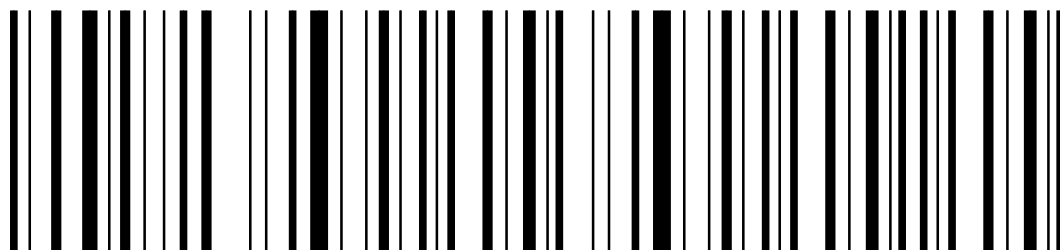


Realize More Value from Your Label Printing Systems with ZebraNet™ Bridge Enterprise



APPLICATION WHITE PAPER



Zebra Technologies



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Executive Summary

Bar code and RFID label printers are trusted with the critical task of creating labels that link physical goods with the information systems used to manage them. If companies lose their labeling system, they lose their ability to prepare outbound shipments, manage materials, accurately record inventory, and track products. Bar code and RFID label printing is truly mission-critical, and must be managed as such.

A comprehensive management system creates value far beyond keeping printers up and running. Label printing systems that can be managed centrally cost less to install, operate, upgrade, and maintain than traditional systems. The result is lower total cost of ownership (TCO) and improved return on investment (ROI) for the data collection applications. The value of remote, centralized management grows with the number of printers and label formats used throughout the enterprise.

Yet enterprises rarely manage label printers as thoroughly as they do as other information technology (IT) assets like network devices, servers, PCs, and even office document printers. Mainstream IT management systems like HP OpenView® and Tivoli® provide comprehensive management and monitoring applications that provide reliable performance and minimize administration and troubleshooting time. However, enterprise management systems don't support features critical to bar code and RFID label printers, making them of limited use for managing mission-critical label printing. Utilities for label printer management typically don't offer the same scalability, depth and centralized management capabilities as mainstream enterprise IT asset management systems.

Comprehensive, centralized management becomes more valuable the more labeling needs change. Companies are constantly creating label formats to support new customer requirements, internal materials management processes, and other applications. Installing new and updated label formats on all printers is time-consuming and expensive, but necessary to ensure consistency, especially for compliance labeling applications. Often, label format changes require changes to the printer, such as new font or bar code support or additional memory. Another round of printer-by-printer installation, configuration, and testing follows, driving up support costs. Printers with reduced support requirements provide a value advantage every day compared to those that aren't supported with centralized management.

Zebra Technologies has created a bridge between the control users need for mission-critical label printers and the robust management systems they're accustomed to with enterprise asset management applications. ZebraNet Bridge Enterprise is an enterprise printer management system exclusively for Zebra® printers, including mobile and wireless models, that provides a centralized way to remotely deploy, manage, and monitor printers throughout the enterprise. ZebraNet Bridge Enterprise leverages the power of ZebraLink™, fully supports the features specific to Zebra bar code and RFID printers, and provides features typically associated with mainstream IT management applications like automatic discovery, group management, remote configuration, status and alert monitoring, and more.

This white paper presents an overview of bar code and RFID label printer management options. It will discuss how label printer utility software, general IT management applications, and ZebraNet Bridge Enterprise can each be used to manage label printers. The paper will outline the advantages and limitations of each method. The paper will also describe the features, capabilities, and requirements of ZebraNet Bridge Enterprise.



Management Options—General IT Tools

Tivoli, HP OpenView, and other enterprise IT management systems have set a high standard for functionality, user interfaces, and convenience. System administrators rely on these tools to manage most of their IT resources. Folding label printers into this management environment gives administrators the advantage of using a single, familiar environment to manage label and document printers, along with computers and other equipment. The drawbacks are enterprise IT asset management systems provide only limited support for specialty label printers and can't be used to optimize performance.


