

Tessent UDAgent

Python-driven interface to an Embedded Analytics infrastructure

Siemens Digital Industries Software

At-a-glance

- High-level scripting interface to the Tessent Embedded Analytics infrastructure
- Scalable roll-out to many host machines
- Run-time configuration of the Tessent Embedded Analytics subsystem IP
- Heterogenous multi-core debug, run control and performance tuning
- Remote configuration and debug of target system
- Extensible using Configuration Definition Layer (CDL)

Tessent UDAgent is a software layer that connects to the Tessent Embedded Analytics infrastructure to facilitate communication between on-chip analytics modules and application software running external to the chip. It provides valuable services to interfacing software, including run-control of the target CPU and configuration and management of the Embedded Analytics infrastructure.

UDAgent provides the necessary connectivity to interface off-chip software applications with Embedded Analytics while leaving customers free to view data via the user interface of their choice. It allows external applications to interface to and configure the full range of Embedded Analytics hardware monitors: embedded logic analyzers, memory monitors, protocol-aware monitors for interconnects and networks, and more.

By interfacing to UDAgent, engineers can simultaneously interrogate the behavior of hardware structures and the execution of software, across the whole SoC.

UDAgent provides batch scripting to help automate the process of module configuration. With a single site-wide license, it is scalable from one to many servers across the enterprise. UDAgent allows configuration and debug of physically remote targets.

UDAgent is an integral part of the Embedded Analytics software toolchain. It is supplied as a bundled component of the Tessent SystemInsight integrated development environment, or as a standalone version.

Overview

Hardware, firmware and software teams need an efficient, easy-to-use interfacing tool that gives control and oversight of the operation of hardware and software within an SoC.

In a complex, heterogeneous system developers need:

- Flexible multi-core run control and trace
- Configuration of Tessent on-chip analytics IP
- Rapid and scalable roll-out to many host machines

UDAgent delivers these capabilities and more.

Used in conjunction with the customer's preferred user interface, it provides an integrated view that encompasses real-time, protocol-aware monitoring of hardware structures within the SoC (including custom logic), single step and breakpoint code execution status for multiple processors (which may be based on different architectures), and instruction trace for many common CPU architectures. Key features include:

- Utilize rich data generated by the Embedded Analytics on-chip monitoring infrastructure
- Create an independent system-level monitoring, optimization and debug infrastructure

- Gather and consolidate data from anywhere on the chip
- Identify and analyze subtle bugs, including hardware-firmware-software interactions
- Create sophisticated cross-triggering, breakpoint and control schemes to analyze the chip's behavior

Configuration of Tessent Embedded Analytics IP

- Simple and convenient configuration of all Embedded Analytics IP modules via Python scripts
- Exploit run-time configuration and advanced functionality
- Monitors are "smart" – allow filtering, counting, timing in hardware
 - Helps focus on "region of interest" and reduce volume of data generated

Command line interface

- Configure Tessent analytic modules and monitors from the command line
- Run scripts and batch jobs for full automation
- Python interface
- Highly extensible Python API for configuration and data processing
- Create sophisticated charts of harvested analytics data for in-depth analysis, when used in conjunction with an external user interface

Virtual Console

- The Virtual Console hardware module provides a peripheral interface that enables communication with the debug host via the Embedded Analytics infrastructure
- Replace conventional UART based communication

