Agenda

Related Sessions

- FactoryTalk Historian Product Family Overview
- FactoryTalk Historian Site Edition v4.00 – What’s New?
- FactoryTalk Historian Site Edition v4.00 – Design Considerations
- FactoryTalk Historian Site Edition v4.00 - Post Installation Activities
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FactoryTalk Historian Product Family Overview

FactoryTalk Historian Site Edition v4.00 – What’s New?

FactoryTalk Historian Site Edition v4.00 – Design Considerations

FactoryTalk Historian Site Edition v4.00 - Post Installation Activities
Strategic Partnership

Rockwell Automation

- Leadership in Automation and Information Solutions
- Solution Provider
- Automation and Controls Expertise
- Solution Platform

OSIsoft

- Real-time Performance Management Software Products
- Technology Provider
- Data Historian and Context Experts
- Product Platform
Distributed Historian Strategy

The Right Information, at the Right Time, with the Right Fidelity…
Agenda

Related Sessions

FactoryTalk Historian Product Family Overview

**FactoryTalk Historian Site Edition v4.00 – What’s New?**

FactoryTalk Historian Site Edition v4.00 – Design Considerations

FactoryTalk Historian Site Edition v4.00 - Post Installation Activities
What’s New in FactoryTalk Historian Site Edition v4.00?

- FactoryTalk Services Platform CPR 9  SR 6
  - Two FactoryTalk Historian Site Edition Servers (or Collectives) in one FactoryTalk Directory
- New OSI PI Server
  - PI Server 2012 (x64 - 390.16)
- New Data Access License Options
- FactoryTalk DataLink 5.0
- FactoryTalk VantagePoint EMI v5.0 Bundled
New FactoryTalk Historian Server

- FactoryTalk Historian 4.0 –
  - Based on OSIsoft PI Server 2012
  - Increased Performance (Factor of 2)
    - Events/Server From 50,000 to 100,000
  - Increased Tags on FactoryTalk Historian Server (Factor of 5)
    - Tags From 100,000 to 500,000
  - Increased points on FactoryTalk Live Data Interface
    - Tags From 20,000 to 50,000
    - Events/Second From 20,000 to 25,000 (15,000 to 20,000 Redundant)
  - Improved Backfilling of Archive Files
Data Access License Options

- **Data Access**
  - Defined as the following components
    - PIOLEDB Data Provider
    - JDBC Data Provider
    - OPC DA and HDA Servers
    - Web Services
  - **New Option to license**
    - PIOLEDB Data Provider
    - OPC Connectivity – OPC DA and HDA Server
FactoryTalk DataLink 5.0

- Integration with Office 2013 (32bit only)
  - Supports the following x86 versions Excel
    - 2007
    - 2010
    - 2013

- Asset Framework Support
  - Work with Assets and Tags
    - Accept Asset Framework attributes as equals to Tags
  - Integrated Search Functionality to locate information quickly
Windows Integrated Security Model

- V2.x used FactoryTalk Security:
  - Users: FactoryTalk Historian installation created 4 “FactoryTalk Historian” Groups
  - Computers: Were required to join the FactoryTalk Directory
  - PI Connections: Were relatively automatic

- V4.00 uses Windows Authentication
  - Users: Now managed with Windows (Domain preferred)
  - Computers: Still required to join the FactoryTalk Directory
  - PI Connections: Require mapping Windows Users/Groups to FactoryTalk Historian
    Users/Groups using System Management Tools > Security > Mappings & Trusts > Mappings

- Applies to FactoryTalk Historian Asset Framework (FTHAF) as well

- For more information, refer to:
  - KB AID 533433 - FactoryTalk Historian SE v3.xx: Configuring Security (Video)
  - KB AID 471159 - FAQ: FactoryTalk Historian v3.xx Asset Framework Server
FactoryTalk Historian to Historian Interface

- A modified version of the OSIsoft PI to PI Interface
- Used to move archive data from FactoryTalk Historian Site Edition to another
  - Destination will always be FactoryTalk Historian Site Edition v3.00 (or higher)
- Also used to move data from FactoryTalk Historian Machine Edition to a FactoryTalk Historian Site Edition Collective

For more information, refer to KB AID 58662 - FAQ: The Rockwell Automation FactoryTalk Historian to Historian Interface and the OSIsoft PI to PI Interface.
FactoryTalk Historian Batch Interface

- A modified version of the OSIsoft PI Batch Generator (PiBaGEN) Interface
- Used to interface with FactoryTalk Batch
- Only supported on a dedicated host:

For more information, refer to KB AID 115328 - FAQ: The Rockwell Automation FactoryTalk Batch Interface and the OSIsoft PiBaGen Interface.
Agenda

Related Sessions

FactoryTalk Historian Product Family Overview

FactoryTalk Historian Site Edition v4.00 – What’s New?

