SIEMENS

Process Historian - Installation Notes 1

Process Historian - Release Notes 2022 2

SIMATIC Process Historian 3

SIMATIC

Process Historian
SIMATIC Process Historian

System Manual

10/2022
A5E52028712-AA

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION
indicates that minor personal injury can result if proper precautions are not taken.

NOTICE
indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

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We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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A5E52028712-AA
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Process Historian - Installation Notes 1

1.1 System requirements

1.1.1 System requirements

Overview

The following requirements must be met for the installation and operation of the SIMATIC Process Historian:

- Hardware requirements (Page 10)
- Software requirements (Page 15)

We recommend operating the Process Historian server in a Windows domain.

The security settings of the firewall form the basis of the security concept for operating the Process Historian:

Firewall settings (Page 18)

You require the following licenses to operate a Process Historian system:

Licenses of the Process Historian (Page 8)

Note

The passwords configured for a user must match on the PCs

Make sure that all passwords specified for a user are identical on the following systems:

- Monitoring & Control server
- OS server
- Process Historian server

Make sure to notice any changes to passwords.

Order of installation of Process Historian and Information Server on a system

If Process Historian and Information Server are to be installed on the same computer, they must be installed in the same SQL Server instance. The Process Historian must be installed first.

Cleanup of the corrupt Information Server installation

If you did not install the Information Server together with the Process Historian but installed it afterwards, use the following procedure to clean up the faulty installation:

1. Create a full SQL Server backup of the existing PH database.
   Details can be found in the section "Creating a Full PH Database Backup" in the FAQ: Backup and restore of a Process Historian database (https://support.industry.siemens.com/cs/attachments/66579062/66579062_pcs7_ph_backup_restore_en.pdf)
   The procedure described there also applies to the SQL Server 2017.
   If you use SIMATIC BATCH, the data supplied from the batches are saved separately in the Process Historian and must therefore be taken into account in the full backup.
2. Perform a complete new installation of the operating system.
3. Start the general setup and select the installation for Process Historian and Information Server.
4. A new, empty Process Historian database is created. Use the same configuration settings for the newly created database.
5. Once the functionality is completed and verified, restore the previously created SQL Server backup of the Process Historian database.
   Details can be found in the section "Restore Historian Storage Database" in the FAQ: Backup and restore of a Process Historian database (https://support.industry.siemens.com/cs/attachments/66579062/66579062_pcs7_ph_backup_restore_en.pdf)

1.1.2 Licenses of the Process Historian

Products for PCS neo

Product	License type	Validity	MLFB	WiBu
Process Historian Server	Single	Unlimited	6DL8905-0AD00-0AB5 6DL8905-0AD00-0AH5	50001
Process Historian - Archive Tags	Single	Counter-relevant (100)	6DL8905-0BD00-0AB5 6DL8905-0BD00-0AH5	50002
Process Historian - Archive Tags	Single	Counter-relevant (1000)	6DL8905-0ED00-0AB5 6DL8905-0ED00-0AH5	50002
Process Historian - Archive Batch	Single	Unlimited	6DL8905-0DD00-0AB5 6DL8905-0DD00-0AH5	50004

An additional license is required for the following connectivity function:

Product	License type	Validity	MLFB	WiBu
Process Historian OPC UA Server	Single	1	6DL8905-0CD00-0AB5 6DL8905-0CD00-0AH5	50003

Note

MLFB numbers

MLFB numbers ending with 0AB5 are goods deliveries.
MLFB numbers ending with 0AH5 are OSD deliveries (downloads).

Products for PCS 7

Product	License type	Validity	MLFB
Process Historian and Information Server Basic Package	Single	Unlimited	6ES7652-7AX68-2YB0 6ES7652-7AX68-2YH0
Process Historian Basic Package	Single	Unlimited	6ES7652-7BX68-2YB0 6ES7652-7BX68-2YH0
Process Historian Archive BATCH	Single	Unlimited	6ES7652-7DX68-2YB0 6ES7652-7DX68-2YH0
Process Historian Server Redundancy	Single	Unlimited	6ES7652-7CX68-2YB0 6ES7652-7CX68-2YH0

An additional license is required for the following connectivity function:

Product	License type	Validity	MLFB
Process Historian OPC UA Server	Single	Unlimited	6ES7652-7FX68-2YB0 6ES7652-7FX68-2YH0

Products for WinCC

Product	License type	Validity	MLFB
Process Historian and Information Server, Software Media Package	Single	Unlimited	6ES7652-7AX68-0YT8 6ES7652-7AX68-0YH8

Note

MLFB numbers

MLFB numbers ending with 2YB0/2YE0/0YT8 are goods deliveries.
MLFB numbers ending with 2YH0/0YH8 are OSD deliveries (downloads).

1.1.3 Hardware requirements

1.1.3.1 Hardware requirements

Overview

Before you decide on hardware equipment, you must:

- Estimate the expected tag and message load.
- Determine how long the data is stored in the Process Historian.

Based on these numbers, you can determine the necessary hard disk capacity.

The "PH-HWAdvisor" tool calculates the hardware configuration for the Process Historian based on the specific project.

PH-HW Advisor (https://support.industry.siemens.com/cs/ww/en/view/109740115)

Overview of the configuration limits

The following assumptions are made regarding the values for the configuration limits:

- The Process Historian was configured with 6 runtime segments and a future segment.
- The compression factor is "10".
- The data is available for 2 years on the Process Historian database.
- The calculation of the required storage space is based on the **high** limit of the respective tags.

Configuration limits	Small (S)	Medium (M)	Large (L)	Extra Large (XL)
Monitoring & Control server / OS server (redundant)	1	2 - 4	5 - 10	11 - 18
Monitoring & Control station / OS client	1 - 4	16	40	40
Max. process values/s	1500	6000	15,000	27,000
∅ messages/min	20	40	100	180
Storage space required				
For the process values in TB	1	4	10	18
For the messages in TB	0.04	0.16	0.4	0.7
Configured hard disk space*)				
For the process values in TB	2	7.2	14.4	21.6
For the messages in TB		0.6	0.9	1.8

*) The following is taken into account:

- The compression factor may vary.
- The data can be available for more than 2 years on the Process Historian database.
- The capacity of the hard disks is larger than calculated by the operating system.

The following hardware equipment is recommended:

- Low configuration limits (S) (Page 11)
- Medium configuration limits (M) (Page 12)
- High configuration limits (L) (Page 13)
- Very high configuration limits (XL) (Page 13)

Overview of the configuration limits with SIMATIC BATCH

Configuration limits	Medium (M)	Large (L)
Monitoring & Control server / OS server (redundant)	2 - 4	5 - 10
Monitoring & Control station / OS client	16	40
Max. process values/s	6000	15,000
∅ messages/min	40	100
Required storage space (with a redundant BATCH server)		
For the process values in TB	4	10
For the messages in TB	0.16	0.4
For the BATCH messages*)	2	2
Configured hard disk space		
For the process values in TB	7.2	14.4
For the messages in TB	3.6	3.6

*) 60 recipe steps / min. require 1 TB for the BATCH messages

The following hardware equipment is recommended:

- Medium scale configuration limits with BATCH data and Information Server (M) (Page 14)
- Medium scale configuration limits with BATCH data and Process Historian redundancy (M) (Page 14)
- Large scale configuration limits with BATCH data and Information Server (L) (Page 15)

1.1.3.2 Low configuration limits (S)

Overview

Platform	Process Historian IPC 647E (e.g. 6ES7661-0PU57-1RA4)	
CPU	Xeon E-2278GE (8C/16T, 3.3 (4.7) GHz, 16 MB Cache, TB, AMT)	
RAM	64 GB DDR4 SDRAM (4x 16 GB), EEC, Dual Channel	
Hard disks	**Properties and quantity**	**Use**
	512 GB SSD M.2	Operating system and software
	RAID 1, ~2 TB (2 x 1920 GB SSD 2.5" SATA)	Transaction log and Process Historian database

Applications

Process Historian single:

- 1 OS (with 1500 values/s, 20 messages/min), plus Information Server, 2 years of online data availability
- 1 OS (with 1500 values/s, 20 messages/min), 3 years of online data availability
- 2 OS (each with 1500 values/s, 20 messages/min), 2 years of online data availability

Platform	Process Historian IPC 847E (e.g. 6ES7661-1PW67-1RA4)	
CPU	Xeon E-2278GE (8C/16T, 3.3 (4.7) GHz, 16 MB Cache, TB, AMT)	
RAM	64 GB DDR4 SDRAM (4x 16 GB), EEC, Dual Channel	
Hard disks	**Properties and quantity**	**Use**
	1024 GB SSD M.2	Operating system and software
	RAID 5, ~5.7 TB (4 x 1920 GB SSD 2.5" SATA)	Transaction log and Process Historian database

Applications

Process Historian single:

- 4 OS (each with 1500 values/s, 20 messages/min), plus Information Server, 2 years of online data availability
- 2 OS (each with 1500 values/s, 20 messages/min), plus Information Server, plus Batch, 2 years of online data availability

Process Historian redundant:

- 4 OS (each with 1500 values/s, 20 messages/min), plus Batch, 2 years of online data availability

1.1.3.3 Medium configuration limits (M)

Overview

CPU	Intel® Xeon® processor E5-2643v4 (6C/12T, 3.40 GHz, TLC: 20 MB, Turbo: 3.60 GHz, 9.6 GT/s, Mem bus: 2,400 MHz, 135 W, AVX Base 2.80 GHz, AVX Turbo 3.60 GHz). Comparable or better CPU.		
RAM	64 GB, EEC		
Hard disks	**Properties and quantity**	**Total storage space capacity**	**Use**
(18x)	RAID 1, 2 x 600 GB	600 GB	Operating system
2.5"	RAID 1, 2 x 1.8 TB	1.8 TB	Transaction log
SAS 12 GB/s	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 0)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 1)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 2)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 3)
	RAID 1, 2 x 600 GB	600 GB	Messages
	RAID 1, 2 x 600 GB	600 GB	General data
	RAID 1, 2 x 1.8 TB	1.8 TB	Information Server database

The redundant partner may be absent for a maximum of 20 days.

1.1.3.4 High configuration limits (L)

Overview

CPU	2x Intel® Xeon® processor E5-2643v4 (6C/12T, 3.40 GHz, TLC: 20 MB, Turbo: 3.60 GHz, 9.6 GT/s, Mem bus: 2,400 MHz, 135 W, AVX Base 2.80 GHz, AVX Turbo 3.60 GHz). Comparable or better CPU.		
RAM	64 GB, EEC		
Hard disks (24x) 2.5" SAS 12 GB/s	**Properties and quantity**	**Total storage space capacity**	**Use**
	RAID 1, 2 x 600 GB	600 GB	Operating system
	RAID 10, 4 x 1.8 TB	3.6 TB	Transaction log
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 0)
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 1)
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 2)
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 3)
	RAID 1, 2 x 900 GB	900 GB	Messages
	RAID 1, 2 x 900 GB	900 GB	General data
	RAID 1, 2 x 1.8 TB	1.8 TB	Information Server database

The redundant partner may be absent for a maximum of 20 days.

1.1.3.5 Very high configuration limits (XL)

Overview

CPU	2x Intel® Xeon® processor E5-2643v4 (6C/12T, 3.40 GHz, TLC: 20 MB, Turbo: 3.60 GHz, 9.6 GT/s, Mem bus: 2,400 MHz, 135 W, AVX Base 2.80 GHz, AVX Turbo 3.60 GHz). Comparable or better CPU.		
RAM	128 GB, EEC		
Hard disks (32x) 2.5" SAS 12 GB/s	**Properties and quantity**	**Total storage space capacity**	**Use**
	RAID 1, 2 x 1.8 TB	1.8 TB	Operating system
	RAID 1, 2 x 1.8 TB	1.8 TB	Transaction log
	RAID 10, 6 x 1.8 TB	5.4 TB	Process values (data group 0)
	RAID 10, 6 x 1.8 TB	5.4 TB	Process values (data group 1)
	RAID 10, 6 x 1.8 TB	5.4 TB	Process values (data group 2)
	RAID 10, 6 x 1.8 TB	5.4 TB	Process values (data group 3)
	RAID 1, 2 x 1.8 TB	1.8 TB	Messages
	RAID 1, 2 x 1.8 TB	1.8 TB	General data

With this hardware equipment, you cannot use the following options:

- Combining the Process Historian and Information Server
- SIMATIC BATCH archive
- Process Historian Redundancy

Note

You can expand the scale in regard to performance and the database size by using a Storage Area Network (SAN).

1.1.3.6 Medium scale configuration limits with BATCH data and Information Server (M)

Overview

CPU	Intel® Xeon® processor E5-2643v4 (6C/12T, 3.40 GHz, TLC: 20 MB, Turbo: 3.60 GHz, 9.6 GT/s, Mem bus: 2400 MHz, 135 W, AVX Base 2.80 GHz, AVX Turbo 3.60 GHz). Comparable or better CPU.		
RAM	64 GB, EEC		
Hard disks (22 x) 2.5" SAS 12 GB/s	**Properties and quantity**	**Total storage space capacity**	**Use**
	RAID 1, 2 x 600 GB	600 GB	Operating system
	RAID 1, 2 x 1.8 TB	1.8 TB	Transaction log
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 0)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 1)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 2)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 3)
	RAID 10, 4 x 1.8 TB	3.6 TB	Messages
	RAID 1, 2 x 600 GB	600 GB	General data
	RAID 1, 2 x 1.8 TB	1.8 TB	Information Server database
	RAID 1, 2 x 1.8 TB	1.8 TB	BATCH data

With this hardware equipment, you cannot use the following options:

- Process Historian Redundancy

1.1.3.7 Medium scale configuration limits with BATCH data and Process Historian redundancy (M)

Overview

CPU	Intel® Xeon® processor E5-2643v4 (6C/12T, 3.40 GHz, TLC: 20 MB, Turbo: 3.60 GHz, 9.6 GT/s, Mem bus: 2400 MHz, 135 W, AVX Base 2.80 GHz, AVX Turbo 3.60 GHz). Comparable or better CPU.
RAM	64 GB, EEC

Hard disks (22 x) 2.5" SAS 12 GB/s	**Properties and quantity**	**Total storage space capacity**	**Use**
	RAID 1, 2 x 600 GB	600 GB	Operating system
	RAID 10, 4 x 1.8 TB	3.6 TB	Transaction log
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 0)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 1)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 2)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 3)
	RAID 10, 4 x 1.8 TB	3.6 TB	Messages
	RAID 1, 2 x 600 GB	600 GB	General data
	RAID 1, 2 x 1.8 TB	1.8 TB	BATCH data

1.1.3.8 Large scale configuration limits with BATCH data and Information Server (L)

Overview

CPU	2x Intel® Xeon® processor E5-2643v4 (6C/12T, 3.40 GHz, TLC: 20 MB, Turbo: 3.60 GHz, 9.6 GT/s, Mem bus: 2400 MHz, 135 W, AVX Base 2.80 GHz, AVX Turbo 3.60 GHz). Comparable or better CPU.		
RAM	128 GB, EEC		
Hard disks (32x) 2.5" SAS 12 GB/s	**Properties and quantity**	**Total storage space capacity**	**Use**
	RAID 1, 2 x 600 GB	600 GB	Operating system
	RAID 1, 2 x 1.8 TB	1.8 TB	Transaction log
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 0)
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 1)
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 2)
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 3)
	RAID 10, 4 x 1.8 TB	3.6 TB	Messages
	RAID 1, 2 x 900 GB	900 GB	General data
	RAID 1, 2 x 1.8 TB	1.8 TB	Information Server database
	RAID 10, 4 x 1.8 TB	3.6 TB	BATCH data

With this hardware equipment, you cannot use the following options:

- Process Historian Redundancy

1.1.4 Software requirements

1.1.4.1 Software requirements

Operating systems

The following Microsoft operating system is supported:

- Windows Server 2019

Supported operating system languages (Page 17)

An update of the operating system is not allowed while the Process Historian is running. To install an update, proceed as follows:

Updating the operating system for Process Historian (Page 35)

Note

Process Historian identifies the hosts using the host SID

The computer SID is a unique security identifier. The Process Historian identifies the Monitoring & Control stations / OS clients / WinCC stations by their computer SID. Computers that have the same computer SID and store data on the Process Historian are not uniquely identified by the Process Historian. This can lead to malfunctions on the Process Historian.

When computers are cloned, the computer SID is not adjusted automatically.

The combined Process Historian/Information Server computer must also have a unique SID.

.NET Framework

The Process Historian requires ".NET Framework 4.6.2." or higher. You might need to install this version of the Framework.

Installing Microsoft .NET Framework (Page 35)

Microsoft Message Queuing Services for PCS 7/WinCC

The Process Historian uses the Microsoft Message Queuing services for PCS 7 and WinCC. This component is part of the operating system. You may need to subsequently install Microsoft Message Queuing.

SQL Server

The Process Historian server requires the Microsoft SQL Server 2017 Standard Edition 64-bit. The SQL Server is installed automatically during the Process Historian installation.

You need to set up appropriate user rights to access the data on the SQL Server. Read the relevant documentation.

"Historian" SQL server instance (Page 17)

Note

Do not change Windows computer name

Do not change the Windows computer name after installing the Process Historian.

If you do change the Windows computer name, you must uninstall and reinstall the SQL Server.

Do not use the name "HIST" or "HISTORIAN" for the Process Historian computer

These names are already pre-defined for the SQL Server instance. Using these names leads to a conflict with the SQL server. The Database Wizard will not work.

Virtual systems

You can use Process Historian in the virtualized environments supported by PCS neo/PCS 7/ WinCC.

See also

Hardware requirements (Page 10)

1.1.4.2 Supported operating system languages

Overview

Process Historian is released for the following operating system languages:

- German
- English
- French
- Italian
- Spanish
- Multilingual operating system

The Asian version of Process Historian is released for the following operating system languages:

- English
- Chinese (Simplified, PRC)
- Japanese
- Multilingual operating system

Note

The Process Historian supports the primary languages of the operating system languages. For example, English (USA).

1.1.4.3 "Historian" SQL server instance

Overview

An "Historian" instance is created with the required settings during installation on a Microsoft SQL. You can change the name of the instance later.

This instance is always installed in English. The language in which existing SQL Server instances are installed has no influence on this. Existing instances are not affected by the Service Pack.

"Historian" instance after uninstalling Process Historian

The SQL Server "Historian" instance is retained when the Process Historian is uninstalled. For licensing reasons, this instance must be uninstalled manually.

1.1.4.4 Firewall settings

Overview

The security settings of the firewall are the basis of the security concept. The required security settings for the locally installed Windows firewall to run the Process Historian server are adapted via the Database Installation Wizard after installation. The settings depend on the data sources used.

If you use an additional firewall between the Monitoring & Control station / OS client / WinCC station and the Process Historian, these ports must remain accessible.

Make sure that firewall features that make checks at application level are adjusted, if necessary. For example, you must disable the "RPC Filter" feature in the SIEMENS Application Firewall.

Note

The ports which are not necessary for communication of the current configuration must be closed.

Assignment of SIMATIC products as data sources to the firewall settings

Firewall settings	PCS neo	PCS 7	BATCH	WinCC	WinCC Performance Monitor	Process Historian Redundancy	Information Server (Remote)	OPC UA Server (Remote)	OPC UA Data Collector (Remote)
PH LLMNR-UDP-In	x	x		x					
PH Database Writer SF2	x							x	x
PH SQL server port		x	x	x	x	x	x		
PH SQL Server Monitor Port		x	x	x	x	x	x		
PH SQL Server Application		x	x	x	x	x	x		
PH RPC for MSMQ		x		x					
PH Network Discovery		x	x	x	x			x	x
PH Discovery Services		x		x	x			x	x
PH Management			x						
PH Redundancy Services						x			

Firewall settings	PCS neo	PCS 7	BATCH	Win CC	WinCC Performance Monitor	Process Historian Redundancy	Information Server (Remote)	OPC UA Server (Remote)	OPC UA Data Collector (Remote)
PH WCF Message Queue Service (Redundancy Maintenance Service)						x			
PH WCF Message Queue Service (SQL Mirroring Setup)						x			
PH WCF Message Queue Service (Maintenance Service)						x			
PH SQL - Server Mirroring Port (UDP)						x			
PH SQL - Server Mirroring Port (TCP)						x			

Open ports

The Process Historian server requires the following open ports for operation:

Name	Protocol	Port
PH LLMNR-UDP-In	UDP	5355
PH RPC for MSMQ	TCP	135
PH Network Discovery (NetBios Name Resolution)	UDP	137
PH SQL Server Monitor Port	UDP	1434
Microsoft Message Queuing	TCP	1801
PH DatabaseWriterServiceUI	TCP	2224
PH Maintenance Service (Srv ServerPort)	TCP	2225
PH Maintenance Service (Srv ClientPort)	TCP	2226
PH Database Writer SF2	TCP	2227
PH Server 2020 (Server, License; Info; Live data)	TCP	2230
PH SQL Server Port	TCP	3723
PH SQL Mirroring Port (TCP)	TCP	5022
PH SQL Mirroring Port (UDP)	UDP	5022
PH Discovery Services	TCP	5048
PH Management	TCP	2222
Generic Import Export Service	TCP	44220
PH Redundancy Services	TCP	60000

Name	Protocol	Port
PH WCF Message Queue Service (Redundancy Maintenance Service)	TCP	60001
PH WCF Message Queue Service (SqlMirroringSetup)	TCP	60002
PH WCF Message Queue Service (MaintenanceService)	TCP	60003
PH SQL Server Application	TCP	Any port
OPC UA Local Discovery Server	TCP	Any port

The Monitoring & Control server / OS server requires the following open ports for operation:

Name	Protocol	Port
PH Database Writer SF2	TCP	2228
NetBios Name Resolution	UDP	137

1.2 Installation

1.2.1 Process Historian for PCS neo

1.2.1.1 Installing Process Historian for PCS neo

Note

Configuration of the target computer in the Administration Console

Before manually installing the Process Historian/Information Server, the target computer must be configured in the Administration Console:

1. Install AC Agent via "AdditionalProducts\AC Agent" of the PCS neo setup or a remote installation of the AC agent from the AC Server to the Process Historian-Server/Information Server.
2. Add the Process Historian Server/Information Server to the Administration Console.
3. Create an AC server certificate for the Process Historian Server/Information Server.

To do so, follow the instructions in the PUD for the Administration Console:

- Administration > SIMATIC PCS neo Administration Console > Getting Started > Use cases > Create setup definition for AC agent
- Administration > SIMATIC PCS neo Administration Console > Communication > Adding target computer to AC
- Administration > SIMATIC PCS neo Administration Console > Communication > Use cases > Create certificate for target computer

After successful local installation of Process Historian/Information Server, perform the following advanced steps in the Administration Console:

1. Connect the PH/IS computer to the UMC domain.
2. Determine the inventory data for the PH/IS computer.
3. Update the distribution of the configuration.

Follow the instructions in the PUD: "Administration > Administration Console > Inventory > Work with inventory data"

After the Process Historian Server is started, in the Administration Console, in "Configuration" > "S&F Allow List", add to the Allow List the Monitoring & Control Stations as S&F Clients that are allowed to write data to the Process Historian Server.

Requirement

- You have the Windows "Administrator" permission.
- The system requirements for the Process Historian are met.

Procedure

1. Install the "SIMATIC PCS neo Process Historian Server" software module via the PCS neo setup.
2. After completion, conclude the setup with a restart.

Result

Process Historian is installed on the PC.

The Database Installation Wizard is started, which you use to configure the Process Historian database. You can find additional information on the configuration of the database in the "Process Historian Server" manual.

Permissions for Windows domain users

If the operating system login on the Process Historian only has user authorization, the Process Historian Management Console is not opened automatically when the system is restarted. To open the Process Historian Management Console, go to "Start > Siemens Automation > SIMATIC > Process Historian > Process Historian Management Console".

To start the Process Historian Management Console automatically after restarting, enter the Windows domain user in the local administrator group.

See also

Configuring the database (Page 95)

Opening the Process Historian Management Console (Page 111)

1.2.2 Process Historian for PCS 7

1.2.2.1 Process Historian for PCS 7 - Overview

Overview

Depending on the configuration, you have various configuration options:

- Combined Process Historian/Information Server:
  - On the Process Historian/Information Server
    Installing a combined Process Historian/Information Server (Page 31)
  - On the OS servers
    Installing PH-Ready on a PCS 7 OS (Page 24)
- Redundant Process Historian with Information Server as witness
  - On the Process Historian/Information Server
    Installing redundant Process Historian (Page 25)
  - On the OS servers
    Installing PH-Ready on a PCS 7 OS (Page 24)

- Process Historian/Information Server and SIMATIC BATCH
  - On the Process Historian/Information Server
    Installing Process Historian/Information Server with SIMATIC BATCH (Page 32)
  - On the OS servers
    Installing PH-Ready on a PCS 7 OS (Page 24)
- Dedicated Process Historian/Information Server
  - On the Process Historian/Information Server
    Installing a dedicated Process Historian/Information Server (Page 31)
  - On the OS servers
    Installing PH-Ready on a PCS 7 OS (Page 24)
- Referenced OS single station with Process Historian/Information Server
  - On the Process Historian/Information Server
    Installing a combined Process Historian/Information Server (Page 31)
  - On the referenced OS single station. The OS single station base must be redundant when using a Process Historian in this configuration. You can use a total of eight OS stations.
    Installing PH-Ref on a PCS 7 OS (Page 24)

1.2.2.2 Installing Process Historian for PCS 7

Requirement

- You have the Windows "Administrator" permission.
- The system requirements are met.
- Microsoft Message Queuing (MSMQ) is installed.

Procedure

1. Start the PCS 7 setup from the data storage medium.
2. Follow the instructions of the installation wizard.
   Read the License Agreement and the Open Source License Agreement.
3. If necessary, enter the following information in the "User information" dialog:
   - User
   - Associated organization
4. Select the required "Type of installation":
   - Package installation
   - Custom installation
5. In the "Archiving and Reporting" category, select the "Process Historian" program package for package installation or the "Process Historian Server 2022" program for custom installation.

6. If you want to install a combined Process Historian/Information Server, select the "Process Historian" and "Information Server" program packages in the "Archiving and Reporting" category for a package installation or the "Process Historian Server 2022" and "Information Server" 2022" programs for a custom installation.
7. If required, select additional components in the "Programs" dialog.
8. Read the license agreement for Microsoft SQL Server.
9. Confirm the changes to the system settings in the "System settings" dialog.
10. Start the installation.
11. To complete the installation, restart the system.

Note

Restart during the installation

Several restarts are requested during installation. These restarts must be executed when they are requested and not at a later time.

Result

Process Historian is installed on the PC.

The Database Installation Wizard is started, which you use to configure the Process Historian database. You can find additional information on the configuration of the database in the "Process Historian Server" manual.

Permissions for Windows domain users

If the operating system login on the Process Historian only has user authorization, the Process Historian Management Console is not opened automatically when the system is restarted. To open the Process Historian Management Console, go to "Start > Siemens Automation > SIMATIC > Process Historian > Process Historian Management Console".

To start the Process Historian Management Console automatically after restarting, enter the Windows domain user in the local administrator group.

1.2.2.3 Installing PH-Ready on a PCS 7 OS

Introduction

With the following OS installation options, the PH-Ready component is installed automatically:

- OS Server for Process Historian
- Maintenance Station for Process Historian
- OS Single Station for Process Historian

Requirement

- Microsoft Message Queuing (MSMQ) is installed.
- The user under which the Process Historian was installed is registered on the computer.

Procedure

1. Start the setup with the PCS 7 data storage medium. The version of the PH-Ready must always correspond to the version of the Process Historian.
2. Follow the instructions of the installation wizard.
   Read the License Agreement and the Open Source License Agreement.
3. In the "Server" category, select the "OS Server for Process Historian " program package.
   For a subsequent installation, use the "OS Server for Process Historian" program package or the "Process Historian Ready Component 2022" program under "Archiving and Reporting".
4. Confirm the changes to the system settings in the "System settings" dialog.
5. Start the installation.
6. To complete the installation, reboot the system.

Note

Restart during the installation

Several restarts are requested during installation. You cannot postpone the reboots to a later time.

Result

The PH-Ready component is installed on the computer.

After installation, you need to configure the PH-Ready service using the Service Configuration Wizard.
Configuring the PH-Ready service (Page 34)

1.2.2.4 Installing redundant Process Historian

Procedure

1. Install the "Process Historian" program package on the principal.
   Installing Process Historian for PCS 7 (Page 23)
2. Install the "Process Historian" program package on the mirror.
3. Install the "Information Server" program package on a PC.

4. Install the witness on a PC, such as the Information Server.
   Configure the Process Historian Redundancy Service.
   Installing the Process Historian Witness (Page 26)
5. In the "Redundancy" dashboard of the Process Historian Management console, configure the redundant system with the wizard for redundancy configuration.
   Configuring a redundant Process Historian (Page 27)

Result

The redundant Process Historian is installed and set up.

The Process Historian Redundancy Service is configured during the setup.

1.2.2.5 Installing the Process Historian Witness

Requirement

A SIMATIC Information Server is installed on the PC.

Procedure

1. Run the "Setup.exe" file.
   The "Setup" dialog opens.
2. Follow the procedure when installing the Process Historian Server.
3. Under "Custom Installation", select:
   – "Archiving and Reporting" > Program "Process Historian Witness 2022"
4. Restart the system.
   After the restart, the service configuration wizard opens; it will configure the Process Historian Redundancy Service.
5. Define a user who has access rights to the Process Historian database of the redundant PC.
6. Click "Next".
7. In the "Service configuration" dialog of the "New security setting" plant complex, enter a user and a password.
8. Click "Next".
   A summary of the configuration is displayed in the "Overview" dialog.
9. Check your inputs and click "Finish".

Result

The Process Historian Witness is installed and Process Historian Redundancy Service is configured.

1.2.2.6 Configuring a redundant Process Historian

Requirement

- The redundant Process Historian is installed.
- You have configured the following using the database installation wizard:
  - The Process Historian database is configured in the "Redundant system" server mode.
  - "SIMATIC Process Historian Redundancy" is selected as the data source.
- You have become familiar with the basics of the redundant Process Historian.
- You have administrator rights.
- You use the PC that is the designated principal to set up the redundancy.
- The "Redundancy" dashboard is opened in the Management Console on the PC.

Procedure

1. In the "Redundancy" area, click the "Start Redundancy Configuration Wizard ..." button.
   The "Host configuration" dialog opens. The SQL Server instance for the principal is pre-selected; it is called "HISTORIAN". This setting cannot be changed.
2. Specify the network adapter via which the principal is executing the mirroring. To do so, select the dedicated redundancy connection between the principal and the mirror.
3. Select the SQL Server instance for the mirror from the drop-down menu. If necessary, reload the list with the "Refresh" button. The SQL Server instance is in the format "<PC name> \<SQLServerInstanceName>".
4. A dialog for setting up the certificates is displayed.
5. On the principal, start the "PH Redundancy Configuration Enabler" via "Start > Siemens Automation".
   The "PH Redundancy Configuration Enabler" displays the certificate of the mirror.
   Select the certificate and click "Accept certificate".
6. On the mirror, start the "PH Redundancy Configuration Enabler".
   The "PH Redundancy Configuration Enabler" displays the certificate of the principal.
   Select the certificate and click "Accept certificate".
7. On the principal, in the dialog to set up the certificates, click "Certificates are trustworthy".
   If you click "Certificates are trustworthy" before you have accepted the certificates, the dialog is displayed again with the certificates that are not yet trustworthy.
8. Specify the network adapter for the dedicated redundancy connection.
9. Select the SQL Server instance for the witness from the drop-down menu. The instance depends on the basis of the witness server, for example, an Information Server. The instance name, therefore, is "INFSERVER".
   Enter the PC manually ("PC NAME\INSTANCE NAME") when the PC:
   - Is not included in the list
   - Is displayed incompletely in the list with name but without SQL instance

   Jump to the next box using the TAB key.

10. The dialog for setting up the certificates is displayed again.
    On the principal, mirror and witness, via the "PH Redundancy Configuration Enabler", accept each other's certificates.
    On the witness, start the "PH Redundancy Configuration Enabler" via "C:\Program Files \Siemens\ProcessHistorian\bin\PHRedundancyConfigurationEnabler.exe".
11. On the Principal, in the dialog to set up the certificates, click "Certificates are trustworthy".
12. Specify the network adapter for the terminal bus connection.
13. Click "Next".
    The "TCP Port Settings" dialog opens.
14. In the "TCP Port Settings" dialog you specify the ports and make the required firewall settings. Apply the default settings of the Process Historian. These include the firewall settings specified in the database installation wizard.
15. The plausibility of the configuration and the connectivity of the configured servers and paths is checked in the "Validation" dialog. A protocol in the "Validation" area shows which action is currently being executed.
    When the validation process is interrupted, click "Rerun".
16. Click "Next".
    The "Overview" dialog opens and shows a summary of the configuration.
17. Check the entries to make sure that they are correct.
18. Click "Next".
    The configuration process is started.
19. The redundancy on the servers is configured in the "Execution" dialog.
    - The newly created configuration is set up gradually. The actions log is displayed in the "Setup actions" area.
    - Depending on the size of the Process Historian database, some of the setup actions will take longer.

    A distinction is made between the following processes:
    - "Fast data backup and restore": Creates a full backup of the principal database that is concurrently being restored on the mirror.
    - "Fast log backup and restore": A backup of the transaction log is created and restored at the same time.
20. When the configuration is interrupted, click "Rerun".

Result

A redundant system has been set up for operation of the Process Historian.

You can change the redundancy configuration or exit the redundancy synchronization on the "Redundancy" dashboard in the Management console.

See also

Installing redundant Process Historian (Page 25)
Firewall settings (Page 18)
Basics of the redundant Process Historian (Page 93)

1.2.3 Process Historian for WinCC

1.2.3.1 Installing Process Historian for WinCC

Introduction

You can use a separate server with installed Process Historian in the WinCC environment.

Requirement

- You have the Windows "Administrator" permission.
- The system requirements are met.
- Microsoft Message Queuing (MSMQ) is installed.

Procedure

1. Start the setup via the data storage medium for Process Historian / Information Server.
2. Follow the instructions of the installation wizard.
   Read the License Agreement and the Open Source License Agreement.
3. In the "Process Historian" category, select the "Process Historian Server" program package.
4. If required, select additional components in the "Programs" dialog.
5. Read the license agreement for Microsoft SQL Server.
6. Accept the changes made to the system settings.
   You can see an overview of the setup process.
7. Start the installation.
8. To complete the installation, restart the system.

Note

Restart during the installation

Several restarts are requested during installation. These restarts must be executed when they are requested and not at a later time.

Result

Process Historian is installed on the separate server.

The Database Installation Wizard is started, which you use to configure the Process Historian database. You can find additional information on the configuration of the database in the "Process Historian Server" manual.

Permissions for Windows domain users

If the operating system login on the Process Historian only has user authorization, the Process Historian Management Console is not opened automatically when the system is restarted. To open the Process Historian Management Console, go to "Start > Siemens Automation > SIMATIC > Process Historian > Process Historian Management Console".

To start the Process Historian Management Console automatically after restarting, enter the Windows domain user in the local administrator group.

1.2.3.2 Installing PH-Ready on a WinCC station

Requirement

- Microsoft Message Queuing (MSMQ) is installed.
- The user under which the Process Historian was installed is registered on the computer.

Procedure

1. Start the setup via the "Process Historian / Information Server 2022" data storage medium.
2. Select the product language.
3. Follow the instructions of the installation wizard.
   Read the License Agreement and the Open Source License Agreement.
4. In the "Process Historian" category, select the "Process Historian Ready Component 2022" program package.
5. Start the installation.
6. To complete the installation, reboot the system.

Note

Restart during the installation

Several restarts are requested during installation. You cannot postpone the reboots to a later time.

Result

The PH-Ready component is installed on the computer.

