

nGeniusONE Platform for Database Performance Management

These days, Enterprise organizations depend on the successful delivery of services to end users to support their business. These services include many different elements, but one of the most important and often overlooked is the database. If access to the database becomes impaired, the business can suffer from downtime, lost data, service degradation and more, causing delays, lost revenue, and user irritation so quick identification of the source of the problem is essential. This includes proving when it is not the database causing the problem. Faster root cause analysis is important for reducing finger-pointing and rapidly discovering the true source of a performance degradation.

In addition to the backend database service, network infrastructure, web servers, application servers, and service enablers (such as DNS, LDAP, RADIUS and Active Directory) are also important components that together deliver services to end users. With so many possible areas potentially contributing to performance degradation, IT teams need a robust service assurance solution capable of isolating faults across multiple domains very quickly.

The nGeniusONE® platform provides real-time visibility into the performance of application services by analyzing packet data across the network, on premises or in the cloud. Powered by Adaptive Service Intelligence™ (ASI) technology, the highly scalable and patented deep-packet inspection engine, the nGeniusONE platform provides IT organizations with a comprehensive view of database performance across the service delivery environment. nGeniusONE leverages high-value packet data to generate “smart data” for smarter analytics to assure performance, manage risk, and facilitate superior decision-making regarding application and network services. With these smarter analytics, IT teams can quickly triage performance issues even in complex multi-vendor environments, ultimately reducing Mean Time to Repair (MTTR).

Database Performance Issues Solved by nGeniusONE

Database performance is one of those essential services that is routinely taken for granted, right up until an application starts generating errors or experiencing

slow response times. It is very common for database issues to be reported as network issues, because the symptoms so often mimic those of network degradation.

nGeniusONE delivers end-to-end visibility into the performance of application tiers, network traffic, service enablers (e.g., DHCP, Active Directory/LDAP, and RADIUS), and end users to understand the full context of the service and database errors contributing to poor user experience or application performance. With its common workflow across all tiers of a service, the nGeniusONE platform reduces the time to troubleshoot performance-impacting service degradations including:

- **Server Load Issues** – IT teams get visibility into the load to and from each database server and into which database commands are contributing to that workload for each server.
- **Session Latencies** – nGeniusONE tracks database performance by monitoring session response times between clients and servers. The platform is able to differentiate between different message types, and independently report on the performance characteristics of connects, queries and other modifications to the database. With the information provided, IT teams are able to identify the root cause of database slowness, including possibly database connect times, database writes, or database search times.
- **Database Errors and Messages** – Errors and messages are automatically discovered to allow IT teams to proactively monitor and troubleshoot root causes of database performance issues. Causes could include failures, bottlenecked performance, out of memory conditions, out of resource conditions and more.
- **Load Balancing Issues within Database Server Clusters** – nGeniusONE can help IT teams verify that performance and workloads are evenly distributed across different nodes in a database server cluster.

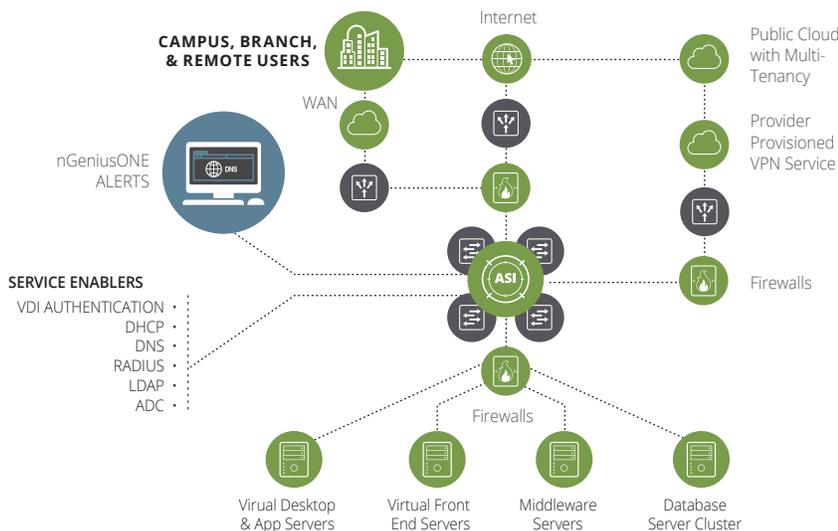


Figure 1: The nGeniusONE platform delivers database, application, web servers, service enablers, and network performance analytics to support end-to-end visibility.

