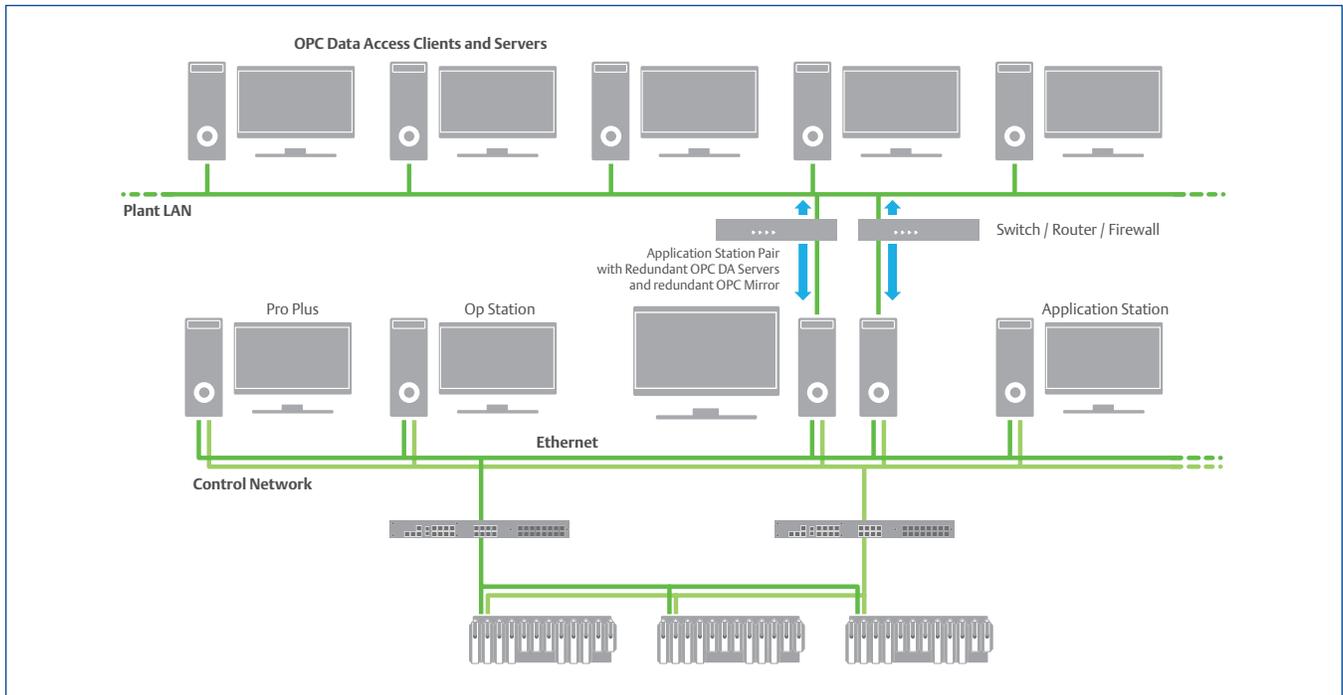# OPC Data Access Server Redundancy

Redundant OPC Data Access servers provide highly reliable data transfer.

- Reliable data transfer
- Hardware and module redundancy
- Automatic switchover
- Online upgradable

Introduction

The DeltaV OPC Data Access Server (OPC Server) provides a fast and efficient means for transferring data between the DeltaV system and OPC Data Access client applications. With redundant OPC servers, you don't have to worry about a failure of an OPC server or the Application Station interrupting your data transfer and causing costly downtime. Using redundant OPC servers, there is no single point of failure in the DeltaV OPC communications, so you are automatically protected against single point OPC server hardware and software failures.

The redundant OPC servers reside on a dedicated pair of Application Stations. When the active OPC server fails, the standby OPC server automatically takes over, providing reliable data transfer without user intervention.

The redundant OPC servers communicate with each other over the DeltaV control network, so no special cabling is required to add OPC server redundancy.

Benefits

Reliable data transfer. OPC redundancy consists of an active and standby OPC server. If the active OPC server or its associated Application Station detects a failure, the standby OPC server assumes the active role, providing reliable data transfer. *Your OPC communications are protected against unexpected failures.*

Hardware and module redundancy. The *redundant OPC servers reside on a pair of Application Stations.* One Application Station is dedicated to the active OPC server and the other Application Station is dedicated to the standby OPC server. In addition to hardware redundancy, the *Assigned Modules subsystem on the Application Station pair is also redundant,* providing redundant operation for all control modules assigned to the Application Station pair.

