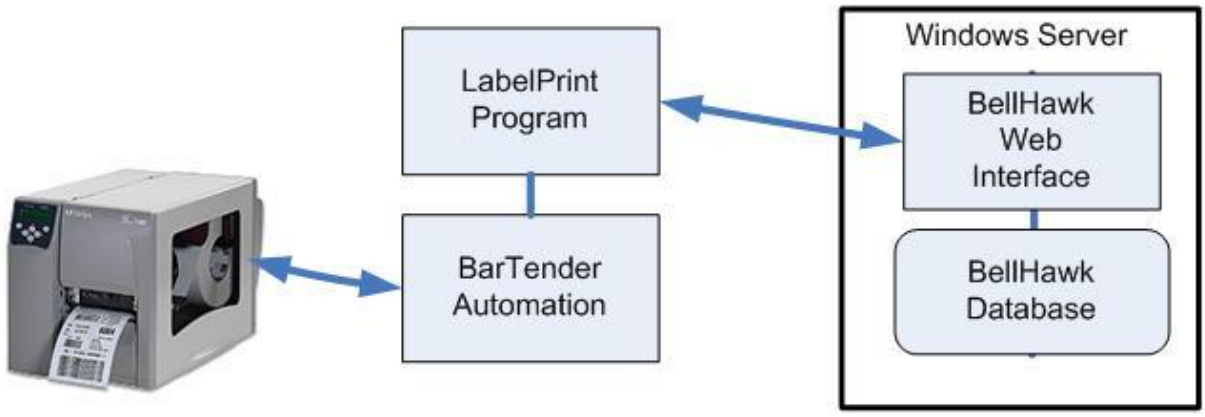
Configuring and Installing the BellHawk TAG Barcode Labeling Option

Introduction

The BellHawk TAG barcode labeling module is used to print labels with tracking barcodes and human readable information on barcode label printers. The labels are in a user specified format and based upon the contents of the BellHawk database. The labels can be pre-printed and scanned during transactional data entry or they can be printed on demand as part of the transactional data entry.

Please note that TAG and BarTender are not needed to print out forms with barcodes on them from BellHawk, such barcoded pick sheets, as these are printed on office printers using the DevExpress Reports DLL, which does not require the use of BarTender as it includes its own barcode label formatting capability.

When a print request is received through the web-browser interface of BellHawk, that print request is placed in a print queue table in the BellHawk database. This print request contains the label format to be used, the values to be placed in named fields in the label, and the number of copies of the label to be printed.



The print request is retrieved by the LabelPrint, which then calls the BarTender SDK to cause the labels to be printed.

Labels are printed on a wide variety of barcode printers using the BarTender Automation software. The printing is performed by the LabelPrint program which gets its label printing instructions from the print queue in the BellHawk database and then calls the SDK interface of the BarTender Automation software to print out the label.

The LabelPrint software comes in two forms:

1. LabelPrintS which runs on the same Windows Server as is used for BellHawk.
2. LabelPrintR which runs on a Windows Workstation computer, along with BarTender Automation in a remote plant.

BarTender only works efficiently when printing over a local area network and so needs to be local to the plant in which it is used. If the BellHawk Windows Server is installed in the local plant then the LabelPrintS program and BarTender Automation should be installed on the same server as BellHawk.

If BellHawk is running at a remote data center then LabelPrintR and BarTender Automation should be installed on a Windows Workstation in the plant and access BellHawk remotely.

When installed on the Windows Server, the LabelPrintS.exe program is automatically run as a separate process by the BellHawk software itself when a new entry is placed in the BellHawk print queue.

The LabelPrintR.exe program runs continuously as a user process in a Windows Workstation, in the remote plant, to monitor the print queue in near real-time by making long-polling requests to the BellHawk web-services interface over the Internet.

LabelPrint performs label printing by:

1. Reading the print queue to get the label format, the named field values and the number of labels to be printed.
2. Fetching the specified BarTender (.btw) label format from a designated folder on a local or network disk drive.
3. Calling BarTender Automation to print the label(s) on a printer specified as part of the BarTender label format. The labeling request can be for a single label or for a set of sequentially numbered identical labels to be applied to a set of identical containers.