Many features that are specific to bar code and RFID label printers are not supported in general-purpose management applications. These applications are further limited because thermal printers also have specialized printer control languages (ZPL® for Zebra printers), which are incompatible with common languages that control most document printers, such as PostScript® and PCL®. The proprietary control languages for thermal printers are optimized to provide high-quality bar code printing and smart label encoding. They support specific features like temperature and darkness settings, print speed, bar code symbology support, and special graphics and font handling performance that mission-critical label printing requires.

Management Options—Printer Utilities

Thermal printer utilities provide the opposite option to enterprise IT applications for printer management: Utilities are optimized to support specific thermal printers, but lack many of the scalability and centralized management advantages of mainstream solutions. The ZebraNet™ Utilities suite for Zebra printers is an excellent example. ZebraNet Utilities provides monitoring and alerts for specific label printing conditions, but the applications work best in local rather than large, distributed enterprise environments. ZebraNet Utilities provides monitoring and management capabilities, which are extremely valuable for improving uptime, but have limited value when configuring printers for rollouts and upgrades.

ZebraNet Utilities are a convenient way to configure Zebra printers and often are sufficient for companies that need only manage a few label printers at a single location. However, with the consolidation of operations and headcount that is prevalent in most manufacturing and IT organizations, there is a trend toward centralized management and administration of peripheral equipment, including printers. In a distributed environment, IT professionals tend to value the functions found in general-purpose IT management applications.

For more information about Zebra's printer management offerings, visit Zebra's Web site, www.zebra.com, which includes product information, brochures, and several white papers.



Management Options — ZebraNet Bridge Enterprise

ZebraNet Bridge Enterprise was created to bridge the gap between label printer-specific support provided by printer utilities and the centralized management, configuration, and control available in general-purpose management applications. ZebraNet Bridge Enterprise is exclusively for Zebra printers and ZebraNet® print servers. It can be used with printers with the ZPL command language and firmware version X.10 and higher, which makes it backward-compatible with many legacy installed Zebra printers. Printers with ZebraNet Wireless Print Servers are also supported. Unlike other printer management applications, ZebraNet Bridge Enterprise can also manage Zebra's mobile printers and provides limited support for printers with EPL™ that have a ZebraNet print server. ZebraNet Bridge Enterprise runs on Microsoft® Windows® NT 4.0 with service pack 6 through Windows XP, and Microsoft Windows Server™ versions NT 4.0 through 2003.

ZebraNet Bridge Enterprise Features

ZebraNet Bridge Enterprise provides comprehensive, centralized support for multiple-printer and multi-site customers. It includes several completely new features that previously weren't available for label printers, particularly for configuration and group management. ZebraNet Bridge Enterprise removes the redundancy from printer setup, which significantly reduces time required for installation, modification, and support. Combined with advanced monitoring features like automatic discovery and real-time alert notification, ZebraNet Bridge Enterprise maximizes printer uptime, maintains quality performance for mission-critical printing, and lowers the TCO for the print system. The following sections provide more details about ZebraNet Bridge Enterprise features and their advantages.

Automatic Discovery

When ZebraNet Bridge Enterprise launches, it automatically seeks and detects all the printers on the network's local subnet. Users can configure the software to search by local broadcast, subnet, multicast, by IP address or a range of IP addresses, and directed broadcast. Manual discovery is also supported. Discovery and monitoring are not limited to a single location, so administrators can view all Zebra printers in the enterprise from a single PC console application. Discovery can execute across subnets, WANs, and 802.11b wireless networks. ZebraNet Bridge Enterprise is believed to be the first management application to provide automatic discovery for wireless printers, which typically have been managed separately. These features make ZebraNet Bridge Enterprise a true tool for centralized, enterprise-wide printer management.

Remote Configuration

Remote configuration is a foundation of efficient, centralized management. It provides the ability for a single administrator to manage all Zebra label printers throughout the enterprise—without having to travel to remote sites or physically handle any printers. The remote configuration capabilities and limitations of ZebraNet Bridge Enterprise are quite simple: Any Zebra printer connected to the enterprise network can be accessed from the ZebraNet Bridge Enterprise interface and configured remotely through an easy-to-use graphical user interface. As with automatic discovery, remote configuration works across subnets, WANs, and 802.11b wireless networks. There is no need for a trained administrator at each site to support Zebra printers.



