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2019 MATRIKON OPC SALES PLAYBOOK

BIGGER SALES THROUGH BETTER QUESTIONS™

AWESOME SOLUTIONS INDEX

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Data Management

- ODH - Easy History
- ODBC Products - Easy Database Integration
- ORB - Easy Redundancy
- OSG - Easy OPC Server Data Security
- ODM - Easy Data Mapping
- OPC Funnel - The OPC Gateway/Aggregation
- HL - Easy Reliable Data Historical Transfer
- OPC Edge Calc (OEC) - Easy OPC Edge Analytics
- Industrial Data Gateway (IDG) - Shop-To-Cloud
- OPC Excel Reporter

Connectors

- Allen Bradley PLC Access – OPC UA & OPC
- Siemens PLCs Access – OPC UA & OPC
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- Modbus (Plant/Telemetry)– OPC UA & OPC
- Triconex – OPC UA & OPC
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Solutions & Services

- DMZ Agent - DMZ Friendly Data Sharing
- OPC Workshop4.0 – Hands-on Training

OPC UA

- Mix, Match, & Migrate with Matrikon
- Matrikon FLEX - OPC UA SDK [Developers]
- Mobile OPC UA Explorer - OPC UA Utility Client

MIX, MATCH, & MIGRATE WITH MATRIKON

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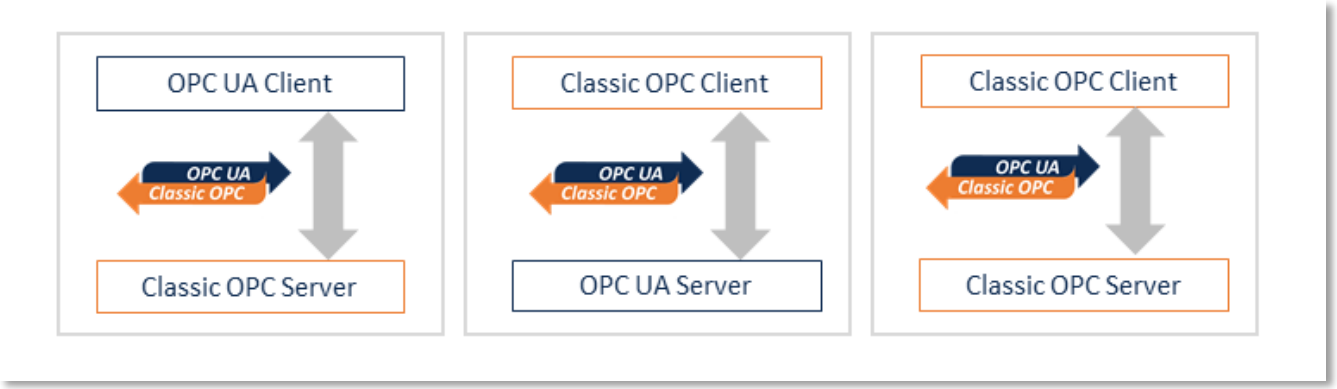
At Matrikon we believe everyone should:

- have easy access to open standards based, secure, and reliable data connectivity to all their 3rd party systems.
- be free to **mix, match, & migrate** infrastructure components as needed so they can focus on getting their jobs done right and on time.



Matrikon has a tradition of developing innovative yet pragmatic products that empower people to best utilize open standards based data connectivity. Today, this tradition is stronger than ever as Matrikon develops its next generation data interoperability system. A new era of innovation is coming…

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MATRIKON OPC DESKTOP HISTORIAN (ODH)

ARCHIVE DATA FROM 3RD PARTY OPC SERVERS SHARE IT WITH OPC CLIENTS

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HISTORY MADE SIMPLE

Capturing control automation data, working with it, centralizing it, synchronizing it between different archives, or migrating it can all be easily done using time tested Matrikon OPC solutions.

Matrikon has the technology, so the question is not ‘can a customer do X’, the question is ‘what does the customer want to achieve and why’.

Once you know this, the best solution will naturally emerge.

2018-01 ODH CAMPAIGN: EASY HISTORY

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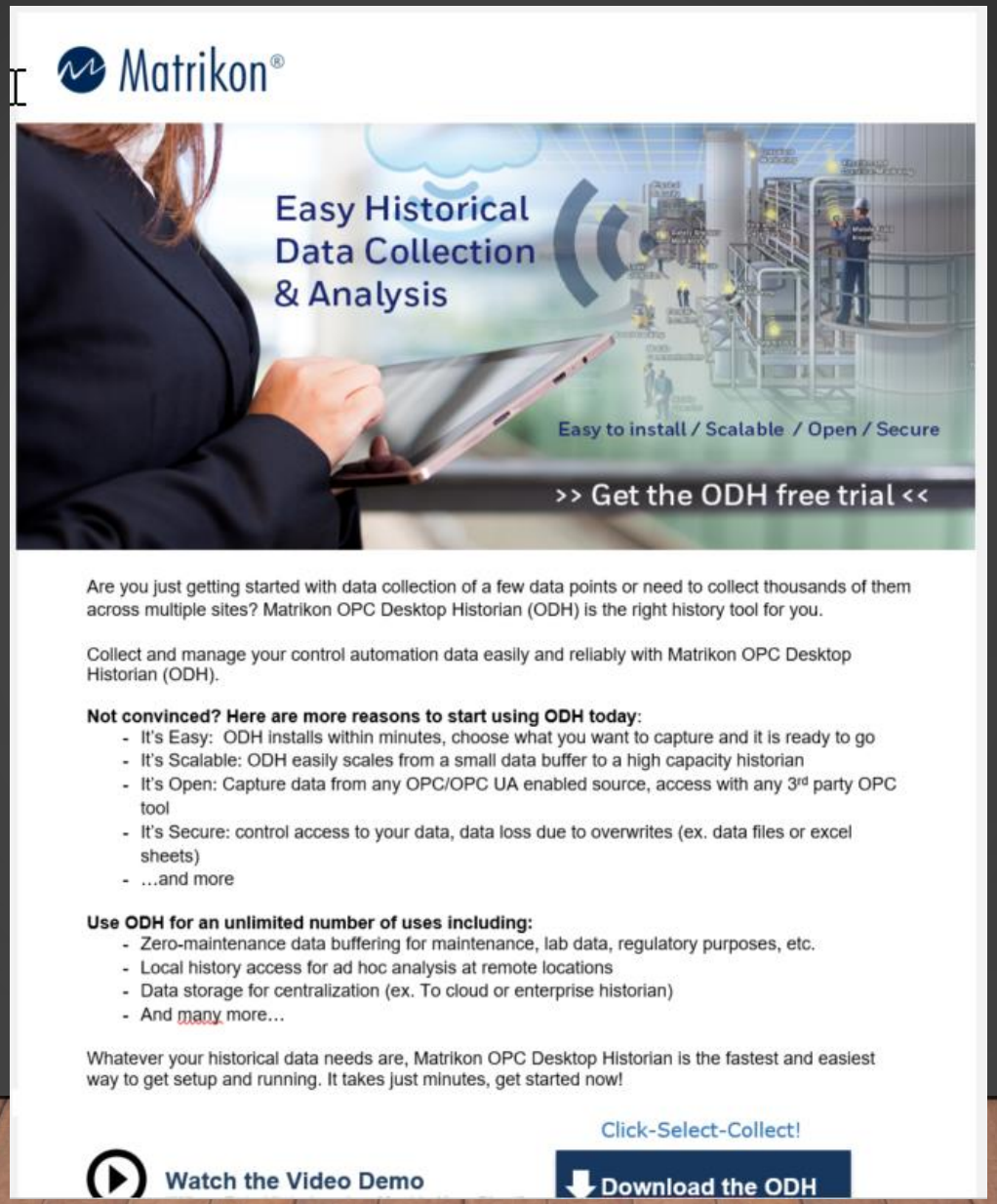

Matrikon®

Easy Historical
Data Collection
& Analysis

Easy to install / Scalable / Open / Secure

>> Get the ODH free trial <<

Are you just getting started with data collection of a few data points or need to collect thousands of them across multiple sites? Matrikon OPC Desktop Historian (ODH) is the right history tool for you.

Collect and manage your control automation data easily and reliably with Matrikon OPC Desktop Historian (ODH).

Not convinced? Here are more reasons to start using ODH today:

- It's Easy: ODH installs within minutes, choose what you want to capture and it is ready to go
- It's Scalable: ODH easily scales from a small data buffer to a high capacity historian
- It's Open: Capture data from any OPC/OPC UA enabled source, access with any 3rd party OPC tool
- It's Secure: control access to your data, data loss due to overwrites (ex. data files or excel sheets)
- …and more

Use ODH for an unlimited number of uses including:

- Zero-maintenance data buffering for maintenance, lab data, regulatory purposes, etc.
- Local history access for ad hoc analysis at remote locations
- Data storage for centralization (ex. To cloud or enterprise historian)
- And many more…

Whatever your historical data needs are, Matrikon OPC Desktop Historian is the fastest and easiest way to get setup and running. It takes just minutes, get started now!

Click-Select-Collect!

Watch the Video Demo

Download the ODH

ODH MONEY TRAIL QUESTIONS…

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Start

Easy History

ODH

- Additional Data Sources? → +OPC Servers
- Any Data critical? → +ORB + UAT
- Multiple Sites or Databases?
  - Need Stable Connectivity? → +UAT
  - Need to Centralize?
    - Have OPC Ent. Historian? → HL+OPC Server?
    - Have ODBC Database? → +GDA +HL
    - Need a central node? → ODH (High Capacity?)
  - History Migration/Synch /Forwarding? → +HL
- Adhoc Data Analysis? → +Excel Reporter +Easy Trender
- Future Ready Suggestion…. → Classic OPC + OPC UA Ready → +UAT

Leverage TSCs To work out Architecture Needed!

ODH DETAILS & USES

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- What Version(s) are right for your customer?
  - Now includes: OPC Buffer
    - Use Case: Redundant 'buffers' feeding into ODH (instead of multiple ODHs)
  - Free: 50 tag version (no UAT)
  - Small: 500 Tag version (MicroHistorian)
  - High Capacity: 100K+ Items
- Disaster Recovery

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MATRIKON OPC ←→DATABASE CONNECTIVITY

READ AND WRITE OPC DATA FROM/TO RELATIONAL DATABASES

SUITE: ODBC SUITE OF OPC CONNECTORS

2019-05 ODBC CAMPAIGN: DATABASES MADE SIMPLE

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- Databases support storage and they are a systematic collection and manipulation of data

EVOLUTION → Flat File DBMS → Hierarchical DBMS → Relational (SQL) DBMS → No SQL DBMS

- Flat File is like a huge single table, data was only used to retrieve information in case of concerns
- Hierarchical databases are restricted to one-to-one mapping data structures, similar to your folder structure on the PC
- Structured Query Language (SQL) is the standard language for dealing with Relational Databases, it is based on ISO/IEC 9075 (9 parts). This type of structure should allow one-to-many mapping
- NoSQL, no adherence to Relational Database and also high volumes of data (scaling-out and web applications)

2019-05 ODBC CAMPAIGN: DATABASES MADE SIMPLE

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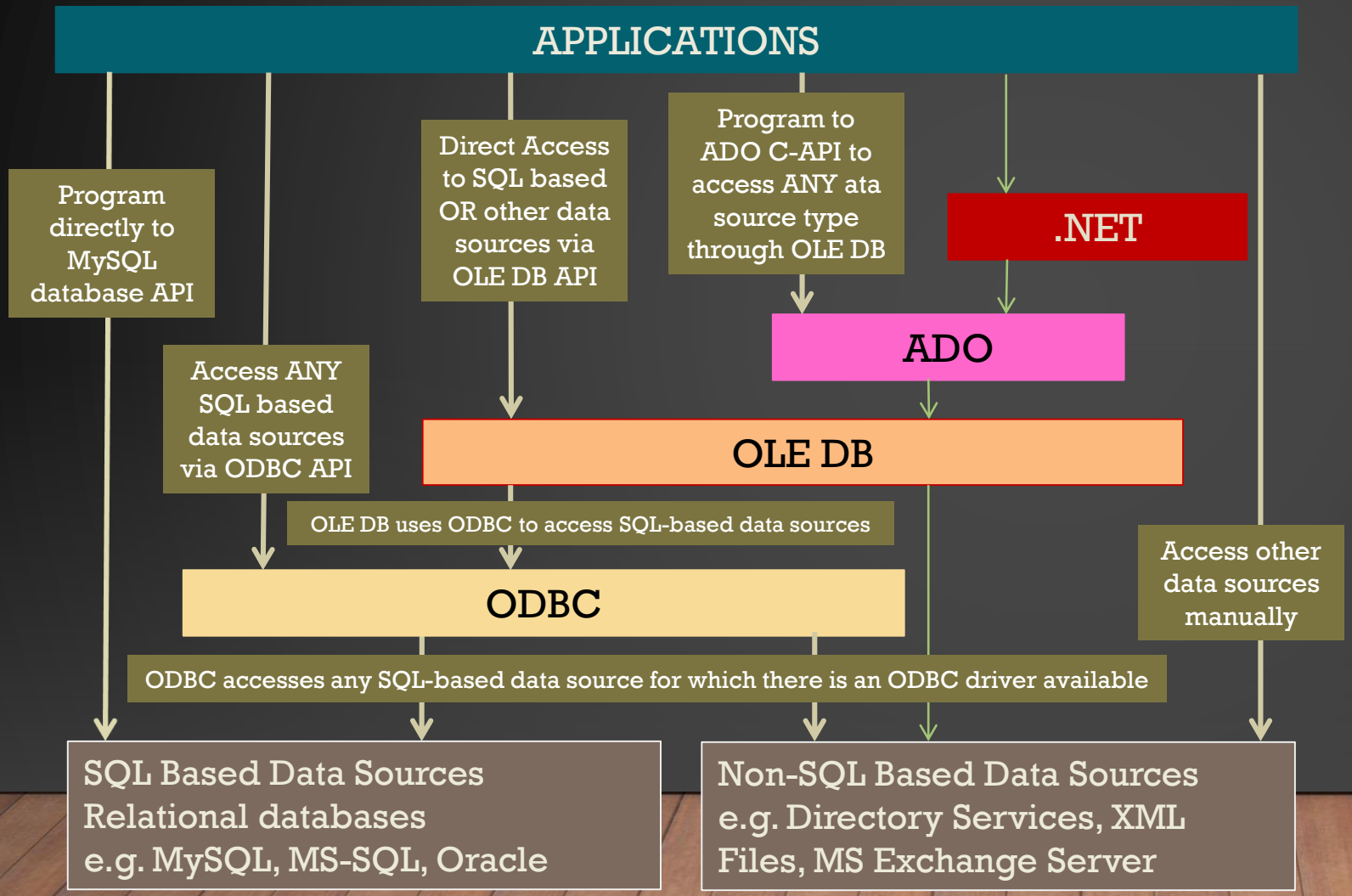
- ODBC (API) enables an ODBC-compliant application to use a RDBMS or Non-RDBMS)



SQL

- MS Access
- Oracle
- PostgreSQL
- MySQL
- MS SQL
- Sybase ASE
- SAP HANA
- DB2
- MariaDB
- SQLite
- Elasticsearch
- Azure SQL

NoSQL

- MongoDB
- Redis
- CouchDB
- RavenDB
- MemcacheDB
- Riak
- Neo4j
- HBASE
- Perst
- Cassandra

Microsoft ODBC Specification 4.0 (latest)

2019-05 ODBC CAMPAIGN: DATABASES MADE SIMPLE

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MatrikonOPC Client for ODBC

- Move realtime data (OPC DA) into ODBC compliant databases
- Contains an OPC DA Client
- Connects to any OPC DA Server
- Allows you to map OPC DA tags to database rows
- Average performance: 900 tags per second

- Note: Easy to configure but limited to **realtime (OPC DA) only**

2019-05 ODBC CAMPAIGN: DATABASES MADE SIMPLE

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Matrikon OPC Server for ODBC (GDA)

- Provides OPC Server interface to ODBC compliant Databases
- Read/Write Database access
- Realtime (OPC DA) and Historical (OPC HDA) Server interfaces
- Requires OPC Client

- Average Performance:
  - DA Write (Without Bulk Insert feature enabled) – 140 writes / sec
  - DA Write (Bulk Insert feature enabled) – 700 writes /sec
  - HDA Write (Without Bulk Insert feature enabled) – 370 writes / sec
  - HDA Write (Bulk Insert feature enabled) – approx. 3350 writes / sec (overall 10K in 3 seconds)

2019-05 ODBC CAMPAIGN: DATABASES MADE SIMPLE

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Matrikon OPC Server for ODBC (GDA)

Question: I have an existing OPC Server , how do I connect it to the Matrikon OPC Server for ODBC?