Automatic switchover. If the active OPC server or its associated Application Station detects a failure, the *standby OPC server assumes the active role automatically,* with no user intervention required. The standby OPC server is in "hot standby" mode, so *switchover occurs quickly.* Depending on the failure condition and OPC redundancy configuration, the failed OPC server and Application Station will reboot and automatically assume the standby role, restoring OPC server redundancy with no user intervention.

Online upgradable. Since the redundant OPC servers reside on a pair of Application Stations, the OPC servers can be upgraded online. Just like the DeltaV controllers, *you can upgrade the standby OPC server and its associated Application Station while the active maintains OPC communications,* then manually switch over to the upgraded Application Station.

Product Description

The DeltaV OPC Data Access Server provides real-time, read/write data communications to OPC client applications. For critical OPC data communications where you can't afford interruptions, the DeltaV system offers OPC server redundancy. You can add a standby OPC server that operates in hot standby mode, mirroring the operation of the active OPC server.

When a monitored fault is detected, the active OPC server fails over to the standby OPC server, which then assumes the active role. Your OPC communications continue on the "new" active OPC server without losing OPC communications. In addition, the DeltaV Event Chronicle stores a record of each OPC server switchover and the reason it occurred, if known.

The redundant OPC servers reside on a pair of DeltaV Application Stations. OPC server redundancy is configured in DeltaV Explorer from the Application Station Properties dialog. Then, during DeltaV workstation configuration, you identify the Application Station that will host the initial active OPC server and the Application Station that will host the initial standby OPC server.
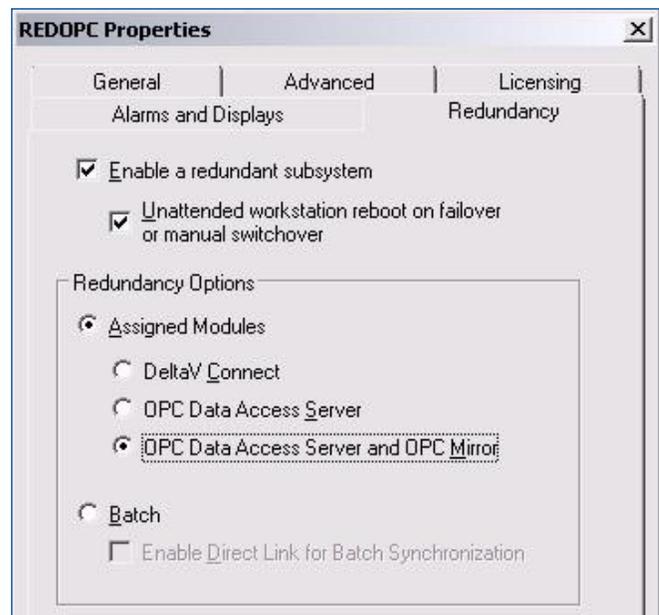

Although there are two physical Application Stations that host the redundant OPC servers, they are seen by the DeltaV system as a single workstation. The Application Station pair is known by the name configured for the initial active OPC server node (e.g. *REDOPC*). The initial standby OPC server node has the same name appended with *_S* (e.g. *REDOPC_S*). The Application Station pair appears in the DeltaV Explorer system tree as a single icon.

By configuring OPC server redundancy, a redundancy subsystem is created on the Application Station pair. The redundancy subsystem transfers messages and data between the Application Stations, keeping the OPC servers synchronized.

OPC server redundancy also includes redundant Assigned Modules on the Application Station pair. Any control modules assigned to the Application Station pair are redundant. Landing your OPC data in control modules running in the Application Station pair ensures redundant module execution, just like in redundant DeltaV controllers. When you assign control modules to execute in the Application Station pair, the redundancy subsystem ensures that the modules running in the standby Assigned Modules subsystem are synchronized with the modules running in the active Assigned Modules subsystem.

The DeltaV Diagnostics Explorer application shows the status of the redundant OPC servers, the Application Station pair, and the redundancy subsystem, as shown below.

