

# White paper

## FUJITSU DynamicLoM Technology

Key Features: Dual- and Quad-Port options. One and 10GbE models. Support for multiple 10GbE interface types. Low power.

### Content

Fujitsu DynamicLoM technology	2
Value for Money	2
Flexibility of Choice	2
Form factor with ease-of-use	3
Intel® X722 in Intel® C62x Chipsets	3
Interface Card Overview	3
Interface Card Feature Details	4
Conclusion	4

### Fujitsu DynamicLoM technology

When servers are provided with network adapters aligned to the current infrastructure, this offers less flexibility and scalability opportunities for future requirements. The Fujitsu DynamicLoM technology delivers a perfect solution against these limitation barriers. Through seamless configuration and integration in existing infrastructures, the solution represents the direct opposite to inflexible LoM (LAN on motherboard) architectures.

The diversity in the market, the need and demand for more flexibility in a continuously changing world required a change of thinking. This is why Fujitsu sets new standards for its systems. FUJITSU DynamicLoM technology based on the standardized OCP V2 gives IT-Admins the chance to configure their Ethernet network connectivity the way it needs to be – seamlessly integrated and ready for future changes.

The benefits are Perfect space saving efficiency without PCIe slot occupancy and field-proven technology. Also, Reduced replacement, energy and management costs at less complexity leveraging OCP V2 Type 1 form factor mezzanine cards..

### Value for Money

FUJITSU DynamicLoM technology offers perfect value for money with RDMA capabilities R-NIC for the price of a standard NIC, the cheapest way to connect to the Ethernet network. Also, open optics support means that there is no reason to pay for Intel optics.

### Flexibility of Choice

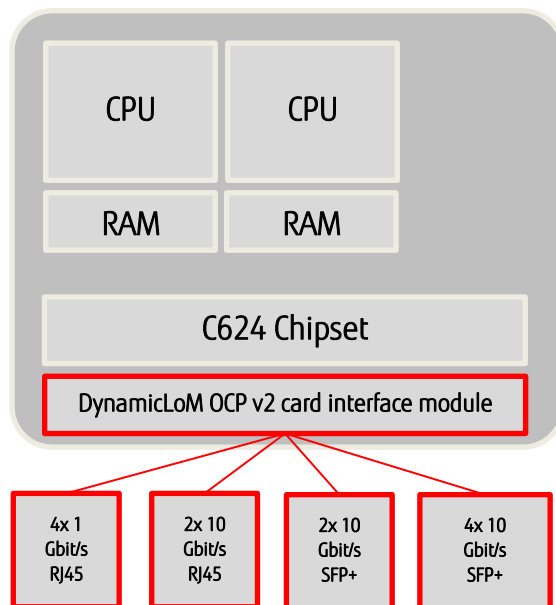
Intel® Ethernet Network Connection OCP PHY mezzanine adapters enable Gigabit (GbE) and 10 Gigabit Ethernet (10GbE) connectivity for Intel® Ethernet Network Connection x722 in Intel® C624 Chipsets as used in dual and quad socket Fujitsu Server PRIMERGY systems M4 and M5 generations. Together, these components provide unmatched features for server and network virtualization, flexibility for LAN and SAN networks, and proven, reliable performance.

For SMBs, DynamicLoM options range from 4x 1Gbit/s solutions to 2x 10Gbit/s solutions. For datacenters or other markets requiring high bandwidth, Fujitsu offers DynamicLoM options with up to 4x 10Gbit/s SFP+ cages for optical transceivers or DAC.

For your preferred system configuration, you really just buy the interace card you need – this is how we understand flexibility.



PRIMERGY RX2530 M5 with DynamicLoM option Quad Port 1G BASE-T installed



System board with DynamicLoM technology

### Form factor with ease-of-use

The interface cards are pre-defined in form factor:

- lowering replacement cost and decreasing service and maintenance complexity
- perfect integration for in-chassis space efficiency
- functionality and connector type are determined by the interface module, not the whole NIC unit, making it easy to select what is needed
- DynamicLoM is a solution not only providing flexibility for the selection of the “right” connector, moreover it also does not occupy a PCIe slot. This leaves you enough headroom for all possible I/O-configurations now or in future

### Intel® Ethernet Network Connection X722 in Intel® C62x Chipsets

FUJITSU DynamicLoM delivers you not just with a very flexible and scalable solution, but also offers a market-leading feature set, depending upon form factor.

