Move data faster with Intel® Ethernet 800 Series

Key Features
- Supports multiple port speeds with a single architecture: 100/50/25/10/1GbE
- Application Device Queues (ADQ)
- Dynamic Device Personalization (DDP)
- Enhanced Data Plane Development Kit (DPDK)
- iWARP and RoCEv2 Remote Direct Memory Access (RDMA)
- Intel® Ethernet Adaptive Virtual Function (Intel® Ethernet AVF)
- Enhanced server virtualizations: 256 VFs, 768 VSIs
- Optimized Advanced Transmission Scheduler
- Extensive Network protocol support
- IEEE1588/Precision Time Protocol

Overview
Intel® Ethernet 800 Series supports up to 100Gb/s throughput for a variety of workloads.

Enterprise:
- Broad physical interfaces support, thorough test and validation with ecosystem devices for compatibility
- Extensive Microsoft solution support

Communications:
- Flexible Ethernet Port Configuration with link modes supporting different fan-in or fan-out connections
- DDP, with fully programmable pipeline, can add or modify protocols on-demand allowing for fast-paced innovations
- Enhanced DPDK for Network Functions Virtualization acceleration, advanced packet forwarding, and highly efficient packet processing
- IEEE1588 Precision Time Protocol (v1 and v2) with per-packet time stamping

Cloud:
- Up to 100Gb/s throughput for diverse workloads in modern data centers
- Support both iWARP and RoCEv2 RDMA, selectable via software per port for low-latency, high-throughput workloads
- Application Device Queues (ADQ) to increase application predictability, reduce application latency and improve application throughput

Intel® Ethernet products are customers' choice for extensive compatibility, performance assurance, broad product selection, and world-wide support.
All Intel® Ethernet 800 Series Controllers¹ include these technologies:

Supports both iWARP and RoCEv2 RDMA
RDMA is a host-offload, host-bypass technology, that enables a direct memory-to-memory data communication between applications over a network. RDMA provides high throughput and low-latency performance for modern high-speed Ethernet by eliminating three major sources of networking overhead: TCP/IP stack process, memory copies, and application context switches.

RoCEv2 (RDMA over Converged Ethernet): RoCEv2 substitutes the InfiniBand physical layer and data link layer with Ethernet, operates on top of UDP/IP, and is routable over IP networks.

iWARP, IETF standard protocols based: Delivers RDMA on top of the pervasive TCP/IP protocol. iWARP RDMA runs over standard network and transport layers and works with all Ethernet network infrastructure. TCP provides flow control and congestion management and does not require a lossless Ethernet network. iWARP is a highly routable and scalable RDMA implementation.

Intel Ethernet 800 Series supports both RoCEv2 and iWARP that are selectable via software per port to provide the flexibility that customers need.

Deliver consistent application performance with Application Device Queues (ADQ)
As modern data centers scale, a key challenge is to provide scalable, predictable application-level performance. ADQ technology improves performance scalability and predictability for key workloads by dedicating specific resources to key workloads. ADQ enables application-specific data steering, signaling, and rate limiting, using an optimized application thread to device data path.

Improve packet processing efficiency with enhanced Dynamic Device Personalization (DDP)
Dynamic Device Personalization (DDP) customizable packet filtering, along with enhanced Data Plane Development Kit (DPDK), support advanced packet forwarding and highly-efficient packet processing for both Cloud and Network Functions Virtualization (NFV) workloads.

The introduction of the fully programmable pipeline on the Intel Ethernet 800 Series, enhances DDP functionality by improving the number of protocols that can be added in a DDP profile package. While DDP support on the Intel Ethernet 700 Series was introduced with a few protocols that could be added to the default set defined in the firmware, Intel Ethernet 800 Series firmware loads an enhanced DDP profile with many workload-specific protocols at driver initialization for greater flexibility.

Advanced Transmission Scheduling
The Intel Ethernet 800 Series features an enhanced Advanced Transmission Scheduling mechanism for a steady Tx traffic flow to avoid burst-send.

The transmission scheduling mechanism provides a decision tree of multiple layers with abundant queue resources, fine granularity of quanta size, high frequency decisions and advanced scheduling algorithm.

IEEE 1588 Precision Time Protocol
Intel Ethernet 800 Series supports both IEEE 1588 v1 and v2 with 2-step option. The products provide increased accuracy and can report the reception time for every packet.

