

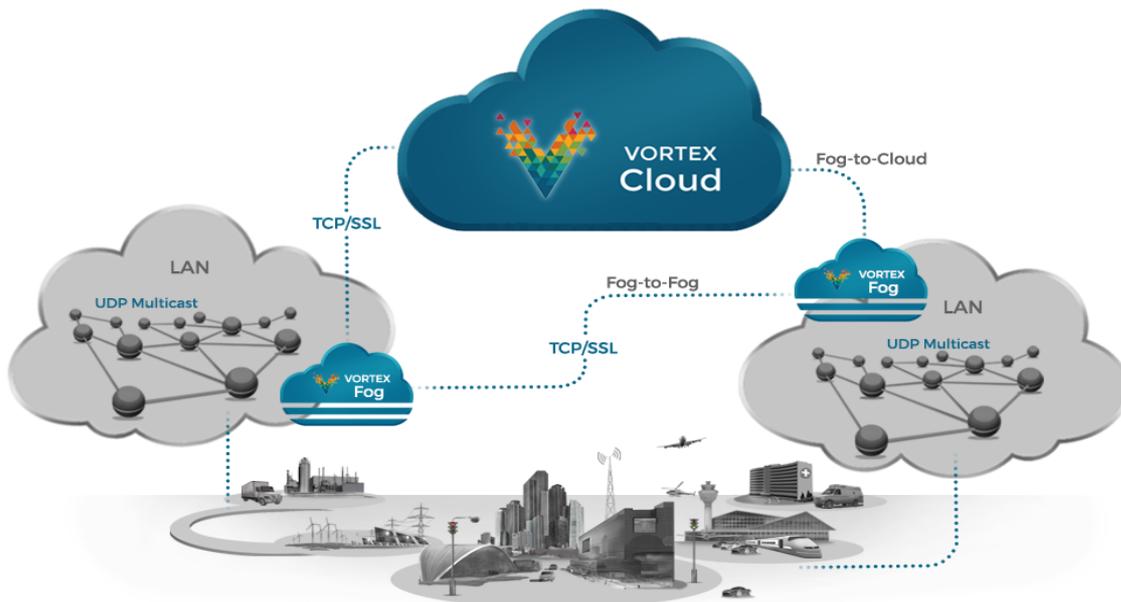
Enabling Intelligence at the Network's Edge

Vortex Fog enables the secure forwarding of data between Fog subsystems containing edge node applications communicating with each other on a Local Area Network (LAN) and other nodes and subsystems that are connected over a Wide Area Network (WAN). Vortex Fog can be configured to ensure that only 'data of interest' is forwarded to the WAN in order to optimize network bandwidth. It can also transparently manage any impedance mismatches when forwarding data from a low latency UDP multicast LAN to a TCP endpoint. Vortex Fog enables secure data sharing between subsystems by supporting encrypted communications, combined with authentication and access control at the Fog subsystem boundary.

Overview

The dramatic increases expected in the volume of data generated from millions of new connected devices means that for the next generation of Industrial Internet of Things (IIoT) systems it no longer makes sense to ship all of this data to the Cloud for processing and storage. The idea of Fog computing is to distribute data, services, storage and applications to the edge of the network much closer to the devices and users as a way to complement and optimize traditional Cloud architectures.

Keeping the data at the edge of the network where the connected devices are creating the data offers the possibility to create new and innovative services and process efficiencies not possible with Cloud computing alone. Smart Cities, Smart Grids even connected Cars make use of "horizontal" Device-to-Device (D2D) connectivity in the same way traditional M2M systems typically rely on "vertical" Device-to-Cloud (D2C) communication only. The idea is not to replace existing Cloud architectures but to enhance a system by ensuring critical data is available where it can add most value. A Fog computing architecture can help assuring the required determinism and efficiency 'at the edge' by reducing latency and improving QoS (quality-of-service) leading to improved services and a better user experience.



The Vortex Intelligent Data Sharing Platform can natively support both Cloud and Fog computing environments providing system wide support for key features such as automatic discovery independent of the underlying network topology and computing platform technologies. Based on the Object Management Group's Data Distribution Service (DDS) for Real-time Systems, Vortex provides implementations optimized for different device platforms (sensor, embedded, desktop, server and web), each the providing low latency, secure, QoS-enabled data connectivity required by IIoT systems. Where there is a requirement to manage high velocity data, typically in the Fog tier at the network edge, Vortex can take advantage of network capabilities such as UDP multicast to enable efficient, low-latency and reliable Device-to-Device data sharing between Fog nodes, adapting to the underlying network capabilities when necessary. For example, Vortex will use TCP connections when UDP multicast is not available.

Key Features

By default Vortex applications in a LAN environment communicate with each other using UDP multicast. Where multicast is not available, for example between a LAN-based network of devices and the Cloud, then Vortex Fog enables transparent, secure, interest-based data routing and UDP unicast/multicast to TCP mediation between subsystems. Vortex Fog should be used when:

- Both applications are using UDP multicast and are deployed in two different LANs (e.g. in two different Fog subsystems) and the Router/Gateway/NAT firewall connecting the networks does not permit multicast traffic.
- Both applications are using different transports. The first is deployed in a LAN using UDP multicast and the second is using TCP.
- In these cases Vortex Fog can securely establish a route to allow the data to flow between applications.

Vortex Fog enables **Boundary Security** for Fog subsystems by providing certificate-based authentication between subsystems and also individual devices (e.g. mobile device using TCP) connecting into a LAN, secure encrypted communications and access control rules defining the privileges each subsystem or TCP-enabled device has to read or write data.

Complementary Technologies

Vortex Fog is a key component of the Vortex Intelligent Data Sharing platform, an advanced suite of complementary interoperable technologies that enable business-critical and industrial IoT systems. Vortex Cloud can be used to provide Internet wide, secure data sharing and is often deployed together with Vortex Fog. The Vortex platform provides implementations targeting different device platforms, including:- Vortex Lite for embedded IoT devices, Vortex Café for Android and Java-centric environments, Vortex Web for web browsers, and Vortex OpenSplice for servers and desktops. To support complex multi-protocol IIoT systems, Vortex Gateway can be used to enable the efficient integration of different communication technologies.

Summary of Vortex Fog Benefits

- Key enabling technology for Fog Service providers.
- Used in conjunction with Vortex Cloud Can support Internet wide data sharing for any DDS compliant application (Including 3rd party applications).
- Enables "plug and play" integration and data sharing between different parts of a Vortex IoT system deployed on either a LAN or a WAN.
- Boundary Security with TLS based encryption, certificate-based authentication and access control rules between subsystems.

For More Information

For further information regarding Vortex Fog availability, platform support and pricing please e-mail: ist_info@adlinktech.com or visit: ist.adlinktech.com



Leading **EDGE COMPUTING**