Innovative Bar Code and RFID Printing Solutions for SAP Users

Executive Summary

Producing bar code and RFID output from SAP® applications has traditionally been a challenge. The specialized, rugged printers used for printing bar code and RFID labels on production lines, warehouses, shipping docks, and other industrial environments use different command languages than the office printers supported by legacy SAP software. IT departments often depend on middleware or printer-specific SAPscript to enable the printer to recognize SAP output. However, innovative solutions from SAP and Zebra now provide a seamless environment for creating complex bar code and RFID labels for a wide range of business applications.

In 2004, SAP simplified what formerly was a complex task for its customers by including native bar code printing capability in its software, and including a true bar code printer driver for the first time. The functionality is available for mySAP™ Business Suite, included with Smart Forms, and also included in the Interactive Forms product co-developed with Adobe Systems. Interactive Forms is a component of the SAP NetWeaver® application server platform.

Working in close partnership with Zebra, SAP embedded into its products the Zebra Programming Language (ZPL®). With Zebra support woven into the SAP fabric, Zebra® printers can print both bar code and RFID labels directly from SAP applications, eliminating the need for additional software, drivers, print servers, or programming—thus providing a more robust, scalable, and reliable solution.
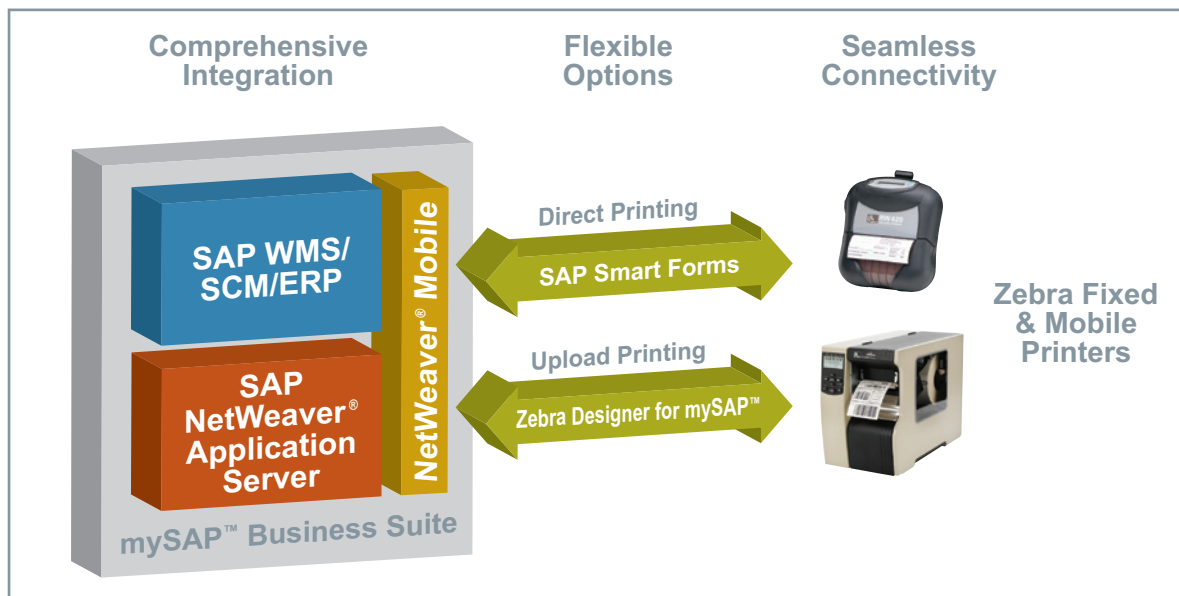
Seamless Integration for Reliable, Efficient Bar Code and RFID Printing

The enterprise IT, label-printing environment, desired label, and form output are all variables unique to each enterprise and application. To help SAP users understand how to get the most printing value from their environment, this white paper overviews SAP bar code and RFID printing solutions offered by Zebra. The paper also describes different output methods for common SAP usage scenarios including:

- Upload printing methods (SAPscript)

- Zebra's upload solution: ZebraDesigner™ *for mySAP™ Business Suite*

- Direct Printing from SAP (SAP Smart Forms and Interactive Forms)

- How to use Unicode™-enabled printers to avoid custom forms design to support international character printing

- SAP NetWeaver® Mobile support for Zebra wireless printers

- SAP Auto-ID infrastructure support for RFID printers/encoders

Introduction

Without native printer support, generating bar codes from SAP requires software to translate printer commands into device-specific formats. First, software must extract the static and/or variable data required for the bar code or RFID label from the SAP system. Next, the software must encode the information to meet the content and presentation requirements for specific bar code label fields and RFID data. The label file, with all bar code, text, graphics, and RFID data, also requires formatting for the target printer's command language.

Prior to SAP's breakthrough developments, a variety of alternatives were developed so SAP customers could output enterprise information in bar code format wherever and whenever necessary. Today, all the approaches for bar code and RFID label printing from SAP leverage either uploading the printer control language to the SAP application, or downloading an SAP conversion functionality to the print system. The most common approaches for printing in the SAP environment are:

- Upload method—Designers create bar code and RFID labels using a third-party software package and upload them into SAP through SAPscript programming.

