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FactoryTalk® System Design Fundamentals
系统设计基础

PUBLIC

Allen-Bradley · Rockwell Software

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Agenda 议程

- **初建立系统时，需要考虑的几个方面**:

FactoryTalk® Services Platform

Data Servers 数据服务器

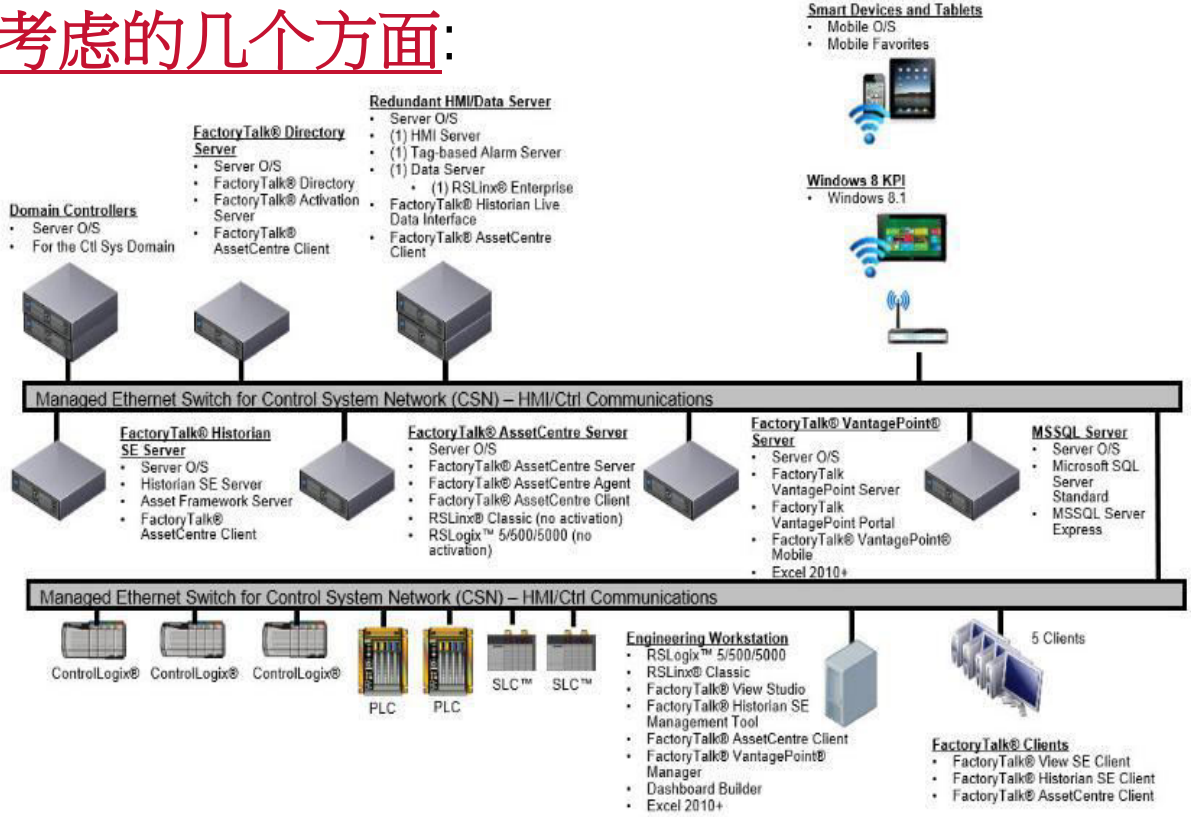
FactoryTalk® View Site Edition (SE)

FactoryTalk® Historian

FactoryTalk® AssetCentre

FactoryTalk® VantagePoint

Microsoft SQL Server



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Prerequisite Knowledge 前提知识

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- Controller **程序**设计(CL14)
  - **数**组 vs **零散**标签 tags
  - Continuous vs Periodic **任**务
  - Connections and memory **消耗**

- 网络基础知识(NS02)
  - **管理型交**换机
  - **防火**墙设置
  - **网**络容错设置

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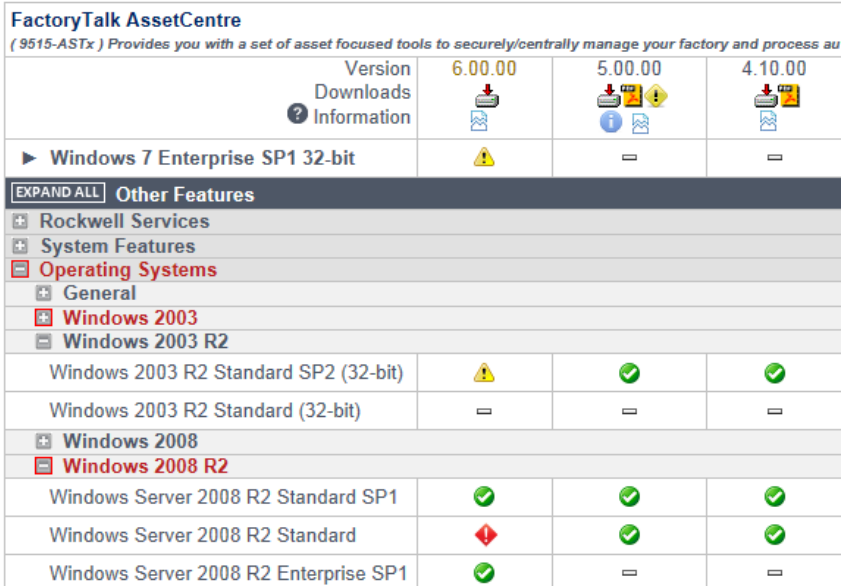
Windows 结构体系

- 建议应用服务器使用Windows服务器操作系统

- Windows *系统兼容:*
  Product Compatibility & Download Center

- 软件*补丁兼容:*
  Rockwell Software® MS Patch Qualifications



- http://www.rockwellautomation.com/rockwellsoftware/**support**/overview.page?

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Windows 结构体系
Workgroups 工作组 vs Domains 域

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- **工作**组支持小于**10个 FactoryTalk®计算机的架构，超过10个推荐**Windows域
- **常**见的要求
  - **独特的IP地址--集中的**环境可以允许保**留**DHCP**服**务器
  - **独特的主机名--集中的**环境可以允许DNS
- **域与工作**组的差异
  - **用**户名认证**--工作**组需要特别配置
  - **安全--域允**许活动目录用户连接

Workgroup 环境:
所有电脑在同一个Workgroup里.

Domain 环境:
所有电脑必须在同一个域中.

Domain 或者 Workgroup 不可以混合搭配.

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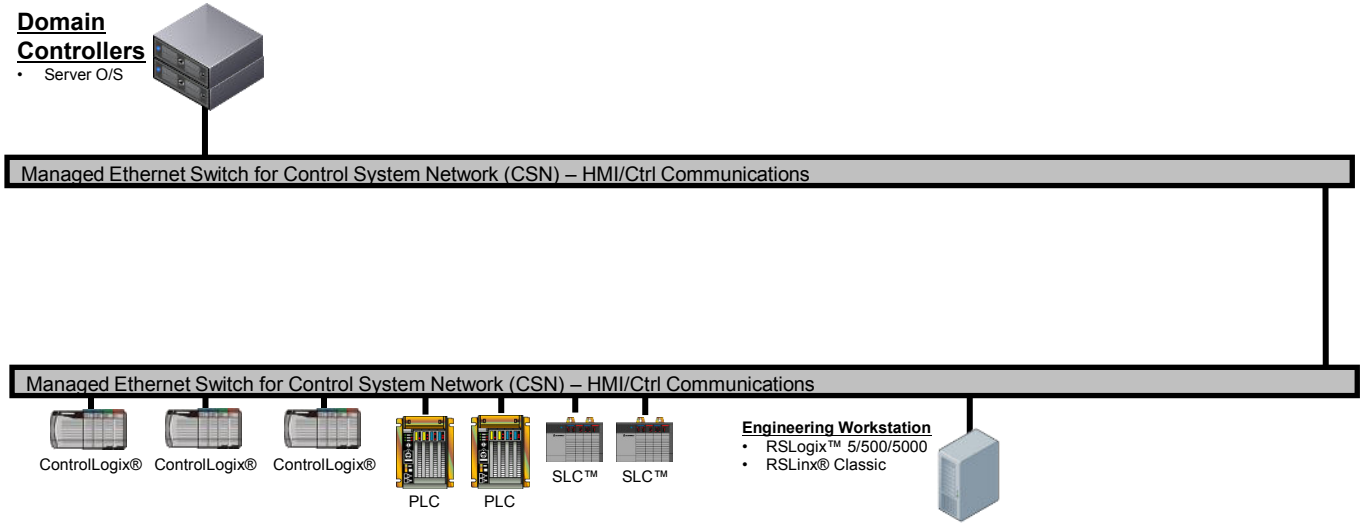
域控制器



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FactoryTalk® Services Platform

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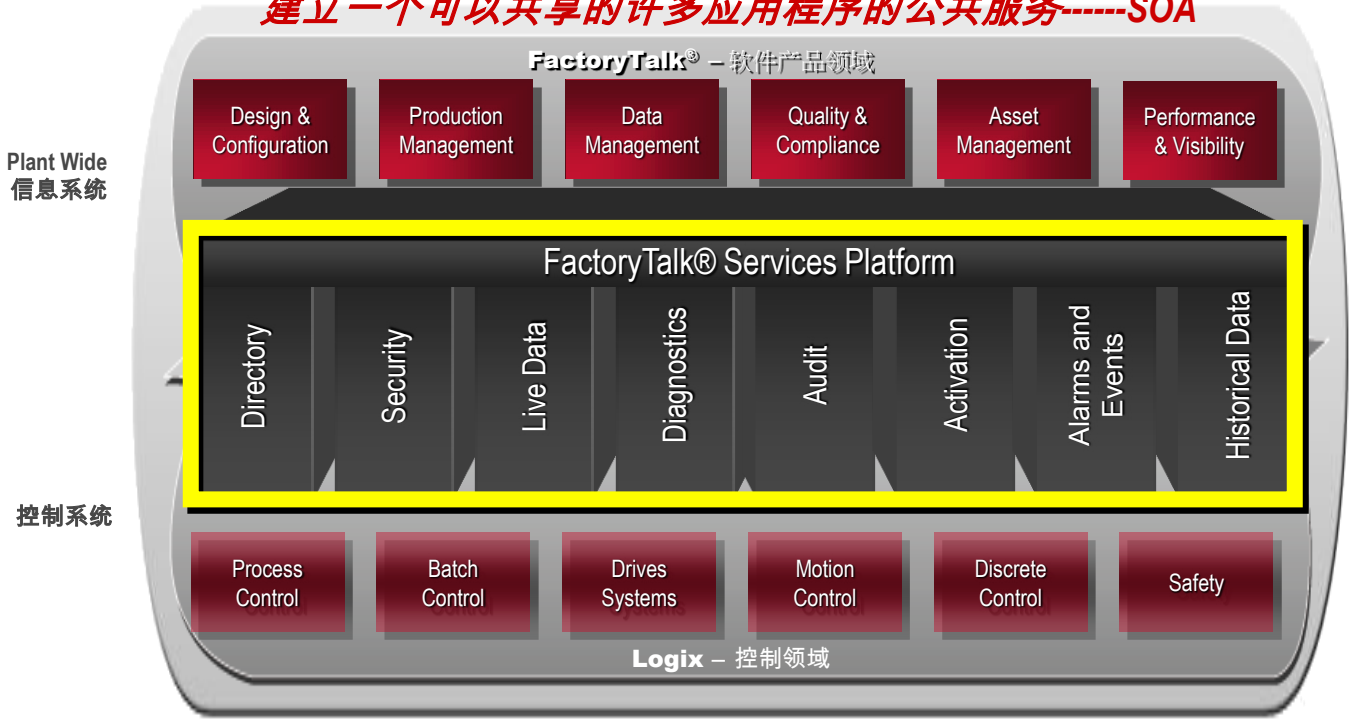
FactoryTalk® Services Platform 概述

"Build a suite of common services that can be shared by many applications"

建立一个可以共享的许多应用程序的公共服务------SOA



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FactoryTalk® Services Platform 兼容性建议

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- FactoryTalk® Services Platform CPR9 兼容所有的 Service Releases (SRs.)
  - 例如: CPR9 SR6 可以兼容 CPR9 SR5.
  - 建议在所有主机上保持相同的FactoryTalk®服务平台版本和补丁级别。
  - 请参考软件产品兼容查询网站: http://**compatibility**.rockwellautomation.com/Pages/ProductReplacement.aspx?crumb=101
  - Coordinated Product Release (CPR) Service Release (SR)
- 建议升级FactoryTalk®目录服务器到最高的FactoryTalk®服务平台版本
  - 有些产品可能需要FactoryTalk目录升级。

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FactoryTalk® Services Platform
本地FTD vs 网络FTD

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- Local FactoryTalk® Directory:
  - **本地**应用：Encompasses applications and FactoryTalk® products.
  - **独立**应用：local components can be used in local FactoryTalk® Directory applications.

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FactoryTalk® Services Platform
本地FTD vs 网络FTD

Rockwell Automation

- Network FactoryTalk® Directory:
  - 连接各主机：Ties multiple FactoryTalk® PCs together, all utilizing a central FactoryTalk® Directory.
  - 共享服务：FactoryTalk® Products in a Network FactoryTalk® Directory can share services, such as FactoryTalk® Security, FactoryTalk® Diagnostics, and FactoryTalk® Live Data.
  - 分布式应用：Can be utilized for distributed applications, or applications with everything installed on one PC.

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FactoryTalk® Services Platform
关于Network FTD主机的建议

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- 为何建议FTD单独一台主机？ **The role of the Network server should be hosted on a dedicated computer.**
  - FTD需要优先启动– FactoryTalk® Directory should be first to start
  - 方便控制版本 – Occasionally required versioning
  - 更易升级和补丁 – Independent patching easy
  - 降低风险– Lowest risk option keeps FTD available for failover/failback
- **FTD的主机上建议安装？ Additionally, a dedicated Network FactoryTalk® Directory is an ideal location for the following roles that are often present in a FactoryTalk® system:**
  - FactoryTalk® Activation Server
  - FactoryTalk® Alarms and Events Historical Log (SQL Standard/Express)
  - Centralized FactoryTalk® Diagnostics Server (including SQL Server) in absence of AssetCentre
  - FactoryTalk® Historian Components, including redundancy shared file
- **建议使用server系统~ A server operating system (2008, 2012 Server) should be used.**
  - 服务器系统优越性——A server OS is optimized to service network requests, which is a common function of a Network FactoryTalk® Directory.
  - 建议FTD与域服务器分开——This server should not be a Windows domain controller.