FactoryTalk Historian Site Edition v4.00 – Design Considerations

FactoryTalk Historian Site Edition v4.00 - Post Installation Activities
Links to roughly 90% of the information contained in this presentation can be found in the Rockwell Automation Knowledgebase in one Answer ID: 56070 – FactoryTalk Historian SE Tips and Best Practices TOC.

Rockwell Automation Support Center

Resolve Your Technical Issues Quickly and Accurately

The Rockwell Automation Support Center is your 24/7 support for the answers you need now.

With the Support Center, you can:
- Search for public answers
- Request notification updates
- Access the public forums
- Get help with master disks & activations
- Download patches, firmware & drivers
- Manage & organize your account

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- Gain full access to premium answers
- Access all forums
- Submit questions
- Chat Live
- Download software updates

The intent of this session and 56070 is to make a user aware of the numerous variables that must be considered when designing a FactoryTalk Historian Site Edition System.
A typical FactoryTalk Historian Site Edition system consists of the following software components (or roles):

- Network FactoryTalk Directory Server (FTD) (1)
- FactoryTalk Historian Server (1)
- FactoryTalk Asset Framework Server (1)
- SQL Server (Express or Standard) (1)
- FactoryTalk Historian Live Data Interface(s) (1+)
- FactoryTalk Live Data Server(s) (1+)
- FactoryTalk Historian Client(s) (1+)
- Internet Information Server (IIS)* (1)

* Only if using FactoryTalk Security Services, FactoryTalk Historian Web Services or FactoryTalk ActiveView Client

Can all these roles coexist on a single computer?
A single host FactoryTalk Historian Site Edition system is **good** (supported).

However, it is not recommend because:

- “All eggs in one basket”
- Potential for resource conflicts
- No data collection buffering
- No client server autonomy
- Challenging to expand or modify

A single host system that includes FactoryTalk VantagePoint is also supported **within limits**: 62869 - FactoryTalk Historian SE and FactoryTalk VantagePoint on a Single Host Computer
A two host FactoryTalk Historian Site Edition system (ignoring clients) is better:

- Host 1: FTD, Historian Server, Asset Framework Server, SQL Server
- Host 2: Historian Live Data Interface and Data Server (RSLE)

A two host system leverages data collection buffering (aka store and forward). However, its scalability is limited and the potential for resource conflicts still exists on Host 1.
A three host FactoryTalk Historian Site Edition system (ignoring clients) is best:

- Host 2: FactoryTalk Historian Server
- Host 3: FactoryTalk Historian Live Data Interface and Data Server (RSLE)

A three host system is the Best Practice because it is the most scalable and minimizes the potential for resource conflicts.
High Availability

If you require highly available data for reporting, then you need redundant servers (a Collective).

If you require minimal data loss, then you need redundant interface nodes.

System Management Tools


PI SDK

Secondary Historian

Primary Historian

Configuration Changes

Data Buffering Services

Historian Interfaces
Interface Redundancy

Recommendation is to have the Interface node on the same computer as RSLinx® Enterprise.
Interface Redundancy (Con’t)

- One host should be designated as the “Primary Data” with the responsibility of the Primary Interface Node and Primary Data Server. The second host is designated as “Secondary” with the responsibility of the Secondary Interface Node Server and Secondary Data Server.

