Application Note

Increased Reliability of Batch Data Collection

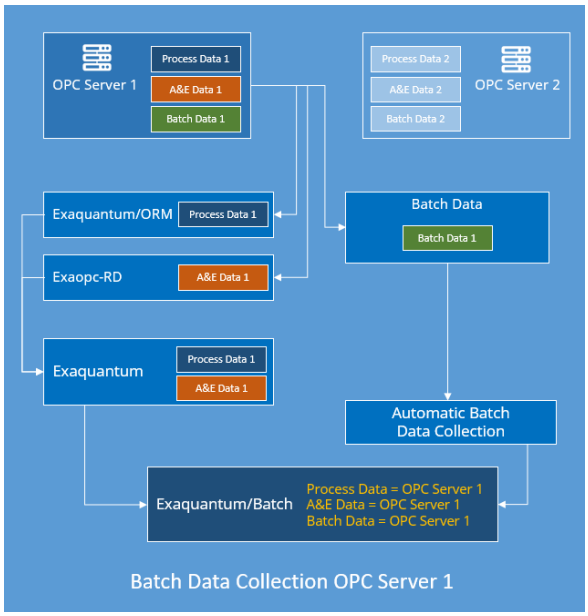
Availability of Data

The batch industry relies on dependable batch management and control systems to handle product recipes and formulas and to ensure the quality, consistency and traceability of production. Every batch must be monitored and assessed throughout its entire execution cycle to ensure product reliability, efficiency and profitability. The availability of production data throughout the entire batch execution is therefore critically important.

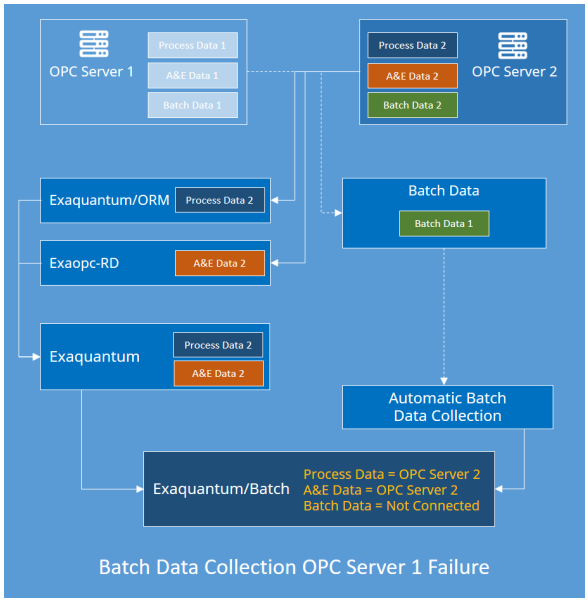
Redundancy helps to increase both the availability and reliability of data to improve the batch management system performance, helping to ensure that batch data collection is maintained for every recipe. A customer required redundancy of the data collection path for their Yokogawa batch installation including, the historisation of master recipes read directly from the DCS (CENTUM VP Batch) and process values, alarm and events and batch data read via Exaopc.

Limited Redundancy

- Exaquantum/Batch has the ability to monitor two DCS human interface stations in order to provide redundancy of the master recipe data collection.
- Exaopc-RD (Redundancy) provides automatic redundancy for process and alarm and events data.
- Exaopc-RD does not support redundancy for OPC batch data.
- If the configured Exaopc/Batch server fails then Exaquantum/Batch will continue to try to re-connect to it until, either the Exaopc/Batch server is restarted, or the Exaquantum/Batch configuration is changed and the automatic batch data collection service is restarted.
- Exaquantum/Batch requires manual intervention to switch between Exaopc/Batch servers.
- In the event of a failure and recovery of one Exaopc/ Batch server, batches created or completed during this period will not be recognized and read into the Exaquantum/Batch database until after connection has been re-established, providing they have not been deleted from the DCS.
- Any status changes during this ‘down time’ will be missed as well.