Ask: What OPC Server type do you want to connect to your Database?

- Realtime OPC DA Server
  - Use MatrikonOPC Data Manager and Matrikon OPC Server for ODBC (GDA)
- Historical OPC HDA Server
  - Use MatrikonOPC Historylink and Matrikon OPC Server for ODBC (GDA)

2019-05 ODBC CAMPAIGN: DATABASES MADE SIMPLE

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- Common features:
  - Windows OS Support: Win 7, Win 10, Server 2008, 2012 and 2016
  - Interfaces with 32-bit Windows ODBC Data Source Administrator Manager

- Strong Competitors:
  - Kepware
  - Cogent DataHub
  - Integration Objects
  - Industrial Softing
  - OPCLabs

ODBC MONEY TRAIL QUESTIONS…

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Start

OPC Client for ODBC

DB Driving OPC DA Transfers

- Additional Data Sources? → +OPC Servers
- Any Data critical? → +ORB + UAT
- Future Ready Suggestion…. → Classic OPC + OPC UA Ready → +UAT

Databases Made Simple

OPC Server for ODBC

OPC Data IN/OUT of DB

- Multiple Archives?
  - Need Stable Connectivity? → +UAT
  - Centralize, Migrate/Synch?
    - Have OPC Ent. Historian? → +HL
    - Other ODBC Database? → +Extra OPC Server for ODBC +HL
    - Need a central node? → ODH (High Capacity?)
- Push OPC DA Into DB → +ODM +UAT
- Adhoc Data Analysis? → +Excel Reporter +Easy Trender

Leverage TSCs To work out Architecture Needed!

SCENARIOS: WORKING WITH DATABASES

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OPC CLIENT FOR ODBC

- Archive real time OPC data in a relational Database
- Not tested for NoSQL DB's

OPC SERVER FOR ODBC (GDA)

- Applications:
  - Batch Management – triggered r/w
  - Reporting & Traceability
  - Gateway to database for web/cloud use
  - LIMS data transfer to SCADA
  - OPC integration with closed system through ODBC, ERP middleware, downtime or production tracking, etc.

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MATRIKON OPC REDUNDANCY BROKER (ORB)

EASY REDUNDANCY FOR 3RD PARTY OPC SERVERS

DATA REDUNDANCY MADE SIMPLE

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Redundant communications with critical automation data sources provides different users with different benefits (solves different pain points) such as:

- Avoiding regulatory infringement fines
- Maximizing worker and equipment safety
- Preventing unplanned shutdowns
- Enabling maintenance work on critical assets without shutdown by using manual failover
- …

When talking with customers about ORB, find out what they want to use redundancy for and why. Their interest in redundancy is driven by more than solving a technical problem. Tap into that need.

ORB MONEY TRAIL QUESTIONS…

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Start

Redundancy Made Easy

ORB

- Data Sources not OPC Enabled? → +OPC Servers
- IT Security?
  - Firewall between components? → + UAT
  - DMZ involved? → +DMZ Agent
- OPC UA and Classic OPC Mix? → OPC UA Client Application? OPC UA Sources? → +UAT
- Historical Data Recovery Needed?
  - OPC Based Archive(s) → +HL +UAT
  - ODBC Based Archive(s) → +ODBC Apps +UAT
- OPC Client remote to ORB installation? → +Funnel
- Adhoc Data Analysis? → +Excel Reporter +Easy Trender
- Per-User-Per Tag Security Needed? → +SG

Leverage TSCs To work out Architecture Needed!

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MATRIKON OPC SECURITY GATEWAY (OSG)

OPC SERVER SECURITY FOR 3RD PARTY CLASSIC OPC SERVERS

OPC SERVER DATA SECURITY MADE SIMPLE

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Industrial Control System (ICS) cyber security is a hot topic in todays increasingly connected world.

Key Issues End-users are concerned about:

- Down time and safety risks from the growing number of increasingly sophisticated cyber-attacks.
- Need to provide greater visibility to the right shop floor data to the right people (not everything to everyone)
- Maintaining OT service levels while playing well with IT policies
- Ensuring legacy equipment remains safe as it continues to operate in an ever more connected world

When talking with customers about OPC security, find out what their concerns are to suggest the best possible solution. Are they trying to prevent people from accessing key OPC Servers directly? Are they trying to prevent different users from seeing other users' data (ex. Co-owners of a well want to keep production data related to their portion private from other owners), engineers want to prevent others from writing to key registers, etc. OPC Security Gateway helps to address many of these issues but you need to understand a users situation to help them best address their needs.

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MATRIKON OPC DATA MANAGER (ODM)

EASY AUTOMATED DATA MOVEMENT BETWEEN 3RD PARTY OPC SERVERS

OPC SERVER DATA MAPPING MADE SIMPLE

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A common control system integration issue engineers and SIs face is the need to share data between two different control automation products which, use incompatible data connectivity protocols (or proprietary ones).

Matrikon® OPC DATA MANAGER (ODM) provides powerful functionality to make short work of sharing such data. Common ODM uses include:

- Synchronizing data between two controllers (in one or both directions)
- Eliminating the need for connecting systems directly using cables. (Wiring systems together is expensive)
- Some systems like the older Emerson DeltaV only had an OPC Server. Using ODM allowed data to be pushed to DeltaV. (Source OPC Server → ODM → DeltaV OPC Server)

ODM EMAIL BLAST

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Map and Share data from different control systems with Matrikon® OPC Data Manager

Your control automation data is only as valuable as your ability to reliably move it between your data sources and the systems that need to use it.

The challenge is to integrate third party control automation systems because they use incompatible data protocols. While OPC servers are used to overcome the protocol incompatibility challenge, use **Matrikon® OPC Data Manager (ODM)** to easily move that data between your OPC sources

ODM is used at thousands of sites to share Real-Time, Historical, and Alarm & Event data between two or more OPC Servers, regardless of vendor, in a secure and reliable manner. Companies like 3M, Rockwell Automation, Honeywell, International Paper, WellDynamics, and Emerson Process Management and many more use Matrikon OPC Data Manager in their projects.

Take advantage of these ODM benefits today:

- Save time with easy Drag and Drop item mapping for quick setup
- Simplify your architecte with a single soltion for all your controller mapping needs
- Maximize uptime with ODM redundancy to minimize unexpected outages
- Avoid the cost of using using expensive cabled solutions with software
- And much more!

DOWNLOAD NOW >> REQUEST A DEMO

:: Reply to this email if you'd like information regarding current promotions that we're offering::

If you found this information usefly, please feel free to share!

If you have any questions or concerns - please contact me directly and I will be happy to help.

Regards,

ODM MONEY TRAIL QUESTIONS…

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Start

Data Mapping Made Easy

ODM

- Data Sources not OPC Enabled? → +OPC Servers
- IT Security?
  - Firewall between components? → + UAT
  - DMZ involved? → +DMZ Agent (ODM upsell)
- OPC UA and Classic OPC Mix?
  - OPC UA Source? OPC UA Destination? → +UAT
- Write DA data based on A&E?
  - Need to Archive the data? → +ODH +ODBC if databases
- Critical Data → +ORB
- Adhoc Data Analysis? → +Excel Reporter +Easy Trender

Leverage TSCs To work out Architecture Needed!

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MATRIKON DMZ AGENT

IT FRIENDLY, OPC CONNECTIVITY FOR DE-MILITARIZED ZONE APPLICATIONS

MOVE OPC DATA IN-AND-OUT OF THE DMZ (A.K.A. LEVEL 3.5)

DMZ AGENT - WHAT IS A DMZ?

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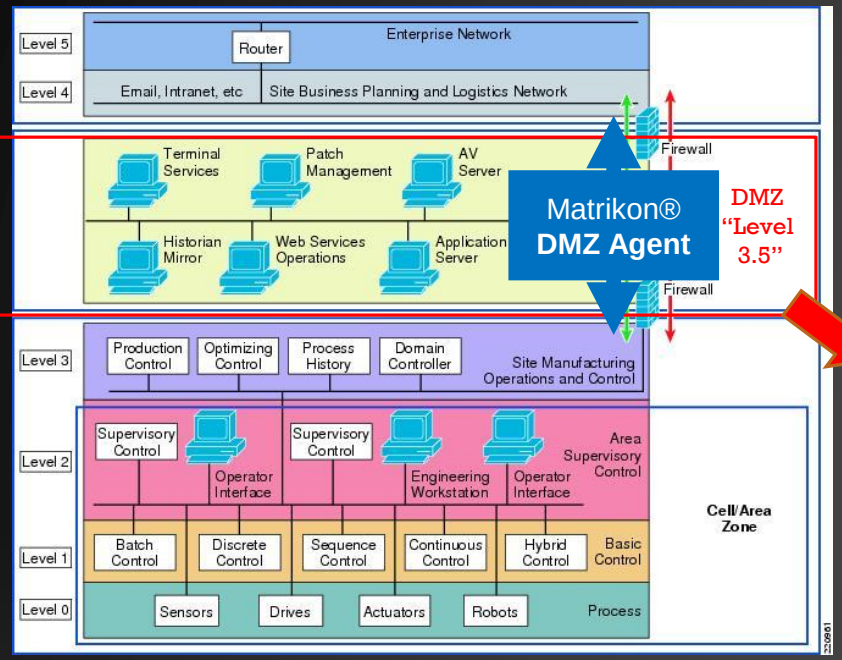

Purdue Enterprise Reference Architecture (a.k.a.Purdue Model) assigns labels & level numbers to each network level in a company according to what it is used for.

- Level 0/1: Physical Process & Intelligent devices (sensors, analyzers, actuators, etc.)
- Level 2: Supervisory Control – (controllers, PLCs, DCSs, SCADA systems, etc.)
- Level 3: Operations – (Batch management, Historians, middleware, MES, etc.)
- Level 4+: Business/Logistics - (ERP, inventory, office network, internet connectivity, etc.)

De-Militarized Zone (DMZ) : Given the critical nature of the shop floor systems, firewalls are placed between Level 3 and Level 4 to prevent direct business network contact down to the manufacturing levels. Given the number of firewalls involved customers face technical and coordination challenges of trying to move OPC data 'across' the DMZ.

Standard Matrikon solutions can move OPC data across DMZs using combinations of our applications. These all form the **Matrikon® DMZ Agent.** DMZ Agent makes it easy for Matrikon sales to talk to customers about this solution at a high level without unnecessarily complicating it in customers' minds.

Once the need for a Matrikon® DMZ Agent has been identified and sufficient information has been gathered about the customer's situation and challenge – **Matrikon Sales can engage Matrikon TSCs** to assist in working out specific DMZ Agent solution needed.

DMZ AGENT – FIREWALL'S VS DMZ'S

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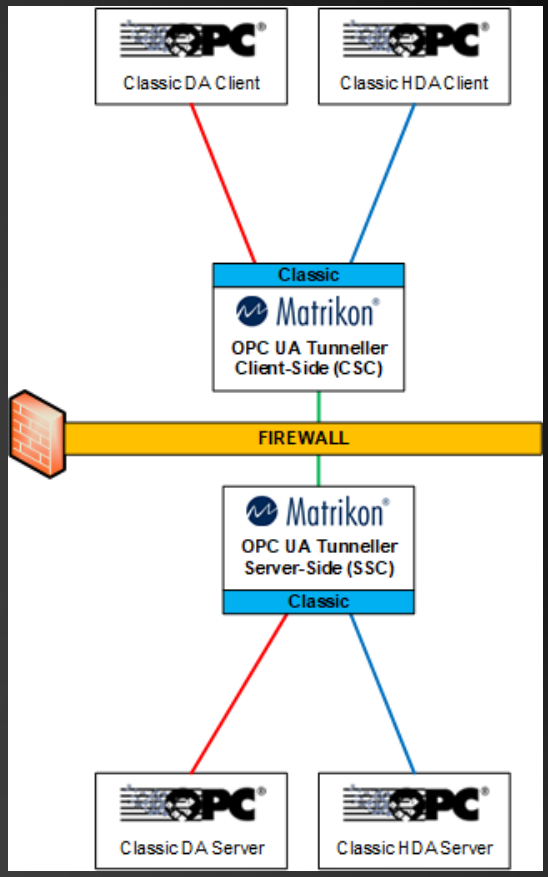
- Firewalls:
  - Can be hardware or software
  - Designed to protect data
  - Used to prevent unauthorized access
  - Can be configured to block/allow ports
  - Disrupts OPC (DCOM) communications

- OPC Solution:
  - Matrikon OPC UA Tunneller is Firewall Friendly



DMZ AGENT – FIREWALL'S VS DMZ'S

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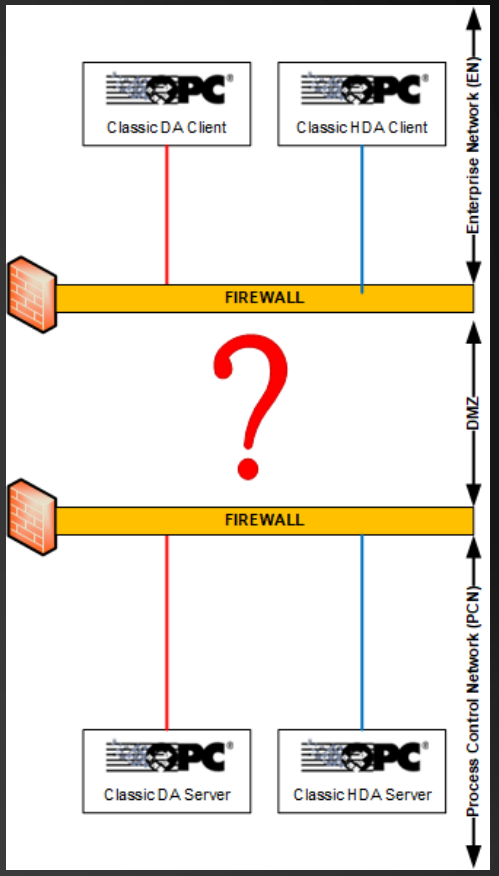
- DMZs:
  - Isolate inside networks from outside networks
  - Typically two firewalls involved - DMZ is the layer between the two firewalls
  - Blocks direct connections between networks
  - Can be hardware or software; generally hardware
  - Can be configured to block or allow TCP connection requests
  - Typically blocks requests from lower security networks
  - Never assume what rules are configured, always ask the customer!