The Intel® Ethernet Network Connection x722 in Intel® C62x Chipsets are the foundation for server connectivity, providing broad interoperability, critical performance optimizations, and increased agility for Telecommunications, Cloud, and Enterprise IT network solutions.

- Interoperability - Multiple speeds and media types for broad compatibility backed by extensive testing and validation.
- Optimization - Intelligent offloads and accelerators to unlock network performance in servers with Intel® Xeon® processors.
- Agility - Both Kernel and Data Plane Development Kit (DPDK) drivers for scalable packet processing.

The Intel® Ethernet Network Adapter X722 features iWARP RDMA for high data throughput, low latency workloads and low CPU utilization. It is ideal for Software Defined Storage solutions, NVMe over Fabric solutions and Virtual Machine Migrations acceleration.

### Network Virtualization Offloads

Abstract the network for cloud flexibility. Enhanced programmability and application affinity with flexible Filters ATR, Flow Director and NVGRE, VXLAN, GENEVE. SR-IOV enables multiple virtual machines to directly access the Ethernet network adapter’s physical I/O-resources. Using the concept of physical and virtual PCIe functions, the controller can appear as multiple physical and virtual devices. This allows for a higher I/O performance and a lower thus better CPU utilization.

In a highly virtualized IT architecture, network can reach its limits, either in terms of amounts of service or due to the evolution of cloud services demanding thousands of virtual LANs. Overlay Networking is a solution to these problems to react properly. It does not just allow for

easier network integration and hence precious time savings, it also facilitates the chance to create up to 16 million private, isolated networks necessary in today’s challenges in the situation of big data. Overlay Networking for Virtual Machines and their data interchange require different needs for hardware. The Fujitsu solution, in conjunction with Intel, supports two leading tunnels in hardware offload, NVGRE by Microsoft and VXLAN by VMware. The increased VM density maximizes general CAPEX and operational expenditures can be lowered due to a more efficient running system requiring less cooling.

### Low Latency Ethernet and iWARP Remote Direct Memory Access

Routable and scalable RDMA is ideal for large segmented networks in private and public clouds.

Ethernet is the de facto standard for data center server and storage connectivity and is by far the most agile and general-purpose network.

Workloads like storage, that ran over dedicated fabric, are now moving to Ethernet. These workloads require high data throughput and a low latency network. The advent of NVMe and NVMe over fabrics further drives the demand for higher-speed Ethernet.

Remote Direct Memory Access (RDMA) is one of the technologies that relieves Ethernet overhead for high-speed applications. RDMA is a relatively mature technology, but with the evolution of storage, it has become a significant technology for Ethernet. This host-offload, host-bypass technology enables a low-latency, high-throughput direct memory-to-memory data communication between applications over the network. RDMA reduces server resources typically dedicated to network functions.

iWARP, IETF standard protocols based, delivers RDMA on top of the pervasive TCP/IP protocol. iWARP 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 lossless Ethernet network. iWARP is a highly routable and scalable RDMA implementation.

### Interface Card Overview



4x 1Gbit/s  
DynamicLoM card



2x 10/1Gbit/s  
DynamicLoM card



2x 10Gbit/s SFP+  
DynamicLoM card



4x 10Gbit/s SFP+  
DynamicLoM card

## Interface Card Feature Details

### 4x 1Gbit/s DynamicLoM Mezzanine Card PLAN EM 4x 1Gb T OCP interface

- 1000BASE-T Network Standard Physical Layer Interfaces
- Quad RJ-45 copper connections
- Wake-on-LAN support
- Intel® Ethernet Connection OCP I357-T4