Remote configuration creates superior total cost of ownership for the printing system because it eliminates redundant, time-consuming configuration efforts. Consider a company that uses Zebra printers at three locations and wants to take advantage of a free firmware upgrade to enhance their printer capabilities (for example, to add international language support or a new bar code symbology). Previously, administrators at all three locations would go from printer to printer to install the firmware, or a specialist would travel to each location to perform the task. With remote configuration, the firmware could be pushed from a single location for simultaneous installation to all printers on the network. It would require about the same amount of time to upgrade all printers as it would a single device—without the travel or the involvement of additional administrators. It is now much more cost-effective to upgrade, modify, and optimize printer settings, because the time and labor expenses associated with doing so are significantly reduced.

Printer Group Management

Central management doesn't mean all printers must be managed the same. Printer group management allows administrators to easily create and define their own groups for printer management. Printers can be grouped by location, printer type, application, or other criteria, and can be included in multiple groups. Modifications can be communicated to specific printer groups, so the entire printer population doesn't have to be modified and printers don't need to be configured individually. Grouping is an important feature that makes it time-effective to optimize printers for their specific tasks.


There are many ways to group printers to save administrative time. All wireless printers could be placed in a group to simplify security upgrades. RFID smart label printer/encoders could be grouped because of the specialty output they provide. There are benefits to grouping for more common applications. For example, printers used to create work-in-process tracking labels for components perform differently from the printers used to create large shipping labels for the finished product. Imagine if users noticed a change in the bar-code-reading performance of their work-in-process labels. A simple analysis could find the problem would be corrected by printing bar codes slightly darker, which requires an adjustment to the print temperature. The system administrator could make the adjustment on the ZebraNet Bridge Enterprise console and load it to all printers used to produce WIP labels within a facility, or to factories around the world. Meanwhile, printers for shipping labels and other uses would retain the settings optimized for their applications. The grouping feature could also be used to download new customer label formats to shipping label printers at only the facilities that supply the specific customer, which saves memory on unaffected printers.

Grouping eliminates redundancy from configuration, which provides valuable time savings. Again, it takes practically the same amount of time to optimize a group of printers as it does to change settings on a single device. Users can frequently update and modify their printers to take advantage of new developments, without paying a penalty in excessive administrative time requirements. Grouping is one of the most valuable features of ZebraNet Bridge Enterprise and sets the foundation for other configuration capabilities.

1-to-1, 1-to-Many Configuration Copy and Printer Profiles

ZebraNet Bridge Enterprise enables configuration settings to be copied from one printer and pasted to another, or broadcast to an entire group. The option to do 1-to-1 and 1-to-many configuration copying enhances the value of printer grouping. In addition to printer alert settings, objects including label formats, graphics files, and fonts can be copied between printers. After the first printer is set up, only a small amount of incremental time is required to configure other printers with the same settings.

Users can also create a printer profile—a virtual “golden printer”—with desired settings, objects, and alerts, and clone or broadcast them as if it were a real printer. By replacing individual printer configuration with a cut-and-



paste or broadcast operation, ZebraNet Bridge Enterprise provides extensive savings for setup time. This feature is especially valuable in large installations and upgrades. The printer profile feature enables administrators to set up and configure a virtual printer on the PC application, without setting up an actual printer. Users can take advantage of this feature to streamline rollouts by setting configurations while waiting for equipment to be installed. Once printers are on the networks, the virtual printer configuration can be communicated to any printer or group from the console. Printer profiles are also an excellent way to back up a printer's configuration for crisis recovery.

Heartbeat Monitoring and Status Information

From the moment printers are identified through the auto discovery feature, their status is continuously monitored and reported in real time with no user action required to check status or download data. The heartbeat monitoring feature provides the information needed for proactive management and reliable performance in mission-critical operations through visual status icons in the application's group management window. The icons provide a quick, at-a-glance confirmation of printer status. In critical printing applications, printer status information can be key. For example, if a mission-critical printer's power cord has been knocked loose and it can't communicate to the application, the status icon for that printer will become white in the application's group management window, indicating that immediate action should be taken.

More status information is available in the Status tab. From print server Quick Status and Port Status information windows, to the printer's Detailed Status information window that displays the current printer condition, everything needed to monitor status and troubleshoot all Zebra printers is at hand in a single, easy-to-use application.

