GEV-Stream GigE Vision 3.0 Transmit and Receive Solution

GEV-Stream

POWERED BY
imavix engineering and
Pleora Technologies

Transmit-to-receive solution speeds design and boosts performance of high-bandwidth imaging devices

Overview

GEV-Stream is a high performance GigE Vision 3.0 transmit and receive solution powered by Pleora and imavix engineering to accelerate the development of advanced cameras and embedded imaging systems. By combining imavix's GigE Vision IP Core with Pleora's proven eBUS SDK, GEV-Stream delivers a standards-compliant, end-to-end Ethernet streaming pipeline with deterministic low latency and minimal CPU overhead.

The solution leverages RoCEv2 and FPGA-based data paths to scale efficiently across 10 Gbps and 25 Gbps data rates, with a clear growth path to 100 Gbps and beyond. This enables developers to meet increasing bandwidth and real-time performance requirements while reducing integration complexity and time to market.

Pleora's eBUS SDK provides a feature-rich development platform with integrated receive capabilities that streamline end-to-end data delivery between the imavix GigE Vision IP Core and host applications. The eBUS Universal Pro driver delivers key performance benefits, including low latency, low jitter, and reduced CPU utilization, allowing manufacturers to shorten development cycles and lower overall system integration costs.

Applications

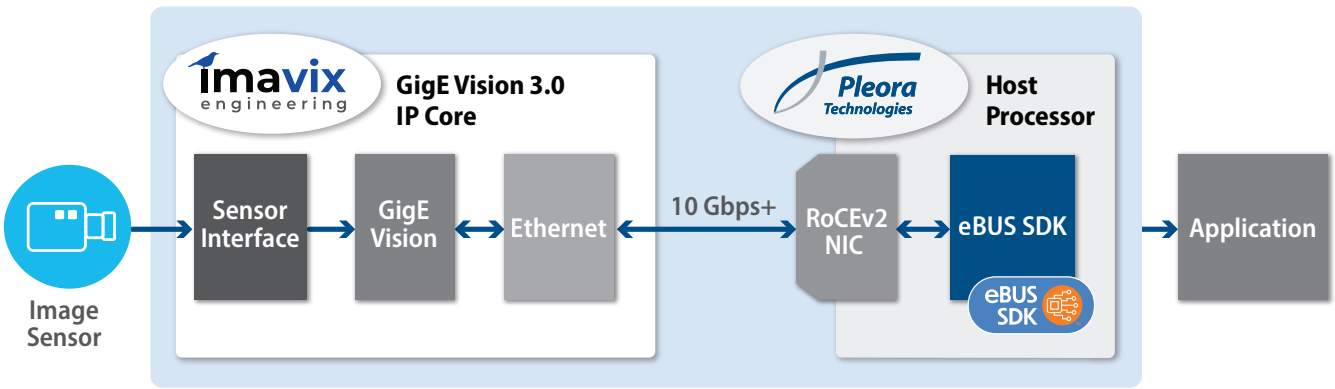
- Industrial machine vision cameras
- Embedded imaging devices
- Network-attached accelerators
- General-purpose fast, reliable, low-latency data transfers

Features

Standards Compliant GigE Vision 3.0 Pipeline:

- GigE Vision 3.0 transmit to receive architecture supporting 10 Gbps, 25 Gbps, and future higher speed links
- Support for GVRSP, GVCP, GenICam, and native GenDC payload delivery
- Interoperable with GigE Vision and GenICam-compliant devices and applications
- RoCEv2-based GVRSP streaming protocol implemented entirely in FPGA hardware
- Deterministic, low-latency data delivery with minimal jitter
- Configurable number of simultaneous streaming flows using independent RoCEv2 queue pairs
- Integrated receive pipeline using Pleora's eBUS SDK handles device control, streaming reception, and application integration on the host
- eBUS Universal Pro driver optimized for low latency, low jitter, and low CPU utilization reduces reliance on host side packet processing
- Host application development support in C++, .NET, and Python on Windows and Linux (x86_64 and ARM)

GEV-Stream Transmit-to-Receive Pipeline



imavix engineering

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GEV-Stream GigE Vision 3.0

The GEV-Stream solution consists of the following main functional blocks.

