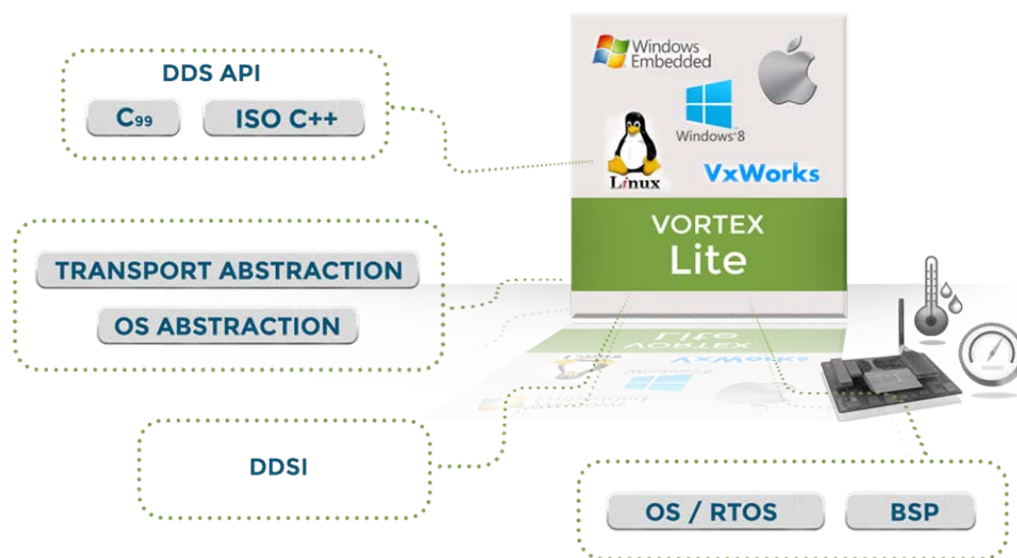


# Vortex Lite Real-time Data Sharing for Embedded IoT Devices

*Vortex Lite provides low latency, real-time data sharing for resource constrained Internet of Things (IoT) devices and environments with limited memory and processing capabilities. Vortex Lite is a part of the Vortex DDS Intelligent Data Sharing platform which provides a comprehensive suite of interoperable solutions based on the Object Management Group's (OMG) Data Distribution Service (DDS) standards and enables device-to-device, device-to-cloud and cloud-to-cloud data sharing.*

## Overview

Vortex Lite was designed for use with IoT devices and other embedded environments that have limited memory and processing power, when compared to more powerful desktop PCs and servers. Vortex Lite can run in as little as a few hundred kilo bytes of memory but still deliver exceptional low latency data sharing. Vortex Lite is well suited for use with networked sensors, single board computers, embedded gateways and micro-controllers.



Vortex Lite has a highly modular and extensible architecture that can be used to exploit the capabilities of the underlying platform, making it easy to support different operating systems, processors architectures and interconnects. Vortex Lite's architecture and limited code size make it a natural candidate for safety critical applications requiring certification.

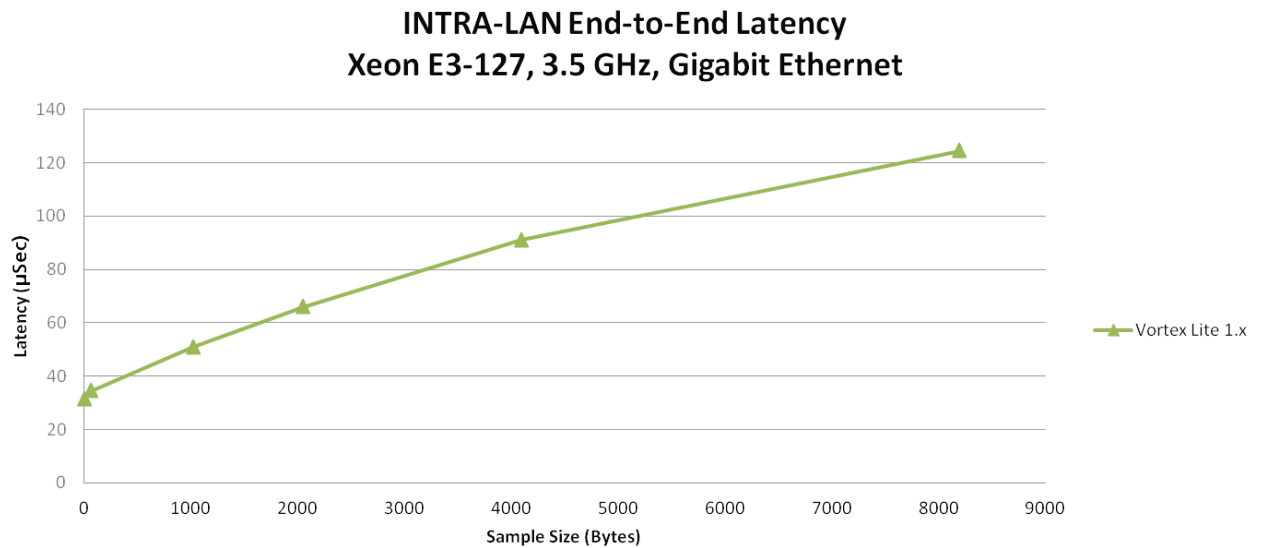
Vortex Lite provides users friendly C and pluggable C++ APIs with support for the OMG's Data-Centric Publish-Subscribe (DCPS) minimum profile (with planned add-ons for content-subscription and persistency).