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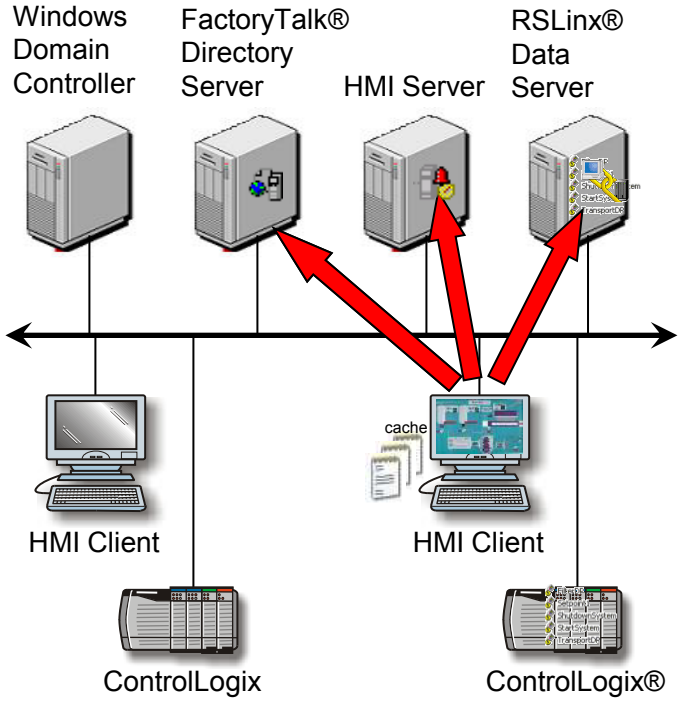
FactoryTalk® Services Platform
“去中心化”的Network FTD

- **FTD配置独立**缓存于各台主机 Client-side caching allows for operation independent of FactoryTalk® Directory in the event of downtime.
- **宕机**时，启用缓存机制 Security and directory cached, only used for access if FactoryTalk® Directory unavailable
  - Other objects can be cached, such as HMI displays
- FTD缓存机制相关测试详见ID66352
  Detailed testing results on FactoryTalk® View SE system in absence of FactoryTalk® Directory:
  - AID 66352 - FactoryTalk® View SE Behavior when FactoryTalk® Directory is Unavailable



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FactoryTalk® Services Platform
常见问题

- **域服**务器 FactoryTalk® Services Platform not required/recommended on a Domain Controller.
  - Do not co-locate a FactoryTalk® Directory server or any other FactoryTalk® software on a Domain Controller.
- **服**务器系统 A FactoryTalk® Directory server should be installed on a Windows Server operating system (as opposed to a Workstation/Desktop OS.)
- **多FTD服**务器 FactoryTalk® Directory servers do not communicate with each other.

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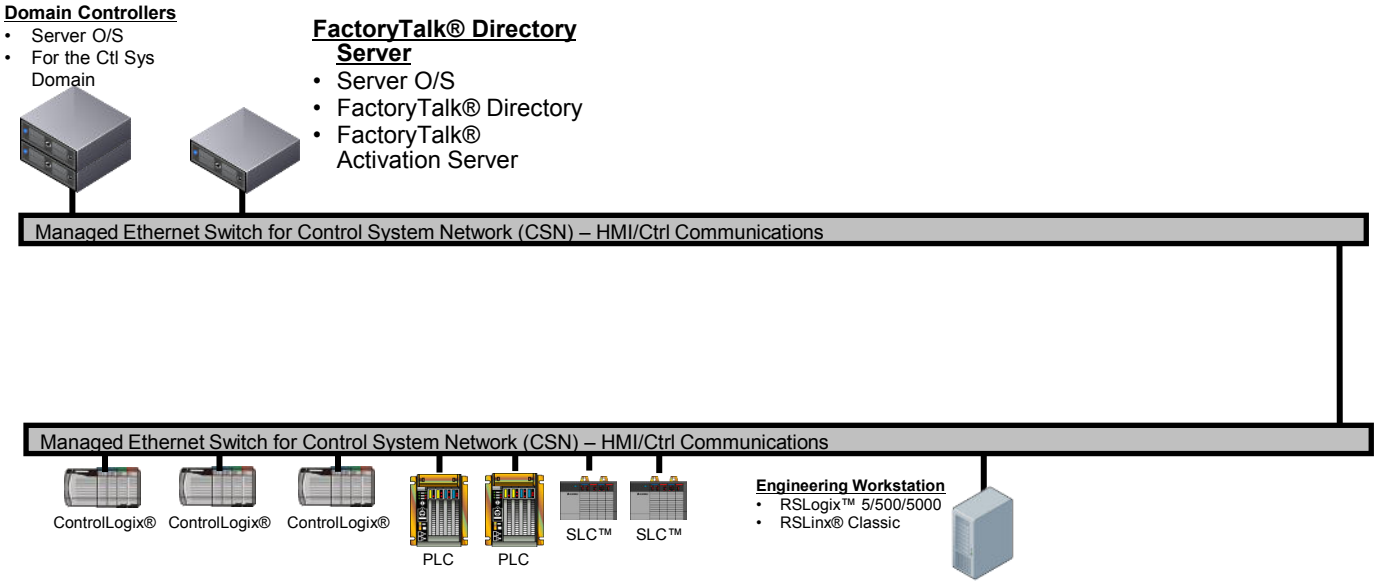
FactoryTalk® Directory – FTD



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关于FactoryTalk® Services Platform更多的问题请参考…

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- 课程- Rockwell Automation TechED™ 2016
  - NS17 - Introduction to the Design & Implementation of FactoryTalk® Security in a DCS
  - NS18 - Advanced Design, Management & Implementation of FactoryTalk® Security in a DCS
- 网络- 罗克韦尔知识库 RA Knowledgebase
  - AID 58803 – Network FactoryTalk® Directory Best Practices
  - AID 116811 - CPR9 FactoryTalk® Services Platform Compatibility Guidelines
  - AID 66352 - FactoryTalk® View SE Behavior when FactoryTalk® Directory is Unavailable

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Data Server 数据服务器

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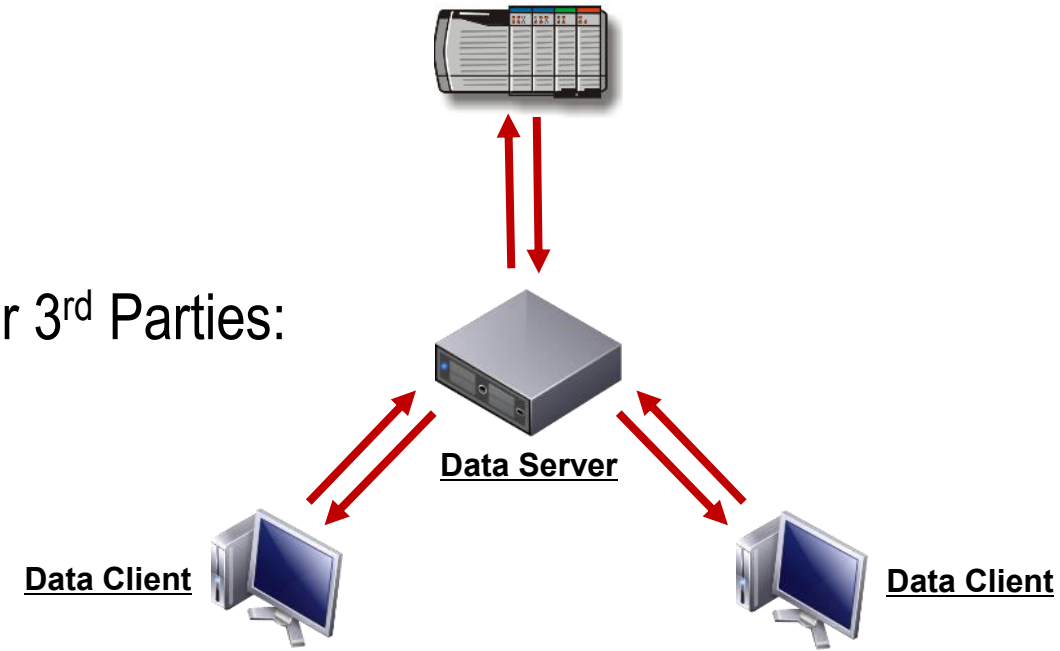
Data Servers 的选择…

- 对于Rockwell Automation® 硬件
  - RSLinx® Classic
  - RSLinx® Enterprise
  - FactoryTalk® Gateway
- 对于第三方设备 OPC for 3rd Parties:
  - Kepware
  - Matrikon
  - 其他..



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Data Servers
RSLinx® Enterprise vs RSLinx® Classic

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- RSLinx® Enterprise （推荐）
  - Wherever possible!
  - **Preferred Data Server for Rockwell Automation® Hardware**
  - Performance is greatly increased, particularly with Logix family controllers
  - Also supports legacy controllers (PLC5, SLC™, etc)
- RSLinx® Classic
  - Only when features are not available in RSLinx® Enterprise
    - 支持Alias Topic
    - 复杂网络 Complex Paths
      - Ethernet to DH, DH+, DH-485
    - 支持DDE
    - 特别驱动

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Data Servers
特例1：Alias Topics

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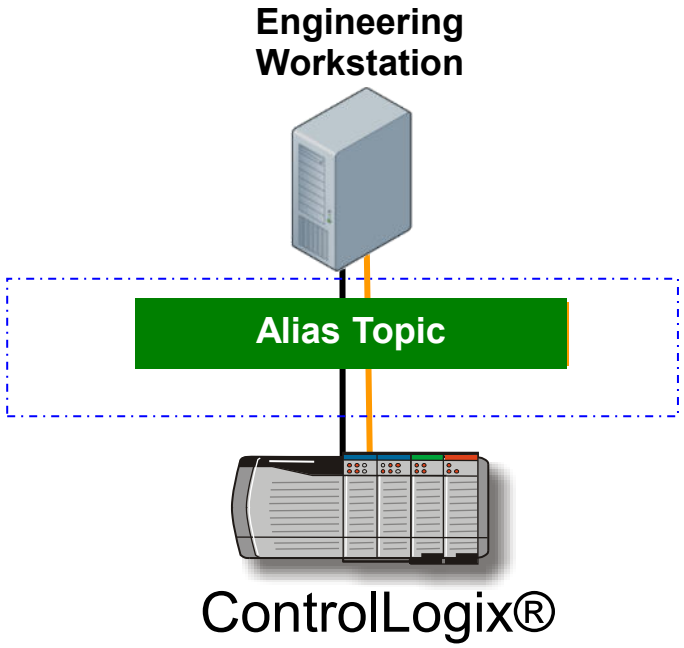
替代方案 :Redundant Ethernet? Team the NICs and use ControlLogix® redundancy!



- Workstation communicating to ControlLogix® via Ethernet and ControlNet
- RSLinx® Classic
  - Two total topics, one for each path (EtherNet/IP & ControlNet)
  - Alias topic references both existing topics
- RSLinx® Enterprise
  - Two total shortcuts, one for each path (EtherNet/IP & ControlNet)

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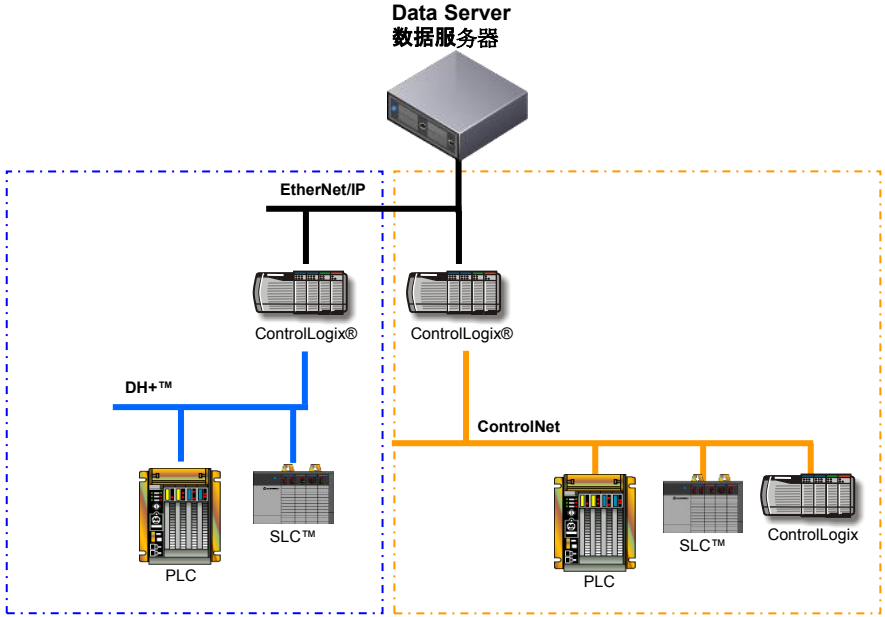
Data Servers
特例2：Complex Paths



- RSLinx® Classic 支持
  - DH+™ protocol = PCCC
  - Ethernet protocol = CIP
- RSLinx® Enterprise 支持
  - ControlNet protocol = CIP
  - Ethernet protocol = CIP

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Data Servers
OPC如何选？

- RSLinx® Enterprise 是Live Data 数据服务器
  - RSLinx® Classic 不是唯一的OPC选择
- FactoryTalk® Gateway 是什么？ 变 Live Data 为 OPC
  - Converts at an application level, including HMI information
  - Not the same as RSLinx® Classic Gateway
- FactoryTalk® Gateway 的部署参考近client原则

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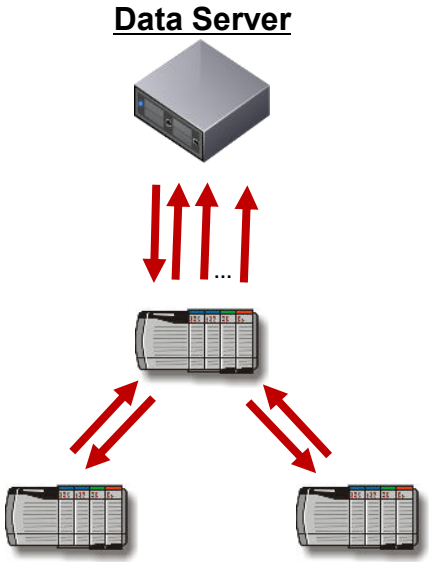
Data Servers
ControlLogix® Connections 连接数~

- RSLinx® Enterprise 建议 **6 connections** in a Logix Controller.
- RSLinx® Classic 建议 **5 connections** to a Logix Controller.
  - Though typically not recommended, can be increased.
- 单个CLX建议不超过**3个数据服务器** Recommend no more than **3 data server connections** to a single ControlLogix® controller.