The retrieving of the label format, the population of its fields and the launching of the BarTender Automation mechanism is all performed using an SDK supplied by Seagull Scientific, the developer of BarTender.

BarTender has the capability to print labels on a wide range of different barcode printers. When the SDK is called to print the label, it runs a program called BarTend.exe on the Workstation or Server computer. BarTend.exe then checks with the designated BarTender License server that the designated printer is part of the pool of currently licensed printers before handing off the printing of the label(s) to a BarTender provided Windows printer driver for the specific printer in question.

While the named printer can be specified as part of the label setup in BellHawk, LabelPrint uses the default printer setup in the BarTender .btw label format file.

Most barcode printers are specialized digital offset printers in a box. They take a stream of instructions in a specialized language and then process this to print and process labels at high speed. Each model of barcode printer has its own unique features requiring the downloading of a driver for the specific model from the BarTender website.

BarTender will also print on a regular office printer using regular Windows drivers for these printers, which can be useful for testing. But this is not for operational use, as the point of a barcode printer is to print labels on a rugged substrate in ink that will withstand abrasion.

The exception to this are color inkjet barcode label printers, which use a regular windows driver. In this case, the label formats are still created in BarTender and the label fields are still filled in by the LabelPrint software but the output from Bartender is a Windows printer image file rather than a stream of commands to the barcode label printer.

Software Distribution

The software is distributed as two sets of zipped files:

LabelPrintSsetup.zip – contains the flowing .msi installation files for installation on a Windows Server:

- LabelPrintSsetup.msi installs the TAG files in C:\Program Files (x86)\BellHawk Systems Corp\LabelPrint\
- LabelPrintStestsetup.msi installs the TAG files in C:\Program Files (x86)\BellHawk Systems Corp\LabelPrintTest\

LabelPrintRsetup.zip – contains the flowing .msi installation files for installation on a Windows Workstation in a remote plant:

- LabelPrintRsetup.msi installs the TAG files in C:\Program Files (x86)\BellHawk Systems Corp\LabelPrint\
- LabelPrintRtestsetup.msi installs the TAG files in C:\Program Files (x86)\BellHawk Systems Corp\LabelPrintTest\

The test and operational versions are for use with the Test and Operational BellHawk websites

Installing BarTender

Please note that only one copy of BarTender needs to be installed on the Windows Server or Workstation, as appropriate. This will be used for label printing by both the test and operational versions of BellHawk.

Configuration Limitations

The primary limitation is BarTender itself. It is recommended the following restrictions be followed:

1. BarTender must be run on a Windows Workstation or Windows Server which has access over the local area network (LAN) to the printers on which barcode labels will be printed. These printers can be network connected printers or can be connected to PCs on the LAN.
2. The BarTend.exe program must be run on the same computer as the BarTender SDK that called it. The BarTender SDK is called by the LabelPrint software and so BarTend.exe and LabelPrint must be installed on the same computer
3. The BarTender label format must be accessible over the local area network. These (.btw) label formats are typically kept in a folder on the same Windows Server or Workstation on which BarTender is installed.

4. The BarTend.exe must be able to access a BarTender License Server over the same local area network that BarTend.exe is running on.

The BarTender print drivers are supplied for network printers and for printers that plug into the USB ports of PCs. The BarTender network print drivers need installing on the same Windows Workstation or Server as BarTend.exe runs on. The print drivers for printers that plug into PCs need to be also installed on the individual PCs into which the printers are plugged.

It may be that some of the LAN constraints detailed above can be relaxed to include use over a VLAN (Virtual LAN) but the VLAN needs to support a high speed connection otherwise label printing will be very slow.

BarTender Automation Editions

If you have not already purchased BarTender Automation then you will need to purchase or upgrade to this edition unless you already have licensed the Enterprise edition of BarTender, which also includes the BarTender SDK. Please note that other editions, such as the Professional edition, do not include the SDK, which is used by the LabelPrint program.

BarTender Automation is licensed by the number of barcode printers in use, which are controlled through the BarTender license server, which also needs to be installed on the same Windows Workstation or Server on which BarTender is installed or on a Server accessible over the LAN.