Flexible Ethernet Port Configuration
Moving into high speed Ethernet with 100Gb throughput, support for different link modes and specifications can be challenging. Intel Ethernet 800 Series, with Flexible Ethernet Port Configuration, provides the flexibility to support different link modes and speeds. The built-in Link Establishment State Machine (LESM) guarantees compatibility with the device on the other end of the wire.

Intel® Ethernet Adaptive Virtual Function (Intel® Ethernet AVF)
A virtual function driver that eases SR-IOV hardware upgrades or changes, and preserves base mode functionality in hardware and software. Customers deploying mass-scale VMs or containers for their network infrastructure now have a common Virtual Function (VF) driver.
PERFORMANCE

100Gb Throughput

HOST INTERFACE FEATURES

PCI Express 3.0/4.0 x16, x8

NETWORK INTERFACE FEATURES

Link Establishment State Machine (LESM)
Flexible Ethernet Port Configuration with Ethernet Port Configuration Tool (EPCT)
Up to 2 100Gb/50Gb connections or 4 25Gb connections or 8 10Gb connections
100Gb: 100GBASE-CR4/KR4, CAUI-4, 100GBASE-CR2/KR2, 100GAAUI-2, 100GAAUI-4
10Gb: 10GBASE-KR, 10G SFI/SFP+

PIPELINE

Fully programmable pipeline with enhanced Dynamic Device Personalization (DDP)

VIRTUALIZATION FEATURES

8 Physical Functions (PF)
SR-IOV with up to 256 Virtual Functions (VF)
768 Virtual Station Interfaces (VSI)
Microsoft VM Queue (VMQ)
VMware NetQueue

TRAFFIC STEERING

Receive Side Scaling (RSS)
Intel® Ethernet Flow Director
Application Device Queues

STATELESS OFFLOAD

TCP Segment Offload (TSO)
UDP Segment Offload (USO)
Large Segment Offload (LSO)
Checksum Offload (TCP/UDP/IP)

OVERLAY NETWORK STATELESS OFFLOAD

vLAN
GENEVE
GRE

QUALITY OF SERVICE (QoS)

Priority Code Point (PCP)
Differentiated Services Code Point (DSCP)
Data Center Bridging (DCB/DCB-X)
Enhanced Transmission Selection (802.1Qaz)
Priority-based Flow Control (802.1Qbb)
Advanced Transmission Scheduling

RDMA

iWARP
RoCEv2

CONVERGED STORAGE NETWORK

iSCSI
SMB Direct
iSER
NVMe over RDMA (iWARP and RoCEv2)
Storage Performance Development Kit (SPDK)
NVMe over TCP

PRECISION CLOCKS SYNCHRONIZATION

IEEE 1588 Precision Time Protocol, per packet time stamping

REMOTE BOOT

Legacy PXE Boot
UEFI PXE Boot

MANAGEMENT

NC-Si over MCTP
NC-Si over SMBus
MCTP over PCIe
BMC
PLDM and PLDM based firmware update

ENVIRONMENTAL

Operating Temperature: 0 °C to 105 °C
Storage Temperature: -40 °C to 115 °C

CERTIFICATIONS

RoHS Compliant
FCC Class A

PRODUCT ORDER CODES

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Product Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel® Ethernet Controller E810-CAM2</td>
<td>EZE810CAM2</td>
</tr>
<tr>
<td>Intel® Ethernet Controller E810-CAM1</td>
<td>EZE810CAM1</td>
</tr>
</tbody>
</table>

SUPPORTED OPERATING SYSTEMS

For a complete list of supported operating systems for Intel® Ethernet 800 Series Controllers visit intel.com/support/EthernetOS
1. Features availability varies based on software and NVM release.

No license (express or implied, by estoppel or otherwise) to any intellectual property rights is granted by this document. Intel disclaims all express and implied warranties, including without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement, as well as any warranty arising from course of performance, course of dealing, or usage in trade.

This document contains information on products, services and/or processes in development. All information provided here is subject to change without notice. Contact your Intel representative to obtain the latest forecast, schedule, specifications and roadmaps.

The products and services described may contain defects or errors which may cause deviations from published specifications.

Intel, the Intel logo are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries.

© Intel Corporation. All rights reserved.