

# LUCATA PATHFINDER-S

Reimagine graph analytics with the Lucata Pathfinder next-generation computing architecture. The Pathfinder enhances common graph databases or graph engines developed in-house to perform multi-hop analytics, including breadth-first search (BFS), on graph databases with 1 trillion nodes (scale 40) with no data pruning or database sharding. Lucata leverages patented migrating thread technology to treat even massive graph databases as unsharded instances, enabling fast analytics with no MapReduce-like processing.

## PATHFINDER POWERS A NEW GENERATION OF GRAPH ANALYTICS

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The Lucata Pathfinder hardware platform can power open-source or custom graph databases to achieve previously unattainable performance for graph analytics. The Pathfinder platform leverages Cilk open-source libraries to enable common graph databases such as RedisGraph or in-house developed graph engines to run on the platform. Cilk is a concurrency platform that makes parallel programming a simple extension of serial programming, while Pathfinder performs all memory and thread management behind the scenes.

Lucata Pathfinder can easily scale to meet your needs with no manual reprogramming required; it runs BFS analytics on petabyte-scale graph databases. A Lucata Pathfinder-S chassis features 512 GB of RAM and a minimum of 8 TB of SSD, which allows you to run real-time analytics on a 512 GB graph database with no database sharding while storing up to 8 TBs of graph data in near-memory. Each Pathfinder chassis can support up to eight 100 GBit I/O cards, allowing your graph database engine to ingest data at its maximum rate. A Pathfinder rack seamlessly connects eight Pathfinder chassis, providing 4 TB of RAM and a minimum of 64 TB of SSD. Over 1,000 racks can be interconnected as a single shared memory image, supporting over 4 PB of RAM and 64 PB of SSD.

There is no data pruning required for graph analytics or machine or deep learning training, eliminating the potential for introducing bias during pruning or sharding processes.

## PATHFINDER IS A SMART CHOICE

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The Pathfinder platform is cost-effective. The patented Lucata migratory thread approach to computing means compute threads move to your data rather than moving data to the CPUs. This approach results in much lower interconnect bandwidth requirements between Pathfinder chassis and racks than current approaches to distributed computing clusters require. Migratory thread computing allows Pathfinder chassis to consistently maintain high CPU and RAM utilization rates, lowering your operating costs.

Lucata Pathfinder is a new computing paradigm for big data. You can process petabyte-scale datasets in real-time with no data pruning or database sharding. Initially available for graph databases, the Pathfinder platform has the capability to power massive performance gains for a variety of other database types. Pathfinder can also power high-performance machine and AI model training on sparse data.

## CONTACT US

Contact Lucata now to learn more about the Pathfinder-S for high performance graph analytics.  
Please email us at [info@lucata.com](mailto:info@lucata.com) or call us at **646 661-5252**.

## PATHFINDER-S SPECIFICATIONS

Enclosure	Chassis	Rack	Multi Rack
Enclosure Type	4.5U rack mountable	8 chassis, 42U rack	2 to 1,024 42U racks
Maximum Memory	512 GB	4.096 TB	4.194 PB
Internal NVMe SSD	1 TB per node, 3 nodes per chassis		
Node Boards	8	64	128 to 65,536
Maximum Lucata Compute Elements	192	1,536	1,572,864
Maximum Concurrent Threads	12,288	98,304	201,326,592
Interconnect & Topology	Six 12-port specialized switches	24 uplinks per module	Specialized second tier switches
Expansion Slots	8 PCIe	64 PCIe	65,536 PCIe
Bi-Section Bandwidth	240 GB/s	Up to 1,920 GB/s	Up to 7,680 GB/s +
External Storage Options	Industry-standard Linux RAID, NAS, SAN		
Cooling	Front to back, forced convection air-cooled		
Power Architecture	N+1 Hot swappable power supplies		
Input Power	90-264VAC, single phase 50/60Hz	200-240VAC, 3 phase 50/60Hz	200-240VAC, 3 phase 50/60Hz
Power Supplies per Enclosure	3 per chassis		
Environmental (Operating)	18-27C, 40-60% RH ASHRAE server room standards		
Dimensions	19" width, 27" depth, 7.9" height	24" width, 43" depth, 84" height	24" width, 43" depth, 84" height each
Shipping Weight (Pounds)	75	1,300	1,300 per rack

## SOFTWARE SPECIFICATIONS

Operating System	YOCTO Linux
System Compiler	Lucata C / C++ / OpenCilk LLVM 6 compiler
Optimizing Languages	Cilk, C, C++, CilkPlus
Front-end Languages	Python 2/3, Java, SQL, any code running on NXP/PowerPC

