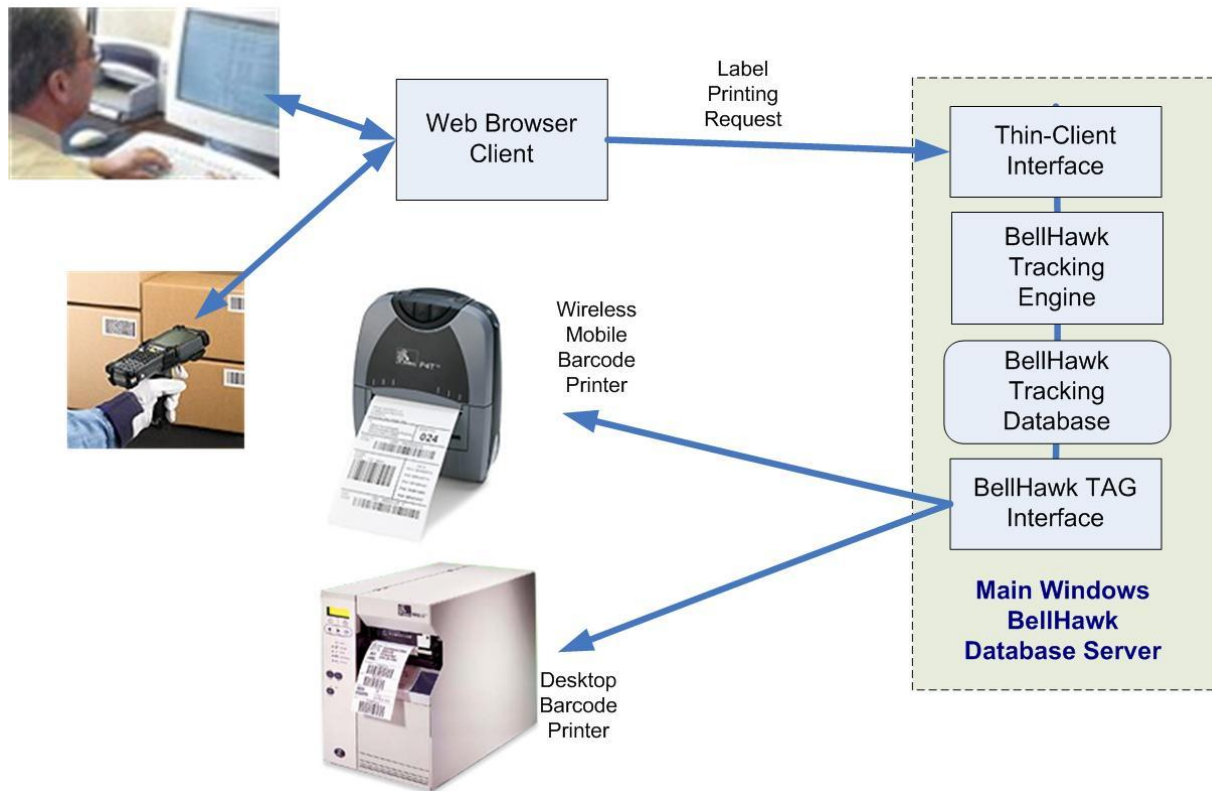




BellHawk Product Labeling Module Overview



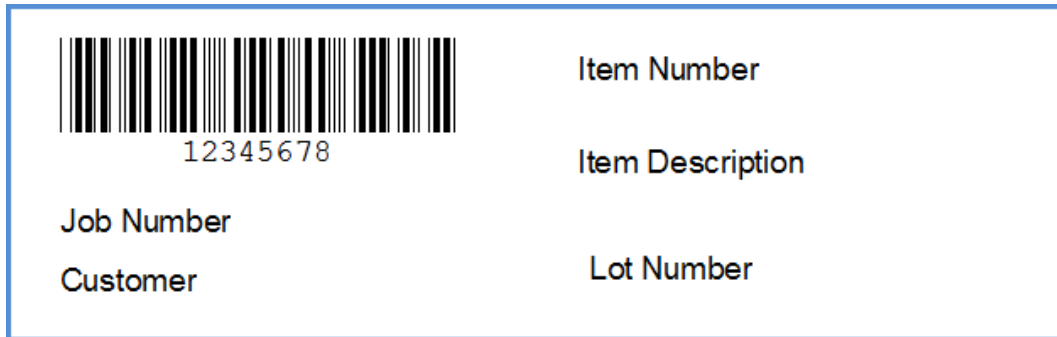
An important part of any operations tracking and management system is the ability to quickly and efficiently print barcode labels for incoming materials, finished products and the packing materials used to ship these products to customers. It is essential that this be performed without a lot of manual data entry, which takes time and can cause mistakes.