After installation, you need to configure the PH-Ready service using the Service Configuration Wizard.
Configuring the PH-Ready service (Page 34)

1.2.4 Installing a combined Process Historian/Information Server

Procedure

1. For PCS 7, install the combined "Process Historian" and "Information Server" program package on the PC.
   For PCS neo and WinCC, install the respective "Process Historian" program package on the PC.
   Installing Process Historian for PCS neo (Page 21)
   Installing Process Historian for PCS 7 (Page 23)
   Installing Process Historian for WinCC (Page 29)
2. Install the "Information Server" program package on the PC for PCS neo and WinCC.

Result

A combined Process Historian/Information Server is installed on the PC.

1.2.5 Installing a dedicated Process Historian/Information Server

Procedure

1. Install the respective "Process Historian" program package on the Process Historian OPC UA Server.
   Installing Process Historian for PCS neo (Page 21)
   Installing Process Historian for PCS 7 (Page 23)
   Installing Process Historian for WinCC (Page 29)
2. Install the "Process Historian OPC UA" program package on the Process Historian OPC UA Server.
   Installing the Process Historian OPC UA Server (Page 32)
3. Install the "Information Server" program package on the PC.

Result

A dedicated Process Historian/Information Server is installed on the Process Historian OPC UA Server.

1.2.6 Installing Process Historian/Information Server with SIMATIC BATCH

Procedure

1. Install the respective "Process Historian" program package on the PC.
   Installing Process Historian for PCS neo (Page 21)
   Installing Process Historian for PCS 7 (Page 23)
   Installing Process Historian for WinCC (Page 29)
2. Install the "Information Server" program package on the PC.
3. Install the "Information Server - BATCH Reports" program package on the Information Server.
4. Install the "Information Server - MS Office Add-in" program package on the Information Server client if the client is used as an MS Office client.

Result

A Process Historian/Information Server is installed on the PC which integrates SIMATIC BATCH.

1.2.7 Installing the Process Historian OPC UA Server

Requirement

- Process Historian is installed on the PC.
- The "Process Historian OPC UA Server" license is available.

Procedure for PCS neo

1. Install the "SIMATIC PCS neo Process Historian OPC UA Server" software module via the PCS neo setup.
2. After completion, conclude the setup with a restart.

Procedure for PCS 7/WinCC

1. Start the setup from the data storage medium with the PCS/WinCC software.
2. Carry out the installation.
3. Under "Custom Installation", select:
   – "Options" > "Process Historian OPC UA" program package
4. After completion, conclude the setup with a restart.

Result

The Process Historian Server is pre-configured as an OPC UA Server If necessary, change the server configuration using the "OpcUaServerPH.xml" configuration file. For more information on the server configuration, refer to the "Process Historian OPC UA Server" manual.

The OPC UA Local Discovery Server (LDS) from the OPC Foundation is also installed.

See also

Discovery Server (Page 191)

Installing Process Historian for PCS neo (Page 21)

Configuring the Process Historian OPC UA Server (Page 183)

1.2.8 Installing Information Server Ready

Requirement

- The required hardware and software requirements for the installation of the Information Server are fulfilled.
- Close all Windows programs before running Setup.
- The specified user information must match on the different systems. Password changes must be tracked in all systems.
- For using the IS Ready with Process Historian: The IS Ready Service user must be created as a system administrator on the SQL Server instance.

Installation of the Information Server Ready on the Process Historian computer

1. Open the setup folder.
2. Select the "Start.exe" file of the component to be installed.
3. Select the language.
4. Read the installation instructions.
5. Accept the license agreement.
6. Select the installation content.
   You see an overview of the setup for the installation process.
7. The installation is completed.
   Restart the system now or at a later time.

Configuration on the Process Historian computer

1. Open "Start > All Programs > Siemens Automation > SIMATIC > IS Ready".
2. Select "IS Ready Configuration".
   The "IS Ready Configurator" opens.

3. Select "Next".
4. Enter your logon information.
   You see an overview of the setup for the installation process.
5. Select "Finish".

Note

Checking the configuration

The configuration was successful if you have been assigned to the "SIMATIC Reporting Services" group under "Local Users and Groups" on your computer.

Result

Information Server Ready is installed.

1.2.9 Configuring the PH-Ready service

You can use the Service Configuration Wizard to define the user under which the PH-Ready service is executed on the PCS 7 and WinCC computers. The user should be the same user who installed the Process Historian. The user automatically becomes a member of the "SIMATIC HMI" user group.

You can start the Configuration Wizard at any time and reset the access rights.

Requirement

PH-Ready is installed.

Procedure

1. After restarting the computer, start the Configuration Wizard for the "CCCAPHServer" service via" Siemens Automation" > "PH-Ready Configuration".
2. In the "New security setting" area, select the "Run with user credentials" option.
3. Enter the user under which the Process Historian was installed. Enter the password.
   The user must be created on the OS for this.
4. Complete the configuration of the "CCCAPHServer" service with "Finish".

Note

The passwords set for a user must match on the computers

Make sure that the passwords set for a user match on the following systems:

- WinCC OS/PCS 7 OS
- Process Historian server

Make sure to notice any changes to passwords.

Note

Update installation of PCS 7

If you upgrade the PCS 7 version on the OS, you then need to re-configure the PH-Ready service.

Result

The PH-Ready component is configured.

1.2.10 Updating the operating system for Process Historian

Introduction

The following procedure describes an update of the operating system.

Procedure

1. Go to the "Process Historian Management" dashboard on the Management Console.
2. In the "Process Historian operating state" area, select the "Shut down" status.
   Click "Apply".
3. Update the operating system, for example, using the Windows Server Update Service (WSUS).
4. Start the computer again after updating the operating system.
5. Start the Management Console with "Start > Siemens Automation > Process Historian Management Console".
6. Go to the "Process Historian Management" dashboard on the Management Console.
7. In the "Process Historian operating state" area, select the "Start" status.
   Click "Apply".

Result

The operating system on the Process Historian is updated to the latest version.

1.2.11 Installing Microsoft .NET Framework

Procedure

1. Open the Server Manager with "Start > Server Manager".
2. Select "Add roles and features".
3. Click "Next" on the "Before you begin" page.

4. Select "Installation Type > Role based or feature based installation > Server selection > Server role > Features".
5. Select ".Net Framework 4.8" or higher.
6. Click "Install".

Result

The ".Net Framework 4.8" or higher was installed.

1.3 Installation of the upgrade

1.3.1 Installing and uninstalling the Process Historian

Installation of the upgrade

You can upgrade a previous version of Process Historian to the latest version via the upgrade installation.

When you upgrade, you upgrade all computers in the Process Historian system. Therefore, install the upgrade on all computers on which the following components are installed:

- Process Historian
- PH-Ready component of the Process Historian on the PCS 7 Operator Stations (OS) and WinCC stations

The installation of the upgrade depends on the PC on which the installation is started. Detailed information is available in the sections below.

To install an upgrade, you need to completely shut down the Process Historian.

NOTICE
Backing up existing data Before upgrading the Process Historian server, create a manual backup or cyclic full backup of the existing database.

Update installation procedure

Note

Order of the software update of PCS 7 and Process Historian

You need to update the Process Historian server to the corresponding Process Historian version of the new PCS 7 version first before you update the PCS 7 plant.

In this context, also read the instructions "SIMATIC Process Control System PCS 7 Software update" with the section "How to update the Process Historian and Information Server".

SIMATIC Process Control System PCS 7 Software update (https://support.industry.siemens.com/cs/ww/en/view/109767557)

Do not change the computer name or memory structure

During the upgrade, you cannot change the computer name or the structure of the memory paths.

1. When required, replace the hardware.
2. A full backup of the database is required when upgrading from PH 2014 SP3. Next, upgrade the operating system of the Process Historian system computers and reinstall the Process Historian server on Windows Server 2019. If you have deployed a redundant Process Historian, you must remove the redundancy at the "Redundancy" dashboard before the full backup and upgrade.
3. Upgrade of the Process Historian server and update of the Process Historian database.
   If you are using a redundant Process Historian, you must upgrade the redundant Process Historian.
   Upgrading the Process Historian server (Page 39)
4. Upgrade PH-Ready on the PCS 7 OS and/or the WinCC stations.
   Upgrade Process Historian Ready (Page 40)

The upgrade installation is possible for the following versions:

From version	Via version	To version
Every version from 2014 SP3	2014 SP3 Update 6	2022
2020 / 2020 SP2	-	2022

Upgrade via download file

If you have the upgrade as a self-extracting download file, extract this upgrade only on a PC with the Process Historian product installed.

Performing the installation

The Setup program guides you through the entire installation.

Depending on the system configuration, a restart may be necessary following the installation.

Supplementary installation

You will have to install the upgrade once again if you have performed a retro-installation from the supplied data storage medium.

System behavior after the upgrade installation is complete

- The applications (services) are automatically restarted after restart of the computer.
- The Process Historian Management Console is started in the background on the Process Historian server.

Note

The process data is only transmitted again when the new version is installed on all Process Historian servers and computers with PH-Ready.

PCS neo: Add Monitoring & Control Stations as S&F Clients

After the Process Historian Server is started, in the Administration Console, in "Configuration" > "S&F Allow List", add to the Allow List the Monitoring & Control Stations as S&F Clients that are allowed to write data to the Process Historian Server.

Status of the Process Historian server and the licensing status

The Process Historian and the Management Console are not available during the upgrade installation.

Database: Access rights during installation

The access rights of the registered user to the SQL server of the database are temporarily revoked during the upgrade installation. Clients also lose access to the database during this time.

Uninstalling

The upgrade cannot be uninstalled.

1.3.2 Upgrading the Process Historian server

Introduction

To upgrade a Process Historian server, use the corresponding, latest version on the PCS neo, PCS 7, WinCC data storage medium or the upgrade download, depending on the configuration.

After installation, the Process Historian database is updated via the Database Installation Wizard.

NOTICE
Backing up existing data Before upgrading the Process Historian server, create a manual backup or cyclic full backup of the existing database.

Procedure

1. Shut down the Process Historian on the "Process Historian Management" dashboard.
2. Run the setup.
3. Follow the instructions of the installation wizard.
4. Perform the installation.
   If you want to install Process Historian/Information Server with SIMATIC BATCH, install the software package "Information Server - BATCH Reports" on the Information Server.
   If you want to upgrade a redundant Process Historian on the PCS 7 system, follow the procedure outlined below:
   Upgrading the redundant Process Historian (Page 42)

5. To complete the installation, reboot the system. After the upgrade installation, the Process Historian Database Installation Wizard starts. Databases from predecessor versions are migrated by means of this wizard without modification of the interfaces.
6. If you are using new hardware or performing an operating system change or a new installation, you need to cancel the Database Installation Wizard. Restore the database with the "Database Recovery" program, which you will find via the start window of the operating system. Then restart and start the Database Installation Wizard.
7. Follow the instructions of the database installation wizard to update the existing data. As soon as the database is updated, a window appears with an overview of actions already performed.
8. To complete the installation, reboot the system.

Result

The Process Historian Server is upgraded and the Process Historian database is updated.

The Process Historian server goes into operation.

After a certain time, the previous PH-Ready components on the PCS 7 Operator Stations (OS) and WinCC stations supply data again.

1.3.3 Upgrade Process Historian Ready

After the upgrade installation of Process Historian Server, upgrade the other computers in the Process Historian system:

- On the WinCC stations
- On the PCS 7 operator stations (OS)

Perform an upgrade of Process Historian Ready (PH-Ready). Use the update download or, depending on the configuration, the latest version of the WinCC or PCS 7 data storage medium.

Upgrading n PH-Ready without upgrading PCS 7 OS

When upgrading the PH components in a PCS 7 system in isolation, only the Process Historian server and PH-Ready are upgraded to a newer version. All other PCS 7 products and components remain unchanged.

- Via update download:
  Only the PH components on the PCS 7 OS are upgraded during the setup.
- Via a newer PCS 7 data storage medium without upgrading the complete PCS 7 OS: Manually uninstall
  PH-Ready and then manually install PH-Ready from the corresponding subfolders of the PCS 7 data storage medium.

Note

Restart during the installation

Several restarts may be requested during installation. These restarts must be executed when they are requested and not at a later time.

Install Process Historian Ready if the OS server has the same hardware and the same computer name

1. Set WinCC offline and end WinCC.
2. Update the operating system, for example, using the Windows Server Update Service (WSUS).
3. Start the setup for the PH-Ready via the WinCC or PCS 7 data storage medium. The version of the PH-Ready must always correspond to the version of the Process Historian.
4. Follow the instructions of the installation wizard.
   Read the License Agreement and the Open Source License Agreement.
5. After installing the settings, check the PH-Ready service using the Service Configuration Wizard.
   Configuring the PH-Ready service (Page 34)
6. Restart the computer.
7. Set WinCC online again.

Install Process Historian Ready if the OS server has new hardware and the previous computer name.

1. Set up the new hardware with the appropriate operating system.
2. Install WinCC.
3. Start the setup for the PH-Ready via the WinCC or PCS 7 data storage medium. The version of the PH-Ready must always correspond to the version of the Process Historian.
4. Follow the instructions of the installation wizard.
   Read the License Agreement and the Open Source License Agreement.
5. After installation, you need to configure the PH-Ready service using the Service Configuration Wizard.
   Configuring the PH-Ready service (Page 34)
6. Restart the computer.
7. Import the WinCC projects from the ES to the new computers.
8. Set WinCC online.
9. Set the old WinCC system offline.

Install Process Historian Ready if the OS server has new hardware and new computer names

1. Set up the new hardware with the appropriate operating system.
2. Install WinCC.
3. Start the Setup for the PH-Ready via the WinCC or PCS 7 data storage medium. The version of the PH-Ready must always correspond to the version of the Process Historian.
4. Follow the instructions of the Installation Wizard.
   Read the License Agreement and the Open Source License Agreement.
5. After installation, you need to configure the PH-Ready service using the Service Configuration Wizard.
   Configuring the PH-Ready service (Page 34)
6. Restart the computer.
7. Import the WinCC projects from the ES to the new computers.
8. In the navigation window of the WinCC Explorer, select the "Process Historian" item to open the "WinCC Process Historian Editor".
9. On the "Computer Name" tab, input the computer names used thus far so as to get messages from those computers as well.
10. Set WinCC online.
11. Set the old WinCC system offline.

Result

The current PH-Ready is installed on the computer.

1.3.4 Upgrading the redundant Process Historian

Procedure

1. Upgrade the Process Historian server that serves as the principal.
2. Upgrade the Process Historian server that serves as the mirror.
3. Install the witness on a PC, such as the Information Server.
   Configure the Process Historian Redundancy Service.
   Installing the Process Historian Witness (Page 26)
4. Set up the redundancy afresh. Start the redundancy configuration on the management console in the "Redundancy" dashboard.
   Configuring a redundant Process Historian (Page 27)

Result

The redundant Process Historian is installed and set up.

The Process Historian Redundancy Service is configured during the setup.

Process Historian - Release Notes 2022

2

2.1 Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit
https://www.siemens.com/industrialsecurity.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under
https://www.siemens.com/cert.

2.2 Release Notes

Contents

These Release Notes contain important information on the SIMATIC Process Historian. The information in these Release Notes takes precedence over statements in the manuals and in the online help. Read these Release Notes carefully because they contain useful information for you.

The Release Notes for SIMATIC Process Historian 2022 are available in two versions:

- SIMATIC Process Historian Release Notes 2022
  This version is supplied with the product and is installed during setup. This file contains general information about SIMATIC Process Historian 2022 and a link to the update readme on the internet.
- SIMATIC Process Historian 2022 Online Readme
  This version contains all information on installation and notes on updating SIMATIC Process Historian 2022. This file is only available online, ensuring that the current state of the readme is available.
  Process Historian Online Readme (https://support.industry.siemens.com/cs/ww/en/view/109810714)

2.3 Customer Support

Customer Support and Technical Support

You can reach the SIMATIC hotlines at the times specified in the following table. The SIMATIC hotline employees speak German and English. The Authorization hotline offers French, Italian or Spanish customer support in addition to German and English.

Technical support

Nuremberg	(GMT +1:00)
Service Hours	Monday - Friday, 8:00 to 17:00 (CET/CEST)
Phone	+49 911 895 7222
Fax	+49 911 895 7223
E-mail	Support request (https://support.industry.siemens.com/My/ww/en/requests)

Automation Value Card (AVC)

The Automation Value Card (AVC) provides extended Technical Support and is available 24 hours every day of the week. Information on the AVC can be found at the following URL:

- Automation Value Card (https://support.industry.siemens.com/cs/sc/2021/automation-value-card?lc=en-WW)

SIMATIC Customer Online Support

Service and Support

An overview of the support offering for our products is available at the following URL:

- Online support (https://support.industry.siemens.com/cs/start?lc=en-WW)

Support app

For Siemens support on the go, get the app:

- Support app (https://support.industry.siemens.com/cs/sc/2067/mobile-use-via-app?lc=en-WW)

Technical documentation for SIMATIC products

You can find a guide to the technical documentation provided for individual SIMATIC products and systems at the following URL:

- Technical documentation portal (https://support.industry.siemens.com/cs/document/109742705/documentation?dti=0&lc=en-WW)

Contact person database

To contact your local agent, search our contact database at the following URL:

- Contact person database (http://www.automation.siemens.com/partner/index.asp?lang=en)

Product Information

SIMATIC Products

Go to the following URL for additional information about SIMATIC products:

- Overview of SIMATIC products (http://w3.siemens.com/mcms/topics/en/simatic/Pages/default.aspx)

SIMATIC Process Historian 3

3.1 Process Historian Server

3.1.1 Process Historian - Installation Notes

3.1.1.1 System requirements

System requirements

Overview

The following requirements must be met for the installation and operation of the SIMATIC Process Historian:

- Hardware requirements (Page 10)
- Software requirements (Page 15)

We recommend operating the Process Historian server in a Windows domain.

The security settings of the firewall form the basis of the security concept for operating the Process Historian:

Firewall settings (Page 18)

You require the following licenses to operate a Process Historian system:

Licenses of the Process Historian (Page 8)

Note

The passwords configured for a user must match on the PCs

Make sure that all passwords specified for a user are identical on the following systems:

- Monitoring & Control server
- OS server
- Process Historian server

Make sure to notice any changes to passwords.

Order of installation of Process Historian and Information Server on a system

If Process Historian and Information Server are to be installed on the same computer, they must be installed in the same SQL Server instance. The Process Historian must be installed first.

Cleanup of the corrupt Information Server installation

If you did not install the Information Server together with the Process Historian but installed it afterwards, use the following procedure to clean up the faulty installation:

1. Create a full SQL Server backup of the existing PH database.
   Details can be found in the section "Creating a Full PH Database Backup" in the FAQ: Backup and restore of a Process Historian database (https://support.industry.siemens.com/cs/attachments/66579062/66579062_pcs7_ph_backup_restore_en.pdf)
   The procedure described there also applies to the SQL Server 2017.
   If you use SIMATIC BATCH, the data supplied from the batches are saved separately in the Process Historian and must therefore be taken into account in the full backup.
2. Perform a complete new installation of the operating system.
3. Start the general setup and select the installation for Process Historian and Information Server.
4. A new, empty Process Historian database is created. Use the same configuration settings for the newly created database.
5. Once the functionality is completed and verified, restore the previously created SQL Server backup of the Process Historian database.
   Details can be found in the section "Restore Historian Storage Database" in the FAQ: Backup and restore of a Process Historian database (https://support.industry.siemens.com/cs/attachments/66579062/66579062_pcs7_ph_backup_restore_en.pdf)

Licenses of the Process Historian

Products for PCS neo

Product	License type	Validity	MLFB	WiBu
Process Historian Server	Single	Unlimited	6DL8905-0AD00-0AB5 6DL8905-0AD00-0AH5	50001
Process Historian - Archive Tags	Single	Counter-relevant (100)	6DL8905-0BD00-0AB5 6DL8905-0BD00-0AH5	50002
Process Historian - Archive Tags	Single	Counter-relevant (1000)	6DL8905-0ED00-0AB5 6DL8905-0ED00-0AH5	50002
Process Historian - Archive Batch	Single	Unlimited	6DL8905-0DD00-0AB5 6DL8905-0DD00-0AH5	50004

An additional license is required for the following connectivity function:

Product	License type	Validity	MLFB	WiBu
Process Historian OPC UA Server	Single	1	6DL8905-0CD00-0AB5 6DL8905-0CD00-0AH5	50003

Note

MLFB numbers

MLFB numbers ending with 0AB5 are goods deliveries.
MLFB numbers ending with 0AH5 are OSD deliveries (downloads).

Products for PCS 7

Product	License type	Validity	MLFB
Process Historian and Information Server Basic Package	Single	Unlimited	6ES7652-7AX68-2YB0 6ES7652-7AX68-2YH0
Process Historian Basic Package	Single	Unlimited	6ES7652-7BX68-2YB0 6ES7652-7BX68-2YH0
Process Historian Archive BATCH	Single	Unlimited	6ES7652-7DX68-2YB0 6ES7652-7DX68-2YH0
Process Historian Server Redundancy	Single	Unlimited	6ES7652-7CX68-2YB0 6ES7652-7CX68-2YH0

An additional license is required for the following connectivity function:

Product	License type	Validity	MLFB
Process Historian OPC UA Server	Single	Unlimited	6ES7652-7FX68-2YB0 6ES7652-7FX68-2YH0

Products for WinCC

Product	License type	Validity	MLFB
Process Historian and Information Server, Software Media Package	Single	Unlimited	6ES7652-7AX68-0YT8 6ES7652-7AX68-0YH8

Note

MLFB numbers

MLFB numbers ending with 2YB0/2YE0/0YT8 are goods deliveries.
MLFB numbers ending with 2YH0/0YH8 are OSD deliveries (downloads).

Hardware requirements

Hardware requirements

Overview

Before you decide on hardware equipment, you must:

- Estimate the expected tag and message load.
- Determine how long the data is stored in the Process Historian.

Based on these numbers, you can determine the necessary hard disk capacity.

The "PH-HWAdvisor" tool calculates the hardware configuration for the Process Historian based on the specific project.

PH-HW Advisor (https://support.industry.siemens.com/cs/ww/en/view/109740115)

Overview of the configuration limits

The following assumptions are made regarding the values for the configuration limits:

- The Process Historian was configured with 6 runtime segments and a future segment.
- The compression factor is "10".
- The data is available for 2 years on the Process Historian database.
- The calculation of the required storage space is based on the **high** limit of the respective tags.

Configuration limits	Small (S)	Medium (M)	Large (L)	Extra Large (XL)
Monitoring & Control server / OS server (redundant)	1	2 - 4	5 - 10	11 - 18
Monitoring & Control station / OS client	1 - 4	16	40	40
Max. process values/s	1500	6000	15,000	27,000
∅ messages/min	20	40	100	180
Storage space required				
For the process values in TB	1	4	10	18
For the messages in TB	0.04	0.16	0.4	0.7
Configured hard disk space*)				
For the process values in TB	2	7.2	14.4	21.6
For the messages in TB		0.6	0.9	1.8

*) The following is taken into account:

- The compression factor may vary.
- The data can be available for more than 2 years on the Process Historian database.
- The capacity of the hard disks is larger than calculated by the operating system.

The following hardware equipment is recommended:

- Low configuration limits (S) (Page 11)
- Medium configuration limits (M) (Page 12)
- High configuration limits (L) (Page 13)
- Very high configuration limits (XL) (Page 13)

Overview of the configuration limits with SIMATIC BATCH

Configuration limits	Medium (M)	Large (L)
Monitoring & Control server / OS server (redundant)	2 - 4	5 - 10
Monitoring & Control station / OS client	16	40
Max. process values/s	6000	15,000
∅ messages/min	40	100
Required storage space (with a redundant BATCH server)		
For the process values in TB	4	10
For the messages in TB	0.16	0.4
For the BATCH messages*)	2	2
Configured hard disk space		
For the process values in TB	7.2	14.4
For the messages in TB	3.6	3.6

*) 60 recipe steps / min. require 1 TB for the BATCH messages

The following hardware equipment is recommended:

- Medium scale configuration limits with BATCH data and Information Server (M) (Page 14)
- Medium scale configuration limits with BATCH data and Process Historian redundancy (M) (Page 14)
- Large scale configuration limits with BATCH data and Information Server (L) (Page 15)

Low configuration limits (S)

Overview

Platform	Process Historian IPC 647E (e.g. 6ES7661-0PU57-1RA4)	
CPU	Xeon E-2278GE (8C/16T, 3.3 (4.7) GHz, 16 MB Cache, TB, AMT)	
RAM	64 GB DDR4 SDRAM (4x 16 GB), EEC, Dual Channel	
Hard disks	**Properties and quantity**	**Use**
	512 GB SSD M.2	Operating system and software
	RAID 1, ~2 TB (2 x 1920 GB SSD 2.5" SATA)	Transaction log and Process Historian database

Applications

Process Historian single:

- 1 OS (with 1500 values/s, 20 messages/min), plus Information Server, 2 years of online data availability
- 1 OS (with 1500 values/s, 20 messages/min), 3 years of online data availability
- 2 OS (each with 1500 values/s, 20 messages/min), 2 years of online data availability

Platform	Process Historian IPC 847E (e.g. 6ES7661-1PW67-1RA4)	
CPU	Xeon E-2278GE (8C/16T, 3.3 (4.7) GHz, 16 MB Cache, TB, AMT)	
RAM	64 GB DDR4 SDRAM (4x 16 GB), EEC, Dual Channel	
Hard disks	**Properties and quantity**	**Use**
	1024 GB SSD M.2	Operating system and software
	RAID 5, ~5.7 TB (4 x 1920 GB SSD 2.5" SATA)	Transaction log and Process Historian database

Applications

Process Historian single:

- 4 OS (each with 1500 values/s, 20 messages/min), plus Information Server, 2 years of online data availability
- 2 OS (each with 1500 values/s, 20 messages/min), plus Information Server, plus Batch, 2 years of online data availability

Process Historian redundant:

- 4 OS (each with 1500 values/s, 20 messages/min), plus Batch, 2 years of online data availability

Medium configuration limits (M)

Overview

CPU	Intel® Xeon® processor E5-2643v4 (6C/12T, 3.40 GHz, TLC: 20 MB, Turbo: 3.60 GHz, 9.6 GT/s, Mem bus: 2,400 MHz, 135 W, AVX Base 2.80 GHz, AVX Turbo 3.60 GHz). Comparable or better CPU.		
RAM	64 GB, EEC		
Hard disks (18x) 2.5" SAS 12 GB/s	**Properties and quantity**	**Total storage space capacity**	**Use**
	RAID 1, 2 x 600 GB	600 GB	Operating system
	RAID 1, 2 x 1.8 TB	1.8 TB	Transaction log
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 0)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 1)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 2)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 3)
	RAID 1, 2 x 600 GB	600 GB	Messages
	RAID 1, 2 x 600 GB	600 GB	General data
	RAID 1, 2 x 1.8 TB	1.8 TB	Information Server database

The redundant partner may be absent for a maximum of 20 days.

High configuration limits (L)

Overview

CPU	2x Intel® Xeon® processor E5-2643v4 (6C/12T, 3.40 GHz, TLC: 20 MB, Turbo: 3.60 GHz, 9.6 GT/s, Mem bus: 2,400 MHz, 135 W, AVX Base 2.80 GHz, AVX Turbo 3.60 GHz). Comparable or better CPU.		
RAM	64 GB, EEC		
Hard disks	**Properties and quantity**	**Total storage space capacity**	**Use**
(24x)	RAID 1, 2 x 600 GB	600 GB	Operating system
2.5"	RAID 10, 4 x 1.8 TB	3.6 TB	Transaction log
SAS 12 GB/s	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 0)
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 1)
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 2)
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 3)
	RAID 1, 2 x 900 GB	900 GB	Messages
	RAID 1, 2 x 900 GB	900 GB	General data
	RAID 1, 2 x 1.8 TB	1.8 TB	Information Server database

The redundant partner may be absent for a maximum of 20 days.

Very high configuration limits (XL)

Overview

CPU	2x Intel® Xeon® processor E5-2643v4 (6C/12T, 3.40 GHz, TLC: 20 MB, Turbo: 3.60 GHz, 9.6 GT/s, Mem bus: 2,400 MHz, 135 W, AVX Base 2.80 GHz, AVX Turbo 3.60 GHz). Comparable or better CPU.		
RAM	128 GB, EEC		
Hard disks	**Properties and quantity**	**Total storage space capacity**	**Use**
(32x)	RAID 1, 2 x 1.8 TB	1.8 TB	Operating system
2.5"	RAID 1, 2 x 1.8 TB	1.8 TB	Transaction log
SAS 12 GB/s	RAID 10, 6 x 1.8 TB	5.4 TB	Process values (data group 0)
	RAID 10, 6 x 1.8 TB	5.4 TB	Process values (data group 1)
	RAID 10, 6 x 1.8 TB	5.4 TB	Process values (data group 2)
	RAID 10, 6 x 1.8 TB	5.4 TB	Process values (data group 3)
	RAID 1, 2 x 1.8 TB	1.8 TB	Messages
	RAID 1, 2 x 1.8 TB	1.8 TB	General data

With this hardware equipment, you cannot use the following options:

- Combining the Process Historian and Information Server
- SIMATIC BATCH archive
- Process Historian Redundancy

Note

You can expand the scale in regard to performance and the database size by using a Storage Area Network (SAN).

Medium scale configuration limits with BATCH data and Information Server (M)

Overview

CPU	Intel® Xeon® processor E5-2643v4 (6C/12T, 3.40 GHz, TLC: 20 MB, Turbo: 3.60 GHz, 9.6 GT/s, Mem bus: 2400 MHz, 135 W, AVX Base 2.80 GHz, AVX Turbo 3.60 GHz). Comparable or better CPU.		
RAM	64 GB, EEC		
Hard disks (22 x) 2.5" SAS 12 GB/s	**Properties and quantity**	**Total storage space capacity**	**Use**
	RAID 1, 2 x 600 GB	600 GB	Operating system
	RAID 1, 2 x 1.8 TB	1.8 TB	Transaction log
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 0)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 1)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 2)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 3)
	RAID 10, 4 x 1.8 TB	3.6 TB	Messages
	RAID 1, 2 x 600 GB	600 GB	General data
	RAID 1, 2 x 1.8 TB	1.8 TB	Information Server database
	RAID 1, 2 x 1.8 TB	1.8 TB	BATCH data

With this hardware equipment, you cannot use the following options:

- Process Historian Redundancy

Medium scale configuration limits with BATCH data and Process Historian redundancy (M)

Overview

CPU	Intel® Xeon® processor E5-2643v4 (6C/12T, 3.40 GHz, TLC: 20 MB, Turbo: 3.60 GHz, 9.6 GT/s, Mem bus: 2400 MHz, 135 W, AVX Base 2.80 GHz, AVX Turbo 3.60 GHz). Comparable or better CPU.
RAM	64 GB, EEC

Hard disks (22 x) 2.5" SAS 12 GB/s	**Properties and quantity**	**Total storage space capacity**	**Use**
	RAID 1, 2 x 600 GB	600 GB	Operating system
	RAID 10, 4 x 1.8 TB	3.6 TB	Transaction log
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 0)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 1)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 2)
	RAID 1, 2 x 1.8 TB	1.8 TB	Process values (data group 3)
	RAID 10, 4 x 1.8 TB	3.6 TB	Messages
	RAID 1, 2 x 600 GB	600 GB	General data
	RAID 1, 2 x 1.8 TB	1.8 TB	BATCH data

Large scale configuration limits with BATCH data and Information Server (L)

Overview

CPU	2x Intel® Xeon® processor E5-2643v4 (6C/12T, 3.40 GHz, TLC: 20 MB, Turbo: 3.60 GHz, 9.6 GT/s, Mem bus: 2400 MHz, 135 W, AVX Base 2.80 GHz, AVX Turbo 3.60 GHz). Comparable or better CPU.		
RAM	128 GB, EEC		
Hard disks (32x) 2.5" SAS 12 GB/s	**Properties and quantity**	**Total storage space capacity**	**Use**
	RAID 1, 2 x 600 GB	600 GB	Operating system
	RAID 1, 2 x 1.8 TB	1.8 TB	Transaction log
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 0)
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 1)
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 2)
	RAID 10, 4 x 1.8 TB	3.6 TB	Process values (data group 3)
	RAID 10, 4 x 1.8 TB	3.6 TB	Messages
	RAID 1, 2 x 900 GB	900 GB	General data
	RAID 1, 2 x 1.8 TB	1.8 TB	Information Server database
	RAID 10, 4 x 1.8 TB	3.6 TB	BATCH data

With this hardware equipment, you cannot use the following options:

- Process Historian Redundancy

Software requirements

Software requirements

Operating systems

The following Microsoft operating system is supported:

- Windows Server 2019

Supported operating system languages (Page 17)

An update of the operating system is not allowed while the Process Historian is running. To install an update, proceed as follows:

Updating the operating system for Process Historian (Page 35)

Note

Process Historian identifies the hosts using the host SID

The computer SID is a unique security identifier. The Process Historian identifies the Monitoring & Control stations / OS clients / WinCC stations by their computer SID. Computers that have the same computer SID and store data on the Process Historian are not uniquely identified by the Process Historian. This can lead to malfunctions on the Process Historian.

When computers are cloned, the computer SID is not adjusted automatically.

The combined Process Historian/Information Server computer must also have a unique SID.

.NET Framework

The Process Historian requires ".NET Framework 4.6.2." or higher. You might need to install this version of the Framework.

Installing Microsoft .NET Framework (Page 35)

Microsoft Message Queuing Services for PCS 7/WinCC

The Process Historian uses the Microsoft Message Queuing services for PCS 7 and WinCC. This component is part of the operating system. You may need to subsequently install Microsoft Message Queuing.

SQL Server

The Process Historian server requires the Microsoft SQL Server 2017 Standard Edition 64-bit. The SQL Server is installed automatically during the Process Historian installation.

You need to set up appropriate user rights to access the data on the SQL Server. Read the relevant documentation.

"Historian" SQL server instance (Page 17)

Note

Do not change Windows computer name

Do not change the Windows computer name after installing the Process Historian.

If you do change the Windows computer name, you must uninstall and reinstall the SQL Server.

Do not use the name "HIST" or "HISTORIAN" for the Process Historian computer

These names are already pre-defined for the SQL Server instance. Using these names leads to a conflict with the SQL server. The Database Wizard will not work.

Virtual systems

You can use Process Historian in the virtualized environments supported by PCS neo/PCS 7/ WinCC.

See also

Hardware requirements (Page 10)

Supported operating system languages

Overview

Process Historian is released for the following operating system languages:

- German
- English
- French
- Italian
- Spanish
- Multilingual operating system

The Asian version of Process Historian is released for the following operating system languages:

- English
- Chinese (Simplified, PRC)
- Japanese
- Multilingual operating system

Note

The Process Historian supports the primary languages of the operating system languages. For example, English (USA).

"Historian" SQL server instance

Overview

An "Historian" instance is created with the required settings during installation on a Microsoft SQL. You can change the name of the instance later.

This instance is always installed in English. The language in which existing SQL Server instances are installed has no influence on this. Existing instances are not affected by the Service Pack.

"Historian" instance after uninstalling Process Historian

The SQL Server "Historian" instance is retained when the Process Historian is uninstalled. For licensing reasons, this instance must be uninstalled manually.

Firewall settings

Overview

The security settings of the firewall are the basis of the security concept. The required security settings for the locally installed Windows firewall to run the Process Historian server are adapted via the Database Installation Wizard after installation. The settings depend on the data sources used.

If you use an additional firewall between the Monitoring & Control station / OS client / WinCC station and the Process Historian, these ports must remain accessible.

Make sure that firewall features that make checks at application level are adjusted, if necessary. For example, you must disable the "RPC Filter" feature in the SIEMENS Application Firewall.

Note

The ports which are not necessary for communication of the current configuration must be closed.

