BarTender®

The World's Leading Software for
Label, Barcode, RFID & Card Printing

White Paper

Integration with SAP

Automatically Printing with SAP's Auto-ID Infrastructure (AII), IDocs, and SAPscript

SEAGULL SCIENTIFIC

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Choosing the Best Method of Integrating BarTender with SAP

SAP™ (Systems, Applications, and Products in Data Processing) is an enterprise-scale, customizable workflow application produced by SAP AG of Frankfurt, Germany. It is designed to automate all of the core processes in a large business, including order processing, order fulfillment, customer service, supply chain management, and inventory management. It is used by medium and large businesses worldwide. Crucial to SAP's success are its powerful integration features that enable disparate third-party applications to exchange information with each other. BarTender uses a variety of these integration technologies to print data from any of your company's SAP-connected databases.

Print using BarTender or SAPscript

When selecting a method of integrating BarTender's printing functions with SAP, the primary consideration is whether you want to have the print job output by BarTender or SAPscript.

> **NOTE:** When printing from BarTender, you can still have SAP trigger and control the print job. In fact, your users don't even have to see BarTender or know that it's running.

Printing using SAPscript

If you choose to print using SAPscript, this does not allow you to take advantage of the rich, print-time functionality that BarTender provides, such as logging, reprinting, and object sizing. It also results in a system that is harder to maintain, as design changes and printer configuration changes do not take place immediately; they must be updated in the SAP system. SAPscript printing is covered in the chapter, SAPscript.

Printing using BarTender

When using BarTender as your print engine, you have several options for implementing the integration. The benefits of one option vs. another will depend on the skill set of the person doing the integration. All options require at least the Automation edition of BarTender. The option "AII" requires the Enterprise Automation edition of BarTender.

- AII (Auto ID Infrastructure)
  AII sends XML data packets that contain the data to print, the name of the format to print, and the name of the requested printer over a TCP/IP socket. Commander receives this data and uses it to instruct BarTender to print. AII is particularly well suited for RFID applications. See the AII (Auto-ID Infrastructure) section below for details.
- IDoc Files
  Within the ALE component of the SAP system, the user can choose an existing IDoc or create a new IDoc that contains the data to appear on the printed item. The ALE component also defines the transaction(s) that affect the generation of the IDoc and the destination directory for the IDoc file. See the IDoc (Intermediate Documents) chapter for details.
- BAPI-Generated Flat Text Files
  Within SAP, a BAPI can be written using ABAP to export a flat text file.

- **SAPscript-Generated Flat, Fixed-Width Text File**
  A SAPscript report can be designed to generate a flat, fixed-width text file that contains the data to be printed. (SAP can be configured to run this report any time you want to print.) Commander can then be configured to detect these files and initiate BarTender print jobs.
- **Custom BarTender Integrations**
  The SAP system can be configured to make ActiveX calls or execute command lines whenever you want to print. This can be used to control BarTender, and specify the BarTender document, printer, and data to be printed.

SAP AII (Auto-ID Infrastructure)

This section explains how the SAP Auto-ID Infrastructure (AII) can be integrated with the Enterprise Automation edition of BarTender to automatically print.

There are two primary tasks that must be completed to implement this printing integration:

- **Configuring the SAP AII Application:** Printing integration with SAP AII is based on the generation of an XML file containing all of the information needed to describe an RFID label print job. SAP AII must be configured to generate an XML file and send it over a specified TCP\IP port. The steps to do this are not documented here, but can be found in your SAP documentation. We cannot provide technical support for this part of the task. SAP is responsible for training users to correctly generate these XML messages. For additional information on SAP AII integration, see the AII-DC-RFID 1.0.doc file from SAP.
- **Configuring Commander:** To handle XML print requests, Commander must be configured to monitor the port in which the XML files will be received, and to respond by executing the requested print job.

SAP Auto-ID Infrastructure (AII)

AII is a part of the NetWeaver platform. It sends XML data packets that contain the data to print, the name of the format to print, and the name of the requested printer over a TCP/IP socket.

Commander

Commander is an application included in the BarTender Suite that allows BarTender to automatically print in response to certain triggering events from other software. One of these events is the detection of incoming data via a TCP/IP socket. When the trigger event is detected, Commander reads commands and/or data over the incoming port and passes them on to BarTender, which executes the print job.