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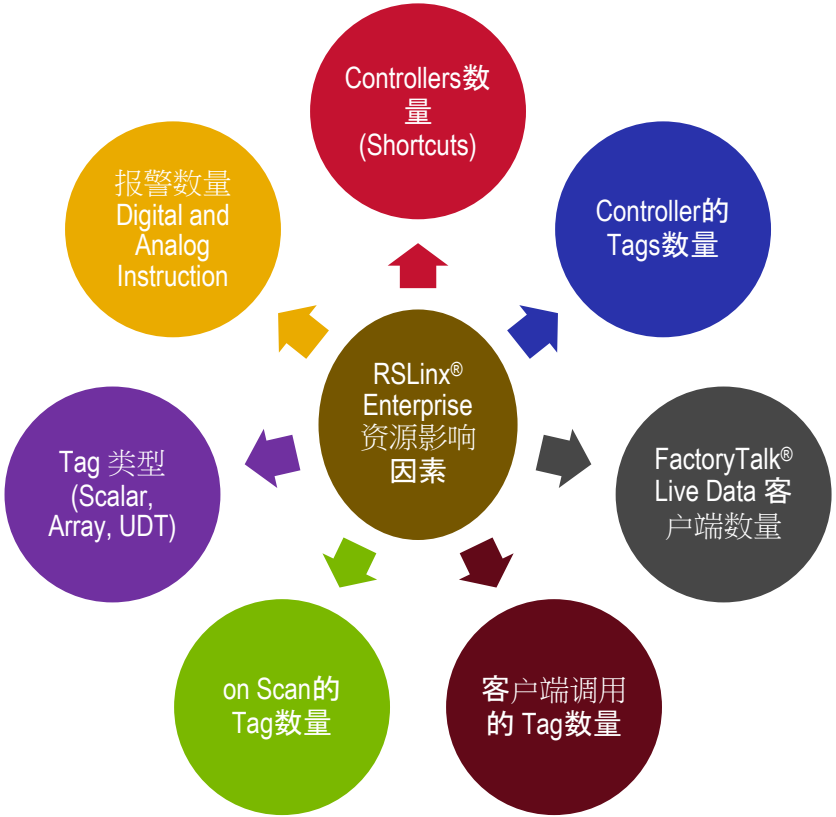
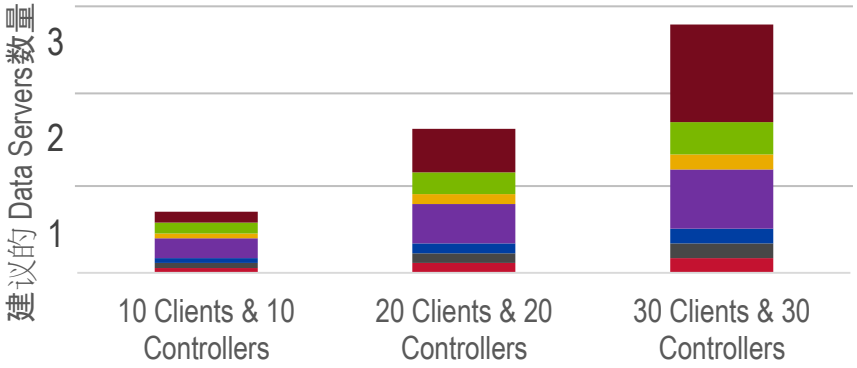
Data Servers
RSLinx® Enterprise 部署参考



部署参考



参考情况: 每个 Controller 有10K Numeric Tags和 1K Strings Tags ; 每个客户端数据按 2K Numeric tags, 200 Stings, 500 Digital and 500 Analog Alarms考虑。

合理部署分配 RSLinx® Enterprise 数据服务器.

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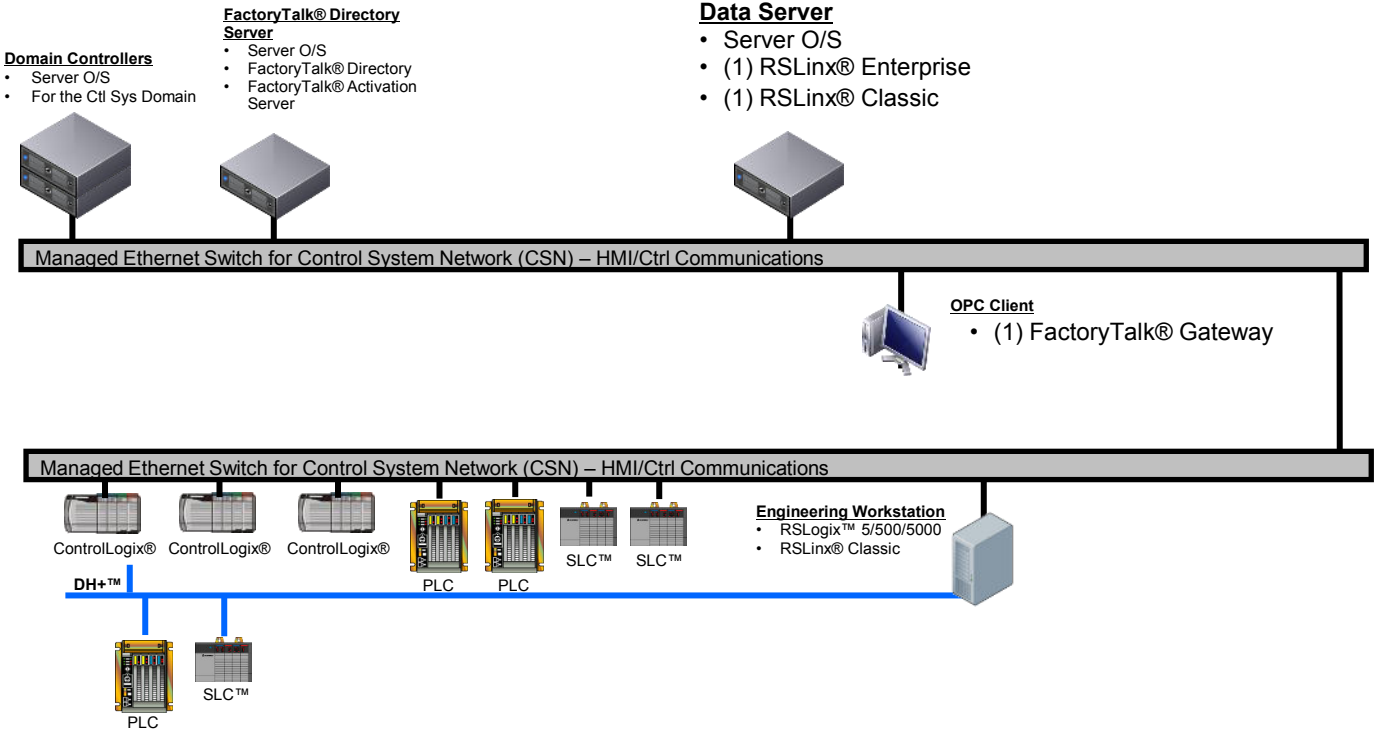
Data Servers



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关于Data Servers的更多问题…

- 课程 Rockwell Automation TechED™ 2016
  - CL14 – Optimize ControlLogix® Performance for FactoryTalk® Client Applications
    SY25 – Optimizing Data Access with RSLinx® and FactoryTalk® Connectivity Software

- 网络 RA Knowledgebase
  - AID 507425 – Rockwell Automation® Data Server Decision Guide
  - AID 685789 - RSLinx® Enterprise LogixDP Data Provider Information

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FactoryTalk® View SE

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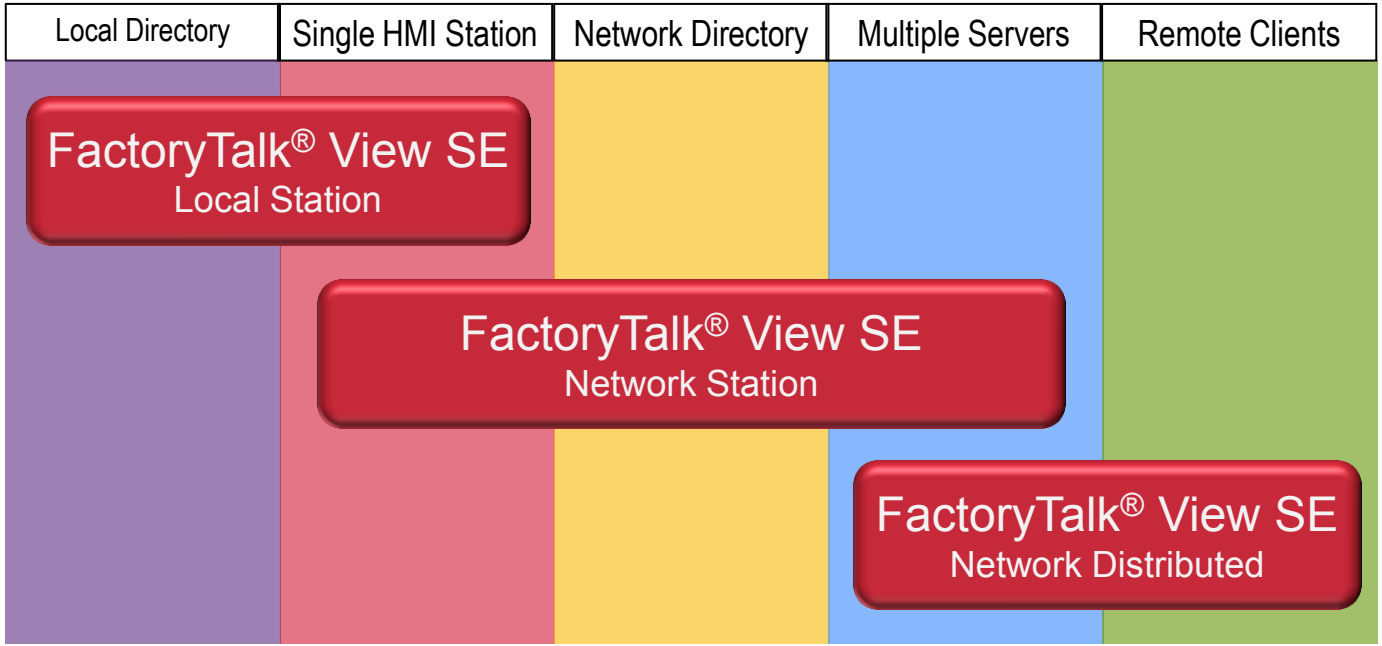
FactoryTalk® View SE 如何选？



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FactoryTalk® View SE 的安装组件

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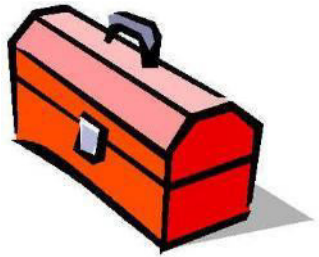
- FactoryTalk® View SE 包含了：
  - Network FactoryTalk® Directory Server (FTD) (1)
  - FactoryTalk® View SE Server （HMI） (1+)
  - SQL Server (Express or Standard) (1+)
  - FactoryTalk® Live Data Server (1+)
  - FactoryTalk® Alarm Server (1+)
  - FactoryTalk® View SE Client (1+)
  - FactoryTalk® View SE Studio (1+)



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FactoryTalk® View SE 的术语

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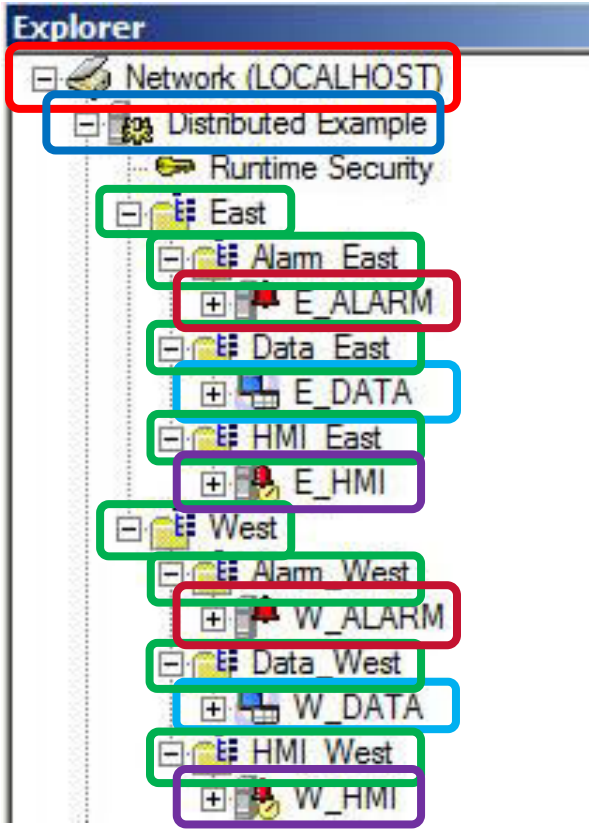
- 术语:
  - FTD
  - Application
  - Area
  - Alarm Server
  - Data Server
  - HMI Server



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FactoryTalk® View SE Network Station 网络单机版（v7.0之后）

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- 仅支持单机运行 Maximum of 1 HMI Server and 1 Client, located on the same host.
  - Each HMI Server is in a separate application.
  - Remote Desktop Services not supported.
- 部分支持分布式架构 Multiple data/alarm servers supported.
  - Network Station applications can share instances, but not configurations.
  - Server sharing is dependent on host resources and data requirements.
- 支持历史数据库 Share historical data.
  - Local Station unable to communicate with FactoryTalk® Historian SE.