Alert Management and Event Notification

ZebraNet Bridge Enterprise leverages the power of ZebraLink for advanced, configurable alert management and event notification features. Using ZebraNet Bridge Enterprise, an administrator can configure alerts on printers (for either individuals, groups, or the entire population) to send unsolicited alerts if media runs out or other error conditions exist. Users can choose to have alerts and notifications in SNMP or TCP/IP sent to them by e-mail, cell phone/pager, and the ZebraNet Bridge Enterprise application in any combination.

One way to take advantage of this powerful ZebraLink feature is to request notification when media consumption reaches a certain level. The information gathered in ZebraNet Bridge Enterprise can be used to proactively manage supplies and prevent running out of materials during peak periods. Proactive management, real-time notification, and flexible communications options can improve uptime, lead to early detection of potential performance issues, and prevent costly work stoppages.

View and Change Settings

ZebraNet Bridge Enterprise takes advantage of IP addresses and Web server support integrated in Zebra printers to enable administrators to remotely view and configure printer settings. If changes are required after viewing settings, a new graphical user interface simplifies the process. Configurations can be changed manually by the administrator, or by broadcasting settings from printer to printer or to a printer group.

Remote configuration goes beyond changing settings. ZebraNet Bridge Enterprise supports firmware, font, graphic, and software object file (SOF) downloads to the printer. These features are described in upcoming sections.





View Memory

Memory locations on a Zebra printer can be viewed and managed similar to printer settings. Administrators can check available memory, plus the specific items that are stored in a printer's memory. This functionality is useful for verifying that proper versions of label formats are stored on printers, and that there is enough memory to add new formats. Double-clicking on a ZPL file in a printer will open the file in the system's default text editor and save the file to the application's resource directory.

If out-of-date or obsolete formats are stored on the printer, the administrator can delete them through the printer's Web interface. Another option is to copy a printer profile configuration to the printer and use it to replace the previous configuration and memory contents. This remote software management approach may prevent having to purchase and install memory cards to support label formats, fonts, and graphics.

Font and Graphics Conversion

Labels print faster when the required graphics and fonts are stored on the printer, rather than transmitted over the network along with the print job. To facilitate faster printing, ZebraNet Bridge Enterprise includes easy-to-use application wizards for converting and loading fonts and graphics to printers. The interface can be used to transfer many file formats, including bitmap, .jpeg, non-animated .gif and others. The conversion feature makes these files compatible for output from the Zebra printer. The font conversion wizard enables fonts that are not Zebra-resident to be printed properly.

If enterprises use the same graphic in multiple label formats (such as a corporate logo), then all the formats need to be updated if the graphic changes—unless the graphic is stored in the printer. Stored graphics can be changed easily, using the central management and printer grouping features in ZebraNet Bridge Enterprise. Storing graphics on printers and managing them centrally eliminates the need to manually update multiple label formats.

Other Features

ZebraNet Bridge Enterprise includes many other features to provide ease of use and simplify printer management. These include drag-and-drop editing, setup wizards, and help menus throughout the application to support the main functionality. User interfaces have been redesigned and improved from previous printer management offerings, particularly interfaces to manage downloads and to view monitor status.



C o n c l u s i o n

Comprehensive management improves the value of a label printing system by increasing reliability and reducing support time and expenses. Enterprises can maintain the print quality they need to satisfy customer and internal requirements, while increasing printer uptime and reliability. Automated monitoring helps prevent downtime for media outages and leads to fast, proactive problem resolution. Central, automated management makes it possible to improve printer asset utilization without increasing operator labor or administrative support time to do so.

Good printer management systems also make more efficient use of their system administrator's time. Features like cloning, grouping, and broadcasting slash the time and effort required to configure and deploy printers. The time savings for a single deployment could provide a positive return on the management system investment. The investment will be leveraged and become more valuable when new printers, label formats, or other upgrades are added to the system. ZebraNet Bridge Enterprise removes most of the time and expense required to optimize printers, which helps customers get the most performance and value from their printing system.

Zebra is the trusted brand for more than 90 percent of Fortune 500 companies and has sold more than 4 million printers. ZebraNet Bridge Enterprise is a powerful complement that enhances the value of legacy installed Zebra printers and extends the value and reliable performance that Zebra print systems provide. Visit www.zebra.com to learn more about ZebraNet Bridge Enterprise and other connectivity solutions for Zebra printers and software.



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