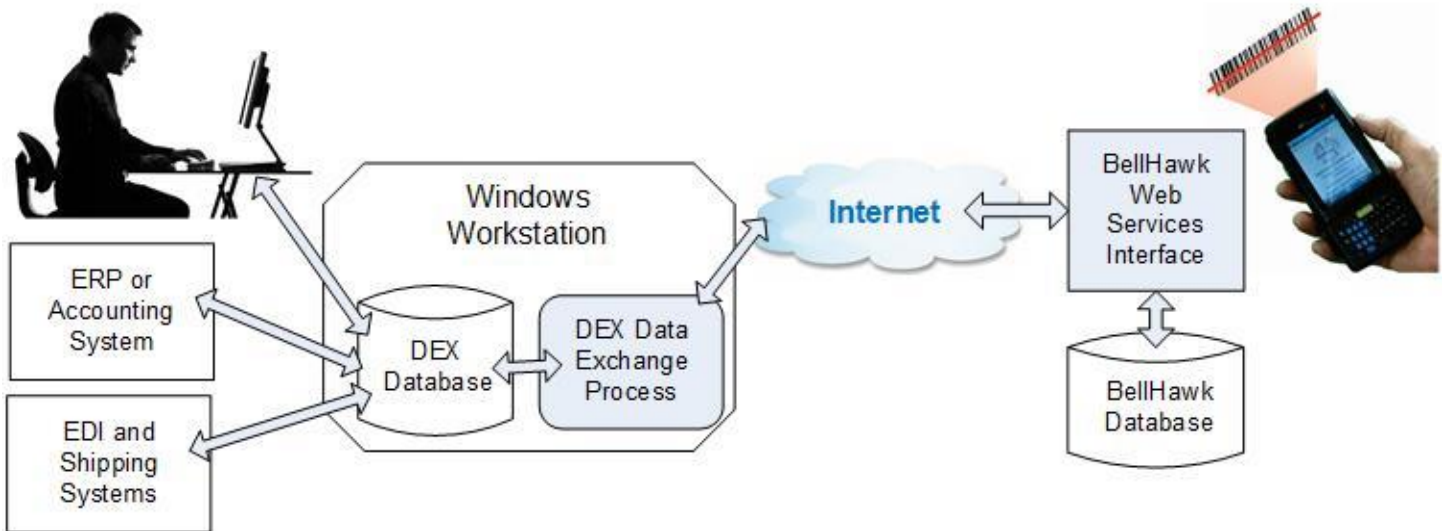


BellHawk Data Sheet DEX Data Exchange Interface



Introduction

Running software such as BellHawk in the Cloud has many advantages, whether it is being run on computers at a secure data center managed by a third party, or is being run at a client's data center, or on a private Cloud based server.

The disadvantage is that this makes the BellHawk database inaccessible for implementing automated data exchange interfaces with ERP and accounting systems or for clients creating custom reports.

Skilled programmers can use the BellHawk web-services interface to exchange data with BellHawk but for many users and, even their IT departments, this is way too complicated. As a result, the DEX data exchange interface was developed to make it easy to exchange data with BellHawk without needing to understand the intricacies of the BellHawk database or the BellHawk web-services interface.

The DEX interface essentially mirrors the data tables in the BellHawk database into a local SQL Server database, which is formatted such as to be user friendly for interface and report creators.

This overcomes a major disadvantage of directly using the BellHawk database, which is structured for rapid response to many users doing barcode scanning at the same time. This structure, while good for rapid data capture, is not very user friendly for interface or report implementation.

Also, the DEX interface is well documented whereas the structure of the BellHawk database is only documented by means of the HLDO (High Level Data Object) definitions used by programs, such as the DEX interface, to communicate with the BellHawk database.

Data written into specific tables within the DEX database, such as for Items or Work Orders, will be automatically be transferred to the BellHawk database. Similarly, data captured by BellHawk transactions are automatically made available in specific tables within the DEX database.