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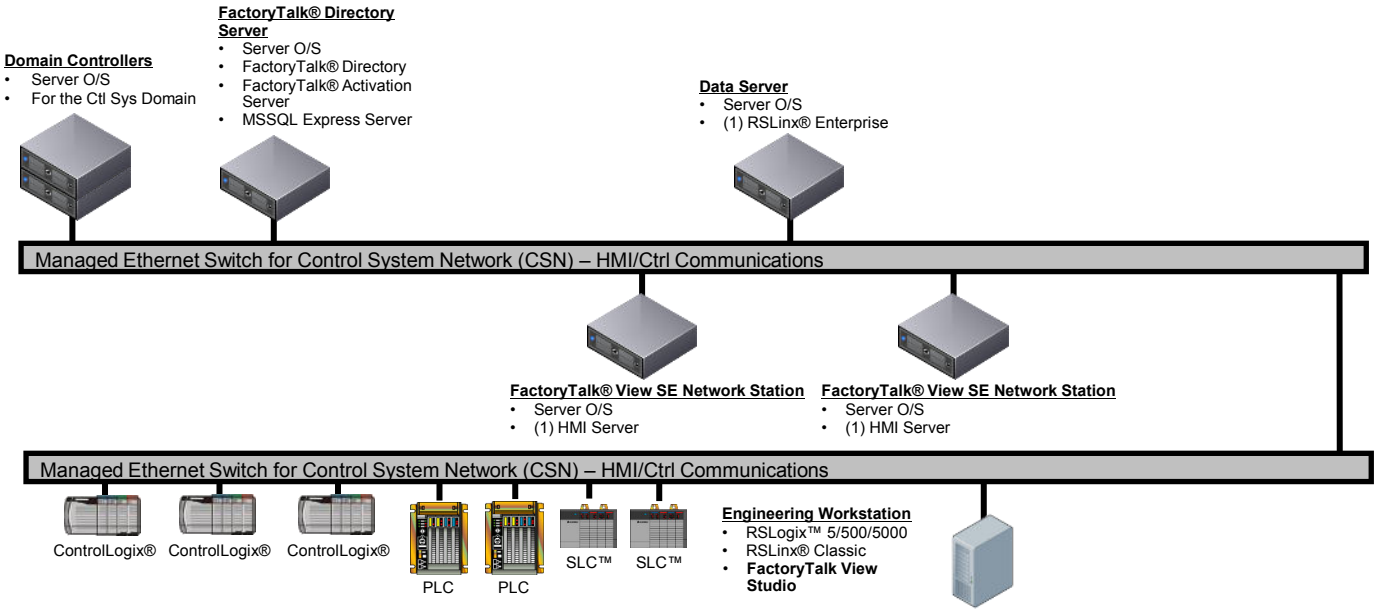
3、FactoryTalk® View SE Network Station



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FactoryTalk® View SE Distributed 分布式架构 (v7.00 及以上版本)

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- 画面 HMI Servers: 10 per application (redundant or non-redundant)
- 数据 Data Servers: 10 per application (redundant or non-redundant)
- 报警 Alarm Servers: 10 per application (redundant or non-redundant)
- 客户端 Clients:
  - 50 per application (total mix of thick & thin clients)
- 每个FTD只容纳一个分布式架构 1 **Distributed** application per FactoryTalk® Directory (production)

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FactoryTalk® View SE Distributed
分布式架构：画面服务器 HMI Server

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- 可以与FTD在一起，但是建议分置 Can be co-located with the FactoryTalk® Directory, but recommend separate hosts
- 建议与客户端和工程师站分置 Recommend independent hosts – no clients or Engineering Workstation co-located, One HMI server per host
- MSSQL与Tag database MSSQL Express instance must be co-located for tag database
  - Not supported for use with anything outside of the HMI server. e.g., it cannot be used for historical logging
- Recommended 25:1 Client:Server ratio
  - 冗余不等同于均衡负载 Redundant servers do not equate to load-balancing
  - HMI标签可以用来估计负载 HMI tag utilization can be used to estimate server loading

参考 AID 732555 – FactoryTalk® View SE Product Characterization

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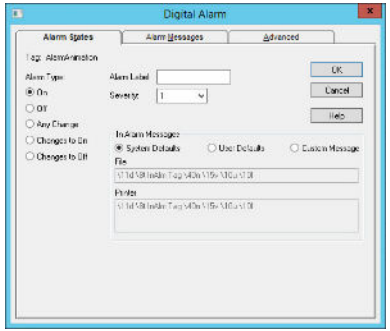
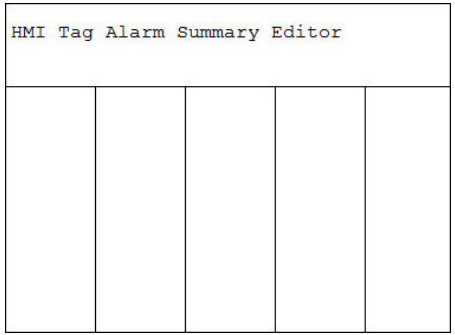
FactoryTalk® View SE 分布式架构：报警服务器 Alarm Server

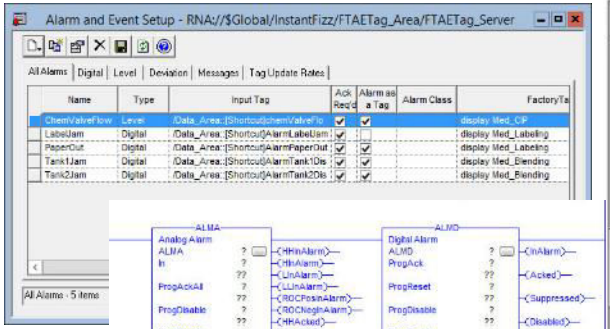
Rockwell Automation

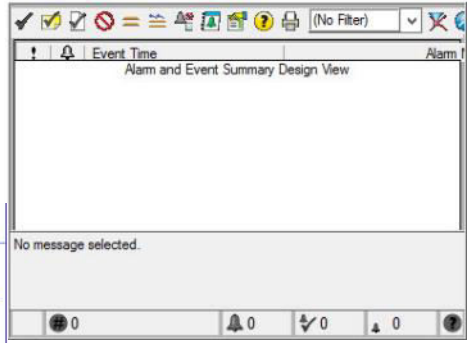
- HMI Alarm
  - 40,000 条报警 per **HMI Server**
    - 10,000 条模拟量报警 Analog
  - 默认更新时间 = 2 seconds





- FactoryTalk® Alarms & Events
  - 100,000 条报警 per **Application**
  - 10,000 条报警 per **Alarm Server**
  - 每个 controller FactoryTalk® Alarms
    - 2,000 – non-redundant
    - 500 – redundant
  - AID 44177 - FactoryTalk® Alarms & Events





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FactoryTalk® View SE Distributed
分布式架构的Data & Alarm Server

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- RSLinx® Enterprise 和 RSLinx® Classic
  - Can be **co-located** with HMI server
  - No more than two different data servers per host
    - 例如 : RSLinx® Classic and RSLinx® Enterprise installed on the same host
- Device-based Alarming
  - RSLinx® Enterprise used as alarm server
  - Often **co-located** with HMI server
  - v21, v23 does not support device-based
- Tag-based Alarming
  - Can be **co-located** with HMI and/or Data server, or independent

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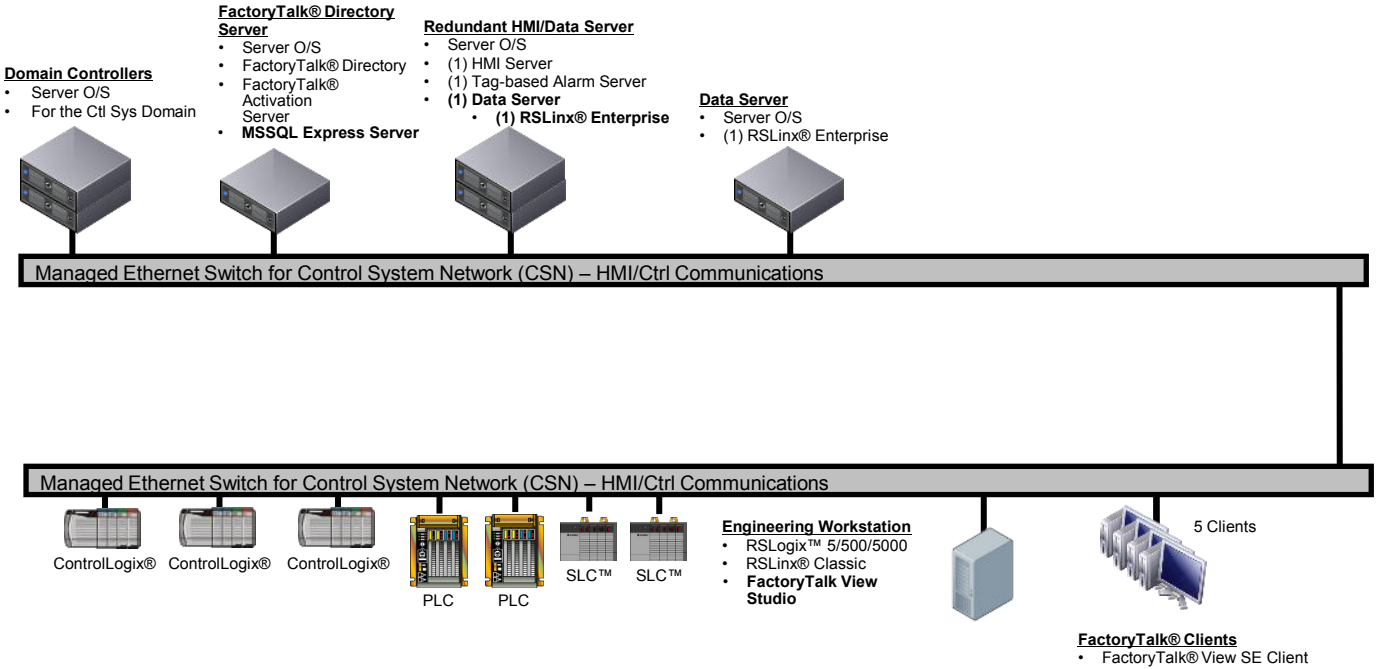
FactoryTalk® View SE



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FactoryTalk® View SE web发布：FactoryTalk® ViewPoint

Rockwell Automation

- ViewPoint can be used to extend beyond 50 clients if mobile clients meet the application needs.
  - Up to 25 extra ViewPoint clients are within the reference architecture guidelines.
- 注意:
  - ViewPoint uses only FactoryTalk® Alarming, no Legacy/HMI Alarming
  - ActiveX controls and VBA cannot be used by ViewPoint displays

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FactoryTalk® View SE web发布： FactoryTalk® ViewPoint

Rockwell Automation

- **推荐**Server**系**统 Use a server Operating System
- **大型**应用请分置主机 A separate host is recommended for larger applications (>10 clients) and/or Redundancy
  - Can be co-located with FactoryTalk® View SE HMI server
- **每次只能**发布一个工程 ViewPoint can service one application at a time

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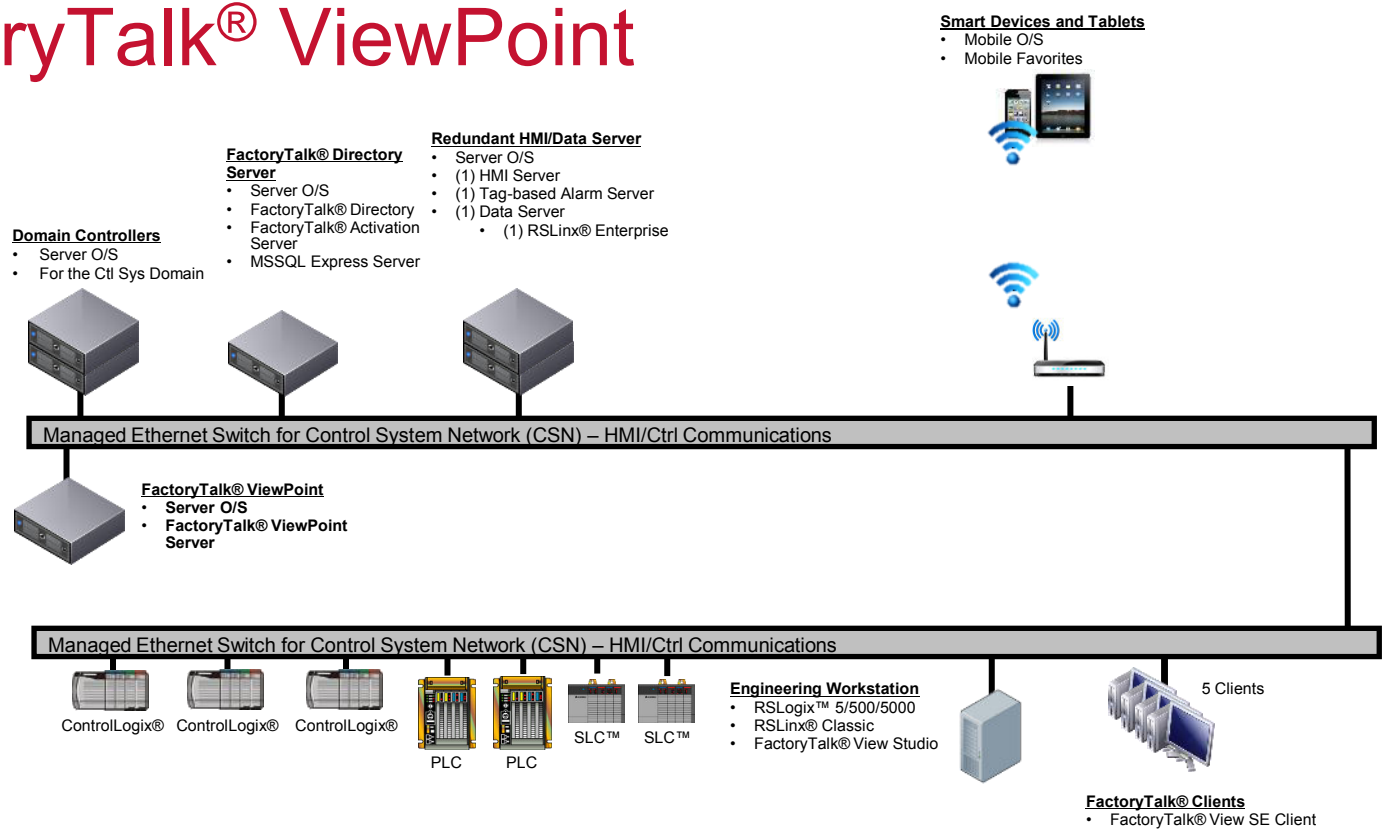
FactoryTalk® ViewPoint



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FactoryTalk® View SE
常见问题

Rockwell Automation

- 一台主机支持多个HMI Server， 但建议分置 Don't put more than one production HMI server on the same host.
  - Support multiple HMI servers on a single host for development purposes.
- 冗余不等同于平衡负载 Redundancy is not load balancing.
  - Only one server is actively serving clients at a time.
- 50 Client limit is per application, not per server.
  - 25 clients per server is recommended.
  - Consider ViewPoint for extending applications.