BarTender Versions are not backwards compatible, so it is necessary for the LabelPrint program to be linked with the correct version of the BarTender SDK DLL before the LabelPrint.exe process is created. Please contact BellHawk with details of the version of BarTender that you plan to use so that a compatible version of the LabelPrint software can be supplied.

Setting up BarTender Automation

BarTender Automation edition needs to be installed on the Windows Workstation or Server according to the instructions provided by Seagull Scientific. Also the print drivers for the printers need to be downloaded from the Seagull Scientific website and installed on the Workstation or Server and on PCs that have local barcode printers.

You also need to install and set up the BarTender license sever according to instructions supplied by Seagull Scientific. This needs to be accessible to the Workstation or Server used to run the LabelPrint. On the Windows Workstation or Server you can verify that the automation components are installed and registered as follows:

1. Open the Control Panel and select Uninstall a program.
2. Right-click BarTender, select Change.
3. Click Next in the opening screen of the BarTender Setup Wizard.
4. Select Modify in the Program Maintenance screen, then click Next.
5. In the Custom Setup screen, scroll to the bottom of the list of features and verify that BarTender .NET SDKs has been installed. If so, cancel out of the Setup Wizard. If not, follow the Setup Wizard instructions to install that feature on the local hard drive.
6. Exit the Control Panel.

Setting up the BellHawk Web Services Interface

This is done on the BellHawk Windows Server computer and is required for LabelPrintR.

The following process enables the use of the Windows Communications Foundation (WCF) for all web servers running under IIS on the Windows Server. This enables the LabelPrint software to access the print queue using SOAP/XML requests. This only needs to be done once for both the test and operational versions of BellHawk.

To register WCF on the Windows Server, Perform the following steps:

1. Start the command window as administrator: from the taskbar click Start -> All Programs -> Accessories, right-click Command Prompt and select Run as administrator.
2. Navigate to "C:\windows\Microsoft.NET\Framework64\v3.0\Windows Communication Foundation\". (If not on a 64-bit system, omit "64" from the path.)
3. Run the following command: ServiceModelReg.exe /i /x
4. Exit the command window.

Installation and Configuration on a Windows Server

Installing LabelPrintS

1. Run LabelPrintSsetup.msi to install operational TAG LabelPrint files in C:\Program Files (x86)\LabelPrint\
2. Run LabelPrintStestsetup.msi to install test TAG files in C:\Program Files (x86)\LabelPrint\
3. Copy the BH.Lex license file that was provided for installation with BellHawk into C:\Program Files (x86)\LabelPrint\

Note that, LabelPrintS.exe is launched as a separate background process by BellHawk. LabelPrintS uses the BHISDK DLL to access the BellHawk database. This DLL requires a local copy of the BH.Lex license file in the same folder as its executable program.

Please note that LabelPrint now is available in a 64 bit version to work with the 64 bit version of BarTender 16. If this version is used then LabelPrint is installed in C:\Program Files\ rather than C:\Program Files X86

Configuring BellHawk Initialization File for TAG printing with LabelPrintS

The illustration below shows the prototype BHSDK.ini file with the additional lines for the operational version of LabelPrintS.exe highlighted.

```
[BellHawk]
XMLFile = BHMeta_v7.00.XML
DBType = SQLSERVER

; UNCOMMENT ONE of the three following SETS of configuration assignments
;   according to your connection type.
; Replace the values in the lines following "Type = ..."
;   as appropriate for your BellHawk environment.

;Type = WCFService
;SVC_URL = http://localhost/WebHawk/BCService.svc
;UserID = *****
;Password = *****

;Type = ODBC
;DSN-Name = BellHawk_DSN
;UserID = *****
;Password = *****

Type = ODBC
Server = localhost\SQLEXPRESS
Database = BellHawk
UserID = *****
Password = *****

[Control]
; Replace the values on the next 4 lines with your BellHawk BHCTL SQL server database/login settings
Server = localhost\SQLEXPRESS
Database = BellHawk
UserID = *****
Password = *****
; The following 3 lines are added for local printing
LabelProg = "C:\Program Files (x86)\BellHawk Systems Corp\LabelPrint\LabelPrintS.exe"
LabelProgUserID = *****
LabelProgPassword = *****

[Debug]
DebugLevel = 0
```

