



## **OPC Tunnelling: Increases Data Availability for OPC DA, HDA and A&E**

MatrikonOPC - 2010

### **Executive Summary**

**OPC is the current de facto open communication standard in the world of industrial connectivity. It offers improved data connectivity, while dramatically lowering the cost of data transfer between devices and applications. The most widely used OPC specifications, collectively called OPC Classic, employ communications layered on top of various Microsoft operating system components commonly referred to as DCOM. These components function very well under office like LAN conditions (high bandwidth and reliable connections), but under less favorable conditions, their behavior often leads to unreliable data delivery, and even data loss. OPC Tunnelling technology provides an industry proven solution to this problem.**

## What is OPC?

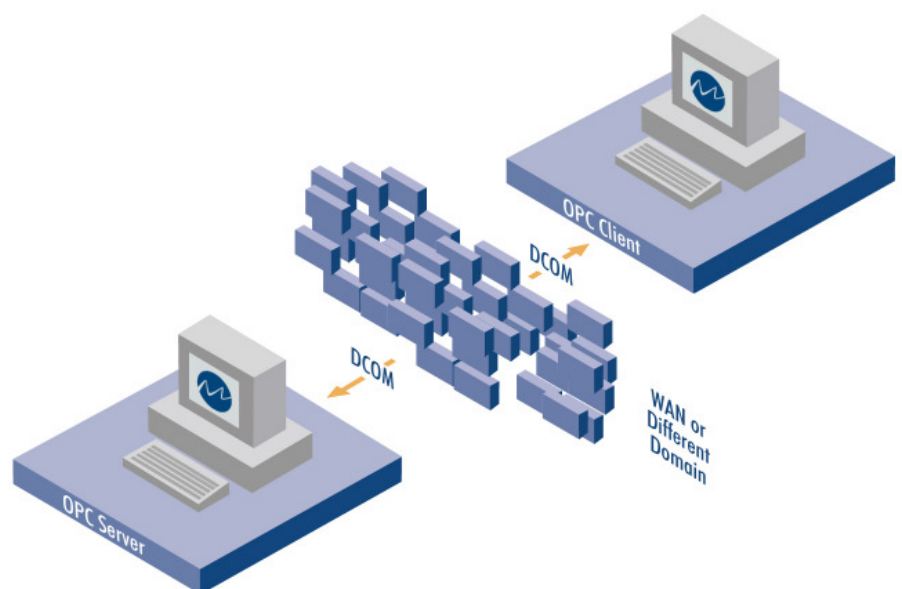
OPC standardizes data sharing between plant floor devices (DCSs, PLCs, analyzers, etc) and software applications (such as HMIs, Process Historians, trends, etc). No matter what the device is, data is always shared with an application in a standardized format. OPC was formally an acronym for OLE (Object Linking and Embedding) for Process Control. Over the years, OPC grew beyond these original technologies, and is now used in a wide variety of applications outside of Process Control. OPC now stands for 'open connectivity in industrial automation and the enterprise'. There are several OPC Classic specifications that target different data use cases; OPC Data Access (DA) for current value updates, OPC Historical Data Access (HDA) for historical or archived values, and OPC Alarms and Events (A&E) for event based data. Of course, standards-based communication is only half the task – the other half deals with the actual method by which the data moves across the network.

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OPC Tunneling provides a viable and reliable alternative for OPC DA, OPC HDA and OPC A&E.

## COM/DCOM: The infrastructure for OPC

OPC is built on Microsoft technology called COM, which stands for Component Object Model. It is a framework that defines how applications communicate with each other and share data. When OPC applications are installed on the same computer they use COM to exchange data. However, when OPC calls are required to go across network boundaries or 'over the wire', the operating system uses DCOM (Distributed COM). DCOM adds extensions that handle data communication marshalling and added security requirements. (See Figure 1)



**Figure 1 - Standard OPC DCOM Connection**

Typical OPC architectures are comprised of more than one PC and therefore involve the use of DCOM. There are circumstances where DCOM can experience timeouts that can lead to unreliable data delivery and even data loss. Such circumstances can include:

- Hardware problems, such as a faulty network card, router or switch
- System issues, such as an overloaded network
- Inherently unstable network architectures that use satellite links, WAN, radio communication, etc.