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关于FactoryTalk® View SE更多问题请参考…

- 课程 Rockwell Automation TechED™ 2016
  - VZ05 – Architecting a Distributed FactoryTalk® View Site Edition System
  - VZ06 – FactoryTalk® View Site Edition: Configuration and Maintenance Lab
  - VZ07 - FactoryTalk® View Site Edition: Introductory Lab
  - VZ09 – FactoryTalk® View Site Edition: Implementing FactoryTalk® Alarms and Events
- 网络 Rockwell Automation® Knowledgebase
  - AID 32549 – FactoryTalk® View SE Distributed System Design Considerations
  - AID 37110 – FactoryTalk® View SE Tips and Best Practices TOC
  - AID 612506 – Architecting FactoryTalk® View Site Edition Network Distributed Systems
- 设计文档 Rockwell Automation® Literature Library
  - FactoryTalk® View SE Popular Configuration Drawings

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FactoryTalk® Historian SE

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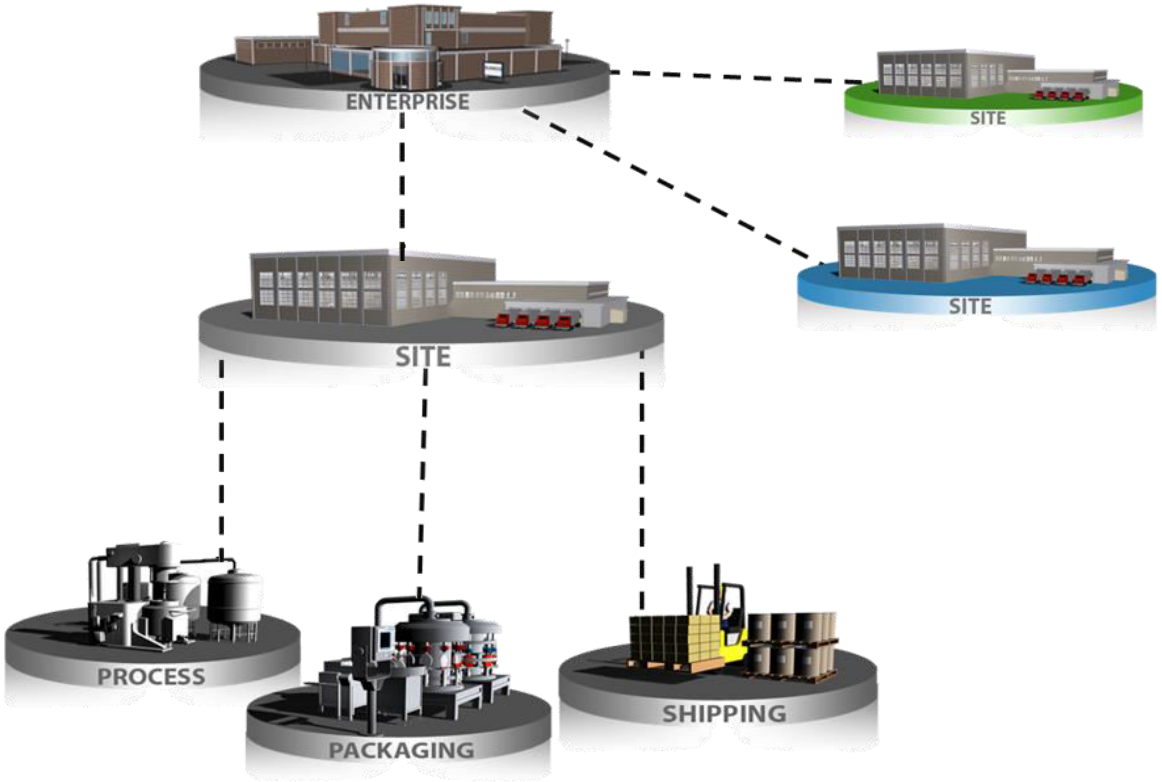
FactoryTalk® Historian



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FactoryTalk® Historian
FactoryTalk® Directory Connectivity

Rockwell Automation

- **FactoryTalk® Historian ME** can function independently of a FactoryTalk® Directory, or within a Network FactoryTalk® Directory.
  - Native (local to ME module) or FactoryTalk® Security (Network FactoryTalk® Directory) options.
- **FactoryTalk® Historian SE** is only supported in the Network FactoryTalk® Directory
  - FactoryTalk® Historian SE **不支持** Local Directory.
- FactoryTalk® Historian SE does **not** use the FactoryTalk® Services Platform.
  - **一个**FactoryTalk® Historian SE **服**务器可以配置为**“企**业级**”聚合, 从而只支持** Network FactoryTalk® Directory.

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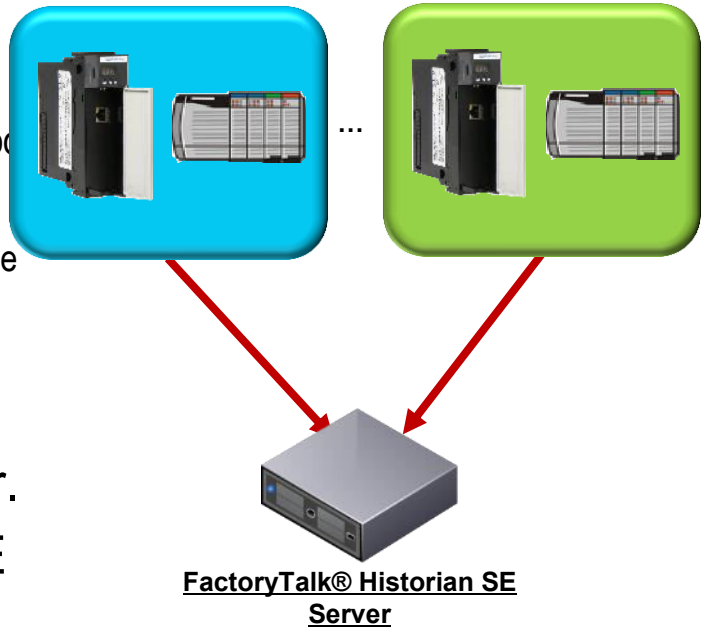
“FactoryTalk® Historian ME 卡件式数据库”

Rockwell Automation

- 1756 Module can communicate across backplane or with modules outside of its own chassis.
  - 不超过四个模块 Can service up to 4 ControlLogix® mod (when not using high-speed collection.)
  - 仅限处理器模块 Can only service controller modules in the same chassis for high-speed collection.
- 2500 events/sec.
  - Onboard memory storage must be accounted for.
  - 长期存储数据仍需FactoryTalk® Historian SE server.



See AID 63082 – FAQ: FactoryTalk® Historian Machine Edition

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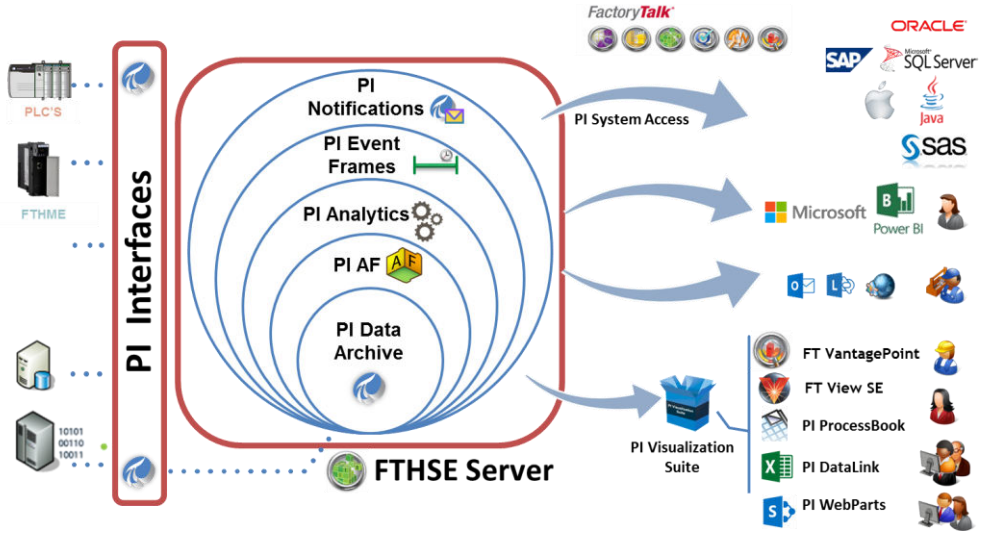
FactoryTalk® Historian SE 组件

- **典型FactoryTalk® Historian SE 系统通常包含以下组件：**

Network FactoryTalk® Directory Server (FTD)	(1*)
FactoryTalk® Historian Server	(1-2)
FactoryTalk® Asset Framework Server	(1)
Microsoft SQL Server (Express or Standard)	(1)
FactoryTalk® Historian Live Data Interface	(1+)
FactoryTalk® Live Data Server	(1+)
FactoryTalk® Historian Client	(1+)



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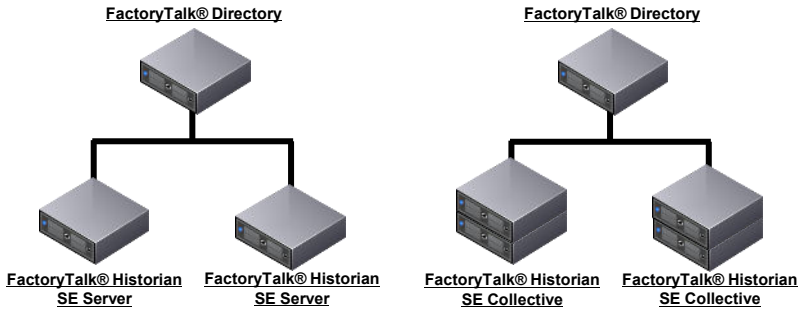
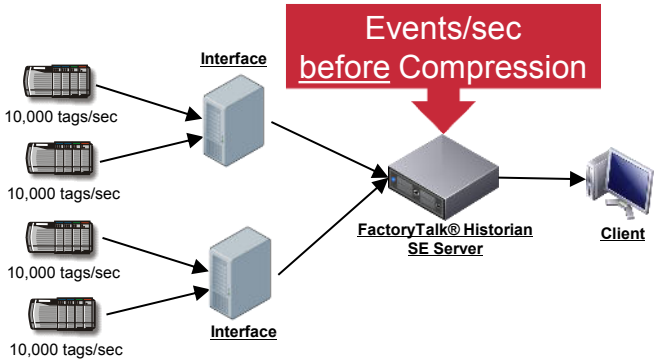
FactoryTalk® Historian SE 服务器、客户端

- 仅限两个 Historian SE Servers per FactoryTalk® Directory
  - Or two (2) collectives consisting of 2 members each
- 100,000 Events/sec
  - 50,000 在v4.00版之前只有一半
- 建议不超过20 Clients
- FactoryTalk® View, FactoryTalk® VantagePoint®, Datalink, ProcessBook, ActiveView





See *AID 49189 – FactoryTalk® Historian SE System Design Considerations*

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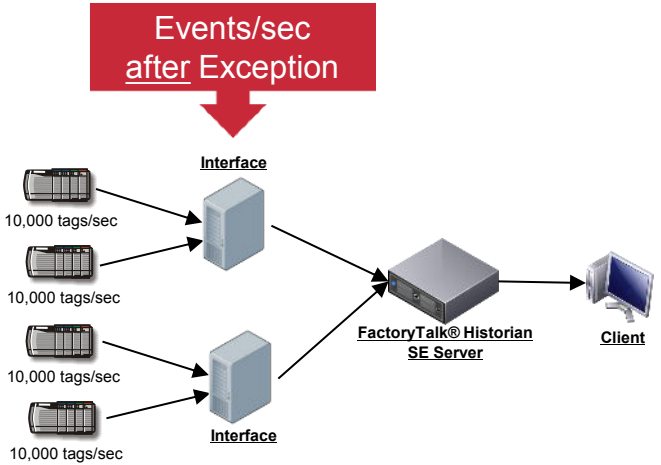
FactoryTalk® Historian SE 接口节点 interface

- 25,000 events/sec **on one Interface**
  - Up to 50,000 defined tags
  - V4.0版之前只有20,000
- 20,000 events/sec **on one redundant interface pair**
  - V4.0版之前只有15,000



- 每个FactoryTalk® Historian Server之多50个接口节点
  - 50 interfaces / ME modules per server, 25 redundant

See *AID 66997 – FAQ: FactoryTalk® Historian SE FactoryTalk® Live Data Interface*

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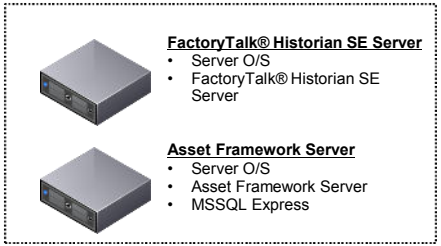
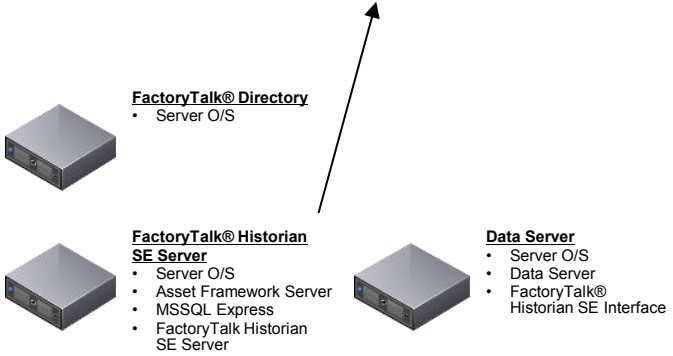
FactoryTalk® Historian SE 基本结构

- **接口节点缓存数据** Interfaces buffer data when the FactoryTalk® Historian Server is absent.
  - **推荐分置** Not recommended to co-locate interfaces with Historian Server host.
  - **推荐近数据服务器** As a rule, Interface should be co-hosted with Data Server.

- **FTHAF服务器主机** Asset Framework server can be co-located with Historian SE Server in non-collective configurations.
  - MSSQL Express instance can also be **co-located** in this configuration.