**Good**

- **Server #1**
  - Data Server Primary
  - Interface Node Primary

- **Server #2**
  - Data Server Secondary
  - Interface Node Secondary

**Bad**

- **Server #1**
  - Data Server Primary
  - Interface Node Secondary

- **Server #2**
  - Data Server Secondary
  - Interface Node Primary
‘Phase 1’ Interface Failover

Phase 1 Failover
Failover detection by configuring redundant failover tags

In either a Redundant FactoryTalk View SE Server or a redundant controller

Phase 1 method requires write-back to HMI system or a controller.
Phase 2 Failover

Failover detection is handled by utilizing a common share between the two interface nodes.

Phase 2 method uses a file share and is preferred over Phase 1.
Accomplished by having two Historian servers - serve data to clients
Factory Talk Historian Site Edition Server Limits

- Two (2) per FactoryTalk Directory
  - Or two (2) Collective consisting of 2 members
- 500,000 Tags
- 100,000 Events/sec (sum all events on all interfaces)
- 50 Inbound Connections - this could be 50 FactoryTalk Live Data Interface (FTLD) nodes maximum or (25 Redundant pair) or 50 FactoryTalk Machine Edition modules
- 20 Clients maximum
  - FactoryTalk View, VantagePoint, DataLink, ProcessBook, ActiveView
Factory Talk Historian Live Data Interface Limits

- **Tags on scan**
  - 25,000 events/sec on one Interface

- **Tags on scan – redundant interface**
  - 20,000 events/sec on one redundant interface pair

- **Total Interfaces per FactoryTalk Historian Server**
  - 50 interfaces per server or 25 redundant pairs
Derived Tags

- **Performance Equations**
  - Can be very CPU intensive
  - Make sure your Performance Equations are not too complicated
  - Consider the use of Offsets
  - Consider potentially utilizing ACE for more complex tasks
    - ACE can be installed on a separate computer

- **Statistical Totalizers**
  - Has a measurably less impact on resources
Depending on the server performance, some of those components are recommended to be installed on a separate server:

- Advanced Computation Engine (ACE)
- Data Access (OLEDB, OPC DA, OPC HDA, OLEDB Enterprise, Web Services)

These components typically require more resources than you would want to co-locate on the same server.
Virtualization Considerations

- Virtualization is supported. For more information, refer to [AID 30209 - Rockwell Software in Virtual Environments](#).

- However, the same architectural considerations apply:
  - 1 guest image: good (supported), but not recommended
  - 2 guest images: better, but should be on two physical hosts
  - 3 guest images: best, but should be on two physical hosts (three preferred)

Host 1:
- Guest image for Server

Host 2:
- Guest image for Interface
FactoryTalk Historian Site Edition v4.0
Microsoft Platform Requirements

- **Server**
  - **Operating Systems**
    - Windows 2008 R2 SP1 (64 bit)
  - **Software**
    - SQL Server 2008 R2 (32/64 bit) Express or Standard Edition
    - SQL Server 2012 (32/64 bit) Express or Standard Edition

- **Interfaces**
  - **Operating Systems**
    - Windows 2008 R2 SP1 (64 bit), Windows 2008 SP2 (32 & 64 bit)
    - Windows 7 Pro SP1 (32 & 64 bit), Windows XP Pro SP3 (32 bit)

- **Clients**
  - **Operating Systems**
    - Windows 7 Pro SP1 (32 & 64 bit), Windows XP Pro SP3 (32 bit)
    - Windows 2008 R2 SP1 (64 bit), Windows 2008 SP2 (32 & 64 bit)
Domain & Workgroup Configurations

- Common requirements
  - Unique IP address
  - Unique computer names
  - Proper name resolution

- Differences
  - PC configuration
  - User name authentication
  - Security
  - Connectivity
Workgroup Considerations

**Workgroups:**

- FactoryTalk Historian requires full name resolution to be working on:
  - Server, Interface and Client
  - Which means you either have to specifically install a DNS server, or a manual host file has to be maintained on both FactoryTalk Historian server and FactoryTalk Historian clients, where:
    - All clients are referenced in the server host file, and
    - The server is referenced in all the client host files.
**Workgroup** - Decentralized administration

- **Workgroups Advantages:**
  - No domain controller (Windows Server OS) to purchase.
  - One less computer in network to maintain.
  - Recommended only for small FactoryTalk Historian Site Edition applications where user accounts don’t change often.