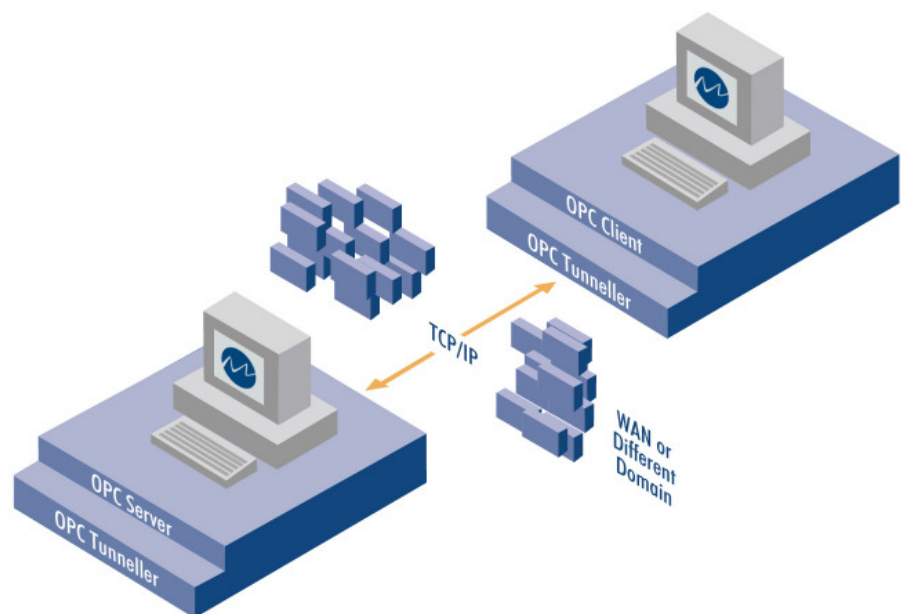
Typical OPC architectures are comprised of more than one PC therefore involve the use of DCOM. [MatrikonOPC Tunneller](#) solves several major issues encountered using OPC over DCOM:

1. Cross Domains and Workgroups
2. DCOM and OPC through firewalls
3. DCOM needs a lot of bandwidth
4. Timeouts and Disconnections
5. Data Privacy
6. Easy Configuration.

It should be noted that most networks, even reliable ones, suffer from these problems from time to time. As an example, assume an OPC application has requested a value from another OPC application running on separate computer. After the request is sent, but before a reply is received, the network connection between the two applications is temporarily broken. In this case, the requesting application can be forced to wait for up to six minutes to realize that an error has occurred. Unfortunately users do not have the ability to change the DCOM timeout settings and must wait the full six minutes under some failure conditions. In the meantime, the requesting application waits for DCOM to reply. All process data for the application is unavailable during that time.

### Tunneling Eliminates DCOM

OPC Tunnelling provides an alternative approach that eliminates the DCOM risk altogether. This technology uses standards-based TCP/IP communications instead of DCOM for carrying OPC messages. It provides users with configurable timeouts that can be adjusted for the users' specific infrastructure needs. In a typical setup, an OPC Tunneller application is installed on each of the two PCs that are running the OPC Client and OPC server respectively. (See Figure 2).



**Figure 2 - OPC Tunneller Application Setup**

Each OPC Tunneller communicates with the locally installed OPC application using standard OPC communications via COM. The two OPC Tunneller applications then pass the OPC messages using TCP/IP directly, instead of relying on Microsoft Windows to do it for them via DCOM. The OPC Tunneller applications provide similar marshalling and security functionality as DCOM, but in a much timelier, robust and flexible manner.

OPC Tunnelling offers other advantages over DCOM:

- Eliminates initial DCOM configuration problems and ongoing issues when Windows Updates happen to modify DCOM settings in the background, which can stop OPC communications in their tracks.
- Enables OPC applications to share data across firewalls and different domains
- Allows for tighter, secure, IT friendly firewall configuration without impeding OPC traffic
- Reduces bandwidth requirements considerably
- Transmits OPC data in encrypted form if the user so chooses – this maximizes security, privacy, and data integrity

### **OPC Tunnelling is possible for DA, HDA and A&E.**

Since the three major OPC Classic specifications, OPC DA, HDA and A&E, are all based on COM/DCOM technology, they are all susceptible to the same DCOM risks. Fortunately there are OPC Tunneller products available that support all the OPC specifications. For increased data reliability these same products provide strong data encryption and compression.

Using OPC Tunnelling technology provides all the benefits of standardized communication, while compensating for poor network setup, geographically dispersed networks, and unreliable network infrastructures such as satellite or wireless networks.