DMZ AGENT – DMZ EXAMPLE

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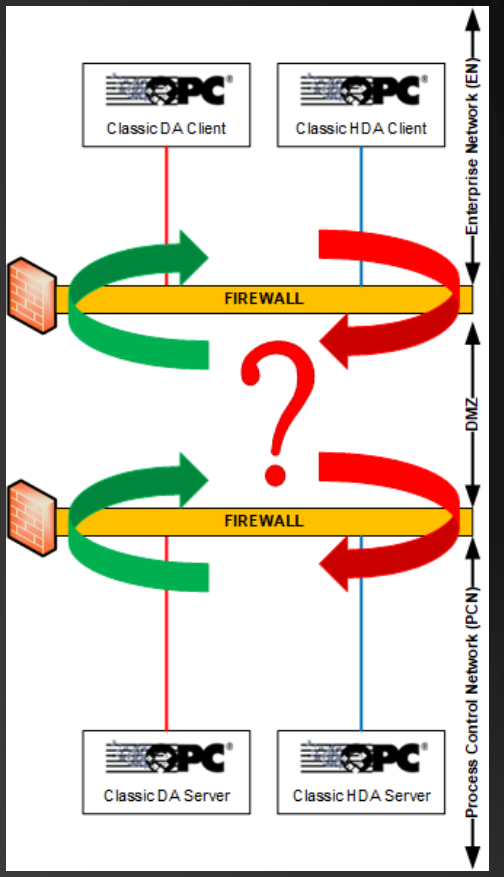
- DMZ Example:
  - Enterprise Network (EN) needs data from Process Control Network (PCN)
  - PCN is considered higher security area than EN
    - PCN must not be disrupted by EN actions
    - DMZ prevents EN directly connecting to PCN
    - TCP requests from EN to DMZ are blocked; so no access to PCN
    - PCN TCP requests to DMZ allowed
    - DMZ TCP requests to EN allowed
  - OPC/Tunneller communications blocked



OPC Solution - Matrikon DMZ Agent!

DMZ AGENT – WHAT IS IT?

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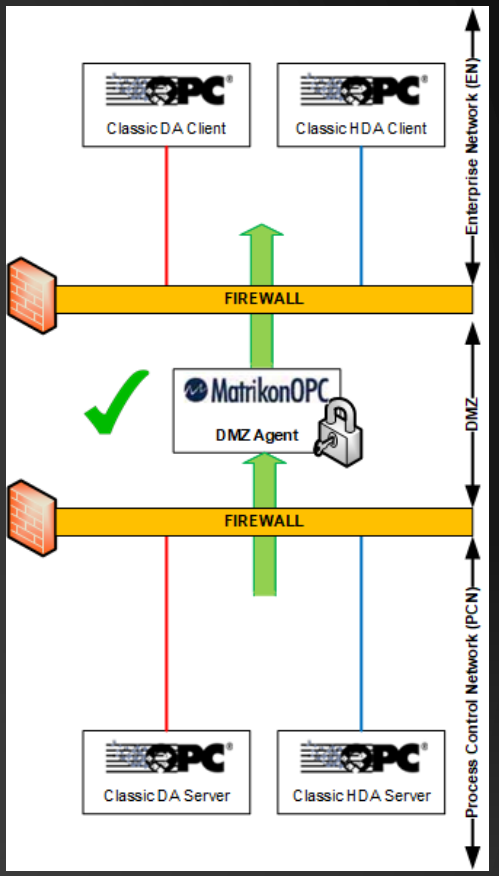
- Matrikon DMZ Agent is:
  - A solution customized to the customer's environment
  - **Not** an "Off the Shelf Product"
  - A collection of Matrikon Products
  - Can be designed for DMZ "Push" or "Pull"
  - Allows OPC data to traverse DMZ's without compromising security
  - Solutions for Realtime data (OPC DA) and Historical Data (OPC HDA)



DMZ AGENT – TYPES

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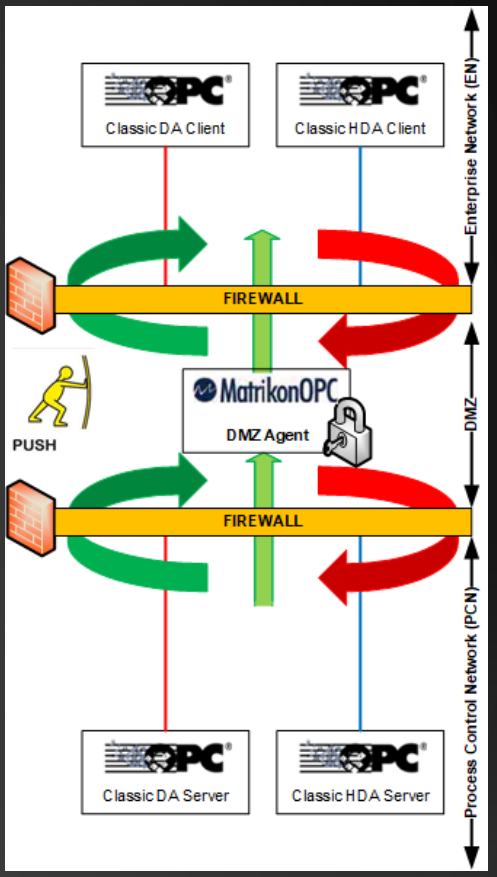
- **Push:**
  - TCP connection initiated in PCN->DMZ allowed
  - TCP connection initiated in DMZ->EN allowed
  - EN->DMZ blocked
  - DMZ->PCN blocked
  - Need to push from PCN to DMZ
  - Need to PUSH from DMZ to EN



DMZ AGENT – TYPES

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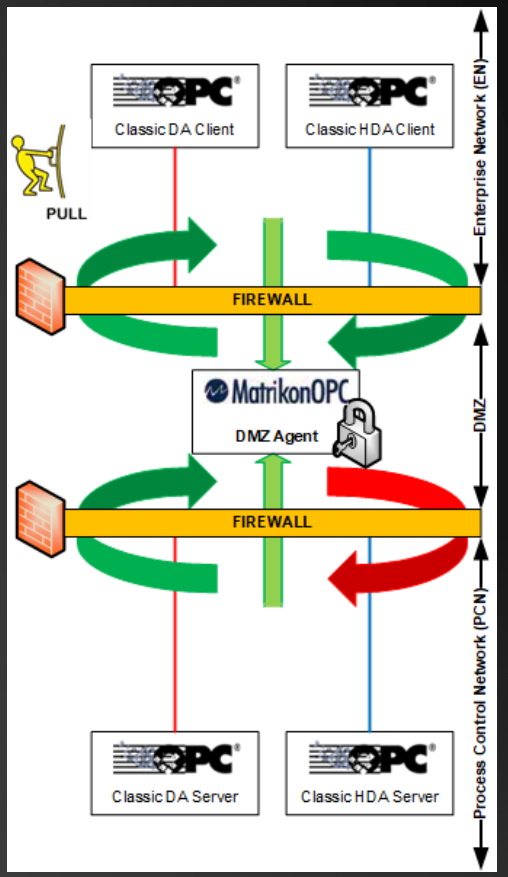
- **Pull:**
  - TCP connection initiated in PCN->DMZ allowed
  - TCP connection initiated in EN->DMZ allowed
  - DMZ->PCN blocked
  - Need to push from PCN to DMZ
  - Need to PULL from DMZ into EN



DMZ AGENT - QUESTIONS

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- Location of OPC Components:
  - Where do you want the data to come from? Is there an OPC Server available there?
  - Where do you want the data to go to? Is there an OPC Client or Server available there?
- OPC Specifications:
  - What OPC Specifications do you require support for (OPC DA, HDA, UA)?
- Security Rules:
  - Get a network drawing if possible
  - How many firewalls are between your OPC Client and OPC Server?
  - Which way can TCP connections happen? What side can they be initiated from? (Push/Pull)
- Throughput:
  - How many tags are you looking at transferring?
  - What update rate do you expect?

DMZ AGENT - NOTES / USES

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- ***Requires TSC Group Design – always submit Architect Request!***
- Not an off the shelf product – customized solution
- Options for DA and HDA
- Two solution types depending on situation:
  - DMZ Agent "Pull"
  - DMZ Agent "Push"
- Provides secure data transfer whilst maintaining security
- Aligns with current IT standard

DMZ AGENT - EMAIL BLAST

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2016 READERS' CHOICE AWARDS CONTROL

Firewalls and De-militarized Zones (DMZs) are common and effective IT security tools for managing network access throughout the enterprise. For this reason, they are used by virtually all production and manufacturing facilities to maximize operational cybersecurity.

While correctly implemented DMZs help to protect control automation data sources, they can make it difficult for valid outside users to access the data they need because systems

DMZ AGENT - MONEY TRAIL QUESTIONS…

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Start

Easy Data over DMZs

DMZ Agent

- Data Sources not OPC Enabled? → +OPC Servers
- IT Security?
  - Just a Firewall between components? → + UAT
  - True DMZ involved? → +DMZ Agent
- OPC UA and Classic OPC Mix? → OPC UA Source? OPC UA Destination? → +UAT
- Historical Data over DMZ → Historian at L2/3? → +HL +Buffer
- Real Time data
  - → +ODM | ODH
  - Critical Assets? (Redundancy) → +ORB | ODM Redundancy
- Complex Network? → +Site Assessment?

Leverage TSCs To work out Architecture Needed!

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MATRIKON OPC SERVER FOR ALLEN BRADLEY + UAT

OPC UA AND CLASSIC OPC CONNECTIVITY FOR ALLEN BRADLEY PLCS

ALLEN BRADLEY PLC ACCESS – OPC UA & OPC

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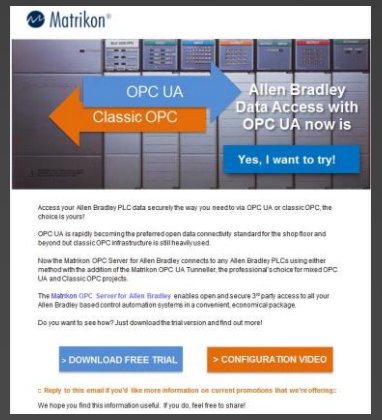
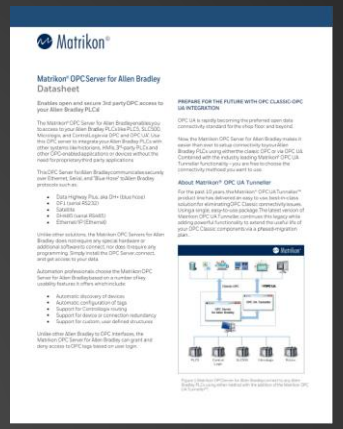
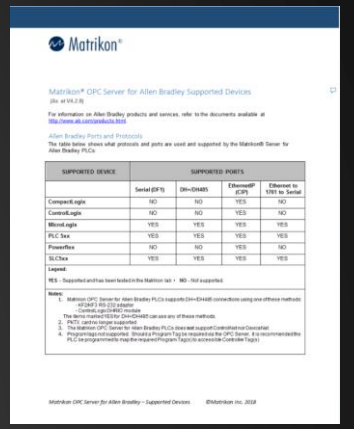
- HON is standardized on Matrikon OPC solution for Allen Bradley PLCs - it's solid.
- **Better Together** (AB+UAT)
  - Users can choose classic OPC or OPC UA access
  - UAT enhances classic OPC connectivity
- All ControlLogix PLC models running V31 or newer are supported.



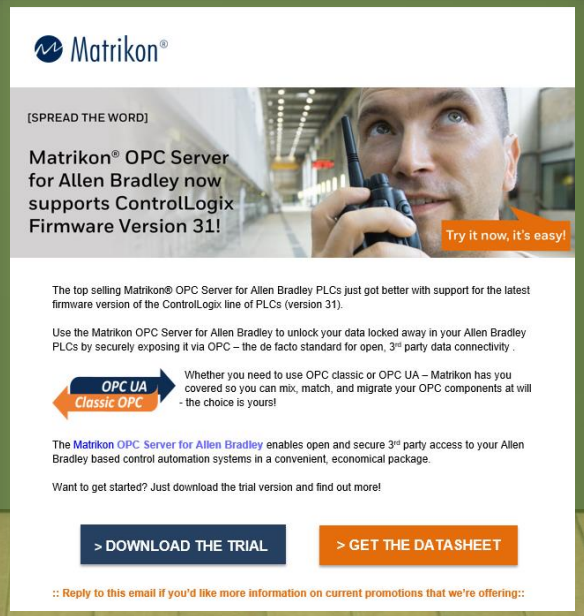
Email Blast



Updated Data Sheet



Updated Device List



NEW 2019 FEATURE: PROGRAM TAGS

Matrikon®
Powering
Interoperability

- Background
  - AB PLC's allow Applications to be split into multiple programs
  - AB Tags are either:
    - Global Tags: Visible Controller wide
    - Program Tags: only visible within a Program (local scope)

    → **Matrikon server sees both tag types**
- Program Tags:
  - Can have the same name in more than one program and can be copied and reused more easily
  - Program tags show up in their own program sub folders

  → **Matrikon OPC Server is similar to the Allen Bradley's browse structure**

SUPPORTED DATA TYPES

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Interoperability

Standard Data Types: Supported
- Examples: Real, Int, Bool, etc.

Data Types	Requested	Supported	Details
User-Defined (UDT)	Often	Yes	Multiple Tags with the same data layout
Strings	Often	Yes	Variable Length Strings Contains: DATA (char) and LEN (number of char in Data).
Predefined (PDT)	Rare	Yes	Used by the Instruction set (PLC's operations)
Add-OnDefined	Rare	-	Created to Support Add-On Instructions
Module-Defined (MDT)	Rare	-	Define Memory that is used by a physical module

ALLEN BRADLEY PLC MONEY TRAIL QUESTIONS…

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Interoperability

Start

Easy AB Access

AB+UAT

Any Data critical?

Remote Sites?

Need to Centralize?
On Site History?

Adhoc Data Analysis?

Additional NON OPC Sources?

+ORB

+ODH
(High Capacity?)

+Excel Reporter
+Easy Trender

+OPC Servers

Leverage TSCs
To work out Architecture Needed!

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MATRIKON OPC HISTORY LINK (HL)

RELIABLE HISTORICAL OPC DATA TRANSPORT

ARCHIVE CENTRALIZATION, SYNCHRONIZATION, AND MIGRATION

KEY HISTORY LINK USE CASES

Matrikon® Powering

- **Guaranteed Delivery**
  - **Challenge:** Connection loss creates gaps in real-time Data. People need all the data.
    Solution: HL keeps track of all disconnects, ensures all missed data transferred via HDA.
- **Event Triggered Tx**
  - **Challenge:** Data relevant to a specific event is needed instead of ‘all data all the time’
    Solution: HL allows users to specify multiple triggers that can cause historical data Tx.
- **Archive Migration**
  - **Challenge:** Need easy way to move data from one historian to another without scripts.
    Solution: HL easily and reliably moves HDA data between historians. No Scripting.
- **History to CSV File**
  - **Challenge:** Users have a local archive but only text files (CSV) can be sent/used due to firewall or old application restrictions.
    Solution: HL can write HDA data into a CSV file. Problem solved.

HL EMAIL BLAST

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Your ability to reliably select, capture and transfer key automation historical data between different archives and locations is essential in today's competitive, data-driven, and the regulatory compliance-centric world.
Use Matrikon® History Link (HL) to easily control what data is captured, under what conditions, and to move it wherever you need to regardless of where the OPC enabled 3rd party source and destination archives are located.

Download Matrikon® History Link now, to be able to:

- Ensure all your multi-site data can be centralized over unreliable networks
- Selectively capture trip event data
- Trigger batch related data capture
- And much more

Flexible and easy to use, Matrikon History Link is the integrator's tool-of-choice for ensuring reliable OPC historical data transfer between multi-site and multi-vendor systems.

