



# KENWOOD MAKES OPERATIONS SING WITH RED HAT LINUX

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## FAST FACTS

**Industry-Solution:**

Retail Manufacturing

**Platform:**

Linux

**Hardware:**

Dell servers

**Challenge:**

An established corporation has outgrown its long-time information systems, needs a full overhaul, while retaining its valuable legacy data.

**Solution:**

Red Hat Linux enables the company to redesign its system, adding many new features while maintaining its valuable data.

**Benefits:**

Essential information dating back more than a decade is preserved -- with a quantum improvement in operating-system speed, user productivity and flexibility for future growth.

When Gary Calvin cites the ideal systems solution for running the mission-critical accounting and point-of-sale applications at Kenwood Americas Corp. The terms "slow," "expensive," "single-tasking," and "hard to manage" are nowhere to be found on the spec sheet. Yet those were precisely the specifications that defined the aging computing environment at Kenwood.

To establish an IT image consistent with its image as one of the world's leaders in mobile, portable, and home audio electronics, Kenwood looked for a system that would give the company faster access to key operational applications, improved systems security, enhanced user productivity, automated applications management, and reduced system administration costs.

To get there, Kenwood would have to deal with back office accounting woes that centered around its aging McDonnell Douglas Information System (MDIS), which bundled a Microdyne Series 18 minicomputer with REALITY 7.0, a Pick operating system that includes an integrated database, programming tools, and a query language. Deployed in the 1980s, MDIS originally handled Kenwood's enterprise resource planning (ERP) application with ease, supporting terminal and terminal emulation users via 9.6Kbps serial port connections to order entry, invoicing, general ledger, time and attendance, and other critical business functions.



Though stable, MDIS performance began to suffer over time as Kenwood added more users to the system. Meanwhile, demands placed on the system continued to evolve. The company sought MDIS integration with Microsoft Excel and other Microsoft Office applications in an effort to move away from a text-oriented, green screen data view to being able to analyze and manipulate sales figures and other ERP data with graphically-oriented tools.

The introduction of multi-tasking PCs on users' desktops further highlighted the single-session constraints of the MDIS serial terminal connections. If a Kenwood representative needed to run an inquiry in the middle of entering an order, the rep would have to back out of the order screen, go to the inquiry screen, run the inquiry, and then return to the order, a process that involved several steps and was very time consuming.

"The MDIS machine was solid and reliable, but support costs were expensive, and the only access to it was via RS-232 serial ports," Calvin says. "Extracting data from the minicomputer to integrate with Windows apps was a slow, cumbersome process."

Given the competitive nature of the audio electronics arena, Kenwood sorely needed to expedite its ERP online transaction processing and decision support activities to maintain its position as an industry leader. So Calvin turned to Red Hat and jBASE Software. Using jBASE, Kenwood recompiled its REALITY DATA/BASIC source code into native Linux executables and leveraged jBASE's processor for the REALITY query language, REALITY-compatible print spooler, and other tools to further extend its investment in MDIS.

To power its revamped ERP suite, Kenwood selected Red Hat Linux over Windows NT and the many flavors of Unix that jBASE supports. With DNS and mail services already running successfully under Linux, Kenwood felt confident that Red Hat Linux would provide the requisite performance and reliability. Meanwhile, cost and lack of experience ruled out the Unix option while hardware and performance issues eliminated Windows NT. In particular, Kenwood recognized that Windows NT would squander precious CPU time on an unnecessary graphical interface while Red Hat Linux

gave the company the option of disabling the GUI. Calvin said, "This is a character-based application, and we didn't need to waste processor cycles on NT's GUI console. Running under Red Hat, we can get equivalent performance with more cost-effective hardware. "

The Red Hat implementation also lets Kenwood simplify its desktop environment. Under MDIS, each desktop PC had two wired connections - one to the Windows NT-based network and another to the MDIS minicomputer. The Red Hat solution lets Kenwood completely eliminate the serial connection. PC users that previously ran terminal emulation to access the ERP applications on MDIS now run telnet sessions to access the ERP suite on Red Hat. While desktop management is easier, the real benefits are found in the productivity gains found in replacing 9.6Kbps serial connections with fast network connections. Remote users enjoy a similar benefit: Previously users would dial-in to modems plugged directly into MDIS; now they can access the ERP application via RAS or VPN connections.

Porting its ERP application to Red Hat Linux also lets Kenwood integrate it much more smoothly with the company's network via Red Hat's PAM feature, which enables the company to validate logins against the NT domain, rather than maintaining a separate password database. According to Calvin, the result is improved systems security. "Since users have one password for everything, they make the password harder to guess, change it more often," Calvin says. "When we had multiple passwords per user, users would either write them down or use passwords that were easy to guess, making the environment less secure."

Kenwood users reap the most from the Red Hat-based solution, which lets Calvin deliver faster data integration with Microsoft Office applications by extracting data from the legacy MDIS database and writing comma-delimited files into users' home directories, which are accessible via Samba. Performance on the new Dell PowerEdge 4300 server is considerably faster than on the old minicomputer, and now users can open multiple sessions to the server a productivity enhancement that they were unable to enjoy on the serial-based minicomputer. In addition, users can spool reports directly to email or the Web, saving time as well



as paper and distribution costs. "Red Hat lets us put all of our applications on the network, which simplifies the infrastructure for our IT department and accelerates information access for our local and remote users," Calvin says.

Motivated by the success of its Red Hat-based ERP system, Kenwood returned to Red Hat with another challenge - to reduce operating costs and improve the manageability of Vigilant, the DOS-based point-of-sale application running at its five Kenwood Factory Outlet stores. Previously running on a Windows NT or Windows 95 server in each store, Vigilant has been redeployed on generic Pentium PCs running Red Hat Linux. The low-cost Red Hat solution lets Kenwood share files and printers in the heterogeneous network environment via Samba and run Vigilant over dial-up connections via dosemu when necessary. In some cases, the Red Hat server also acts as a firewall for the store's DSL Internet connection.

Key to the success of the Red Hat/Vigilant solution is Red Hat's support for automated multi-site polling, the Vigilant feature that collects sales and stock data from the individual stores and feeds it to Kenwood's corporate headquarters and also distributes stock information from headquarters out to the individual stores. In the earlier Windows environment, multi-site polling was conducted manually. Red Hat is also reducing Kenwood's in-store systems administration costs by enabling remote administration via mgetty+sendfax, pppd, and PERL, which lets Calvin dial in to each store's server and work with it as if it were a local machine. Remote administration was not an option under Windows.

"We've found Red Hat Linux to be very stable and reliable," Calvin says. "For building servers, no one does it better."



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