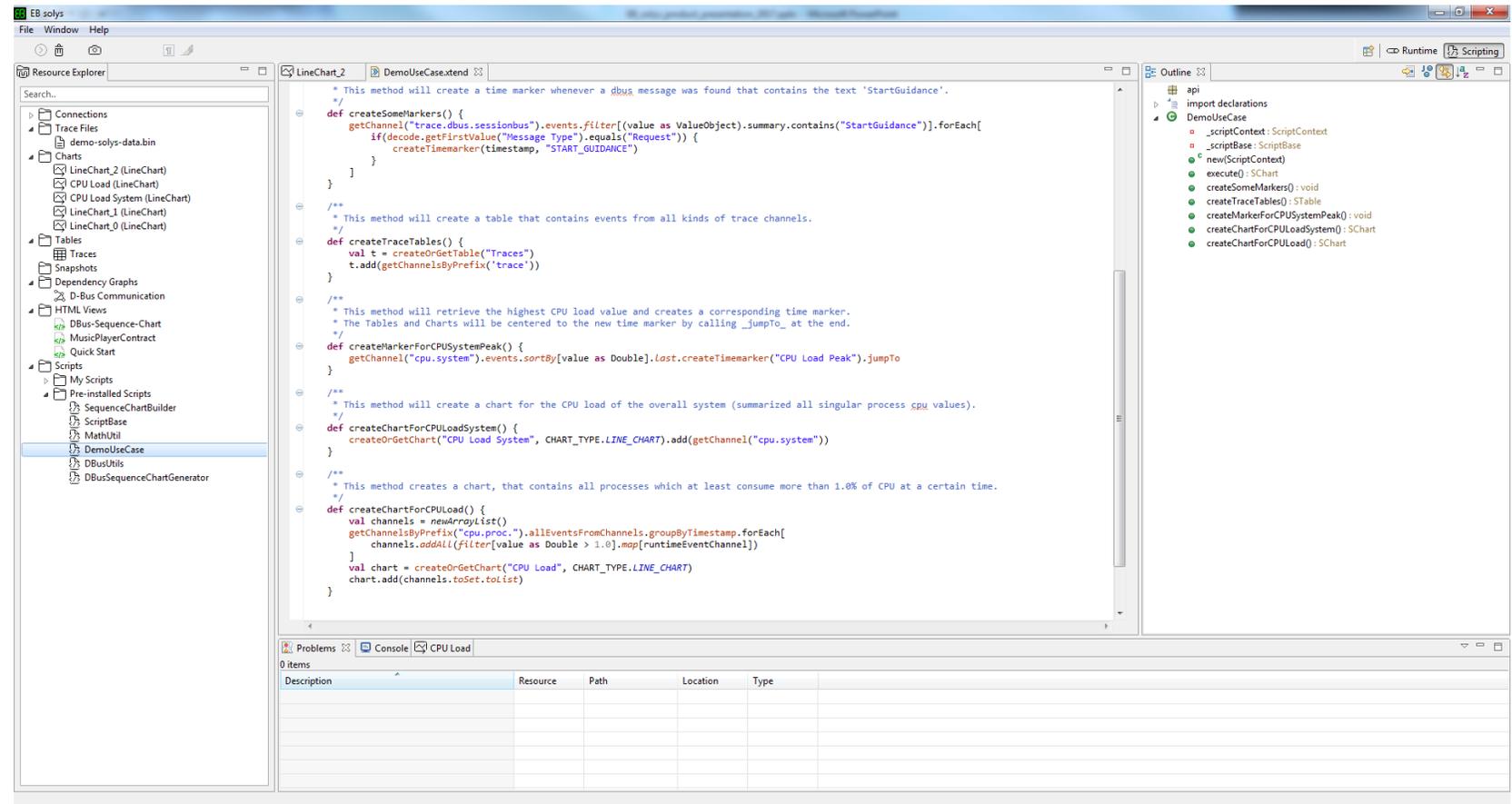
Use existing **target agent plug-ins** or **extend** the target agent with your own plug-ins, that retrieves project/system specific data.



Programmatic analysis

Built-in Script Engine

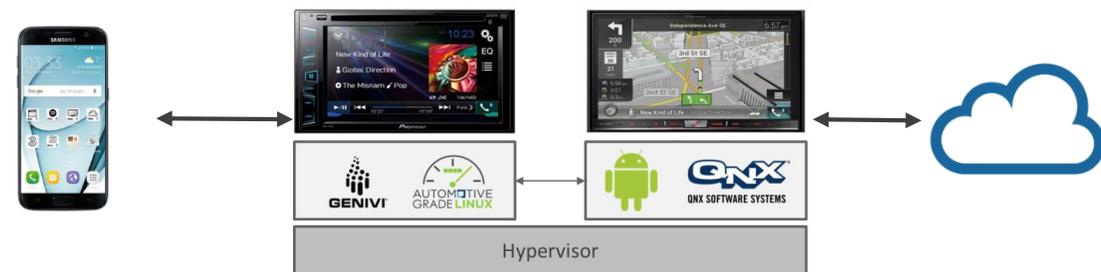
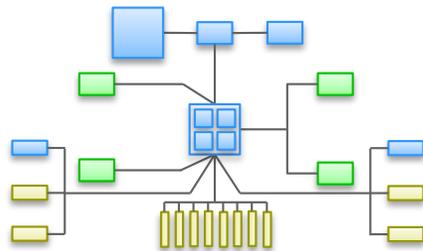
- Based on the programming language Xtend
- Powerful API to access all runtime events and UI resources
- Includes editor with syntax highlighting, code completion, outline, etc.
- Compiles executable scripts in the background on-the-fly
- Integrated into UI widgets by special annotations
- Special filter 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**.



