

Neo4j 3.5 Poised to Power the Next Generation of AI & Machine Learning Systems

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Latest Neo4j Graph Platform Reveals Context for AI Applications using a Connections-First Approach

LONDON – September 20, 2018 – Neo4j (<http://www.neo4j.com/?ref=pr-sarum>), the market leader in connected data, announced today the upcoming release of Neo4j 3.5, the native graph platform designed to drive the success and adoption of real-time business applications, including artificial intelligence (AI) and machine learning (ML) systems (<https://neo4j.com/use-cases/artificial-intelligence/?ref=pr-sarum>).

Neo4j customers – including eBay (<https://neo4j.com/case-studies/eBay-shopbot/?ref=pr-sarum>) and Caterpillar (<https://www.youtube.com/watch?v=pBSWNd4gx3U>) – have demonstrated that connected graph datasets are a foundational element of enterprise AI applications. Graph-based data models provide the necessary context for AI applications by capturing facts related to and relationships among people, processes, applications, data and machines.

Informed by successful AI customer deployments – including knowledge graphs, fraud detection, recommendation systems and conversation engines – Neo4j 3.5 delivers foundational features for AI-powered systems of connection to generate bottom-line business value.

Adrian Bowles, founder of STORM Insights, had this to say about the synergy between artificial intelligence and graphs:

"The way we organise and represent knowledge in AI-powered systems has a profound effect on what and how they can learn," said Bowles. "The essence of cognition is the ability to analyse or synthesise what we know, within context, using relationships between existing units of knowledge to enable the synthesis of new knowledge. Representing these relationships in a graph enables more efficient and effective artificial cognitive processes."

Data Relationships Drive Context for AI

Most current models and techniques that underpin AI systems are not optimised for detecting connections or traversing relationships within datasets. Property graphs reveal and navigate connections, and therefore discover context by linking attributes and complex relationships across the graph (<https://neo4j.com/why-graph-databases/?ref=pr-sarum>), making them the ideal data structure to power machine learning models.

Furthermore, the robustness of the Neo4j Graph Platform (<https://neo4j.com/product/?ref=pr-sarum>) and its breadth of use cases demonstrate that it functions as the ideal system of record to safeguard and maintain connected data even while complex algorithms are being run multiple times per second.

A perfect example of Neo4j being deployed within a machine learning context is the German Center for Diabetes Research (DZD) (<https://www.dzd-ev.de/en/index.html>).

“Neo4j enables a new dimension of data analyses to fight diabetes by helping us to connect highly heterogeneous data from various disciplines, species and locations to build an invaluable body of knowledge,” said Dr. Alexander Jarasch, Head of Bioinformatics and Data Management at the DZD. “By applying modern machine learning techniques to our Neo4j graph, we are getting closer to understanding this complex disease to help diabetics and those with prediabetes.”

Neo4j CEO and Co-Founder Emil Eifrem notes that the forthcoming Neo4j 3.5 release will power the evolution of AI systems even more effectively in the future.

“Our customers are pushing the envelope of what can be achieved with graph-powered AI, which we think of as intelligent systems of connection,” said Eifrem. “They are able to do so because graph technology fundamentally embraces relationships as first-class entities. This relationships-first approach adds context to data, which is key to accurate, well-informed predictions. With Neo4j 3.5 we have worked extensively with our customers to deliver the robustness and scale they need for tomorrow’s graph-powered artificial intelligence systems.”

Release Highlights for Neo4j 3.5

The forthcoming release of Neo4j 3.5 will include the following features and upgrades.

Developer Productivity

* Full-Text Search: The 3.5 release brings the entire power of full-text search into the graph, enabling text-intensive graph applications such as knowledge graphs, metadata management and bill of materials (BoM). It also opens up powerful possibilities in the world of AI with natural language processing (NLP).

* Official Language Driver for Go: The Go programming language is gaining in popularity across a variety of applications – including AI – due to its ability to support CPU-level parallel processing while remaining simple to read, maintain and deploy. Neo4j 3.5 will support an official Golang driver.

* Graph Algorithms for Enhanced AI: Additions to the Neo4j graph algorithm library in the 3.5 release include unsupervised learning methods such as:

- Random Walks
- Personalised PageRank
- Similarities (e.g., Jaccard index)
- DeepGL
- DeepWalk

* Framework for Building Driver Apps: The 3.5 release also includes a framework to create Bolt drivers for new languages based upon C. Nicknamed "Seabolt," this framework handles the complexities of interacting with a Neo4j cluster, allowing driver authors to focus on idiomatic language support and higher-level abstractions.

Performance & Scale

* Expanded Native Indexing: Speed up data insertion up to 5x with expanded use of native indexes for all data types (including spatial, temporal and Boolean values) with added support for composite indexing.

* Faster Sorting: Native indexes are now used for sorting operations, greatly speeding Cypher queries.

* Improved Handling of Large Write Transactions: A new off-heap transaction memory subsystem – coupled

with optimisations in Neo4j's Raft-based clustering – greatly improves the handling of large writes.

Cloud Security

* Subject Alternative Name / Hostname Verification: In private and public cloud environments where IP addresses and hostnames may change, an option to provide a list of multiple IP addresses and servers to a X.509 standard Common Name certificate enables stronger verification.

* Encryption of Intra-Cluster Discovery Traffic: 100% of intra-cluster traffic is now encrypted, adding further security for multi-data centre cloud applications.

Neo4j 3.5 will be generally available in the fourth quarter of 2018.

Find Out More

AI and machine learning: To see how customers are using the Neo4j Graph Platform for AI and machine learning visit neo4j.com/artificial-intelligence

(<https://neo4j.com/use-cases/artificial-intelligence/?ref=pr-sarum>).

Neo4j 3.5: To get an early peek of the new features of Neo4j 3.5, visit the Neo4j downloads centre

(<https://neo4j.com/download-center/?ref=pr-sarum/#preview>).

About Neo4j, Inc.

Neo4j, Inc. is the graph company behind the #1 platform for connected data. The Neo4j graph platform helps organisations make sense of their data by revealing how people, processes and digital systems are interrelated. This connections-first approach powers intelligent applications tackling challenges such as artificial intelligence, fraud detection, real-time recommendations and master data.

The company boasts the world's largest dedicated investment in native graph technology, has amassed more than 20 million downloads, and has a huge developer community deploying graph applications around the globe. More than 300 commercial customers, including global enterprises like Walmart, Comcast, Cisco, eBay, and UBS use Neo4j to create a competitive advantage from connections in their data.

Neo4j is privately held and funded by Eight Roads Ventures (an investment arm of Fidelity International Limited), Sunstone Capital, Conor Venture Partners, Creandum, Dawn Capital and Greenbridge Investment Partners. Headquartered in San Mateo, Calif., Neo4j has regional offices in Sweden, Germany and the UK. For more information, visit [Neo4j.com](http://www.neo4j.com) (<http://www.neo4j.com/?ref=pr-sarum>) and follow [@Neo4j](https://twitter.com/neo4j) (<https://twitter.com/neo4j>).

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