Monitor, Control, Record and Replay Your DDS System

OpenSplice DDS Tools-Ecosystem - Overview & Demo

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Abstract

- Integrating, Operating and Troubleshooting large-scale distributed systems can be quite hard if you are not equipped with the right set of tools. OpenSplice DDS provides an ecosystem of tools that allow (1) monitoring the key resource and performance indicators of a DDS-based system, (2) controlling the behaviour of your distributed system by dynamically changing the key QoS parameters, and (3) controlling the record and replay of any data flowing in your system. This presentation will highlight and demonstrate how OpenSplice DDS tooling ecosystem can greatly simplify the integration, operation and troubleshooting of distributed applications.
OpenSplice Tools
OpenSplice Modeler

- Eclipse-based MDD tool
- Information Modeling
  - Importing IDL
  - Modeling topics (with type and QoS)
  - Annotating Topics with QoS
- Application Modeling
  - Graphical Modeling of DDS entities
  - C++ / Java code-generation
- Videos on OpenSpliceTube
  - http://www.youtube.com/user/OpenSpliceTube
Total Control: OpenSplice Configurator

- The reference tool for configuring OpenSplice DDS
- Rich **online guide** to configuration options
- **Context help** and parameter validation
- 100% Java
OpenSplice Tester

“Black-Box” DDS system testing

☐ Automated testing of DDS systems
☐ Dynamic Discovery of DDS Entities
☐ Domain-specific scripting languages
☐ Batch execution of regression tests
☐ Debugging of distributed DDS systems
☐ System browser of DDS participants
   ☐ Connectivity & QoS conflict monitoring
☐ One-click definition of monitoring timeline
   ☐ Analysis/comparison of topic data
   ☐ Virtual topic-attributes to ease analysis
☐ Statistics monitoring
☐ 1-click spawning of Tuner to ‘attach’ to a remote process / federation
☐ Integrated IDE
☐ Syntax highlighting editor
☐ One-click relations between script/logs/timeline
OpenSplice Tuner

- “Whitebox” debug/tuning Tool
  - Looking ‘inside’ a federation and/or application
  - Different perspectives (participant, topic, partition)

- Monitoring & Tuning
  - Inspect and Tune the app’s DDS entities
  - Make snapshots of reader-caches
  - Detect and resolve QoS Mismatch
  - Inspect Statistics

- Reading & Writing
  - Read/Write data for arbitrary topics

- Import & Export
  - Inject Topic Definitions
  - export and import XML-based reader/writer snapshots
OpenSplice RnR

- **Dynamic recording** of any topic-data in a DDS system
- **Selective replay** with variable speed
- **Distributed control** by topic-based API (‘command’ & ‘status’ topics)
- **Seamless integration** with OpenSplice Tester (topic-based API)
- Dedicated RnR-Manager graphical GUI for scenario-definition and data import/analysis
Wireshark

- WireShark Packet Dissector
- Watch what goes on the wire
- Inspect DDSI-RTPS and/or RT-Networking packets being exchanged between applications
- Native RTNetworking dissector support available in source-distribution

- OpenSpliceDDS\V6.3.0\HDE\x86.win32\tools\wireshark-plugins\ospl (see README)
**mmStat**

Shared-Memory Statistics viewer

```
mmstat -h
mmstat [-M|m] [-e] [-a] [-i interval] [-s sample_count] [URI]
mstat [-t|T] [-i interval] [-s sample_count] [-l limit] [-f filter_expression]

Mode:
-m Show memory statistics (default mode)
-M Show memory statistics difference
-t Show meta object references
-T Show meta object references difference
-h Show this help
-e Extended mode, shows bar for allocated memory
-a Show pre-allocated memory as well.
-i interval Display interval (in milliseconds)
-s sample_count Stop after sample_count samples
-l limit Show only object count >= limit
-f filter_expr Show only meta objects which name passes the filter expression
```
Tester: QoS conflict detection
Tuner: QoS Tuning
Tuner: Statistics Monitoring
Tester: Data-Capture
Tester: Scripted Record/Replay
RnR-Manager: Graphical Recording & Replay
Visualization Options
Tuner/Tester/Scada-'OsplVis'/Excel