

Ericsson

A leading provider of Information and Communication Technology (ICT) to service providers.

Industry

Telecommunication

Solution

OrientDB Enterprise

Ericsson Boosts Telecommunications Throughput by 30% with OrientDB



About Ericsson

Ericsson provides cutting-edge information and communication technology to telecommunication service providers around the world. With 40% of the world's mobile traffic carried through the company's network, Ericsson continually offers evolving solutions for data management and digital services across numerous network configurations.

Ericsson's research arm, spearheaded by Senior Software Engineer Cliff Roberts, develops modern solutions that solve the upcoming needs of telecommunication companies. Implementing competitive solutions for areas such as 5G commercialization, IoT connectivity, and more means that Ericsson always keeps an arsenal of the most advanced software options at its disposal.

The Problem

Marrying Complex Telecom Networks with a Database Solution

Roberts' team is constantly searching for ways to improve their clients' network performance and service expansion. He notes that the move away from relational databases in the telecommunications world was inevitable as networks require multiple devices, hardware and internal systems to communicate over large, unconnected geospatial areas.

"Comparing relational databases with a graph database is like trying to bring a knife to a gun fight," Roberts says "Where the equipment is and how it is interconnected gets unbelievably complex in the network. We wanted to move a significant portion of the value of our data records into a graph database. Because the telecommunications network already looks like a graph database, there's really no learning curve."

The Problem

A large telecommunications provider needed to connect various applications, geospatial models, inventory systems and customers bases to expand its service footprint without the limitations and costs of relational databases.

The Solution

Using OrientDB's database, Ericsson created an integrated graph database in just one week that connects inventory layers, provisioning, service topologies, device activation and capacity planning to powers automatic business insights and modern, more efficient network management.

The graph database solution first became a realistic option when Ericsson was working with a client who had acquired a small regional telecommunications company servicing a significant portion of the Western US.

The acquisition meant the client could drastically expand its customer base and bring high-speed internet across an extensive, multi-state service footprint. To do so, the client needed to merge the company's separate service topology into its existing corporate model. Further, the client wanted to move away from Oracle licenses and Weblogic servers that were too cost-prohibitive to support across a growing service area.

Ericsson needed to quickly present a solution that:

- Allowed two vast, complex data models to work together as one seamless network
- Combined decentralized and distributed ordering, activation systems, provisioning, transmitters, customers, and inventory into one multi-city and state internet coverage area.

The Solution

An Integrated Inventory and Provisioning Network Topology

In collaboration with the client and deep industry research, Roberts' team tested trial versions of numerous graph vendors with little luck. Internally-built graph databases also fell short of creating a working solution for pitching to clients.

"We started with a Neo4j database, but it couldn't reply with APIs and hold data very well. Many vendors lacked community versions and sandboxes we could actually use," says Roberts.

When Roberts' team found OrientDB, its full-featured community license impressed his engineers. With OrientDB, they could model precisely how capacities, services, transmitters and customers could all be linked into one database and maintain vast stores of data across the network before needing to buy a license for the system.

"Other vendors give you enough to learn but not enough for you to show a customer a full solution. With OrientDB, you can demonstrate exactly what the solution looks like to the customer sooner, and move onto closing contracts quickly," says Roberts. "Using a graph database with a full-featured community version was a quantum leap. It was like going from black and white TV to outer space."

Roberts' team created an integrated application solution for the client that unified the telecommunication provider's distributed inventory and provisioning topology into one database.

Results

- Network throughput improved 20-30% using OrientDB graph database instead of a relational database model.
- Integrated solutions connect multiple complex network topologies and geospatial networks.
- Client prototype was created in one week instead of a month, a faster and more efficient implementation than other graph database vendors.
- Physical inventory can be tracked against service provisioning, ordering and quality assurance workflows.



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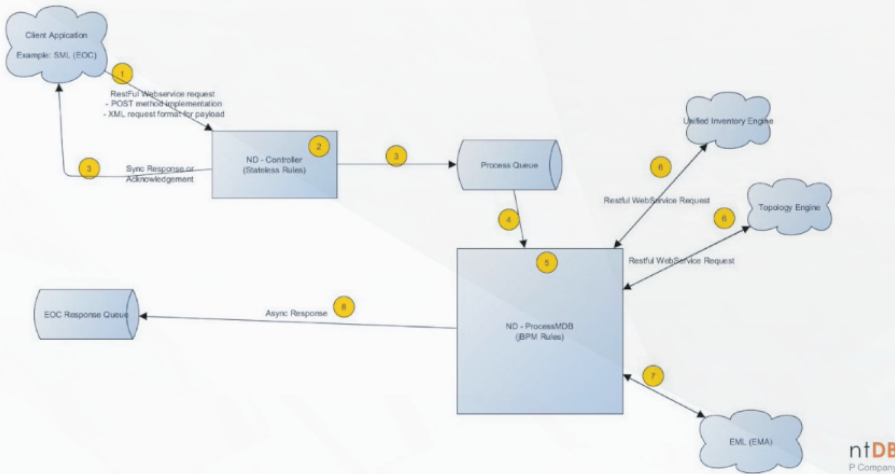
The graph database combined a service management layer and order processing centers for metro-ethernet services with RESTful web services, stateless rules and process queues to quickly onboard new clients and track which devices are in use.