HL NOTES

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Interoperability

- **Reliable** data transfer between OPC HDA servers
  - Data migration
  - Backup/refill
- Important part of the "Hub and Spoke" / "Store and Forward" architecture
- Export OPC HDA data to a CSV file
  - Some customers may need to work with a text data file (ex. Transfer it via FTP.)… HL can help!
- Supports redundancy at OPC client level
  - For support of redundancy at OPC server level ORB is required
- Addendum to Release Notes: Added support to Win 10, Win 2012 R2 and Win 2016

HL MONEY TRAIL QUESTIONS…

Matrikon®
Powering Interoperability

Start

HDA Data Transfer Made Simple

HL

- No OPC HDA Servers/Historians in Place? → +ODH / +Buffer
- IT Security?
  - DMZ involved? → +DMZ Agent
  - Firewall between components? → +UAT
- OPC UA and Classic OPC Mix? → OPC UA Sources? → +UAT
- Critical Data?
  - Redundant OPC servers? → +ORB
  - Redundancy at OPC Client level? → +HL (backup transporter)
- Hub & Spoke Architecture? → +ODH / +UAT
- SQL Database?
  - Push HDA Data into a Database? → +GDA
  - Get HDA Data from a Database? → +GDA
- One point of access for multiple OPC servers? → +Funnel
- Per-User-Per Tag Security Needed? → +SG
- Adhoc Data Analysis? → +Excel Reporter +Easy Trender

Leverage TSCs To work out Architecture Needed!

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MATRIKON OPC EDGE CALC (OEC)

OPC BASED EDGE COMPUTING FOR THE IIOT ERA

SOLUTION: MATRIKON CONDITION MANAGER + UAT

END-USERS: WANT TO PUT DATA TO WORK

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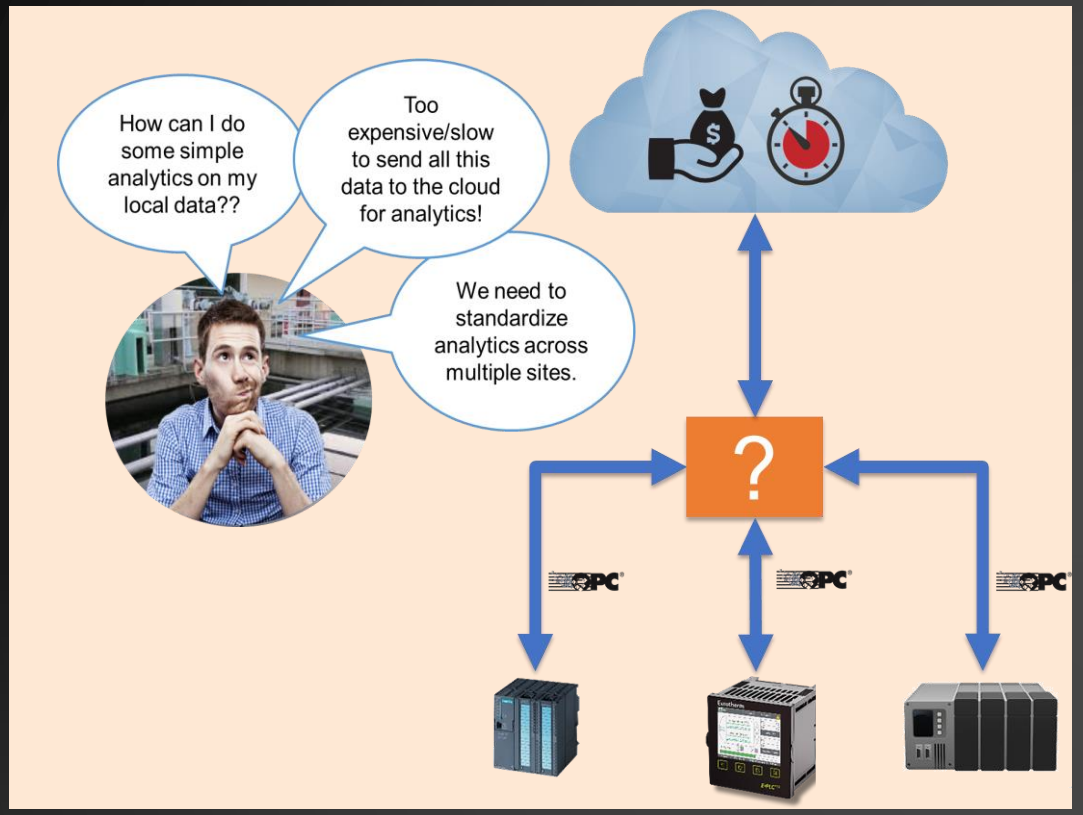


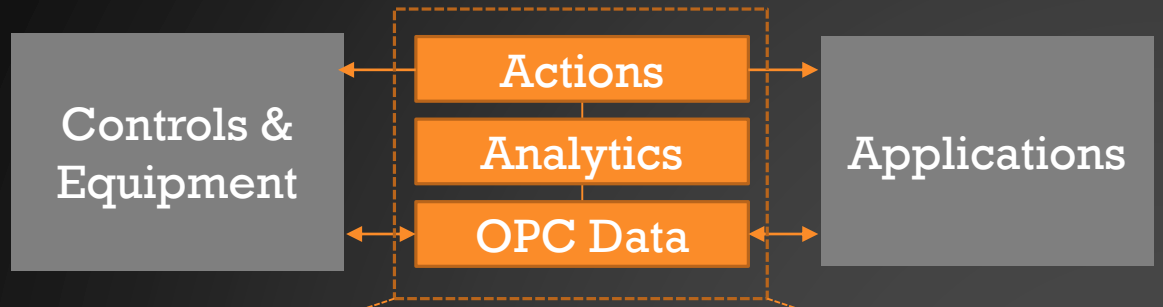
Common Customer Challenges

- Need on the fly EU conversion
- Ability to combine multiple real-time data inputs to create real time outputs (OPC)
- Perform Supervisory control based on inputs and calculated values
- Offload computational loading on historian
- Standardized calculations across all sections
- Reliability required
- Low cost (acquisition and ownership)
- Fleet wide deployment & maintenance

OPPORTUNITY: Customers need to extract value from their OPC Data and to act on the results.

NEW MATRIKON VALUE ADD: EDGE COMPUTING

Matrikon®
Powering Interoperability



- Traditional Matrikon Solutions:
  - OPC Data Connectivity Only
- New Matrikon Value Add :
  - Edge Analytics:
    - Calculations & Logic
  - Edge Actions:
    - Write results back to Controls & Equipment
    - Expose results to higher level applications

Matrikon®
OPC EdgeCalc (OEC)

Matrikon® OEC:
OPC UA Tunneller

Matrikon® OEC:
Condtion Manager

MATRIKON OPC EDGE CALC (OEC)

Matrikon®
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Matrikon®
OPC EdgeCalc (OEC)

Matrikon® OEC:
OPC UA Tunneller

Matrikon® OEC:
Condtion Manager

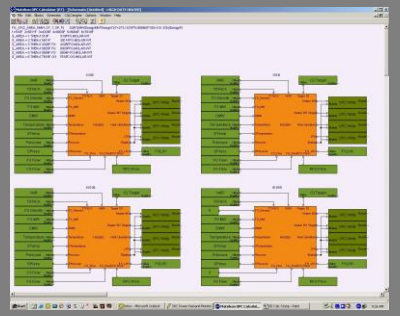
OPC UA and classic OPC Clients

Step 1: Build

Step 2: Run

Matrikon®
OPC UA Tunneller

CM
Graphical Logic Designer



CM
Calculation Engine

Matrikon®
OPC UA Tunneller

OPC UA and classic OPC Servers

OEC: CUSTOMER PROFILES & USES

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- Customers:
  - Engineers
  - System Integrators
    - Provide custom control solutions using standardized tool
  - Managers
    - Multi-site deployments
- Uses: Anywhere calculations and/or logic is needed
  - Water Utility: flood gate control
  - Wind park: turbine control for bat safety
  - Refinery: offload historian from calculations
  - Drilling: Drilling rate based on changing conditions
  - General: EU Conversions
  - …

OEC MONEY TRAIL QUESTIONS

Matrikon®
Interoperability

Multi-OPC Item/server calculations?

Logic based decisions?

Real-time control based on results?

Reduce data sent to central?

Multi (remote) site calculation/logic standardization?

Matrikon® OPC EdgeCalc

Any Data critical?

Remote Sites?

Adhoc Data Analysis?

Data Sources not OPC Enabled?

OPC UA and Classic OPC Mix?

Complex Network ?

History? Centralization?

+ORB

+ODH

+Excel Reporter
+Easy Trender

+OPC Servers

+UAT

+Site Assessment?

Leverage TSCs
To work out Architecture Needed!

Matrikon®
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Interoperability

MATRIKON OPC UA EXPLORER FOR MOBILES

FINALLY – A CONVENIENT & FREE OPC UA UTILITY CLIENT FOR MOBILES

SOLUTION: ANDROID & IOS BASED OPC UA EXPLORER

END-USERS: WANT EASY OPC UA TEST CLIENTS

Matrikon®
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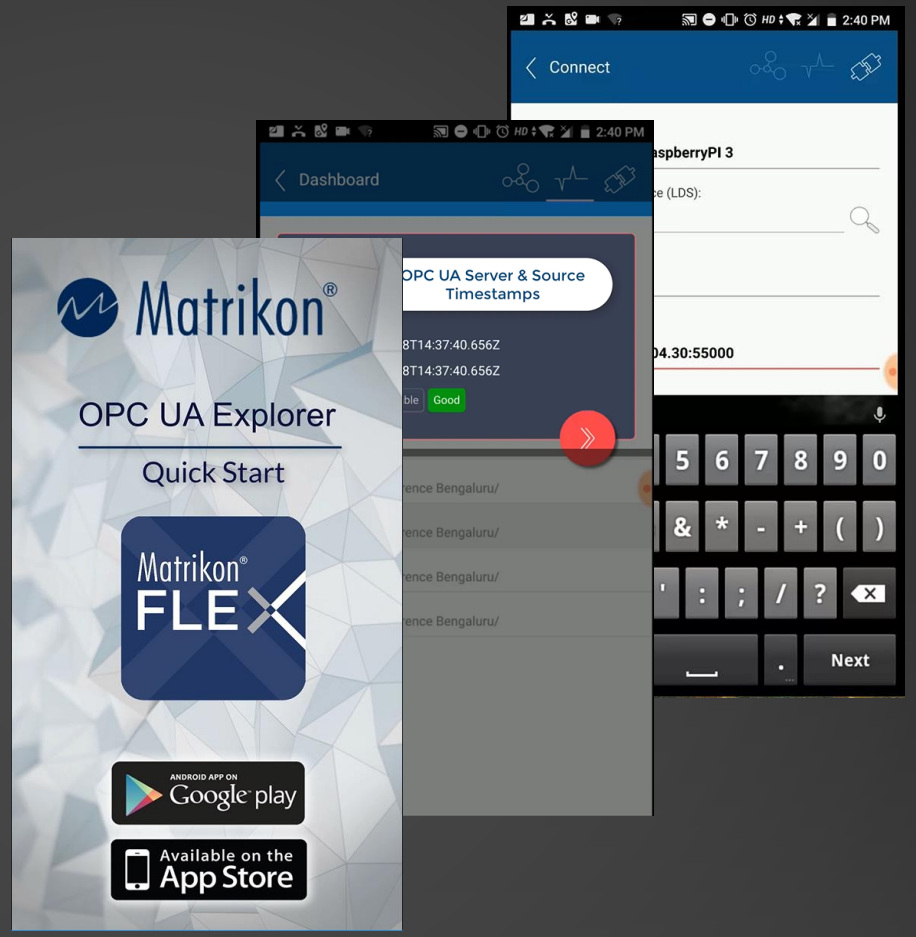
The Power of OPC UA at Your Fingertips.

- Available on Android & iOS
- Intuitive & Stable
- Subscriptions supported
- Read/Write
- Security Supported



OPPORTUNITY: Customers want new, more convenient ways to interact with their equipment.

UNLOCK NEW WAYS TO WORK WITH DEVICES

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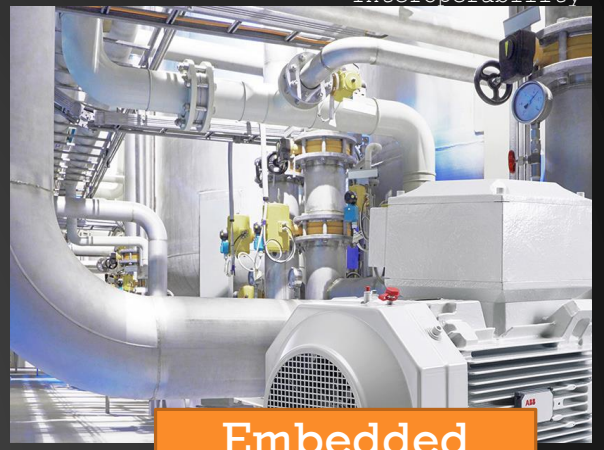
Powering
Interoperability

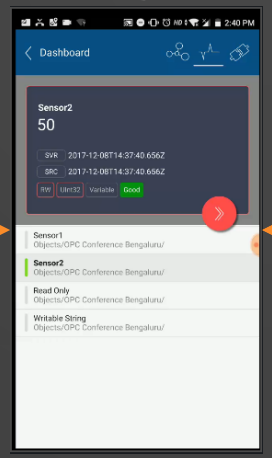
Classic OPC Server

UAT

PC Based OPC UA Server



Embedded OPC UA Server



Matrikon®
OPC UA Explorer for Mobiles

OPC UA EXPLORER MONEY TRAIL QUESTIONS

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Matrikon®
OPC UA Explorer
for Mobiles

- Additional Data Sources not OPC Enabled? → +OPC Servers (+UAT)
- Classic OPC Sources? → +UAT
- Want to do more Adhoc Data Analysis? → +Excel Reporter +Easy Trender (+UAT)
- Want to capture data? → Multigen OPC? → +ODH (+UAT)
- Developing OPC UA for own product? → Matrikon® FLEX

Leverage TSCs
To work out Architecture Needed!

Matrikon®
Powering
Interoperability

MATRIKON FLEX

THE BEST CHOICE FOR IMPLEMENTING OPC UA

SOLUTION: MATRIKON® FLEX OPC UA SDK

OPC UA: EASY TO USE, HARD TO IMPLEMENT

Matrikon®
Powering
Interoperability

- The IIoT and I4.0 depend on secure data interoperability. OPC UA delivers this.
- OPC UA technology is:
  - accepted by IT and OT
  - end-user & SI friendly
  - complex to understand and implement by developers
  - best adopted in applications using OPC UA software toolkits
- Toolkits
  - Matrikon® FLEX
  - Open Source Toolkits (ie. Free) provide:
    - various OPC UA facets on different platforms
    - do not include ongoing support
    - are not verified to be coded in a secure fashion (do not undergo professional security analysis/testing)
  - Other Professional Toolkits (Non-Matrikon):
    - provide a mosaic of different versions and toolkits for different platforms and facets
    - may not be thoroughly tested for secure implementation
    - offer poor support as they are geared for generating service work for the vendors

MATRIKON FLEX – OPC UA SDK R410.3

Matrikon®
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Interoperability

New features adopted from OPC UA v1.04 Specification

- Reverse Connect/Hello (UA Part 6)
  - Firewalls maintain the port access in both directions.
  - If a firewall has no open ports on the OPC UA Client side, the OPC UA Clients TCP connect call will not get to the OPC server. With "ReverseHello" the OPC server can now start a TCP connection to the OPC UA Client through a unilaterally opened firewall.
- Discovery and Global Services (UA Part 12)
  - OPC UA Spec. Part 12 has been renamed from "Discovery" to "Discovery and Global Services" because of additional services
    - "Push" and "Pull" certificate management services (to allow GDS and device to initiate a certificate renewal)
    - Support of "Certificate Revocation List" updates from GDS, to be compatible with any GDS's that support Certificate Managent
    - Support of the Node Management service
- New Security Policies (UA Part 7)
  - Since SHA1 has been broken and considered unsafe, the policies **Basic128RSA15** and **Basic256** are deprecated in OPC UA v1.04 spec. and replaced with two new policies that use **SHA256**
  - Support of OpenSSL v.1.1.0 and OpenSSL v.1.1.1