In BellHawk, when a user is entering materials into inventory using a PC or a mobile computer, they can request that labels can be printed out as part of the data entry transaction. The label is then printed out automatically on the designated barcode printer. This can be on a desktop printer or on a wireless printer attached to the belt of a mobile worker or located in cradle on his fork-lift truck.

Alternately users can pre-print a set of labels, ready to attach to a set of items or containers. The information about these items, such as part numbers and lot numbers, is entered when the set of labels is requested, so that this information can be printed on the label in human readable format. These labels do not become active until the tracking barcode on them is scanned to record the items or containers into inventory. At this time the previously entered data is picked up from the database for each label and transferred to the item or container record in inventory.

In this way, users can pre-print more labels than they need and discard the rest, without incorrectly creating inventory entries for pre-printed labels that are not used.

Typically container and item tracking labels used in a BellHawk system have a tracking barcode and human readable information on the label:



When these labels are being printed out by the BellHawk Product Labeling (TAG) module, the tracking barcode and the other entries are filled in from the BellHawk database. The label fields are based on the data entered into the transaction or label pre-print request screen, thus eliminating duplicate data entry. BellHawk ensures that the tracking barcode is unique across all labels printed at the same time across all barcode printers. It also saves data entry time and prevents mistakes by, for example, filling in the item number and item description based on the item being produced by the job selected from a drop-down list.

As well as creating labels for incoming materials and product containers, BellHawk can also create labels for shipping containers. Again these can be pre-printed based on the customer order or printed on demand as part of a shipment transaction.

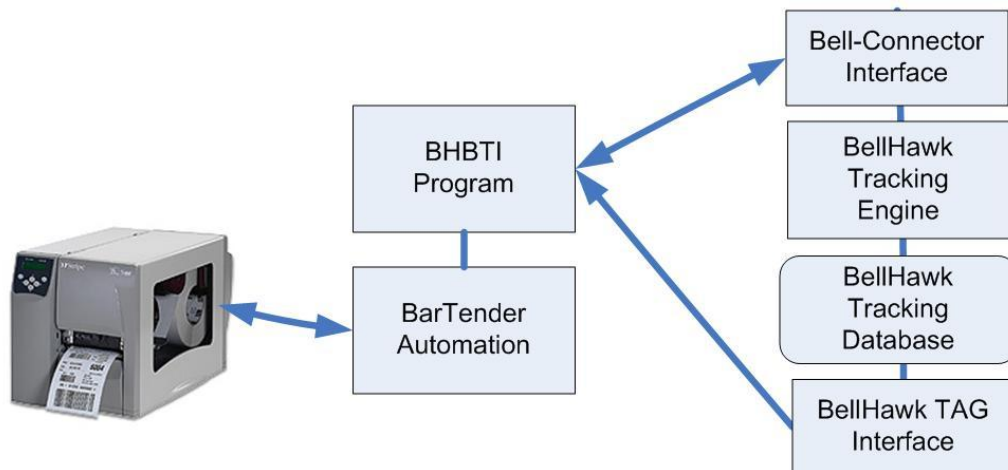
BellHawk works in conjunction with BarTender Automation from Seagull Scientific, which provides printer drivers for a wide-range of barcode printers and RFID labelers. BellHawk also uses BarTender's label layout capabilities to allow its users to create labels in a wide variety of formats for a wide variety of media.

When setting up labels in BarTender, users can specify these as named fields with names such as `Container:ItemNumber` where the word `Container` is the Bell-Connector Keyword for the object and `ItemNumber` is the parameter name. This enables the BellHawk TAG module to retrieve the relevant information from the BellHawk database and automatically fill in the fields on the label before requesting BarTender to automatically print out the selected label on the printer designated for that label.

This enables users to create their own labels, with their own fields, in their own formats without needing any software development to create new label formats.

BellHawk and TAG can be setup to tell the printer to print a set of labels with sequential tracking numbers, all at one time. This is useful, if you are receiving 20 identical boxes at the same time and want to put a tracking barcode on each one. Instead of printing out one label at a time, BellHawk is able to tell the printer to print all 20 at once, which is much faster than printing one at a time.

Systems Architecture



When a request to print a label is received by the thin-client interface, a request is placed in the label print queue in the BellHawk database. Then the BellHawk TAG interface runs a background process called the BHBTI program with a pointer to the print queue entry.

The BHBTI process retrieves the print request and label format and then fills in the values of the parameters specified on the label. It then calls BarTender Automation to print out the formatted label(s) on the designated printer.

BarTender Automation needs to be running on the same computer as the BHBTI program. This can be on the server used for hosting BellHawk or can be on a Windows 7 Professional based PC on the same local area network (LAN) as the server.