Moreover, they were able to implement this inventory and topology engine in a week, a full three weeks faster than the client’s requested timeline.

“The only vendor that really allowed us to be productive, prototype right away, and get the throughput we required was OrientDB. In seven days, we had the database up and running. That’s virtually impossible anywhere else.”

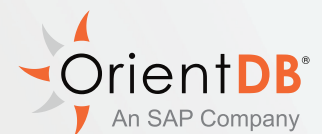
- Cliff Roberts, Senior Software Engineer

Integrated Application Solution



When Ericsson implemented the integrated application solution within the customer’s network, the difference in the throughput from the network’s previously complicated, disparate infrastructure astounded the client, who immediately saw a 20-30% improvement in processing speed.

“When I handed the interfaces for the OrientDB database over to the service assurance people, they were shocked at the throughput and the fact that they could make requests across multiple layers, geographic areas, autonomous systems and networks. That was the cherry on top of the sundae for us,” says Roberts.



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Expanding One Solution for Multiple Network Models

OrientDB's flexibility allowed Ericsson to offer this integrated solution across numerous and disparate data models and use cases, from wireless and metro-ethernet to cloud and cell phone networks.

Regardless of topology, Ericsson employs OrientDB to offer customers a planned view that demonstrates exactly how the network can operate in response to new geospatial maps, infrastructure projects, and order volumes. Ericsson then converts the planned view into an end-service view that illustrates exactly how routers, cables, transmitters and other hardware will translate across the network.

With this insight, clients extract an endless array of business insights, from pinpointing exactly where to put satellite and microwave transmissions with split government and privately-owned ownership and tracking and troubleshooting network usage and capacity planning across a distributed model to extracting hardware inventory and depreciation schedules for reporting to regulatory bodies.

Some of the most popular use cases of the OrientDB database include:

Faster Service Fulfillment

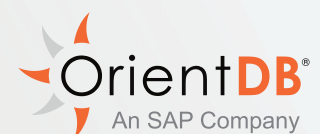
OrientDB's graph database enables Ericsson to enact 24-hour flowthrough from when new orders are placed to service activation. By connecting the dots between ordering, equipment inventory and equipment activation, devices can be turned on as quickly, and new accounts can go live as soon as possible for billing to begin.

Deeper Data Reconciliation

Graph databases also help reconcile the equipment data stored in databases against the reality of actual hardware states. Graph databases make it easy to cross-reference what is contained in data persistence layers with element management systems for easier data discovery and reconciliation. When dealing with millions of dollars of equipment spread across many, many locations, having an accurate snapshot of device inventory, use, activation and more is critical.

Delivery of Field Technician Tech-Access Documents

Skilled field technicians lean on graph databases to determine and assign the scope and area of proper work. With a graph solution, the database automatically reads services orders and converts the most appropriate instructional documents into the right format for tech access in the field. For example, the graph database can automatically send and format fiber-related documents for iPad use and only assign new fiber network orders to field technicians directly skilled in that type of work. This intelligent infrastructure enables more efficient technician assignments and reduces wasted time and effort.



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Improved Service Assurance

Networks powered by a graph database enables much more insightful data monitoring across a complex web of devices, hardware and throughput streams. With graph databases, dispatch centers can automatically correlate where service disruptions may be occurring and why, analyze the full extent of impacted areas and send the right skilled technicians promptly. Not only does this maintain high-quality customer service, but it creates a stronger competitive advantage for telecommunications companies when providing service to high-profile sporting and corporate events correlated across numerous temporary locations and devices.

5G Network Implementation

As telecommunications companies move towards improving transmission rates with 5G networks and away from physical cables and satellite transmitters, OrientDB's graph solution is perfect for tracking how 5G transmitters are daisy-chained through the network and how data is persisted on a geospatial model. From remote drill sites, home fiber networks, solar power, SIM cards, advertising in sporting events and more, 5G modeling with graph databases has the potential to transform the infrastructure costs and service layers within the telecommunications industry.

No matter the use case, the power of OrientDB's full prototyping and community version enables Roberts' team to create a working solution and easily demonstrate to Ericsson's clients exactly how their full-scale network management will improve with a graph application—no guesswork required. For an industry with a rapidly changing infrastructure and customer device usage, being able to show a fully-integrated, modern solution is critical.

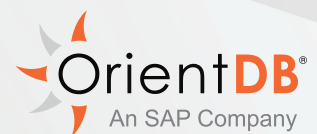
"Our customers aren't going to take a chance on a powerpoint. We have four weeks to get the solution right before our client move onto another option. With OrientDB's solutions, our clients have faith that we understand their needs."

"With OrientDB's solutions, our clients have faith that we understand their needs."

- Cliff Roberts,
Senior Software Engineer

About OrientDB

The native multi-model database combines the connectedness of graphs, the agility of documents and a familiar SQL dialect. Fortune 500 companies, government entities and startups all use the technology to build large-scale innovative applications. Some of their clients include Accenture, Comcast, Ericsson, the United Nations, Verisign, Pitney Bowes, Sky, Diaku, CenturyLink and Sonatype.



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