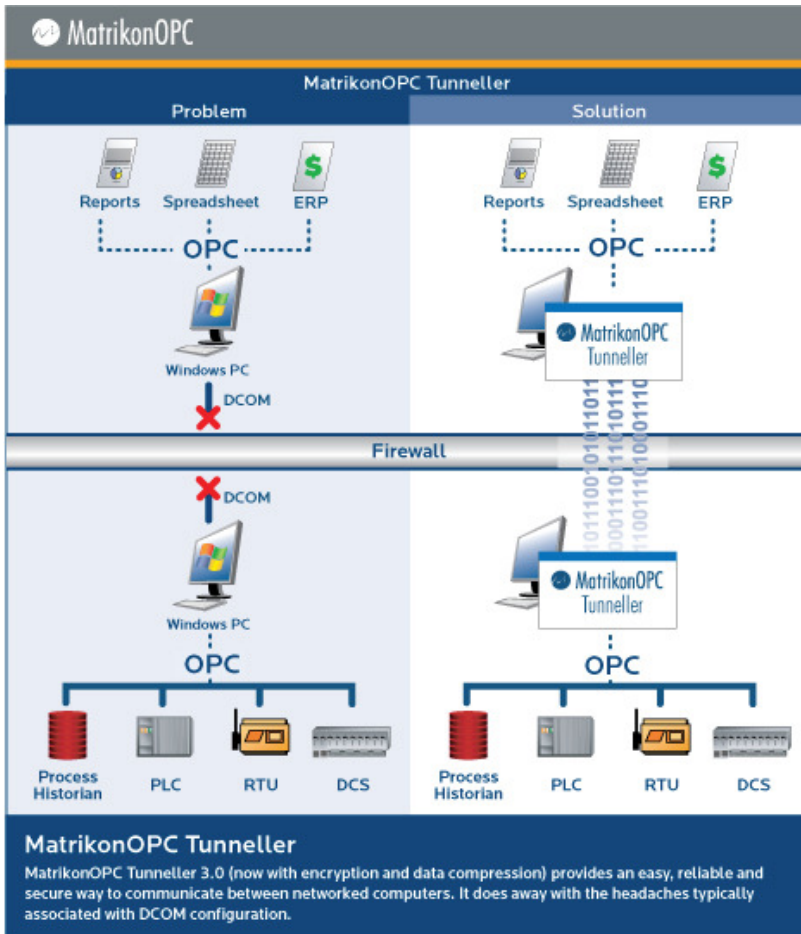
## Increased Data Availability for all situations

OPC is an accepted standard within the process control industry. While there is nothing wrong with users continuing to work with their existing default Microsoft Windows based COM/DCOM infrastructures - it is reassuring to know that in cases where this underlying technology cannot accommodate the users' project's specific needs, OPC Tunnelling is there to provide a proven, reliable alternative.

The ability of OPC Tunneller products to provide secure and reliable OPC DA, OPC HDA and OPC A&E connectivity where DCOM communications either fail or cannot even be established, is a step in the right direction towards creating open standards based architectures that are scalable and robust enough to handle the control automation industry's needs today and into the future.



# OPC Tunnelling for DA, HDA and A&E. Any Data, Any Where.



## MatrikonOPC Tunneller

Provides an easy, reliable and secure way to communicate between networked computers. It does away with the headaches typically associated with DCOM configuration.

No longer are different protocols, security settings or locations a factor when sharing data between computers. This is achieved by simply installing MatrikonOPC Tunneller on the OPC client and OPC server nodes and then telling the Tunneller client where the Tunneller server exists. Matrikon OPC Tunneller even allows for user configurable time-outs, thus giving you complete control.

- Supports OPC DA, HDA and A&E
- Provides data encryption and compression.
- Simple configuration



## About MatrikonOPC

MatrikonOPC provides software to access device data using the OPC standard. Our promise is to help clients unlock the potential of their data and provide them with vendor neutral training and superior client care. We build close relationships with our customers, allowing us to have a true understanding of their business. We help them attain operational efficiency from both a technical and business perspective. With offices in Canada, the United States, Europe, UK, Asia-Pacific, and the Middle East, we provide local presence on a global scale. We are committed to connectivity.

## For More information on OPC HDA Architectures

For more information on OPC Tunnel technology and other OPC topics, be sure to follow up with these associated titles on our website at <http://www.MatrikonOPC.com>

### [Bulletproof OPC Security in 30 Minutes](#)

This webcast will explore: How to make connections across different domains or workgroups. How to securely Tunnel through firewalls. How MatrikonOPC Tunneller compression increases bandwidth, reduces network loads and saves you money. How to reduce timeouts and disconnections. How to secure your OPC data and ensure data privacy with encryption. How MatrikonOPC Tunneller reduces your system integration time to just minutes.

### [Hydro Tasmania Uses MatrikonOPC Tunneling Technology to Overcome DCOM Issues When Connecting to Allen-Bradley PLCs](#)

"MatrikonOPC Tunneller was literally Plug and Play. Once we installed it and followed the simple configuration instructions, we haven't had to touch it. Since it was installed, MatrikonOPC Tunneller has been pretty much transparent." Said Simon van der Aa, Control Systems Engineer with Hydro Tasmania Consulting. Read more on why.

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