Assignment of SIMATIC products as data sources to the firewall settings

Firewall settings	PCS neo	PCS 7	BATCH	WinCC	WinCC Performance Monitor	Process Historian Redundancy	Information Server (Remote)	OPC UA Server (Remote)	OPC UA Data Collector (Remote)
PH LLMNR-UDP-In	x	x		x					
PH Database Writer SF2	x							x	x
PH SQL server port		x	x	x	x	x	x		
PH SQL Server Monitor Port		x	x	x	x	x	x		
PH SQL Server Application		x	x	x	x	x	x		
PH RPC for MSMQ		x		x					
PH Network Discovery		x	x	x	x			x	x
PH Discovery Services		x		x	x			x	x
PH Management			x						
PH Redundancy Services						x			

Firewall settings	PCS neo	PCS 7	BATCH	Win CC	WinCC Performance Monitor	Process Historian Redundancy	Information Server (Remote)	OPC UA Server (Remote)	OPC UA Data Collector (Remote)
PH WCF Message Queue Service (Redundancy Maintenance Service)						x			
PH WCF Message Queue Service (SQL Mirroring Setup)						x			
PH WCF Message Queue Service (Maintenance Service)						x			
PH SQL - Server Mirroring Port (UDP)						x			
PH SQL - Server Mirroring Port (TCP)						x			

Open ports

The Process Historian server requires the following open ports for operation:

Name	Protocol	Port
PH LLMNR-UDP-In	UDP	5355
PH RPC for MSMQ	TCP	135
PH Network Discovery (NetBios Name Resolution)	UDP	137
PH SQL Server Monitor Port	UDP	1434
Microsoft Message Queuing	TCP	1801
PH DatabaseWriterServiceUI	TCP	2224
PH Maintenance Service (Srv ServerPort)	TCP	2225
PH Maintenance Service (Srv ClientPort)	TCP	2226
PH Database Writer SF2	TCP	2227
PH Server 2020 (Server, License; Info; Live data)	TCP	2230
PH SQL Server Port	TCP	3723
PH SQL Mirroring Port (TCP)	TCP	5022
PH SQL Mirroring Port (UDP)	UDP	5022
PH Discovery Services	TCP	5048
PH Management	TCP	2222
Generic Import Export Service	TCP	44220
PH Redundancy Services	TCP	60000

Name	Protocol	Port
PH WCF Message Queue Service (Redundancy Maintenance Service)	TCP	60001
PH WCF Message Queue Service (SqlMirroringSetup)	TCP	60002
PH WCF Message Queue Service (MaintenanceService)	TCP	60003
PH SQL Server Application	TCP	Any port
OPC UA Local Discovery Server	TCP	Any port

The Monitoring & Control server / OS server requires the following open ports for operation:

Name	Protocol	Port
PH Database Writer SF2	TCP	2228
NetBios Name Resolution	UDP	137

3.1.1.2 Installation

Process Historian for PCS neo

Installing Process Historian for PCS neo

Note

Configuration of the target computer in the Administration Console

Before manually installing the Process Historian/Information Server, the target computer must be configured in the Administration Console:

1. Install AC Agent via "AdditionalProducts\AC Agent" of the PCS neo setup or a remote installation of the AC agent from the AC Server to the Process Historian-Server/Information Server.
2. Add the Process Historian Server/Information Server to the Administration Console.
3. Create an AC server certificate for the Process Historian Server/Information Server.

To do so, follow the instructions in the PUD for the Administration Console:

- Administration > SIMATIC PCS neo Administration Console > Getting Started > Use cases > Create setup definition for AC agent
- Administration > SIMATIC PCS neo Administration Console > Communication > Adding target computer to AC
- Administration > SIMATIC PCS neo Administration Console > Communication > Use cases > Create certificate for target computer

After successful local installation of Process Historian/Information Server, perform the following advanced steps in the Administration Console:

1. Connect the PH/IS computer to the UMC domain.
2. Determine the inventory data for the PH/IS computer.
3. Update the distribution of the configuration.

Follow the instructions in the PUD: "Administration > Administration Console > Inventory > Work with inventory data"

After the Process Historian Server is started, in the Administration Console, in "Configuration" > "S&F Allow List", add to the Allow List the Monitoring & Control Stations as S&F Clients that are allowed to write data to the Process Historian Server.

Requirement

- You have the Windows "Administrator" permission.
- The system requirements for the Process Historian are met.

Procedure

1. Install the "SIMATIC PCS neo Process Historian Server" software module via the PCS neo setup.
2. After completion, conclude the setup with a restart.

Result

Process Historian is installed on the PC.

The Database Installation Wizard is started, which you use to configure the Process Historian database. You can find additional information on the configuration of the database in the "Process Historian Server" manual.

Permissions for Windows domain users

If the operating system login on the Process Historian only has user authorization, the Process Historian Management Console is not opened automatically when the system is restarted. To open the Process Historian Management Console, go to "Start > Siemens Automation > SIMATIC > Process Historian > Process Historian Management Console".

To start the Process Historian Management Console automatically after restarting, enter the Windows domain user in the local administrator group.

See also

Configuring the database (Page 95)

Opening the Process Historian Management Console (Page 111)

Process Historian for PCS 7

Process Historian for PCS 7 - Overview

Overview

Depending on the configuration, you have various configuration options:

- Combined Process Historian/Information Server:
  - On the Process Historian/Information Server
    Installing a combined Process Historian/Information Server (Page 31)
  - On the OS servers
    Installing PH-Ready on a PCS 7 OS (Page 24)
- Redundant Process Historian with Information Server as witness
  - On the Process Historian/Information Server
    Installing redundant Process Historian (Page 25)
  - On the OS servers
    Installing PH-Ready on a PCS 7 OS (Page 24)
- Process Historian/Information Server and SIMATIC BATCH
  - On the Process Historian/Information Server
    Installing Process Historian/Information Server with SIMATIC BATCH (Page 32)
  - On the OS servers
    Installing PH-Ready on a PCS 7 OS (Page 24)

- Dedicated Process Historian/Information Server
  - On the Process Historian/Information Server
    Installing a dedicated Process Historian/Information Server (Page 31)
  - On the OS servers
    Installing PH-Ready on a PCS 7 OS (Page 24)
- Referenced OS single station with Process Historian/Information Server
  - On the Process Historian/Information Server
    Installing a combined Process Historian/Information Server (Page 31)
  - On the referenced OS single station. The OS single station base must be redundant when using a Process Historian in this configuration. You can use a total of eight OS stations.
    Installing PH-Ready on a PCS 7 OS (Page 24)

Installing Process Historian for PCS 7

Requirement

- You have the Windows "Administrator" permission.
- The system requirements are met.
- Microsoft Message Queuing (MSMQ) is installed.

Procedure

1. Start the PCS 7 setup from the data storage medium.
2. Follow the instructions of the installation wizard.
   Read the License Agreement and the Open Source License Agreement.
3. If necessary, enter the following information in the "User information" dialog:
   - User
   - Associated organization
4. Select the required "Type of installation":
   - Package installation
   - Custom installation
5. In the "Archiving and Reporting" category, select the "Process Historian" program package for package installation or the "Process Historian Server 2022" program for custom installation.
6. If you want to install a combined Process Historian/Information Server, select the "Process Historian" and "Information Server" program packages in the "Archiving and Reporting" category for a package installation or the "Process Historian Server 2022" and "Information Server" 2022" programs for a custom installation.
7. If required, select additional components in the "Programs" dialog.
8. Read the license agreement for Microsoft SQL Server.
9. Confirm the changes to the system settings in the "System settings" dialog.

10. Start the installation.
11. To complete the installation, restart the system.

Note

Restart during the installation

Several restarts are requested during installation. These restarts must be executed when they are requested and not at a later time.

Result

Process Historian is installed on the PC.

The Database Installation Wizard is started, which you use to configure the Process Historian database. You can find additional information on the configuration of the database in the "Process Historian Server" manual.

Permissions for Windows domain users

If the operating system login on the Process Historian only has user authorization, the Process Historian Management Console is not opened automatically when the system is restarted. To open the Process Historian Management Console, go to "Start > Siemens Automation > SIMATIC > Process Historian > Process Historian Management Console".

To start the Process Historian Management Console automatically after restarting, enter the Windows domain user in the local administrator group.

Installing PH-Ready on a PCS 7 OS

Introduction

With the following OS installation options, the PH-Ready component is installed automatically:

- OS Server for Process Historian
- Maintenance Station for Process Historian
- OS Single Station for Process Historian

Requirement

- Microsoft Message Queuing (MSMQ) is installed.
- The user under which the Process Historian was installed is registered on the computer.

Procedure

1. Start the setup with the PCS 7 data storage medium. The version of the PH-Ready must always correspond to the version of the Process Historian.
2. Follow the instructions of the installation wizard.
   Read the License Agreement and the Open Source License Agreement.
3. In the "Server" category, select the "OS Server for Process Historian " program package.
   For a subsequent installation, use the "OS Server for Process Historian" program package or the "Process Historian Ready Component 2022" program under "Archiving and Reporting".
4. Confirm the changes to the system settings in the "System settings" dialog.
5. Start the installation.
6. To complete the installation, reboot the system.

Note

Restart during the installation

Several restarts are requested during installation. You cannot postpone the reboots to a later time.

Result

The PH-Ready component is installed on the computer.

After installation, you need to configure the PH-Ready service using the Service Configuration Wizard.
Configuring the PH-Ready service (Page 34)

Installing redundant Process Historian

Procedure

1. Install the "Process Historian" program package on the principal.
   Installing Process Historian for PCS 7 (Page 23)
2. Install the "Process Historian" program package on the mirror.
3. Install the "Information Server" program package on a PC.
4. Install the witness on a PC, such as the Information Server.
   Configure the Process Historian Redundancy Service.
   Installing the Process Historian Witness (Page 26)
5. In the "Redundancy" dashboard of the Process Historian Management console, configure the redundant system with the wizard for redundancy configuration.
   Configuring a redundant Process Historian (Page 27)

Result

The redundant Process Historian is installed and set up.

The Process Historian Redundancy Service is configured during the setup.

Installing the Process Historian Witness

Requirement

A SIMATIC Information Server is installed on the PC.

Procedure

1. Run the "Setup.exe" file.
   The "Setup" dialog opens.
2. Follow the procedure when installing the Process Historian Server.
3. Under "Custom Installation", select:
   – "Archiving and Reporting" > Program "Process Historian Witness 2022"
4. Restart the system.
   After the restart, the service configuration wizard opens; it will configure the Process Historian Redundancy Service.
5. Define a user who has access rights to the Process Historian database of the redundant PC.
6. Click "Next".
7. In the "Service configuration" dialog of the "New security setting" plant complex, enter a user and a password.
8. Click "Next".
   A summary of the configuration is displayed in the "Overview" dialog.
9. Check your inputs and click "Finish".

Result

The Process Historian Witness is installed and Process Historian Redundancy Service is configured.

Configuring a redundant Process Historian

Requirement

- The redundant Process Historian is installed.
- You have configured the following using the database installation wizard:
  – The Process Historian database is configured in the "Redundant system" server mode.
  – "SIMATIC Process Historian Redundancy" is selected as the data source.
- You have become familiar with the basics of the redundant Process Historian.
- You have administrator rights.

- You use the PC that is the designated principal to set up the redundancy.
- The "Redundancy" dashboard is opened in the Management Console on the PC.

Procedure

1. In the "Redundancy" area, click the "Start Redundancy Configuration Wizard ..." button.
   The "Host configuration" dialog opens. The SQL Server instance for the principal is pre-selected; it is called "HISTORIAN". This setting cannot be changed.
2. Specify the network adapter via which the principal is executing the mirroring. To do so, select the dedicated redundancy connection between the principal and the mirror.
3. Select the SQL Server instance for the mirror from the drop-down menu. If necessary, reload the list with the "Refresh" button. The SQL Server instance is in the format "<PC name>\<SQLServerInstanceName>".
4. A dialog for setting up the certificates is displayed.
5. On the principal, start the "PH Redundancy Configuration Enabler" via "Start > Siemens Automation".
   The "PH Redundancy Configuration Enabler" displays the certificate of the mirror.
   Select the certificate and click "Accept certificate".
6. On the mirror, start the "PH Redundancy Configuration Enabler".
   The "PH Redundancy Configuration Enabler" displays the certificate of the principal.
   Select the certificate and click "Accept certificate".
7. On the principal, in the dialog to set up the certificates, click "Certificates are trustworthy".
   If you click "Certificates are trustworthy" before you have accepted the certificates, the dialog is displayed again with the certificates that are not yet trustworthy.
8. Specify the network adapter for the dedicated redundancy connection.
9. Select the SQL Server instance for the witness from the drop-down menu. The instance depends on the basis of the witness server, for example, an Information Server. The instance name, therefore, is "INFSERVER".
   Enter the PC manually ("PC NAME\INSTANCE NAME") when the PC:
   - Is not included in the list
   - Is displayed incompletely in the list with name but without SQL instance

   Jump to the next box using the TAB key.
10. The dialog for setting up the certificates is displayed again.
    On the principal, mirror and witness, via the "PH Redundancy Configuration Enabler", accept each other's certificates.
    On the witness, start the "PH Redundancy Configuration Enabler" via "C:\Program Files\Siemens\ProcessHistorian\bin\PHRedundancyConfigurationEnabler.exe".
11. On the Principal, in the dialog to set up the certificates, click "Certificates are trustworthy".
12. Specify the network adapter for the terminal bus connection.
13. Click "Next".
    The "TCP Port Settings" dialog opens.

14. In the "TCP Port Settings" dialog you specify the ports and make the required firewall settings. Apply the default settings of the Process Historian. These include the firewall settings specified in the database installation wizard.
15. The plausibility of the configuration and the connectivity of the configured servers and paths is checked in the "Validation" dialog. A protocol in the "Validation" area shows which action is currently being executed.
    When the validation process is interrupted, click "Rerun".
16. Click "Next".
    The "Overview" dialog opens and shows a summary of the configuration.
17. Check the entries to make sure that they are correct.
18. Click "Next".
    The configuration process is started.
19. The redundancy on the servers is configured in the "Execution" dialog.
    - The newly created configuration is set up gradually. The actions log is displayed in the "Setup actions" area.
    - Depending on the size of the Process Historian database, some of the setup actions will take longer.

    A distinction is made between the following processes:
    - "Fast data backup and restore": Creates a full backup of the principal database that is concurrently being restored on the mirror.
    - "Fast log backup and restore": A backup of the transaction log is created and restored at the same time.
20. When the configuration is interrupted, click "Rerun".

Result

A redundant system has been set up for operation of the Process Historian.

You can change the redundancy configuration or exit the redundancy synchronization on the "Redundancy" dashboard in the Management console.

See also

Installing redundant Process Historian (Page 25)

Firewall settings (Page 18)

Basics of the redundant Process Historian (Page 93)

Process Historian for WinCC

Installing Process Historian for WinCC

Introduction

You can use a separate server with installed Process Historian in the WinCC environment.

Requirement

- You have the Windows "Administrator" permission.
- The system requirements are met.
- Microsoft Message Queuing (MSMQ) is installed.

Procedure

1. Start the setup via the data storage medium for Process Historian / Information Server.
2. Follow the instructions of the installation wizard.
   Read the License Agreement and the Open Source License Agreement.
3. In the "Process Historian" category, select the "Process Historian Server" program package.
4. If required, select additional components in the "Programs" dialog.
5. Read the license agreement for Microsoft SQL Server.
6. Accept the changes made to the system settings.
   You can see an overview of the setup process.
7. Start the installation.
8. To complete the installation, restart the system.

Note

Restart during the installation

Several restarts are requested during installation. These restarts must be executed when they are requested and not at a later time.

Result

Process Historian is installed on the separate server.

The Database Installation Wizard is started, which you use to configure the Process Historian database. You can find additional information on the configuration of the database in the "Process Historian Server" manual.

Permissions for Windows domain users

If the operating system login on the Process Historian only has user authorization, the Process Historian Management Console is not opened automatically when the system is restarted. To open the Process Historian Management Console, go to "Start > Siemens Automation > SIMATIC > Process Historian > Process Historian Management Console".

To start the Process Historian Management Console automatically after restarting, enter the Windows domain user in the local administrator group.

Installing PH-Ready on a WinCC station

Requirement

- Microsoft Message Queuing (MSMQ) is installed.
- The user under which the Process Historian was installed is registered on the computer.

Procedure

1. Start the setup via the "Process Historian / Information Server 2022" data storage medium.
2. Select the product language.
3. Follow the instructions of the installation wizard.
   Read the License Agreement and the Open Source License Agreement.
4. In the "Process Historian" category, select the "Process Historian Ready Component 2022" program package.
5. Start the installation.
6. To complete the installation, reboot the system.

Note

Restart during the installation

Several restarts are requested during installation. You cannot postpone the reboots to a later time.

Result

The PH-Ready component is installed on the computer.

After installation, you need to configure the PH-Ready service using the Service Configuration Wizard.
Configuring the PH-Ready service (Page 34)

Installing a combined Process Historian/Information Server

Procedure

1. For PCS 7, install the combined "Process Historian" and "Information Server" program package on the PC.
   For PCS neo and WinCC, install the respective "Process Historian" program package on the PC.
   Installing Process Historian for PCS neo (Page 21)
   Installing Process Historian for PCS 7 (Page 23)
   Installing Process Historian for WinCC (Page 29)
2. Install the "Information Server" program package on the PC for PCS neo and WinCC.

Result

A combined Process Historian/Information Server is installed on the PC.

Installing a dedicated Process Historian/Information Server

Procedure

1. Install the respective "Process Historian" program package on the Process Historian OPC UA Server.
   Installing Process Historian for PCS neo (Page 21)
   Installing Process Historian for PCS 7 (Page 23)
   Installing Process Historian for WinCC (Page 29)
2. Install the "Process Historian OPC UA" program package on the Process Historian OPC UA Server.
   Installing the Process Historian OPC UA Server (Page 32)
3. Install the "Information Server" program package on the PC.

Result

A dedicated Process Historian/Information Server is installed on the Process Historian OPC UA Server.

Installing Process Historian/Information Server with SIMATIC BATCH

Procedure

1. Install the respective "Process Historian" program package on the PC.
   Installing Process Historian for PCS neo (Page 21)
   Installing Process Historian for PCS 7 (Page 23)
   Installing Process Historian for WinCC (Page 29)
2. Install the "Information Server" program package on the PC.

3. Install the "Information Server - BATCH Reports" program package on the Information Server.
4. Install the "Information Server - MS Office Add-in" program package on the Information Server client if the client is used as an MS Office client.

Result

A Process Historian/Information Server is installed on the PC which integrates SIMATIC BATCH.

Installing the Process Historian OPC UA Server

Requirement

- Process Historian is installed on the PC.
- The "Process Historian OPC UA Server" license is available.

Procedure for PCS neo

1. Install the "SIMATIC PCS neo Process Historian OPC UA Server" software module via the PCS neo setup.
2. After completion, conclude the setup with a restart.

Procedure for PCS 7/WinCC

1. Start the setup from the data storage medium with the PCS/WinCC software.
2. Carry out the installation.
3. Under "Custom Installation", select:
   – "Options" > "Process Historian OPC UA" program package
4. After completion, conclude the setup with a restart.

Result

The Process Historian Server is pre-configured as an OPC UA Server If necessary, change the server configuration using the "OpcUaServerPH.xml" configuration file. For more information on the server configuration, refer to the "Process Historian OPC UA Server" manual.

The OPC UA Local Discovery Server (LDS) from the OPC Foundation is also installed.

See also

Discovery Server (Page 191)

Installing Process Historian for PCS neo (Page 21)

Configuring the Process Historian OPC UA Server (Page 183)

Installing Information Server Ready

Requirement

- The required hardware and software requirements for the installation of the Information Server are fulfilled.
- Close all Windows programs before running Setup.
- The specified user information must match on the different systems. Password changes must be tracked in all systems.
- For using the IS Ready with Process Historian: The IS Ready Service user must be created as a system administrator on the SQL Server instance.

Installation of the Information Server Ready on the Process Historian computer

1. Open the setup folder.
2. Select the "Start.exe" file of the component to be installed.
3. Select the language.
4. Read the installation instructions.
5. Accept the license agreement.
6. Select the installation content.
   You see an overview of the setup for the installation process.
7. The installation is completed.
   Restart the system now or at a later time.

Configuration on the Process Historian computer

1. Open "Start > All Programs > Siemens Automation > SIMATIC > IS Ready".
2. Select "IS Ready Configuration".
   The "IS Ready Configurator" opens.
3. Select "Next".

4. Enter your logon information.
   You see an overview of the setup for the installation process.
5. Select "Finish".

Note

Checking the configuration

The configuration was successful if you have been assigned to the "SIMATIC Reporting Services" group under "Local Users and Groups" on your computer.

Result

Information Server Ready is installed.

Configuring the PH-Ready service

You can use the Service Configuration Wizard to define the user under which the PH-Ready service is executed on the PCS 7 and WinCC computers. The user should be the same user who installed the Process Historian. The user automatically becomes a member of the "SIMATIC HMI" user group.

You can start the Configuration Wizard at any time and reset the access rights.

Requirement

PH-Ready is installed.

Procedure

1. After restarting the computer, start the Configuration Wizard for the "CCCAPHServer" service via" Siemens Automation" > "PH-Ready Configuration".
2. In the "New security setting" area, select the "Run with user credentials" option.
3. Enter the user under which the Process Historian was installed. Enter the password.
   The user must be created on the OS for this.
4. Complete the configuration of the "CCCAPHServer" service with "Finish".

Note

The passwords set for a user must match on the computers

Make sure that the passwords set for a user match on the following systems:

- WinCC OS/PCS 7 OS
- Process Historian server

Make sure to notice any changes to passwords.

Note

Update installation of PCS 7

If you upgrade the PCS 7 version on the OS, you then need to re-configure the PH-Ready service.

Result

The PH-Ready component is configured.

Updating the operating system for Process Historian

Introduction

The following procedure describes an update of the operating system.

Procedure

1. Go to the "Process Historian Management" dashboard on the Management Console.
2. In the "Process Historian operating state" area, select the "Shut down" status.
   Click "Apply".
3. Update the operating system, for example, using the Windows Server Update Service (WSUS).
4. Start the computer again after updating the operating system.
5. Start the Management Console with "Start > Siemens Automation > Process Historian Management Console".
6. Go to the "Process Historian Management" dashboard on the Management Console.
7. In the "Process Historian operating state" area, select the "Start" status.
   Click "Apply".

Result

The operating system on the Process Historian is updated to the latest version.

Installing Microsoft .NET Framework

Procedure

1. Open the Server Manager with "Start > Server Manager".
2. Select "Add roles and features".
3. Click "Next" on the "Before you begin" page.
4. Select "Installation Type > Role based or feature based installation > Server selection > Server role > Features".

5. Select ".Net Framework 4.8" or higher.
6. Click "Install".

Result

The ".Net Framework 4.8" or higher was installed.

3.1.1.3 Installation of the upgrade

Installing and uninstalling the Process Historian

Installation of the upgrade

You can upgrade a previous version of Process Historian to the latest version via the upgrade installation.

When you upgrade, you upgrade all computers in the Process Historian system. Therefore, install the upgrade on all computers on which the following components are installed:

- Process Historian
- PH-Ready component of the Process Historian on the PCS 7 Operator Stations (OS) and WinCC stations

The installation of the upgrade depends on the PC on which the installation is started. Detailed information is available in the sections below.

To install an upgrade, you need to completely shut down the Process Historian.

NOTICE
Backing up existing data Before upgrading the Process Historian server, create a manual backup or cyclic full backup of the existing database.

Update installation procedure

Note

Order of the software update of PCS 7 and Process Historian

You need to update the Process Historian server to the corresponding Process Historian version of the new PCS 7 version first before you update the PCS 7 plant.

In this context, also read the instructions "SIMATIC Process Control System PCS 7 Software update" with the section "How to update the Process Historian and Information Server".

SIMATIC Process Control System PCS 7 Software update (https://support.industry.siemens.com/cs/ww/en/view/109767557)

Do not change the computer name or memory structure

During the upgrade, you cannot change the computer name or the structure of the memory paths.

1. When required, replace the hardware.
2. A full backup of the database is required when upgrading from PH 2014 SP3. Next, upgrade the operating system of the Process Historian system computers and reinstall the Process Historian server on Windows Server 2019. If you have deployed a redundant Process Historian, you must remove the redundancy at the "Redundancy" dashboard before the full backup and upgrade.
3. Upgrade of the Process Historian server and update of the Process Historian database.
   If you are using a redundant Process Historian, you must upgrade the redundant Process Historian.
   Upgrading the Process Historian server (Page 39)
4. Upgrade PH-Ready on the PCS 7 OS and/or the WinCC stations.
   Upgrade Process Historian Ready (Page 40)

The upgrade installation is possible for the following versions:

From version	Via version	To version
Every version from 2014 SP3	2014 SP3 Update 6	2022
2020 / 2020 SP2	-	2022

Upgrade via download file

If you have the upgrade as a self-extracting download file, extract this upgrade only on a PC with the Process Historian product installed.

Performing the installation

The Setup program guides you through the entire installation.

Depending on the system configuration, a restart may be necessary following the installation.

Supplementary installation

You will have to install the upgrade once again if you have performed a retro-installation from the supplied data storage medium.

System behavior after the upgrade installation is complete

- The applications (services) are automatically restarted after restart of the computer.
- The Process Historian Management Console is started in the background on the Process Historian server.

Note

The process data is only transmitted again when the new version is installed on all Process Historian servers and computers with PH-Ready.

PCS neo: Add Monitoring & Control Stations as S&F Clients

After the Process Historian Server is started, in the Administration Console, in "Configuration" > "S&F Allow List", add to the Allow List the Monitoring & Control Stations as S&F Clients that are allowed to write data to the Process Historian Server.

Status of the Process Historian server and the licensing status

The Process Historian and the Management Console are not available during the upgrade installation.

Database: Access rights during installation

The access rights of the registered user to the SQL server of the database are temporarily revoked during the upgrade installation. Clients also lose access to the database during this time.

Uninstalling

The upgrade cannot be uninstalled.

Upgrading the Process Historian server

Introduction

To upgrade a Process Historian server, use the corresponding, latest version on the PCS neo, PCS 7, WinCC data storage medium or the upgrade download, depending on the configuration.

After installation, the Process Historian database is updated via the Database Installation Wizard.

NOTICE
Backing up existing data Before upgrading the Process Historian server, create a manual backup or cyclic full backup of the existing database.

Procedure

1. Shut down the Process Historian on the "Process Historian Management" dashboard.
2. Run the setup.
3. Follow the instructions of the installation wizard.
4. Perform the installation.
   If you want to install Process Historian/Information Server with SIMATIC BATCH, install the software package "Information Server - BATCH Reports" on the Information Server.
   If you want to upgrade a redundant Process Historian on the PCS 7 system, follow the procedure outlined below:
   Upgrading the redundant Process Historian (Page 42)
5. To complete the installation, reboot the system. After the upgrade installation, the Process Historian Database Installation Wizard starts. Databases from predecessor versions are migrated by means of this wizard without modification of the interfaces.
6. If you are using new hardware or performing an operating system change or a new installation, you need to cancel the Database Installation Wizard. Restore the database with the "Database Recovery" program, which you will find via the start window of the operating system. Then restart and start the Database Installation Wizard.
7. Follow the instructions of the database installation wizard to update the existing data. As soon as the database is updated, a window appears with an overview of actions already performed.
8. To complete the installation, reboot the system.

Result

The Process Historian Server is upgraded and the Process Historian database is updated.

The Process Historian server goes into operation.

After a certain time, the previous PH-Ready components on the PCS 7 Operator Stations (OS) and WinCC stations supply data again.

Upgrade Process Historian Ready

After the upgrade installation of Process Historian Server, upgrade the other computers in the Process Historian system:

- On the WinCC stations
- On the PCS 7 operator stations (OS)

Perform an upgrade of Process Historian Ready (PH-Ready). Use the update download or, depending on the configuration, the latest version of the WinCC or PCS 7 data storage medium.

Upgrading n PH-Ready without upgrading PCS 7 OS

When upgrading the PH components in a PCS 7 system in isolation, only the Process Historian server and PH-Ready are upgraded to a newer version. All other PCS 7 products and components remain unchanged.

- Via update download:
  Only the PH components on the PCS 7 OS are upgraded during the setup.
- Via a newer PCS 7 data storage medium without upgrading the complete PCS 7 OS: Manually uninstall
  PH-Ready and then manually install PH-Ready from the corresponding subfolders of the PCS 7 data storage medium.

Note

Restart during the installation

Several restarts may be requested during installation. These restarts must be executed when they are requested and not at a later time.

Install Process Historian Ready if the OS server has the same hardware and the same computer name

1. Set WinCC offline and end WinCC.
2. Update the operating system, for example, using the Windows Server Update Service (WSUS).
3. Start the setup for the PH-Ready via the WinCC or PCS 7 data storage medium. The version of the PH-Ready must always correspond to the version of the Process Historian.
4. Follow the instructions of the installation wizard.
   Read the License Agreement and the Open Source License Agreement.
5. After installing the settings, check the PH-Ready service using the Service Configuration Wizard.
   Configuring the PH-Ready service (Page 34)
6. Restart the computer.
7. Set WinCC online again.

Install Process Historian Ready if the OS server has new hardware and the previous computer name.

1. Set up the new hardware with the appropriate operating system.
2. Install WinCC.
3. Start the setup for the PH-Ready via the WinCC or PCS 7 data storage medium. The version of the PH-Ready must always correspond to the version of the Process Historian.
4. Follow the instructions of the installation wizard.
   Read the License Agreement and the Open Source License Agreement.

5. After installation, you need to configure the PH-Ready service using the Service Configuration Wizard.
   Configuring the PH-Ready service (Page 34)
6. Restart the computer.
7. Import the WinCC projects from the ES to the new computers.
8. Set WinCC online.
9. Set the old WinCC system offline.

Install Process Historian Ready if the OS server has new hardware and new computer names

1. Set up the new hardware with the appropriate operating system.
2. Install WinCC.
3. Start the Setup for the PH-Ready via the WinCC or PCS 7 data storage medium. The version of the PH-Ready must always correspond to the version of the Process Historian.
4. Follow the instructions of the Installation Wizard.
   Read the License Agreement and the Open Source License Agreement.
5. After installation, you need to configure the PH-Ready service using the Service Configuration Wizard.
   Configuring the PH-Ready service (Page 34)
6. Restart the computer.
7. Import the WinCC projects from the ES to the new computers.
8. In the navigation window of the WinCC Explorer, select the "Process Historian" item to open the "WinCC Process Historian Editor".
9. On the "Computer Name" tab, input the computer names used thus far so as to get messages from those computers as well.
10. Set WinCC online.
11. Set the old WinCC system offline.

Result

The current PH-Ready is installed on the computer.

Upgrading the redundant Process Historian

Procedure

1. Upgrade the Process Historian server that serves as the principal.
2. Upgrade the Process Historian server that serves as the mirror.

3. Install the witness on a PC, such as the Information Server.
   Configure the Process Historian Redundancy Service.
   Installing the Process Historian Witness (Page 26)
4. Set up the redundancy afresh. Start the redundancy configuration on the management console in the "Redundancy" dashboard.
   Configuring a redundant Process Historian (Page 27)

Result

The redundant Process Historian is installed and set up.

The Process Historian Redundancy Service is configured during the setup.

3.1.2 Concepts

3.1.2.1 Process Historian basics

Definition

The SIMATIC Process Historian is the central long-term archiving system based on the Microsoft SQL Server.

All process data and messages from the following data sources are archived on the Process Historian server in real time:

- PCS neo Monitoring & Control Server
- PCS 7 OS Server and OS Clients
- WinCC Server and Stations
- WinCC Performance Monitor
- The external system connected to the Monitoring & Control server, e.g. OPC UA Server
- SIMATIC BATCH Server

The Process Historian can be used in the following plant configurations:

- Process Historian on a server
- Process Historian and Information Server combined on one server
- Process Historian with integrated OPC UA Server
  Basics of the Process Historian OPC UA Server (Page 181)

The redundancy for Process Historian is supported for PCS 7 systems.
Basics of the redundant Process Historian (Page 93)

Implementation in the system

The Process Historian runs as an archiving service on a server and uses services for processing and backing up data.
Services of the Process Historian (Page 148)

The Process Historian receives the archiving requests of the integrated projects and transfers the data promptly to the Process Historian database.

The integrated projects are displayed in Process Historian with their computers in a plant structure. The data is organized within the project; it can originate from multiple data sources. Each data source collects its own data, which is transferred to the Process Historian.

To ensure that no data is lost during transfer, the data is stored in a data buffer (PH Core Logging / Store & Forward cache) at the data sources until the data is archived in the database. For example, if the Process Historian is not accessible during maintenance work.
Data transfer from the Monitoring & Control server to the Process Historian (Page 89)
Data transfer from PCS 7 OS / WinCC station to the Process Historian (Page 91)

The database is divided chronologically into daily, weekly or monthly segments and logically into data groups. You can distribute the data groups to different hard disks to optimize the performance of the database.
Basics of data storage (Page 84)
Basics of segmentation (Page 85)

The following are present in the database at any one time:

- A currently active segment
- Some prepared segments
- Older segments that have been archived and swapped out of storage

Batch data from the BATCH server

The data to be archived contains the batch information supplied by the BATCH server and the Runtime information during batch creation.

You can remove the archived batch data to backup files and then remove it from the Process Historian. You can use "Restore" to make the removed batch data available again to the Monitoring & Control stations, OS servers, OS clients or the Information Server. The process values and messages from the batches provided by the Monitoring & Control stations, OS servers and OS clients are stored separately in segments in the Process Historian, like all process data.

Language scope

In addition to the following 11 standard languages, you can also archive 22 additional languages in the Process Historian:

- German (Germany)
- English (United States)
- French (France)
- Italian (Italy)
- Russian
- Spanish (Spain)

- Spanish
- Chinese (People's Republic of China)
- Chinese (Taiwan)
- Japanese (Japan)
- Korean (Korea)

3.1.2.2 Basics of data storage

Overview

The Process Historian stores each value sequence to be archived, e.g. from a process tag, and individual values at specific times under a unique identifier. The physical location of the individual values is determined with this identifier.

To improve performance when archiving a large number of process values and alarms, the value sequences in the Process Historian can be divided into data groups. 1000 values per data group are organized, for example, with 2 data groups and 2000 values per second. The number of data groups used also depends on the number of processor cores. The maximum value of the data groups is automatically determined by the Process Historian installation depending on the available resources.

Each data group is assigned a storage location on a shared cluster of physical sources.

- Data group 1 on drive partition 1
- Data group 2 on drive partition 2
- etc.

Note

To influence the performance and scaling of the system used, you can use the Database Installation Wizard to split the data groups among the existing hard disks.

Partition

The amount of runtime data of a single value sequence to be archived is not limited and constantly increases. The amount of data assigned to a single value sequence is therefore divided into several partitions over the time axis.

Data groups are divided into partitions using the time axis.

The following conditions apply to partitions:

- Each partition has a high and low limit for the time range.
- The high time limit is always higher than the low time limit.
- The partitions of a data group do not overlap.

Database segment

A database segment consists of the sum of partitions of all data groups that share the same high and low time limits. These groups correspond to the limits of the segment.

You can find out more about segments in Process Historian in:

Basics of segmentation (Page 85)

Application recommendations

The disk space of the Process Historian is continuously filled with data. If the available disk space falls below a limit, the Process Historian is set to the "Locked" operating state and archiving is stopped.

In order to have enough available disk space available again in time, you have the following options:

- Back up the segments
  Backup a segment manually (Page 115)
  Backup segment automatically (Page 116)
- Setting the saved segments "Offline" and thus removing them from the Process Historian database
  Set segment "Offline" (Page 118)

The backed up data is initially available in parallel both in the backup file and in the Process Historian database. The data of the segment is only removed from the database when the data is swapped out, thus freeing up hard disk space on the database drives.

3.1.2.3 Basics of segmentation

Segment

Segment (Page 154)

Implementation in the system

The Process Historian archives the following data:

- Process values
- Messages
- Configuration data on the process values and messages
- Aggregation data

Note

The data from long-term relevant and archive relevant text variables are not saved.