> **NOTE:** XML print requests can only be processed by the Enterprise Automation edition of BarTender. This is because the Enterprise Automation edition provides the following functionality that is not available with the base Automation edition:
>
> - Monitors TCP/IP socket communcations as trigger.
> - Transforms incoming XML data to other formats using XML. For the special case of converting SAP AII XML files into BTXML Script, Commander includes a built-in XSL style sheet designed for this purpose.
> - Launches and communicates with multiple instances of BarTender in high-performance environments.

Included Files

Several files are installed with BarTender to make integration with SAP AII easier. They are installed into the **BarTender\BarTender Documents\SAP AII** subfolder of your Documents folder.

BarTender Document

A sample BarTender document called SGTIN-96.btw is provided. It references the field names that are supplied by SAP AII.

XML File

A sample XML file called SGTIN-96.xml is provided.

Commander Task List

A sample Commander Task List called SAP-AII.tl is provided. It is configured to allow reception of SAP AII XML messages through the TCP/IP port 5171.

Configuring Commander for Integration with SAP AII

The process of configuring Commander to receive XML print requests and transform them into usable BTXML Script is outlined below. This process assumes that Commander is installed on your PC and BarTender is activated as the Enterprise Automation edition.

1. Open Commander.
2. From the **File** menu, select **Open**.
3. Browse to the **SAP AII** samples folder (located in the `Documents\BarTender\BarTender Documents\SAP AII` directory of your computer).
4. Open "SAP-AII.tl".
5. From the **Detection** menu, select **Start Detection**. Commander starts listening for SAP AII messages on port 5171.