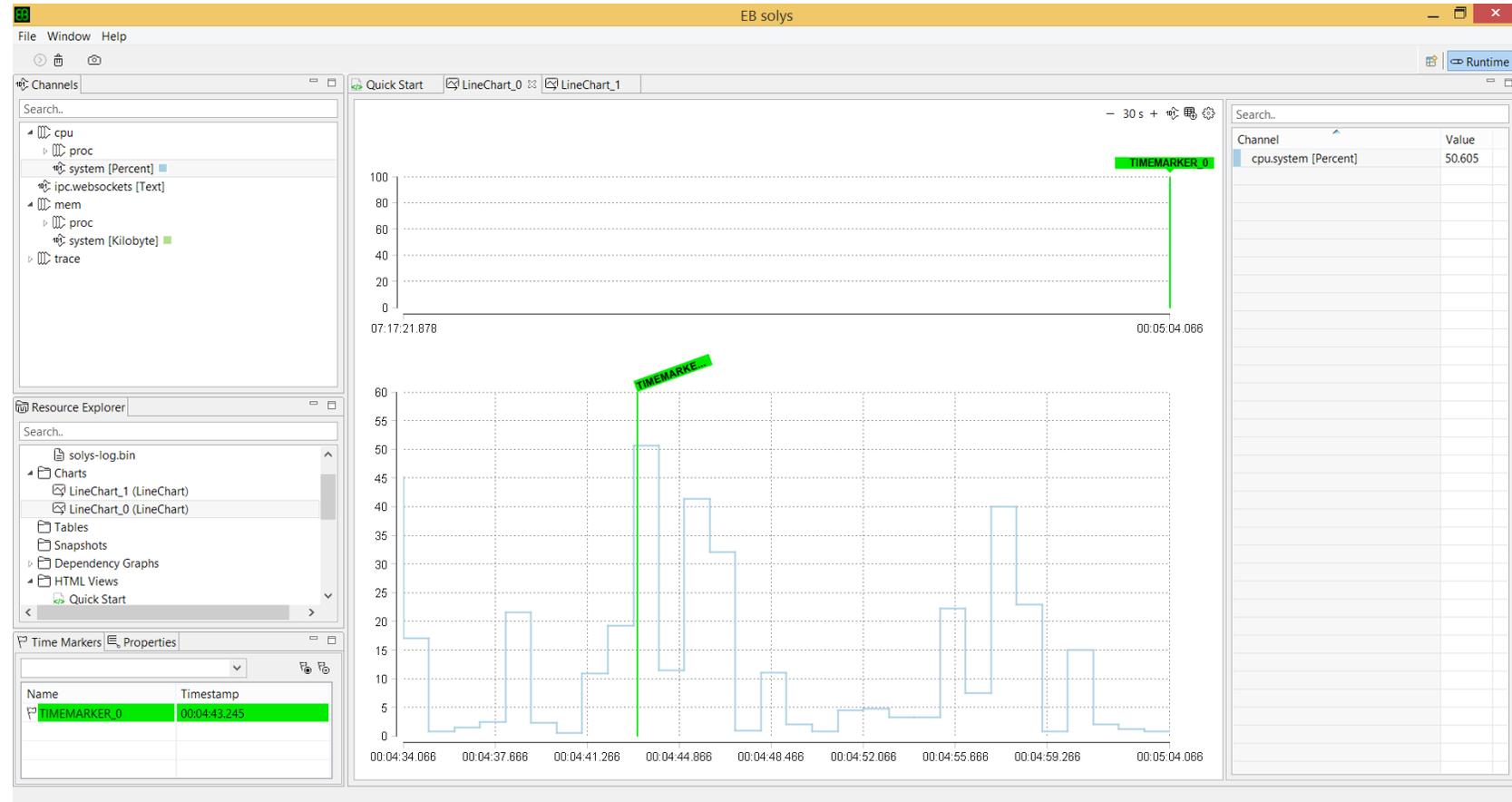
Feature Description

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?



EB solys & SDL Example 2/3

TimeMarker corresponds to communication between SDL Core and HMI

What was the communication flow ?