The active OPC server and Assigned Modules subsystem work together with their associated Application Station to provide one-for-one redundancy with the standby OPC server, its Assigned Modules subsystem, and its associated Application Station. If a problem is detected with any of the monitored components on the active OPC server node, the entire Application Station will switch over to the standby OPC server node, with the standby OPC server assuming the active role.
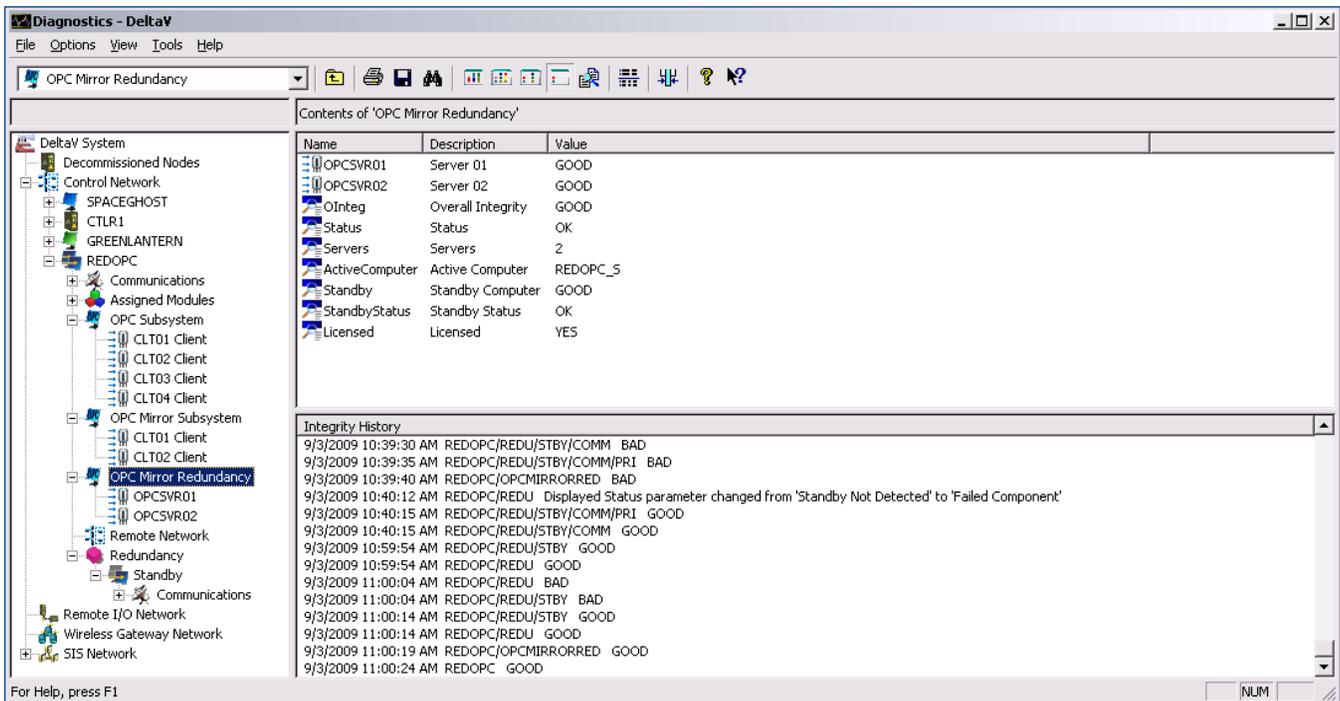
DeltaV Diagnostics Explorer allows you to view OPC Mirror redundancy diagnostics data.

When you configure DeltaV OPC server redundancy, the Application Station itself is not redundant, only the OPC server and Assigned Modules subsystem. In addition, the Application Station pair is dedicated to redundant OPC communications. Once the Application Station pair is configured for OPC redundancy, no other subsystems on the Application Station pair may be enabled.

When you configure the Application Station pair for the first time, you identify the initial active and the initial standby OPC server nodes. However, during operation, either Application Station can host the active OPC server, depending on the last switchover. Since either OPC server can be the active OPC server, each Application Station should be sized to handle the active OPC server role.

The automatic OPC server switchover protects you in the event of a failure. If the active OPC server fails, then standby OPC server automatically becomes the active OPC server. During normal operation, the standby OPC server is in "hot standby" mode, so switchover from the failed active to the standby OPC server typically occurs immediately after the redundancy subsystem has detected the failure and triggered the switchover. The hot standby mode adds more load to the DeltaV system, but ensures immediate availability of OPC data after switchover.