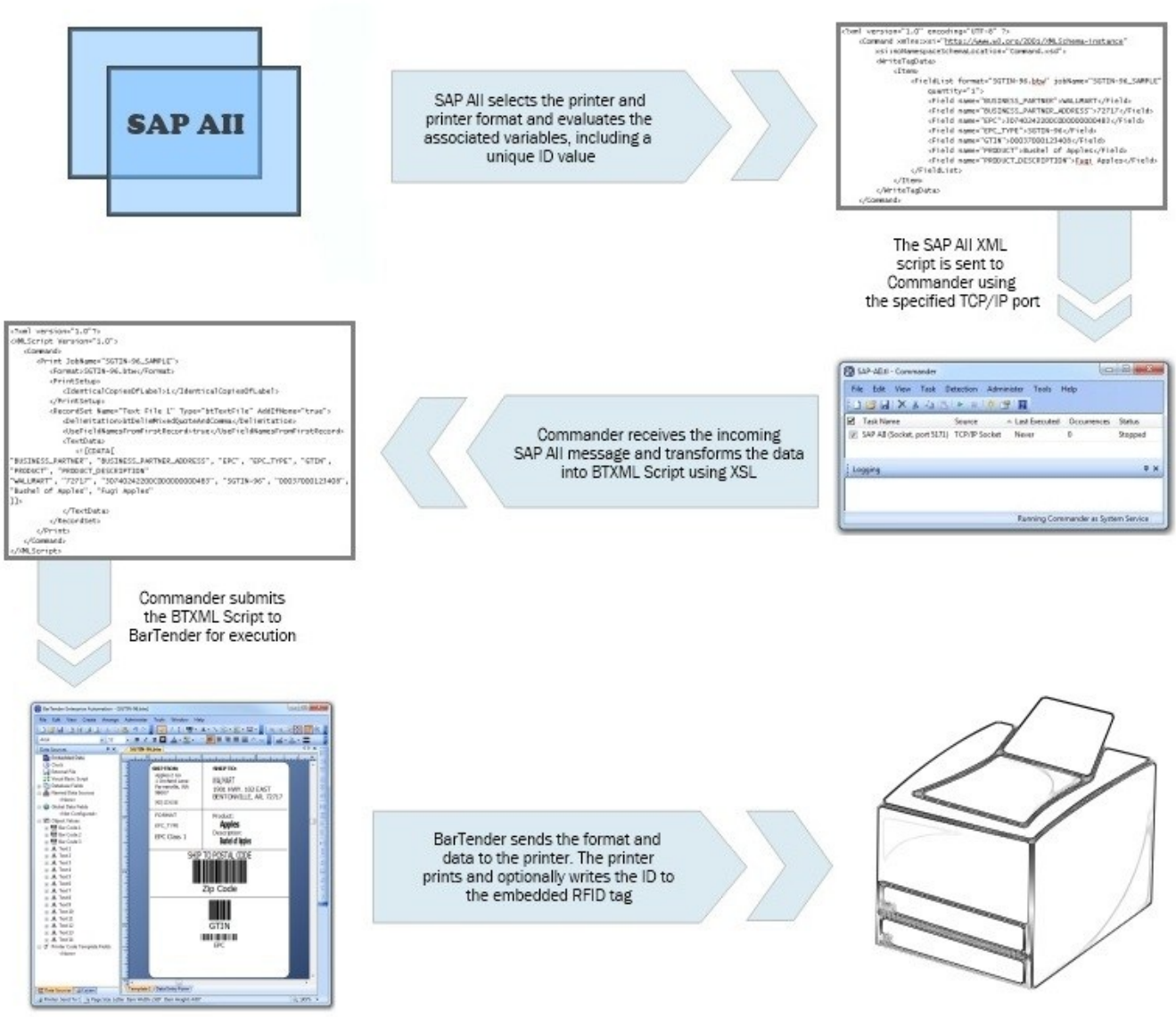
Testing the Commander Configuration

To confirm that you have Commander properly configured, perform the following test:

1. Send a SAP AII message/print job specifying the printer and the BarTender document to print to port 5171.
2. BarTender should respond to the message by automatically printing a label to the printer specified in your SAP AII message.

Diagram of the Print Process

The diagram and bulleted steps below illustrate the printing process:



IDocs (Intermediate Documents)

This section explains how you can integrate SAP R/3 IDocs with one of the two Automation editions of BarTender to automatically print.

SAP R/3 Intermediate Documents (IDocs)

An IDoc is a transactional message, in the form of a pure ASCII file, sent from a SAP-connected application to other applications. In an IDoc message, most of the contents are fields of data grouped into segments. The segments themselves have a hierarchical relation to each other.

Example

A physician's prescription of a drug for a hospital patient needs to get to the hospital's pharmacy. This could be done by means of an IDoc sent from a bedside application to an application in the pharmacy. Suppose the IDoc has a hierarchy of four levels of segments:

```
Patient Name: Johnson
      Diagnosis: croup
      Diagnosis: tibia fracture
            Visit Type: admission
                  Drug: codeine
                  Drug: amidol
            Visit Type: followup
                  Drug: naprosyn
```

- **Level 1:** Contains data that remains constant for years at a time, such as patient name and address.
- **Level 2:** Contains data that remains constant through a given illness, but changes from illness-to-illness; such as primary physician and diagnosis. There can be more than one second level segment for a given patient.
- **Level 3:** Contains data that tends to change from visit to visit but remains constant through a particular visit to the hospital, such as visit type (admission or followup) and attending physician. A patient may have more than one hospital visit during an illness.
- **Level 4:** Contains data that tends to change from prescription to prescription, such as prescribing physician, medicine, and dosage. More than one medicine may be ordered for a given patient on a given visit.

IDoc Types and Segment Definitions

Since an IDoc is a message, both the sending and receiving applications must conform to a common convention about where, in a given IDoc, each piece of data will be found. To this end, SAP AG has defined several hundred IDoc types and a large number of segment types. Furthermore, SAP owners can create their own custom IDoc types and segment types.

A sending application must construct an IDoc of a given type in accordance with these definitions; a receiving application, like BarTender, must conform to the definitions when parsing the IDoc. This

means that identifying a parser file is one step in setting up BarTender to use data from IDocs. A parser file for an IDoc type contains the information BarTender needs to parse the IDocs; such as what segments can appear in it, which segments are repeatable, what data fields will appear in each segment, what order the fields will be in, and what length each field will have.

IDoc types have names of six letters and two numerals. SHPMNT01 is an IDoc that embodies a message about shipments. SAP revises the definitions of IDocs from time to time, and the two numerals at the end of the name identify the revision.

Segment names may end in three digit version numbers. For example, E2KNA1M001 is a segment for the DEBMAS02 (customer masters) IDoc type.

Converting IDoc Hierarchical Data to Flat Records

Because BarTender views data as organized into tables, it must convert the hierarchies in IDocs to flat records. Fortunately, since data in a child segment is always associated with the data in its parent, any non-branching paths through a tree in an IDoc, from a top node to a bottom node, can be reconstructed as a record.