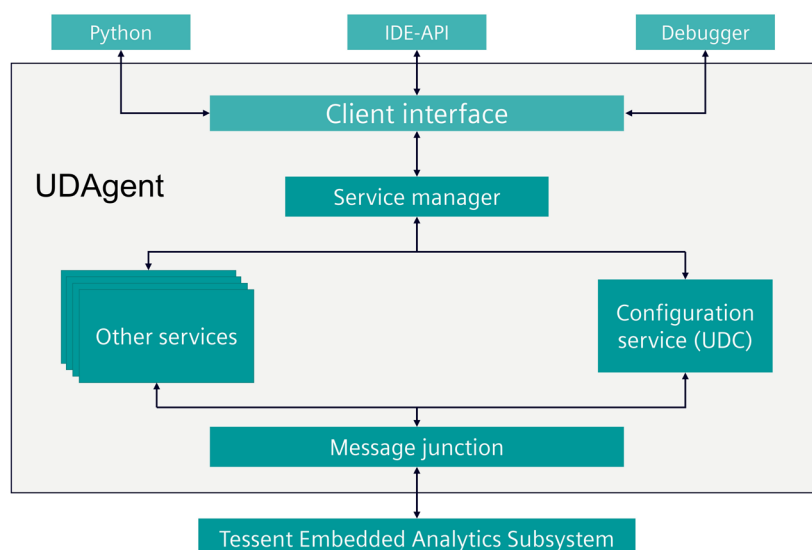
Specifications

Specification	Details
Product versions	<ul style="list-style-type: none"> ■ Packaged with Tessent SystemInsight ■ UDAgent stand-alone (100 seats) ■ Hardware-locked sub-license
Operating systems	Windows 10, Linux (CentOS 7, Ubuntu 18.04 LTS)
Connectivity	JTAG, USB2, PCIe, Ethernet
Embedded Analytics IP modules supported	All applicable modules ¹
Processor debug	Run control, breakpoints, watchpoints, step through, step over
Vendor/ISA (debug)	Arm v7, Arm v8, RISC-V, Xtensa ² , CEVA ²
Vendor/ISA (trace)	Arm ETM, Embedded Analytics RISC-V Trace Encoder
Embedded target	Silicon, FPGA, emulation, simulation

¹ UDAgent supports Embedded Analytics modules where appropriate. The modules for which UDAgent support is not relevant are Trace Communicator, AXI Bus Communicator, and Message Lock.

² Contact the Tessent product team for more information:

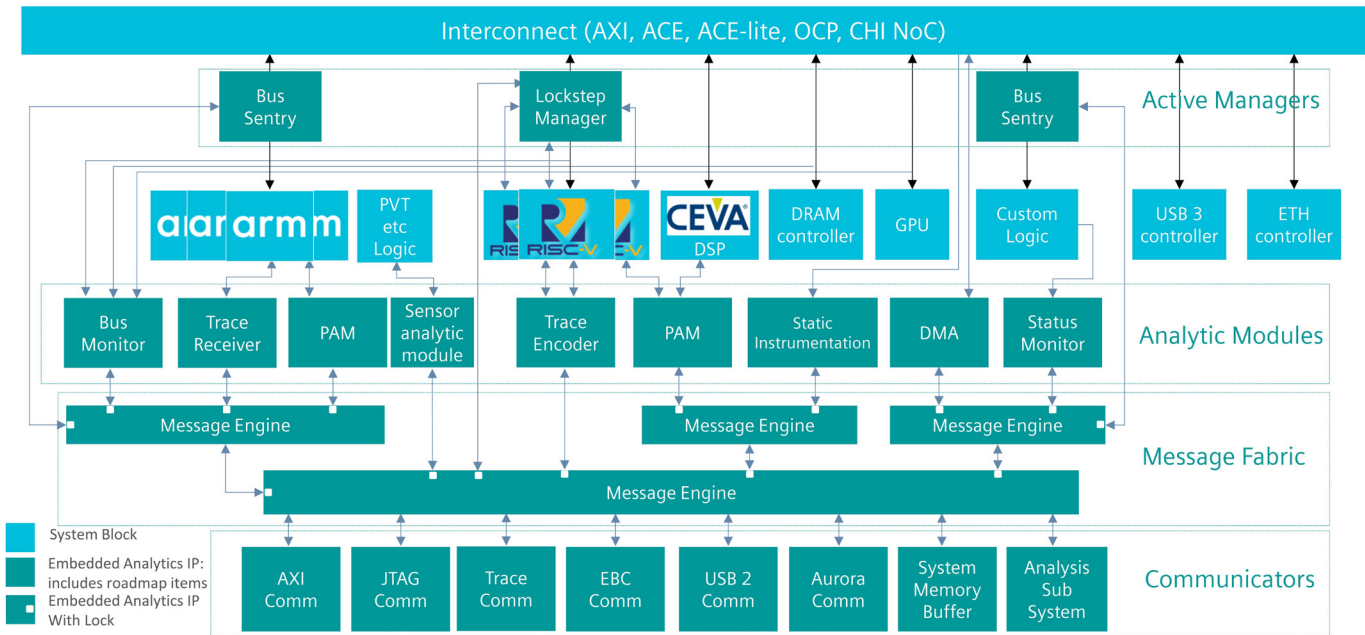
embedded.analytics.sisw@siemens.com



Enabling SoC analytics

In addition to the software to analyze and interpret system data, Tessent also provides a comprehensive range of analytic, message, and communicator modules.

Tessent Embedded Analytics IP modules provide system-wide visibility. Configurable at run-time and highly parameterized, with flexible message-based cross-triggering, the IP modules enable effective and efficient on-chip analytics.



Schematic of a typical SoC, showing Tessent analytic modules, communicators and secure message fabric.

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