- **至少三台主机** Equates to at least 3 server hosts:
  - FactoryTalk® Directory Server (FTD)
  - FactoryTalk® Historian SE server
    - w/ FactoryTalk® Historian SE Asset Framework Server (FTAF)
    - w/ MSSQL Express
  - Data Server/Interface



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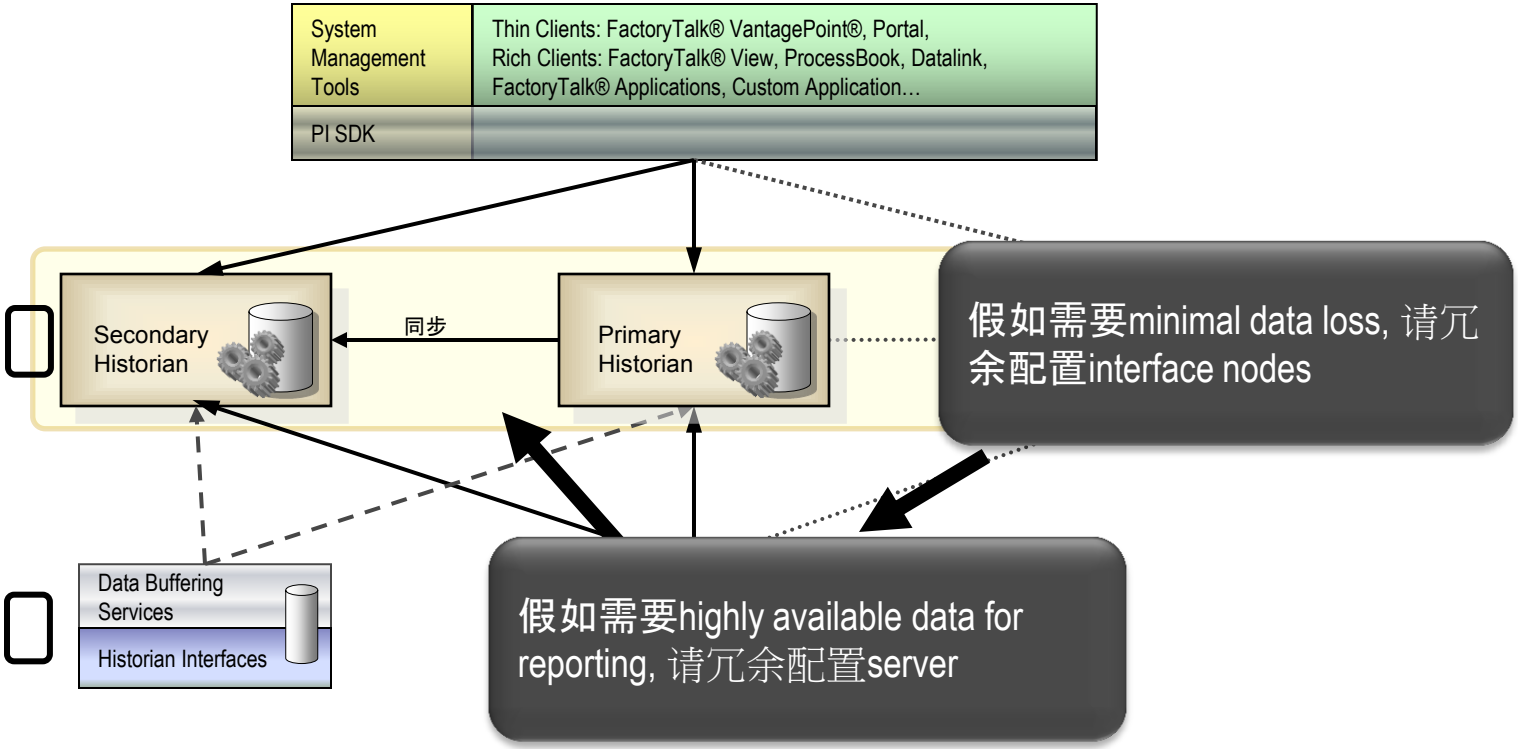
FactoryTalk® Historian SE
历史数据库冗余 vs 接口节点冗余



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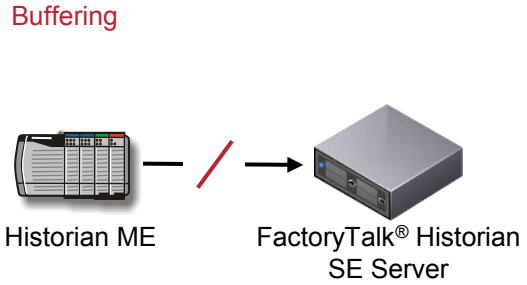
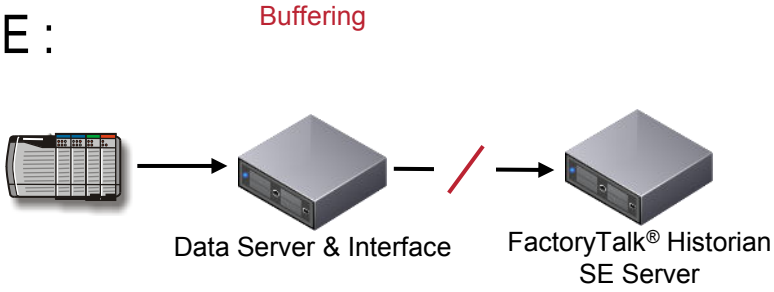
FactoryTalk® Historian ME Module vs SE Interface

Rockwell Automation

- **硬接口特点** FactoryTalk® Historian ME :
  - **通**讯减损优势 Mitigate against loss of communications from data server to controller.
  - 节省本地数据server Data collection for remote devices without local data server requirement.
  - **需要接口**连接 Cannot directly connect to Historian SE collective (requires additional interface.)



- Live Data **接口特点** FactoryTalk® Historian SE :
  - **支持冗余** Native redundancy.
  - **直接采集** Direct collective connectivity.
  - **通**讯优势 Greater events/sec limit.



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FactoryTalk® Historian
常见问题

Rockwell Automation

- **Historian Interface ≠ Data Server.**
  - **接口只是接口** An Historian Interface is a data client, receiving information from the data server, then forwarding it on to the Historian Server.

- **接口**节点与server**共享主机**时缓存关闭 Historian Interface buffering is effectively disabled when co-located with Historian Server.

- PI历史数据库的数据存储 Historical data is not natively stored in an open database (e.g., MSSQL.)

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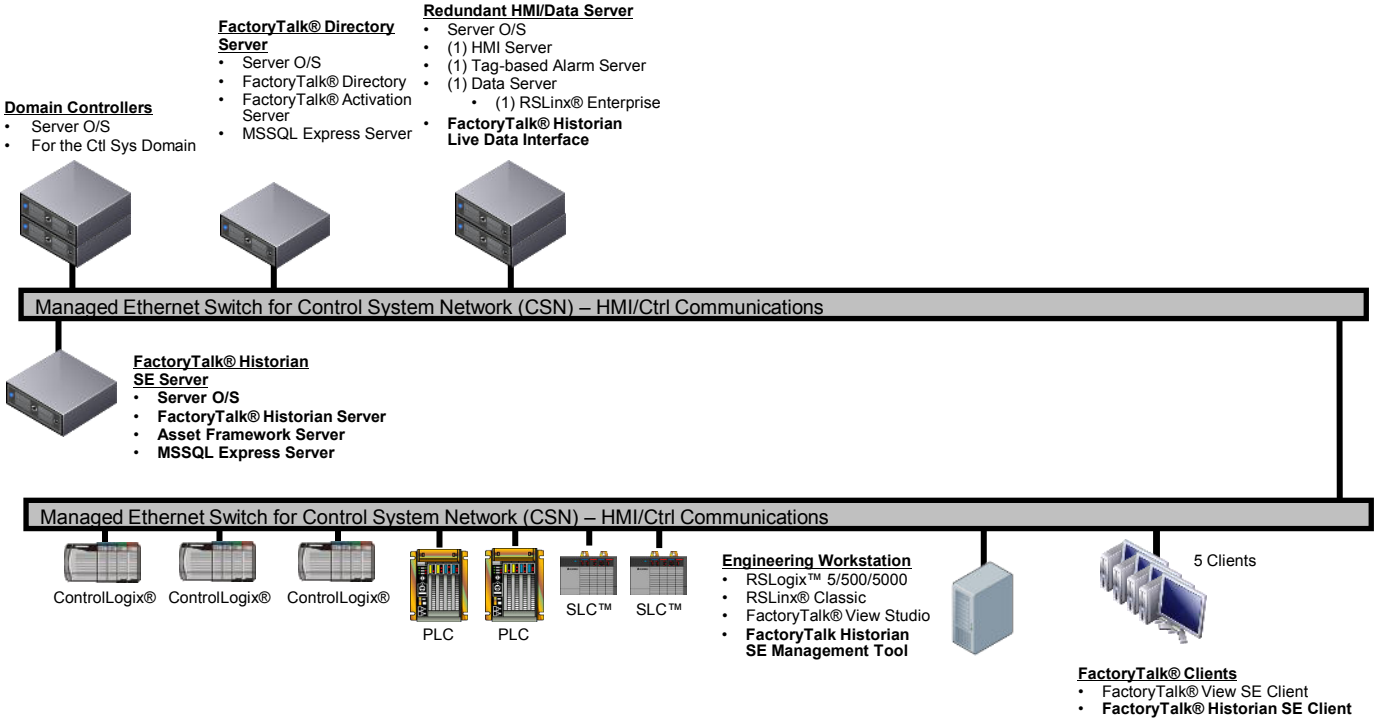
FactoryTalk® Historian SE



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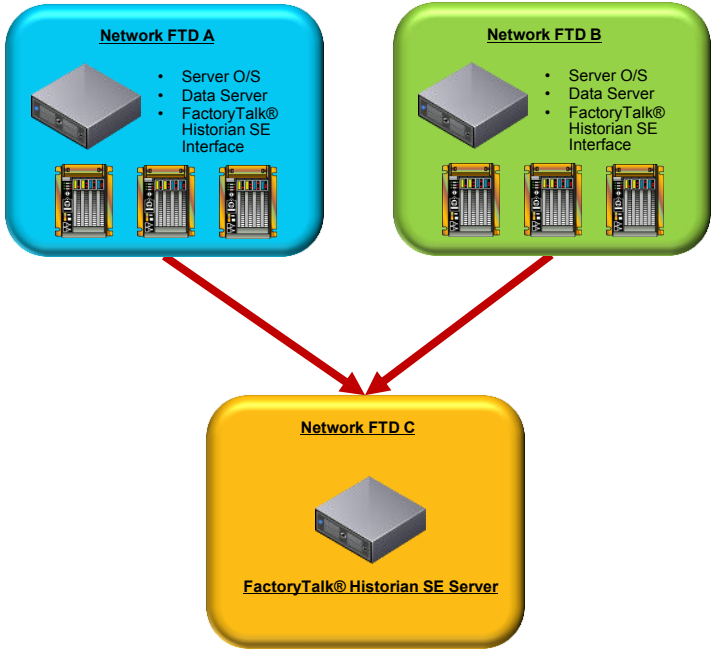
FactoryTalk® Historian
“另类”架构

Rockwell Automation

- **接口节点置于另一个FTD架构特点**
  Allows Live Data interfaces to be part of different FactoryTalk® Directories.
  - **只能存不能用** Data collection purposes only; remote sites cannot access historical data as clients.
  - **常常使用于ME模块不支持的硬件**
    Intended for architectures where ME module cannot be used.
  - **如果是1756系列还是最推荐ME模块**
    ME module is preferred for architectures using 1756.



参见 AID 277208 – The FactoryTalk® Historian SE Alternative Architecture

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关于FactoryTalk® Historian更多的问题请参考

Rockwell Automation

- 课程 Rockwell Automation TechED™ 2016
  - IN09 – FactoryTalk® Historian SE: Architectures and Design Considerations
  - IN07 – FactoryTalk® Historian Site Edition: Basic Lab on Data Collection and Reporting
  - IN06 - FactoryTalk® Historian Machine Edition: Basic Configuration in ControlLogix® Rack
- 网络 Rockwell Automation® Knowledgebase
  - AID 49189 – FactoryTalk® Historian SE System Design Considerations
  - AID 56070 – FactoryTalk® Historian SE Tips and Best Practices TOC
  - AID 60114 – FAQ: FactoryTalk® Historian SE
  - AID 66997 – FAQ: FactoryTalk® Historian SE Live Data Interface
  - AID 60277 – FAQ: FactoryTalk® Historian Collectives

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FactoryTalk® AssetCentre

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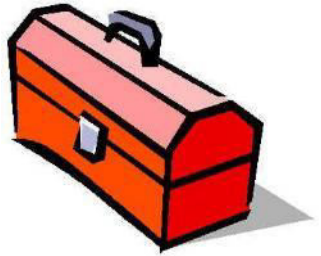
FactoryTalk® AssetCentre
组件

- **一个典型的 FactoryTalk® AssetCentre系统通常包含以下组件：**
  - Network FactoryTalk® Directory Server (FTD) (1)
  - Microsoft SQL Server (1)
  - FactoryTalk® AssetCentre Server (1)
  - FactoryTalk® AssetCentre Agent (1+)
  - FactoryTalk® AssetCentre Client (1+)
  - ProCalV5 Server (0-1)
  - ProCalV5 Client (0-1+)



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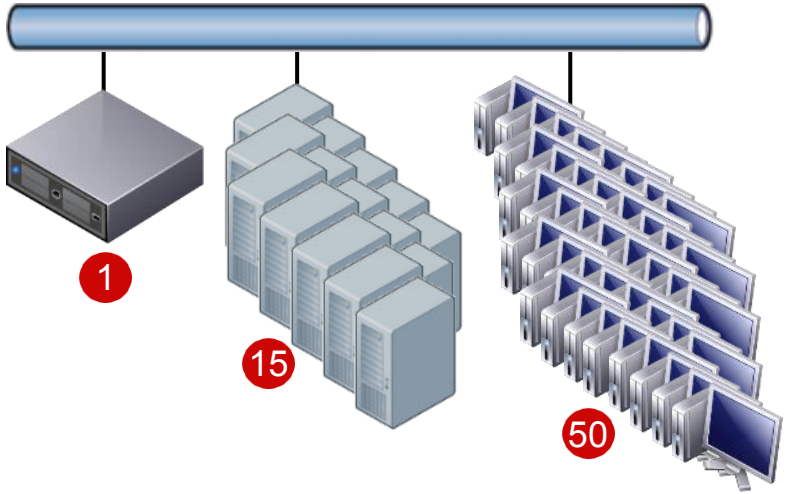
FactoryTalk® AssetCentre 系统限制