- **Workgroup Rules:**
  - All computers participating in a single application must be members of the same Windows workgroup.
  - All users participating in the workgroup must be members of the Administrator’s group.
  - Create the same set of user accounts and passwords on every computer in a FactoryTalk Historian Site Edition application.
Domain - Centralized administration

**Domain Advantages:**

- Centralized administration
- Automated name resolution when used with DHCP, DNS, WINS
- Recommended for larger FactoryTalk Historian Site Edition applications, or environments with changing user accounts

**Domain Rules:**

- For applications consisting of more than 10 computers, a domain controller is required.
- The domain controller should be its own independent PC that does not contain any application software installations of any kind.
- The FactoryTalk Historian Site Edition Server and FactoryTalk Directory should **not** be installed on the same computer as the domain controller.
Domain Controller

- Rockwell Software® does not support running application software on computers configured as domain controllers.

- The following information comes from a Microsoft TechNet article: [http://www.microsoft.com/technet/prodtechnol/windows2000serv/maintain/security/secdefs.mspx](http://www.microsoft.com/technet/prodtechnol/windows2000serv/maintain/security/secdefs.mspx) The key sentence in this TechNote is “...Microsoft does not recommend running applications on computers configured as domain controllers, and certainly not applications that require more than Authenticated User privileges in order to run successfully.”

- Installation of any application software on a domain controller can have adverse affects on the network and system performance.

- A domain controller should **NOT** refer to itself as the time keeper
  - 3rd-party devices can exist within the domain controller to be the time keeper
FactoryTalk Directory Limits

- Two Historian Servers per Network
  - FactoryTalk Directory (FTD)
    - The Local FactoryTalk Directory is not supported host for Historian
- Historian icons are located under:
  - System | Connections | Historical Data
- FactoryTalk Live Data interfaces installed under the Historian they are connected to.
- Historian has Scope of all applications in the FactoryTalk Directory
Area Best Practices

- Any 1 Area contains only 1 Server of any type (HMI or Data)
- Any 1 installation of a server instance is referenced 1 time. Value is then “shared” with the application.
- Use proper load balancing of components to keep steady state CPU utilization <40%

**Recommended Architecture:**
- No duplication of data servers.
- Each data server in its own Area.
- HMI server and data server(s) are separated by Areas.

**NOT Recommended Architecture:**
- Do not duplicate data servers!
- Do not have more than one data server in one Area!
- Do not put HMI server & data server in the same Area.
FactoryTalk Historian Scan Types

**Advised Mode:**
- Standard scan type
- Used for most applications
- Less load on data server
- Less communication

**Basic Concept:**
- System subscribes to changes at a defined interval, i.e. one second
- The system will automatically inform system of changes to tags based on the defined interval.

**Default Polled Mode:**
- Optimized Polled scan
- Used to force records at a defined interval
- Higher load on data server (polled every scan cycle for updates)

**Basic Concept:**
- System subscribes to changes at a defined interval, i.e. one second.
- If there is no change to the value, a record is created with the previous value and a new timestamp.

**Poll from Device Mode:**
- Highest load on data server (Data server is forced to check tag value every scan cycle)
- Used for triggers to make sure the exact value from the devices are recorded when triggered.

**Basic Concept:**
- Tags are defined with triggers
- When triggered the system will read the current value directly from the device
FactoryTalk Historian Client Considerations

What are the FactoryTalk Historian clients?

- FactoryTalk VantagePoint
  - Native FactoryTalk Historian Integration and Trending
- FactoryTalk View Site Edition
  - Native Trending from FactoryTalk Historian
- FactoryTalk Historian DataLink
  - Excel Add-In
- FactoryTalk Historian ProcessBook
  - Advanced Analytics Client
**Historian Client Considerations**

**When are these clients used?**

- **FactoryTalk VantagePoint**
  - Is the client platform for multiple type of applications:
    - Portal
    - Dashboard
    - Reports
  - Has native access to FactoryTalk Historian
  - Used for mainly all pre-configured content to the majority of users in a plant
  - Used with reporting from disparate data sources – including FactoryTalk Historian

- **FactoryTalk View Site Edition**
  - Native integration – optimally used with all FactoryTalk View Site Edition installation and should be used instead of the FactoryTalk View Datalogger
Historian Client Considerations (con’t)

When are these clients used?

