

THE HART SERVER ARCHITECTURE

The principle objective of the Server is to facilitate access to HART field devices and simplify the development of HART applications. The architecture supports client applications that communicate with HART instrumentation. Named data items may be accessed in a no-programming tag-access method without concern for the underlying HART technology or the details of data formatting, transmission, error checking, etc. In addition the capability to utilize all Hart commands is also provide for advanced operations. The modular architecture provides the ability to easily add future enhancements, new networks, multiplexers, I/O systems, etc. To accomplish this, the architecture is separated into a series of well defined blocks each having its own responsibilities as defined below and shown in Figure 1:

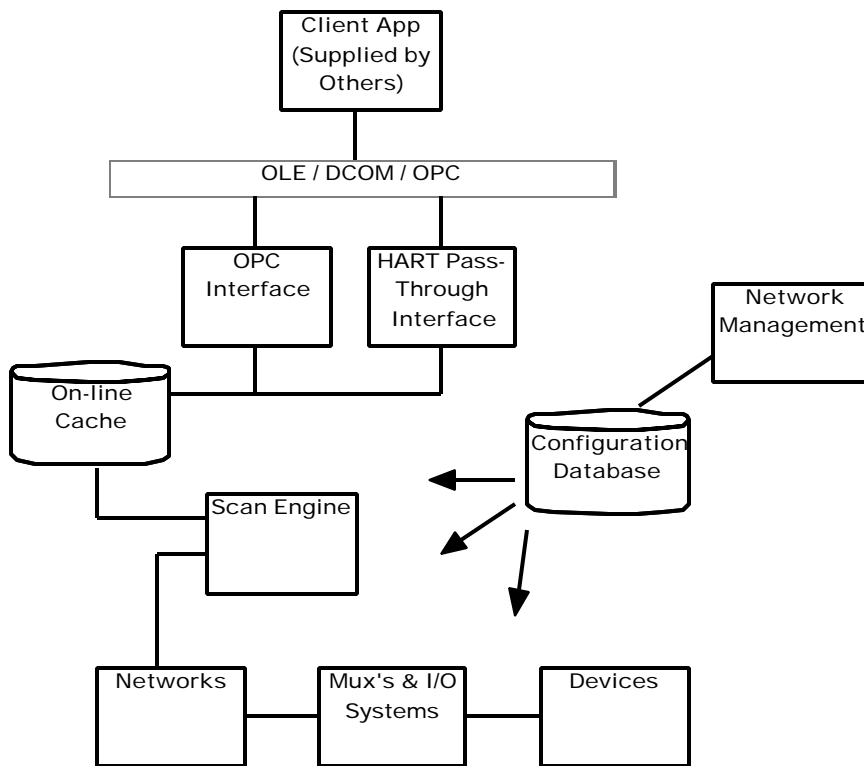


Figure 1: Simplified HART Server Architecture

- **Client Application** - Client application may be an existing or new OPC Client application developed by HCF members or interfaced to the Server by System Integrators . In addition a HART Server users may develop specific applications for manufacturing or QC functions or any type of utility to support customer products. The HCF does not provide client applications for distribution to end-users.
- **OLE/ DCOM/ OPC** - Software components with the MS-Windows environment are built on DCOM - Microsoft's Distributed Component Object Model. OLE builds on this technology and has required software interfaces. In turn OPC builds on OLE adding software interface specifications targeting process control applications. This operating system level "glue" connects the Client Application with the Server.
- **OPC Interface** - This interface is specified by the OPC Foundation. This block provides all the software interfaces required to support OPC Client Applications using the HART named data items.
- **HART Pass-Through Interface** - This interface is specified by the HCF and allows HART device specific commands to be passed from the Client Application through the Server to a field device.
- **Network Management** - This block provides a MS-Windows Explorer style interface to the Server that allow the networks, mux's & I/O Systems and HART devices to be automatically identified and "browsed" during the Server configuration and ongoing operation.
- **On-line Cache** - This element stores the process data as it is read from the field devices. OPC allows clients to specify condition for data being transmitted to the client. For example, A client may only be interested in the data when a process value has changed more than a specified amount.
- **Configuration Database** - This block stores the map of the networks, multiplexers, and devices connected to this Server installation.
- **Scan Engine** - The scan engine identifies the data items that need to be accessed in the field devices to fulfill requests from the on-line cache.
- **Devices** - This block represents generic HART field device. This function knows what HART commands must be dispatched to access the requested data items. The data items known by the device object are accessed through the HART Universal and Common Practice commands.
- **Mux's & I/O Systems** - This block is responsible for dispatching the HART commands to the field device and transporting the data items across a network to the Server. Several manufacturers' muxs are currently supported and additional products

are added periodically. In addition this block supports a HART direct connection to the Server (ie, no multiplexer.)

- **Networks** - This block represents Networks as a transport mechanism between the Server and the multiplexer or I/O system. They often include their own Physical, Data Link and Application layer. The Server can support any network that allows a random device specific command to be communicated. Currently HART networks and RS-485 networks are supported via standard MS-Windows PC serial ports. The Foundation is discussing support for additional networks with several organizations.)