Batch Data Collection OPC Server 1



Batch Data Collection OPC Server 1 Failure

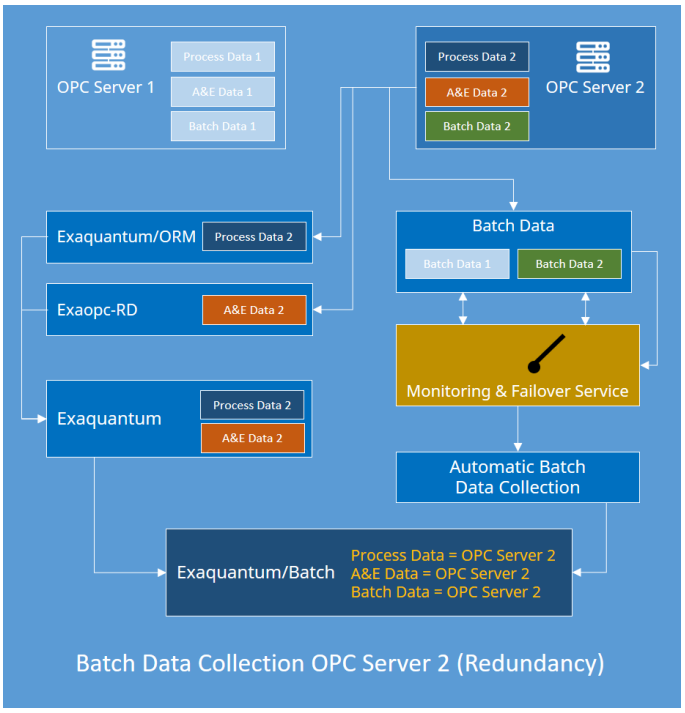
Released March 2018

More info: sales@ymx.yokogawa.com

YOKOGAWA

Solution

To overcome this redundancy gap, Yokogawa developed a solution to provide an external monitoring and failover service to run alongside Exaquantum/Batch to increase the reliability and availability of batch data collection following failure and recovery of an Exaopc server. This standalone application provided the ability to switch the automatic batch data collection (ABDC) between a pair of Exaopc/Batch servers following failure of the connection to the current live Exaopc/Batch server or failure of the (connected) Exaopc/Batch server. This helps to safeguard continued data collection following a failure or network disruption to one Exaopc server.



Benefits of Exaquantum/Batch Redundancy

- Increased availability and reliability of batch data collection to improve batch system performance at an operational level. This solution provides a more reliable data service by switching between OPC servers in the event of a server failure or network outage.

- Improved collection of batch data throughout the batch cycle by reducing the impact of data interruptions to improve the dependability and overall productivity of the plant.

How Does it Work?

Without the Batch Failover Extension

Data Collection

Exaquantum/Batch ABDC monitors the batches in the CENTUM VP/Batch system by periodically requesting for the batch list. New batches are identified and their details requested then the system registers to be informed of status changes for the batch. When a batch is completed or aborted, the status change is notified to Exaquantum/Batch and the batch properties are read again from Exaopc/Batch that collects the data from the DCS.

Exaquantum Restart

Following a restart of Exaquantum/Batch, the batch list is read and new batches identified. All incomplete batches have their status checked, any that have completed or been aborted since the last read have their details reread and updated. Exaquantum/Batch registers to be informed of any status changes for any batches still running.

Exaopc/Batch does not retain any history of batch details and collects all information on request from Exaquantum/Batch; hence, if a batch is deleted on the VP/Batch system before it has had its data read by Exaquantum/Batch, then the data is missed.

Exaopc/Batch Failure

If the configured Exaopc/Batch server fails, then the standard Exaquantum/Batch will continue to try to re-connect to it until, either the Exaopc/Batch server is restarted, or the Exaquantum/Batch configuration is changed and the automatic batch data collection service is restarted. Batches created or completed during this period will not be recognized and read into the Exaquantum/Batch database until the connection is re-established when the same processing as for an Exaquantum restart is performed.

Released March 2018

More info: sales@ymx.yokogawa.com

With Batch Failover Extension

Exaquantum/Batch Failover Extension

The monitoring and failover service periodically checks both the current live and standby Exaopc/Batch server for their ability to provide a batch list and respond with batch properties for batches in that list. On failure of the live Exaopc/Batch server being recognized, the automatic batch data collection service process will be restarted using the alternate Exaopc/Batch server. The processing will be the same as for an Exaquantum/Batch restart as described previously. Batches that have been registered or ended during the downtime will be read provided they have not been deleted prior to the failover. The monitoring and failover extension allows an administrator to manually switch between Exaopc/Batch servers, this manual intervention helps to safeguard the transmission path of data collection between Exaopc/Batch servers.

Key Takeaways

Redundancy for Yokogawa Batch Solution

Yokogawa developed a solution to provide an external monitoring and failover service to run alongside Exaquantum/Batch to increase the reliability of batch data collection following failure and recovery of the Exaopc/Batch server.

Batch Data Availability

Each batch process has a specific set of requirements, which must be optimized and assessed throughout the batch cycle. In the event that the live or connected Exaopc/Batch server is not able to provide data due to network problems or connection failure, it is possible to switch the automatic batch data collection to a second Exaopc/Batch server.

References

Exaquantum
Exaquantum/Batch
Exaquantum OPC Redundancy Manager
Exaopc
Exaopc-RD

Source Information

For more information, please contact
sales@ymx.yokogawa.com

Released March 2018
More info: sales@ymx.yokogawa.com

YOKOGAWA