- Direct printing—Smart and Interactive Forms allow users to create label designs within SAP and generate native command outputs to specific printers.

Determining the best way to make the conversion depends on several variables. These include the number of label formats used, the frequency that labels change and the requirements for new formats and RFID data fields, the number of printers (fixed or mobile), and the legacy base of the label printers. The following sections present the options for generating bar code and RFID label output from SAP, with guidance to where each method is appropriate.

Upload Methods (SAPScript)

SAP users have made the upload method the most popular way to generate bar code and RFID labels from their applications. Designers create labels using a third-party label design application. Then, through SAP-script, the label design file uploads into the SAP form. Users can easily print bar code and RFID labels directly from SAP without additional processing.

Simplicity and reliability are the key benefits of the upload method. Printing systems are easy to administer, because after the one-time uploading into the SAPscript form executes, there is no print server hardware to maintain. Direct printing also enables fast label output, which is important for many supply chain management (SCM), warehouse management system (WMS), and enterprise resource planning (ERP) operations.

For traditional printers, the upload method may require ABAP™ programming to make output convenient. Each label format requires manual modifications to the printer control language (PCL) file. These modifications are required to embed the SAP variables names and SAPscript logic, consuming time and money. In addition, printers do not support the upload of binary files, which prevents the use of Asian characters, restricts

graphics capabilities, and on some printers, prevents the use of TrueType™ fonts. The upload method also imposes limitations on text wrapping, justifications, and variable field scaling.

Zebra's Upload Solution: ZebraDesigner™ *for mySAP™ Business Suite*

Zebra offers ZebraDesigner *for mySAP™ Business Suite* for bar code label design and output in the SAP environment. The ZebraDesigner software family makes producing sophisticated labels easier than ever before. Created specifically for use with Zebra bar code printers, ZebraDesigner software delivers a unique level of access to the advanced features found exclusively on Zebra printers. ZebraDesigner is a unique upload solution that eliminates manual modifications or scripting. Designers can create label formats in a fraction of the time it takes to generate and continually modify SAPscripts.

ZebraDesigner provides all the tools required for a wide range of label designs—from the simple to the complex—and uploads the files to the SAP system through the mySAP Business Suite Windows® client. ZebraDesigner performs the conversion from the desktop design environment to SAP compatibility by automatically generating SAPscript in mySAP Business Suite Internal Text Format (ITF). The SAP system can direct bar code label output to Zebra fixed or mobile printers. A single license of the bar code design software is the only requirement, and covers printing at all enterprise locations.

Visit www.zebra.com/sap to learn more about ZebraDesigner *for mySAP™ Business Suite* software.

Direct Printing from SAP (SAP Smart Forms and Interactive Forms)

SAP built native bar code printing support into its software by adding bar code rendering functionality and including drivers for Zebra printers. Bar code rendering and printing support launched at SAP release 4.6c. Users create bar code and RFID labels and forms for output from SAP applications using the SAP Smart Forms environment. If the destination printer can recognize ZPL, PostScript, or PCL output, it can print bar codes with no additional programming required. This is also true of Interactive Forms, SAP's form design tool available through SAP NetWeaver. Interactive Forms includes the intuitive Adobe Form Designer, and affords seamless integration with ABAP Workbench and SAP NetWeaver® Developer Studio. Interactive Forms also supports ZPL and bar code design.

Simplicity is the biggest advantage of printing bar codes directly from SAP. It makes the process of print-ing bar codes from the SAP environment as easy as printing a Word document on a PC. There are no addi-tional software licenses, servers, or PCs to buy and support. The approach is very economical, because SAP customers can take advantage of their existing Smart Forms license to satisfy their label and form printing needs. Support of the ZPL bar code printer command language provides users with an easy way to migrate their label production from laser printers to thermal printers, which are much more efficient to operate and offer many additional features.

There are limitations to direct bar code output from SAP. Users need a PostScript, PCL, or ZPL printer. De-signed to print documents, however, PostScript and PCL laser printers are poorly suited for enterprise bar code label printing. They frequently lack the bar code print quality, speed, media options, and reliability required for daily label production, and often makes inefficient use of toner and label material. Zebra's ZPL thermal printers are available in numerous sizes, enclosures, and configurations, including compact desktop units; rugged, metal-encased industrial models, and mobile printers wearable on a belt or carried by hand. ZPL printers support a wide range of connectivity options, including Ethernet, 802.11a/b/g-standard wireless, Bluetooth®, and more. Other thermal printer makers may develop ZPL emulation, but these devices cannot provide all the compatibility, features, and performance available in true ZPL-enabled devices.

For more information about SAP Smart Forms bar code support, refer to SAP OSS Notes 430887, 750002, and 750772, available at www.service.sap.com. Also, see Zebra's white paper *"Using SAP® Smart Forms for Bar Code Label Printing from mySAP™ Business Suite"* or Zebra's SAP Smart Forms technical documentation on Zebra's Smart Forms Web page at www.zebra.com/smartforms.