- **1个服务器 FactoryTalk® AssetCentre Server**
  - ProCalV5 Server (if using Calibration Management)
- **15个agent FactoryTalk® AssetCentre Agents**
  - 十个组 Up to 10 Agent Groups
  - Single agent services ~100 assets/ 12hrs
- **50个并发客户端 concurrent FactoryTalk® AssetCentre Clients**
  - ProCalV5 Client (if using Calibration Management)



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FactoryTalk® AssetCentre 系统建议

Rockwell Automation

- 系统仅限一个FTD FactoryTalk® Directory – there can be only one!
  - A FactoryTalk® AssetCentre Server can be linked with **one and only one** FactoryTalk® Network Directory.
- FTAC后台数据库 Microsoft SQL Server
  - Each FactoryTalk® AssetCentre system can use a single Microsoft SQL (MSSQL.)
  - MSSQL Server can be co-located with Server component.
- FTAC多agent FactoryTalk® AssetCentre Agents
  - **每台机器**仅有一个agent， agent**可以与服**务器共存同一主机 One agent per host, Agent component can be co-located with Server component.
  - **每个**agent**可以**单独配置 As of v6.0, Agents can be configured differently!
  - 资产授权 Each agent requires un-activated editor software for applicable assets.
  - **安装**agent**的主机不推荐作**为工程师站使用 Agent hosts should not be used as Engineering Workstations due to resource usage.
  - **具体参**见 AID 106118 – Determining the Necessary Number of AssetCentre Agents

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FactoryTalk® AssetCentre Client 设置

- 建议FTAC Client跟工程师站同主机 Locally on Engineering Workstations
  - Engineer workstation = PC being used with editing software such as RSLogix™, View Studio, etc.
  - 便于管理程序的变更 Allows user to check out files for use with editing application, make changes, then check files back into archive.
- 审计功能 Any FactoryTalk® PC requiring audit functionality
  - FactoryTalk® AssetCentre Client acts as Audit “listener”
- Web client目前不支持诊断 Web Client will not collect diagnostics

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FactoryTalk® AssetCentre
常见问题

- …spelling…
- **必**备Agent组件 The FactoryTalk® AssetCentre Agent component is required for all configurations.
- **配置**审计和诊断信息 Audits/Events are not collected automatically – an AssetCentre Client must be installed on the host to send the diagnostic information to the Server.
- **系**统仅限一个FTD Only one AssetCentre Server is supported per FactoryTalk® Directory.

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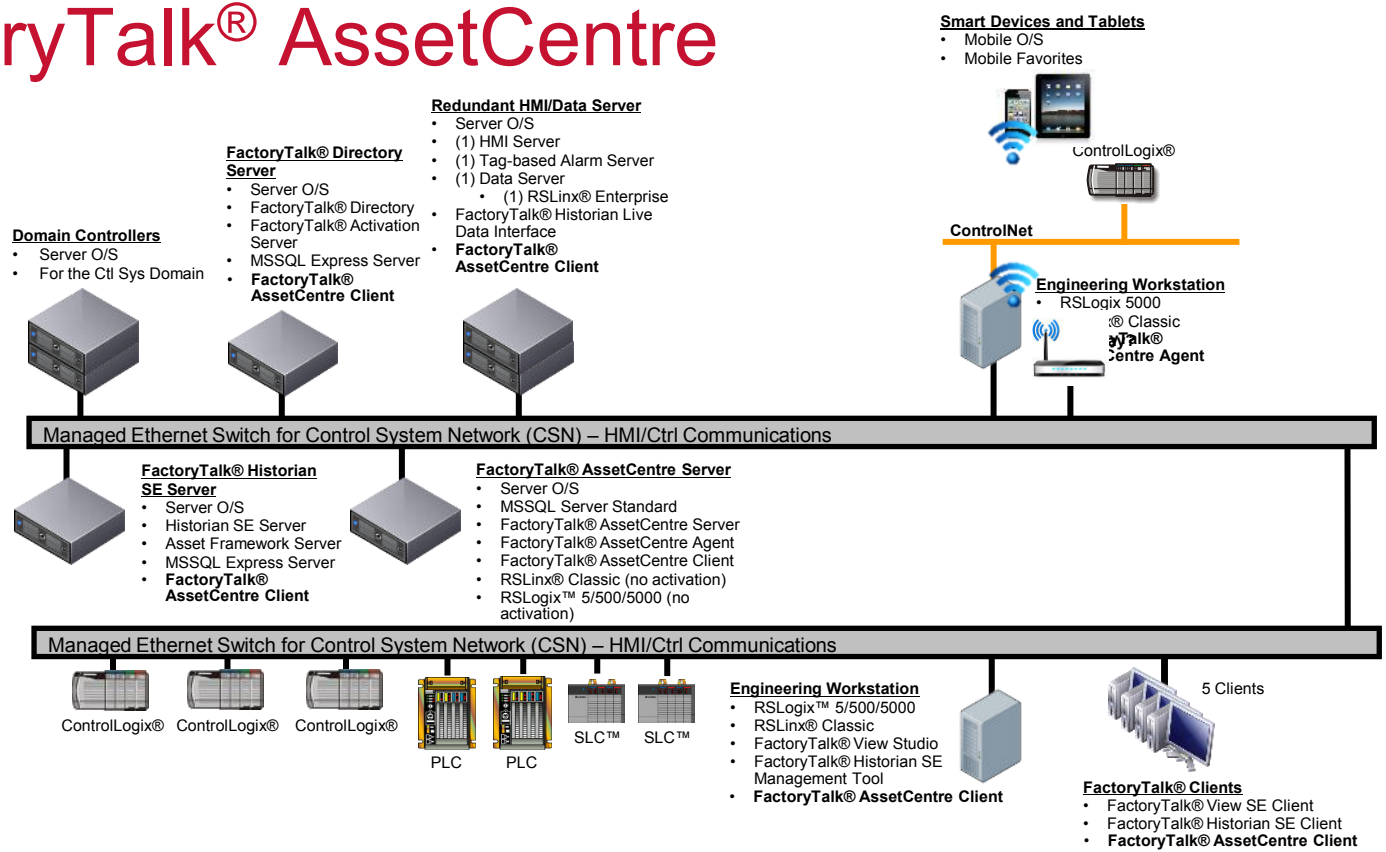
FactoryTalk® AssetCentre



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关于FactoryTalk® AssetCentre 更多问题请参考

Rockwell Automation

- 课程 Rockwell Automation TechED™ 2016
  - SY09 – FactoryTalk® AssetCentre: Overview
  - SY10 – FactoryTalk® AssetCentre: Introductory Hands-on Lab
  - SY11 – FactoryTalk® AssetCentre: Advanced Hands-on Lab
- 网络 Rockwell Automation® Knowledgebase
  - AID 57483 – FactoryTalk® AssetCentre System Design Considerations
  - AID 56049 – FactoryTalk® AssetCentre Tips and Best Practices TOC
  - AID 60057 – Architecting FactoryTalk® AssetCentre
- 视频 Product Portfolio
  - Introduction to FactoryTalk® AssetCentre Architecture (video)

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FactoryTalk® VantagePoint

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FactoryTalk® VantagePoint 与FactoryTalk® Directory

Rockwell Automation

- FT VantagePoint 与FTD的关系 FactoryTalk® VantagePoint® can function independently of a FactoryTalk® Directory, or within a Network FactoryTalk® Directory.
  - **Within** a FactoryTalk® Directory server, FactoryTalk® VantagePoint can connect to:
    - **FactoryTalk® Live Data**
    - **FactoryTalk® Historian SE or ME**
    - **FactoryTalk® Alarms and Events historical database**
  - **FactoryTalk® Historian and FactoryTalk® Alarms & Event information** can also be collected from **outside** of the FactoryTalk® Directory server.

- FT VantagePoint 仅支持网络架构 FactoryTalk® VantagePoint® is only supported in the **Network** FactoryTalk® Directory.

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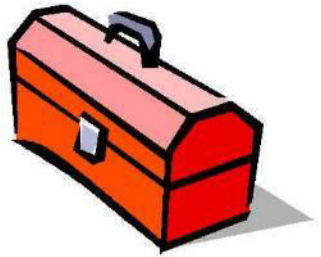
FactoryTalk® VantagePoint 组件

Rockwell Automation

- 典型的FactoryTalk® VantagePoint 系统包含以下部分：
  - Network FactoryTalk® Directory Server (FTD) (0-1)
  - Microsoft SQL Server (1)
    - MSSQL CLR (0-1)
  - Microsoft SharePoint Server w/Web Parts (0-1)
  - FactoryTalk® VantagePoint Server (1)
  - FactoryTalk® VantagePoint Mobile Site (0-1)
  - Data Source (1+)
  - FactoryTalk® VantagePoint Client (1+)
  - FactoryTalk® VantagePoint KPI App (0+)



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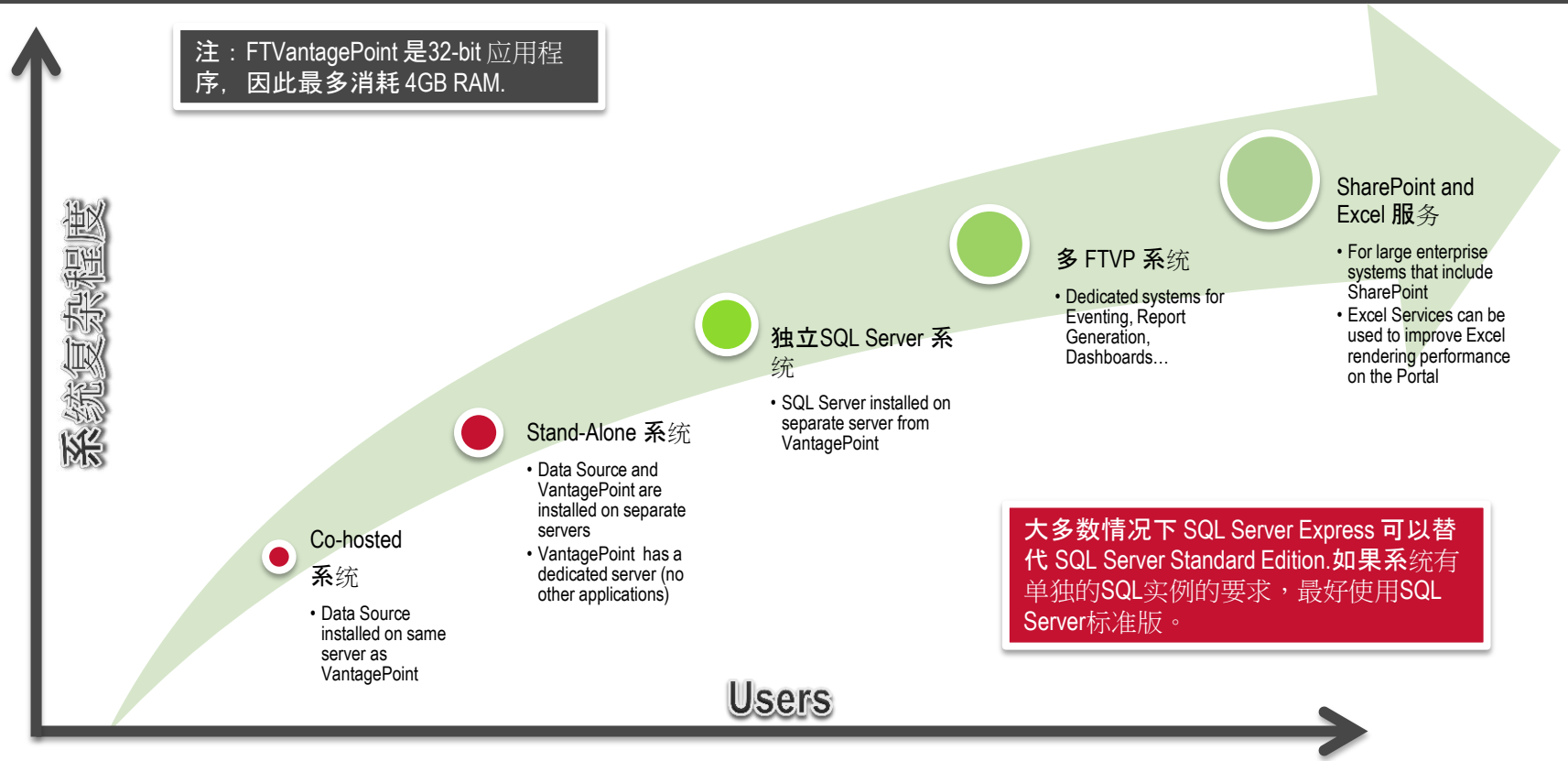
FactoryTalk® VantagePoint 规模



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FactoryTalk® VantagePoint 架构

Rockwell Automation

- **最推荐典型3机系统:**
  - FactoryTalk® VantagePoint Server
    - (w/Mobile Site & FTD)
  - Data Source
  - SQL Server

推荐3机系统，因为其具有扩展性，并能够最大限度地减少潜在的资源冲突。

- **小型系统也可以共置于一个主机:**
  - FactoryTalk® VantagePoint Server and MSSQL combined (w/Mobile Site & FTD)
  - Data Source

建议小型系统不超过十个users

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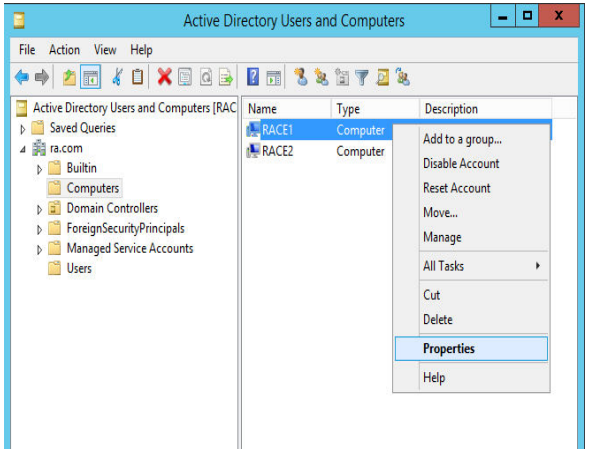
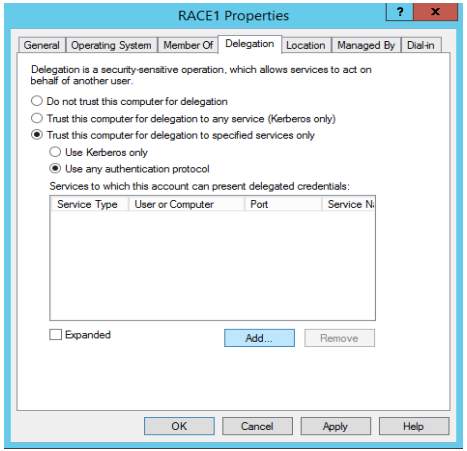
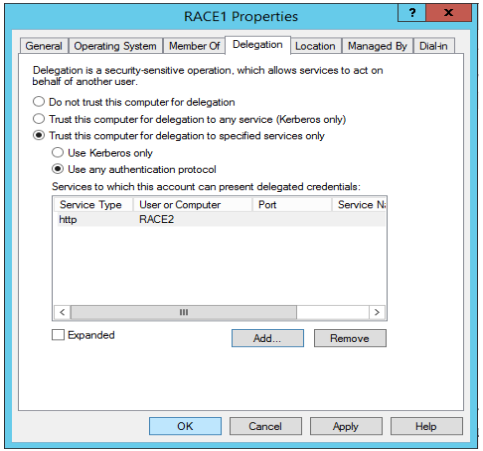
FactoryTalk® VantagePoint® Separating SQL Server

