

LUCATA PATHFINDER

Run deeper analytics on larger graphs than ever before possible using the Lucata Pathfinder next-generation computing architecture. Pathfinder enhances common graph databases or graph engines developed in-house by eliminating scaling issues and dramatically increasing performance. It accelerates multi-hop analytics on graph databases with 1 trillion nodes (scale 40) and beyond with no data pruning required leveraging patented Migrating Thread technology enabling fast analytics on massive graphs with no MapReduce-like processing by delivering 16x the performance using only 1/10th the power of a comparable x86 server-based system.

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 chassis with 2 TBs of RAM and a minimum of 8 TB of SSD, allows you to run real-time analytics on a nearly 2 TB 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 up to 16 TBs of RAM and a minimum of 64 TB of SSD. 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

Pathfinder is cost-effective. Our Migratory Threads technology means compute threads move to your data rather than moving data to the CPUs. This 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 to consistently maintain high CPU and RAM utilization rates, slashing 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 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 for high performance graph analytics.
Please email us at info@lucata.com or call us at (646) 661-5252.

HARDWARE SPECIFICATIONS

Enclosure	Chassis	Rack	Multi Rack
Enclosure Type	4 U rack mountable	8 chassis, 42U rack	2 to 1,024 42U racks
Maximum Memory	2 TB	16 TB	16.4 PB
Internal NVMe SSD	1 TB per node, 8 nodes per chassis		
Node Boards	4	32	64 to 32,768
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	4 OCP	32 OCP	32,768 OCP
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" 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	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