As a full member of the Vortex DDS platform, Vortex Lite seamlessly interoperates with Vortex Link, Café and OpenSplice as well as with any DDS compliant implementation.

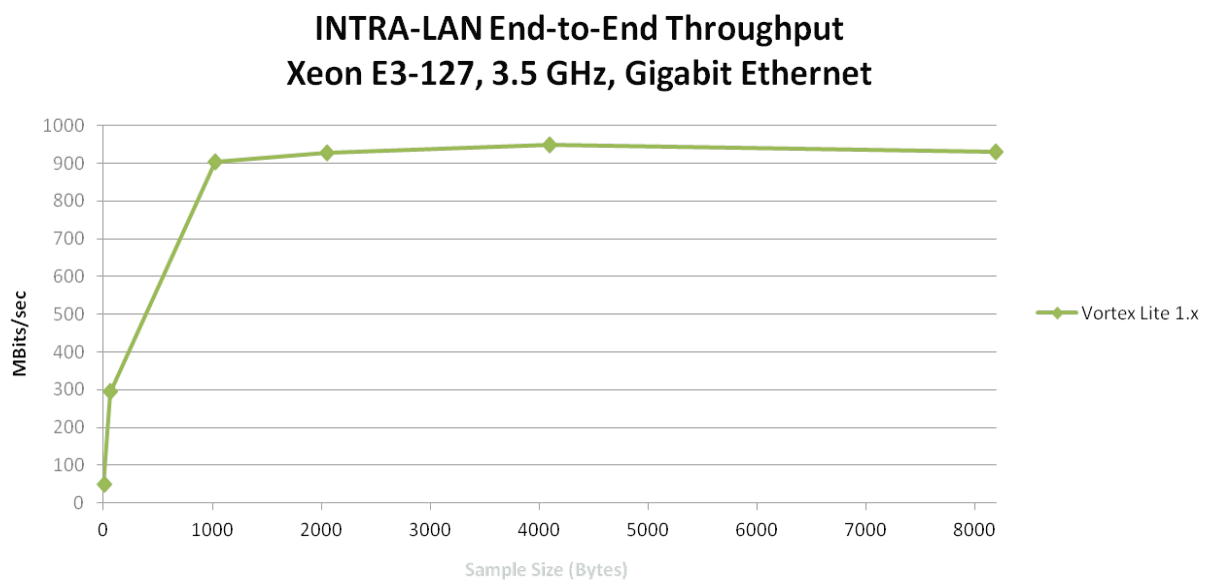
## Exceptional Performance and Low Footprint

Users already familiar with the exceptional low latency, high throughput and deterministic performance of Vortex OpenSplice will be impressed that Vortex Lite's performance is even better. On a range of different platforms and operating systems and across a range of packet sizes we believe that Vortex Lite has the lowest latency of any DDS implementation available on the market. The figure below shows the end-to-end latency

between a publisher and a subscriber node separated by a Gigabit Ethernet connection for varying packet sizes. For this configuration, an end-to-end latency of 30 $\mu$ Sec for small data packets is possible.



Vortex Lite also has excellent sustainable throughput characteristics. For the same configuration the following curve shows that for a relatively small packet size (<3 Kbytes), throughput is only limited by the available network bandwidth and not Vortex Lite.