The archived data is stored in the following segments:

- Runtime segment (Page 156)
- Archive segment (Page 155)

The Process Historian continuously creates runtime segments with the defined time span. When the configured number of Runtime segments has been reached, the oldest Runtime segment becomes an archive segment.

When setting up the Process Historian database, segments are already configured. Five runtime segments with a future segment are preset and one segment has a time span of one week. You can change the default setting when you set up the database or at a later point in time.

Depending on the configuration limits, the amount of data on the hard disk per segment can be very large, especially for uncompressed Runtime segments. When the segments are created, the expected required disk space is calculated taking into account the size of the past segments and reserved for the future segments.

To ensure that all data is stored independently of the time stamp, the Process Historian also creates the following "catch-all" segments:

- CAL segment (Page 156)
- CAU segment (Page 157)

These segments collect all incoming data that lies outside the current Runtime segments. This includes data for all types of archive segments, because it is no longer possible to write to these segments. CAL segment and CAU segment are permanently available and cannot be stored directly in a backup file and removed from the database.

The segments can have the status "Online" or "Offline" when accessing the data in the Process Historian.

Status (Page 177)

Properties of segments

Type	Status	Reading	Writing	Archiving	Deleting
Runtime	Online	Yes	Yes	No	No
Archive	Online	Yes	Yes	Yes	No
Archive (backed-up)	Online	Yes	Yes/Indirect [3]	Yes	Yes [2]
Archive (deleted)	Offline	No	Indirect [1]	No	No

[1] Pending changes in the CAL segment are transferred to the archive segment during the backup.

[2] Can only be deleted if the data has not been changed since the last archiving.

[3] "Indirect" with redundant Process Historian

Deleting an archive means "Setting offline" a backed up archive segment. The data of this segment is only available in the backup file. There is no more segment data in the Process Historian database. Only the information about a backup and "Set offline" is available.

Data can be written directly to the archive segments as long as the segments have "Online" status.

The configuration data for the process values and messages are archived in a common area outside the segments. When a segment is swapped out, the configuration data is swapped out

as well. After restoring the swapped out segments, the segments also contain the configuration data.

Application recommendations

Configuration of the segments

The optimum settings for the segmentation are a compromise between the occupied disk space and the number of uncompressed data segments to be reserved.

You can change the default settings of the segments when setting up the database. For information on how to configure the segments, see:

Configuring segments (Page 109)

The selection of the segment time range has an effect on the required hard disk space. The required disk space is calculated according to the user-defined settings of the segments and based on the estimated load of the data values.

For information on how to minimize required disk space, see:

Minimizing storage requirements (Page 146)

Note

The more measured values or messages are archived per second, the smaller the segments should be. This prevents the individual segments from getting too large. 50,000 tags per second is the high limit that should not be exceeded.

Changing the configuration of the segments

Segments that have already been created cannot be changed afterwards. However, you can change the configuration for future segmentation. For example, you want to change the number of Runtime segments because the time period for archiving changes in the segments.

If you want to change the total number of Runtime segments or the number of future segments, you do not need to change the anchor point. Existing segments are not deleted by changing the settings, e.g. you need to reduce prepared segments.

This means that the new settings are not used when you reduce the future segments until the surplus and prepared segments are used. For example, reducing the number of future segments from "3" to "1" only has an effect if two of these future segments have also been described written, i.e. in the case of weekly segments only after two weeks.

If you increase the number of future segments, segmentation with the new settings is initiated immediately. In this case, one segment more than those configured is temporarily created as a future segment.

If you change the anchor point, the anchor point must point to a point in time that lies on or after the last time stamp of all segments.

Note

If the last segment of the existing segmentation configuration ends before the anchor point of the new segmentation, an intermediate segment must be created. This intermediate segment starts with the end time of the last segment of the existing configuration and ends with the start time of the new configuration. A suitable anchor point is suggested to avoid the need for an intermediate segment. If you reject this suggestion, an intermediate segment is created automatically.

Compression of archive segments

The internal compression of the archive segments reduces the space requirements for the Process Historian server. The archive segments are compressed automatically in the background.

The reduction in space requirements through compression depends on the saved values. For example, if a value does not change over an extended period of time, the compression factor is high. If a value changes constantly, the compression ratio is lower. A compression factor of "5" is a conservative assumption.

Access period for the archived data

You need to align the time period over which the Process Historian provides access to the data of the segments with the "Online" status with the hard disk space absolutely available. You must also take into account a reserve on the order of several segment units, since the system temporarily requires additional free space for internal processes such as segmentation, compression, etc. You must also reserve free space to restore older backups for temporary integration of the segments in the Process Historian.

Note

No access to the database when executing the following functions in the segments:

- During the preparation of a segment
- During the backup of a segment
- During the restoration of a segment
- "Offline" setting of a segment

Example

Initial situation

- Three future segments are configured.
- A total of eight runtime segments are configured.
- The time span for a segment is set to one week.
- Automatic backup scheduling is enabled.
- The number of delayed segments for offline setting is set to "2".

Segmentation process

The Process Historian database has always stored data uncompressed for a period of 7 (= 8 - 3 + 2) weeks.

Segmentation is performed at the end of each week:

- A new future Runtime segment is created.
- If there are more than 8 Runtime segments, the oldest Runtime segment becomes an archive segment.

Furthermore, there is a cyclical check regarding the backup to determine:

- Whether an archive segment can be backed up.
- The oldest backed up archive segment is set offline when the number of backed up archive segments is greater than the configured number of delayed segments.

3.1.2.4 Data transfer from the Monitoring & Control server to the Process Historian

Overview

The process values and messages stored on the Monitoring & Control stations are automatically transferred to the Process Historian database via a data buffer (PH Core Logging) and the Store & Forward component.

The clients of the Monitoring & Control stations must be authorized by means of certificates to access the Process Historian server via the Store & Forward component. For information on how to add clients to an Allow list, refer to the documentation of the Administration Console.

All servers and all S7 controllers that assign time stamps for process values and messages must be time-synchronized.

Transmission process

1. The Monitoring & Control server first saves the acquired process values and the messages in a data buffer on the local drive. In the data cache, the data is prepared in such a way that the data is optimally transferred to the Process Historian.
2. The data is automatically transferred from the data cache to the Process Historian.
3. The Process Historian stores this data in the Process Historian database.
4. The Process Historian acknowledges the successful saving of the data to the Monitoring & Control servers. While the Monitoring & Control server waits for acknowledgment of the transmitted data, the Monitoring & Control server is already storing the next data from the short-term archive in the data buffer.
5. The Monitoring & Control server releases the allocated data buffer again.

Result

The normal flow of the transmission ensures that the data is transferred to the Process Historian in a timely manner to where and then stored there in the current Runtime segment.

The data transferred to the Process Historian are stored in the CAL segment if the data are older than the oldest runtime segment of the Process Historian.
CAL segment (Page 156)

To be prepared for the delayed transfer of the data, select the number of correspondingly large Runtime segments and slow down the backup of the archive segments and setting them offline.

Monitoring & Control server and Process Historian are separated

1. The Monitoring & Control server continues to store the data in its local data buffer.
2. The data buffer will grow until the available disk space reaches a low limit.

The connection to the Process Historian is restored

1. The Monitoring & Control server transfers the data from the data cache to the Process Historian server.
2. When there is free space on the drive again, the missing data in the data buffer is read directly from the short-term archive and transferred to the data buffer.

Note

Behavior with reduced space

The available disk space is monitored by the Monitoring & Control server.

The data buffer can grow in the following cases:

- Loss of connection to the Process Historian server
- Reduced performance when processing the transferred data on the Process Historian server, because the transfer involves numerous additional access operations for reading data from the short-term archive.

The occupied data cache is released again when the cached data has been transferred to the Process Historian server.

Warning on the Monitoring & Control server

If one of the following conditions occurs, a warning is sent to the Monitoring & Control server:

- The available disk space for the data buffer falls below the limit of 10 GB.
- The free disk space for the data buffer is less than 30% of the reserved drive capacity. The value can drop to 6% for hard drives with less than 60GB total capacity. The disk space must be increased above the warning level to return to normal working state.

Interruption of data transmission

If one of the following conditions occurs, data buffering and data transfer are interrupted:

- The available disk space for the data buffer falls below the limit of 5 GB.
- The free space for the data buffer is less than 10 % of the reserved drive capacity. The value can drop to 3% for hard drives with less than 60GB total capacity.

From this time on, the process data is only available in the short-term archive.

The saving process in the data buffer is automatically resumed when the available disk space has been increased. You can increase the available space by using a larger hard disk or by removing files. The available disk space also increases once data is successfully transferred from the active data cache to the Process Historian, acknowledged by the Process Historian and deleted in the data cache.

3.1.2.5 Data transfer from PCS 7 OS / WinCC station to the Process Historian

Introduction

The long-term relevant process values and messages occurring on an OS server are transferred to the Process Historian database via PH-Ready. The chronological order of data transfer must be observed.

Note

The PH-Ready service user must be a member of the "SIMATIC HMI" user group. If you are using the PH-Ready configuration wizard, the user normally automatically becomes a member of the user group.

All servers and all S7 controllers that assign time stamps for process values and messages must be time-synchronized. The data archived with ODK by WinCC must be written synchronously.

Transmission sequence

1. PH-Ready first stores all process values and messages relevant over the long term in the Store & Forward cache on a local drive. The Store & Forward cache is created on the computer in the installation folder in the path "C:\Program Data\Siemens\SFCache". In the Store & Forward cache, the data is prepared in such a way that the data is optimally transferred to the Process Historian.
2. PH-Ready transfers the data from the Store & Forward cache to the Process Historian.
3. The Process Historian stores this data in the Process Historian database.
4. The Process Historian acknowledges the successful saving of the data to PH-Ready. While PH-Ready is waiting for acknowledgment of the data sent, it is already storing the next data from WinCC in the Store & Forward cache.
5. PH-Ready releases the occupied Store & Forward cache again.

The normal flow of the transmission ensures that the data is transferred to the Process Historian in a timely manner to where and then stored there in the current Runtime segment.

PH-Ready and Process Historian are separated

1. PH-Ready continues to store the data in its local Store & Forward cache.
2. The Store & Forward cache expands until the free disk space reaches a low limit.

The connection to the Process Historian is restored

1. PH-Ready transfers the data from the Store & Forward cache to the Process Historian.
2. When free space is available again on the drive, the data missing in the Store & Forward cache is read directly from the WinCC archive and transferred to the Store & Forward cache.

Reading large amounts of data from the WinCC archive reduces performance compared to direct acquisition in the Store & Forward cache.

The data transferred to the Process Historian is stored in the CAL segment if the data is older than the oldest Runtime segment of the Process Historian. The data of the CAL segment is transferred to the appropriate archive segments in an automatic process on the Process Historian. You

therefore need to restore it archive segments already set offline. You can see whether you need to restore a segment in the "New data" column of the "Backup/Restore" dashboard. You need to repeat the backup of an archive segment that has received additional data from the CAL segment.

To be prepared for the delayed transfer of the data, select the number of correspondingly large runtime segments and slow down the backup of the archive segments and setting them offline.

NOTICE

Behavior with reduced space

The available space is monitored with PH-Ready.

The Store & Forward cache can increase in the following situations:

- Loss of connection to the Process Historian server
- Reduced performance when processing the transferred data on the Process Historian server, because the transfer involves many additional access operations for reading data from the WinCC archive.

The occupied Store & Forward cache is released again when the cached data has been transferred to the Process Historian server.

Alarm to WinCC

An alarm is sent to WinCC when one of the following situations occurs:

- The free disk space for the Store & Forward cache falls below the limit of 10 GB.
- The free disk space for the Store & Forward cache is less than 30% of the reserved disk capacity. The value can drop to 6% for hard drives with less than 60GB total capacity. The disk space must be increased above the warning level to return to normal working state.

Interruption of data transmission

If one of the following conditions occurs, the storage process in the Store & Forward cache and the transfer of data is interrupted:

- The free disk space for the Store & Forward cache falls below the 5 GB limit.
- The free disk space for the Store & Forward cache is less than 10 % of the reserved disk capacity. The value can drop to 3% for hard drives with less than 60GB total capacity.

As of this time, the process data is only available in the WinCC archive.

The storage process in the Store & Forward cache is automatically resumed when the free disk space has been increased. You can increase the free space available by using a larger hard disk or by removing files. The free disk space also increases if data has been successfully transferred to the Process Historian from the existing Store & Forward cache, confirmed by the Process Historian, and deleted in the Store & Forward cache.

Adapt the circular buffer of the WinCC archives

Configure the circular buffer in the WinCC archive large enough to cover long connection failures between PH-Ready and WinCC. After all, it is only possible to read the data from the WinCC archive if the data in the archive are still available.

See also

Configuring the PH-Ready service (Page 34)

3.1.2.6 Basics of the redundant Process Historian

Definition

Process Historian has its own redundancy concept and uses Microsoft SQL Server Mirroring. The redundancy for Process Historian is supported for PCS 7 systems.

The redundancy is based on the following symmetrically configured partner servers:

- Principal (Page 159)
- Mirror (Page 159)

To verify the availability of the redundancy, Process Historian requires an additional Witness server that can be installed on an Information Server.

Implementation in the system

In the redundant Process Historian, only the principal writes the configuration data and runtime data to the Process Historian database. The mirror will also set up message queues to the Process Historian but is not sending runtime data. The redundant Process Historian constantly synchronizes the database of the principal with the mirror.

If the redundant mirror fails, all data will remain saved in the transaction log of the principal. Depending on the incoming data volume and the downtime of the mirror, the transaction log will grow and become rather large. As soon as the mirror is available again, the data is being synchronized via the transaction log. The transaction log is once again reduced to its former size.

If the mirror fails for a longer period, the lack of disk space may result in the principal being set to the "Locked" state. The Process Historian Server is locked in this case and is no longer set to "Active". Only when the disk space has been increased will the Process Historian Server be set to "Active" again. In the "Locked" operating state, the log data are buffered in the buffer of the stations. The buffer time depends on the available disk space and the accumulating data volume.

Principal and mirror in the Management Console

In the Management console of the principal, all information is available in the dashboards.

In the Management console of the mirror, only information on computer-specific data is available in the following dashboards:

- Process Historian Management
  - Basic hardware performance indicators
  - Basic Process Historian indicators: Sources
  - Process Historian status
  - Redundancy state
- I/O systems
- Diagnostics: Event log for Windows applications
- Redundancy: Disconnecting the redundant partner under certain prerequisites

The information that is saved in the Process Historian database is only displayed in the dashboards of the principal.

Redundancy scenarios

The following scenarios may occur in a redundant Process Historian system:

- Mirror is temporarily inactive (Page 161)
- Principal not available (Page 161)
- Witness not available (Page 162)
- Mirror is inactive and the transaction log has not enough disk space (Page 162)
- Mirror and principal are switched off and then switched on (Page 163)
- Redundancy scenario: Mirror is in the Error state (Page 164)

Application recommendations

Configuring a redundant Process Historian (Page 27)

We recommend a dedicated redundancy connection with a bandwidth of at least 1 gigabit between the redundant Process Historian servers. The Witness server is connected via the terminal bus.

You must not start the servers simultaneously during first commissioning. First, start the principal followed by the mirror a few minutes later. When both are started simultaneously, the Process Historian does not recognize the redundant system. After the first commissioning, the principal sends data to the Process Historian as soon as the "Store & Forward Cache" data buffer has been synchronized. If the principal is not sending any data after the first commissioning, you must verify that the "Store & Forward Cache" was synchronized.
Commissioning redundant servers (Page 105)

The redundancy can be switched for synchronized systems with the roles of principal and mirror being swapped.
Switching redundancy (Page 129)

If the principal is no longer available or is in an undefined state, you can disconnect the principal from the redundant system via the mirror. The current mirror is declared as the principal even when the systems are not synchronized at the time. A disconnect results in the loss of data that are not synchronized.
Disconnect Principal (Page 130)

If the mirror does not respond or is not available for a longer period, you can finish the redundancy synchronization on the principal. This prevents an overflow of the transaction log and thus locking of the principal. The transaction log is automatically reduced in size in this case.

Removing redundancy manually (Page 128)
Removing the redundancy automatically (Page 129)

Note

Avoiding the "Locked" operating state by providing enough disk space

To prevent the loss of data due to a lack of available disk space, make sure that you provide enough free disk space:

- Regularly check the currently available disk space in the "I/O systems" dashboard of the Process Historian Management console.
- Determine which automatic mechanisms for reducing the used disk space you can activate in the "Backup/Restore" dashboard.

3.1.3 Applications

3.1.3.1 Configuring the database

Requirement

- The Process Historian is installed.
- The RAID configuration and partitioning of the server hard disks is complete.
- The connections to USB drives are disconnected.
- If you want to change the default settings, you have made yourself familiar with the basics of data storage and segmentation.
  Basics of data storage (Page 84)
  Basics of segmentation (Page 85)

Note

Overwriting an existing Process Historian database

When you recreate an existing database with the same name, the existing database is overwritten.

Procedure

1. Start the Database Installation Wizard.
   Database installation wizard (Page 107)
2. Activate all hard disks that you want to use for data archiving.
   Do not use the following hard disks for the data of the Process Historian:
   - System drive
   - Drives with partitions for license keys or images
   - Drive with a partition used for the Information Server
3. Click "Start analysis".
   The Database Installation Wizard analyzes the system.
4. Click "Next".
5. Select the data sources you want to connect to the Process Historian system. This also determines the firewall settings.
   You can change the configuration at any time. You can reach the configuration dialog in the start menu via "Siemens Automation/Firewall and configuration settings".
6. Click "Next".
7. If the SQL Server instance "HISTORIAN" is not found by the system, a dialog opens. In the dialog, enter a new SQL Server instance or select an existing SQL Server instance. The wizard checks whether the Process Historian database can be installed in the selected SQL instance.
8. Click "Next".
9. For server mode, select the installation for a stand-alone system.
   If you want to install a redundant Process Historian on a PCS 7 system, select the installation on a redundant system.
10. Click "Next".
11. When you are installing a redundant system, enter a user and a password for the security setting.
    The Process Historian Redundancy Service is configured.

12. Click "Next".
    An overview page lists the default settings of the configured Process Historian database.

Topic	Action
SQL-Server instance PH1\HISTORIAN is used	
SQL-Server instance runs with 32433 MB memory on 12 cores	
This is a stand-alone machine installation	
Estimated data load is 1000 tags/s, 60 messages/m	Change...
Default segmentation is used (Size: week, 5 runtime, 1 prepared)	Change...
Uncompressed runtime segments can reach a estimate size of 197 GB	
All common data are located in the folder E:\Historian\DB	Change...
Runtime message data are located in the folder E:\Historian\DB	Change...
3 datagroups are used for storing tag runtime data	Change...
Tag Runtime Compressed DG0 is located in the folder H:\Historian\DB	Change...
Tag Runtime Compressed DG1 is located in the folder F:\Historian\DB	Change...
Tag Runtime Compressed DG2 is located in the folder D:\Historian\DB	Change...
Tag Runtime DG0 is located in the folder D:\Historian\DB	Change...
Tag Runtime DG1 is located in the folder H:\Historian\DB	Change...
Tag Runtime DG2 is located in the folder F:\Historian\DB	Change...
This system is not configurated as Simatic Batch repository	Change...
The transaction log files are located in the folder G:\Historian\TA	Change...
Data can be stored for 47 Week	

13. Change the default settings if necessary. Click "Change..." at the appropriate entry
14. If you want to change the estimated data load of process values and messages, you need to define the expected data load.
    Enter data load of process values and messages (Page 108)
15. If you want to change the default segmentation setting, you must configure the segments.
    Configuring segments (Page 109)
16. If you want to change the drives for the data files and log files, you must set the paths for the corresponding files. Specify the hard disks for archiving the data according to the RAID configuration.
    Assign a drive for a data file or log file (Page 108)
17. Check the overview. If all information is correct, click "Finish".
    The database is now created. The progress of the database installation is documented in a window.
    A message is displayed when the installation is completed successfully.
18. If you want to use the Process Historian server as the repository for SIMATIC BATCH, you need to configure the repository.
    Configuring the SIMATIC BATCH Repository (Page 110)
19. Shut down the wizard with "Close".
20. Restart the PC to install all services.

Result

You have successfully set up a Process Historian database.

See also

Installing Process Historian for PCS neo (Page 21)

3.1.3.2 Commissioning the Process Historian

Requirement

- The Process Historian is installed.
- The database has been configured.
  Configuring the database (Page 95)
  In a redundant system, the redundant Process Historian is installed and set up.
  Configuring a redundant Process Historian (Page 27)
- The server license for the Process Historian is available.
- The required Process Historian services are active.
  Services of the Process Historian (Page 148)
- PH-Ready (CCCAPHServer service) is installed on the OS servers.

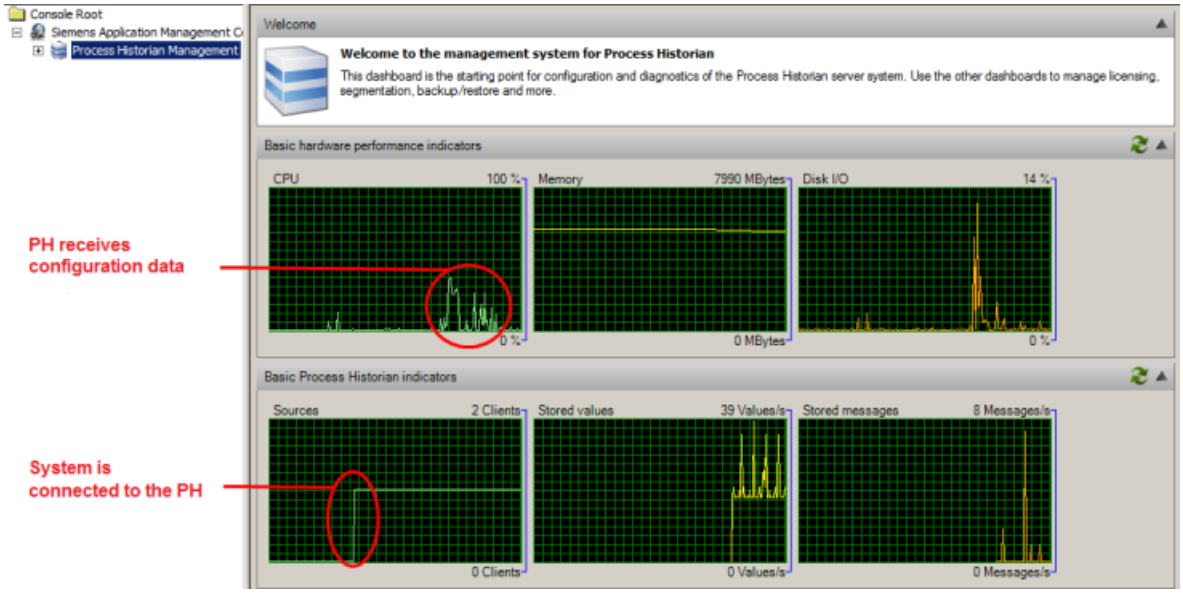
Procedure

1. Before initial commissioning, start the Process Historian server before the Monitoring & Control servers / OS servers.
2. Open the Management Console of Process Historian.
   Management Console (Page 130)
3. Go from the Management Console to the Process Historian Management dashboard.
   There is no connection to a data source and there are no tags and messages saved.
4. In the "Process Historian status" area, select the entry "Start" under "Action:".
   The Process Historian is activated.
5. Start the project on the Monitoring & Control server / OS server.
6. Start runtime on the Monitoring & Control server / OS server.

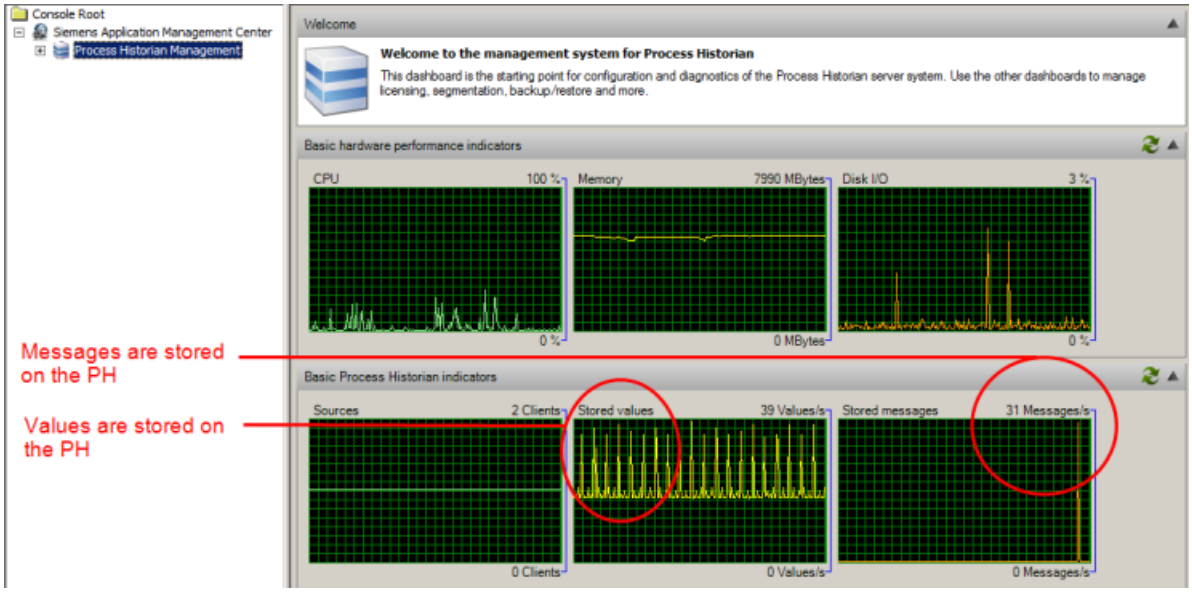
Result

Once the Monitoring & Control server / OS server has started, the server sends the configuration data to the Process Historian. In the figure, you can see that the Monitoring & Control server / OS server is the only data source to which the Process Historian is connected.

When using a redundant Process Historian, the principal and the mirror are the data sources. The archive configuration data are transmitted by both servers. Only the principal sends runtime data to the Process Historian database.



After Runtime starts, the archive tags and messages are stored on the Process Historian.



Note

Starting the Process Historian server before the Monitoring & Control server / OS server

If you start the Process Historian server after the Monitoring & Control server / OS server, the Monitoring & Control server / OS server might not establish the required message queue correctly.

See also

Installing Process Historian for PCS neo (Page 21)

Licenses of the Process Historian (Page 8)

3.1.3.3 Backup and restore segment

Requirement

- The segment is of the "Archive" type.
  Basics of segmentation (Page 85)
- The "Backup/Restore" dashboard is open in the Management Console.
  "Backup/Restore" dashboard (Page 139)

Procedure

1. Save the selected segment manually and, after successful backup, remove the data from the Process Historian.
   Backup a segment manually (Page 115)
   Set segment "Offline" (Page 118)
2. Or save the segments automatically using a configured scheduler.
   Backup segment automatically (Page 116)
3. If you need swapped-out segments back in the Process Historian, restore this data to the Process Historian.
   Restoring a segment (Page 119)

Result

The archive segment has been saved and stored in a backup file. Only the information for restoring the saved segment is stored in the Process Historian.

Restore the segment for the Process Historian to access the data of the segment again from the stations.

The storage area for the segment is released. Check the available storage space in the "I/O Systems" dashboard
"I/O Systems" dashboard (Page 136)

3.1.3.4 Backing up the database

Overview

Incremental backup

The Process Historian database data is stored in many data groups, which consist of individual files that contain the following:

- Backing up a single data group
- Backing up the current status of the transaction log after saving a data group

When all existing data groups are stored in files, the backup state "Completed" is displayed for this database with the time stamp. In this case, the database can be restored by using these files.

Manual backup and cyclic full backup

A backup file is created for the Process Historian database data with the time stamp of the backup creation. The database is then recoverable for the time when the database backup file was created.

During manual backup, the database is backed up once in full in a single backup file. The manual backup takes the same amount of time as an automatic full backup. Both backups are faster than the incremental backup. The database backup is finished when the "Completed" backup status is displayed. A recovery of the backed up file restores the data until the database backup is complete.

The manual backup can run in parallel with the automatic backup. In this case, the backup chain is not interrupted, especially in the case of incremental backup.

Database backup in a redundant system

The "Database backup" function is used to back up a complete database. In case of a redundant Process Historian, the mirror is responsible for this task.

Manual backup and cyclic full backup are possible in a redundant system when no failover occurs during the backup.

Filing the files during the automatic backup

For automatic backup, you can specify one or two paths:

- Only one path is set, or two paths are set but for some reason one path is not accessible or full:
  - Incremental backup: When 100% is reached, the 100% is continuously advanced. In the event of a system failure, an incremental backup is available, which is usually only a few hours old. If an error occurs during the backup, the old state can no longer be continued since this backup requires a continuous backup chain. The backup starts again from the beginning. An incremental backup is not available in the event of a system failure until 100% is available again.
  - Cyclic full backup: Up to two backup files are created in this path. When the third backup file is successfully created, the oldest backup file is deleted.
- Two paths are configured and accessible:
  - Incremental backup: When 100% is reached and an error occurs, the next backup is started in the alternative path. As a result, in the previous path the backup with the reached level of 100% remains. An existing backup is deleted in the new path.
  - Cyclic full backup: After a successful backup, the next backup file is created in the respective other path. When a third backup file is created, the oldest file is deleted. Each path can then contain up to two backup files.

Requirement

The "Database Backup" dashboard in the Management Console is open.

Procedure for automatic backup

1. Select the backup type.
   Backup type (Page 178)
2. If you have selected "Cyclic full backup" as the backup type, specify the cycle in days.
3. Enter the desired drive and a folder in which the database is to be backed up in the "Destination path" field.
   If you select a folder on another computer for the backup path, you must grant access rights to the user for the "Process Historian Maintenance Service" using the "Create/Read/Write" permission.
   Configuring access rights for backups (Page 117)
   Storage medium of the database backup (Page 153)
4. If required, enter an alternative path.
5. Click "Apply settings".
   The steps that are performed after confirmation are specified in an overview window.
6. Check your entries.
7. Confirm with "OK" if all the entries are correct.

Result with automatic backup

Result with incremental backup

The backup files are saved for the first time in the specified destination path in the subdirectory with the name of the database. The following backup is saved in the same destination path and the previous backup is deleted. To prevent the loss of previous backups, enter a new destination path when you start the incremental backup.

The destination path is, for example, "D:\RecoveryBackups". The Process Historian database has the name "HistorianStorage". The backups are always saved in the destination path "D:\RecoveryBackups\HistorianStorage".

Note

When you copy the backup files over, you must also copy the parent folder that contains the database name.

Result with cyclic full backup

The backup file is saved directly in the specified destination path. The time stamp with date and time is part of the name of the backup file.

Procedure for manual backup

1. Click on the "Manual Backup" button.
   The "Manual Backup" dialog opens.
2. In the "Destination path" field, enter the desired drive and a folder.
3. Click "Apply settings". The steps that are performed after confirmation are specified in an overview window.
4. Check your entries.
5. Confirm with "OK" if all the entries are correct. The database backup is performed.

Result with manual backup

The backup file is saved in the specified destination path. The time stamp with date and time is part of the name of the backup file.

Example:

The Process Historian database has the name "HistorianStorage". The backup was started on 15/09/2021 at 12:15 hrs. The created backup file has the name: "HistorianStorage_2021_09_15_12_15.PhDbBak".

Because the date and time are used in the file name, any backups can be saved in the same destination path. The existing backups are not changed or deleted.

Incomplete backups

An incremental backup is incomplete if 100% has not yet been reached. If an incremental backup, even with 100%, is briefly suspended or an automatic full backup is started, the incremental backup cannot be continued.

Incomplete backups are unsuitable for restoring the database.

If there are write errors on the database backup drive, it is not possible to perform the restore.

Recovering a database

After an incremental backup

With a recovery, you restore the state of the database in the Process Historian to which the last data group in a file was saved. Before the restore starts, the backup file is checked for completeness and whether 100% has been reached. Restore is started only when the backup is complete, i.e. the backup status shows "Completed".

Note

For a recovery, the name of the destination path is important. The name must correspond to the name of the database. If the path has been renamed, no recovery is possible and an error message is output.

After a manual backup and cyclic full backup

The database is then recovered for the time when the database backup file was created.

Recovering a database (Page 147)

3.1.3.5 Backing up and restoring BATCH data

Requirement

- The batch data from the SIMATIC BATCH server is archived in the Process Historian.
- The process values and messages from the batches provided by the Monitoring & Control stations are stored separately in segments in the Process Historian.
- The tree view of the plant structure corresponds to the respective BATCH project.
- The "SIMATIC BATCH Backup/Restore" dashboard is open in the Management Console.

Procedure

1. Select the archived batch data that you want to save.
   Select batch data (Page 120)
2. Specify which batch data you want to display in the table, for example, batches with a specific start time.
   Add batch data to the selection (Page 121)

3. Manually save the batch data displayed in the table and delete the data from the Process Historian.
   Save batch data manually (Page 122)
   Manually deleting saved batch data (Page 126)
4. Or save the batch data displayed in the table automatically using a configured scheduler.
   Automatically save batch data (Page 123)
5. Display the history of the automatic backups.
   Displaying scheduling (Page 128)
6. If you need swapped out batch data again in the Process Historian, restore this data for the Process Historian.
   Restoring saved batch data (Page 126)
7. Use the "Task history" button to display the history of backups, deletions and restorations of the batch data.

Result

The batch data was stored in backup files.

To access the batch data of the segment from the Monitoring & Control stations / OS clients / WinCC stations or Information Server again, restore the segment for the Process Historian.

See also

"Plant structure" dashboard (Page 133)

"SIMATIC Batch Backup/Restore" dashboard (Page 143)

"Backup/Restore" dashboard (Page 139)

3.1.3.6 Commissioning redundant servers

Requirement

- You have become familiar with the concept of the redundant Process Historian system.
- The redundant Process Historian system is installed.
- The Process Historian Witness is installed.

Procedure

1. Start the principal and enable the project.
2. Ensure that the principal is enabled.
3. Start the mirror and enable the project.
4. Check the redundancy state in the "Redundancy" dashboard or in the "Process Historian Management" dashboard.
   "Redundancy" dashboard (Page 140)
   "Process Historian Management" dashboard (Page 132)

5. If necessary, determine the synchronization status by opening the file "PHSFSettings.cfg" under "C:\ProgramData\Siemens\SFCache" on the principal.
6. When "SyncState = Error", the principal is not sending any data to the Process Historian after first commissioning.

Result

The redundant Process Historian system is in operation.

See also

Installing the Process Historian Witness (Page 26)

Installing redundant Process Historian (Page 25)

Basics of the redundant Process Historian (Page 93)

3.1.3.7 Migrating a database

Requirement

- Your are using a WinCC / PCS 7 system.
- The system requirements for the Process Historian system are met.
- The Process Historian is installed on the target computer.
- The Process Historian database has been created and configured on the target computer.
- There is sufficient free storage space on the drives for the migrated data.
- The Process Historian is running.

Procedure

1. On the target computer, select the Database Migration Wizard.
   Database Migration Wizard (Page 170)
2. Follow these steps:
   – If you want to migrate online segments:
     Migrating WinCC project online segments (Page 171)
   – If you want to migrate backup segments:
     Migrating WinCC project backup segments (Page 172)

Note

Migration duration

The migration can take some time depending on the volume of data.

Result

The data was migrated from a Process Historian database to the target computer.

