

ELECTRIC POWER GENERATION SECTOR

vNode Unlocks Connectivity Access at Jebel Ali Power Station in UAE

How Rebus Novus implemented vNode to establish secure OPC UA connectivity between Advantech's SCADA system and ABB's historian

INTEGRATOR:  REBUS NOVUS
ENABLING POSSIBILITIES

CLIENT:  Dubai Electricity & Water Authority

Project

Design and deployment of OPC UA middleware integration between Advantech SCADA and ABB Historian for DEWA's GT4 and GT5 turbines.

Solution

vNode was implemented to re-map OPC UA NodeIDs, enabling historian compatibility and seamless secure data transfer.

Integrator



Rebus Novus is a solutions provider that empowers digital transformation across industrial environments.

Client



Dubai Electricity and Water Authority (DEWA) operates one of the largest power and water utilities in the UAE



Objectives



Enable historian logging for GT4 & GT5 turbines.



Standardize OPC UA tag naming for integration.



Ensure security and zero disruption during deployment.

Challenges

Incompatibility Between OPC UA Servers and Clients:

Advantech's OPC UA server used numeric NodeIDs, which ABB Historian cannot interpret for historical logging.

No Direct Translation Layer Available:

ABB Historian could not natively re-map or reinterpret Advantech's tag structure.

Need for Non-Intrusive Integration:

Any solution had to be implemented without disturbing the real-time control or turbine operations.

Results:



Full historian integration achieved via vNode.



Namespace conversion completed with no downtime.



Scalable, standards-based architecture implemented.



Background

DEWA faced a namespace incompatibility between the numeric NodeIDs from Advantech SCADA and the string-based requirements of ABB Historian. No native solution was available to bridge this gap. Moreover, the deployment had to be performed without disrupting turbine operations.

Existing System Landscape

Both GT4 and GT5 turbines were equipped with Advantech SCADA/HMI systems, which served as the primary data acquisition layer.

Advantech SCADA provided an OPC UA server interface, exposing all turbine operational tags however, these tags were published using integer-based NodeIDs (NamespaceIndex:NumericId).

ABB Historian, on the other hand, only supports OPC UA tags with string-based NodeIDs, making direct connection and data browsing impossible.

Software used

vNode IoT Gateway:

- ✓ OPC UA Client
- ✓ OPC UA

[Download vNode](#)



Solution

To resolve this integration issue, vNode v1.21 was deployed as a middleware OPC UA Gateway between Advantech SCADA and ABB Historian.

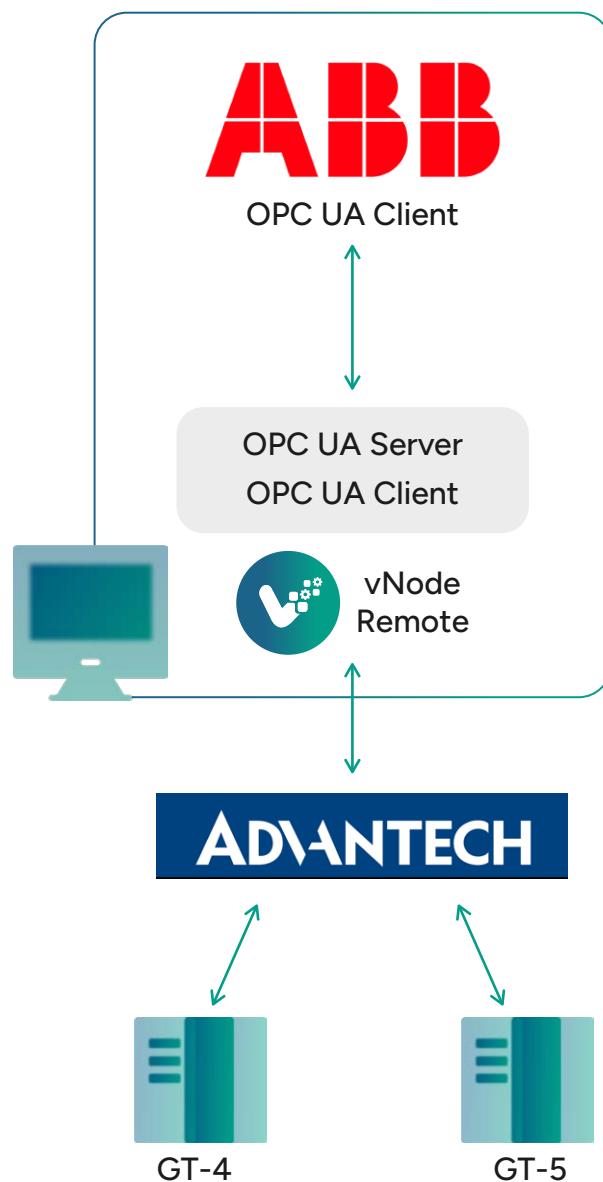
vNode was configured as an OPC UA client for Advantech SCADA, converting numeric NodeIDs into structured, readable strings. It exposed these remapped tags via its own OPC UA server for ABB Historian. The approach ensured historian compatibility, encryption, authentication, and performance tuning. Additionally, vNode's support for Unified Namespace principles enables future scalability and integration readiness.

vNode Connected to Advantech via OPC UA

- vNode was configured as an OPC UA client to connect to Advantech SCADA's server.
- It subscribed to all required GT4 & GT5 data points (analog inputs, digital statuses, setpoints, alarms).

NodeID Re-Mapping in vNode

- Internally, vNode converted all numeric-based NodeIDs obtained from Advantech into custom string-based tags.
- These tags were assigned readable, structured names (e.g., GT5.Load, GT4.FuelPressure, GT5.Alarm.Status) in vNode's tag manager.





vNode Served OPC UA Data to ABB Historian

- vNode exposed the re-mapped tags through its own OPC UA Server, with string-based NodeIDs fully compatible with ABB Historian.
- ABB Historian was configured to connect to vNode, browse the restructured tag tree, and log all selected tags for analysis and reporting.

Security & Performance Configuration

- OPC UA sessions were encrypted and authenticated as per DEWA IT/OT policy.
- Data rates and deadbands were tuned for historian-optimized performance.

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vNode made it possible for DEWA to access their SCADA data in real-time for historical logging, without modifying any existing system.

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-Avijit Sur
Leader - Digitalization & Automation



Outcome & Benefits

Complete Historian Integration Achieved

Real-time and historical data from both turbines is now fully available in ABB Historian via vNode.

Seamless Namespace Conversion

vNode acted as a real-time translator, converting numeric NodeIDs into structured string NodeIDs without altering the original SCADA setup.

Vendo Neutral & Scalable Architecture

The solution is fully scalable to additional turbines or control systems with similar namespace issues.

Zero Downtime Deployment

The entire integration was completed in real-time, with no disruption to turbine operation.

Future Ready Integration

Easily connect future DEWA systems Siemens, GE, IEC, DLMS, OPC DA without additional middleware or integration costs.

Secure Scalability

Expand data flows to cloud, ERP, or other platforms while maintaining full compliance with IT/OT security standards.

Conclusion

This project highlights the power of vNode as a flexible OPC UA middleware, resolving critical namespace incompatibilities between Advantech SCADA and ABB Historian. Rebus Novus delivered a seamless, standards-based and future-ready integration for DEWA's GT4 & GT5 turbines, enhancing their operational transparency and historian-based analytics.

Partner



Rebus Novus is a Dubai-based consulting firm offering business development, engineering consultancy, digital transformation, market analytics, M&A and company formation services across the MENA region. They support firms from startups to SMEs to scale efficiently.

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