- **User Impact** – IT teams gain visibility into which community of users is affected, or which particular location is affected by the problem. nGeniusONE enables IT teams to understand quickly which users or locations are affected by a performance degradation and how their service is impaired.

nGeniusONE Support for Database Services

In order to help NetOps resolve poor user experience issues, nGeniusONE relies on the power of ASI. Using the efficient data organization provided by ASI, nGeniusONE offers an efficient top-down vendor agnostic approach to problem identification, service troubleshooting, and resolution of database protocols such as Oracle, MySQL, MS SQL, or DB2. This highly structured data provides operational insights and visibility into the potential sources for database degradation including: which servers are delivering database services to which users; which of these servers are heavily loaded; what their latencies are; and what errors and messages are generated. In addition to application performance, nGeniusONE also provides advanced TCP analysis to help identify any network level issues.

The nGeniusONE platform ultimately improves root cause analysis and reduces MTTR by:

- Identifying errors and messages generated by the database application during transaction processing.
- Isolating the specific database instance generating the error when several databases are running on the same database management system.
- Pinpointing which database commands are causing the most problems.
- Discovering which users, sites, locations, and communities are experiencing the most service degradation.

The platform provides a consistent set of service-oriented workflows and situational analysis to enable seamless, contextual transitioning across multiple layers of

analysis. This allows the nGeniusONE platform to facilitate efficient and informed hand-off of incident response tasks across different IT groups involved in delivery of an application from one end to the other.

The platform streamlines service delivery management for database services by providing the following key analysis layers:

- **Service Dashboard** – Delivers real-time health status, metrics, alarms, and intelligent early warning of problems with database instances. IT teams can use it to quickly spot any performance issues related to a composite service including the web components, key middleware and service enablers, and the database servers in a single view.
- **Service Dependency Map** – Provides visibility into the current state of the service environment including database tier, web tier, application tier, and associated enabling protocols by automatic discovery and mapping of client - server relationships.
- **Database Monitor** – Provides a single, consolidated view of session workload affecting the database servers for every user community. This view enables IT teams to triage and isolate the sources contributing to performance degradation issues. This view provides visibility into the latency, number of database requests, and informational messages/errors related to database transactions such as DB Connect and DB Open, and SQL commands such as INSERT, UPDATE, COMMIT, ROLLBACK, and DELETE.
- **Session Analysis** – Delivers session-level analysis with hop-by-hop ladder diagrams detailing individual database transactions to help identify specific issues such as malformed queries. This view helps IT teams analyze transaction latencies, network statistics such as average round trip time (RTT), number of TCP retransmissions and timeouts, as well as detailed session and flow information such as the user name accessing the database, the name of the database instance, error codes, and server host and client information.

- **Packet Analysis** – Enables deep-dive database protocol level analysis and forensic evidence collection. Using packet analysis, IT teams get visibility into specific SQL query strings and table names accessed.

The majority of database performance issues can be efficiently investigated by using the dashboard and the database monitor screens alone. However, should deep dive troubleshooting be needed, IT teams can further drill down to the session and the packet analysis layers.

Benefits of nGeniusONE for Database Services

- **Quickly and Efficiently Investigate Database Issues** – Comprehensive service delivery platform covers all tiers including the web, application, and the Oracle Database tiers, enabling IT teams to efficiently troubleshoot performance issues, quickly identify the root cause, and reduce MTTR.
- **Get Visibility into the Production Database without Deploying Agents** – This non-intrusive data capture and analysis methodology helps IT teams monitor the performance of the production environment without the need for logging into the database itself or making changes to the database, user accounts, or application logic.
- **Isolate Specific Database Instances among Several that are Having Issues** – Provides visibility into the specific database instance name and the user impacted. This information helps IT teams troubleshoot problems quickly when multiple database instances are used concurrently to increase productivity.
- **Improve IT Team Collaboration** – Using common workflows across all application tiers, the platform speeds time to knowledge by enabling collaboration between network, application, and database teams.
- **Monitor Data, Voice, and Video Performance within a Single Solution** – Combined visibility of data, voice, and video helps organizations optimize the performance over a converged IP network.



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