MATRIKON FLEX – OPC UA SDK

Matrikon®
Powering
Interoperability

Performant

Lightning Fast Performance

Secure

Security Baked into its DNA

Complete

All Facets – All The Time

Ultra Scalable

From Embedded to Enormous Projects

FLEX: RIGHT FOR ALL OPC UA IMPLEMENTATIONS

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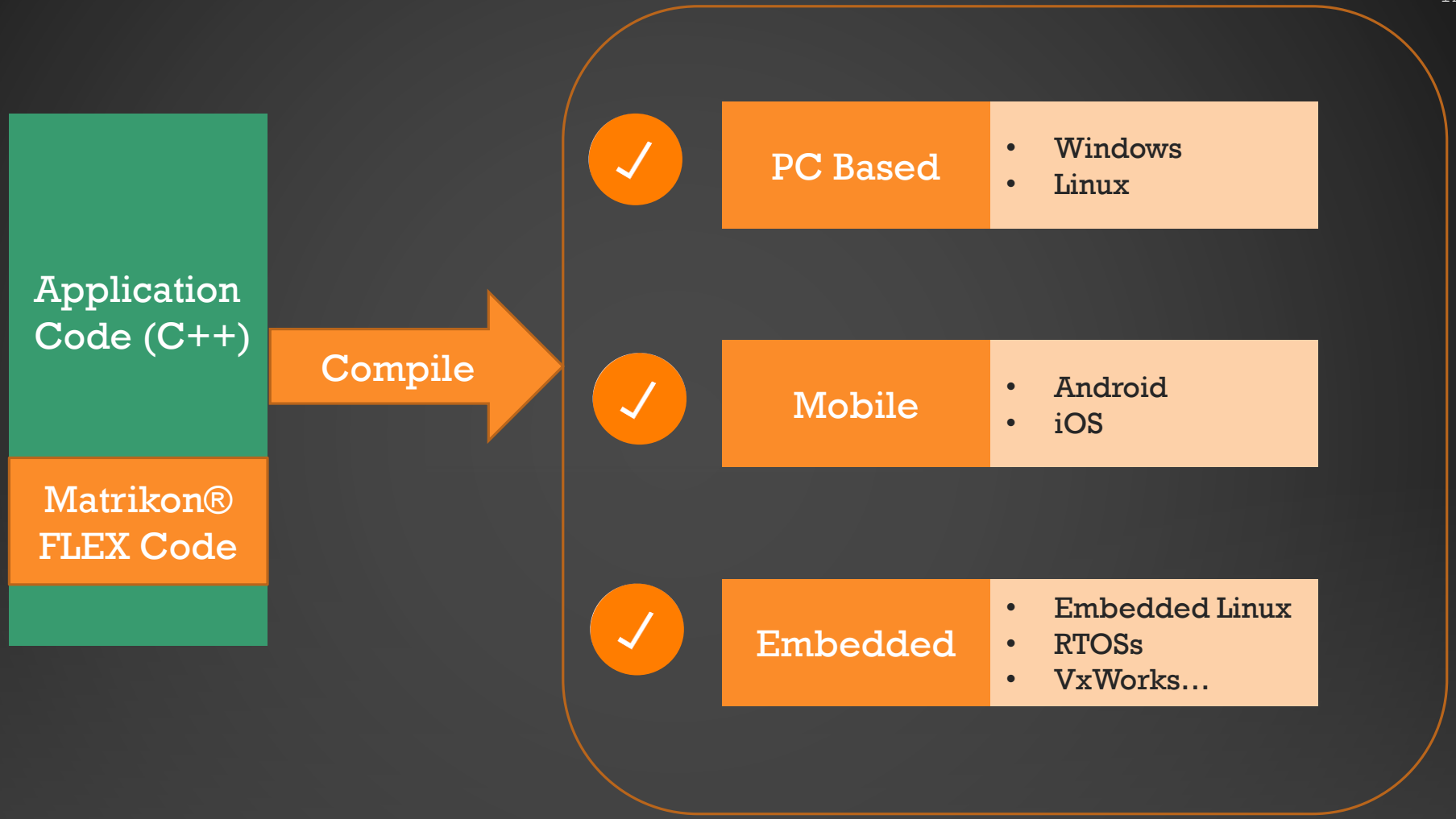
Interoperability



FLEX MONEY TRAIL QUESTIONS

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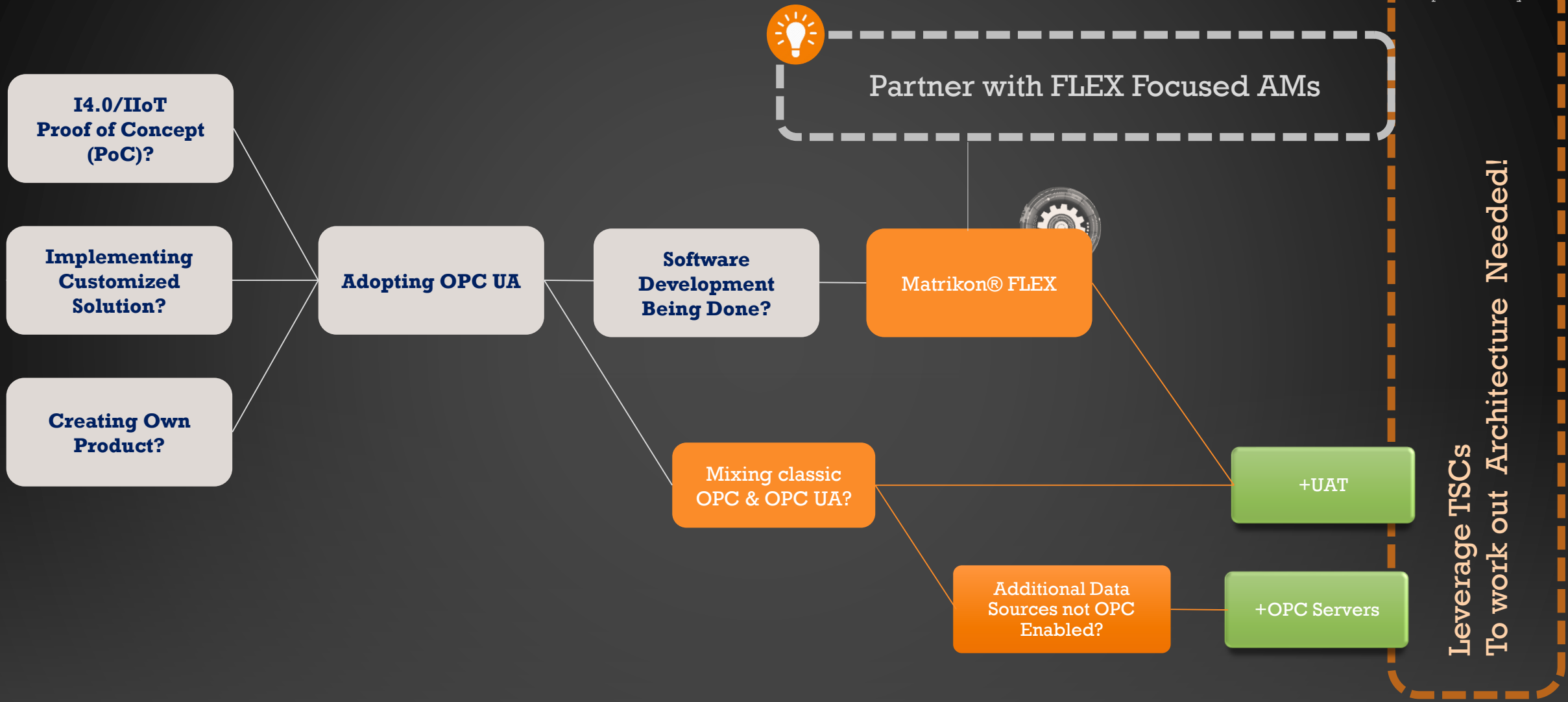
Powering Interoperability



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MATRIKON OPC SERVER FOR SIEMENS PLCs + UAT

OPC UA AND CLASSIC OPC CONNECTIVITY FOR SIEMENS SIMATIC S7 PLCs

SIEMENS PLC ACCESS – OPC UA & OPC

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- Key Siemens PLC Series:

Series	Status	Models	Matrikon Connectivity
Simatic S7	Current	200, 300, 400, 1200,1500	Yes
Simatic S5	Obsolete	N/A	No
TI5	Obsolete	TI505, TI525, TI535, TI545, TI555, TI565, TI575	Yes* [Unsupported]

- Better Together (AB+UAT)

- **Mix, Match, and Migrate** between classic OPC and OPC UA
- UAT enhances classic OPC connectivity

SIEMENS EMAIL BLAST

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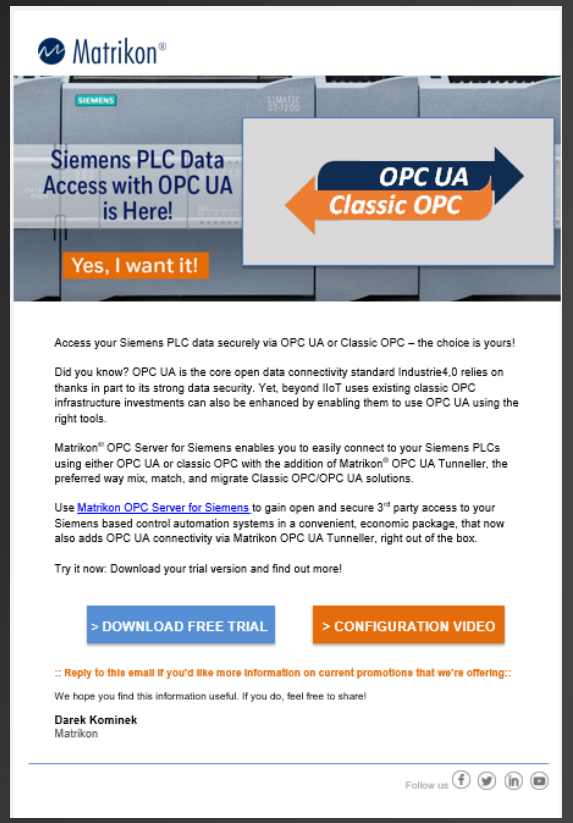
Interoperability



Email Blast

Web Page and Data Sheet Updates

SIEMENS S7 PLC MONEY TRAIL QUESTIONS…

Matrikon®
Powering Interoperability

Start

Easy Siemens Access

Siemens S7+UAT

- Any Data critical? → +ORB
- Remote Sites? → Need to Centralize? On Site History? → +ODH (High Capacity?)
- Adhoc Data Analysis? → +Excel Reporter +Easy Trender
- Additional NON OPC Sources? → +OPC Servers
- Asking about TI5 Connectivity? → [Unsupported] OPC Server for Siemens TI5

Leverage TSCs To work out Architecture Needed!

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Interoperability

MATRIKON OPC SERVER FOR MODBUS + UAT

OPC UA AND CLASSIC OPC CONNECTIVITY FOR MODBUS

(PLANT & TELEMETRY EDITIONS)

MODBUS ACCESS – OPC UA & OPC

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Interoperability

- most common legacy protocol
- has **many** variants
- has no timestamps
- has no security
- Uses registers addresses instead of named variables
- Has no context (ex. Units, structures)

Modbus is often available on systems using other protocols. If Matrikon does not support a protocol the customer is asking about → ask if Modbus is available!

- Matrikon® OPC Server for Modbus:
  - Supports over 600 different Modbus devices
  - Covers all major Modbus variants
  - Adds timestamps
  - Implements OPC Security (Who can do what)
  - Allows use of aliases instead of registers
- SCADA Class Version:
  - Supports thousands of device connections
  - 1 Million + OPC Items per serer
  - Handles slow and unreliable networks (common)
  - Supports round-robin calling via modem pools
  - A must for wireless environments…

- **Better Together** (Modbus + UAT) PLANT edition install combo coming soon.
- Note: UAT + Plant/SCADA versions can be used today!

SCADA MODBUS – TELEMETRY/WIRELESS MADE EASY

Matrikon®
Powering
Interoperability

- Easily overcome common Modbus connectivity challenges associated with wireless and distributed connections.
- Issues such as:
  - Wireless/telemetry lag: Radio comms like microwave or satellite have long, 10 ms+ lag times
  - **Intermittent connection loss**
  - Robust **Modbus Slave functionality** in various configurations
  - **Redundant channels capabilities** even if each is a different medium
  - **Massive number of items** (a major US city train system uses 1M OPC items per Matrikon server)
  - And more…

North Americans refer to "Telemetry solutions" as "SCADA solutions". Everywhere else, SCADA conjures up images of HMI screens (I.e. Graphical user representation of the data)

MODBUS MONEY TRAIL QUESTIONS…

Matrikon®
Powering Interoperability

Start

Easy Modbus Access

Modbus + UAT

- Any Data critical? → +ORB
- Remote Sites?
  - Unreliable Network to Modbus Source → OPC Server for Modbus SCADA
  - 100+Field Devices → OPC Server for Modbus SCADA
  - Dialup Connections, Round Robin? → OPC Server for Modbus SCADA
  - Need to Centralize? (Store & Forward) → +ODH + HL (High Capacity?)
- Adhoc Data Analysis? → +Excel Reporter +Easy Trender
- Classic OPC Connectivity Only? → +UAT (Classic) Functionality
- Push Data to different Applications? → +ODM | GDA

Leverage TSCs To work out Architecture Needed!

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Interoperability

MATRIKON OPC WORKSHOP

HANDS-ON TRAINING PROGRAM FOR OPC
MATRIKON OPC SYSTEMS INTEGRATOR (OPCSI) CERTIFICATION

OPC TRAINING EMAIL BLAST

Matrikon®
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Last OPC Trainings of the year
Hurry up and save your spot!

> OPC VIRTUAL Workshops

OPC Classic Fundamentals and Real World Architecture Virtual Training EMEA - October 8 - 9	**+ Save your Spot**
OPC UA: OPC Unified Architecture Virtual Training EMEA - October 10 - 11	**+ Save your Spot**
OPC Security Training – Industrial Security for OPC Virtual Training EMEA - October 12	**+ Save your Spot**
OPC Classic Fundamentals and Real World Architecture Virtual Training EMEA - October 14 - 15	**+ Save your Spot**
OPC UA: OPC Unified Architecture Virtual Training EMEA - October 16 - 17	**+ Save your Spot**
Industrial Security for OPC Virtual Training EMEA - October 18, 2018	**+ Save your Spot**
OPC Classic Fundamentals and Real World Architecture Virtual Training EMEA - December 10 - 11, 2018	**+ Save your Spot**
OPC UA: OPC Unified Architecture Virtual Training EMEA - December 12 - 13, 2018	**+ Save your Spot**
Industrial Security for OPC Virtual Training EMEA - December 14, 2018	**+ Save your Spot**

> OPC CLASSROOM Workshops

OPC Unified Architecture (OPC UA): LAST CALL Lyon, France - September 18 - 19, 2018	**+ Save your Spot**
Klassisches OPC Workshop & Real-World Architectures Cologne, Germany - October 8 - 9, 2018	**+ Save your Spot**
Les fondamentaux d'OPC Classique & des Architectures du monde réel Paris, France- October 9 - 11, 2018	**+ Save your Spot**
OPC UA: Unified Architecture Cologne, Germany - October 10 - 11, 2018	**+ Save your Spot**
Industrial Cyber Security for OPC Cologne, Germany - October 12, 2018	**+ Save your Spot**
OPC Classic Fundamentals & Real-World Architectures Johannesburg, South Africa - November 12 - 13, 2018	**+ Save your Spot**
OPC Unified Architecture (OPC UA) Paris, France - November 20 - 21, 2018	**+ Save your Spot**
OPC Unified Architecture (OPC UA) Barcelona, Spain - November 27 - 28, 2018	**+ Save your Spot**
OPC Unified Architecture (OPC UA) Dublin, Ireland - December 11 - 12, 2018	**+ Save your Spot**

:: New workshops and new updates are coming! Keep tuned for what is coming up next: Subscribe to our e-Communications HERE ::

Contact me if you need more info.

