MYRROR

Briefing Note

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Accurately documenting complex processes executing across a disparate legacy infrastructure is non-trivial.

The HELIXsystem Process Assembler™ automates this task. It produces a complete, unambiguous, real-time Digital Twin representation capturing every message interaction regardless of the complexity of the underlying implementation or the fragmentation of the messaging environment.

The HELIXsystem Process Assembler™ documents even the most complex systems in a fraction of the time and at a fraction of the cost than can be achieved using any alternative approach.

HELIXsystem Process Assembler ™ Architecture

The HELIXsystem Process Assembler™ (“Process Assembler”) is comprised of two main components:

- Client Utility
- Assembler Utility

Client Utility and Distributed AI Agents

The Client Utility hosts a portfolio of distributed AI Agents. These are owned and controlled by the client. These agents are lightweight, non-intrusive, messaging environment specific monitors. These Agents are programmable from a centralised console to capture and report selected system interactions.

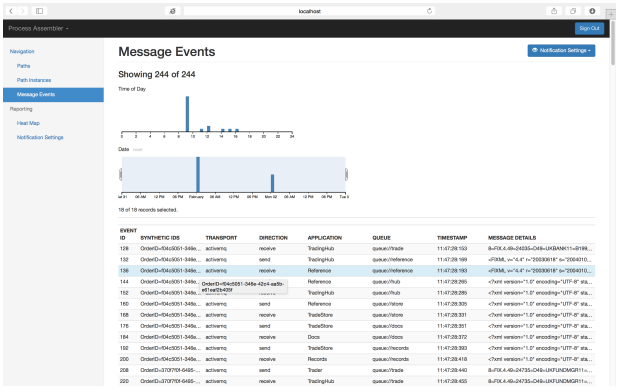
This is achieved without altering the messages, reconfiguring the services, installing agents on data-stores, or refactoring production.

Assembler Utility and the Synthetic ID

The Assembler Utility hosts a Myrror Corporation’s patent protected Correlation Service and Message ID Framework.

The Message ID framework extracts defined data attributes from the reported system interactions and assembles these into a synthetic identify for each message. This synthetic identity is dynamically updated as a message transitions across a complex system, enabling an end-to-end process representation to be generated with ultra-low latency and minimal impact on production.

The Message ID Framework captures concurrent and parallel execution paths, scales lineally and is agnostic to the heterogeneity of the underlying implementation.



Correlation Service

The Correlation Service assembles the system interactions into sets of unique execution paths. This enables irregularly occurring execution traces to be identified and diagnosed.

The Correlation Service is fully automated at run-time and generates a current, complete and unambiguous representation of the system’s activity. As this representation is complete and updates continuously in real-time it is a Digital Twin representation of the executing system.

Bi-Directional Synchronisation

As the Process Assembler’s Digital Twin precisely mirrors the live implementation with minimal latency, it may be used to simulate and test proposed system changes prior to introducing these changes into production.

Once the proposed system changes are found to be acceptable, the Process Assembler's Digital Twin generates the required code enabling the proposed changes to be introduced into production.

Changes to the production environment are in turn identified and reported to the Message ID Framework by the Process Assembler's distributed AI Agents, this ensuring continuous bi-directional synchronisation between the Process Assembler's Digital Twin and the live implementation.

Concurrency and Formal Calculi

Ensuring correct processing behaviour across a distributed, heterogeneous system is a complex problem.

π-calculus is a formal calculi that provides a mathematical model of distributed system behaviour where such behaviour displays both concurrency and dynamically provisioned connectivity.

As the Process Assembler's Digital Twin is a continuously updating, unambiguous, and complete representation of the executing environment, π-calculus may be used dynamically check for starvation, race, deadlock, live-lock and other run-time error conditions that result in non-completing processes even though the individual system components are functioning as designed.

The π-calculus formal calculi is an embedded Process Assembler feature enabling the system to continuously and dynamically check for run-time errors when either change is introduced in the executing environment or when proposed changes are being simulated across the Process Assembler's Digital Twin.

Time Harmonisation Framework

Heterogeneous systems host a multiplicity of inconsistently formatted, non-synchronised clocks resulting in non-compatible event log data. The harmonisation of time stamp data is an essential prerequisite to the compilation of a Digital Twin.

The Process Assembler automates this task by assigning a commonly formatted, identical granularity timestamp to all end-point behaviour. This enables the Process Assembler to identify messaging system latency as it captures the time a messaging event is transmitted and the time it is received.

This also enables monitoring of disparate system performance against the system specified SLA's.

The Process Assembler employs the Precision Time Protocol to ensure time accuracy across its distributed clocks.

The HELIXsystem Process Assembler™ is protected technology by US patent grant No 8,554,594 "Automated Process Assembler".