GigE Vision IP Core	• CPU interface with control/status registers and CPU packet buffers • Ethernet MAC connectivity blocks consisting of the packet interconnect, the MAC receive interface, and the MAC transmit packet buffer • GVRSP stream channels implementing RoCEv2 QPs with GigE Vision-specific protocol, representing individual GenDC flows • GigE Vision upstream message receiver and parser on the first QP • GenDC descriptor engine associated with flow 0 • Action command processor • Fully generic FPGA IP core, discuss support of any specific FPGA platform with your sales contact
Host Side Receive	• eBUS SDK provides versatile, robust, and easy-to-understand classes, methods, and properties that allow developers to quickly build high-performance vision applications with sample applications for GigE Vision-compliant image stream transmission, multicast communication, and link recovery • eBUS Universal Pro Driver increases image acquisition throughput and performance, decreases latency and jitter, while minimizing CPU utilization • ROS2 and ROS-Industrial integration to simplify development and deployment in robotics environments • GStreamer Plug-Ins available for use with eBUS Receive on Linux platforms (x86 / ARM)

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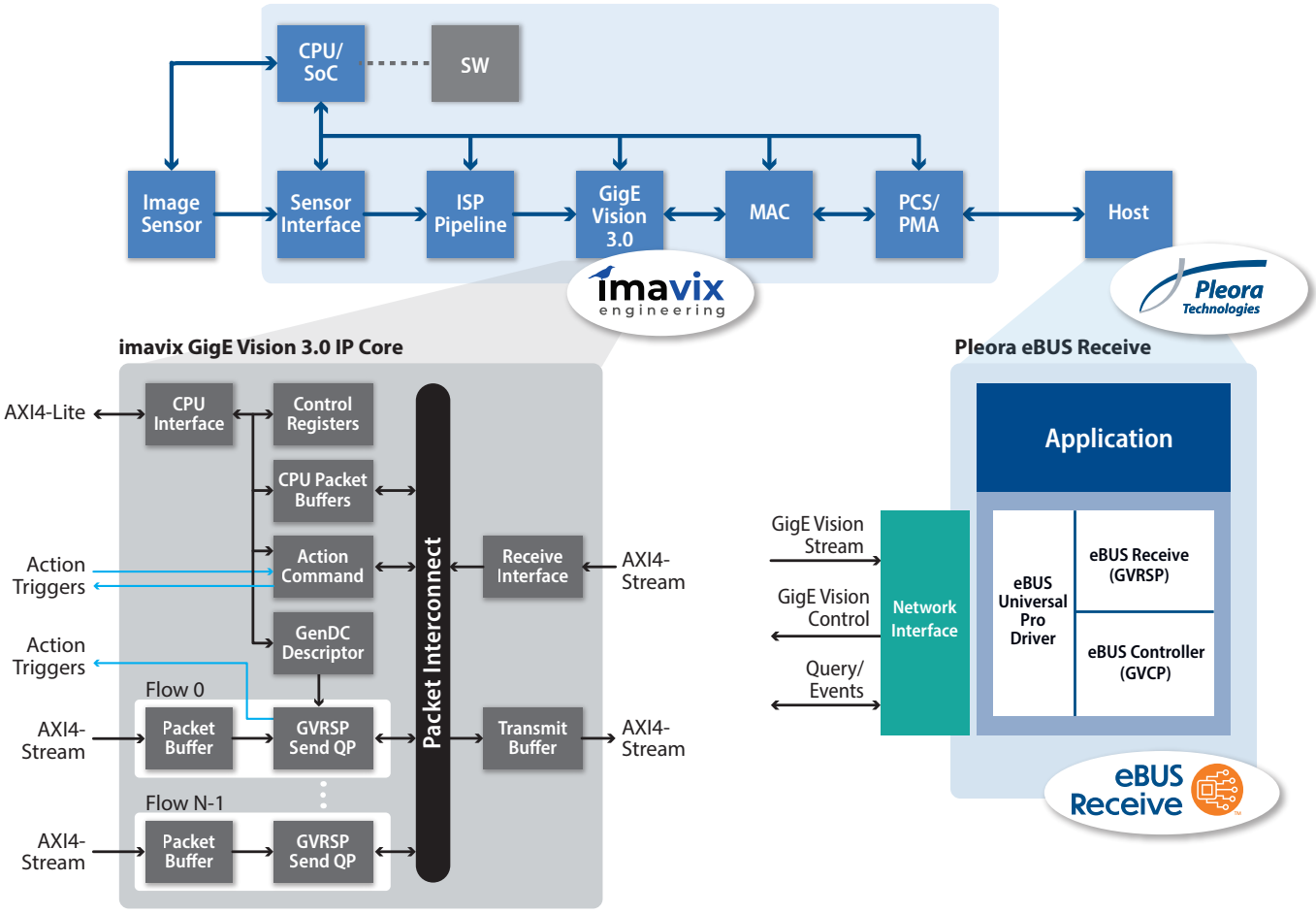

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