Chris Carew
OPC Specialist / Trainer

OPC HANDS-ON WORKSHOP

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- **3 Levels**
  - Level 1: OPC Classic Fundamentals & Real-World Architectures -2 days-
    - Day1: Introduction into Classic OPC and overview of existing solutions and architectures
    - Day2: In depth view into OPC (DCOM, Security, Troubleshooting)
  - Level 2: OPC Unified Architecture (OPC UA) -2 days-
    - Introduction into OPC UA (Vision, Concept, Structure, Possibilities)
    - Differences and Similarities to Classic OPC
  - Level 3: Industrial Cyber Security for OPC -1 day-
    - Application of OPC in Cyber Security context
- Practical and Virtual workshops
- Public or Private workshops
- On completition the participant becomes OPCSI certified (Level 1-3)

OPC HANDS-ON WORKSHOP

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- **Why does it make sense for sales to promote the OPC Workshops?**

  - Customers get introduction into Matrikon portfolio
    - Product awareness
  - Customers become familiar with the functionality and purpose of our solutions
    - Customer can better identify new areas where they can use our products
  - Customers become used to work with our products
    - Increased confidens into our products
    - Less support inquires / higher satisfaction level
    - Customer is getting more out of our producs
  - Customer becomes an OPC expert and therefore prefers OPC in his projects / drives more OPC projects.

→ Recurring sales!

OPC WORKSHOP MONEY TRAIL QUESTIONS…

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Start

Hands-on Training

Workshop

- Interested in specific OPC servers? → +OPC Servers
- Specific OPC project?
  - Further security requirements? → +SG
  - Redundancy Requirement? → +ORB
  - DCOM Issues? → +UAT
  - OPC Classic and OPC UA mix? → +UAT
  - Historical Data? → +ODH +HL
  - ODBC DB? → +GDA +ODBC Client
  - Project team not familiar with OPC? → +Private Workshop
- Complex Network/Architecture? → +Site Assessment?

Leverage TSCs To work out Architecture Needed!

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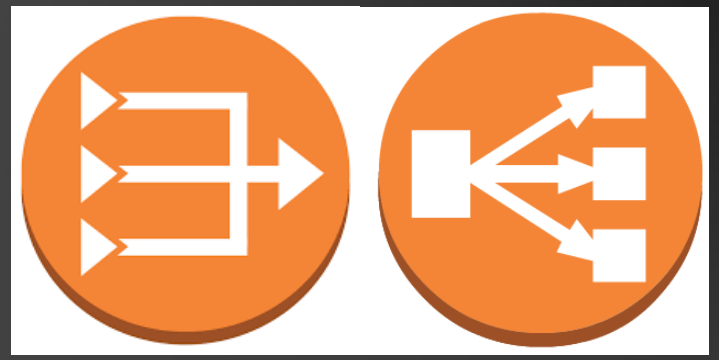
MATRIKONOPC FUNNEL
THE OPC GATEWAY

OPC TO OPC COMMUNICATION



OPC GATEWAY & COMPATIBILITY TOOL

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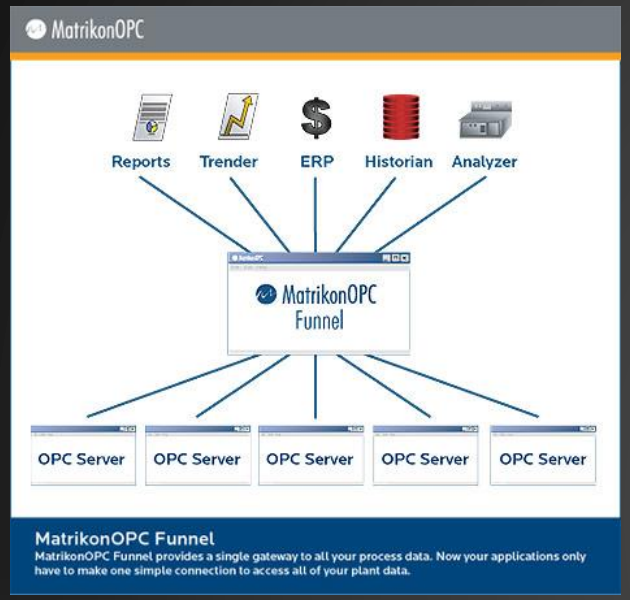


Matrikon OPC Funnel is an OPC-to-OPC Gateway

Concept:

The Funnel constists of a classic OPC DA & HDA client and a classic OPC DA & HDA server.

Functionality:

- Connect one Classic OPC Client to many Classic OPC Servers
- Connect many Classic OPC Clients to one Classic OPC Servers

Most common use cases:

- Creation of "one point of access" for OPC clients to several OPC servers
- Bypassing performance or licensing limitations imposed by OPC servers
- Addressing OPC compatibility issues of OPC clients & OPC servers

- Architectual considerations:
  - Can be used to connect Tunneller SSC to Tunneller CSC on "Jump Boxes" - Tunneller cannot be "cascaded" without Funnel to bridge the gap.
  - As an **OPC client to OPC client "bridge"** - Funnel can be used as an OPC server in between the OPC clients, to allow both clients to exchange data.

FUNNEL MONEY TRAIL QUESTIONS…

Matrikon®
Powering Interoperability

Start

The OPC Gateway

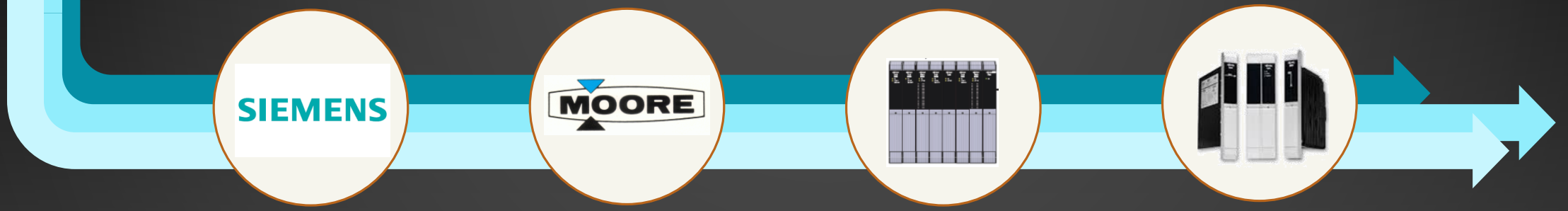
Funnel

- Data Sources not OPC Enabled? → +OPC Servers
- IT Security?
  - Just a Firewall between components? → + UAT
  - True DMZ involved? → +DMZ Agent
- OPC UA and Classic OPC Mix? → OPC UA Source? OPC UA Destination? → +UAT
- Transfer of DA Data to OPC Server? → +HL +Buffer
- Storing/Buffering DA Data? → +ODH + Buffer
  - Transfering HDA Data? → +HL
- Complex Network ? → +Site Assessment?

Leverage TSCs To work out Architecture Needed!

Matrikon®
Powering
Interoperability

MATRIKON OPC SERVER FOR SIEMENS MOORE APACS DCS + UAT



OPC UA AND CLASSIC OPC CONNECTIVITY FOR MOORE APACS DCSs

SIEMENS MOORE DCS ACCESS – OPC UA & OPC

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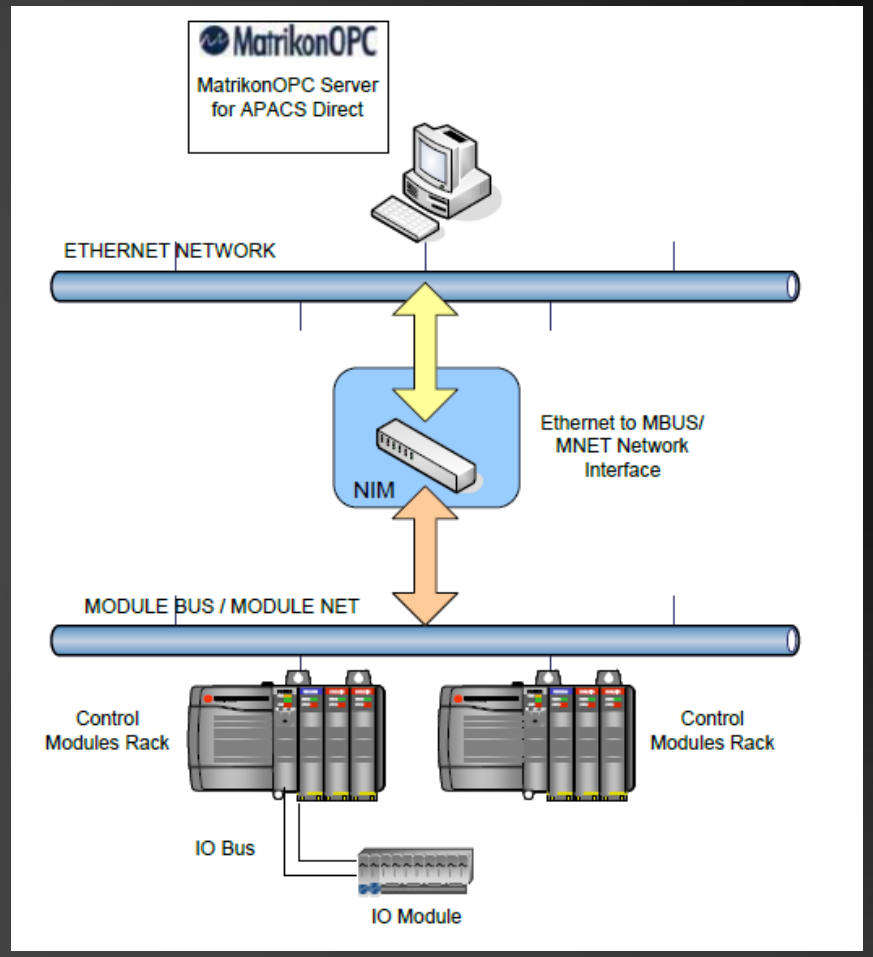
Powering
Interoperability

- Matrikon® OPC Server for APACS Direct communicates with Siemens MOORE APACS control and IO Modules via Network Interface Manager (NIMs) which then communicate with the underlying controllers.

  → Using NIMs allows our OPC Server to communicate with virtually all APACS controllers



- Better Together (Siemens MOORE APACS DCS + UAT)

- **Mix, Match, and Migrate** between classic OPC and OPC UA
- UAT enhances classic OPC connectivity

ROBUST APACS FUNCTIONALITY INCLUDED

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Interoperability

1. Advanced error recovery based on the OPC Quality for OPC Items
    1. Advanced OPC Quality display customization for better decision making.
    2. With multiple NIM's, supports load-balancing and redundancy
2. Fault Prediction - The OPC Server enables users to predict network failures or NIM failures.
    1. Network and NIMs performance monitoring to identify whether the current network and the number of NIMs are sufficient.
3. Configuration:
    1. Throttling options at the APACS resource level
    2. Supports standard Siemens Moore tag syntax making migration easy
    3. Get timestamps direct from the device or from the local PC - your choice
    4. Persistent OPC Server tag address space for fast tag additions
    5. Auto detection or manual addition of NIM's

SIEMENS MOORE APACS MONEY TRAIL QUESTIONS…

Matrikon®
Powering Interoperability

Start

Easy APACS Access

APACS DCS+UAT

- Any Data critical? → +ORB
- Remote Sites? → Need to Centralize? On Site History? → +ODH (High Capacity?)
- Adhoc Data Analysis? → +Excel Reporter +Easy Trender
- Additional NON OPC Sources? → +OPC Servers

Leverage TSCs To work out Architecture Needed!

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MATRIKON OPC SERVER FOR TRICONEX + UAT

OPC UA AND CLASSIC OPC CONNECTIVITY FOR TRICONEX

TRICONEX FAMILY USES

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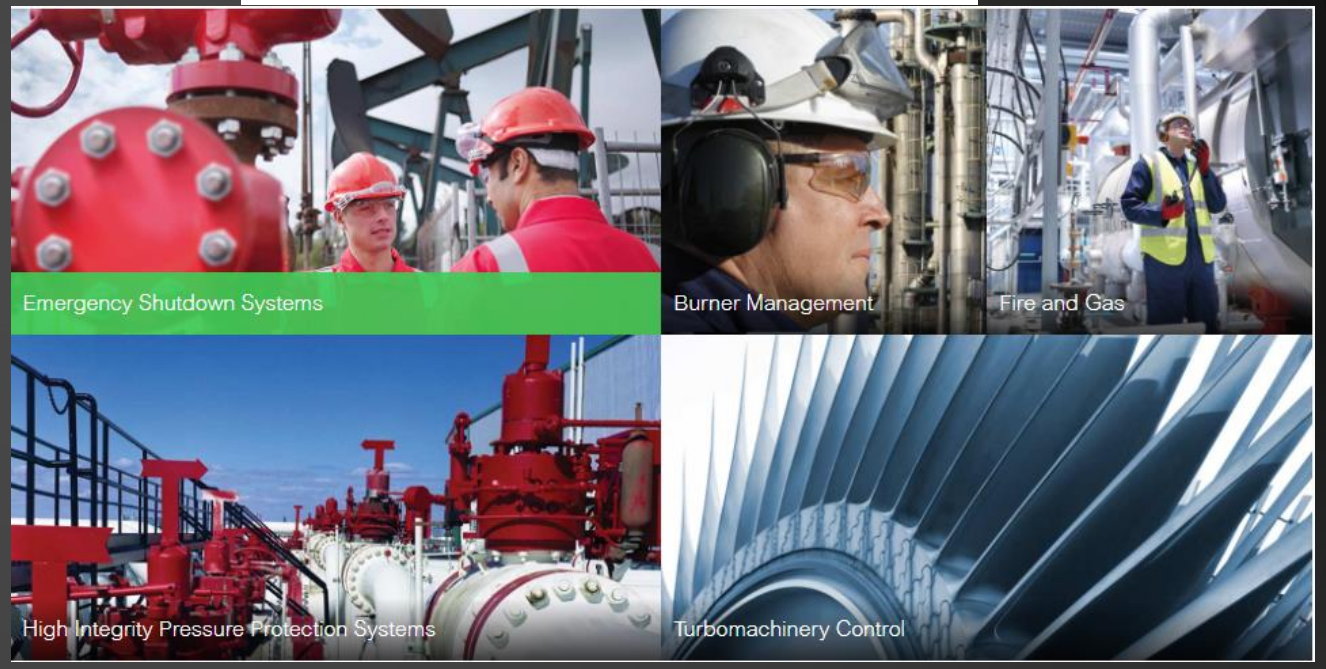
Interoperability

Typical verticals:

- Refining and petrochemicals
- Upstream and midstream oil and gas
- Chemicals and specialty chemicals
- Power generation
- Pharmaceuticals

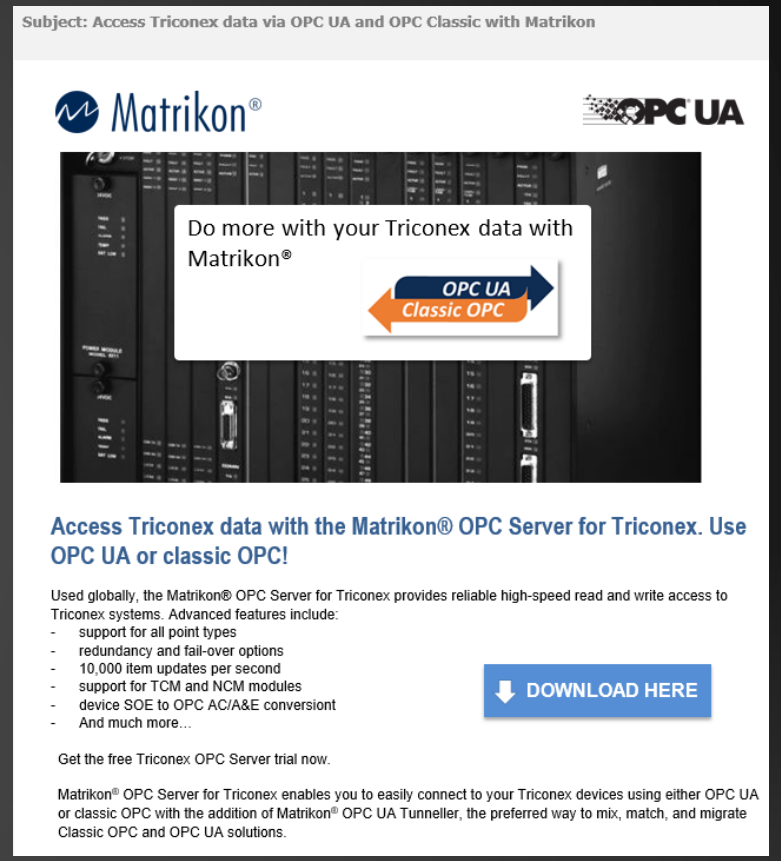
- Uses: Critical Applications
  - Emergency Shutdown
  - Fire and Gas
  - Burner Management Systems
  - High Integrity Pressure Protection Systems
  - Turbomachinery…



TRICONEX DATA ACCESS – OPC UA & OPC

Matrikon®
Powering
Interoperability

- Matrikon® OPC Server for Triconex provides reliable connectivity to Triconex controllers
  - →Redundancy and Failover options
  - →10k item updates per second
  - →Supports TCM and NCM modules
  - →Device SOE to OPC AC/A&E conversion
- **Developed with Invensys → <u>TriStation even exports items DIRECTLY TO MATRIKON FORMAT</u>**
- Better Together (Triconex DCS + UAT)



- **Mix, Match, and Migrate** between classic OPC and OPC UA
- UAT enhances classic OPC connectivity

MATRIKON SERVER HAS THE INSIDE EDGE!

