



Fig. 1: OPC building blocks for intelligent data management: OPC Server, Toolkits and OPC Easy Connect Suite

Simplify your data management!

Intelligent data management is becoming increasingly important to companies, regardless of their sector or position in the value chain. The rate of data growth has exploded in recent years as more and more information has been digitized, legal accountability requirements have been introduced, and companies have begun considering long-term optimization and cost-reduction strategies. In light of this, it is crucial for companies to have a professional data management system that archives data precisely and securely, saves time through simple handling and rapid data retrieval, and offers standardized interfaces between processes.

Standards – Simplification through standardization

Establishing standardized data interfaces with methods, data types and formats – that is, defining standards for capturing, transporting and processing data – is critical to efficient, successful data management. Communication standards for transporting data such as CAN, PROFIBUS, LON and FlexRay™ have already become established in the automotive, manufacturing and process industries as well as in building automation and IT.

As regards archiving data, Structured Query Language (SQL), which is both an ANSI and ISO standard, has emerged as the foremost language for defining, querying and manipulating data in databases with an ODBC database interface.

And for many years, OPC has been the de facto worldwide, cross-industry standard for exchanging data between components from different manufacturers. Standards harmonize processes, enable the horizontal and vertical integration of components from various manufacturers, help automate and efficiently organize processes, and are crucial to successful data management.

OPC and SQL – Two standards in one component

OPC – which stands for “Openness, Productivity & Collaboration” – is the standard interface worldwide for exchanging data and information between software components. Today, OPC is being used in over 15,000 products and millions of installations in practically all branches of industry.

OPC was originally defined as a standardized solution to the recurrent task of connecting PC-based applications to process peripherals for operation and monitoring purposes. Today, visualization programs, process control systems, PC-based controllers, MES and even ERP systems are inconceivable without an OPC interface. OPC servers are now used to easily capture production data in heterogeneous system landscapes. ODBC, which stands for Open Database Connectivity, is a standardized database interface that uses the database language SQL. ODBC offers a programming interface that enables programmers to develop applications independent of the database management system being used. ODBC-enabled databases such as Oracle, MySQL, SQL Server and IBM DB2 are now used to archive data for carrying out statistical analyses or quality assessment.

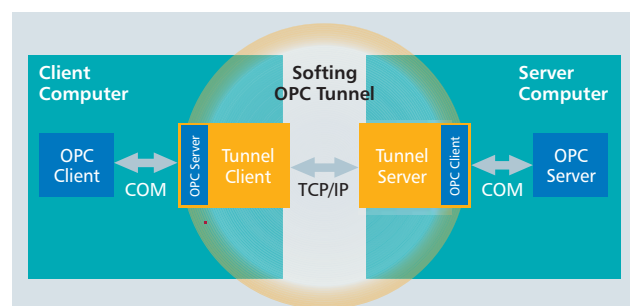


Fig. 2: The OPC Tunnel avoids DCOM configuration problems and allows data to be exchanged through firewalls.

The combination of OPC and ODBC for capturing and archiving data has become increasingly common in modern data management concepts.

The ability to easily capture production data via OPC and automatically archive it in ODBC databases can be integrated into a single component like the OPCto-DataBase solution from Softing AG. OPCtoDataBase is part of Softing's OPC Easy Connect Suite, which consists of a number of tools to help users implement OPC clients and servers. They simplify installation and

when they log in to Windows and the DCOM security settings must be coordinated with one another. In most cases, commissioning technicians and systems integrators take the easy way out by granting very broad access rights on all networked OPC computers, essentially eliminating protection against unauthorized external access. This approach clashes with the requirements of secure data management and opens up the possibility of damage through carelessness or sabotage.

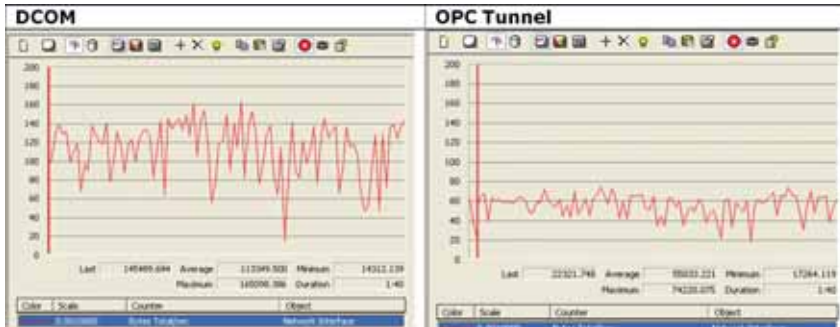


Fig.3: Comparison of volume of OPC data (scale in KB) transported via DCOM and via the Softing OPC Tunnel. On average, only 50% of the bandwidth is needed when the Softing OPC Tunnel is used (source: OPC Training Institute).

use of OPC products in complex network architectures, help save time and money, optimize performance of OPC communication, and provide greater security in OPC projects.

