# NF3
THE ULTIMATE HPC PLATFORM

NF3

FPGA NETWORKING AND ACCELERATION PLATFORM

- 16 Hot-swap FPGA boards in 4U device
- 10 ns board-to-board interconnect
- Dynamically changeable board interconnect topology
- 4 Tbps of non-blocking bandwidth
- AMD EPYC 2nd generation CPU
- Support for any PCIe form factor board:
  Full Height / Full length / Double slot

DSDA™
Direct SerDes Access

Direct SerDes Access™ (DSDA) is a proprietary technology for repurposing standard interfaces such as PCI Express into electrical level transport for other communication protocols and is the cornerstone of LDA Technologies family of FPGA devices including NF3 platform. Using DSDA, all LDA devices expose any I/O that FPGA and board have to offer.

One of its biggest advantages is that it allows FPGA boards to connect directly without a "CPU-in-the-middle", forming 3D Torus, grids, stars, clusters: naturally supporting vertical and horizontal scaling up to the point of hyperscaling.
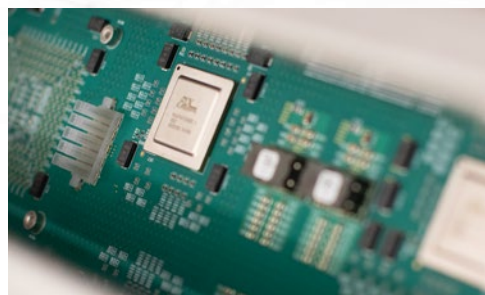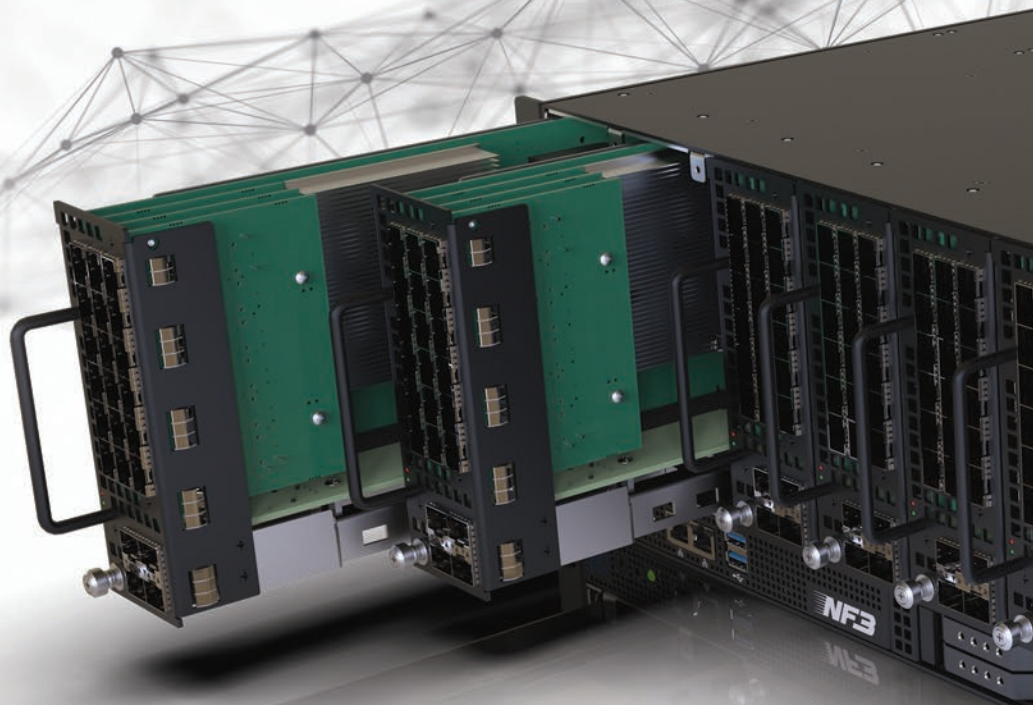
Two independent switching fabrics: standard PCI Express (1) and a Layer 1 interconnect (2). (1) provides up to x8 connectivity to each board and can be dynamically disabled or switched between x2, x4 and x8 modes. (2) links up to 320 ports, supports any data rate up to 12.5 Gbps and provides 4 Tbps of non-blocking bandwidth between 16 cards.

NF3's dynamically configurable Layer 1 interconnect allows selecting various topologies best suited for the use case, such as 3D Torus, daisy chain, star, point-to-point, mirroring, etc. This flexibility makes NF3 a perfect platform for HPC tasks like genomics research, FFT, AI inference, cryptography, blockchain acceleration, image recognition, complex simulations, etc.

Each board sits in its own hot-swap bay. 8 in the front and 8 in the back. All are compatible with any off-the-shelf FPGA board from any manufacturer (PCIe form factor: full-height, full-length and double-slot). All bays are synchronized through a common reference clock, jitter-cleaned per each bay.

Once inserted, each bay run-time connects to the switching system through twenty 12.5 Gbps lanes. 16 go to the PCIe connector, the other 4 go to the SFP+ or QSFP ports on its front panel allowing direct external access to the Layer 1 interconnect fabric. Data delivered from external port can be broadcasted to all 16 boards right away.

NF3 is equipped with latest generation dual socket AMD EPYC Rome extended ATX motherboard capable of sustaining data rates required for all 16 FPGA boards to work at full load. The motherboard is located in a standalone compartment with separate cooling, unaffected by the heat generated by FPGA boards.
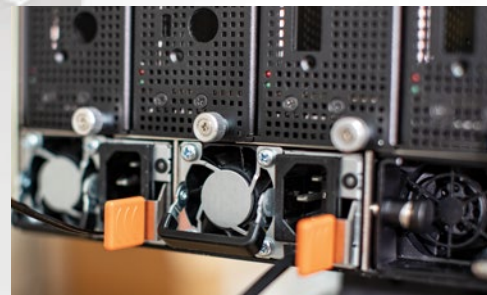
NF3 is a versatile hi-rel system that supports 2N redundancy and automatic failover. It uses four 2.2 KW hot-swap redundant power supplies delivering up to 225 Watts of independent power into each bay. Special monitoring system handles abnormal power consumption scenarios ensuring several levels of power surge protection.

SPECIFICATIONS

Form Factor	**4U Rackmountable (on a shelf)**
Dimensions (W x H x D)	**19" × 6" × 37.5"** **955.4 mm × 175 mm × 443 mm**
Weight	**82 lbs** **37.2 kg**
Motherboard	**up to AMD EPYC Rome extended ATX**
CPU	**up to AMD EPYC Rome 64 Core CPU**
Memory	**up to 1TB DDR4**
HDD	**2x U.2 NVME**
Power	**4x 2.2 KW**
Cooling	**Up to 600 W**

LDA Technologies is a leading provider of high-end FPGA-oriented solutions optimized for ultra-low latency operation; targeted for data processing acceleration, high-performance computing, low-latency networking, and high-frequency trading.

LDA Technologies has been manufacturing products and providing consultancy services since 2010 and is headquartered in Mississauga, Canada

LDATech.com
1 (800) 738-8163
info@ldatech.com

LDA TECHNOLOGIES™