NVIDIA

b - plus

NVIDIA Mellanox Networking technology & b-plus enter a new era of storage performance

Key Benefits

> First-time data center storage performance in a vehicle

> Easy and universal integration into existing data-harvesting architectures

> Simplified edge data ingest, storage and transfers

> Accelerated storage access at up to 128 Gigabits per second

Products Used

> NVIDIA® Mellanox® ConnectX®-5 or ConnectX-6 Ethernet adapter

> NVIDIA® Mellanox® BlueField® SmartNIC with NVIDIA® Mellanox® NVMe SNAP™ license

> NVIDIA® Mellanox® BlueField® controller cards

> NVIDIA® Mellanox® Spectrum® Ethernet switches

> b-plus Mobile Data Lake (MDLake)

DATA CENTER PERFORMANCE FOR IN-VEHICLE APPLICATIONS

"NVIDIA Mellanox networking solutions enable b-plus to deliver the next generation of performance for autonomous vehicle data acquisition"

— Alexander Noack, b-plus, Head of Product Center Automotive Electronics

Managing Big Data on the Road to Full Autonomous Driving

From concept to series development, sensors and systems from Level 2 - Level 5 advanced driving assistance systems (ADAS) must pass a wide variety of test procedures to ensure safe and reliable functionality in real traffic scenarios.

Fully autonomous driving (AD) requires more sensors operating at higher resolutions, further increasing the amount of measurement data that must be recorded and managed. Handling the huge volumes of data required for the development and application of the systems is challenging.

NVIDIA Mellanox Networking technology enables b-plus to transfer data center performance to in-vehicle applications, to start a new era of storing and recording data in test vehicles.

MDLake - Mobile Enterprise Storage

The b-plus MDLake - Mobile Data Lake - is a small form-factor network storage unit designed for mobile SAN applications. Combining high-bandwidth server-storage technology with automotive requirements, MDLake enables the next generation of raw sensor data recording in ADAS/AD.

Running NVMe over Fabrics (NVMe-oF) on top of RoCE (RDMA over Converged Ethernet) technology, MDLake both allows a permanent recording performance of 1x 128Gbit/s or 2x 64Gbit/s data streams, and features capacity options of 60TB and 120 TB.

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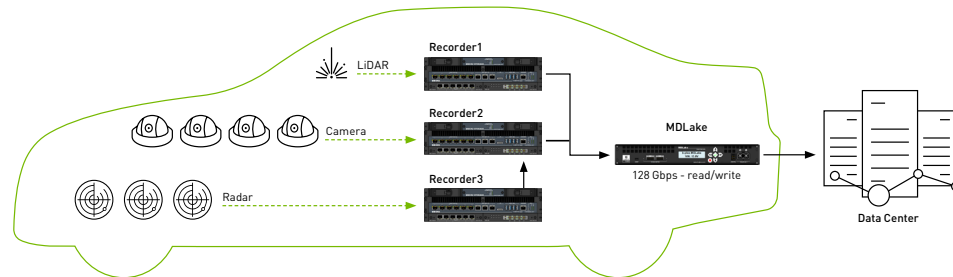
Single recorder source

In-vehicle Recorder

RoCE / NVMe-oF

1x100G Connection, 64 Gbps performance
2x100G Connection, 128 Gbps performance

In-vehicle data lake - MDLake

up to 16GB/s with one source

Required Technology

> 1 or 2 port QSFP28 Ethernet NIC with RoCE and NVMe-oF Support

Example PCIe extensions for Host

> NVIDIA Mellanox ConnectX-5 or ConnectX-6 Ethernet adapter
> NVIDIA Mellanox BlueField SmartNIC with NVMe SNAP licence S
> NVIDIA Mellanox BlueField-2 SmartNIC with NVMe SNAP licence

Multiple recorder source

In-vehicle Recorder 1

RoCE / NVMe-oF

1x50 to 100G Connection, 40 Gbps performance

In-vehicle data lake - MDLake

up to 16GB/s with one source

In-vehicle Recorder 2

RoCE / NVMe-oF

1x50 to 100G Connection, 40 Gbps performance

# NVIDIA Mellanox Networking - End to End Ethernet Solution

NVIDIA Mellanox high-speed networking solutions include ConnectX SmartNICs, BlueField Data Processing Units (DPUs), and Mellanox Spectrum Ethernet switches. Each of these networking products provides optimized support for RDMA over Converged Ethernet (RoCE). RoCE and other networking and security offloads free up the CPU's resources to run compute and storage applications, allowing for higher scalability and greater efficiency within the data center or an autonomous vehicle.

BlueField BF1500/BF1600 controller cards transform existing JBOF systems into NVMe-oF compliant solutions, simply by plugging the cards into PCIe slots. With support for up to 32 PCIe Gen3.0/4.0 lanes, BF1600 provides connectivity to multiple SSDs either directly or through an external PCIe switch. BlueField controller cards include high-speed networking, programmable Arm cores, NVMe-oF acceleration, DRAM controller, and the ability to virtualize networked storage. The use of ConnectX SmartNICs or BlueField controller cards in MDLake enables high-speed connections from the recorder(s) and more efficient storage operations.

One storage for all vehicle data loggers and recorders

MDLake is a storage solution on which all data loggers can store simultaneously.
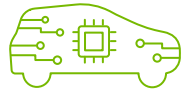
In-Vehicle Data lake class perforfmance

MDLake as SAN storage introduces a category of vehicle storage solutions that are needed for the data volume of level 4 and 5 self-driving vehicles.

Easy Integration into existing concepts

MDLake is easy to integrate into vehicle loggers and software. It offloads the CPU of logger and recorder platforms.

Operate in the vehicle without interference

MDLake withstands the rough environmental conditions in the vehicle and works reliably.

AVETO - Automotive Validation Toolchain

The AVETO Validation Toolchain offers a complete development system consisting of recorder, measurement technology adapter, and the visualization framework for the entire validation process for the recording, analysis, and processing of many sensors, such as cameras, lidar or radars. Mastering data sovereignty and starting test processes earlier is just one goal of the AVETO solution. Additional information about the AVETO validation toolchain can be found on our sensor validation website.

Learn How NVIDIA and b-plus can Deliver Data Center Performance to In-Vehicle Applications

Reach out to your NVIDIA or b-plus representative to find out how you can get started today.

About b-plus   www.b-plus.com

b-plus is the specialist for the development and integration of electronic systems and components. ADAS in the automotive industry and the automation of mobile machines are among the core competencies of the medium-sized company. We rely on 20 years of industry experience and the expertise in safety-critical hardware and system development. Our commitment: Complete and secure key technologies for automated driving and mobile automation today. For autonomous driving tomorrow.