- FactoryTalk Historian DataLink
  - Is used for Excel reporting – mainly when the reporting is only from Historian. If multiple disparate data sources are required – FactoryTalk VantagePoint should be considered instead.

- FactoryTalk Historian ProcessBook
  - Used typically for ad hoc reporting and especially for quality investigation and optimization run by like QA personnel and Lean and Six Sigma professionals.
Firewalls

- The most important aspect of a firewall is that it is at the entry/exit point of the networked system it protects – not within it!

- A firewall is designed to “block” network traffic on one segment of a network from reaching another.
  - This is inherently bad for a distributed system that depends on remote communications.
  - The opening of ports within a firewall may present a security concern, and an IT security expert will need to be involved in the configuration.

- 29402 - TCP ports used by Rockwell products
  - Many other components (such as DCOM and MS authentication services) assign ports at runtime (dynamic).
**Network Firewall**

- If the FactoryTalk Historian Clients or interfaces are segregated from the FactoryTalk Historian Server by a firewall, you must open the following ports:
  - **5450 TCP**
    This port is used for the FactoryTalk Historian Services to operate.

- If the customer has segregated the RSLinx Classic Gateway(s) and/or FactoryTalk Directory from the FactoryTalk Historian system, you must also configure a network firewall for these applications. The process for configuring a network firewall for these Rockwell Automation products can be found in this Rockwell Automation knowledgebase article 29402,

**29402 - TCP ports used by Rockwell products**

Benefits of using Terminal Server with FactoryTalk Historian Site Edition

- **Increased network flexibility**: Users gain access to a Terminal Server over a TCP/IP connection including Remote Access, Ethernet, the Internet, wireless, wide area network (WAN), or virtual private network (VPN).
- **Lower cost of ownership**: A thin client typically consists only of the operating system and the TSAC client.s5
- **Minimize downtime**: Upgrade your entire FactoryTalk Historian Site Edition installation with a single server-side operation.
- **Improve data security**: Terminal Server allows you to focus your security measures on the server.
- **Thin Clients**: No rotating media, small memory, small footprint, low maintenance for patches and such.
For a computer to be a Terminal Services client, it only requires an operating system and the Terminal Services client software. No other software (not even a web browser) is required. For this reason, these clients are known as “Thin” clients.

Since minimal software is needed on the client computer and all the processing is done on the terminal server, client computer hardware can be scaled down to reduce cost.

Terminal services is the preferred method for clients to communicate to the servers if a firewall, VPN, WAN, wireless, or slow connect rate remote access software is used.

29919 - Using FactoryTalk View SE with Windows 2003 Terminal Server
567658 - Using FactoryTalk View SE with Windows 2008 R2 Remote Desktop Services - Getting Started Whitepaper

While the focus of this document is FactoryTalk View Site Edition, it is also applicable to FactoryTalk Historian Site Edition.
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FactoryTalk Historian Site Edition v4.00 – Design Considerations

FactoryTalk Historian Site Edition v4.00 - Post Installation Activities
Post Release Patches

- For post-release product patches, refer to:
  - 49190 - FactoryTalk Services Patch Roll-up for CPR9 SRx
  - 63530 – FactoryTalk Historian Patch TOC.
Default File Locations

- **Installation Manager files (includes log files):**
  - C:\Program Files\Rockwell Software\FactoryTalk Historian\Installation Manager

- **Help files and additional documentation:**
  - x86: C:\Program Files (x86)\Common Files\Rockwell\Help
  - x64: - None

- **Core program files:**
  - x86: C:\Program Files (x86)\Rockwell Software\FactoryTalk Historian
  - x64: C:\Program Files\Rockwell Software\FactoryTalk Historian

- **Database (archive) files:**
  - C:\Program Files\Rockwell Software\FactoryTalk Historian\Server\PI\Dat
  - Should be changed to a separate partition, RAID array or Storage Area Network (SAN). For more information, refer to 63428 - FactoryTalk Historian SE: Moving and/or Deleting Archive Files
  - Disable virus scanning!

For more information refer to: 504345 - FactoryTalk Historian SE: Default Installation Paths and Environment Variables
Time Synchronization

- Time synchronization is vital in a FactoryTalk Historian distributed system as it ensures accurate time stamps on data, alarms and diagnostic logs.
- Using a Windows Domain makes time synchronization automatic.
- Using a workgroup requires configuration of the Windows Time service (W32tm.exe).