Some uses of the DEX interface include:

1. Automatically exchanging data with an ERP or accounting system
2. Generating custom reports using software such as Access, Excel, Crystal Reports, or SSRS based on data from the BellHawk database.
3. Exchanging data with EDI and shipping systems
4. Interfacing with process control equipment and machines
5. Generating large screen shop-floor displays showing performance dashboards

Data Exchange



Tables that can be written into, include:

1. Customers
2. Customer Addresses
3. Suppliers
4. Supplier Addresses
5. Work Centers and Operations
6. Item Categories and Material Types
7. Item Master Records (including routes, BOMs, and estimated labor and equipment time)
8. Purchase Orders (header and detail tables)
9. Pick Orders (for Work Order Operations, Ship Orders, and Material Transfers)
10. Work Orders (including routes, BOMs, and estimated labor and equipment time)
11. Ship Orders (header and detail tables)

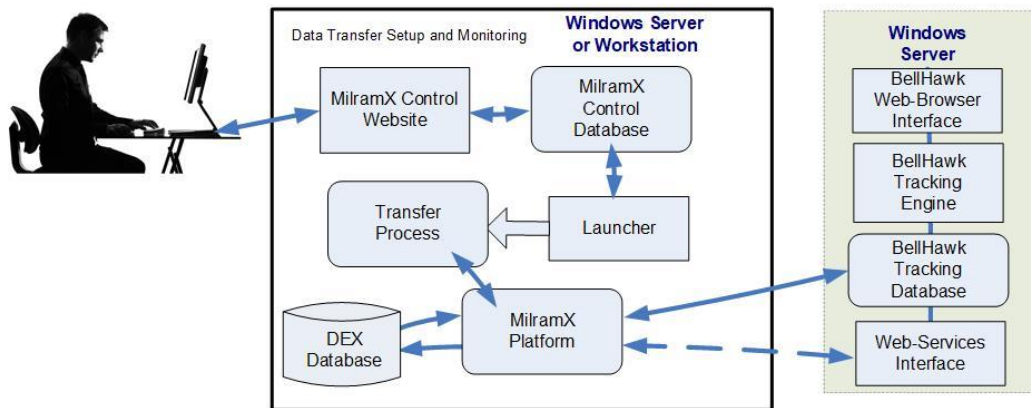
Once data is written into the tables in the DEX database, this data will be automatically transferred to BellHawk via BellHawk's web-services interface.

The DEX Data Exchange process also remotely monitors tables in the BellHawk database looking for new entries by long-polling its web-services interface. It then writes the following into tables in the DEX database, as events occur in the BellHawk database:

1. Received materials/containers
2. Shipped materials/containers
3. Materials Picked against Pick Orders
4. Materials withdrawn from inventory
5. Materials entered into inventory
6. Nightly snapshot of inventory (adding up quantities by ERP location in containers)
7. Nightly snapshot of all containers (in containers table)
8. Status of Work Orders
9. Labor, Materials, and Equipment Time consumed on Work Order Operations
10. Materials produced by Work Orders and Materials Returned to Stock from Work Orders

These entries can then be picked up from the DEX database and transferred to other systems, as needed.

Technology



The DEX interface is implemented as a set of Data Transfer Objects (DTOs), within a MilramX transfer process, using the MilramX data exchange platform; please see www.MilramX.com for details. This enables the MilramX web-browser based user interface to be used to remotely control when data is exchanged. It also enables MilramX to be used for monitoring transfers and fixing any problems that may occur.

The DEX software is typically run on a Windows Workstation in the local facility, so as to make the SQL Server based DEX database available over the local area network. In this case, MilramX communicates with BellHawk over the Internet, using BellHawk's Web-Services interface. MilramX can also communicate directly with the BellHawk database, when installed within the same data center.

This DEX software is sometimes installed in an IIOT appliance, which is referred to as a DEXBox. The advantage is that the IIOT appliance can be drop-shipped to a remote facility, plugged-in to the local Internet connection, and immediately create two-way communication with BellHawk via its internal DEX database.