In the hospital example above, the path through the tibia fracture and the prescription for naprosin can be collapsed into a flat record like this:

Patient Name	Diagnosis	Visit	Drug
Johnson	tibia fracture	followup	naprosyn

The two other complete paths could be collapsed into these records:

Patient Name	Diagnosis	Visit	Drug
Johnson	tibia fracture	admission	codeine
Johnson	tibia fracture	admission	amidol

Master Segment

You will not always need a printed item for every possible record that could be produced from the data hierarchy in an IDoc. BarTender can be configured at print-time to select only some records. BarTender documents that draw data from an IDoc will not need every possible record in the typical case. BarTender uses the concept of the **Master Segment** to help you produce only the records you need from an IDoc.

The Master Segment is the segment whose data is the focus of interest with respect to your printing needs. BarTender will produce one record for every segment in the IDoc that you designate as the Master Segment.

To continue the hospital example, if the hospital needs a label for every drug prescribed, it would set the Master Segment at the fourth level. Thus, BarTender would produce the three flat records shown above.

But suppose the hospital keeps separate files for every patient visit and wants to generate a label to be used for file folders. Only one printed label is needed for each visit. So the Master Segment is set to the third level, and BarTender produces two records:

Patient Name	Diagnosis	Visit	Drug
Johnson	tibia fracture	admission	codeine amidol
Johnson	tibia fracture	followup	naprosyn

The rule of thumb for deciding what your Master Segment should be is:

In the typical run built from this IDoc, I'll want one printed item for every _____.

Steps for Adding an IDoc to Your BarTender System

BarTender's Add Database Connection wizard takes you through the process of connecting a SAP IDoc database to your document.

1. Open BarTender.
2. From the **File** menu, select **Database Connection Setup**. If you have never connected to a database, the **Add Database Connection Wizard** opens. Otherwise, click **Add** on the **Database Connection Setup** dialog to launch the wizard.
3. On the **Add Database Connection** wizard, cick **Next**.
4. On the **Select the type of database to use**page, select **SAP Intermediate Document (IDoc) File**, and click **Next**.
5. On the **Set the IDoc options** page, select an IDoc type and an IDoc file from which to draw data for your printed items. If necessary, add, modify, or remove IDoc types. When you are finished, click **Next**.
6. On the **Set the IDoc master segment** page, select the master segment you want to use and click **Next**.
7. On the **Set the IDoc fields** page, select the fields on the IDoc from which you want to draw data. If you pick any fields on repeating segments, set the repeating segment rules for each such field.
8. Click **Finish** to close the **Add Database Connection** wizard. In the **Database Connection Setup** window under **All Databases**, there is now a child entry called SAP IDoc,
9. Add a barcode or text object to the template.
10. From the object's context menu, select **Properties**. The **Properties** dialog opens.
11. From the left Navigation Pane, select the data source you wish to connect to the database.
12. Next to the **Type** option, click the Properties icon  . The **Change Data Source Type Wizard** opens.
13. From the **Type** dropdown list, select **Database Field**. Click **Next**.
14. From the **Field Name** dropdown list, select the IDoc field you want to use.
15. Click **Finish** to close the **Change Data Source Type Wizard**.

16. Click **Close** to close the **Properties** window.
17. Print the document.

Automatically Printing

You can configure your SAP system to automatically create an IDoc file upon certain transactions. You can then set up Commander to detect these files and launch BarTender. BarTender will read the data out of the IDoc and initiate a print job.

SAPscript

When you print using SAPscript, BarTender simply provides the formatting commands. SAPscript then supplies the print job data, merges it with the formatting commands, and sends the resulting print code to the printer. This method of printing does not allow you to take advantage of the rich, print-time functionality that BarTender provides, such as logging, reprint, and object sizing. It also requires you to upload the format every time changes are made. The procedure is as follows:

1. Use BarTender to create a new document and design your items with the printer settings defined for the printer you want to use.
2. Export the BarTender document to a SAPscript ITF (Interchange Text Format) printer code template. This template consists of a mix of printer commands with placeholder tags to mark where the data fields are to be filled in by SAPscript. (The appropriate Seagull printer driver must be available when generating the ITF file. However, not all printer languages are compatible with ITF. Check with Seagull for a list of compatible printer drivers and models.)
3. Import the ITF file into SAPscript.
4. The SAP system can be configured to run the appropriate SAPscript report whenever you want to print. The SAPscript reporting engine then replaces the placeholder tags with the appropriate data, and sends the resulting code to the printer.

Related Documentation

External Documentation

- SAP Home page
- Solutions for Auto-ID and Item Serialization

Seagull White Papers

- Exporting Printer Code Templates
- Commander
- Licensing for BarTender's Automation Editions

For downloadable versions, visit:

www.seagullscientific.com/label-software/white-papers.aspx