During Application Station switchover, which typically takes a few seconds (depending on the Application Station hardware and the size of the OPC configuration), the OPC data will hold the last value, ensuring bumpless data transfer. A switchover event is generated and collected in the DeltaV Event Chronicle, providing notification to the operator that a switchover has occurred.

A failed active OPC server and its associated Application Station will remain failed by default, waiting for the cause of the failure to be investigated. While the failed OPC server is in the failed state, switchovers are disabled and the active OPC server is in simplex mode. However, you can configure the Application Station pair to automatically reboot the failed Application Station to allow the failed OPC server to assume the standby role without user interaction, if possible. A standby OPC server that assumes the active role will remain the active OPC server until the next switchover.

Some of the events that can cause a switchover are:

- OPC server failure
- DeltaV software process failures
- Application Station hardware failures
- Communication failures between the active and standby OPC servers
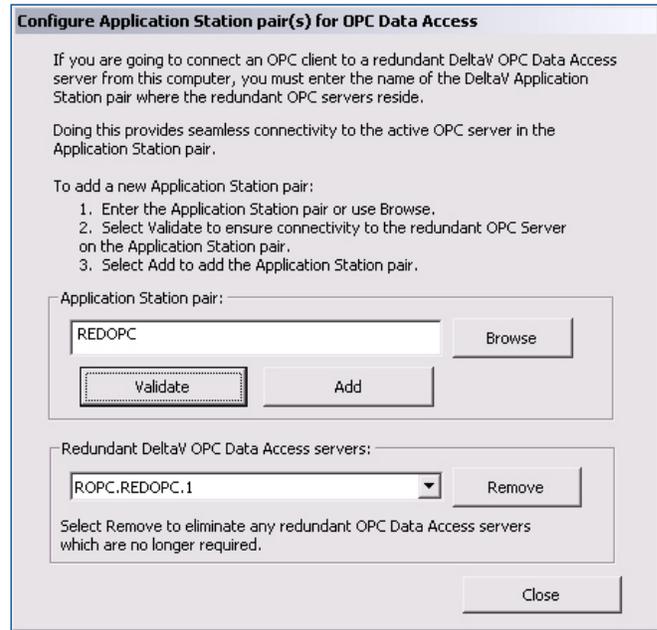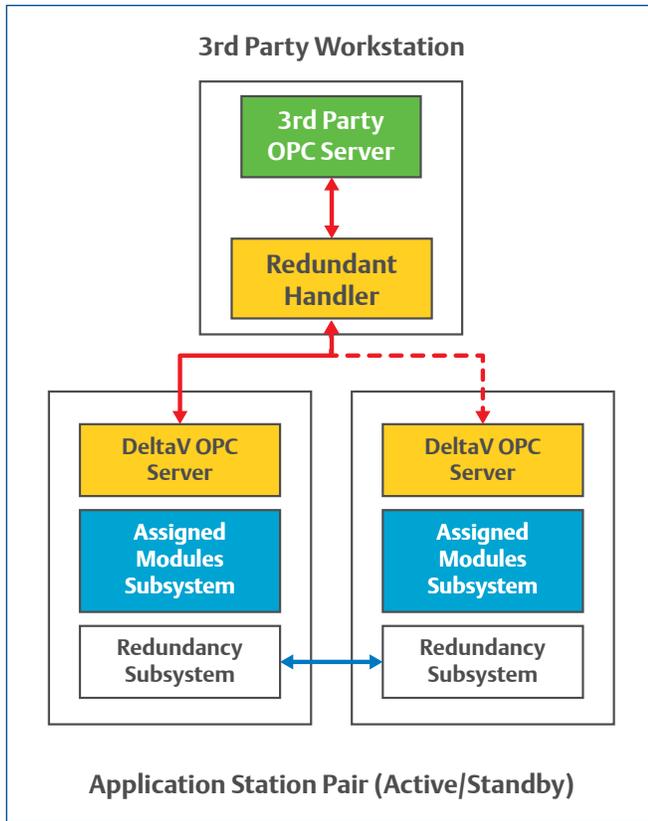- Manual switchover from Diagnostics

From DeltaV Diagnostics you can see the status of the active and standby OPC servers. Indication of the active and standby OPC server status is also available from a redundancy status faceplate display located in the system tray on the Application Station pair.