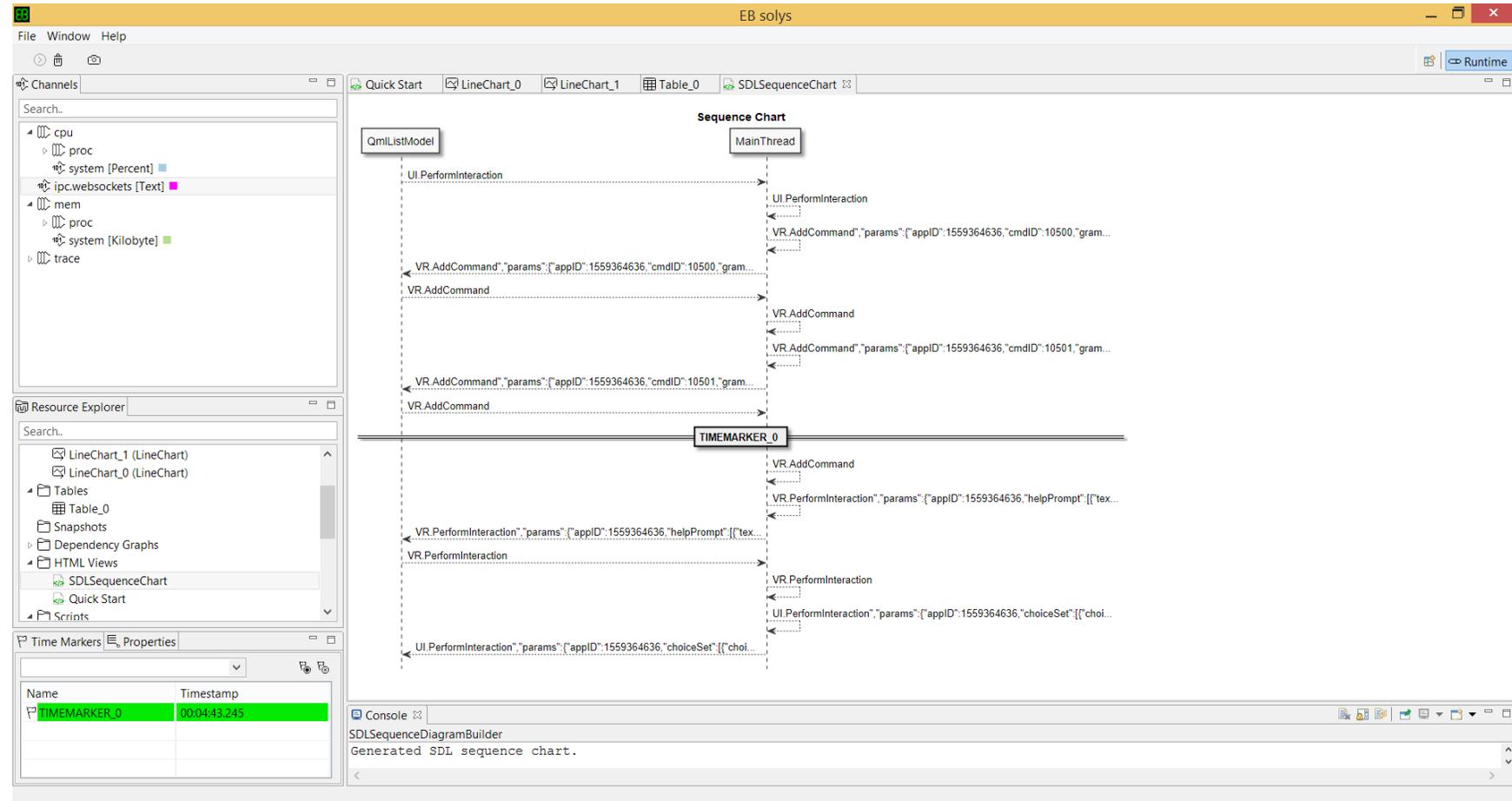
The screenshot shows the EB solys interface with a log table. The table has three columns: Timestamp, Value, and Channel. A specific entry is highlighted in green, indicating a TimeMarker.

Timestamp	Value	Channel
00:04:38.802	["websocket":{"payload":{"jsonrpc":"2.0","method":"UI.OnCommand","params":{"appId":"1559364636","cmdID":"1005"},"metaData":{ "sender":"n	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":"n	ipc.websockets
00:04:38.977	["websocket":{"payload":{"id":"461","jsonrpc":"2.0","result":{"code":"0","method":"VR.PerformInteraction"},"metaData":{"sender":"n	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":"n	ipc.websockets
00:04:43.526	["websocket":{"payload":{"id":"465","jsonrpc":"2.0","result":{"code":"0","method":"VR.PerformInteraction"},"metaData":{"sender":"n	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":"Or	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

The TimeMarker_0 is located at timestamp 00:04:43.245. The Resource Explorer on the left shows the project structure, including solys-log.bin, Charts, Tables, and Snapshots. The Time Markers panel at the bottom shows the selected TimeMarker_0 with its timestamp.

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!



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