3.1.4 Functions

3.1.4.1 Database installation wizard

Database installation wizard

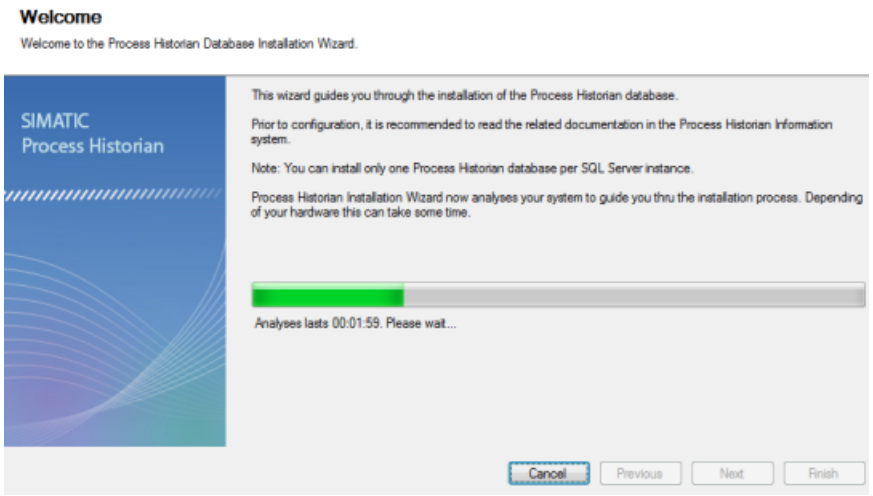
Definition

The database installation wizard guides you through the configuration of the Process Historian database:

- If no database has been set up on the PC yet, "DatabaseInstallationWizard.exe" starts automatically after the installation of the Process Historian.
- If a database is already set up on the PC, start the "DatabaseInstallationWizard.exe" via the Process Historian installation path under "\Siemens\ProcessHistorian\bin".

Structure

The Database Installation Wizard consists of several dialogs in which you configure various properties of the database.



When the configuration is finished, an overview page with the default settings is displayed. You can adapt the settings to your requirements here.
Configuring the database (Page 95)

Step-by-step instructions

Enter data load of process values and messages

Requirement

- The Database Installation Wizard is started.
- The configuration of the database is so far advanced with the default settings that the database installation wizard displays the overview page.
  Configuring the database (Page 95)

Procedure

1. On the overview page, click "Change" for the entry "The estimated data load is x tags/s, x messages/min".
   The dialog for configuring the data load is displayed.
2. Use the slider to set the data load for process values and messages based on your estimate.

Result

You have defined the expected data load of the process values and messages.

The specified number of process values and messages is used by the system to calculate the reserved space and thus the size of the segments. After some of the segments have been written, the system calculates the segment size from the number of values saved in the previous segments.

Assign a drive for a data file or log file

Requirement

- The Database Installation Wizard is started.
- The configuration of the database is so far advanced with the default settings that the database installation wizard displays the overview page.
  Configuring the database (Page 95)
- Only local destination paths for the data files or log files are allowed.

Procedure

1. On the overview page, click "Change" for one of the entries relating to the data files or log files, e.g. "The Runtime data of the messages is stored in the folder x.".
   The dialog for setting the drives is displayed.
2. Specify one or more drives for the corresponding data files or log file.

Note

Distribute data files on different hard disks

Selecting different drives for the database files improves the performance of the storage system. Different partitions on one hard disk do not provide any improvement in performance.

For Process Historian systems for medium and large scale configurations, you need to distribute the tag and alarm load to different hard disks. The hard disk access time is too high for all the data to be written to one hard disk. From about 3000 tags/s, you should distribute the data across different hard disks.

Do not use certain drives for Process Historian

Do not use the following drives for Process Historian data:

- System drive
- Drives with partitions for license keys or images
- Drive with a partition used for the Information Server

Result

You have specified the drive for the data file or log file.

Configuring segments

Requirement

- Segments are already set up or preset on the Process Historian database.
- You are familiar with the basics of segmentation
  Basics of segmentation (Page 85)
- You have administrator rights on the Process Historian.
- You are in the Database Installation Wizard to change the default settings.
- Or you have opened the "Segmentation" dashboard in the Management Console to change the configuration for future segmentation.

Procedure

1. Configure the segments in the "Settings" area.
   Once created, segments cannot be changed later.
2. Select the time period for the segments:
   - Unit (Page 177)
   - Factor (Page 177)

3. Select the start time of the segment for the anchor point:
   - Hour
   - Date
4. Select the number of segments:
   - Number Future segment (Page 157)
   - Total number of Runtime segments (Page 177)

Note

In order to change the segmentation, the Process Historian database is automatically switched to the "Disabled" operating state. After the settings have been applied, the database changes back to the "Active" operating state automatically.

Result

The segmentation of the Process Historian database is configured.

Configuring the SIMATIC BATCH Repository

Requirement

- The Database Installation Wizard is started.
- The default settings for the database setup is so advanced with the that the overview page is displayed in the Database Installation Wizard.

Procedure

1. Click on "Change" in the overview page for the entry "The system is not configured as SIMATIC BATCH repository".
   The dialog for configuring the repository is displayed.
2. Select the check box and specify the path for the data files.

Result

The Process Historian server is used as repository for the BATCH server.

See also

Configuring the database (Page 95)

3.1.4.2 Management Console

Step-by-step instructions

Opening the Process Historian Management Console

Procedure

1. Navigate to "Start > Siemens Automation > Process Historian Management Console".
2. Right-click on the "Process Historian Management Console" button.
3. Click "Start as administrator" in the shortcut menu. Authenticate yourself as administrator.

Result

The Process Historian Management Console opens.

Changing the operating state of the Process Historian

Requirement

The Process Historian Management dashboard in the Management Console opens.

Procedure

1. Go to the Process Historian status area.
2. Select one of the following options under "Action:":
   - Start
   - Shut down
   - Start recovery
3. Click "Apply".

Alternative procedure

1. On the computer, select one of the following commands from the Process Historian shortcut menu in the status bar:
   - Start
   - Shut down
   - Start recovery

Result

The operating state has been changed:

- After starting, the "Active" status is displayed.
- After shutting down, the "Inactive" status is displayed.
- After "Start recovery", the "ActiveRecovery" status is displayed.

Note

Shutting down the Process Historian server before switching it off

Before you switch off the computer running the Process Historian server, you need to shut down the Process Historian server.

Update status

Requirement

The Process Historian Management dashboard in the Management Console opens.

Procedure

1. Go to the "Licensing status", "Redundancy state" or "Database backup status" section.
2. Click on the update button.

Result

The status of licensing, redundancy and database backup has been updated.

Edit organizational structure

Requirement

- The "Plant Structure" dashboard is open in the Management Console.
- The organizational structure of the Process Historian database is displayed in the "Projects" area.
- An extended structure has been added to the structure tree.
  Expand organizational structure (Page 113)

Procedure

1. In the "Projects" area, select an element of the extended structure.
2. Click on the "Rename" menu.
3. Change the entry in the structure tree.

4. If needed, change the type and description of the element in the "Detailed information" area.
5. Click "Apply".
6. To remove an entry from the structure tree, click on the "Delete" menu.

Result

The extended structure of the Process Historian database organization structure has been edited.

Expand organizational structure

Requirement

- The "Plant Structure" dashboard is open in the Management Console.
- The organizational structure of the Process Historian database is displayed in the "Projects" area.

Procedure

1. In the "Projects" area, select the root node in the structure tree.
2. In the "Add" shortcut menu, select a structural element that you want to use to extend the organizational structure.
3. If necessary, add a description of the item in the "Detailed information" section.
4. If required, add further structure elements to the structure tree.
5. Click "Apply".

Result

An extended structure was added to the organizational structure of the Process Historian database.

Merging projects in the organizational structure

Requirement

- The "Plant Structure" dashboard is open in the Management Console.
- The organizational structure of the Process Historian database is displayed in the "Projects" area.

Procedure

1. In the "Projects" area of the tree structure, select a data source.
2. Click on the "Merge" menu.

3. After merging, check the structure tree for duplicate entries.
4. Delete the duplicate entries from the structure tree.

Result

Double entries in the structure tree are combined to form a single entry in the organizational structure.

Delete project data of a selected project

Requirement

- The "Data Sources" dashboard is open in the Management Console.
- The computer of the project to be deleted has been removed from the system. Process Historian checks that the host has not sent any data to Process Historian in the last 15 minutes.
- The project to be deleted is not locked. "No" is entered in the "Locked" column in the overview of data sources.

Procedure

1. Select a project from the overview of data sources.
2. Click on the "Delete" button.
   A message appears to confirm the deletion.

Result

The configuration data of the project are no longer readable.

The computer is removed from the plant structure and no longer displayed in the "Plant structure" dashboard.

Locking the deletion of the project data

Requirement

The "Data Sources" dashboard is open in the Management Console.

Procedure

1. Select a project from the overview of data sources.
2. Click "Lock".
   A message appears to confirm the lock.
3. Click on the "Unlock" button, to unlock a locked project if needed.

Result

The deletion of the configuration data of a project is prevented.

Backup a segment manually

Requirement

- The segment is of the "Archive" type.
- The archive segment must be compressed in full. The "Yes" entry appears in the "Compressed" column on the "Backup/Restore" dashboard.
- The "Backup/Restore" dashboard is open in the Management Console.

Procedure

1. In the "Archive segments" area, select the segment that you want to back up.
   Or select several segments at the same time using the Windows function.
2. Click on the "Backup" button.
   The "Segment Backup" dialog opens.
3. Select the path for the backup file.
   If you select a directory on another computer for the backup path, you must grant access rights to the user for the "Process Historian Maintenance Service" using the "Create/Read/Write" permission.
   Configuring access rights for backups (Page 117)
4. If necessary, select the option "Verify backup file (if the backup time increases by approx. 50 %)".
   The option verifies the backup, but does not restore the backup. The option provides the greatest possible assurance that the segment can be restored. The option performs checks such as:
   - Checksum
   - Some header fields on the data pages
   - The status of the backup
5. Select the option "Set segment offline after backup" to automatically set the segment offline after the backup.
6. Click the "Backup" button.

Result

The archive segment is saved in the backup file.

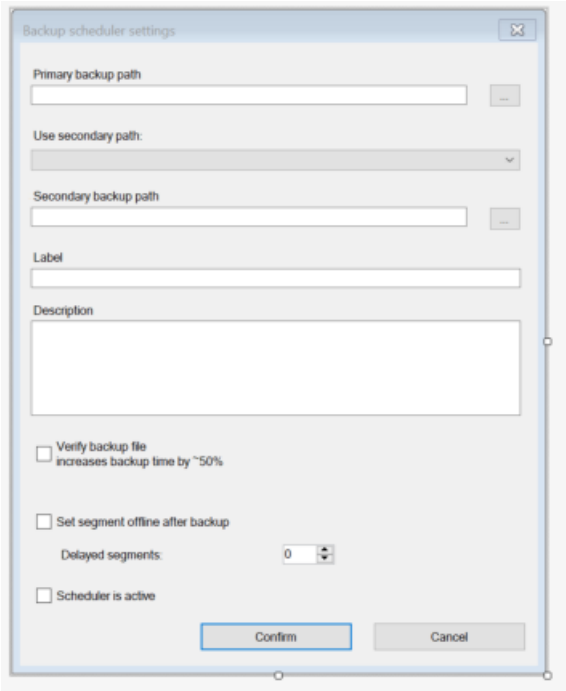
Backup segment automatically

Requirement

- The segment is of the "Archive" type.
- The archive segment must be compressed in full. The "Yes" entry appears in the "Compressed" column on the "Backup/Restore" dashboard.
- The "Backup/Restore" dashboard is open in the Management Console.

Procedure

1. Click on the "Settings" button in the "Archive segments" area.
   The "Automatic Backup Settings" dialog opens.



2. Select a primary backup path for the backup file.
   If you select a directory on another computer for the backup path, you must grant access rights to the user for the "Process Historian Maintenance Service" using the "Create/Read/Write" permission.
   Configuring access rights for backups (Page 117)
   Take note of the definition of the backup path in the redundant Process Historian.
   Backup path for redundant Process Historian (Page 160)

3. You can specify a secondary backup path for the backup file. Select how you want to use the secondary backup path:
   - Do not use
   - Use only in case the primary backup path fails
   - After the backup on the primary backup path, make a copy of it on the secondary backup path.
   - In addition to backing up on the primary backup path, you can also back up the backup files on the secondary backup path.
4. If necessary, specify additional identifiers and descriptions for the backup, such as the name or number of the volume.
5. If necessary, select the option "Verify backup file (if the backup time increases by approx. 50 %)".
   The option verifies the backup, but does not restore the backup. The option provides the greatest possible assurance that the segment can be restored. The option performs checks such as:
   - Checksum
   - Some header fields on the data pages
   - The status of the backup
6. If you want to swap out the segment automatically after the backup, select the option "Set segment offline after backup".
7. Set the number of segments that will still be available "Online" after the backup.
   Number of delayed segments (Page 176)
8. To use the automatic backup, select the option "Scheduler is activated".
9. Click "Confirm".

Result

If the scheduler is activated, the archive segments are automatically saved in the backup file.

If the segment is set "Offline", the segment is removed from the Process Historian database. The storage space area for the segment is released.

Configuring access rights for backups

In a Windows workgroup environment

1. You must configure the share to allow access to a dedicated Windows user account.
2. You must create the user account on the computer where the file share is hosted.
3. You must create the same user account with the same name and password on the computer where the Process Historian Server is installed.
   You must configure the MS SQL Server instance to run in the context of this user account.

4. In addition, you must manually duplicate the account of the users who configure file sharing in PH Management Console to the file sharing host computer in the same way with the same name and password.
   Access to the file share must also be enabled for that user(s).
5. Follow the best practices for backing up the MS SQL database module to ensure security. Apply the Principle of Least Required Privilege (PoLP) as described in the Microsoft documentation.

In a Windows domain environment

1. You must grant access to the file share for the computer account on which Process Historian Server is installed.
   By default, the MS SQL Server database module runs in the security context of the local system account and has access to a file share configured to allow access to the computer account.
2. In addition, you must allow access to the file share for the users used to configure the UNC file share in the PH Management Console.
   Note: All applications and services running under the security context of the local system or network service on this computer will have access to this share, which you enable by giving access to a computer account.
3. You can further restrict access rights to the file share by creating a dedicated Domain Managed Service account and configuring MS SQL Server on the Process Historian Server to run in this context.
4. You can find more security information about configuring service accounts used to run the MS SQL Server module in the Microsoft documentation related to configuring and using domain managed service accounts.

Set segment "Offline"

Requirement

- A backup has already been created for the segment.
- The "Backup/Restore" dashboard is open in the Management Console.
- The segment is marked as "valid" in the "Backup/Restore" dashboard. If a segment is marked as invalid, create a backup of the segment again.

Procedure

1. In the "Archive segments" area, select the segment that you want to set "offline".
   Or use the Windows functionality to select multiple segments at one time.
2. Click the "Set offline" button.

Result

The segments are removed from the Process Historian database. The storage area for the segments is released.

The segment entries in the "Backup/Restore" dashboard are moved to the "Restore segments" list.

Note

Checking the disk space

Repeat these steps regularly to ensure sufficient free space for the Process Historian during operation.

See also

"I/O Systems" dashboard (Page 136)

Restoring a segment

Requirement

- The Process Historian is in "Active" mode.
- The segment is set to "Offline".
- The backup files for the segments to be restored are available.
- The "Backup/Restore" dashboard is open in the Management Console.

Restoring a single segment

1. Select the segment you want to restore in the "Restore segments" area.
2. Click on the "Restore" button.
   The dialog for selecting a backup file opens.
3. Select the appropriate backup file for the segment you want to restore.
4. Clear the "Only restore the most recent backup" check box if multiple backup files for the same segment were found in the backup path and you do not want to restore the most recent backup file.
5. Click the "Restore" button.

Restoring multiple segments

1. In the "Restore segments" area, select the segments.
2. Click on the "Restore" button.
   The dialog for selecting a path opens.
3. Select the path.
   Process Historian automatically selects the latest backup files and restores the segments.
4. If only an older backup file is available, clear the "Only restore the most recent backup" check box.
   Note that the older backup file may contain less data than the latest backup file.
5. Click the "Restore" button.

Result

The restored segments are displayed in the "Backup/Restore" dashboard in the archive segments area.

You can access the data of the restored segments from the Monitoring & Control stations / OS clients / WinCC stations or from the Information Server.

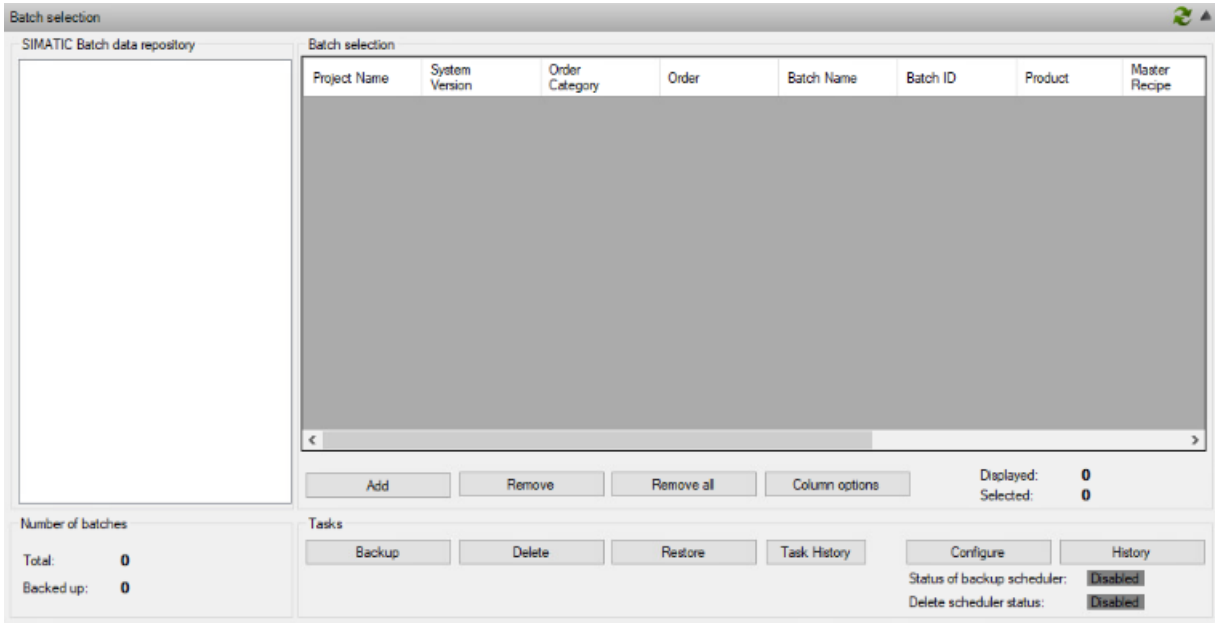
Select batch data

Requirement

- The batch data from the SIMATIC BATCH server is archived in the Process Historian.
- The tree view of the organizational structure corresponds to the respective BATCH project.
- The "SIMATIC BATCH Backup/Restore" dashboard is open in the Management Console.

Procedure

1. In the "SIMATIC BATCH data" navigation window, select the data that you want to save or delete from all archived batch data.
   The "Batch selection" table shows the selected batch data.



2. Specify which batch data you want to display in the table, for example, batches with a specific start time.
   Add batch data to the selection (Page 121)
3. If you want to remove individual rows selected in the table, click the "Remove" button.
4. Or click the "Remove all" button to remove all entries from the table.
   You can now again select batch data that you want to display, save or delete.

Result

The batch data for saving or deleting is selected.

See also

Save batch data manually (Page 122)

Automatically save batch data (Page 123)

Manually deleting saved batch data (Page 126)

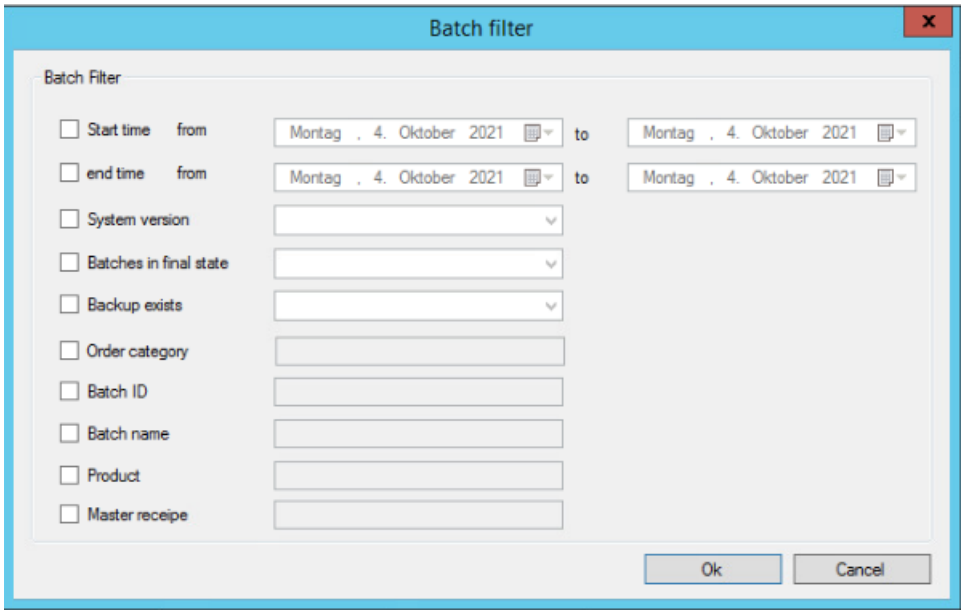
Add batch data to the selection

Requirement

- The "SIMATIC BATCH Backup/Restore" dashboard is open in the Management Console.
- The archived batch data is selected in the "SIMATIC BATCH data" navigation window of the dashboard.

Procedure

1. Click on the "Add" button below the "Batch selection" table.
   The "BATCH filter" dialog opens.



2. Activate the criteria by which you want to filter the batch data.
3. Enter one criterion each or select a criterion from the drop-down list.
   You can use the wildcards "*" and "?" in text fields. You do not need to specify the wildcards at the beginning and end of an entered text. An "*" is automatically added at these positions. Wildcards cannot be used in number fields and check boxes.
4. Click "OK".

Result

The batch data with the selected criteria is displayed in the "Batch selection" table.

Save batch data manually

Requirement

- The batch data from the SIMATIC BATCH server is archived in the Process Historian.
- The batch data for backup are selected.
- The "SIMATIC BATCH Backup/Restore" dashboard is open in the Management Console.

Procedure

1. In the table, select the rows of the batches with the data you want to save. Use "Ctrl A" to select all batch data in the table.
2. Click the "Save" button in the "Tasks" area.
3. Enter the path for the backup files in the dialog box. You can select a local directory as the backup location.

   Note

   Backing up to network paths is not supported.

4. Click "OK".
   No other task can be performed in the dashboard during the backup.

Result

Each batch is backed up in its own compressed backup file in the specified path. The file name of the backed up batches contains the following elements:

- Name of the BATCH process cell
- Batch name
- Start time

The display of saved batches in the dashboard is updated.

Number of batches (Page 180)

In the "Batch selection" table, the "Backup created" column shows the state in which the batches were backed up.

See also

Select batch data (Page 120)

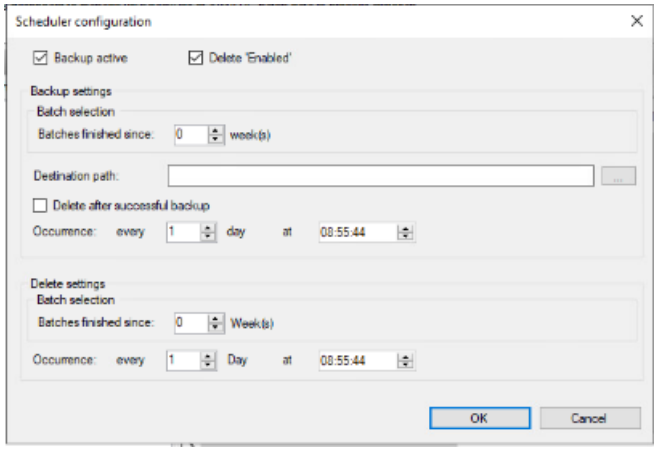
Automatically save batch data

Requirement

- The batch data from the SIMATIC BATCH server is archived in the Process Historian in its final state.
- The batch data for backup are selected.
- The "SIMATIC BATCH Backup/Restore" dashboard is open in the Management Console.

Procedure

1. Click the "Configure" button in the "Tasks" area.
   The "Scheduler configuration" dialog opens. The configuration refers to all batch data that have reached the final state.



2. Select the "Backup active" check box so that the scheduler automatically saves the batches. If you no longer want to use the scheduler for automatic backup, clear the "Backup active" check box.
3. In the "Backup settings/Batch selection" area, select the time interval after which the batches archived in the final state are automatically saved. For example,
   - "1 week": the batches that have reached the final state of archiving one week before the start of the automatic backup are saved automatically.
   - "0 week": Batches that have already reached the final state of archiving are automatically saved immediately after the setting is confirmed with "OK". Batches that only reach the final state after this are backed up once on the day that is set as the backup time.

   We recommend that you save the archived batches together with the segments containing the archive tags and batch messages.
4. Enter the destination path for the backup file.
   All backup files of the batches are stored in the folder.

   Note

   Backing up to network paths is not supported.

5. If you have selected the "Delete after successful backup" check box, the batch data is automatically removed from the Process Historian after successful backup.
6. When you select "Run", select the daily cycle and time at which the scheduler checks whether the criterion for an automatic backup is met.
   The archived data that meets the criterion is then saved.
7. Click "OK".

Result

The configuration of the scheduler is saved.

The scheduler checks if there are batches to be backed in the configurable period. After automatic backup, each batch is saved in a separate, compressed backup file in the specified path.

You can see whether the scheduler is activated and whether the batch data is saved automatically in the "Tasks" area of the dashboard.

Scheduler status "Backup" (Page 180)

You can change the configuration of the scheduler at any time without affecting the running backup process. The updated scheduler is not used until the next time the backup is executed.

See also

Select batch data (Page 120)

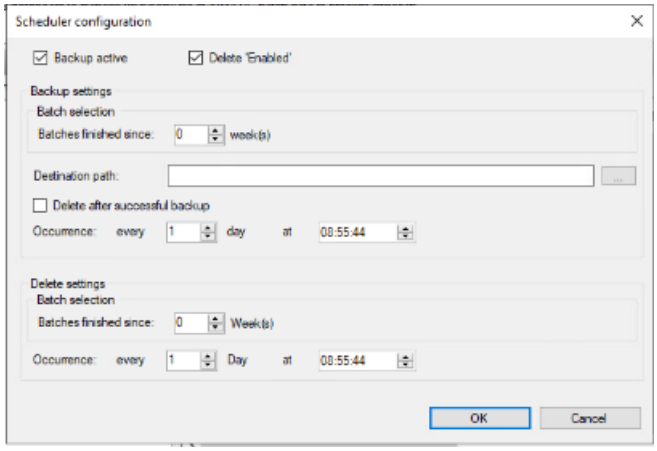
Automatically remove batch data

Requirement

- The batch data from the SIMATIC BATCH server is archived in the Process Historian in its final state.
- The batch data for removal are selected.
- The "SIMATIC BATCH Backup/Restore" dashboard is open in the Management Console.

Procedure

1. Click the "Configure" button in the "Tasks" area.
   The "Scheduler configuration" dialog opens.



2. Select the "Delete "Enabled"" check box so that the Scheduler automatically removes archived batch data.
   If you no longer want to use the Scheduler for automatic removal, clear the "Delete "Enabled"" check box.
3. In the "Delete settings/Batch selection" area, select the time interval after which the batches archived automatically are removed from the Process Historian. For example, "1 week": the batches saved a week prior are automatically removed.
4. When you select "Run", select the daily cycle and time at which the scheduler checks whether the criterion for automatic removal is met.
   The archived data that meets the criterion are then removed.
5. Click "OK".

Result

The configuration of the scheduler for automatic removal is saved.

The scheduler checks if there are batches to be removed in the configurable period. After automatic removal, the batch data are removed from the Process Historian.

You can see whether the scheduler is activated and whether the batch data are removed automatically in the "Tasks" area of the dashboard.

Scheduler status "Delete" (Page 180)

You can change the configuration of the scheduler at any time without affecting the running backup process. The updated scheduler is not used until the next time the removal is executed.

Manually deleting saved batch data

Requirement

- The batch data was saved successfully.
- The batch data for deletion has been selected.
- The "SIMATIC BATCH Backup/Restore" dashboard is open in the Management Console.

Procedure

1. Click the "Delete" button in the "Tasks" area.
   No other task can be performed in the dashboard during deletion.

Result

The batch data selected in the table is removed from the Process Historian.

The batches are removed from the "Batch selection" table.

The display of the total number of batches is updated.

Number of batches (Page 180)

See also

Select batch data (Page 120)

Restoring saved batch data

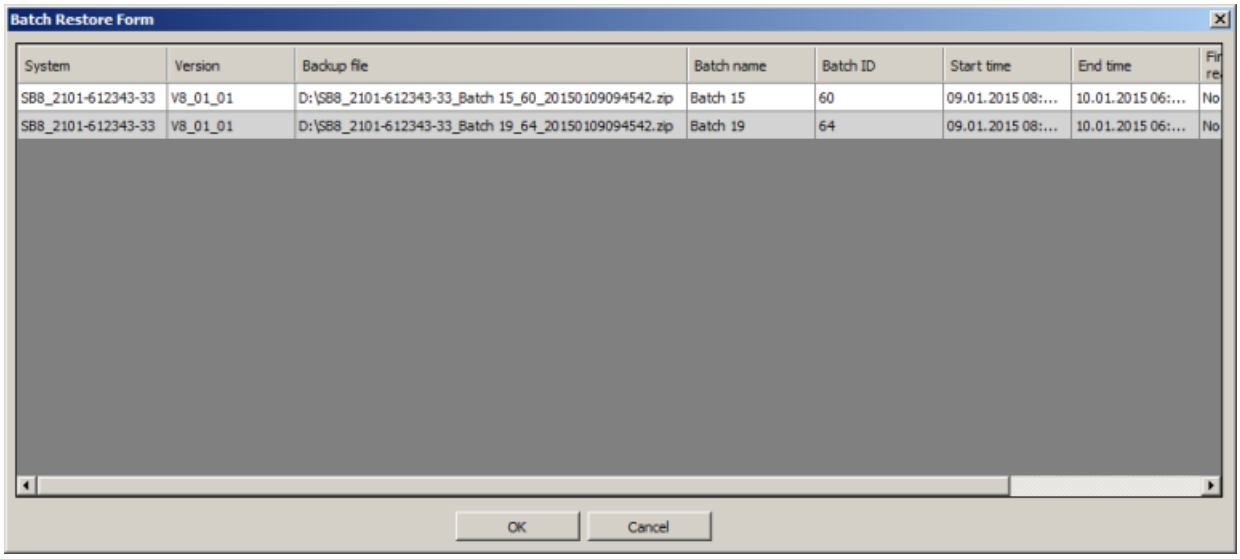
Requirement

- The backup files with the batch data to be restored are available.
- The saved batch data no longer exists in the Process Historian.
- The "SIMATIC BATCH Backup/Restore" dashboard is open in the Management Console.

Procedure

1. Click the "Restore" button in the "Tasks" area.
2. In the dialog box, select one or more backup files of the batch data that you want to restore.

3. Click the "Open" button.
   A window displays the properties of the batch data and the path of the backup file for control purposes.



4. Select the batches that you want to restore.
5. Click "OK".

Result

The batch data from the backup file is transferred back to the Process Historian.

The restored data is displayed in the "Batch selection" table. The "Backup created" column shows the time at which the backed-up batches were restored.

The archive tags and messages provided from the batches, which were archived separately in segments in the Process Historian, must also be restored for the time period.

Restoring a segment (Page 119)

You can now access the restored batch data from the Monitoring & Control stations/OS clients/ WinCC stations or from the Information Server.

Configuring column options

Requirement

- The "SIMATIC BATCH Backup/Restore" dashboard is open in the Management Console.
- The archived batch data is selected in the "SIMATIC Batch data" navigation window of the dashboard.

Procedure

1. Click on the "Column options" button below the "Batch selection" table.
   The "Column options" dialog opens.
2. Select which columns you want to display in the "Batch selection" table.
3. Specify the order and width of each column.
4. Click "OK".

Result

The "Batch selection" table shows the selected columns in the defined order.

Displaying scheduling

Requirement

- The "SIMATIC BATCH Backup/Restore" dashboard is open in the Management Console.
- The batch data is saved automatically.

Procedure

1. Click on the "Tasks" button in the "Scheduling" area.
   The "Scheduling" dialog opens.
2. Specify for how many completed, automatic backups you want to display in the history.
3. Click the "Update" button.

Result

The history is displayed for the specified number of automatic backups.

See also

Automatically save batch data (Page 123)

Removing redundancy manually

Requirement

- When the mirror is not responding or is not or will not be available for some time.
- Only possible on the principal.
- You have administrator rights.
- The "Redundancy" dashboard in the Management Console is open.

Procedure

1. Click "Remove".
2. Also change the settings on the clients so that the clients are no longer sending data to the former mirror.

Result

The redundancy synchronization is ended. The server no longer synchronizes the database of the principal with the mirror.

The transaction log will no longer grow.

Removing the redundancy automatically

Requirement

- When the mirror is not available and the remaining disk space for the transaction log is less than 10 GB.
- Only possible on the principal.
- You have administrator rights.
- The "Redundancy" dashboard in the Management Console is open.

Procedure

1. Enable the option "Enable automatic removal of redundancy".

Result

When the mirror is no longer available and the remaining disk space for the transaction log is less than 10 GB, the redundancy synchronization is ended. The server no longer synchronizes the database of the principal with the mirror.

The transaction log will no longer grow.

Switching redundancy

Requirement

- The data in the Process Historian system are synchronized.
- The "Redundancy" dashboard in the Management Console is open.

Procedure

1. Click "Switch".

Result

Principal and mirror swap roles.

Note

Procedure of the redundancy switching

In case of redundancy switching, the database needs a few seconds to access the new principal. Moreover, the Process Historian Service must reactivate. Depending on the project size, this may take several minutes. The data collected during this time is buffered on the PCs and will be transferred immediately to the Process Historian once reactivation is complete. The Process Historian Service remains "Active" during this time.

If you are not prompted to restart the systems, you must not restart the systems manually as this may result in a loss of data.

Disconnect Principal

Requirement

- When the principal is in an undefined state or automatic switchover fails.
- Only possible on the mirror.
- You have administrator rights.
- The "Redundancy" dashboard in the Management Console is open.

Procedure

1. Click "Disconnect".

Result

By disconnecting, the current mirror is declared as the principal even when the systems are not synchronized at the time.

A disconnect results in the loss of data that are not synchronized.

Management Console

Definition

The Process Historian Management Console includes several dashboards that are available for Process Historian configuration, information and diagnostics.

The Management Console is installed with the Process Historian and is started automatically at login. Manually open the Management Console with "Start > Siemens Automation > Process Historian Management Console".

Note

Disabling Internet Explorer certificate validation

Under "Internet Options > Advanced > Security" in Internet Explorer, clear the option "Check for publisher's certificate revocation". Selecting this option may delay the opening of the Process Historian Management Console and error messages may appear.

Structure

The following dashboards are available for the Process Historian:

Dashboard	Functions
Process Historian Management (Page 132)	• Display of basic information about hardware and performance of PC and operating system • Display of status and current activity of the Process Historian server • Display of the license status • Display and change of the operating status
Plant structure (Page 133)	• Display of the organizational structure of Process Historian – Integrated projects – Data sources • Edit the organizational structure
Data sources (Page 135)	• Display for each individual data source when project data and runtime data were last transferred to the Process Historian • Display of the last lifebeat • Delete project data • Set lock to prevent deletion of project data
I/O systems (Page 136)	• Display of available input and output devices • Display of the disk space used • Detailed information about the load
Diagnostics (Page 137)	• Diagnostic messages of the Process Historian • Messages from the event log of the operating system
Backup/Restore (Page 139)	• Display and status of archive segments • Create segment backups • Restore backed-up segments • Remove segments
Segmentation (Page 139)	• Display of the current configuration of the segmentation • Change the configuration of segmentation
Redundancy (Page 140)	• Display of the redundancy status • Switching/disconnecting principal and mirror • Configure redundancy

Dashboard	Functions
Licensing (Page 141)	• Display of the current license status of server and project
Database backup (Page 142)	• Display the current configuration and status of the database backup • Manual creation of full database backups • Automatic, continuous creation of full database backups
SIMATIC BATCH Backup/Restore (Page 143)	• Display of the selected batch data • Creating backups of the batch data • Restoring backed up batch data • Removing saved batch data
Unassigned data (Page 144)	• Display of unassigned values and messages in the Process Historian database • Display and export of detailed data on the values and messages • Remove unassigned data from the Process Historian database

"Process Historian Management" dashboard

Definition

The Process Historian Management dashboard provides you with basic information about the Process Historian. The configuration and diagnostics of the Process Historian are displayed here in summary form.