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Interoperability

http://iom.invensys.com/en/pdflibrary/techinfo_triconex_tridentcommunicationcapabilities_03-10.pdf

The Trident's Main Processor and Communication Module support Modbus, Ethernet, Peer-to-Peer, and TriStation protocols.

Communication Capabilities

TSAA Client/Server Protocol

Triconex System Access Application is a master/slave protocol that allows an external device acting as a master to communicate with one or more Trident controllers. Typically, a client/server workstation connects to a DCS client

using TSAA protocol to access point data in the Trident controller.

Two client/server programs, DDE Server and OPC Server, use TSAA.

OPC Server for Triconex

OPC Server for Triconex is an OPC-compliant product available from

Matrikon. OPC stands for OLE for Process Control which is a standard set of non-proprietary interfaces used to develop client/server programs. OPC Server allows read and write access to Trident input, output, and memory variables, and system attributes.

Competitive Advantage: No other OPC Server for Triconex was developed with Invensys/Schneider. We have the OEM's endorsement. **Who would you trust with your critical systems?**

TRICONEX OPC SERVER - UPDATE

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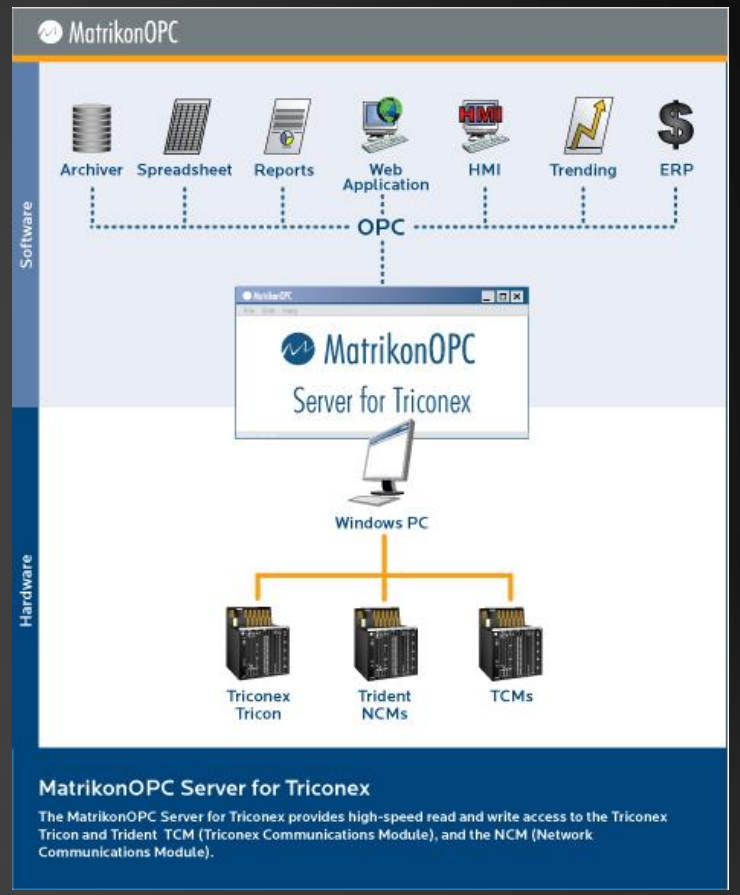
- Matrikon® OPC Server for Triconex new features
  - → Support of Windows 10 and Windows Server 2016
  - → Comes with UAT in one installation package
  - → Now supports SOEX files (previously only SOE)
  - → Support of Chinese, Japanese and Korean characters for parsing of SOE/SOEX files



- Triconex Background Information

  Two Triconex device models:

  - Tricon (most common)
    - No model numbers for Tricons, only "cabinets" (0,125m³ mini-racks) with card-like modules
    - Comm. modules interpret the commands from Triconex API and poll the processor modules
    - "extended" Tricons are processor & comm. modules with support of bigger register spaces (SOEX)
  - Trident (old and very rare)

TRICONEX MONEY TRAIL QUESTIONS…

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Powering Interoperability

Start

Triconex + UAT

Triconex +UAT

- Any Data critical? → +ORB
- Remote Sites? → Need to Centralize? On Site History? → +ODH (High Capacity?)
- Adhoc Data Analysis? → +Excel Reporter +Easy Trender
- Additional NON OPC Sources? → +OPC Servers
- Data exchange with other OPC servers? → Data Manager
- Push Data into SQL DB? → +ODBC Client / +ODM + GDA
- Complex architecture? → +Site Services

Leverage TSCs To work out Architecture Needed!

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MATRIKON INDUSTRIAL DATA GATEWAY

COMPLETE SHOP-TO-CLOUD SOLUTION

IDG – INDUSTRIAL DATA GATEWAY

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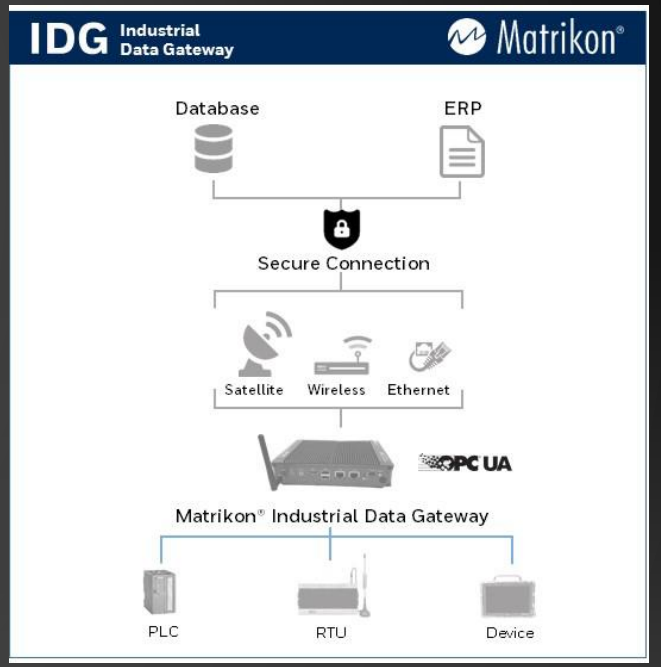
- **Matrikon IIoT Solution**
  - **Lanner hardware (Intel Atom E3825, 120GB SSD, 4GB RAM, 2xCOM, 2xLAN, HDMI/VGA, etc.)**
  - **Matrikon software**
    - **Always included: - ODH - UAT - ET - ORB - DA/HDA Explorer**
    - **Optional: - OEC -PerfMon - File Collector - HL**
  - **Microsoft software**
    - **OS: Windows 10**
    - **Optional: IoT Edge OPC Publisher / Azure IIoT OPC Twin**
- **4 versions**
  - PLC IDG (AB PLC, Siemens, Modbus, GE PLC, Mitshubishi, WITS)
  - Building Automation IDG (BACNet, JCN2, LONWorks, KNX, SNMP, Modbus)
  - Power IDG (Vestas, Mitshubishi Wind Turbines, GE Turbines, IEC 61850, DNP3)
  - SCADA IDG (SCADA Modbus, SCADA IEC, DNP3, OMNI Flow)
  - Future version: "Data Center – Energy Management IDG"



IDG: UNDER THE HOOD

Azure

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Microsoft Data
JSON over MQTT

Azure OPC Twin

OPC UA

OPC UA

Matrikon® UAT Wrapper

OPC Classic

OPC Classic

Matrikon® Security Gateway*

OPC Classic

Matrikon® OPC Servers & EdgeCalc*

Matrikon® UAT Proxy*

3rd Party Protocol

OPC Classic

OPC UA

Device

OPC Classic Server

OPC UA Server

* Optional Matrikon components, not required for base OPC←→Azure architecture

IDG MONEY TRAIL QUESTIONS…

Matrikon®
Powering Interoperability

Start

Industrial Data Gateway

- Data Sources not OPC Enabled? → +OPC Servers
- IT Security? → True DMZ involved? → +DMZ Agent, +Funnel +SG
- Complex Network ? → +Site Assessment?
- Transfer of DA Data to OPC Server? → +ODM
- Optional Products
  - Calculations? → +OEC
  - Historial Data Transfer? → + Store & Forward (HL)
  - Import of Data from Files? → + File Collector

Leverage TSCs To work out Architecture Needed!

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MATRIKON OPC SERVER FOR BACNET

COMMUNICATION PROTOCOL FOR BUILDING AUTOMATION AND CONTROL NETWORKS

OVERVIEW

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Standards

ANSI/ASHRAE Standard 185

(American Society of Heating, Refrigerating and Air-Conditioning Engineers)

ISO-16484-5

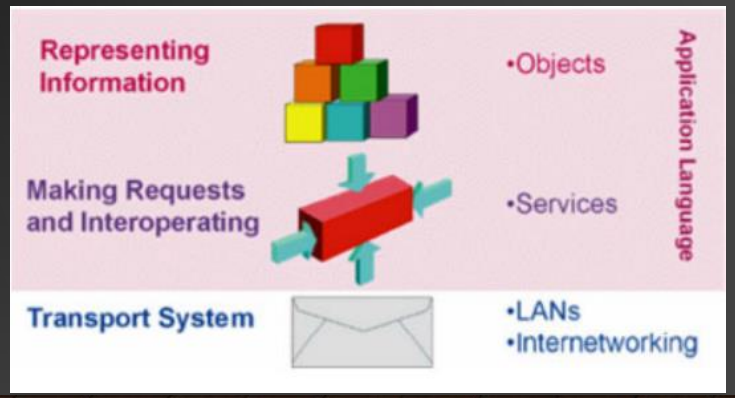
ISO-16484-6

Device areas

Objects (information)

Services (action requests)

Transport Systems (messages)



Network Types

IP

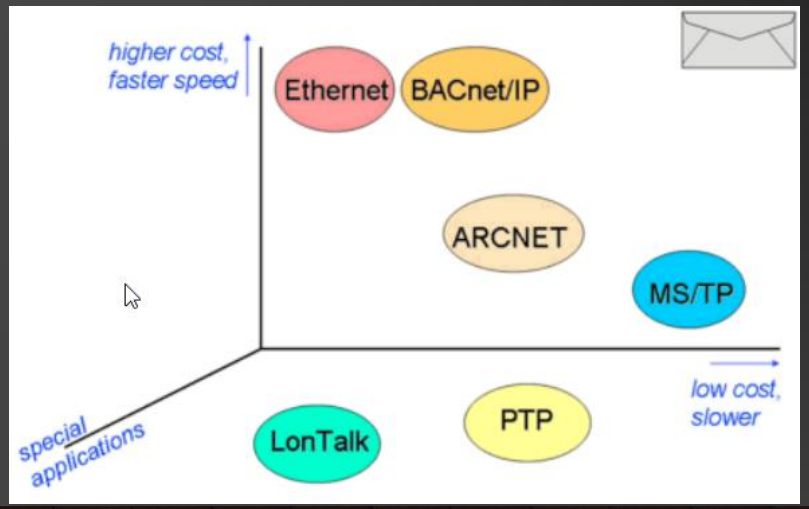
MS/TP (Master Slave/Token Passing)

ISO 8802-3 (Ethernet)

Point to Point

Over ZigBee

Over ARCNET



BACNET OPC SERVER FEATURES

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Interoperability

- All information within a BACnet system is represented by objects. Objects can be physical inputs or outputs, or they can be non-physical concepts like schedules or calendars.
- Connection Types:
  - BACnet Ethernet (BACnet/IP)
  - BACnet MS/TP (gateway device needed)
- Advantages:
  - Scalability (cost, performance and system size)
  - Adaptability to many of the existing BACnet systems
  - Internetworking (2 or more BACnet Networks) with multiple LAN types
  - Unlimited number of field devices that can connect to a master station
  - Enables the capability of remote monitoring for any BACnet vendor (property management)
  - Supports most of BACnet products tested and certified by BACnet Testing Laboratories (BTL)

BACNET OPC SERVER FEATURES CONTINUED

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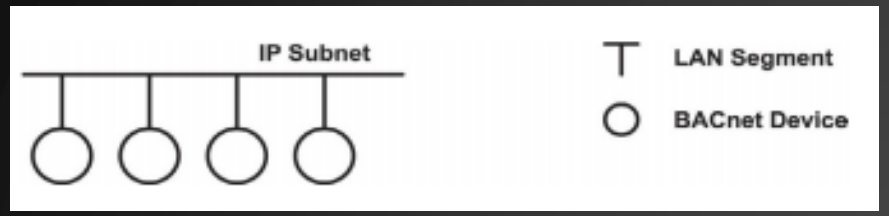
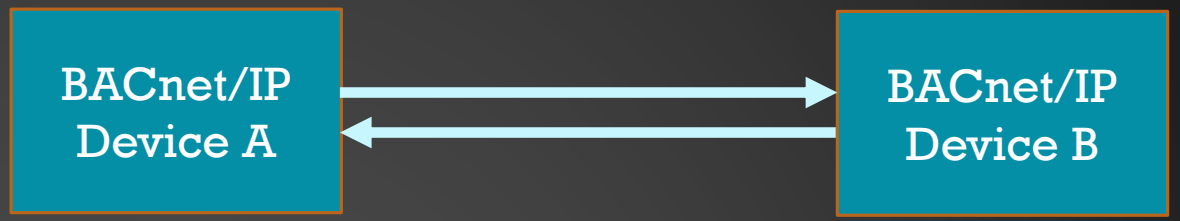
Interoperability

- Windows Operating Systems: Windows 7 to Windows Server 2016
- Discover Multiple BACnet networks: Global and local Broadcast
- Discovery Filter tab to remove unwanted properties for each object type
- Allows you to specify the BACnet device instance number to act as a BACnet device on the network
- Cimetrics (*Company Name*) BACstac (*Interface software*) is used to connect all BACnet Devices to our OPC server
- Three ways to communicate with BACstac (Port, BBMD, Foreign Device)
- BBMD will send any received broadcast messages as directed messages through the IP router to its partner BBMD devices
- Foreign Device Registration (FDR) allows the BACnet/IP device or application to send its broadcast messages to a BBMD