International Printing for mySAP Business Suite—Unicode

Multinational enterprises working across borders should also consider what language their label printer must support. Printers create text by using a codepage to convert numeric codes into characters and expressing them in a font that generates the required characters. Most codepages, including ASCII, support less than 256 characters, which severely limits their ability to print multiple languages. The Unicode codepage features more than 65,000 characters—more than enough to print in all of the world's major languages.

While Western European languages are fully supported, Eastern European, Middle-Eastern, and Asian languages require special consideration. Zebra supports all major business languages from SAP release 4.6c onwards via Unicode (UTF-8) for both Smart Forms and the SAPscript upload method using ZebraDesigner™ f*or mySAP™ Business Suite*. It is not necessary to use SAP 4.7 Enterprise to take advantage of Unicode with Zebra bar code label printers. This means users can implement the same printer model and SAP forms at all locations without having to worry about local languages and dialects, which saves administration time and operating expenses.

Mobile and Wireless Printing

One of the most powerful ways to leverage the investment in an SAP system is to extend information access to non-office workers. Wireless 802.11a/b/g networks are an effective medium for extending information access, and wireless printers can enhance applications by enabling seamless output wherever and whenever the application requires it. Whether fixed or mobile, printers that connect to an 802.11a/b/g network are simply an Internet Protocol (IP) address to the SAP application. Users can design a label that prints the same on a fixed or mobile printer. Zebra printing solutions described in this paper convert SAP data into recognizable command language—regardless if the printer is fixed or wireless. Printer networking, interface, and communications capabilities stay the same.

Zebra printers enable connectivity to 802.11a/b/g-standard wireless local area networks, providing the wireless equivalent of Ethernet connectivity. As a result, the methods used for SAP output on Ethernet networks also apply to wireless printers. The wireless printer contains an IP address and appears as a device on the network. The SAP system sends print jobs and other commands wirelessly instead of over an Ethernet cable. All necessary data conversions and formatting remain the same as when using a physical connection. If printer drivers are used, the same drivers used for specific models of printers will also work for wireless versions.

Mobile printers receive print jobs from SAP applications in one of two ways. Network-addressable wireless mobile printers interface with the host system the same way as described above for stationary mobile printers. Mobile printers that do not connect directly to the network can process print jobs from a mobile computer using a Bluetooth® connection.

The SAP NetWeaver® Mobile infrastructure platform delivers SAP's WMS/SCM/ERP transactions to the mobile worker on handheld devices via wireless local area networks. Mobile users can operate in a connected and disconnected environment, and are supported by full data synchronization. SAP's technology fully supports Zebra's mobile printers, empowering workers on the go to print labels wherever and whenever they need.

A Zebra Technologies White Paper

RFID Printing/Encoding

Zebra was the first company to offer RFID printer/encoders that work seamlessly with SAP's Auto-ID Infrastructure. SAP Auto-ID Infrastructure enables integration with a wide range of auto-ID technologies—including RFID smart labels—with SAP enterprise-level applications. Zebra's XML-enabled RFID printers provide a direct connection with SAP. For each RFID print job, Auto-ID sends an XML task to the printer. The Zebra printer parses the XML data stream for label formatting, quantity, and variable field data. Then, the printer reads the stored XML label format and applies field data while encoding the RFID tag.

Zebra offers several products that support SAP Auto-ID, including the R110Xi™, R170Xi™, R4Mplus™ EMEA version, and R110PAX™ printer/encoders. The Zebra XML Schema V 1.3-based solution enables the tag-commissioning feature of SAP's RFID software, and is fully tested and certified. Learn more about Zebra's direct connect to SAP Auto-ID Infrastructure by visiting www.zebra.com/sap. Visit www.zebra.com/rfid to learn the latest about Zebra RFID.

Conclusion

How to make the software and printer speak the same language stood as the primary challenge confronting users of SAP applications. To solve this challenge, SAP and Zebra teamed up to deliver bar code and RFID labeling solutions that speak the same language—ZPL. To achieve the highest reliability, efficiency, and scalability, SAP users can choose the upload method (ZebraDesigner for mySAP™ Business Suite) or Smart Forms. Businesses using SAP NetWeaver should also consider using Interactive Forms, the latest generation of SAP forms technology.

To find the best method for their operations, companies must assess their label and form printing needs, legacy printer base, and replacement schedule. By matching the method to the enterprise environment, businesses can achieve their SAP bar code printing needs—reliably, efficiently, and cost-effectively.

Zebra Technologies Corporation (NASDAQ: ZBRA) provides the broadest range of innovative technology solutions to identify, track, manage, and optimize the deployment of critical assets for improved business efficiency. Zebra's core technologies include reliable on-demand printer and state-of-the-art software and hardware solutions. By enabling improvements in sourcing, visibility, security and accuracy, Zebra helps its customers to put the right asset in the right place at the right time. Zebra operates in over 100 countries and serves more than 90 percent of Fortune 500 companies worldwide. For more information about Zebra's solutions visit www.zebra.com.

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