Windows Time Service Tools and Settings

- Windows 2003 Server Time Tools
- Windows Time Service Technical Reference
There is a Problem Reporting feature included with Windows that can be used to report computer and program errors to Microsoft. There is currently no benefit to using this feature with Rockwell Software and disabling it is recommended.

For more information refer to:

42651- Instructions for disabling the Windows Error Reporting feature.
Activate the Historian Server

- Activating FactoryTalk Historian Site Edition is unique in that activation must exist on the FactoryTalk Activation Server and be assigned to the Historian Server using the FactoryTalk Administration Console:

  - For more information on FT Historian Activation, refer to:
  - 60530 – FAQ: FactoryTalk Historian SE Activation

- For more information on FactoryTalk Activation, refer to:
  - 35251 - FactoryTalk Activation Frequently Asked Questions
High Availability Licensing & Activation

FactoryTalk Historian Site Edition server and interface node redundancy:

- Possibility of two redundant interface nodes connected to one either redundant or non-redundant data server
- Possibility of up to two redundant FactoryTalk Historian servers with data coming from either redundant or non-redundant Interfaces

Interface

- Does not cost extra. Interfaces are either installed non-redundant or redundant.
- Interfaces need to support redundancy for a redundant architecture.
- You can mix redundant interfaces with non-redundant interface if needed.

Server – a/k/a Collective

- Requires two sets of identical tag licenses – one for each server. i.e. the tag price will double.
  - This does not apply to Advance Server Option
- You cannot share a license between two servers, two separate licenses are needed.

Example: A FactoryTalk Historian collective with 5000 tags, requires: two separate activations for 5000 tags each.
Buffering

- Buffering is not enabled by default!
- Configure and test buffering on all interface nodes.

For more information refer to:
56721 - FAQ: FactoryTalk Historian Site Edition Buffering
Disconnected Startup

-Disconnected startup is not enabled by default!
-Enabling requires deleting 3 “high speed” scan classes (0.05, 0.1, & 0.25)
-Configure and test disconnected startup on all interface nodes.

For more information refer to:
66883 - FactoryTalk Historian SE: FTLD Interface Disconnected Startup
Backup

- Backup is not enabled by default!
- Configure and test Backup on the Historian Server.
- Test Restore too!

For more information refer to: 51487 - How to backup FactoryTalk Historian SE Server
Performance Monitoring Interface Considerations

- Manufacturing Control Network (MCN) Health Monitor includes the Performance Monitoring Interface
  - FactoryTalk Historian includes 140 Performance Tags for monitoring the system's performance at no additional cost. Performance tags provide insights into a number of performance management problems, including memory, disk, and process management problems.
  - Unlike other interfaces, the Performance Monitoring interface gets installed automatically.
  - Customers need to modify the interface Batch file, ICU configuration and the Start/Stop batch files in the system to be able to manage and change the interface configuration.

For more information refer to:
59015 - FactoryTalk Historian SE and the PerfMon Interface.
Performance Monitoring

- FactoryTalk Historian ships with performance monitoring components:
  - The MCN Health Monitor package is a set of data collectors (PI Interfaces) and client tools that facilitates the collection, organization, and visualization of your IT performance data. The MCN Health Monitor is invaluable for monitoring and managing devices such as:
    - Workstations & Servers
    - Firewalls
    - Control system applications
    - Network routers & switches
    - Communications network itself
  - Leveraging FactoryTalk Historian Site Edition core technology and investment, MCN Health Monitor both minimizes the required investment necessary to monitor IT infrastructures and increases the FactoryTalk Historian Site Edition return on investment.

For more information refer to:
Questions?
We care what you think!

Please take a couple minutes to complete a quick session survey to tell us how we’re doing.

- On the mobile app:
  1. Locate session using Schedule or Agenda Builder
  2. Click on the thumbs up icon on the lower right corner of the session detail
  3. Complete survey
  4. Click the Submit Form button

Thank you!!
Thank you for participating!

Please remember to tidy up your work area for the next session.

We want your feedback! Please complete the session survey!

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