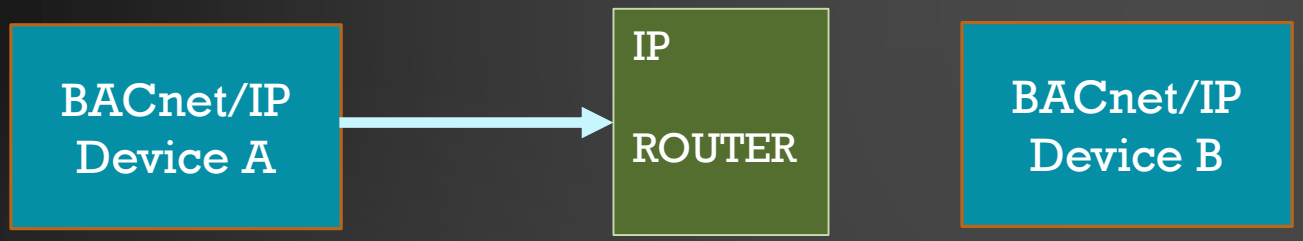
BACNET NETWORK EXAMPLES

Matrikon®
Powering
Interoperability





BACnet network with a single subnet. Device A sends a "Who-Is" Broadcast and Device B responds with an "I-Am" that carries networking information that allows Device A to read/write properties on Device B

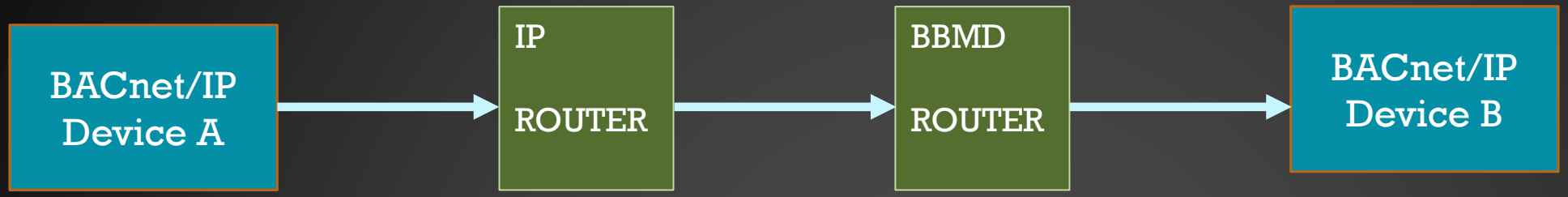


If more than one subnet comprises the BACnet/IP network, there is an issue. The IP router and the Who-Is is thrown away by the IP router and not delivered to Device B

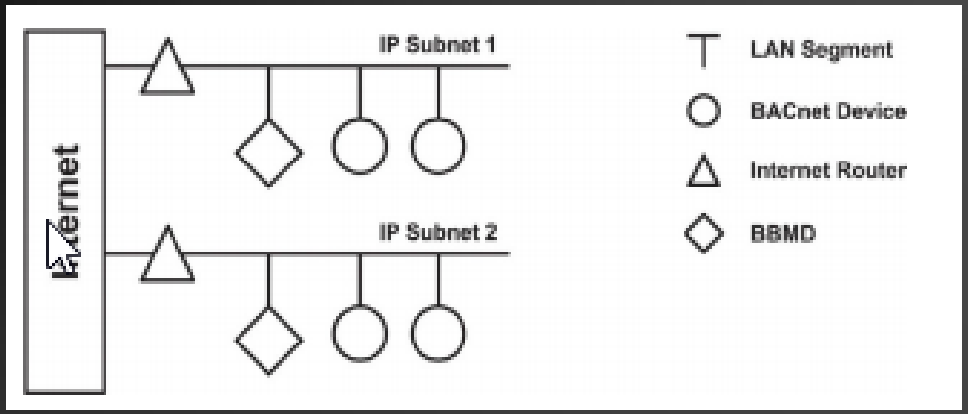
If the BACnet Devices are interconnected via IP Routers then these broadcast messages will be blocked.

BACnet solves the IP router issue by utilizing a BACnet/IP Broadcast Management Device (BBMD)

BACNET NETWORK EXAMPLES

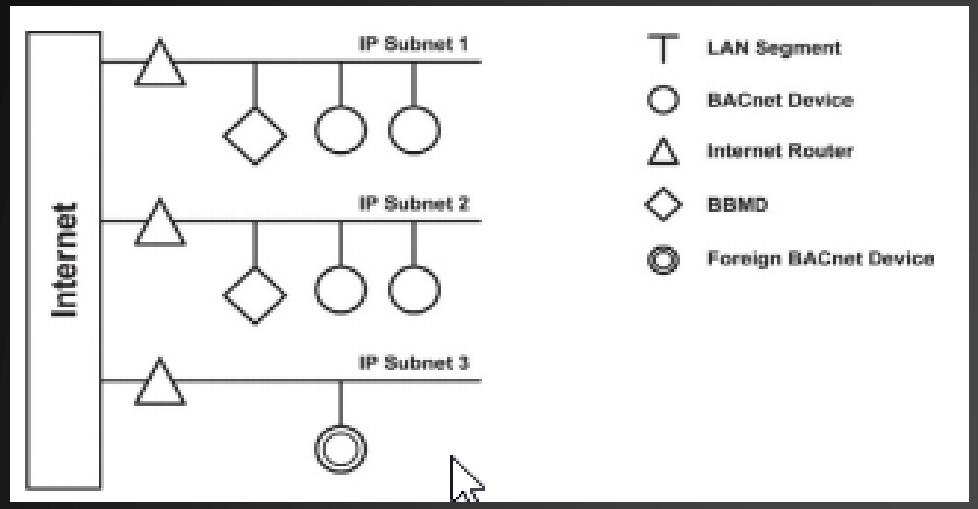


The BBMD will send any received broadcast messages as directed messages through the IP router to its partner BBMD devices



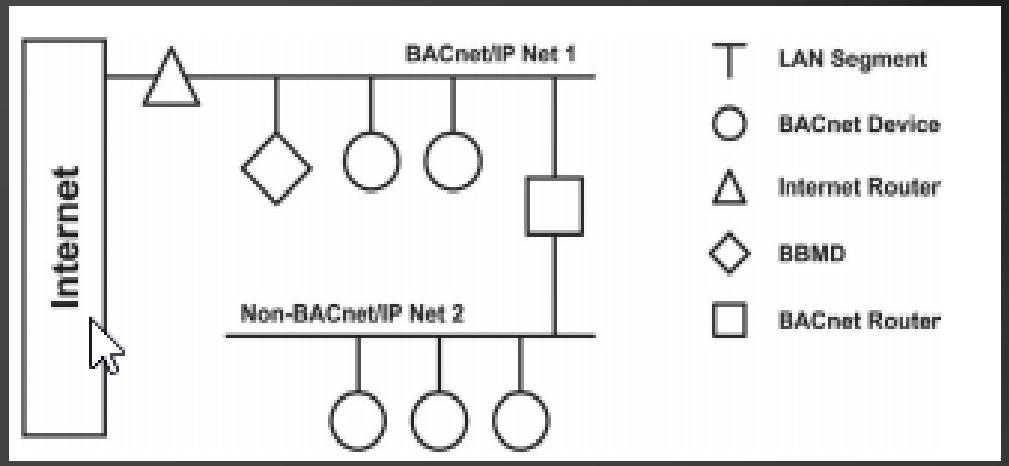
BACnet/IP network with more than one subnet .
A BBMD located on an IP subnet monitors the origination of a broadcast message on that subnet and, in turn, constructs a different broadcast message. BBMD's must know the IP address of all other BBMD's in the network.

BACNET NETWORK EXAMPLES



It is possible to communicate to a device on a subnet that does not have a BBMD. This type of device called a Foreign Device. It resides on a different subnet or different BACnet port number without BBMD.
If the Foreign Device registers with the BBMDs, it must maintain a Foreign Device Table (FDT)

Non-BACnet/IP data link is attached via BACnet router
It creates two networks but one BACnet internetwork



BACNET MARKET AND APPLICATIONS

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Markets

- Industrial
- Transportation
- Energy Management
- Building Automation
- Regulatory, Health and Safety

Applications

- HVAC Controls
- Lighting Controls
- Security (Access control)
- Fire detection/suppression systems
- Smart Elevators
- Fault detection and diagnostic systems

Competitors

- Kepware
- Cimetrics
- Scadaengine
- Chipkin
- Inneasoft
- MasterOPC
- CBMS Studio
- IntesisBox

BACNET MONEY TRAIL QUESTIONS…

Matrikon®
Powering Interoperability

Start

Easy BACnet Access

BACnet

- Any Data critical? → +ORB
- Remote Sites? → Need to Centralize? On Site History? → +ODH (High Capacity?)
- Adhoc Data Analysis? → +Excel Reporter +Easy Trender
- Additional NON OPC Sources? → +OPC Servers
- Data exchange with other OPC servers? → Data Manager
- Push Data into ODBC DB? → +ODBC Client / +ODM + GDA
- Complex architecture? → +Site Services

Leverage TSCs To work out Architecture Needed!

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MATRIKON OPC EXCEL REPORTER



EASY SCHEDULED AND AD-HOC OPC DATA REPORTS AND ANALYSIS

OPC EXCEL REPORTER

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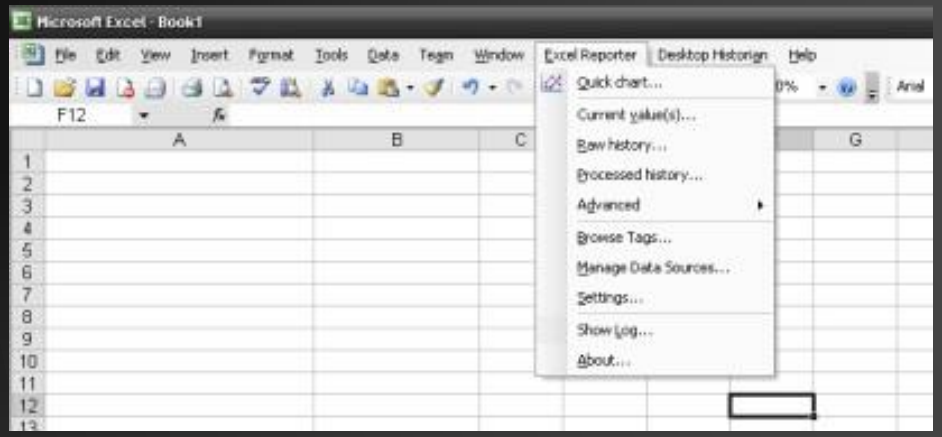
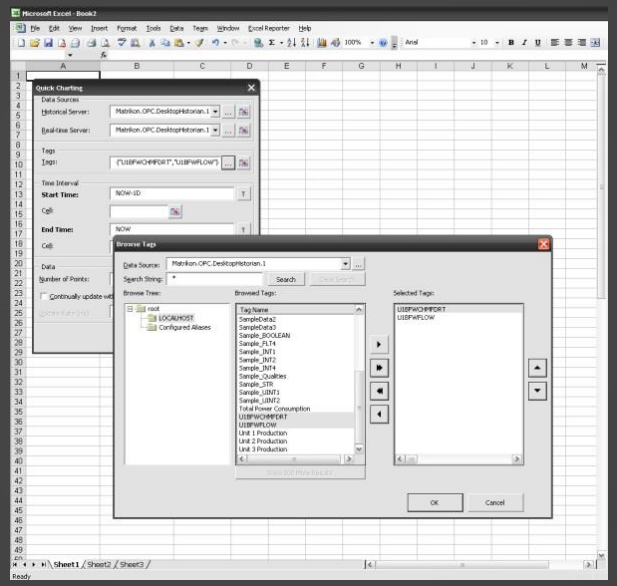
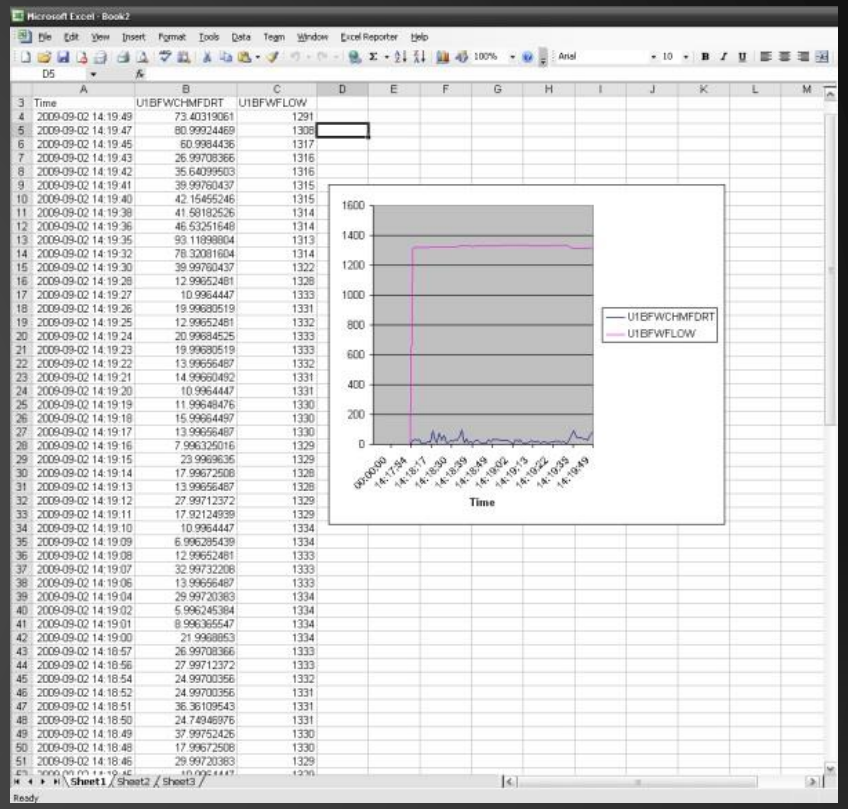
- The easiest way to work with OPC Data for reports, analysis, or engineering work.
- Use the scheduling function to run reports automatically: on-time, every-time!
- OPC DA & OPC HDA supported







1. Open OPC Excel Reporter

2. Choose OPC Server, Browse and use OPC Items you need

2. Start working with your OPC real-time and historical data!

OPC Excel Reporter vs. OPC Edge Calc = Reports/Analysis vs. Real Time calculations & feedback

OPC EXCEL REPORTER MONEY TRAIL QUESTIONS…

Matrikon®
Powering Interoperability

Start

OPC Excel Reporter

- Data Sources not OPC Enabled? → +OPC Servers
- IT Security / Complex Network → Firewall? → +DMZ Agent or UAT
- Optional Products
  - Real time Calculations? → +OEC
  - Historial Data Transfer? → + Store & Forward (HL)
  - Import of Data from Files? → + File Collector

Leverage TSCs To work out Architecture Needed!

COMING UP NEXT :

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Matirkon Reliability Drive

Server **Redundancy**	Connection **Resiliency**	Data **Recovery**
Matrikon® Redundancy Broker (ORB)	Matrikon® OPC UA Tunneller	Matrikon® ODH + HistoryLink
Eliminate OPC single point of failure (real-time)	- Reconnect in unstable networks - data privacy/integrity	- Capture key data at source - Forward data lost during connection loss

GO TO SITES…

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- www.matrikonopc.com
  - LANDING PAGES
  - DATA SHEETS
  - USER MANUAL
- Share Point
- Playbook
- Vault
- MatrikonOPC Support KB
- OS Compatibility Chart
- TSC Engagement Guide
- Hardware Licensed Products
- RELEASE overview and NOTES

- TOP 31 Quickstart guide
- Videos
- Videos on YouTube
- Training Schedule Calender

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Interoperability

CLOSE THE FEEDBACK LOOP:

Have questions or suggestions on how to make this guide better?
Let us know!

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