Structure

The following information is displayed for the Process Historian server:

- Indicators of the server:
  - Processor load (CPU)
  - Available RAM
  - Hard drive load
- Indicators of the Process Historian:
  - Number of connected data sources
  - Stored measured values per second
  - Stored messages per second
- Operating state of the Process Historian server:
  Operating states of the Process Historian (Page 149)
  Changing the operating state of the Process Historian (Page 111)
- Redundancy status of the Process Historian
  The redundancy for Process Historian is supported for PCS 7 systems.
  Redundancy status (Page 180)
- License status of the Process Historian (Page 178)
- Backup status (Page 179)
  Update status (Page 112)

Note

Display in percent

Percentage values displayed can exceed 100 % for a short time. These values are determined by a statistical extrapolation from mean values. They do not correspond to the real values.

"Plant structure" dashboard

Definition

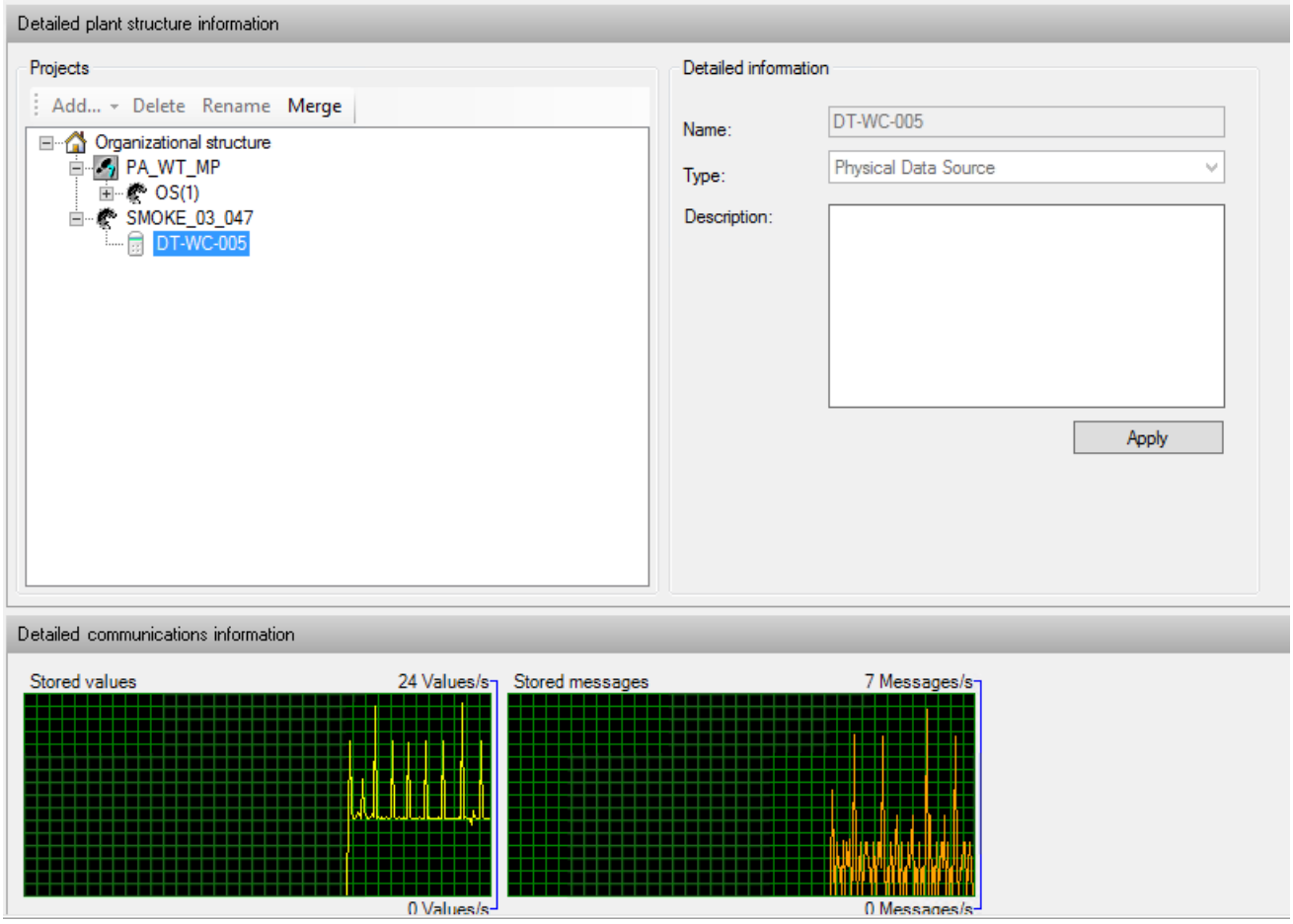
The "Plant Structure" dashboard displays the organizational structure of the Process Historian database and is used for localization of the integrated projects.

The organizational structure is made up of elements, e.g. project or data source, with the following properties:

- Name
- Type (Page 178)
- Description (Page 175)

Structure

The basic area of the organizational structure is automatically recognized and displayed in the "Projects" area. The properties of the selected element of the organizational structure are displayed next to it. Below, you can see the currently stored measured values and messages per second for a selected data source.

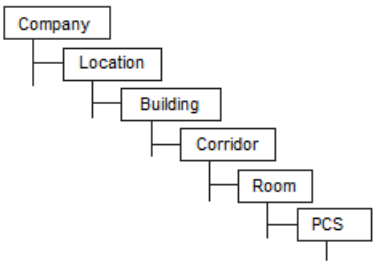


You can add an extended structure to the base area. You can edit the entries in the structure tree and extend their depth as required.

Expand organizational structure (Page 113)

Edit organizational structure (Page 112)

Example of an extended structure:



You can merge projects if there are duplicate project entries in the structure tree. Duplicate entries can occur if, for example, an image of the Monitoring & Control server / OS server has been imported again after a hardware error.

Merging projects in the organizational structure (Page 113)

Note

Do not merge projects if the systems have several projects loaded on a Monitoring & Control server / OS server

Do not use the "Merge" function if the systems have several projects loaded on a Monitoring & Control server / OS server and used in runtime. For additional project nodes may be present, but you are not allowed to merge them.

"Data sources" dashboard

Definition

The "Data sources" dashboard provides an overview of the status of the PCs connected to the Process Historian server in projects.

You can delete the project data of a selected project.

Delete project data of a selected project (Page 114)

To prevent project data from being deleted, set a lock that you can unlock.

Locking the deletion of the project data (Page 114)

Structure

The "Data sources" table shows information on the connected data sources. You can sort the rows of the table according to a column selection.

Data sources

Locked	Computer na	Project	Redundancy st	Alarm recovery	Tag recovery	Sending	Last lifebeat	Last alarm data	Last tag data	Last alarm configuration	Last tag configuration
Yes	02WC4	Smoke_(	StandAlone	NoRecovery	NoRecovery	Yes	7/31/2017 9:30:51 AM	7/31/2017 9:30:58 AM	7/31/2017 9:30:59 AM	7/31/2017 2:59:02 AM	7/31/2017 2:58:53 AM
Yes	02WC3	Smoke_(	StandAlone	NoRecovery	NoRecovery	Yes	7/31/2017 9:30:51 AM	7/31/2017 9:30:58 AM	7/31/2017 9:30:59 AM	7/31/2017 2:33:57 AM	7/31/2017 2:33:45 AM

- Locked (Page 175)
- Name of the connected PC
- Name of the project that is integrated in the Process Historian

- Redundancy status
  The redundancy for Process Historian is supported for PCS 7 systems.
  AUTOHOTSPOT
- Restore messages (Page 175)
- Restore measured values (Page 175)
- Send (Page 176)
- Last lifebeat (Page 176)
- Last alarm data (Page 176)
- Last measured value data (Page 176)
- Last message configuration (Page 176)
- Last measured value configuration (Page 176)

The values of the columns "Last lifebeat", "Last message data" and "Last measured value data" are marked with respect to their actuality:

- Blue marking: No data has been sent from the client to Process Historian for more than 10 minutes.
- If "Last lifebeat" is highlighted in color, the corresponding PC is no longer running.

Note

The time stamp in the columns "Last alarm data" and "Last process data" does not always match the time stamp of the data itself. If, for example, the connection between the Operator control & Monitoring server / OS server and the Process Historian was disrupted beforehand, there may be a wide gap in the time stamps.

See also

Redundancy status (Page 180)

"I/O Systems" dashboard

Definition

The "I/O Systems" dashboard provides information about the storage system that is read and write accessed. You can monitor the disk space of the drives here. You can graphically analyze the states of the input and output devices.

How the Process Historian monitors the storage space is explained on the page:

Storage space monitoring (Page 154)

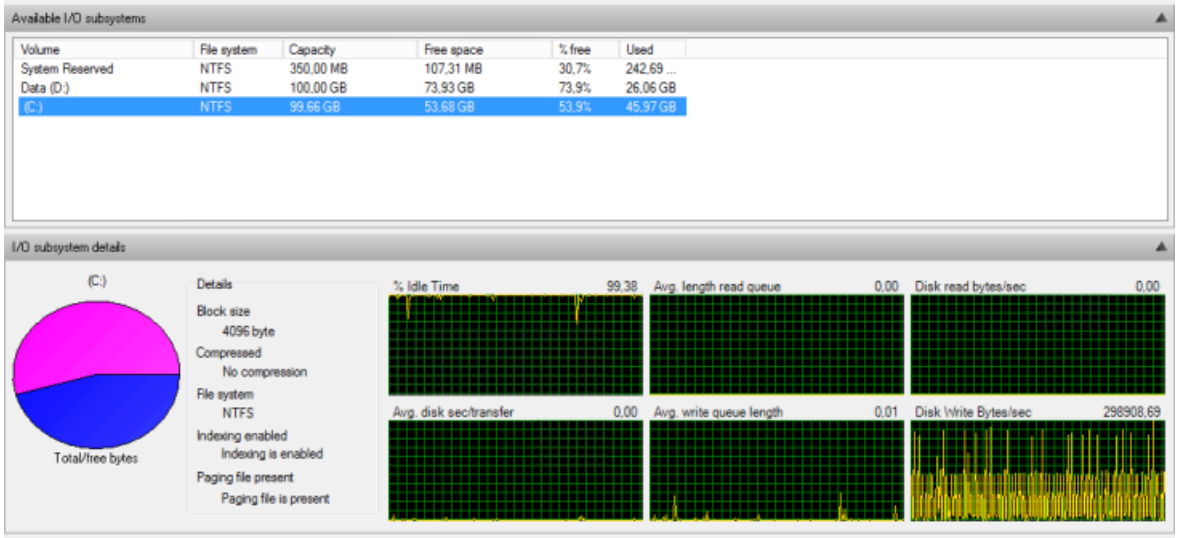
You can find out how to minimize and optimize the storage space on the page:

Minimizing storage requirements (Page 146)

Structure

The following information is displayed for all hard disks included in the system, even for hard disks on which no archive data is stored:

- Name and drive letter of the hard drives
- File system
- Hard disk capacity
- Free disk space absolute and in percent
- Absolute storage space used



You obtain the following detailed graphical information about a selected drive:

- Hard disk inactivity time
- Average length of queue for read access
- Reading speed in bytes per second
- Average duration per transfer
- Average length of queue for write access
- Writing speed in bytes per second

"Diagnostics" dashboard

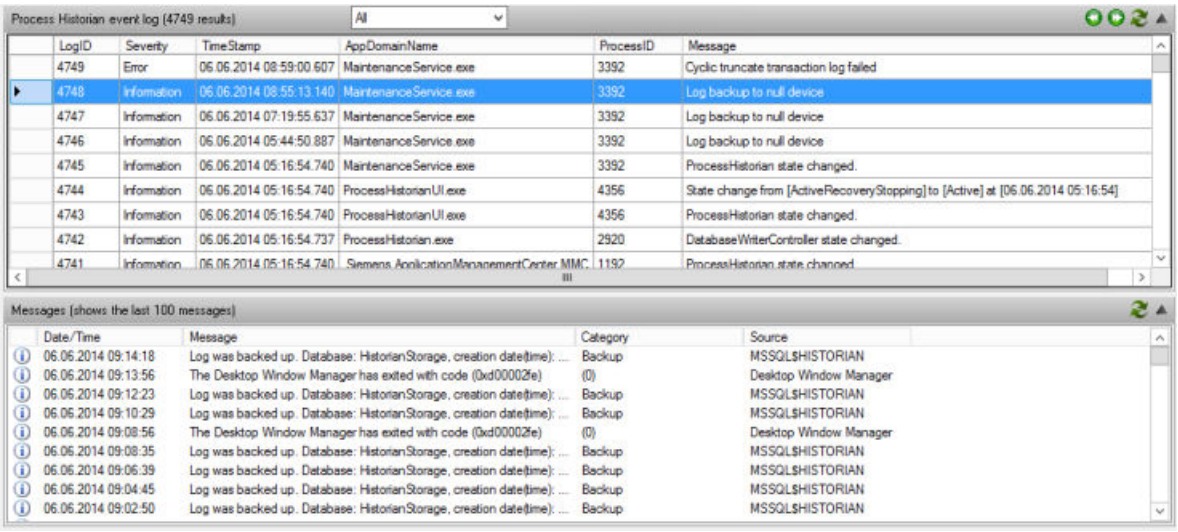
Definition

The "Diagnostics" dashboard displays the last 5000 diagnostic messages from the event log of the Process Historian and the last 100 entries from the event log for Windows applications.

Structure

The Process Historian event log at the top of the page contains the following information:

- Log entry ID
- Severity of the message
- Time stamp
- Name of application domain
- Process ID
- Message



You can filter the entries of the event log. Select one of the following entries:

- All: Show all entries.
- Application name: Select an application from the drop-down menu on the right.
- Message: Enter text for a message in the right field.
- Severity Select a status from the drop-down menu on the right.
- Time stamp: Specify the time period on the right.

The lower pane displays the following information from the event log for Windows applications:

- Time stamp
- Message
- Category
- Source

"Backup/Restore" dashboard

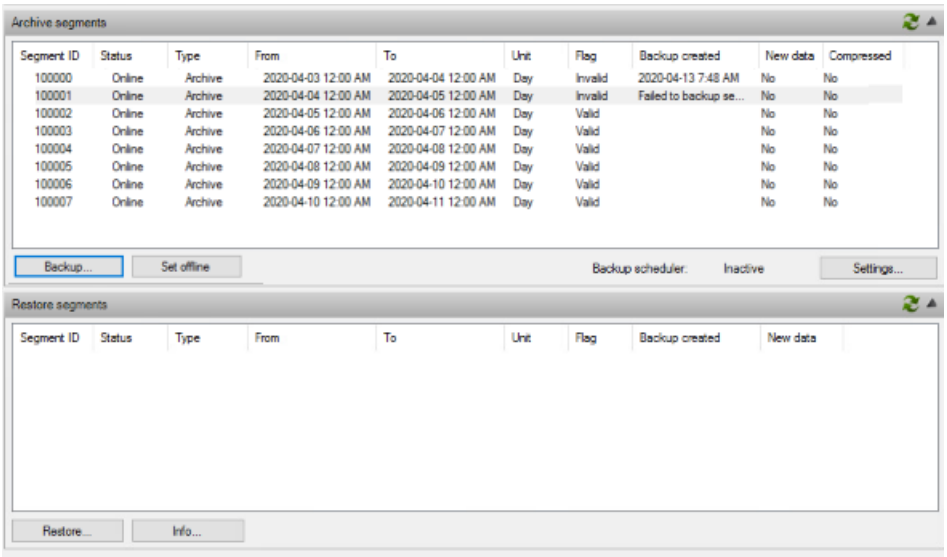
Definition

The "Backup/Restore" dashboard provides an overview of the current status of the archive segments.

You can back up, swap, and restore archive segments on the dashboard.

Structure

The dashboard displays all archive segments of the Process Historian with their properties:



You can obtain an overview of the archive segments at:

Archive segment (Page 155)

You can learn how to back up and restore archive segments at:
Backup and restore segment (Page 100)

"Segmentation" dashboard

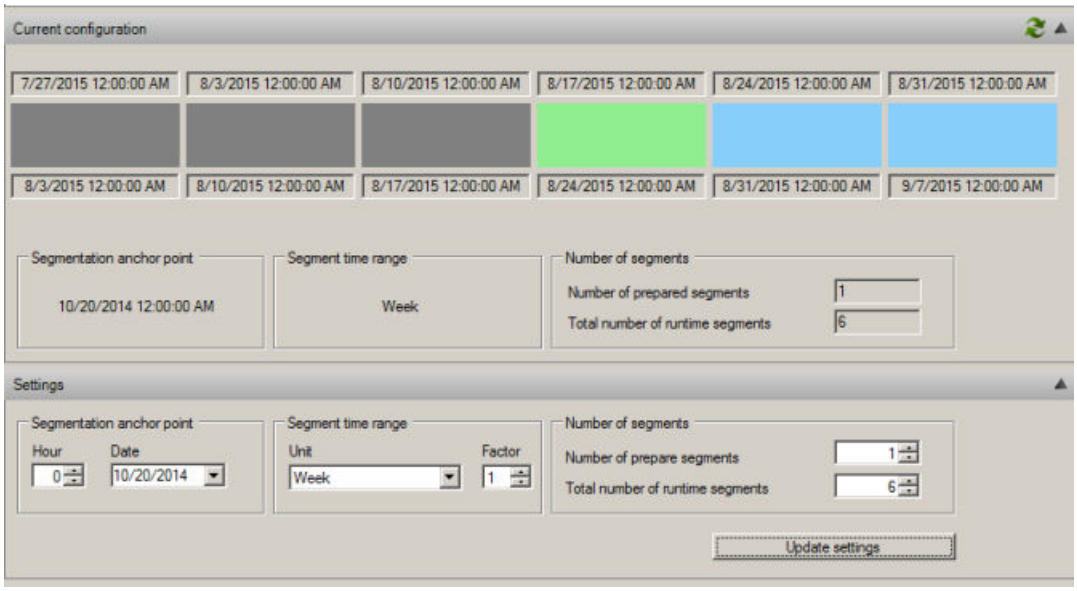
Definition

The "Segmentation" dashboard provides an overview of the current configuration of the segmentation.

Change the configuration of the segments on the dashboard.

Structure

The dashboard displays the current Runtime segments with the general settings.



The Runtime segments displayed are differentiated as follows:

- A segment marked green stores the data with the current time stamp.
- Segments marked blue are reserved for future data.
- Segments marked gray contain stored data with an older time stamp.

The following settings for the Runtime segments are displayed:

- Anchor point (Page 177)
- Time interval (Page 177)
- Number of future segments (Page 157)
- Total number of Runtime segments (Page 177)

In the "Settings" area, change the configuration for future segmentation. Segments that have already been created cannot be changed afterwards.

Configuring segments (Page 109)

"Redundancy" dashboard

Definition

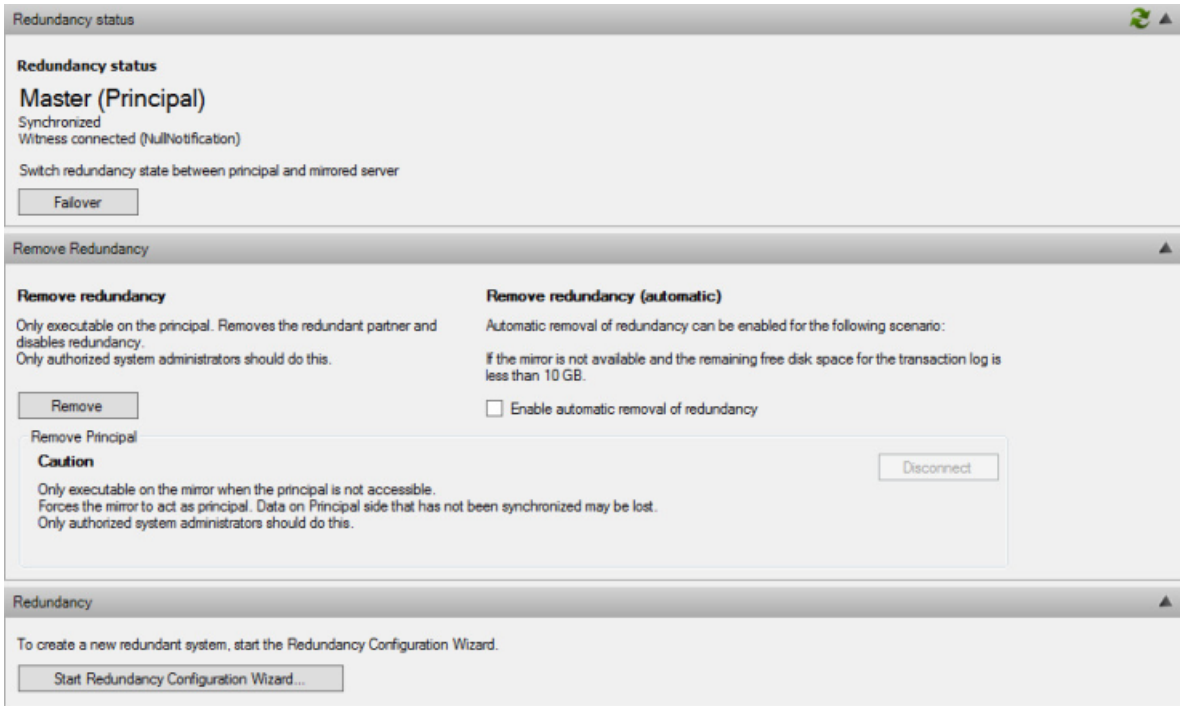
The "Redundancy" dashboard provides an overview of the current configuration of a redundant Process Historian system.

The redundancy for Process Historian is supported for PCS 7 systems.

On the dashboard you configure the redundancy or remove the redundancy.

Structure

On the dashboard you can view the current status of the redundancy at the top.



- You can switch the redundancy and, thus, swap the role of principal and mirror.
  - Switching redundancy (Page 129)
- In some redundancy scenarios you can end the redundancy synchronization by removing the redundancy.
  - Removing redundancy manually (Page 128)
  - Removing the redundancy automatically (Page 129)
- If the principal is no longer available or is in an undefined state, you can disconnect the principal from the redundant system.
  - Disconnect Principal (Page 130)
- If you want to set up a redundant Process Historian system, start the redundancy configuration.
  - Configuring a redundant Process Historian (Page 27)

"Licensing" dashboard

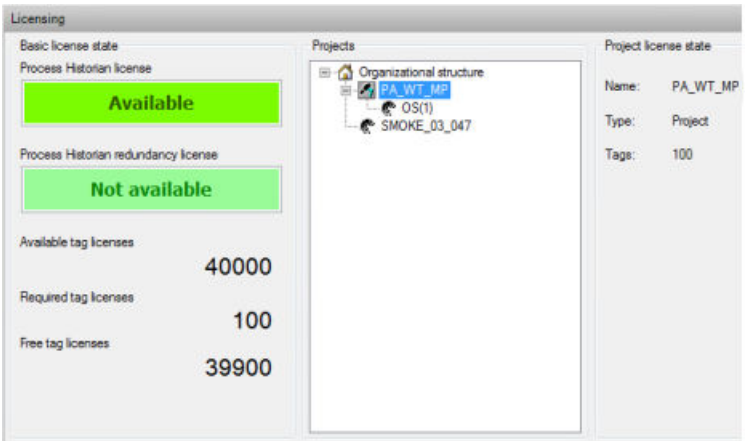
Definition

The "Licensing" dashboard provides an overview of the licenses available and used in the system.

Structure

The dashboard displays the following license information:

- License status of the Process Historian (Page 178)
- Redundancy license status
  The redundancy for Process Historian is supported for PCS 7 systems.
  Redundancy license status (Page 180)
- Tag licenses (Page 177)
- Project license status (Page 178)



Refer to the Installation Guide for an overview of the licenses that are required to run Process Historian.

See also

Licenses of the Process Historian (Page 8)

"Database backup" dashboard

Definition

The "Database Backup" dashboard displays the current configuration and status of the database backup.

Structure

The dashboard displays the following information:

- Backup type (Page 178)
- Backup status (Page 179)
- Destination path (Page 179)

- Alternative path (Page 179)
- Status (Page 179)

You configure the database backup in the lower area.

Backing up the database (Page 101)

For this, you can use backup options.

Backup options (Page 178)

"SIMATIC Batch Backup/Restore" dashboard

Definition

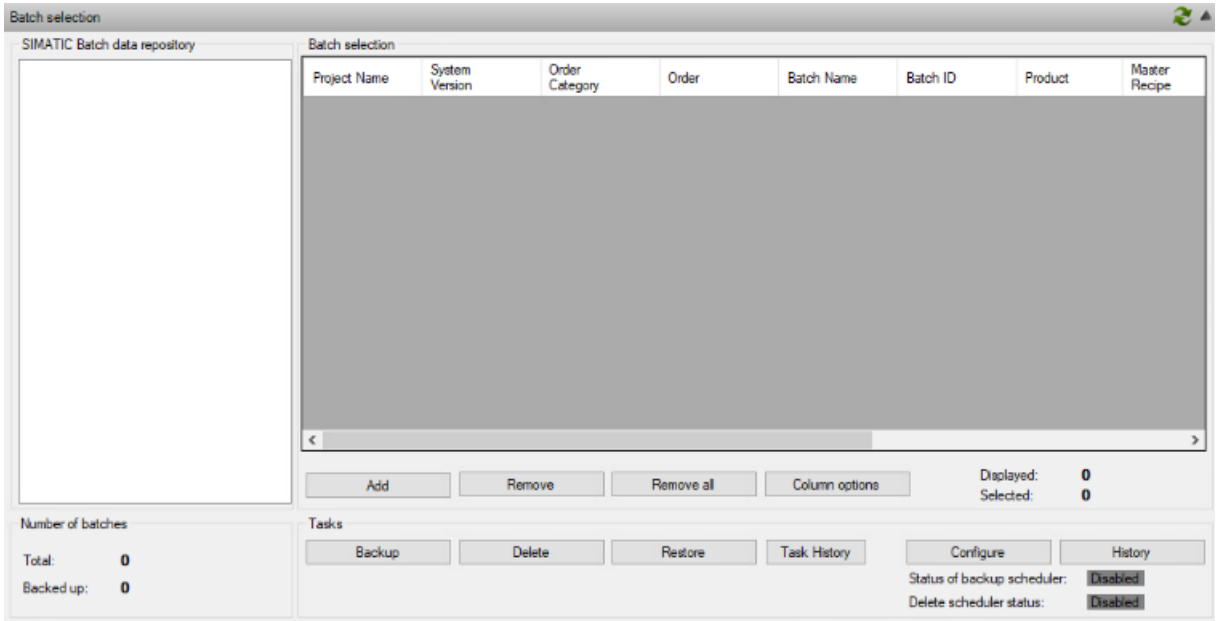
In the "SIMATIC Batch Backup/Restore" dashboard, you can back up and restore batch data archived from the SIMATIC Batch server using the Process Historian.
Backing up and restoring BATCH data (Page 104)

Structure

In the "SIMATIC Batch data" navigation window, the data is displayed in the following hierarchy:

- SIMATIC BATCH System
- Order category
- Order
- Batch

Individual elements of the hierarchy can be expanded/collapsed and selected/collapsed in the navigation window. Selecting a parent node also selects the child elements.



In the "Batch selection" table, the selected batch data is displayed with its properties.

The "Backup created" column shows whether the respective batches have already been backed up and in which state:

- Yes-Final state: A backup is available. The batch is finished and Process Historian has received the "Completed" message.
- Yes-Transient state: A backup is present, but the batch is not completed at this time. If the batch has reached the final state in the meantime, you can create another backup. If you delete the batch without creating another backup, the data is gone.

If you click on the header of a column, the entries are sorted. You can specify the columns that are displayed and their order.

Configuring column options (Page 127)

You can display the history of the automatic backups.

Displaying scheduling (Page 128)

The following additional information is displayed on the dashboard:

- Displayed (Page 180)
- Selected (Page 180)
- Number of batches (Page 180)
- Scheduler status "Backup" (Page 180)
- Scheduler status "Delete" (Page 180)

"Unassigned data" dashboard

Definition

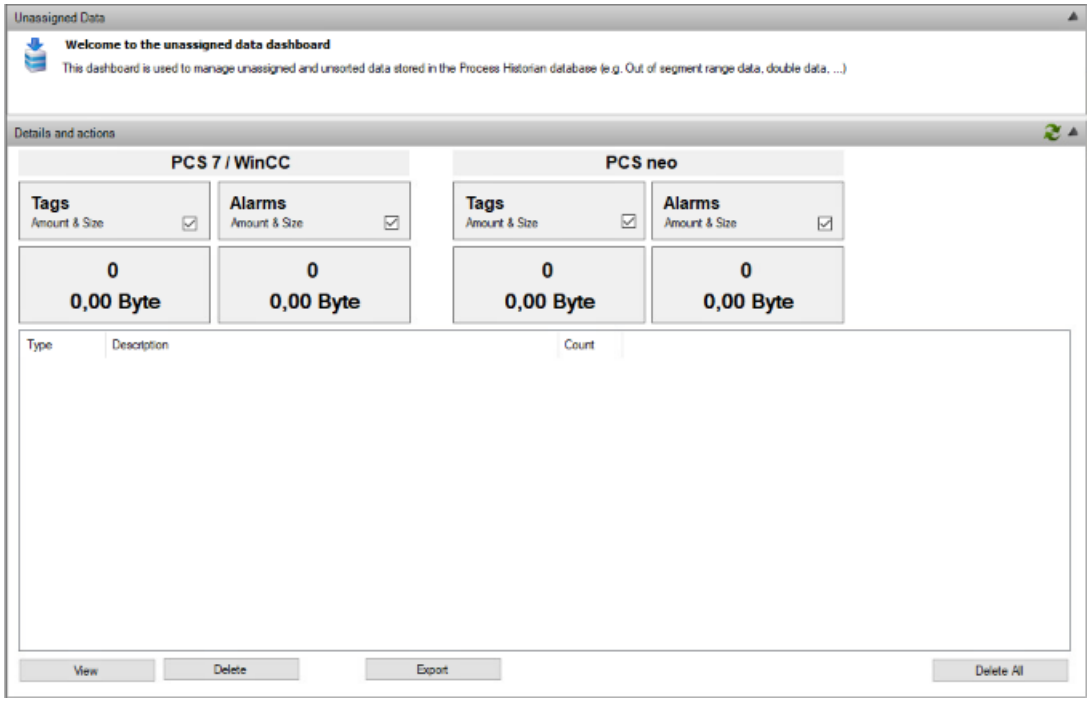
The dashboard displays the logged values and messages that were saved without assignment. Such data occurs, for example, if there are problems with the time-of-day synchronization or whenever the clock is turned back by one hour.
The data is stored outside the normal data in segments and saved during each complete data backup.

Check the dashboard regularly.

Structure

The following information is displayed categorized by data types:

- Number of unassigned values/messages and their memory requirement in the drive
- List of the selected values/messages



You can view the selected data in detail, export it to a ".csv" file and remove it from the Process Historian database.

3.1.4.3 Administration

Step-by-step instructions

Configuring data transfer from PCS 7/WinCC to Process Historian

Requirement

- PH-Ready is installed.
- The PH-Ready service is configured.

Procedure

1. In the navigation window of the WinCC Explorer, select the "PH-Ready" item to open the "WinCC Process Historian Editor".
2. In the "Server" tab, select the Process Historian server to which PH-Ready should transfer the archive data.
   If you are using a redundant Process Historian, select the standby server as the second computer.
3. In the "Filter" tab, select the data that is transferred to the Process Historian server.

4. If you do not want to use the default directory for the "Store and Forward Cache", select a local destination directory in the "Store & Forward" tab.
5. On the "Computer Name" tab, input the computer names used thus far so as to get messages from those computers as well. You need this if you use new hardware with new computer names when reinstalling or updating the Process Historian.

Result

The data transfer is configured for PCS 7/WinCC.

See also

Installing PH-Ready on a PCS 7 OS (Page 24)

Installing PH-Ready on a WinCC station (Page 30)

Configuring the PH-Ready service (Page 34)

Minimizing storage requirements

Procedure

1. Set archive segments "Offline" in good time.
   Set segment "Offline" (Page 118)
   This removes these segments from the Process Historian database and frees up storage space.
2. Leave the number of future segments at the preset minimum value of 1 segment.
   "Segmentation" dashboard (Page 139)
   This means the required hard disk space is reserved only for one future segment. The projection of the initial size is based on the last segments that were completely written.
3. Set the total number of Runtime segments to the minimum value of 4 segments, if they are weekly segments.
   The segments are compressed as soon as possible.
4. Remove log files, temporary files, and other unnecessary files.

Result

Space is made available on the drives. The storage requirements for the hard disks are optimized.

Recovering a database

Introduction

When you restore a Process Historian database, you restore the state of the database in Process Historian that existed at the time of the last database backup.

Note

If, for example, you want to reinstall the Process Historian server after changing an operating system or changing the server hardware and then restore the database, proceed as follows:

1. Run the database installation wizard, but do not restart the PC yet.
2. Perform the procedure described below.
3. Only then restart the computer.

Requirement

- The last database backup must be complete. The backup status "Completed" is displayed on the "Database backup" dashboard.
  "Database backup" dashboard (Page 142)
- During an automatic database backup, the database files can only be restored if the backup files are located in the "HistorianStorage" folder of the destination path for the backup.

Procedure

1. Start the "Database Recovery" program in the start window of the operating system.
2. Click "Next".
3. Select a restoration type. Select either a manual backup or an automatic backup.
4. Click "Next".
5. Set the path to the required database backup.
   The name of the destination path must correspond to the database name and the destination path. If the path has been renamed, you cannot not restore and an error message is output.
6. Click "Next".
   The database backup is checked for it ability to be restored.
   An overview of the restoration of the data is displayed before restoration is started.
7. Click "Next".
   Recovery of the database is now started. The recovery progress is displayed.
   A message is displayed when the recovery is completed successfully.
8. Exit the program with "Close".
9. Restart the PC to install all services.

Result

You have successfully recovered a database.

Services of the Process Historian

Definition

Services are programs that run in the background and bundle Process Historian functions.

Implementation in the system

The Process Historian uses the following services for processing, saving and backing up data:

Service	Description
SIMATIC Process Historian server	Installs all the functions the server needs to process and store data.
Process Historian Maintenance Service	Installs all required functions for maintaining the Process Historian database. The Maintenance Service, for example, launches and monitors mirroring, restoration functions, maintenance of the transaction log and similar tasks.
Process Historian Redundancy Service	Installs the functions that are required for data communication between two redundant server systems.
Process Historian Discovery Service	Supports the search for connected Process Historian systems. The Discovery Service is mandatory for the Process Historian function.
Process Historian GIES Data Transfer Schedule Service	Service used with SIMATIC BATCH.
Process Historian GIES Windows Service Host	Service used with SIMATIC BATCH.

Encryption with the Process Historian

Overview

The encryption of data packets is essential for protecting against attacks from the net.

Encrypted communication is enabled in the default configuration of the Process Historian regardless of the use of OPC UA. The Process Historian API supports encryption of communication channels.

Certificates are used to mutually authenticate communication partners. The certificates are stored in the certificate store on the Process Historian system in the folder "opc\UAClient\PKI \OPCUA".