1. Include a *LabelProg* entry in the [Control] section of the BHSDK.ini file with a full path to the LabelPrintS.exe program. For the test version of LablePrintS.exe, the highlighted path would be
   "C:\Program Files (x86)\BellHawk Systems Corp\LabelPrintTest\LabelPrintStest.exe"

2. Include *LabelProgUserID* and *LabelProgPassword* entries in the [Control] section with the credentials for the Windows user profile under which the program will be run. This is for the "BellHawk" user that need to be setup, as described in the BellHawk Installation and Configuration Guide, if LabelPrintS.exe is to be automatically launched by the BellHawk website when labels are to be printed out on a barcode label printer.

   At a minimum, this user profile needs to have read/execute access to the folder where the BarTender .btw files reside, and modify/write access to the folder where printing log files will be written.

3. Log into BellHawk as Admin. Go to the *Edit System Parameters* page *Printing* tab. Activate local printing by unchecking the *Remote Printing* checkbox as shown below:

Then select which transactions can generate labels on demand and also select any transactions for which pre-printed labels can be generated.

Configuring the LabelPrintS Initialization File

LabelPrintS reads the BellHawk print queue using an ODBC connection to the database, so portions of LabelPrint.ini are very similar to BHSDK.ini.

When setting up the test version LabelPrintStest, be sure to use connection information for the test BellHawk database in both the [BellHawk] and [Control] sections. Similarly, when setting up the operational version LabelPrintS be sure to use connection information for the operational BellHawk database in both sections.

The illustration below is an example of LabelPrintS.ini:

```
[BellHawk]
XMLFile = LabelPrint.XML
DBType = SQLSERVER
Type = ODBC
; Replace the values on the next 4 lines with your BellHawk BHCTL SQL server database/login settings
Server = localhost\sqlserver
Database = bellhawk_v7
UserID = *****
Password = *****

[Control]
; Replace the values on the next 4 lines with your BellHawk BHCTL SQL server database/login settings
Server = localhost\sqlserver
Database = bellhawk_v7
UserID = *****
Password = *****

[LabelPrint]
LogFolder = C:\Users\Public\Documents\Log_Files\LabelPrint
FormatFolder = C:\Users\Public\Documents\BarTender\Formats

[Debug]
DebugLevel = 0
```


1. Set both values of *Server* to the test or operational SQL Server instance where the test or operational BellHawk database resides.
2. Set the value of the Database entry in the [BellHawk] adaptor and [Control] sections to the appropriate BellHawk database name. Also set both sets of *UserID* and *Password* values to SQL Server Authentication credentials with access to the selected BellHawk database.
3. *LogFolder* is where LabelPrintS will write its log files. Test and operational versions of LabelPrintS should each have their own folder.
4. *FormatFolder* is the folder from which LabelPrintS will retrieve BarTender .btw label format files.

Installation on a Remote Workstation

Configuration Notes

The LabelPrintR.exe and LabelPrintRtest.exe programs run as minimized user processes on the Workstation. They shows up in the toolbar of that user process as shown below. They can be run with the user logged in but disconnected from the console.

A separate user account should be set up for running the test and the operational versions of LabelPrint so that a desktop icon in each user account can be used to run the test or operational version of LabelPrint, as appropriate, without confusion

The reason for running LabelPrint as a user process and not a system process is that LabelPrint calls BarTend.exe. By employing a user process for BHTAG, all of these programs run with the user's privileges. But if LabelPrint runs as a system process then BarTend.exe has no access privileges to the printers on the network or other PCs. These limitations can be overcome in each specific installation but can take a significant amount of IT and BellHawk support time to get working correctly.

Most clients use the same Workstation as the station on which they develop and modify their BarTender label formats.