### 2x 10Gbit/s DynamicLoM Mezzanine Card PLAN EM 2x 10Gb T OCP interface

- 10GBASE-T and 1000BASE-T Network Standard Physical Layer Interfaces
- Dual RJ-45 copper connections
- Wake-on-LAN support
- Intel® Ethernet Connection OCP X557-T2

### 2x 10Gbit/s SFP+ DynamicLoM Mezzanine Card PLAN EM 2x 10Gb SFP+ OCP interface

- 10GBASE-SR optical transceivers or 10GbE SFP+ DAC Network Standard Physical Layer Interfaces
- Dual SFP+ cages supporting Direct Attach Copper (DAC) Twinaxial cable and optical transceivers connections
- iWARP RDMA (Remote Direct Memory Access)
- Wake-on-LAN support
- Open optics support, both Finisar and Intel
- Intel® Ethernet Connection OCP X527-DA2

### 4x 10Gbit/s SFP+ DynamicLoM Mezzanine Card PLAN EM 4x 10Gb SFP+ OCP interface

- 10GBASE-SR optical transceivers or 10GbE SFP+ DAC Network Standard Physical Layer Interfaces
- Quad SFP+ cages supporting Direct Attach Copper (DAC) Twinaxial cable and optical transceivers connections
- iWARP RDMA (Remote Direct Memory Access)
- Wake-on-LAN support
- Open optics support, both Finisar and Intel
- Intel® Ethernet Connection OCP X527-DA4

## Fujitsu iWARP RDMA Scale Up and Scape Out Options

<Aswin, ..., our Marvell FastLinQ family of products is the ideal option to scale up and scale out the iWARP RDMA of Fujitsu's DynamicLoM.> .

## Fujitsu QuickAssist Option for DynamicLoM

The Fujitsu PACC EP QAT QuickAssist adapter card adds QuickAssist technology to systems with Intel C624 LBG-4 chipset implementations, in order to provide feature-parity with Intel C627 LBG-T chipsets. QuickAssist accelerates compression ~65Gb/s, encryption ~100Gb/s, and RSA ~100 Ops/s. The adapter card does not implement any kind of Ethernet network functionality, except that it accelerates Ethernet traffic from either DynamicLoM or Intel Ethernet adapter cards.

## Fujitsu Ethernet Accessories

Fujitsu Ethernet optics and cables are proven, reliable solutions for high-density Ethernet connections. Combine these accessories with Fujitsu DynamicLoM network adapters for dependable interoperability and consistent performance across the network. Learn more at [fujitsu.com/](http://fujitsu.com/).

## Links

Fujitsu Data Sheet at

<http://docs.ts.fujitsu.com/dl.aspx?id=8a4cff1c-a738-4667-a787-70bd81d34fac>

Intel Feature Support Matrix at

<https://www.intel.com/content/dam/www/public/us/en/documents/release-notes/x722-ethernet-connection-feature-matrix.pdf?asset=14981>

## Conclusion

Built on more than 35 years of continuous Ethernet innovations, Fujitsu PLAN EM DynamicLoM Ethernet Network Connection OCP PHY mezzanine adapters powered by Intel® with Intel® Ethernet Network Connection X722 in Intel® C624 Chipset on Fujitsu Server PRIMERGY systems deliver networking performance across a wide range of network port speeds through intelligent offloads, sophisticated packet processing, and quality open source drivers.

FUJITSU DynamicLoM technology is the solution for every need. It offers users the ability to individually adapt their current server network as well as the ability to change and thus meet future requirements without giving the server infrastructure a general overhaul. Starting at the initial Fujitsu Server PRIMERGY system configuration, there is no default connection mounted: it is up to you to select from Fujitsu's DynamicLoM options based on your actual needs.

## Contact

Fujitsu Limited  
Website: [www.fujitsu.com/primergy](http://www.fujitsu.com/primergy)  
Aswin Shankar  
E-mail: [aswin.shankar@ts.fujitsu.com](mailto:aswin.shankar@ts.fujitsu.com)  
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