To address the memory footprint constraint requirements of embedded IoT devices, Vortex Lite's static memory overhead is measured in a few hundred kilo bytes (400 to 500 Kbytes).

## Platform Availability

Vortex Lite was designed to be highly portable and can support a range of operating systems and processor architectures common to embedded and resource constrained IoT devices, including:

- Operating Systems – Linux (32 & 64 bit), Windows (32 & 64 bit), VxWorks, Integrity, ElinOS, PikeOS, LynxOS
- Processors – x86, PowerPC, ARM

For the most up to date list of supported configurations please contact ADLINK.

## Supported Qualities-of-Service

Vortex Lite provides predictable and deterministic data sharing between applications by enabling users to have tailored control over the real-time behavior of the data. QoS can be specified to control timing, communication channel priority and resource utilization, including:

| QoS Category        | QoS Policy            | VORTEX Lite                       |
|---------------------|-----------------------|-----------------------------------|
| Data Availability   | DURABILITY            | only VOLATILE and TRANSIENT_LOCAL |
|                     | DURABILITY SERVICE    |                                   |
|                     | LIFESPAN              | writer only                       |
|                     | HISTORY               | Either KEEP_ALL or depth 1        |
|                     | WRITER DATA LIFECYCLE | ✓                                 |
|                     | READER DATA LIFECYCLE |                                   |
| Data Delivery       | PRESENTATION          | only INSTANCE                     |
|                     | RELIABILITY           | ✓                                 |
|                     | PARTITION             | ✓                                 |
|                     | DESTINATION ORDER     | ✓                                 |
|                     | OWNERSHIP             | ✓                                 |
|                     | OWNERSHIP STRENGTH    | ✓                                 |
| Data Timeliness     | DEADLINE              | only INFINITE                     |
|                     | LATENCY BUDGET        | ✓                                 |
|                     | TRANSPORT PRIORITY    | ✓                                 |
| Resources           | TIME BASED FILTER     | only ZERO separation              |
|                     | RESOURCE LIMITS       | only INFINITE limits              |
| Configuration       | USER DATA             | ✓                                 |
|                     | TOPIC DATA            | ✓                                 |
|                     | GROUP DATA            | ✓                                 |
|                     | ENTITY FACTORY        |                                   |
| System Availability | LIVELINESS            | only AUTOMATIC                    |

## Complimentary Technologies

Vortex Lite is a key component of the Vortex DDS Intelligent Data Sharing platform, an advanced suite of complementary interoperable technologies that enable business critical and industrial IoT systems. The Vortex DDS platform consists of Vortex Lite for embedded IoT devices, Vortex Café for Android and Java-centric environments, and Vortex OpenSplice for servers and desktops. Vortex Link provides the infrastructure for Vortex DDS and can be used to provide Internet wide, secure data sharing.

The Vortex DDS platform also includes a complete set of tools to support system development and management (e.g. configuring, testing, optimizing, monitoring and recording system behavior) and it provides a rich and open API for integration with other IoT application development technologies, such as IDEs, Java EE application servers, M2M platforms and analytics engines. It thus helps system integrators, OEMs, device vendors and cloud service providers deliver high-performance IoT system solutions for many vertical markets, including smart cities and urban environments, smart grid and energy, transportation, healthcare, IT & networks, and industrial automation.

## Summary of Vortex Lite Benefits

Vortex Lite provides users with a range of benefits, including:

- Fastest DDS implementation on the market with end-to-end latency as low as 30 µSec over Gigabit Ethernet (which is only 8 µSec. above the low-level linux 'Ping' Latency)
- Minimal resource consumption with regard to memory and CPU usage
- Modular architecture can support variations in platform functionalities, underlying OS / BSP and transport
- Deterministic data delivery - data urgency / importance based network-scheduling
- Networking efficiency – configurable 'network partitions' enabling partition of the physical network
- User friendly C and pluggable ISO C++ DDS APIs
- Full DDSI rev2.1 interoperability
- Comprehensive QoS support to enable application level control over timing, communication channel priority and resource utilization
- Part of a family of interoperable IoT enabling technologies – Vortex DDS Intelligent Data Sharing Platform

## For More Information

For further information regarding Vortex Lite availability, platform support and pricing please e-mail: [ist\\_info@adlinktech.com](mailto:ist_info@adlinktech.com) or visit: [www.adlinktech.com](http://www.adlinktech.com)



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