MySQL Powers the Market Leading Telecoms Network Management Framework

Database:
MySQL 5.1 with InnoDB

OS:
Multi-Platform

"MySQL delivers the extreme levels of performance and availability needed by the tens of thousands of communications companies worldwide who rely on WebNMS for network management."

Eric Wegner,
Business Development Manager,
Zoho Corporation

Introduction

WebNMS, the leading network and element management solution, has been embedding MySQL as the default database for over ten years. To accommodate ever more stringent demands for availability and performance in the market, WebNMS and MySQL can write up to 10 million rows daily and support 2,000 transactions per second across a replicated architecture. WebNMS and MySQL are positioned to address the explosive growth driven by Long Term Evolution (LTE) and mobile broadband in next generation telecom networks.

Zoho WebNMS Overview

Founded in 1996, ZOHO Corp. develops products and solutions that serve a diverse range of enterprise IT, networking and telecom customers. The WebNMS division focuses on the needs of original equipment manufacturers (OEMs) and Communications Service Providers (CSPs) in the network and telecom markets as a critical supplier of NMS, EMS and OSS solutions.

WebNMS is a comprehensive network management platform that offers purpose-built applications and tools designed to help OEMs and CSPs to build, customize and extend their network management systems. WebNMS unique architecture simplifies the management of devices and resources from the edge of network, such as on-premise cable modems through to the core network with routers, switches and long-haul optical devices.

WebNMS is the most deployed NMS/EMS system by service provider networks in the world with more than 25,000 carrier deployments, extending from the largest players in the telecoms industry to rapidly growing emerging firms. In addition many CSPs and military applications have successfully implemented management applications based on the WebNMS architecture.

WebNMS enables network fault monitoring, configuration, provisioning, mapping / topology, performance management and troubleshooting of each device or element from a single platform, with functionalities including:

- **Unified management:** providing a common graphical interface and network management infrastructure for performing management functions, integrating applications, and unifying element management across multiple devices.
- **Network-wide visibility:** enabling extensive views and in-depth reporting of network activity with functions such as discovery, physical and logical topology maps, centralized event management, graphs, and statistical information.
- **Element management:** direct access to each device through its native element manager while allowing all networking devices to be configured from a centralized location. It also supports policy-based management across multiple device types.
- **Remote management of large and distributed networks.** Distributed mediation servers can be deployed to capture network statistics locally that then pass on correlated network information to the central server.

Top tier OEMs and CSPs seek out WebNMS for its dedication to achieving the 5 x 9's of reliability and its unrivaled scalability and flexibility that its customers demand. In addition, WebNMS drastically reduces implementation resources and time to market over in-house development. This enables network managers and engineers to build truly resilient networks that fundamentally support innovation and growth over the long term.

MySQL within the WebNMS Framework

MySQL Embedded Server is bundled with every copy of WebNMS Developer Edition as the default database, and is the foundation for OEMs and CSPs to begin building their own solutions from the WebNMS framework. WebNMS offers customers the flexibility to deploy their solutions on a range of databases, though the vast majority remains with the default MySQL option.