Enable encryption

On the client PCs, you need to rename the "CertificateDisabled" XML element to "Certificate" in the following configuration files of the Process Historian:

- "{ClientAppPath}\StoreAndForward2ClientConfiguration.xml"
- "StoreAndForward2ServiceConfiguration.xml"

Operating states of the Process Historian

Overview

Symbol	Operating state	Description
	Active	In the "Active" operating state, the Process Historian archives the process data. You can retrieve the data from the stations or via the Information Server.
	ActiveRecovery	In the "ActiveRecovery" operating state, the Process Historian requests data from the Monitoring & Control servers / OS servers for a detected period of time without archiving. The preceding and the subsequent operating state is "Active".
	Starting ActiveRecovery	This operating state starts "ActiveRecovery".
	Stopping ActiveRecovery	This operating state terminates "ActiveRecovery" and is the intermediate state between "ActiveRecovery" and "Active".
	Disable	The Process Historian changes to the "Disabled" operating state in the case of maintenance tasks where access to the database is limited. The maintenance tasks can include the creation or the backing up/restoring of segments. The system is offline in this operating state. Access via the network is not possible.
	Locked	The Process Historian server is in the "Locked" operating state, e.g. because the hard disk storage is reaching its capacity limit. The Process Historian server is no longer switched "Active" in this operating state. No values are archived. Read access to stored values is possible. The Maintenance Service only sets the Process Historian server to "Active" again when the free disk space has been increased.
	Enabling	"Enabling" is the intermediate state between "Disabled" and "Active".
	Disabling	"Disabling" is the intermediate state between "Active" and "Disabled".
	Error	The "Error" operating state occurs when • An error is detected. • There is no connection to the SIMATIC Process Historian server service.
	Error shutting down	The intermediate state between any state and "Error".
	Idle	No data are archived in the "Idle" operating state. In this operating state, you can perform updates and maintenance work on the Process Historian server or reboot the PC.
	Shutting down	The intermediate state between "Active" and "Idle".

Symbol	Operating state	Description
	Starting	The intermediate state between "Idle" and "Active".
	Held	Mirror is held. The database is synchronized with the principal. The database of the mirror is used exclusively by the principal. Access from other applications is not possible. When the "Held" state has occurred: • Determine the cause and remedy the problem. • Reset the redundancy.
	Undefined	The Process Historian is not yet initialized or the service is not running.

You can get more detailed information on the operating state on the OS clients and WinCC station:
Display of the operating state on the Operator Station of the PCS 7 system (Page 150)

DCS messages can appear on the OS clients and WinCC station, which indicate certain system states of the Process Historian:
I&C messages for PCS 7 OS clients and WinCC stations (Page 158)

Application recommendations

Note

Avoid the "locked" operating state

To ensure enough free space is available for the operation of the Process Historian, regularly check the currently available space in the "I/O systems" dashboard.

Determine which automatic mechanisms for reducing the used space can be activated in the dashboards.

"I/O Systems" dashboard (Page 136)

You change the operating state as follows:

Changing the operating state of the Process Historian (Page 111)

Display of the operating state on the Operator Station of the PCS 7 system

Overview

The operating state of the Process Historian system is also displayed on the Operator Station, which can access the Process Historian via "PH-Ready". A redundant Process Historian system will also display the status of master (Principal) and standby (Mirror).

The following is displayed in the area overview of the Operator Station:

- Green button: The monitored Process Historian servers are active. The server status is "OK".
- Red button: Open the detail view and check the entries in the "Process Historian" row. When a Process Historian server name is red, check the operating state and the redundancy status in this dashboard. If red is displayed for the active master and standby servers, then the witness server has failed.

The following system tags are created in the tag management for monitoring the status; the tags reflect the current state of the Process Historian :

- @PHServer_Principal_State
- @PHServer_Principal_Details
- @PHServer_Mirror_State
- @PHServer_Mirror_Details

You can further process the tags with WinCC.

Example for "@PHServer_Principal_State" and "@PHServer_Mirror_State":

- PHServer=1. Name of the Process Historian server and current state. "1" means "OK", "0" means "Error".

The tags "@PHServer_Mirror_State" and "@PHServer_Mirror_Details" are only described in mirrored systems.

If no connection to the process is possible from PH-Ready to the Process Historian server, the "Error" state is displayed. This means no information is available on the Process Historian.

Detailed information about the operating state

Detailed information on the current state of the Process Historian is available in the following tags on the OS station:

- @PHServer_Principal_Details
- @PHServer_Mirror_Details

In XML elements, the information on the Process Historian components is divided up as follows:

- Process Historian Service
- Maintenance Service
- PH-Ready

The following example lists all XML elements that can occur during Process Historian operation:

XML elements	Description
<State> <Name>PhServer</Name> <Role>Principal</Role> <Status>Error</Status> </State>	 Contains the name of the Process Historian server that has signaled. Contains the server role: "Principal", "Mirror" or "Standalone". Contains the server state: "Error" when an error has occurred or "Ok" in the Good case.
<Details> <ProcessHistorianService> <State>Suspended</State> </ProcessHistorianService>	Possible values for "State" are: • "Suspended": The normal state on the mirror. On the principal, an error after switchover of mirroring. • "Error": An unspecified error has occurred. • "Shutdown": The service was shut down.
<MaintenanceService> <State>Activating</State>	Is displayed when the connection to the Discovery Service was established while activating the Maintenance Service and the configuration files are being imported.
<MirroringRoleNotification>MirroringSuspended </MirroringRoleNotification>	Shows the error states that can occur during mirroring: • "SynchronizedPrincipalWithoutWitness": Principal cannot reach Witness. • "SynchronizedMirrorWithoutWitness": Mirror cannot reach Witness. • "ConnectionWithPrincipalLost": Principal cannot be reached. • "ConnectionWithMirrorLost": Mirror cannot be reached. • "MirroringSuspended": Mirroring was suspended by the SQL server due to problems. • "NoQuorum": The mirrored system cannot make any decisions regarding a switchover. • "PrincipalRunningExposed": Only the principal is running.
<FreeDiskSpaceState EmergencyExceeded	Not enough free disk space on the Process Historian.
LowDrives="E:\=>25GB G:\=>45GB" LowestFreeDiskSpacePercent ="9%" LowestFreeDiskSapceGb="4GB" </FreeDiskSpaceState>	The drives with not enough free disk space. The lowest amount of measured free disk space as percentage. The lowest amount of measured free disk space in GB.
<DatabaseStatus>Recovering</DatabaseStatus>	A database that has just been connected online may not necessarily be ready for connections. The following values reflect potential reasons: • Recovering • RecoveryPending • Suspect • Emergency • Offline
<DatabaseBackup>IncompleteLessFreeDiskSpace	Error when creating a database backup. Possible values: • "IncompleteLessFreeDiskSpace": Not enough free disk space on the backup drive. • "IncompleteUnspecifiedError": Unspecified error. • "IncompleteWriteAccessDenied": No access rights to the backup drive.

XML elements	Description
FreeDiskSpacePercent="4%" BackupPath="D:\Backups" CompletedPercent>="85%" LastBackupDate="2020.10.23 15:13:59"	The free disk space on the backup drive. The path of the backup drive. The realized database backup as percentage. Date of the last successful database backup of a file group.
<\DatabaseBackup> </MaintenanceService>	
<PHReady> <ErrorMessage>NoCommunication</Error-Message> </PHReady> </Details>	No communication to the Process Historian server.

Storage medium of the database backup

Overview

We recommend that you always store the backup files on a separate drive.

The following external drives can be used as storage media for the backup files:

- USB hard disk
- Network drive via ISCSI.

The selected storage medium must have sufficient available storage space for a complete backup.

Note

Storage medium

You can configure a network share or a path via UNC for the storage medium for database backup and segment restoration.
Backing up the database (Page 101)

Storage requirements

If less than 20 GBs are free on the drive, a warning appears.

The backup of the database is stopped if both of the following criteria are fulfilled:

- The free disk space is less than 50 GB
- Free disk space is less than 10%

For example, the storage medium has a capacity of 200 GB and the free space is 20 GB:

- The criterion "less than 50 GB" is fulfilled
- The criterion "less than 10 %" is not fulfilled

The backup continues.

See also

http://technet.microsoft.com/de-de/library/ee338476(v=ws.10).aspx (http://technet.microsoft.com/de-de/library/ee338476(v=ws.10).aspx)

Storage space monitoring

Overview

On the Process Historian server, the Maintenance Service monitors the storage space on the following drives:

- System drive
- Drive where the transaction log is located
- All drives on which the data of the Process Historian database is distributed

In the following cases, a warning message is sent to the Monitoring & Control server / OS server:

- The free space falls below the limit of 100 GB and is less than 20 % of the drive capacity.
- The free space on the system drive falls below the 200 GB limit and is less than 40 % of the drive capacity.
- The storage space is not sufficient for at least three new segments to be created.

The Process Historian server switches to the "Locked" state in the following situations:

- The free space falls below the limit of 50 GB and is less than 10 % of the drive capacity.
  - Hard drive up to 500 GB: Free space < 10 %
  - Hard drive larger than 500 GB: Free space < 50 GB
- The drive capacity is half the low limit of the drive with the Process Historian database for the drives:
  - on which the Windows system is installed
  - on which the cache of the SQL Server is installed
  - on which the MSDB of the SQL Server is installed

  E.g. When the free space on the drive with the Windows system is below the limit of 25 GB (50/2) and is less than 5 % (10/2) of the disk capacity
- The space is insufficient for at least one newly created segments.

The Monitoring & Control / OS server servers monitor the storage space on the system drive where the cache is located.

Segment

Definition

A database segment contains all the archive data accumulated over a period of time. A segment with weekly segmentation, for example, contains all the data recorded in a week. Each segment thus has a high and low time limit.

Each segment has a unique segment number:

- The start segment, the first segment created in a system, has the number 100,000.
- The segment whose low limit is equal to the high limit of segment "n" is specified as segment "n+1".
- The segment whose high limit is equal to the low limit of segment "n" is specified as segment "n-1".

Archive segment

Definition

The archive segment is created from the oldest Runtime segment You can only save and swap-out the archive segments.

Structure

The following types of archive segments occur in Process Historian and are displayed on the Backup/Restore dashboard as follows

Archive segment	Description
Non-compressed archive segment	During the segmentation, the oldest Runtime segment becomes an archive segment. Compression starts at this point. In the upper list, the "Status" column = "Online" and the "Compressed" column = "No".
Compressed archive segment	The compression of the archive segment is complete. In the upper list, the "Status" column contains "Online" and the "Compressed" column contains "Yes".
Past archive segment	The segment is created during the migration for the process data with a time range that lies before the commissioning of the Process Historian. The segment has a consecutive number less than "100000" and usually covers a period of one month. The migration assistant itself describes all archive segments. In the upper list, the "Status" column = "Online" and the "Compressed" column = "No".
Saved archive segment	Created after backup of an archive segment in a backup file. The "Backup created" column contains the date of the backup in the upper list. The segment is displayed as "valid" in the "Flag" column. A segment is marked "invalid" if more Runtime data has accumulated for this segment after a backup has been created.
Swapped-out archive segment	Created after a backed-up archive segment is "Set offline". The data of this segment is only available in the backup file. There is no more segment data in the Process Historian database. Only the information about a backup and "Set offline" is available. All the archived segments are displayed in the lower list.
External archive segment	Created when backup file with an external archive segment is restored or "Set online" . The data is stored in an external database instead of the Process Historian database. In the upper list, "Status" = "External" appears in the column.

See also

"Backup/Restore" dashboard (Page 139)

Runtime segment

Definition

The runtime segment is a segment to which the Process Historian writes data. The segment records the data with a time stamp that lies within the time span of the segment. A Runtime segment always has the "Online" status.

Runtime segments are uncompressed and therefore take up more space on the hard disk.

Structure

Runtime segments include the following segments, which are color-coded in the Process Historian in the Segmentation dashboard:
"Segmentation" dashboard (Page 139)

- Marked green:
  The segment archives the data with the current time stamp. The segment contains the time range of the current system time.
- Marked blue:
  Future segment (Page 157)
- Marked gray:
  Segments for process data with an older time stamp. After a connection failure, the data is subsequently transferred to these segments from the buffer memory of the OS computers.

The different colors of Runtime segments serve to indicate whether the segmentation in the Process Historian system is still working reliably. If no green or blue segment is visible, there are general problems with the segmentation or not enough free disk space is available.

Note

A weekly segment requires less hard disk space than a monthly segment, for example. The manual backup and restore of the week segments is more complex than the month segment for the same period.

CAL segment

Definition

The CAL segment belongs to the segments that collect all incoming data outside the current Runtime segments. The CAL segment cannot be stored directly in a backup file and removed from the database.

Structure

The CAL segment records all data with a time range older than the time span of the oldest Runtime segment. For example, a PC has not transmitted data to the Process Historian for a long time due to a connection failure. The data transfer is then made up with a datum that lies outside the Runtime segments.

For the archive segments with the "Online" status, the data from the CAL segment is then continuously transferred to the corresponding segments. A time range of 4 hours is transmitted approximately every 10 minutes from the CAL segment to the corresponding archive segment.

For swapped-out archive segments, you must first restore the archive segments to enable automatic transfer of the data from the CAL segment. When you perform the backup again, data from the CAL segment is entered in the backup file of the archive segment.

You can recognize the presence of new data for an archive segment in the "Backup/Restore" dashboard in the lower list in the "New data" column = "Yes".

See also

"Backup/Restore" dashboard (Page 139)

CAU segment

Definition

The CAU segment belongs to the segments that collect all incoming data outside the current Runtime segments. The CAU segment cannot be moved directly to a backup file and removed from the database.

Structure

The CAU segment records all data with a time range younger than the time range of the most recent runtime segment. During the segmentation, the data from the CAU segment is transferred to the newest Runtime segment that has the same time period .

Future segment

Definition

The future segment is a segment that is already reserved for future data.

A future segment is a safety buffer that allows you to continue archiving immediately when you change segments.

Future segments also ensure time flexibility for any adjustments that might be needed to increase the fill level of the data medium.

I&C messages for PCS 7 OS clients and WinCC stations

Overview

There are process control messages in the Process Historian that indicate certain system states. These pre-defined messages only contain information about process control states and do not return process status data.

The following tables provide an overview of the process control messages that appear in the Process Historian.

The following messages are generated by the SIMATIC service Process Historian-Ready:

Message no.	Message text	Event
1012500	PHRDY: Start Recovery for Process Historian	The transmission of the missing data starts once the communication connection between WinCC and the Process Historian has been restored.
1012501	PHRDY: Recovery for Process Historian completed	The transfer of data to the Process Historian has finished.
1012502	PHRDY: No communication to the Process Historian possible	The connection to the Process Historian cannot be established.
1012503	PHRDY: Communication to the Process Historian is interrupted	It is not possible to write and/or read data to/from the Process Historian.
1012504	PHRDY: Communication to the Process Historian restored	Writing and/or reading data to/from the Process Historian is possible again.
1012505	PHRDY: Process Historian Server offline since <date time>	The SIMATIC Process Historian service is not available. Read access to the data is possible.
1012506	PHRDY: Buffer limit Channel <Channel name> exceeded	The configured maximum available buffer memory of the selected communication channel (MSMQ) was exceeded. In this case, the Process Historian server can temporarily slow down the transfer of data from the WinCC systems.
1012507	PHRDY: Buffer limit channel <Channel name> normal	The buffer memory is again operating within the configured limits.
1012508	PHRDY: Less than <number> GB free space on volume '<drive>' for communication with the Process Historian.	On the WinCC station, the available storage space has fallen below a certain limit.
1012509	PHRDY: Communication of the Process Historian has been terminated. Less than <number> GB free space on data medium '<drive>'.	There is no more space available on the WinCC-station.
1012510	PHRDY: Connection to the Process Historian could not be established (check configuration).	Process Historian-Ready is configured incorrectly (e.g. service without user login, configuration error in the configuration file, etc.).

The following messages are generated by Process Historian and sent to all clients:

Message no.	Message text	Event
1012600	PH: Data storage space filled to <number %>	The warning limit of the storage space of the monitored drive was reached.
1012601	PH: System out of resources	The total load of all CPUs has been over 70% for at least 30s.

Message no.	Message text	Event
1012602	PH: Redundancy failed	Redundancy of the Process Historian server is no longer possible (because the redundancy was manually or automatically disconnected or the SQL server detected a problem etc.).
1012603	PH: Redundancy restored	The connection to the redundancy partner has been restored.
1012604	PH: Available licenses exceeded. Shutdown in <number> days	No adequate licenses available.
1012605	PH: PH-Ready <computer name> failed	The Process Historian has lost the connection to the referenced computer.
1012606	PH: An automatic redundancy switchover of the Process Historian server has taken place.	An automatic redundancy switchover of the Process Historian server has taken place.
1012607	PH: Less than <number> GB free space for database of the Process Historian.	The warning limit of storage space for the Process Historian database has been reached.
1012608	PH: Less than <number> GB of free storage space for the "tempdb" database.	The warning limit of the storage space for the "tempdb" database has been reached.
1012609	PH: Less than <number> GB of free storage space for the emergency restore operation.	The warning limit of the space for the emergency restore operation was reached.
1012610	PH: New backup for the emergency restore operation failed. Too little storage space.	The creation of a complete backup failed.
1012611	PH: An unknown error occurred when creating backup for emergency restore operation.	The creation of a complete backup failed, unknown error.
1012612	PH: Storage path <path> not accessible for emergency restore operation.	The storage path for the database backup is not available.
1012613	PH: The emergency threshold for drive <path> was reached. This why the Process Historian is locked.	
1012614	PH: None of the prepared segments exist. Please check why this is.	
1012615	PH: Not all the prepared segments have been generated.	

Redundant system

Principal

The principal is the server in a redundant Process Historian that takes on the role of master.

In the Management console of the principal, all information is available in the dashboards.

Mirror

The mirror is the server in a redundant Process Historian that takes on the role of standby.

In the Management console of the mirror, only information on computer-specific data is available in the following dashboards:

- Process Historian Management
  - Basic hardware performance indicators
  - Basic Process Historian indicators: Sources
  - Process Historian status
  - Redundancy state
- I/O systems
- Diagnostics: Event log for Windows applications
- Redundancy: Disconnecting the redundant partner under certain prerequisites

The information that is saved in the Process Historian database is only displayed in the dashboards of the principal.

Witness

The witness is a server in a redundant Process Historian that is responsible for checking the availability of the redundancy.

The witness server can be installed on an Information Server.

Backup path for redundant Process Historian

Backup path for automatic backup

The segments that are going to be saved are backed up on the principal in the backup path that is specified in the "Backup/Restore" dashboard. After switchover of the redundant partner, the new principal continues backing up the segments.

Local drive

When a local drive, such as "D:\Backup", was specified as primary backup path, the drive must exist on both servers. Because the specified primary and secondary backup paths apply to both the principal and the mirror. When the primary backup path is located on the computer "X", then the current principal will always back up first on path "X" - even after a switchover.

The local drives must not be located on the same hard drive as the Process Historian database:

- Despite the externally stored segments, the database has less available disk space.
- A failure may affect the database and the saved segments.

Disadvantages of a local drive:

- With a local drive, the backup files are only saved on one of the partners.
- The backup files are not automatically copied to the redundant path. After switching the redundant partners, you must copy the backup files manually to restore them.

Network drive

For central backup of the segments, you can specify the accessible backup path on one of the two redundant partners. You connect the network drive via ISCSI and specify the UNC path. A network connected via Windows will not work.

Both Maintenance Services must access the network and have the necessary rights. You have two options:

- As long as the Maintenance Service is running as a system service, the user group "Anyone" must have full access rights to the network drive.
- The Maintenance Service is started under a user. This user has all the rights of a system service on the local system. The access rights to the network are only granted for this user.

Disadvantages of a network drive:

- The UNC paths are more prone to errors on the network drives than on local drives.

See also

http://technet.microsoft.com/de-de/library/ee338476(v=ws.10).aspx (http://technet.microsoft.com/de-de/library/ee338476(v=ws.10).aspx)

Redundancy scenario: Mirror is temporarily inactive

Procedure

1. The principal and the mirror are active and synchronized.
2. The mirror is disconnected from the network for maintenance work, for example.
3. There is no data synchronization between the principal and the mirror.
4. The transaction log on the principal is growing.
5. The mirror is reactivated after some time.
6. The principal and the mirror are in the resynchronization state.
7. After synchronization of the data, the two server systems are once again synchronized and redundant.

Redundancy scenario: Principal failure

Procedure

- The principal and the mirror are active and synchronized.
- The principal fails.
- The mirror queries the witness as to whether it has an active connection to the principal.
- If the witness has no connection to the principal, the mirror automatically switches over to the role of principal.
- If the witness has an active connection to the principal, there is no automatic switchover.

- Before the mirror takes on the role of principal, it will process the pending data from the transaction log. This process can take some time.
- The connection to the principal is restored.
- The original principal now takes on the role of mirror.
- The principal and the mirror are in the resynchronization state.
- After synchronization of the data, the two server systems are once again synchronized and redundant.

Redundancy scenario: Witness failure

Procedure

1. The principal and the mirror are active and synchronized.
2. The witness fails.
3. A switchover is not necessary because none of the archiving systems is affected.
4. An automatic switchover, therefore, is not possible in this case.
5. The witness is active again.
6. Automatic switchover is possible once again.

Redundancy scenario: Mirror is inactive and the transaction log has not enough disk space

Scenario 1: The principal changes to "Locked" state

1. The principal and the mirror are active and synchronized.
2. The mirror is disconnected from the network for maintenance work, for example.
3. There is no data synchronization between the principal and the mirror.
4. The transaction log on the principal is growing.
5. The free disk space for the transaction log is less than the minimum required:
   On hard drives with up to 500 GB, less than 10% is available; on hard drives with more than 500 GB, less than 50 GB is available.
6. The principal is set to the "Locked" state.
   The archive data of the Operator control and monitoring station are buffered in the buffer. The buffered time depends on the available disk space and the accumulating data volume.
7. The mirror is activated once again.
8. The principal is unlocked and set to the "Active" state.
9. The principal and the mirror are in the resynchronization state.
10. After synchronization is complete, the transaction log is automatically reduced in size.
11. The archive data buffered in the buffer are transferred to the principal.

Scenario 2: Redundancy synchronization is stopped to ensure operation of the principal

1. The principal and the mirror are active and synchronized.
2. The mirror is disconnected from the network for maintenance work, for example.
3. There is no data synchronization between the principal and the mirror.
4. The transaction log on the principal is growing.
5. To prevent an overflow of the transaction log and locking of the principal, the redundancy synchronization is stopped:
   - Removing redundancy manually (Page 128)
   - Removing the redundancy automatically (Page 129)
6. The transaction log is automatically reduced in size.
7. The principal is still available.
8. The mirror is activated once again.
9. The data is not synchronized. You must reconfigure the redundancy synchronization.

Redundancy scenario: Mirror and Principal are switched off and switched on again

Procedure

1. The two servers, Principal and Mirror, are synchronized.
   The data is redundant and identical on both servers.
2. The mirror is switched off.
3. The data is still saved on the principal but no longer synchronized.
   The databases are different on both servers. The transaction log of the principal is growing.
4. The principal is switched off.
   Data is not saved.
5. The previous mirror is switched on.
6. The mirror is working. However, the mirror data cannot be synchronized with the principal. To exclude the risk of a loss of data, there is no automatic switchover from the mirror to the principal in this case.
   - When you force a manual switchover, the previous mirror will take on the role of the switched-off principal.
   - When you switch on the original principal once again, it will take on the role of the mirror.

   The data saved up to this point, is deleted during synchronization with the new principal in this case; this means the principal is missing these databases.
   You can resolve these technical conflicts in different ways using the Process Historian Management console.

Redundancy scenario: Mirror is in the Error state

The mirror is in the Error state, for example, not enough free disk space and the mirror can no longer create a new file

1. Resolve the basic problem, for example, by freeing up space on the hard disk on which there is not enough disk space.
2. Open the MS SQL Server Management Studio on the mirror or principal.
3. Execute the command "ALTER DATABASE [HistorianStorage] SET PARTNER RESUME".

Result

After the command has been executed, the redundancy synchronization continues (mirroring) except when the basic problem has not been resolved sufficiently.

3.1.4.4 Aggregation for PCS 7 and WinCC

Basics of aggregation

Definition

A large volume of raw data is generated during operation. Aggregation takes place to answer a query of process data within a reasonable time. The aggregates link and process the incoming raw data.

The aggregates are calculated and permanently stored in the database as soon as the data is archived. This reduces the number of raw data values needed for an ad-hoc query.

The aggregation is available for PCS 7 and WinCC and can be called up via the OS clients and WinCC stations.

Implementation in the system

All aggregation values are stored in the first data group for the process values. The first data group therefore requires more disk space. Approximately 3 % to 6 % additional space is required in the database to save the aggregates. The average storage requirement per aggregate is approximately 128 bytes.

The following aggregates can be used for automatic calculation in the time intervals "1 minute/ 1 hour/1 day":

- MIN (Page 167)
- MAX (Page 167)
- SUM (Page 168)
- NUM (Page 169)
- INT (Page 169)
- AVG and WAV (Page 170)

You can find an overview of the aggregation functions in:
Aggregation functionality (Page 165)

Application recommendations

Select the requested individual aggregate time interval in a way that ensures each possible query regarding query time interval and requested number of aggregates across the range. The requested number of single values for processing is limited to the number that can be processed within the available query time of 60 seconds.

Example

For a query, you want to calculate the "MAX" value over a period of one month.

Without aggregation

With a raw data cycle of 1 second, the query is calculated from the following volume of raw data:

60 (sec) x 60 (min) x 24 (h) x 30 (d) = 2,592,000 values

The query is calculated from 2,592,000 raw data items.

With aggregation:

MAX (30 days)

The query is calculated from 30 aggregate time intervals.

Aggregation functionality

Overview

In addition to the raw data for PCS 7 and WinCC, the aggregates are available in the database and can be opened via the OS clients and WinCC station. The additional computing time required to process the aggregates is lower than that for processing queries based on raw data.

The provision of a sophisticated access function allows the automatic selection of the correct aggregates and connection of the available pre-aggregate values, so that the query is processed as quickly as possible.

Calculation of the aggregates

The following calculation strategies are possible:

- The smallest required raw data sequence should be stored in the main memory (main memory capacity).
- The lowest number of required calculation operations must be performed (CPU performance).
- The raw data is transferred in ascending chronological order for calculation of the aggregates.

The interpolation strategy to be applied must be defined for each tag.

An aggregation structure, which is managed in Runtime, is required for each tag and aggregation level.

Example of aggregates

The following aggregations are possible, for example:

- Query across all aggregate values of a specific tag within a time range $T_Q=\{t_1...t_2\}$.
- Query across all aggregate values for all tags within a time range T_Q.
- Query of n aggregate values from a list of tags within a time range T_Q.

Calculated processing time without pre-aggregated data

The typical number of T_Q is 2 years, sometimes 5 years for extended applications.

The typical value range is from 12 (monthly) to 300. 1200 is a typical number of values requested by the Trend Control. In addition, limits can be requested depending on the queries and settings.

If such an average number of values is requested ad hoc, the amount of raw data to be processed can become very high.

T_Q=2 y, N=2 values/s * 60 s/m * 24 h/d * 365 d/y * 2 y = 126,144,000 values

With a maximum number of values of 100,000 / sec that have to be processed, the required processing time per tag remains very high:

$D_{Q(1)}$ = 126,144,000 values/100,000 values/sec = 1261.44 s = 21.024 min

The aggregate calculation is requested for 200 tags:

$D_{Q(200)}$ = 200 * 21.024 min/60 = 70.08 h

As a result, the assumed calculation rate of 100,000 values/s in the database requires an aggregation request over a period of two years of approx. 70 hours of processing time.

Combinations of aggregate values

Aggregates can be combined or derived in order to, for example, map the time intervals "A" and "B" in one aggregate.

The basic aggregates "MIN", "MAX", "SUM", "NUM" and "INT" must be saved to calculate the aggregates that can be derived from them.

Aggregates that can be combined:

MIN: MIN(A) x MIN(B)=MIN(A+B)

MAX: MAX(A) x MAX(B)=MAX(A+B)

SUM: SUM(A) x SUM(B)=SUM(A+B)

INT: INT(A) x INT(B)=INT(A+B)

Aggregates that can be derived:

The "AVG" and "WAV" aggregates from the time intervals "A" and "B" are derived from the base aggregates.

AVG

AVG(A) x AVG(B) = SUM(A)+SUM(B) / NUM(A) + NUM(B)

If the aggregate values SUM(A) and NUM(A) are known within the time domain, the AVG values need not be explicitly stored as aggregate values in the database. The AVG values are derived aggregate values from the basic aggregates "SUM" and "NUM" of the basic values.

WAV

WAV(A) x WAV(B) = INT(A)+INT(B) / |A| + |B|. For example, "|A|" is the absolute value of "A" within the time interval of "A".

If the size of the aggregation time interval is known, the "WAV(A)" value can be calculated from the base aggregate "INT(A)".

"MIN" aggregate

Definition

The "MIN" aggregate contains the smallest value within the raw data sequence of a time interval.

Calculation

If the time interval does not include any values, "MIN" is interpolated as follows.

The initial value and the final value of the raw data sequence of the aggregation time interval are calculated. The smallest value is saved as temporary "MIN" value in the main memory. The processed raw data is discarded.

Each value that is transferred afterwards is compared to the "MIN" value from the main memory. If the new value is smaller than the "MIN" value, the new value is used as the "MIN" value.

If the transmitted raw data value is outside the aggregation time interval, the last temporary "MIN value" from the main memory is published as a valid "MIN value".

The raw data value that was transferred last is entered as first temporary "MIN" value in the next aggregation time interval.

The dimension of the aggregate has the same dimension as the raw data.

Storage requirements

To implement the algorithm, 8 bytes per tag and aggregation level are required in the main memory in Runtime.

For 100,000 tags and 3 aggregation levels, the storage requirement is: 100,000 x 3 x 8 bytes = 2.4 MB.

"MAX" aggregate

Definition

The "MAX" aggregate contains the largest value within the raw data sequence of a time interval.

Calculation

The first transferred raw data value of the time interval is stored as temporary "MAX" value in the main memory. The processed raw data is discarded.

Each value that is transferred afterwards is compared to the "MAX" value from the main memory. If the new value is greater than the "MAX" value, the new value is used as the "MAX" value.

If the transmitted raw data value is outside the aggregation time interval, the last temporary "MAX value" from the main memory is published as a valid "MAX value".

The raw data value that was transferred last is entered as first temporary "MAX" value in the next aggregation time interval.

The dimension of the aggregate has the same dimension as the raw data.

Storage requirements

To implement the algorithm, 8 bytes per tag and aggregation level are required in the main memory in Runtime.

For 100,000 tags and 3 aggregation levels, the storage requirement is: 100,000 x 3 x 8 bytes = 2.4 MB.

"SUM" aggregate

Definition

The "SUM" aggregate contains the sum of all values within the raw data sequence of a time interval.

Calculation

The first transferred raw data value of the time interval is stored as temporary sum value in the main memory. The processed raw data is discarded.

Each subsequent transferred value is added to the temporary total value. The new total value is stored in the main memory. The processed raw data is discarded.

If the transmitted raw data value is outside the aggregation time interval, the last temporary "SUM value" from the main memory is published as a valid "SUM value".

The raw data value that was transferred last is entered as first temporary "SUM" value in the next aggregation time interval.

The dimension of the aggregate has the same dimension as the raw data.

Storage requirements

To implement the algorithm, 8 bytes per tag and aggregation level are required in the main memory in Runtime.

For 100,000 tags and 3 aggregation levels, the storage requirement is: 100,000 x 3 x 8 bytes = 2.4 MB.

"NUM" aggregate

Definition

The "NUM" aggregate contains the number of values within the raw data sequence of a time interval.

Calculation

As soon as the first raw data value for an aggregation time interval is transmitted, a temporary value with the number "1" is generated and stored in the main memory. The processed raw data is discarded.

For each value that is transferred afterwards, the "NUM" value in the main memory is increased by "1" and stored in the main memory. The processed raw data is discarded.

If the transmitted raw data value is outside the aggregation time interval, the last temporary "NUM value" from the main memory is published as a valid "NUM value".

The raw data value that was transferred last is entered as first temporary "NUM" value in the next aggregation time interval.

When no values are transferred in an aggregation time interval, an assumed "NUM" value is specified at the interval limit before the next raw data values are transferred.

The "NUM" aggregates are set to "-1" for a "Sample and Hold" interpolation and to "-2" for a linear interpolation. This shows that the aggregates "MIN", "MAX" and "SUM" were calculated from virtual values. With "NUM" = "-1" or "-2", the "AVG" values and "WAV" values are calculated correctly.

"NUM" aggregates have no dimension.

Storage requirements

To implement the algorithm, 8 bytes per tag and aggregation level are required in the main memory in Runtime.

For 100,000 tags and 3 aggregation levels, the storage requirement is: 100,000 x 3 x 4 bytes = 1.2 MB.

"INT" aggregate

Definition

The "INT" aggregate contains the result of an integration of all values of a raw data sequence within a time interval.

Calculation

Unlike the other aggregates, "INT" cannot be calculated from a raw data sequence alone within an aggregation time interval. The calculation of an integral from a specified time range requires a continuous function within the time interval. Available discrete interpolation points must be interpolated within the time interval before the integral value is calculated.

To interpolate, information about the last value of the low time interval range and the first value of the higher time interval range is required.

The following methods are used by the Process Historian for interpolation:

- Sample and Hold interpolation (INT1)
- Linear interpolation (INT2)

Storage requirements

To implement the algorithm, 8 bytes per tag and aggregation level are required in the main memory in Runtime.

For 100,000 tags and 3 aggregation levels, the storage requirement is: 100,000 x 3 x 8 bytes = 2.4 MB.

"AVG" and "WAV" aggregates

Definition

The "AVG" aggregate contains the arithmetic mean within the raw data sequence of a time interval.

The "WAV" aggregate contains the weighted mean within the raw data sequence of a time interval.

Calculation

"AVG" and "WAV" are calculated from the basic aggregates "NUM" and "SUM" or "INT".

Storage requirements

Additional memory is not required for the aggregate in Runtime.

3.1.4.5 Database Migration Wizard for PCS 7 and WinCC

Database Migration Wizard

Definition

To use WinCC segments of a PCS 7 or WinCC project on a new Process Historian server, migrate the segments with the Database Migration Wizard.

You migrate:

- Online segments from a running plant
- Backup segments from backup files

The Database Migration Wizard "ProcessdataMigrator.exe" is located in the installation path of the Process Historian under "\Siemens\ProcessHistorian\bin".

The Process Historian must be running to start the Database Migration Wizard.

Implementation in the system

Log entries are created in the Process Historian database for each migrated segment. The advantages:

- An aborted migration can be resumed at that point.
- Once a segment has been fully migrated, the segment is marked accordingly. This segment cannot be migrated again; duplicate data entries are avoided.
- You do not have to migrate all segments at once. At any time, you can migrate segments that have not yet been migrated.

Only data prior to the time the project first sent data to Process Historian will be migrated to the Process Historian database. This prevents duplicate data from being stored.

Step-by-step instructions

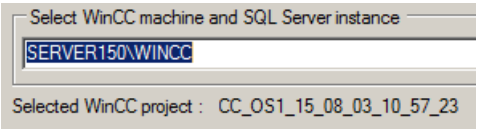
Migrating WinCC project online segments

Requirement

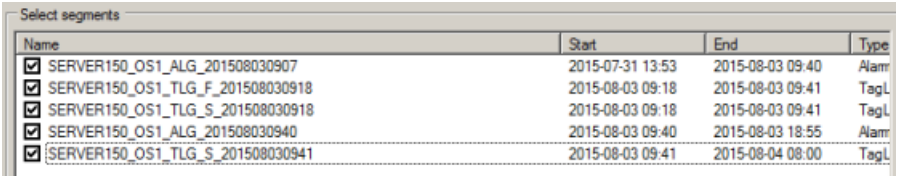
The online segments can only be migrated if the corresponding source system is running.

Procedure

1. Select the source "WinCC / PCS 7 OS" and the segment type "Online".
2. The dialog for the source path shows the available SQL instances in the network.
   Select the PC with the required project from the selection list.
   The selected WinCC project is displayed in the entry field.