Installing LabelPrint R

1. Run LabelPrintSsetup.msi to install operational TAG files in C:\Program Files (x86)\LabelPrint\
2. Run LabelPrintStestsetup.msi to install test TAG files in C:\Program Files (x86)\LabelPrint\

Setting up the LabelPrintR Initialization Files

An example of the LabelPrintR.ini file is shown below:

```
[BellHawk]
SVC_URL = http://localhost/Service/BCService.svc
UserID = LabelPrint
Password = LabelPrintPWD

[LabelPrint]
LogFolder = C:\Users\Public\Documents\Log_Files\LabelPrint
FormatFolder = C:\Users\Public\Documents\BarTender\Formats
POLL_LENGTH_SECONDS = 20
QUERY_INTERVAL_SECONDS = 2

[Debug]
DebugLevel = 0
```

1. Set the value of SVC_URL to the URL of either the test or operational BellHawk website. The actual URL, such as `BellHawkTest.BellHawkOL.com` should replace the `localhost` string in the above example
2. Set the values of *UserID* and *Password* to the credentials of a BellHawk device login dedicated to LabelPrintR.
3. *LogFolder* is where LabelPrintR will write its log files. LabelPrintR and LabelPrintRtest should each have their own folder.
4. *FormatFolder* is the folder from which LabelPrintR will retrieve BarTender .btw label format files.

Note that a device login with its own device name and password needs to be setup for each remote TAG connection to the BellHawk server. This requires the use of one CAL.

Testing

First Test BarTender

The installer should first make sure that they can print the test BarTender label from the Workstation or Server on each of the designated printers to be used. To do this, each of the printers needs to be registered with the BarTender license server. Also test labels need to be set up for each printer, since in BarTender the destination printer is a property of each label format.

On the Server

Once everything is configured and local printing enabled, printing should take place without any additional steps. Use a PC to make a request for printing a label in BellHawk. You should see the entry placed in the Print Queue and see its status change as the label is printed. This queue entry can be viewed through the label printing monitoring screen in BellHawk.

If there is an error, this will show up on the label print monitoring screen in BellHawk. For more details then look in the LabelPrint daily log file for a report of the error. The folder for this log file is setup in the appropriate LabelPrint.ini file.

If needed for troubleshooting, LabelPrintS.exe can be run manually from the command line with the command: `LabelPrintS.exe <printQueueID>`. The single argument is the ID of the Print Queue record to be printed. This method will attempt to print any queue entry regardless of status (waiting, printed, error), making it easy to repeat attempts with the same data.

The tester may want to set the value of DEBUG in LabelPrintS.ini to 1 or 2 in order to get more detailed messages about the program state placed in the daily log file. DEBUG level should be returned to 0 once the system is working as the daily log file can quickly become cluttered with a higher DEBUG setting.

On the Workstation

Run LabelPrintRtest.exe in a user process on the Workstation and make sure that the icon for this appears in the Workstation toolbar. Then use a PC to make a request for printing a label in BellHawk. You should see the entry placed in the Print Queue and see its status change as the label is printed. This queue entry can be viewed through the label printing monitoring screen in BellHawk.

If there is an error, this will show up on the monitoring screen in BellHawk. For more details then look in the LabelPrint daily log file for a report of the error. The folder for this log file is setup in the appropriate LabelPrint.ini file.

The installer may also want to set the value of DEBUG in LabelPrintR.ini to be 1 or 2 in order to report label requests being issued to BarTender (DEBUG= 1) or with more details, such as the response from BarTender (DEBUG=2). Do not forget to reset these to DEBUG=0 once the system is working as the daily log file can quickly become cluttered with a higher DEBUG setting.

Comments

1. If you clean the BellHawk database then this will clear out all device logins. As the LabelPrintR.exe program uses a device license (device credentials are entered in LabelPrintR.ini) you will need to restore this device license. The device licenses can be exported by the Systems Administrator by exporting business objects of type WebDev using DEXEL into an Excel spreadsheet. These can then be reimported after cleaning the database using DEXEL.

2. If you use a secure socket layer (SSL) link to the server, please make sure that you change the settings in the initialization files to use https rather than http protocols.

3. While using the default office printer for testing the printing of your labels is a good way to start, you should change the printer inside each .btw label format, so it correctly reflects the barcode label printer to be used.

4. Seagull Scientific licenses the number of printers with which you can use BarTender. Please make sure that assign these licenses to the barcode label printers you are using and not your office printers.

