Configuration Comparison

1000 server nodes reduced to 84 using Intensivate PCIe card

Overview

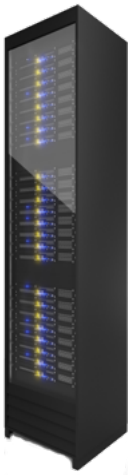
Here is a demonstration of the Intensivate PCIe accelerator advantage using a real world Hadoop cluster node configuration that includes 1PB local storage.

In configuration A there are 1000 typical 1U server nodes for the Hadoop cluster. Configuration B uses the same server as a host, combined with one Intensivate PCIe accelerator card and dual port 100Gb network adaptor.

The calculations show that the 1000 1U cluster is equivalent to 84 1U when equipped with the Intensivate cards, while providing similar network bandwidth per CPU core along with higher main memory bandwidth per CPU core.

Configuration A

1U/24GB memory / dual 10Gb NIC, 1TB storage



1000

1U Systems

IN 24 RACKS

Configuration B

1U/24GB memory / dual 10Gb NIC, 12TB storage ,1 Intensivate card, 1 dual 100GB NIC

84

1U Systems

IN 2 RACKS

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	Configuration A:	**Configuration B:**
Number of Cores / 1U node NIC Main memory GB Total Local storage 1 Rack =	16 2 x 10Gbs 24GB/ node 1PB 42 1U systems	192 (1 card x 12 chips x 16 cores) 2 x 100Gbs + 2 x 10Gbs = 220Gbs 384GB/node (32GB x 12chips) 1PB 42 1U systems
Number of Systems Total CPU Cores Number of Racks Network BW: Gbs/Core Memory BW: GB/Core Local Storage/ Node	1000 16,000 (16 x 1000) 84 (1000/42) 1.25Gb/Core (10Gbs x 2 / 16) 1.5GB/Core (24GB/16 Cores) 1TB (1000/1000)	84 (1000/(192/16)) 16,128 (84 x 192) 2 (84/42) 1.15Gb/Core (100Gbs X 2 + 20Gbs / 192) 2GB/Core (384GB/192 cores) 12TB (1000/84)
Cap EX: Bare bone system ** Host CPU NIC PCIe Accelerator card Total / 1U system Total Saving:	$1200 (1U, 24GB main memory) $850 (2 Broadwell 2.1GHz)* $0 (Built in 2 x 10Gbs) $0 $2050 $2,050,000 (1000 x $2050)	$1200 (Same as Config A) $425 (1Broadwell 2.1Ghz) $850 (2 x 100Gb + host 2 x 10Gb)*** $14,000 $16,475 $1,383,900 (84 x $16,475) $666,100 (30%)
Power: Per Node Total Savings 3 year savings assuming energy cost at $0.07KWh	240W 240KW (250 x1000/ 1000)	330 (PCIe card = 120 + hos) 28KW (370 x 84 / 1000) 212KW (240KW – 28KW) $389,995 (212KW x 0.07 x 24 x 365 x 3)
Total Savings (CapEx + Power)		$1,065,095 ($666,100 + $389,995K)

Pricing Sources:
* Intel Xeon E5-2620 V4
** Supermicro | Products | SuperServers | 1U | 6018R-TDW
*** ConnectX