OPCtoDataBase captures process data and events from any Data Access or XML DA server and stores it in a database such as Oracle, MySQL, SQL Server or IBM DB2 according to preconfigured specifications. OPC data can be converted, rounded, transformed into another type of data, or modified using arithmetic and Boolean operations. A configuration assistant guides users through the commissioning process.

Data management in distributed systems

Applications must be able to access remote computers if networked computers are to communicate successfully. OPC uses DCOM (Distributed Component Object Model), the Windows protocol for connecting distributed computers, to call functions on remote computers and access remote components, such as OPC servers. DCOM security settings regulate access to data and programs on Windows computers. The DCOM security settings are configured with the DCOMCNFG.EXE utility (pronounced DCOM Config). OPC communication is very easy to configure, but inappropriate DCOM settings are frequently a show stopper. Setting workable DCOM parameters is a very challenging task which demands a great deal of expert knowledge. The access rights granted to a user

Companies can now use a method known as OPC tunneling, which establishes secure OPC communication over networked computers. With OPC tunneling, all OPC communication is completely tunneled past DCOM. The OPC tunnel, which essentially functions as a DCOM bypass, plays the key role in this OPC solution. OPC tunnel components are installed on both the OPC client computer (client-side) and the OPC server computer (server-side) (see Fig. 2). Communication between the client-side and server-side OPC Tunnel components is via a TCP/IP connection.

This means that the data exchanged between OPC client and server applications is tunneled via TCP/IP. DCOM – and the time-consuming and error-prone process of configuring DCOM security settings – is avoided entirely.

Another significant advantage of OPC tunneling is that it enables OPC communication through firewalls. This is impossible with DCOM because DCOM address mapping demands that a large number of firewall ports be opened; with OPC tunneling, however, the OPC data stream can be transmitted through a firewall via a single secure channel.

The OPC Tunnel, another component of Softing's OPC Easy Connect suite, enables secure and easy inter-network OPC communication through firewalls. It



Fig. 4: Efficient data management in distributed systems with OPC, ODBC databases and MS Office products

eliminates the need for complex DCOM security settings and makes it possible to realize inter-network OPC communication in a matter of minutes. Second-by-second monitoring ensures that broken connections are detected quickly, and integrated security measures prevent unauthorized external access. Furthermore, an authentication procedure can be configured to allow access to a remote OPC server only after the correct user name and password have been entered. OPC data sent through the tunnel can also be encrypted if desired. This provides additional protection against the manipulation or sniffing of OPC data transmitted over the Internet.

Authentication, OPC data encryption, and the use of firewalls all help guarantee secure, successful data management.

Since the DCOM protocol adds considerable data overhead to the actual user data, communication via the OPC Tunnel is also a much more efficient means of data transmission. The OPC Tunnel requires very little overhead for transmitting data and therefore needs much less bandwidth (see Image 3), which ultimately results in a higher transmission rate.

DCOM does not lend itself to quickly and easily establishing OPC connections between computers. DCOM also inhibits the use of firewalls and often leads to the elimination of safeguards against unauthorized access. Furthermore, DCOM does not offer a reliable means of monitoring connections. For these reasons, intelligent data management concepts require that an OPC tunnel be used.

Using MS Excel and Visual Basic as an OPC client

Data management concepts frequently use MS Office programs such as Excel or Visual Basic to statistically evaluate and graphically present the data which is captured. Windows computers usually include programs like Excel and Visual Basic by default, and there are no runtime fees involved in using or distributing applications created with these programs. As so-called ActiveX containers, MS Office programs can be integrated with other ActiveX components and take advantage of their functionality. There are currently a large number easy-to-integrate ActiveX components which provide a variety of arithmetic and graphical functions. To simultaneously take advantage of Excel, Visual Basic or other ActiveX-enabled applications and OPC technology, you can use an OPC client that has been implemented as an ActiveX component. The OPC ActiveX Client from Softing, part of the Softing OPC Easy Connect Suite, can be integrated into any ActiveX container program, like Excel or Visual Basic, without any programming. OPC client functionality can be called via an input dialog. For example, you

can conveniently view a list of all installed OPC servers and choose the OPC server you want, or you can browse the namespace of the OPC server and select all of the OPC data points (OPC items) to be displayed in Excel or Visual Basic. Combining the simplicity and familiarity of MS Office programs with the advantages of OPC technology is yet another way of simplifying data management.

Standards are crucial to successful data management. OPC, ODBC and MS Office programs have one thing in common: they make it easier to transport, archive, process and display data. The Softing OPC Easy Connect Suite supports OPC, ODBC and MS Office programs and simplifies data management – both locally on a single computer and remotely in distributed systems.

About Softing AG

Softing AG is a member of the OPC Foundation's European Steering Committee and Unified Architecture (UA) Early Adopter Group. The company is a leading manufacturer of OPC productivity enhancement tools and development toolkits. Softing offers OPC servers for all major fieldbuses and the S7/S5 controller family from Siemens. Many of the products and services Softing has developed since its foundation in 1979 have since become globally recognized standards (<http://www.softing.com/opc>).



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