You can upgrade the Application Station pair online without losing OPC data communications between the DeltaV OPC servers and their associated client applications. Simply upgrade the standby OPC server node, and then perform a manual switchover. OPC data transfer will switch from the active OPC server to the upgraded standby OPC server. During switchover, the failed OPC server will hold last value until the standby OPC server assumes the active role. The system is upgraded without losing OPC communications. You can then upgrade the standby OPC server node at your convenience.

An OPC Data Access client application connects to the OPC server on the Application Station pair and does not need to know which OPC server is currently active. The marshalling of the OPC client connection to the active OPC server is handled automatically by DeltaV software. Failure of the active OPC server and switchover to the standby OPC server does not impact communications to the OPC client, providing bumpless transfer of OPC data. During switchover, the OPC client receives the last good value, then once the standby OPC server becomes active, real-time OPC communications will resume.

In order to communicate with the redundant OPC servers, a small software application must be installed on the OPC client workstation. If the OPC client is located on a non- DeltaV workstation, installing the **OPCRemote.exe** application (located in the **DVExtras** folder on DeltaV installation **DVD1**) will install the redundant OPC server handler. If the OPC client is located on a DeltaV workstation, running the **Redundant DeltaV OPC Server application,** located on the DeltaV Start Menu (**Start | DeltaV | Installation | Redundant DeltaV OPC Server**) will install the redundant OPC server handler on the DeltaV workstation. The redundant OPC server handler manages the connection to the active OPC server. You configure the redundant OPC server handler by identifying the Application Station pair.

3rd Party Workstation

Application Station Pair (Active/Standby)

The OPC client connects to the redundant OPC server handler, which allows the OPC client to communicate with the redundant OPC server without needing to know which OPC server is active. The redundant OPC server handler also automatically directs the OPC communications to the active OPC server after switchover. In addition, the redundant OPC server handler allows you to configure the OPC client connections to just the active OPC server—the redundant OPC server handler ensures that the OPC client configuration is copied to the standby OPC server.

When the redundant OPC server handler is configured, a new redundant OPC server interface is available. To use the redundant OPC server, the OPC client will connect to the redundant OPC server interface. The redundant OPC server interface uses the syntax *ROPC.Application Station pair name.1*, where *Application Station pair name* is the name of the Application Station pair hosting the redundant OPC servers, e.g. *REDOPC.* An OPC client application may still connect to the simplex OPC server on the Application Station pair by bypassing the redundant OPC server handler and connecting directly to the simplex OPC interface (*OPC.Deltav.1*) on either Application Station.

Redundant OPC servers are supported only on the Application Station. Only the redundant OPC servers, Assigned Modules subsystem and DeltaV and/or 3rd party OPC applications associated with the OPC redundancy solution shall be installed and run on the Application Station pair. Other DeltaV subsystems may not be enabled on the Application Station pair. Other non-OPC related DeltaV applications are not supported for use on the Application Station pair.

A redundant OPC server may be licensed for up to 30,000 OPC data values (aka OPC items). Each DeltaV system will support up to 20 redundant OPC servers (residing on 20 Application Station pairs). For more information on the Application Station, refer to the Application Station product data sheet.

Ordering Information

Description	Model Number
Redundancy License for OPC Data Access Servers	VE2224RED

Related Products

- **Application Station Software Suite**
  Integrate your DeltaV system with 3rd party systems and applications on a DeltaV workstation. Includes a scalable DeltaV Continuous Historian and DeltaV OPC Data Access server.

- **OPC Mirror**
  Transfers thousands of values back and forth between your DeltaV system and other OPC- compliant systems.

- **OPC Mirror Redundancy**
  Enables redundant OPC server to server communications.

Prerequisites

- One Application Station Software Suite license with the appropriate OPC server scale up, VE2201Sxxxxx (where xxxxx is the number of OPC data values required, from 00250 to 30000).

- Two Dell computers (workstation or server class, as required).

- It is recommended that the Dell computers used for the Application Station pair be the same model.

- The Application Station pair used for OPC server redundancy must be dedicated to OPC communications; you cannot enable any other subsystem on the Application Station pair and you should not install or run non-OPC based applications on the Application Station pair.

- DeltaV v10.3 or later.

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