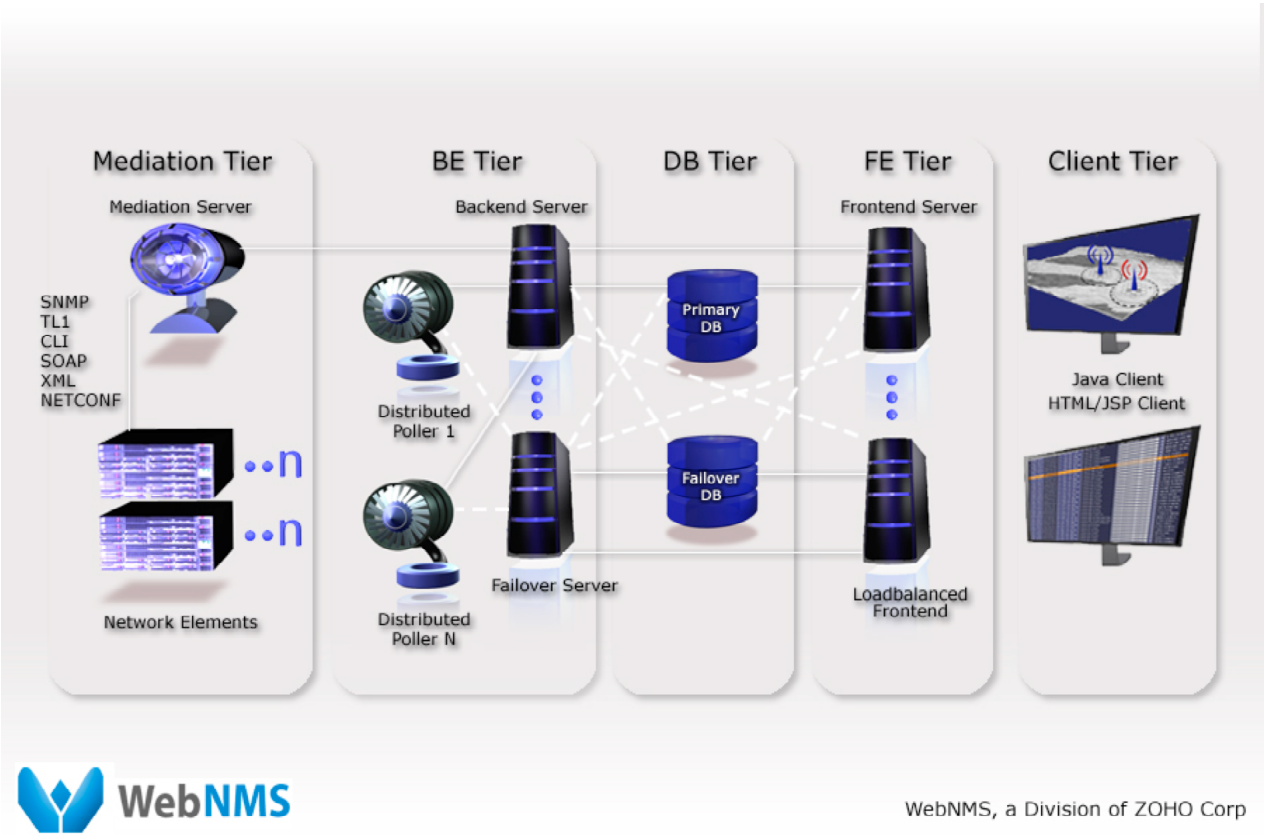

Figure 1: WebNMS Architecture

The WebNMS framework places high demands on the back-end database. Each network device is managed by WebNMS as a Java object, requiring a range of attributes to be persisted for each object across a range of databases and tables, each serving different applications within WebNMS.

The Fault Management application captures every event on each network node, writing up to 10 million rows daily at the rate of 2,000+ transactions per second into the database. WebNMS reporting applications can then drill down into this data to correlate events and generate alarms.

The Performance Management application polls each node at pre-defined intervals, inserting thousands of rows to the database every minute. Reporting applications then read the tables to analyze, filter and aggregate the data into intuitive and graphical performance management reports.

The Inventory Management module of WebNMS provides a complete database of components and devices across the network. As these devices can include cable modems, the database needs to be scalable to accommodate many millions of rows.

In addition WebNMS manages security, discovery and configuration functions of the network, all of which rely on a high performance, highly available database infrastructure.

The Benefits of WebNMS and MySQL

The WebNMS development team within ZOHO Corp. began using MySQL in the late 1990s. Open source licensing and ubiquity among developers and DBAs made it simple to begin building solutions around MySQL. In addition, MySQL required only a very small footprint, was easy to package and use, and provided simple integration with the WebNMS application.

As the WebNMS framework evolved to address ever more challenging network management workloads – driven by proliferation of nodes, higher bandwidth availability and richer communications services, so MySQL has evolved with it:

- The InnoDB storage engine added the transactional support to MySQL to address more stringent data integrity requirements.

- Enhanced performance and scalability of releases of MySQL 4.x and 5.x enabled WebNMS solutions based on MySQL to address networks with in excess of 1,000,000 nodes.

- MySQL replication enabled WebNMS solutions based on MySQL to deliver higher levels of availability and scalability, with simplicity of deployment.

MySQL is the world's most popular open source database relied on by over 2,000 Independent Software Vendors and OEMs to rapidly deliver high-performance applications. It provides a fully integrated, low overhead storage engine delivering an industrial strength, easy to use, and easy to configure database with Master/Slave Replication.

MySQL Embedded Server with the InnoDB storage engine is a fully integrated transaction-safe, ACID compliant storage engine with full commit, rollback, crash recovery and row level locking capabilities.

The Future with MySQL

The WebNMS roadmap is focused on supporting emerging requirements and standards within the communications industry, including the evolution to 4th generation networking technologies such as LTE, mobile broadband and the use of rich media. MySQL will remain the default database, with even greater support for performance, scalability and 5 x 9s availability demanded by next generation network and element management applications.

MySQL as an Embedded Database

MySQL Server is a full-featured, easy to use database that over 2,000 ISVs, OEMs, and VARs rely on to make their products more competitive, bring them to market faster, and lower their COGs (cost of goods sold).

These ISV and OEM customers choose to use MySQL as an embedded database for its:

- **Low-cost,** up to 90% less than Microsoft SQL Server with features that ensure COGS remain low throughout an application's life cycle. Lower database costs allow vendors to offer their products at a fraction of the cost of competing solutions and the flexibility to appeal to more price-sensitive customers.
- **Cross Platform Flexibility** with support for over 20 platforms providing the freedom to ship products on multiple hardware and operating system combinations and into more markets.
- **High Performance, Reliability and Scalability** to meet the requirements of the most demanding applications, such as Telco and Network management, 24x7. Including a full-featured RDBMS helps to make products more competitive initially and over time as customers' data needs inevitably increase.
- **Ease-of-Use** with fast installation, configuration and integration so developers can focus on application development, reducing costs and time to market.
- **Zero-administration**, eliminating the need for customers to hire a dedicated DBA or spend any cycles on database administration, and reducing or eliminating costly database-related support calls.

MySQL is ideally suited for:

Software Applications

- Network & Performance Management
- Monitoring Systems
- Content Management
- Healthcare & Practice
- Management
- Biotech
- Educational Software
- Telecommunications & VoIP

Hardware Appliances

- Networking Equipment
- Routers & Traffic Controllers
- Security Appliances
- Retail Kiosks
- Point-of-Sale (POS) Systems
- Diagnostic Instruments
- Sensory Devices

About MySQL

MySQL is the world's most popular open source database. Many of the largest and fastest-growing organizations such as FaceBook, Google, Alcatel-Lucent, Symantec and Adobe use MySQL to save time and money powering their products, high-volume Web sites, communications networks and critical business systems. Oracle provides commercial licenses, subscriptions, and services for MySQL.

Learn more about MySQL at: www.mysql.com
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