Rockwell Automation

- 推荐VantagePoint Server与SQL Server分置于两个主机
  - 若要使用SQL CLR 必须设置 Kerberos Delegation
  - 详情请参见 672599 - FactoryTalk® VantagePoint: Configuring Kerberos Delegation to Support a Distributed Architecture







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FactoryTalk® VantagePoint 常见问题

Rockwell Automation

- 如何co-located安装FactoryTalk® VantagePoint Server呢?
  - 建议不要co-located共享主机
  - 以下组件可以co-located主机
    - 如果没有独立实例的需求MSSQL可以co-located
    - 在特定情况下FactoryTalk® Historian SE
      请参见 AID 62869 – FactoryTalk® Historian SE and FactoryTalk® VantagePoint on a Single Host Computer

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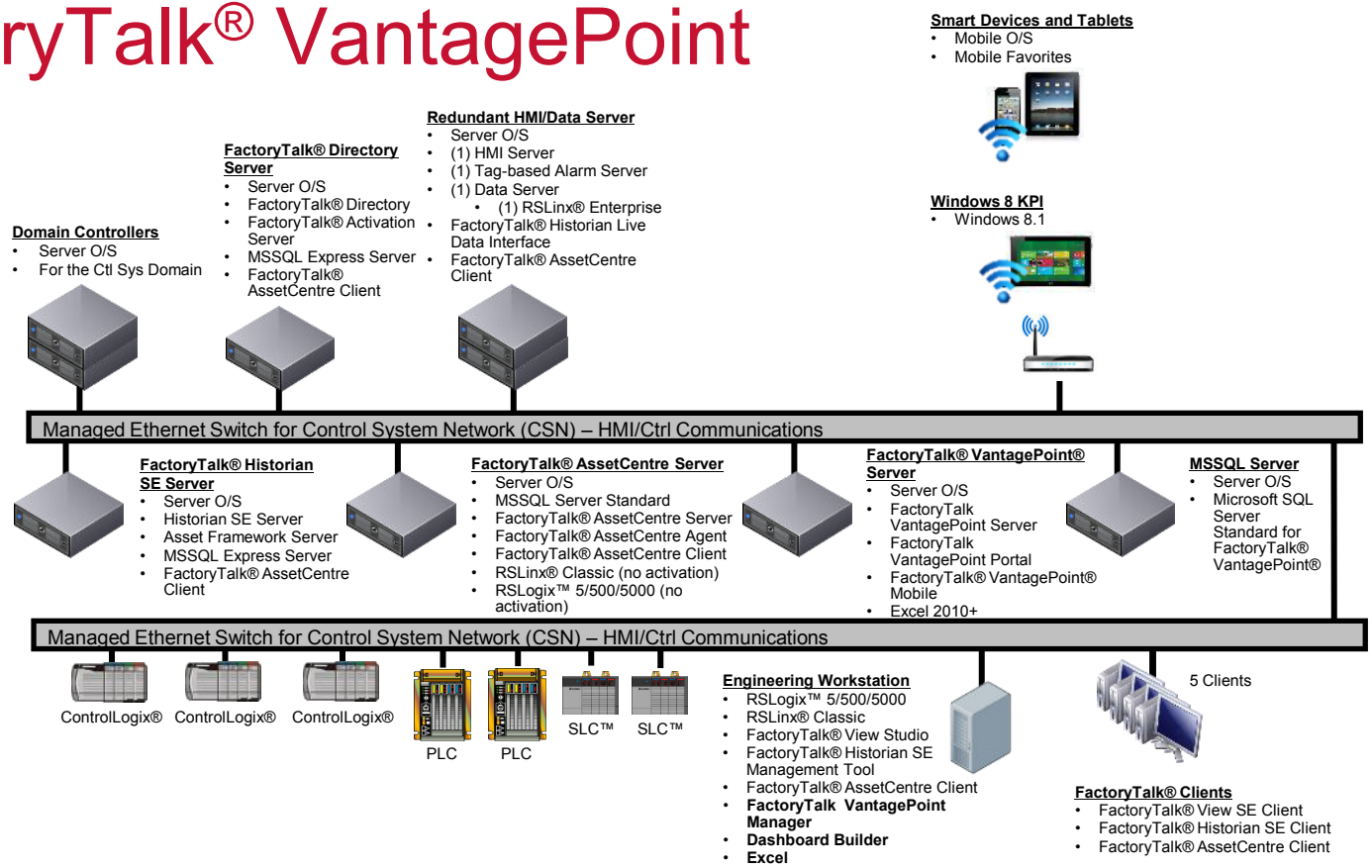
FactoryTalk® VantagePoint



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关于FactoryTalk® VantagePoint更多问题请参考

Rockwell Automation

- 课程 Rockwell Automation TechED™ 2016
  - IN04 – FactoryTalk® VantagePoint EMI Lab: Building an Information System
  - IN05 - FactoryTalk® VantagePoint EMI Advanced Topics and Reporting

- 网络 Rockwell Automation® Knowledgebase
  - AID 59149 – FactoryTalk® VantagePoint Tips and Best Practices TOC
  - AID 61808 - FAQ: FactoryTalk® VantagePoint Frequently Asked Questions
  - AID 493349 – FAQ: FactoryTalk® Information Software Products – Integration with Microsoft SharePoint
  - AID 520456 – FAQ: Using SQL CLR with FactoryTalk® VantagePoint EMI
  - AID 576677 – FAQ: FactoryTalk® VantagePoint EMI Windows 8 KPI Frequently Asked Questions
  - AID 613768 – FAQ: FactoryTalk® VantagePoint Mobile Site

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Microsoft SQL Server

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Microsoft SQL Express vs Standard

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- Many Rockwell Software products requiring SQL databases now ship with Microsoft SQL Express.
  - Intended for smaller systems and/or historical storage
- SQL Express有10G限制.
  - 同时也会限制内存 Also limited to lesser of 1 socket or 4 cores, and 1GB memory per instance
- 支持将SQL Express升级为SQL Standard.

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Microsoft SQL 与RA软件

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- FactoryTalk® View SE HMI Tag Database Server
  - Express instances – must be co-located with HMI Server

Redundant HMI/Data Server
- (1) HMI Server
- (1) Tag-based Alarm Server
- (1) Data Servers
  - (1) RSLinx® Enterprise
- FactoryTalk® Historian Live Data Interface

- FactoryTalk® Alarms & Events

FactoryTalk® Directory Server
- FactoryTalk® Directory Server
- FactoryTalk® Activation Server
- MSSQL Express Server

- FactoryTalk® Historian SE Asset Framework Server

FactoryTalk® Historian SE Server
- Server O/S
- FactoryTalk® Historian SE Server
- Asset Framework Server
- MSSQL Express Server

- FactoryTalk® AssetCentre Server

FactoryTalk® AssetCentre Server
- MSSQL Server Standard
- FactoryTalk® AssetCentre Server
- FactoryTalk® AssetCentre Agent
- FactoryTalk® AssetCentre Client

- FactoryTalk® VantagePoint® Server

FactoryTalk® VantagePoint® Server
- FactoryTalk® VantagePoint® Server
- FactoryTalk® VantagePoint® Portal
- Excel

MSSQL Server
- MSSQL Server Standard for FactoryTalk® VantagePoint®

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Microsoft SQL 服务器合并使用

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- Many instances can be consolidated:
  - FactoryTalk® Alarms & Events (FTAE) History
  - FactoryTalk® Historian SE Application Framework (FTAF) Server
  - FactoryTalk® AssetCentre (FTAC) Server
  - FactoryTalk® VantagePoint® (FTVP) Server

Microsoft SQL Server
- FTAE Database
- FTAF Database
- FTAC Database
- FTVP Database

- MSSQL Standard 和 Express 同机安装 can be installed “side-by-side” on the same host

- 考虑到 SQL 对主机资源的占用和整合
  - 推荐独立安置 Separate server recommended
  - SQL Express instance 没有足够的资源处理多个应用程序

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Microsoft SQL Database Management

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- 建议数据库和时间做备份
  - FactoryTalk® AssetCentre: AID 59541
  - FactoryTalk® VantagePoint: AID 62884

- 存储运行之后监视存储数据的大小 Monitor the size of the transaction logs, particularly in systems with constant data changes (e.g., FactoryTalk® AssetCentre.)
- Discuss further policies with end user's database management team.
  - 建议数据库设置索引和清除 Indexing and cleanup operations.
  - 数据库扩展策略 Database growth policy expansion.

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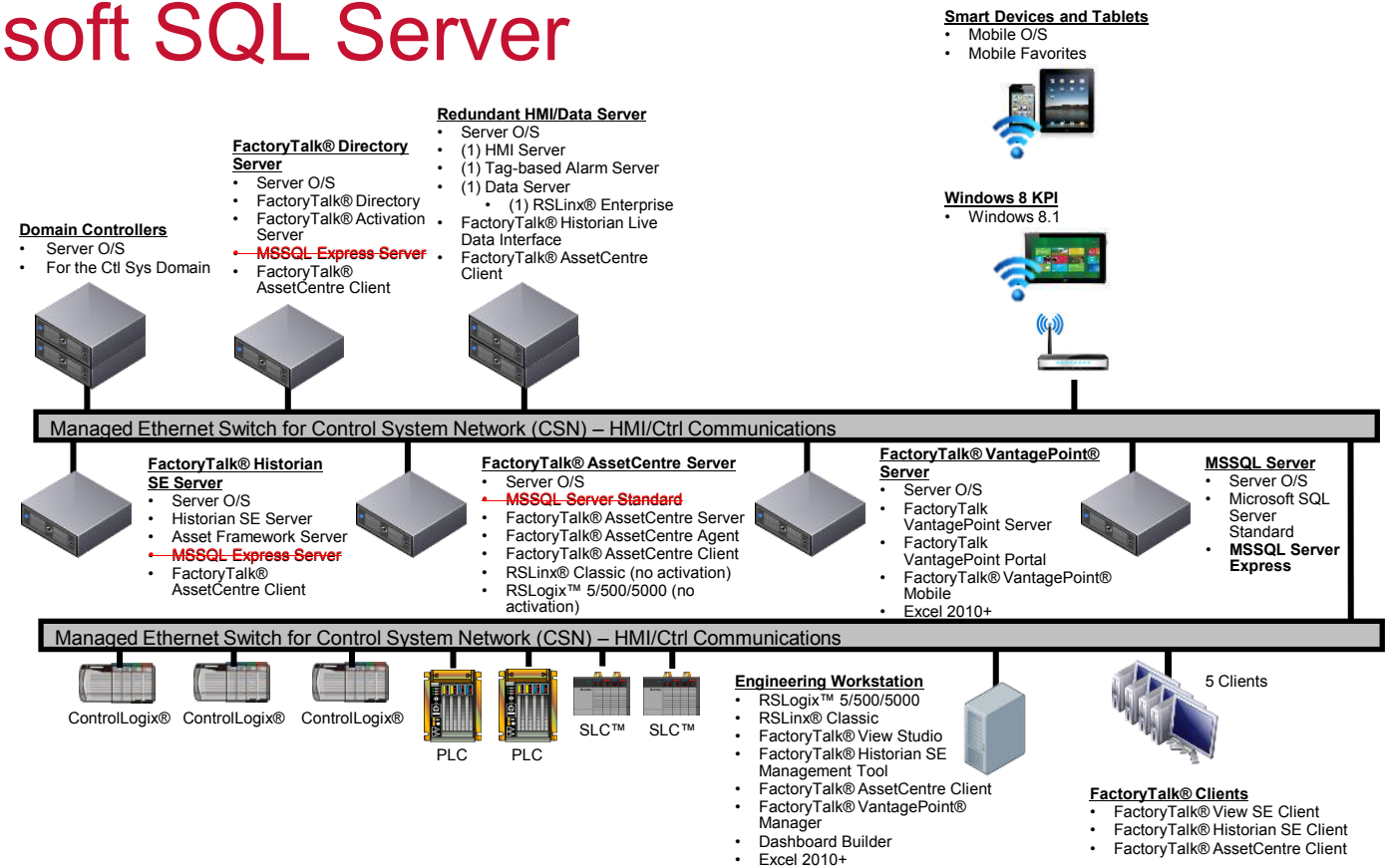
Microsoft SQL Server



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关于Microsoft SQL 和 FactoryTalk®请参考

- Rockwell Automation® Knowledgebase
  - AID 64647 – FAQ: Using Microsoft SQL Server with Rockwell Software® FactoryTalk® Products
    - Includes support information, memory best practice links, licensing FAQs
  - AID 49075 – FactoryTalk® Metrics MSSQL Backup
  - AID 59541 – FactoryTalk® AssetCentre MSSQL Backup & Restore
  - AID 62884 – FactoryTalk® VantagePoint® MSSQL Backup

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更多的问题…

Virtualization相关

- Rockwell Automation TechED™ 2016
  - TS06 - Introduction to Virtualization for Manufacturing Environments
  - TS07 - Building a Hardware Infrastructure for a Virtualized Solution
- Rockwell Automation® Knowledgebase
  - AID 568026 – Using Rockwell Software® with VMware
- Literature Library
  - Virtualization for Process Automation Systems

Thin Clients相关

- Rockwell Automation TechED™ 2016
  - VZ15 - Extending FactoryTalk® View Site Edition with Thin Client Technologies
  - VZ16 – ACP ThinManager: ThinManager Relevance: The Future of Industrial Mobility is Now
  - NS14 - Deploy Secure Network Architectures for The Connected Enterprise
- Rockwell Automation® Knowledgebase
  - AID 567658 – FactoryTalk® View SE with Windows 2008 RDS

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