BarTender can drive network printers connected to the same LAN as the computer on which it is running provided that the network drivers are loaded on the same computer as BarTender. It can also print out labels on printers connected to PCs, provided that the BarTender printer drivers are loaded on those PCs.

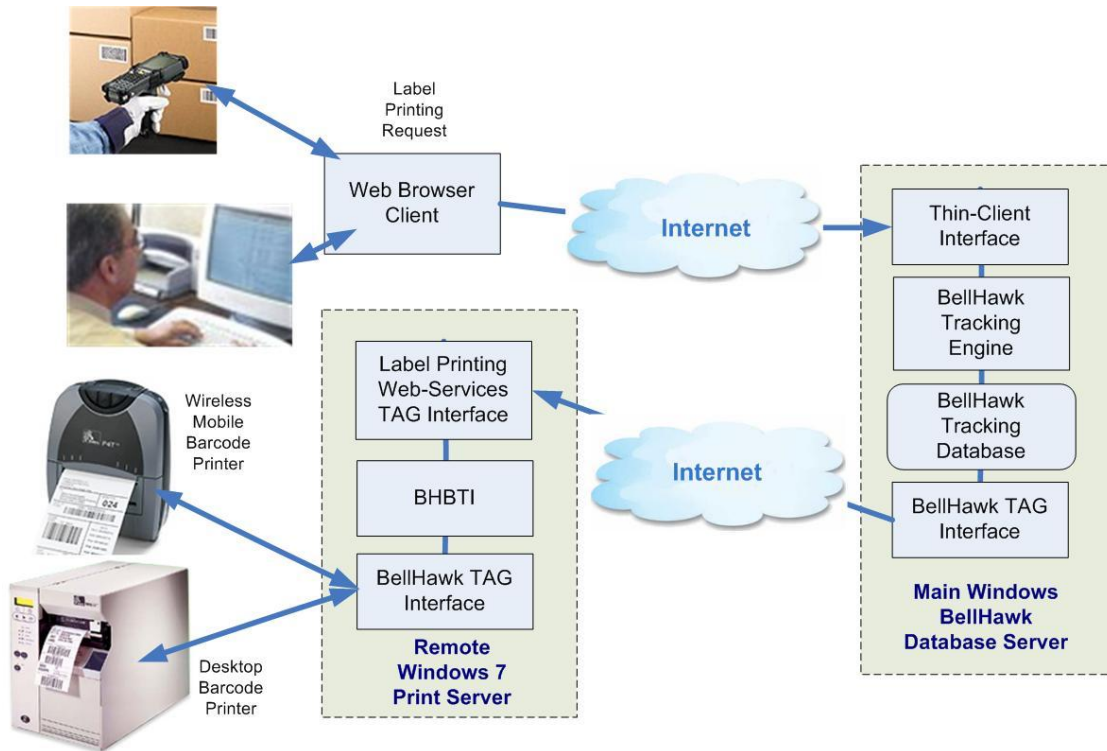
The BHBTI program is run as a separate process that is instantiated for each print request and kills itself after the print request is serviced. This enables the BHBTI process to be used for remote printing over the Internet (as described in the next section of this document). It also is a very efficient way of cleaning up memory usage after printing a complex label.

When the BHBTI process runs, it logs its status back in the print queue. This status is available for viewing through the BellHawk thin-client interface. The BHBTI process also logs more comprehensive information about warnings and errors, including those received from BarTender into a daily log file, which should be examined periodically.

BarTender Automation is licensed by the number of printers that are active during any 24 hour period. This licensing is in specific increments (3, 5, 10 etc.) for the number of printers accessible over the plant LAN.

BellHawk has a license fee for the TAG module and then a fee for each plant in which TAG is used.

Remote Printing



Automatically printing barcode labels in a manufacturing plant where the server is located in another facility presents some additional challenges. This is because BarTender Automation can only print labels automatically on printers to which it is connected over the plant's LAN. When printing needs to be performed in a remote plant then we need to use the configuration shown above. This enables labels to be automatically printed in the manufacturing plant from which the print request originated.

In this configuration, BHBTI, the TAG interface and BarTender Automation are run on a Windows 7 Professional based workstation in the remote plant. The BellHawk label-printing Web-Services TAG interface is run under IIS on this workstation. When a print request from the plant is received over the Internet from a PC or mobile device in the plant the print request is logged in the print queue on the main server, as before.

But, in this case, as SOAP/XML web services message is sent to the print server in the remote plant. This then runs the BHBTI program, which uses the Bell-Connector web services interface to retrieve data from the main BellHawk database to populate the label format. BHBTI then calls the local copy of BarTender Automation which then prints out the label(s) on local network printers or on PCs connected to the local area network in the remote plant.