

# LUCATA PATHFINDER-I

Run deeper analytics on larger graphs than ever before possible using the Lucata Pathfinder next-generation computing platform. The Pathfinder enhances common graph databases or graph engines developed in-house by eliminating scaling issues. It accelerates multi-hop analytics on graph databases with up to 1 trillion nodes (scale 40) with no data pruning required. 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

Pathfinder can power open source, commercial, or custom-developed graph databases using one of three approaches:

- Library calls to Lucata's optimized algorithm library that runs natively on Lucata, including Breadth-First Search (BFS), PageRank, BLAST, Connected Component, Scored Search, Triangle Count, and K-truss Subgraph
- API calls for GraphBLAS queries supported on the Lucata platform, such as Sparse Matrix Multiply. The public domain LAGRAPH library provides an extensive collection of functions constructed with this approach.
- Running RedisGraph queries on Lucata using the optimized data loader and RedisGraph application code which have been ported to Lucata and optimized for use with Lucata Migratory Thread technology

Pathfinder can easily scale to meet your needs. A Lucata Pathfinder-I chassis with 8 TB of RAM allows you to run real-time analytics on a nearly 8 TB graph database with no sharding. 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 four Pathfinder chassis, providing 32 TB of RAM and slots for 128 M.2 NVMe SSDs. Over 1,000 racks can be interconnected as a single shared memory image.

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

The Pathfinder platform is cost-effective. The Lucata Migratory Threads 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.

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 can 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-I for high performance graph analytics.  
Please email us at [info@lucata.com](mailto:info@lucata.com) or call us at **646 661-5252**.

# PATHFINDER-I SPECIFICATIONS

Enclosure	Chassis	Rack	Multi Rack
Enclosure Type	6 U rack mountable	4 chassis, 42U rack	2 to 1,024 42U racks
Maximum Memory	8 TB	32 TB	up to 32 PB
Internal NVMe SSD	8 TB per node board, 8 node boards per chassis		
Node Boards	8	32	up to 32,768
Maximum Lucata Compute Elements	256	1,024	up to 1 Million
Maximum Concurrent Threads	16K	64K	up to 64 Million
Interconnect & Topology	200Gb All-to-All	200 Gb Dual-Level Fat Tree	200 Gb/node Multi-level Fat Tree
Expansion Slots	8 OCP	32 OCP	32,768 OCP
Bi-Section Bandwidth	64 Tb/S	256 Tb/S	Up to 256 Pb/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	4 per chassis		
Environmental (Operating)	18-27C, 40-60% RH ASHRAE server room standards		
Dimensions	19" width, 27" depth, 9.5" height	24" width, 43" depth, 84" height	24" width, 43" depth, 84" height each
Shipping Weight (Pounds)	125	1,300	1,300 per rack

# SOFTWARE SPECIFICATIONS

Operating System	RHEL
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 generated for x86 Server architecture