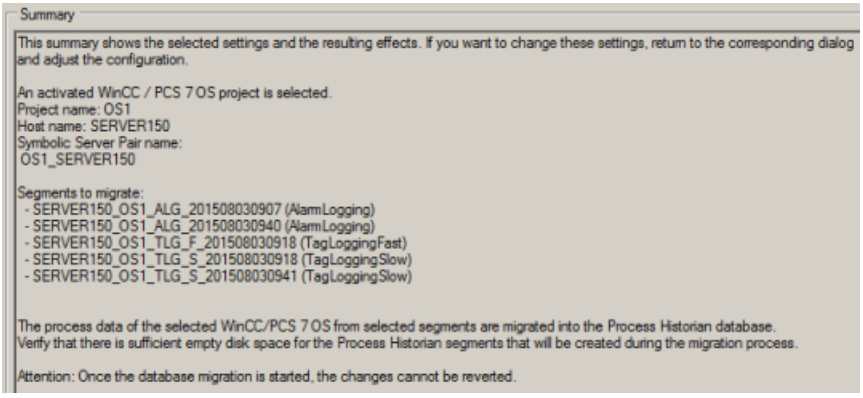


3. Select the segments you want to migrate. Disable all other segments. Use the shortcut menu to select and remove entries.
   In the example, three data segments of the TagLogging type and two data segments of the AlarmLogging type were selected.


Select segments

Name	Start	End	Type
SERVER150_OS1_ALG_201508030907	2015-07-31 13:53	2015-08-03 09:40	Alarm
SERVER150_OS1_TLG_F_201508030918	2015-08-03 09:18	2015-08-03 09:41	TagL
SERVER150_OS1_TLG_S_201508030918	2015-08-03 09:18	2015-08-03 09:41	TagL
SERVER150_OS1_ALG_201508030940	2015-08-03 09:40	2015-08-03 18:55	Alarm
SERVER150_OS1_TLG_S_201508030941	2015-08-03 09:41	2015-08-04 08:00	TagL

4. Check the displayed summary of the migration.


Summary

This summary shows the selected settings and the resulting effects. If you want to change these settings, return to the corresponding dialog and adjust the configuration.

An activated WinCC / PCS 7 OS project is selected.
Project name: OS1
Host name: SERVER150
Symbolic Server Pair name:
OS1_SERVER150

Segments to migrate:
- SERVER150_OS1_ALG_201508030907 (AlarmLogging)
- SERVER150_OS1_ALG_201508030940 (AlarmLogging)
- SERVER150_OS1_TLG_F_201508030918 (TagLoggingFast)
- SERVER150_OS1_TLG_S_201508030918 (TagLoggingSlow)
- SERVER150_OS1_TLG_S_201508030941 (TagLoggingSlow)

The process data of the selected WinCC/PCS 7 OS from selected segments are migrated into the Process Historian database.
Verify that there is sufficient empty disk space for the Process Historian segments that will be created during the migration process.

Attention: Once the database migration is started, the changes cannot be reverted.

5. If the summary is correct, start the migration.
   The progress of the migration is displayed.
6. When the migration is complete, stop the database migration wizard by clicking "Finish".

Result

The selected data from the WinCC Project Online were migrated to the current Process Historian database.

Migrating WinCC project backup segments

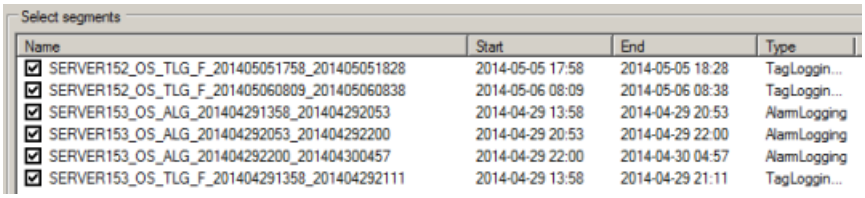
Requirement

The backup segments can only be migrated if the path where the backup segments are located is accessible.

Procedure

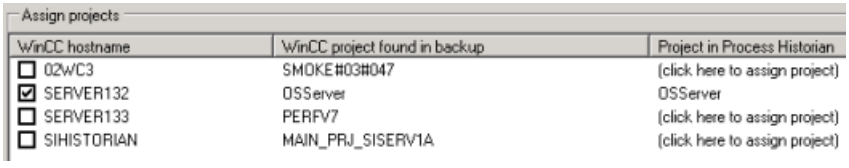
1. Select the source "WinCC / PCS 7 OS" and the segment type "Backup".
2. In the following dialog, select the "Add segments" or "Add folders" entry under "Add" in the shortcut menu of the displayed field. Use the shortcut menu to select and remove entries.

3. Select the desired segments.

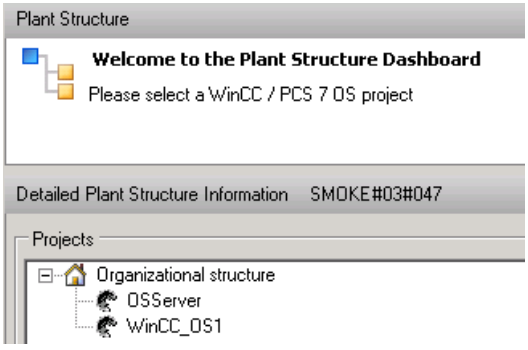


The Database Migration Wizard checks the selected segments for any WinCC projects they contain. A list of all projects found is output.

4. Double-click in the "Project in Process Historian" column to assign the found project to a project in Process Historian. After this selection, the corresponding "WinCC hostname" column is selected automatically. In the end, check to ensure that the "WinCC hostname" column is selected for all projects you want to migrate.

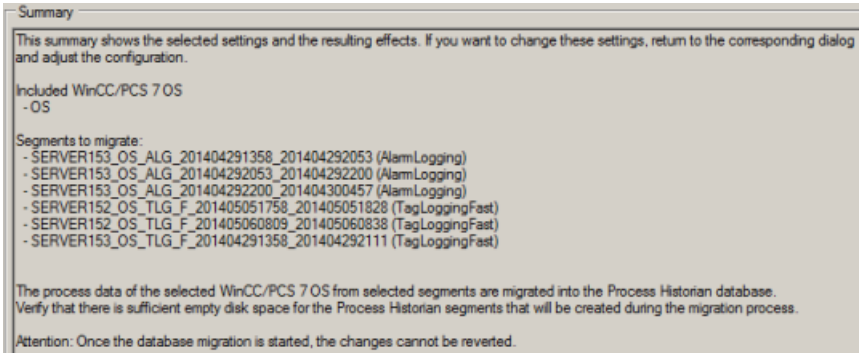


5. The plant structure with the Process Historian projects available for selection opens. Select the path in which you want to save the migrated project. The name of the assignable WinCC project is shown in the header of the projects available for selection.



The selected Process Historian project is displayed in the project assignment dialog.

6. Check the displayed summary of the migration.



7. If the summary is correct, start the migration.
   The progress of the migration is displayed.
8. When the migration is complete, stop the database migration wizard by clicking "Finish".

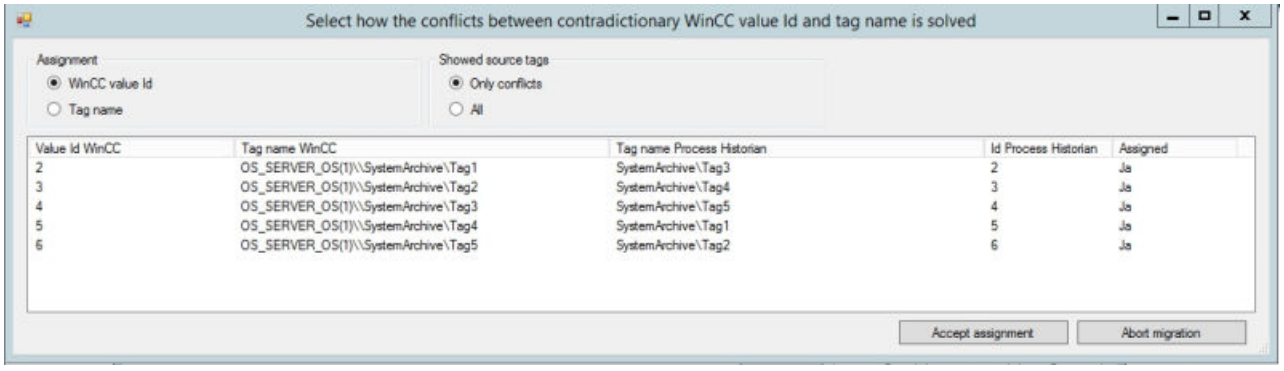
Procedure for contradictory tag assignments

The migration of tags of the backup segments of a WinCC project to a Process Historian project based on the "WinCC value ID" will occasionally result in contradictory tag assignments.

"WinCC value ID" and tag name are usually identical. However, the following contradictions are possible:

- If the WinCC value IDs are the same, the tag names are different.
- There are different WinCC value IDs for the same tag names

During migration, a dialog window appears for the segment in which these contradictions are first identified. In this dialog, you can define how incorrect assignments are resolved.



1. Specify over which properties you want to migrate the tags:
   - Assignment via the "WinCC value ID" (default response).
   - Assignment using the tag name.

   The table is restructured when you select this type of assignment. You can change the arrangement of the columns.
2. Select which tags of the backup segment are displayed in the table:
   - Only the conflicting tags are displayed (default response).
   - All tags of the backup segment whose value ID or tag name already exist on the database are displayed.

   The "Assigned" column indicates whether a tag is assigned and can therefore be migrated.
3. Click "Accept assignment" to apply the selected assignment for this segment and for all other selected segments. Or abort the migration (Abort migration).

NOTICE
Selected assignment applies automatically to all other segments The selected assignment automatically also applies to all other segments that you have selected for migration with the conflicting segment. Regardless of whether the segments have additional or other contradictions.

Result

The selected data from the WinCC project backup has been migrated to the current Process Historian database.

3.1.5 Properties (Process Historian server)

3.1.5.1 Description

The elements of the organizational structure of the Process Historian database and the extended structure can optionally have a multilingual description.

3.1.5.2 Locked

Indicates whether the project is locked for deletion:

- No: The project is not locked. The project data can be deleted. The project or data source can only be deleted if no data transfer has taken place for about 15 minutes.
- Yes: The project is locked. You can deactivate the lock.

3.1.5.3 Restore messages

Indicates whether the Process Historian retrieves the alarm data subsequently from the data source.

3.1.5.4 Restore measured values

Indicates whether the Process Historian retrieves the measured values subsequently from the data source.

3.1.5.5 Send

Shows the status of the connection between the Monitoring & Control / OS / WinCC servers and Process Historian:

- Yes: The connection is established. The Monitoring & Control / OS / WinCC servers can send data to the Process Historian. You see the last transmission of the data in the last columns of the overview.
- No: No connection is established. Therefore, no data is supplied to the Process Historian.

3.1.5.6 Last lifebeat

Time stamp when the contact between server and Process Historian was last successfully checked.

3.1.5.7 Last alarm data

Time stamp when the last message data was transferred from the server to the Process Historian.

3.1.5.8 Last measured value data

Time stamp when the last measured value data was transferred from the server to the Process Historian.

3.1.5.9 Last message configuration

Time stamp when the configuration data for the messages was last transferred from the server to the Process Historian.

3.1.5.10 Last measured value configuration

Time stamp when the configuration data for the measured values was last transferred from the server to the Process Historian.

3.1.5.11 Number of delayed segments

Number of saved archive segments that are not set "Offline" until later after the automatic backup. This extends the period of time during which the archived data can be read.

For For example, the segment size is "1 week" and the number of delayed segments is set to "2". The segments that are older than two weeks are set "Offline".

3.1.5.12 Status

Status of a segment with regard to access options:

- Online: Process Historian has read access to the data. You can display the data of the runtime segments and archive segments, e.g. via trend display or in the information server.
- Offline: The archive segment data has been successfully exported to a backup file and removed from the Process Historian database. The Process Historian can only access the data in a read-only mode again when the archive segment has been restored and is in the "Online" state.

3.1.5.13 Total number of Runtime segments

The total number of Runtime segments includes:

- The Runtime segments that are available for archiving. Minimum 4, maximum: 52.
- The future segments that are reserved for future data. Minimum 1, maximum: 10.

3.1.5.14 Time interval

The time domain that a segment comprises.

The time span is determined by the unit, e.g. week, and the factor.

3.1.5.15 Unit

Specifies the time range that a segment covers:

- Day
- Week
- Month

3.1.5.16 Factor

Integer multiplier for the configured unit of time interval.

For example, Factor "2" and "Week" unit: the segment covers a period of two weeks.

3.1.5.17 Anchor point

Date and time when the segmentation starts.

3.1.5.18 Tag licenses

Displays the number of available, required, and free tag licenses for the Process Historian system.

The Process Historian requires tag licenses for the PCS neo data source. If no licenses are available, a trial license is activated for 30 days.

3.1.5.19 Project license status

Displays the following for the selected project:

- Name of the project
- Type of project (Page 178)
- Number of tags used

3.1.5.20 Type

The elements of the organizational structure of the Process Historian database are linked to a type in order to assign the data to a project type or physical data source. The assigned type can be changed for the created extended structure.

3.1.5.21 License status of the Process Historian

Shows the availability and validity of licenses for the Process Historian.

3.1.5.22 Backup type

Specifies the backup type of the Process Historian database for automatic backup:

- "Disabled": Automatic database backup is disabled.
- "Incremental": If all data groups are backed up in files once, the "Completed" backup status is displayed. Only from this point on a recovery with the current database backup is possible. A backup is then created continuously in additional files for a data group that has been changed in the meantime or for the oldest data group. The oldest backup of this data group is deleted so that the hard disk space does not increase indefinitely. A recovery is always possible up to the point in time at which the last data group was saved.
- "Cyclic full backup": The database is backed up in full in a single backup file after a specified cycle (days). The time stamp with date and time are part of the name of the backup file. The backup of the database is completed much faster than the incremental backup. The database backup is finished when the "Completed" backup status is displayed. A recovery of the backed up file restores the data until the database backup is complete.

3.1.5.23 Backup options

The backup options help you test the data integrity of the database backups so that it is possible to restore the database after the backup.

You can enable the following backup options:

- Verify backup file (If the backup time increases by approx. 50 %)
  The option verifies the backup, but does not restore the backup. The option provides the greatest possible assurance that the database can be restored from the backup file. The option performs checks such as:
  - Checksum
  - Some header fields on the data pages
  - The status of the backup

  If an error is found, an incremental backup will not continue and must be restarted.
- You can specify for the manual backup and the cyclic full backup whether the Process Historian service is disabled during the backup. Thus, the backup process is faster. After the backup is complete, the Process Historian service is reactivated. No runtime data is archived during deactivation.
  You should select the option especially for large databases and a high base load. Because when the service is running, the full backup and normal archiving can interfere with each other.

3.1.5.24 Backup status

Displays the progress of the database backup. If no backup is made, the status is "Inactive".

3.1.5.25 Destination path

Drive and folder on which the Process Historian database is backed up.

3.1.5.26 Alternative path

Alternative drive on which the Process Historian database is backed up.

3.1.5.27 Status

Status of the database backup. Possible states:

- Automatic backup not configured.
- Empty. The database backup has been successfully performed.
- Verification running.
- Operation aborted: Not enough free disk space {0}.
- Operation aborted: An unspecified error has occurred.
- Operation aborted: Write attempt denied.
- Operation aborted: Destination path is not valid.

3.1.5.28 Scheduler status "Backup"

Status of the task scheduler for automatic backup:

- Active: The automatic backup scheduler is active. The scheduler settings are used for the backup.
- Inactive: The automatic backup scheduler is not used.

3.1.5.29 Scheduler status "Delete"

Status of the task scheduler for automatic removal:

- Active: The scheduler for automatic removal is active. The scheduler settings are used for the removal.
- Inactive: The scheduler for automatic removal is not used.

3.1.5.30 Number of batches

Displays the following in the "SIMATIC BATCH Backup/Restore" dashboard in the "Number of batches" area:

- Total: Number of selected batches in the "Batch selection" table.
- Backed up: Number of backed up batches selected for backup in the "Batch selection" table.

3.1.5.31 Displayed

Number of batches displayed in the "Batch selection" table.

3.1.5.32 Selected

Number of selected batches in the "Batch selection" table.

3.1.5.33 Redundancy status

Shows whether the project is integrated in a redundant system and what role the computer plays, e.g. "Stand-alone" or "Master".

3.1.5.34 Redundancy license status

Shows the availability of the license for redundant operation of the Process Historian.

3.2 Process Historian OPC UA Server

3.2.1 Concepts

3.2.1.1 Basics of the Process Historian OPC UA Server

Definition

Process Historian provides an integrated OPC UA server as an option. It allows external OPC UA applications to communicate with the Process Historian server.

OPC UA is a standardized interface of the OPC Foundation with an integrated security concept and a high-performance information model for providing data in a uniform address space.

OPC UA for Process Historian supports the "OPC UA 1.03" specification of the OPC Foundation. Detailed information on the OPC UA specifications:
http://www.opcfoundation.org (http://www.opcfoundation.org)

Implementation in the system

OPC UA for Process Historian supports the following OPC UA services and profiles. Only the binary OPC UA protocol with the "UA-TCP UA-SC UA Binary" profile is used for communication.
Supported OPC UA services (Page 186)
Supported OPC UA profiles (Page 187)

The security concept is implemented in the OPC UA for the Process Historian.
Security concept of the Process Historian OPC UA Server (Page 182)

The external OPC UA applications have read access to the following data of the local Process Historian server:

- Configuration data
  - Project structure of the Process Historian server
  - Tag configuration and process values
  - Alarm logging
- Archived data:
  - Process values
  - Messages

The archived runtime data is available from the OPC UA client via the "HistoryRead" service.

OPC UA for Process Historian also includes the OPC UA Local Discovery Server.
Discovery Server (Page 191)

Application recommendations

The OPC UA Server for the Process Historian is pre-configured during installation. You can change the server configuration if needed.
Configuring the Process Historian OPC UA Server (Page 183)

You can reach the OPC UA server via the URL "opc.tcp://[HostName]:[Port]". HostName is a placeholder for the name of the PC and is set automatically. The default port is "4852".

The OPC UA information model for Process Historian is described in detail in the "OPC UA Information model" document. This document is available on the Internet in English.
OPC UA information model (https://support.industry.siemens.com/cs/de/de/view/109795398)

3.2.1.2 Security concept of the Process Historian OPC UA Server

Overview

The security concept of OPC UA is essentially based:

- On the authentication and authorization of participating applications and users.
- On ensuring the integrity and confidentiality of messages exchanged between applications.

Certificates are the mechanism to authenticate the OPC UA applications. Each application has its own instance certificate and thus identifies itself within the public key infrastructure (PKI).

The security mechanisms used, e.g. algorithms for encryption and signing, are defined by standardized security guidelines. You can find details in the OPC UA specification under "Part 2", "Part 4" and "Part 7".

Implementation in the system

The following certificates are used in the OPC UA Server for the Process Historian.

- Instance certificate of the Process Historian OPC UA server (Page 188)
- Trusted client certificates of the Process Historian OPC UA server (Page 189)
- Rejected client certificates of the Process Historian OPC UA server (Page 191)

In addition to the security mechanisms of the communication level, the OPC UA server also supports the authentication of the user of the client applications. To do this, the client application must specify a valid combination of user name and password when setting up the communication. The OPC UA server checks the combination in the user management of the operating system.

The security policies, user identities supported by the OPC UA server and the certificates used are configured in the "OpcUaServerPH.xml" configuration file.
Configuration file "OpcUaServerPH.xml" (Page 191)

The certificates expire after five years. You must then create new self-signed certificates.
Renew expired certificates (Page 186)

Note

Requirements for secure communication

- Instance certificate for server and client
- Correct configuration of certificate stores

3.2.2 Use cases

3.2.2.1 Configuring the Process Historian OPC UA Server

Requirement

- The OPC UA Server for the Process Historian is installed.
- You have familiarized yourself with the security concept of the OPC UA Server.
  Security concept of the Process Historian OPC UA Server (Page 182)

Note

Changing the server configuration

An improper change of the server configuration can lead to operation faults and/or security gaps.

The server may only be configured by qualified personnel.

Procedure

1. Open the "OpcUaServerPH.xml" configuration file from the installation folder in "\Siemens \PH-OPCUAServer".
   Configuration file "OpcUaServerPH.xml" (Page 191)
2. Change the port number if needed.
   Editing the port number (Page 184)
3. Make the security settings for communication.
   Configuring security settings (Page 184)
4. Set the user identification for the connection setup.
   Configuring user identification (Page 185)

Result

The pre-configuration of the OPC UA server for the Process Historian was changed.

See also

Installing the Process Historian OPC UA Server (Page 32)

3.2.3 Step-by-step instructions

3.2.3.1 Editing the port number

Requirement

The configuration file "OpcUaServerPH.xml" is open
Configuration file "OpcUaServerPH.xml" (Page 191)

Procedure

1. Under <BaseAdresses>, change the default port number "4852".
   Do not use a port number that is used by another application.
   Note the firewall settings.
   Firewall settings (Page 18)

Example

```
<BaseAdresses>
<ua:String>opc.tcp://[HostName]:5210</ua:String>
<BaseAdresses>
```

The parameter [HostName] is a placeholder for the name of the PC and is determined during runtime.

Result

The port number of the Process Historian OPC UA server has been changed.

3.2.3.2 Configuring security settings

Requirement

- You have worked with the security concept of the OPC UA server.
  Security concept of the Process Historian OPC UA Server (Page 182)
- The configuration file "OpcUaServerPH.xml" is open
  Configuration file "OpcUaServerPH.xml" (Page 191)

Procedure

1. Under `<SecurityProfileUris>`, set the supported "Security Policies".
   - Enable the setting with "`true`".
   - Disable the setting with "`false`".
2. Under `<SecurityPolicies>`, set the "Message security modes".
   To disable a setting, delete the complete entry `<SecurityPolicy>... </SecurityPolicy>`.

Example

```
<SecurityProfile>
   <ProfileUri>http://opcfoundation.org/UA/SecurityPolicy#None</ProfileUri>
   <Enabled>false</Enabled>
</SecurityProfile>
<SecurityPolicy>
   <ProfileUri>http://opcfoundation.org/UA/SecurityPolicy#None</ProfileUri>
   <MessageSecurityModes>None</MessageSecurityModes>
</SecurityPolicy>
```

Result

You have defined the security settings OPC UA server.

3.2.3.3 Configuring user identification

Requirement

- You have worked with the security concept of the OPC UA server.
  Security concept of the Process Historian OPC UA Server (Page 182)
- The configuration file "OpcUaServerPH.xml" is open
  Configuration file "OpcUaServerPH.xml" (Page 191)

Procedure

1. Under `<UserTokenPolicies>`, set the user identification for the connection setup.
2. To disable a setting, delete the entire entry.

Example

```
<UserTokenPolicy>
```

```
<TokenType>Anonymous</TokenType>
</UserTokenPolicy>
```

Result

User identification has been defined.

3.2.3.4 Renew expired certificates

Procedure

1. Delete the expired certificates and the certificate folder with the private key from the PH-OPC UA server installation path:
   - C:\Program Files\Siemens\PH-OPCUAServer\bin\PKI\OPCUAServer\own\certs
   - C:\Program Files\Siemens\PH-OPCUAServer\bin\PKI\OPCUAServer\own\private
2. On the PC on which you want to create the certificates, start the command prompt as administrator.
   Run "OpcUaServerPH -CreateCertificate". After that, the new certificates are located in the corresponding folders:
   - C:\Program Files\Siemens\PH-OPCUAServer\bin\PKI\OPCUAServer\own\certs
   - C:\Program Files\Siemens\PH-OPCUAServer\bin\PKI\OPCUAServer\own\private
3. Copy the newly created certificates from "C:\Program Files\Siemens\PH-OPCUAServer\bin\PKI\OPCUAServer\own\certs" to the certificate stores of the trusted certificates (installation folder\...\trusted\certs\) of the OPC UA clients connected to the PH-OPC-UA Server.

Result

New self-signed certificates have been created.

3.2.4 Supported OPC UA services

Definition

The following table summarizes the functionality supported by OPC UA server 1.0.3 for accessing the Process Historian OPC UA server:

OPC UA Service Sets	Services	Comment
Discovery Service Set	FindServers GetEndpoints	Determining the available OPC UA servers
Secure Channel Service Set Session Service Set	Everybody	Establishing a secure communication channel User authentication and session management

OPC UA Service Sets	Services	Comment
View Service Set	Browse BrowseNext	Address space browsing to determine the tags and objects of the Process Historian
Attribute Service Set	Read HistoryRead	Read property value Read process values or messages archived in Process Historian
Subscription Service Set	CreateSubscription SetPublishingMode Publish RePublish DeleteSubscription	Creation, modification and deletion of subscriptions
MonitoredItem Service Set	CreateMonitoredItems SetMonitoringMode DeleteMonitoredItems	Only for standard UA variables, for example: Server/ServerStatus/State

3.2.5 Supported OPC UA profiles

Definition

The OPC UA server for Process Historian supports the following OPC UA 1.03 profiles without restrictions:

- 6.5.3 Base Server Behavior Facet
- 6.5.14 A & C Base Condition Server Facet
- 6.5.30 Historical Raw Data Server Facet
- 6.5.107 UA-TCP UA-SC UA Binary
- 6.5.125 SecurityPolicy - Basic256
- 6.5.124 SecurityPolicy - Basic128Rsa15
- 6.5.123 SecurityPolicy - None

The OPC UA server for Process Historian supports the OPC UA profiles shown in the following table and Conformance Units with restrictions:

Profile	"Group"	Unsupported "Conformance Unit"
6.5.8 Standard DataChangeSubscription Server Facet	Monitored Item Services	ModifyMonitoredItems DeadBand Filter Monitor MinQueueSize_02
6.5.9 Enhanced DataChange Subscription Server Facet	Monitored Item Services	Monitor MinQueueSize_05
6.5.47 Standard UA Server Profile	Attribute Services	Attribute Write StatusCode & Timestamp

3.2.6 Instance certificate of the Process Historian OPC UA server

Overview

Each OPC UA server for Process Historian requires its own instance certificate with a private key for secure operation. The certificate is only valid on the respective PC. Only the OPC UA server installed on this PC is used.

A self-signed instance certificate of the OPC UA server is generated when the OPC UA server is installed for the Process Historian. The instance certificate is stored in the certificate folder of the OPC UA server as well as in the certificate store of the OPC UA Local Discovery Server.

The private key to this certificate is only stored in the certificate folder. You must restrict access to the private key folder to:

- The server itself
- The administrator of the plant

Note

Access to the folder of the private key

For security reasons, only the OPC UA server itself and the administrator may have access to the private key of the OPC UA server.

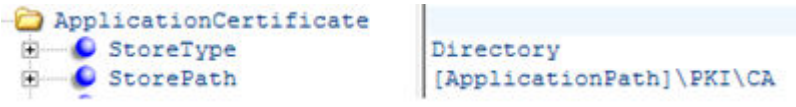
The instance certificate created during installation and the corresponding private key can be replaced by the plant administrator. Depending on the respective security concept of the installation, the new instance certificate can be self-signed or issued by a certification body.

You define the storage location for the instance certificate of the OPC UA server in the "OpcUaServerPH.xml" configuration file in the "ApplicationCertificate" folder.

Parameter	Value	Meaning
StoreType	Directory	Type of certificate storage. The storage must be "Directory".
StorePath	[ApplicationPath]\PKI\CA	The certificate and the private key are stored under this folder.

Example

The instance certificate of the server is in the directory "PKI\CA\Certs". The private key is located in the directory "PKI\CA\Private".



3.2.7 Trusted client certificates of the Process Historian OPC UA server

Overview

The OPC UA server for the Process Historian supports secure communication only with trusted clients. A client is trusted under the following conditions:

- The client has a valid self-signed certificate that is stored in the certificate store of the trusted certificates of the OPC UA server.
- The valid certificate of the client was issued by a certificate authority. The valid certificate of the certificate authority must be stored in the certificate store of the trustworthy certificates of the OPC UA server.
  In this case, only the certificate of the certificate authority must be available. The instance certificate of the client does not have to be in the certificate store of the trusted certificates.

Note

Trustworthiness of certificates from certificate authorities

The certificates from the certificate authority repository are not automatically considered trustworthy.

For a certificate authority to be trusted, its certificate must be stored in the trusted certificates store.

Storage location of the trusted certificates

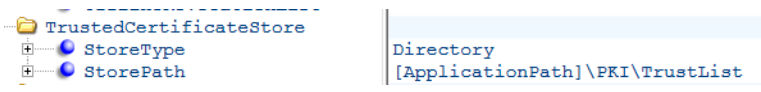
You define the storage location of the trusted certificates in the "OpcUaServerPH.xml" configuration file in the "TrustedCertificateStore" folder:

Parameter	Meaning
StoreType	Type of certificate storage. Storage can be "Directory" or "Windows".
StorePath	The certificates of the trusted clients are stored under this folder.

Example

Configuration with "Directory" storage

In this example, the PH OPC UA server trusts all clients whose instance certificate is located in the "PKI\TrustList\Certs" folder.



Configuration with "Windows" storage

In this example, the instance certificates of the clients must be located in the certificate store of the operating system under "<Local PC>\UA Applications".

```
TrustedCertificateStore
  StoreType          Windows
  StorePath          UA Applications
```

Storage location of certificates issued by a certificate authority

You define the storage location of the trusted certificates from a certificate authority in the "OpcUaServerPH.xml" configuration file in the "IssuerCertificateStore" folder:

Parameter	Meaning
StoreType	Type of certificate storage. Storage can be "Directory" or "Windows".
StorePath	The certificates of the trusted certificate authorities are stored under this folder.

Note

Requirements for the certificates from certificate authorities

- The storage type of the server certificate must be "Directory".
- The two repositories for trusted client certificates and for the certificates of the certificate authorities must have the same "StoreType", i.e. either both "Directory" or both "Windows".

Example

Configuration with "Directory" storage

The certificates of the trusted certificate authorities are located in the "PKI\CA\Certs" folder.

```
IssuerCertificateStore
  StoreType          Directory
  StorePath          [ApplicationPath]\PKI\CA
```

Configuration with "Windows" storage

```
IssuerCertificateStore
  StoreType          Windows
```

The "StorePath" parameter is irrelevant in this example. You must store the certificates of the certificate authorities in the Windows certificate store according to the specifications of the operating system.

The certificates that are in one of the following paths are trusted:

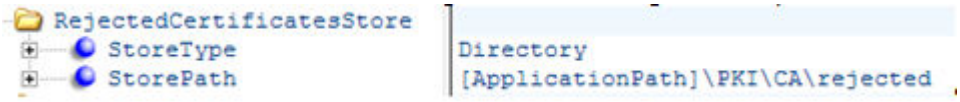
- <Local PC>\trustworthy root certification bodies
- <Local PC>\third-party master certification bodies

3.2.8 Rejected client certificates of the Process Historian OPC UA server

Overview

If a OPC UA client accesses the OPC UA server for the Process Historian whose certificate is not trustworthy, the OPC UA server rejects the secure communication. The OPC UA server copies the client's certificate to the rejected certificate folder.

You define the storage location of the rejected certificates in the "OpcUaServerPH.xml" configuration file in the "RejectedCertificateStore" folder.



Note

Only the "Directory" "StoreType" is supported.

To enable secure communication with this client, move the rejected certificate to the certificate store of the trusted certificates.

3.2.9 Discovery Server

Definition

The OPC UA Local Discovery Server (LDS) of the OPC Foundation enables OPC UA client applications to obtain information about available OPC UA servers.

The OPC UA server logs in to no, one or more discovery servers depending on the configuration. These servers can be installed on the same or different PCs.

Note

Change or add the firewall rules from the OPC UA LDS.

3.2.10 Configuration file "OpcUaServerPH.xml"

Definition

Use the "OpcUaServerPH.xml" file to configure the OPC UA server for the Process Historian. You can find the configuration file in the installation folder under "\Siemens\ProcessHistorian\bin".

Section <Secured Application>

In this section, the OPC UA application security is set according to the OPC UA Specification / Part 6 / § "Security Settings Management".

`<Secured Application>`	

`<BaseAddresses>`
`<...></...>`
`</BaseAddresses>.`
	Configuration of the URL for the OPC UA server

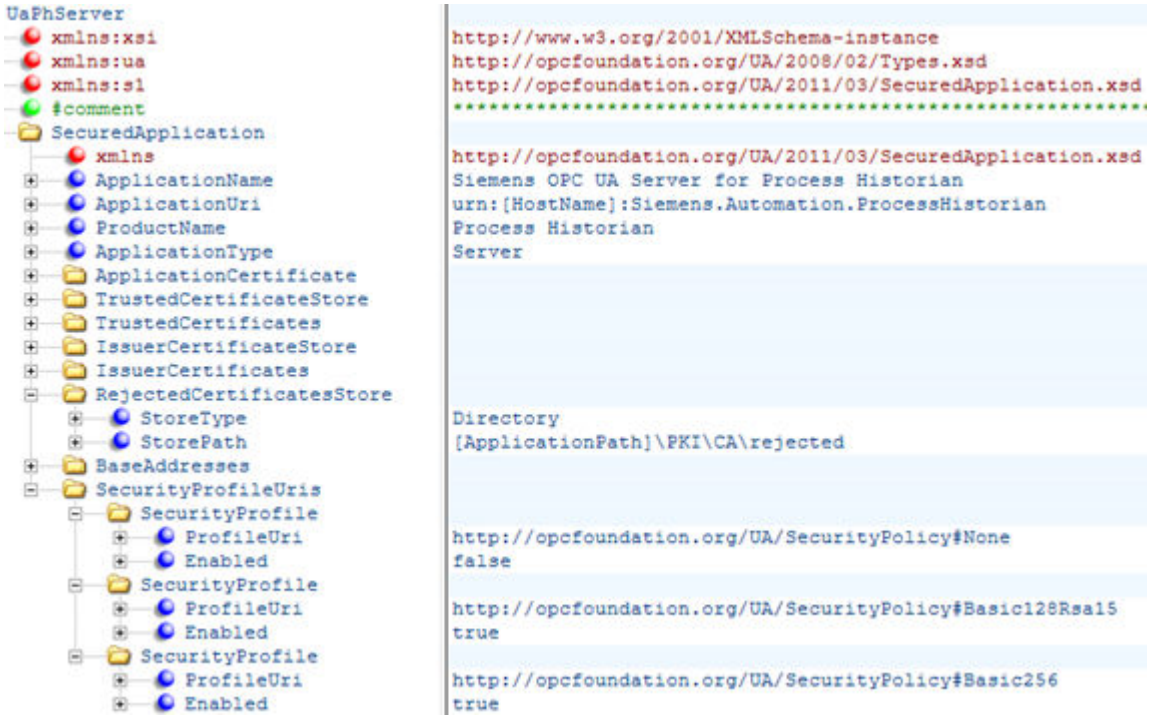
`<SecurityProfileUris>`
`<SecurityProfile>`
`<...></...>`
`</SecurityProfile>`
`...`
`</SecurityProfileUris>`
	Configuration of the supported security policies
	Use the "none" setting only for test or diagnostic purposes.

`<ApplicationCertificate>`
`<TrustedCertificateStore>`
`<TrustedCertificates>`
`<...>`
	Revision of the default certificate configuration according to OPC UA Specification / Part 6
	(optional)

`</Secured Application>`	

The security mechanisms are explicitly enabled or disabled via "SecurityProfileUris".

Below, you see a SecuredApplication in which unsecured communication is disabled:



Section <Server Configuration>

`<Server Configuration>`	

`<SecurityPolicies>`
`<SecurityPolicy>`
`<...></...>`
`</SecurityPolicy>`
`...`
`</SecurityPolicies>`
	Configuration of the Message Security Modes.
	Use the "none" setting only for test or diagnostic purposes.

`<UserTokenPolicies>`
`<UserTokenPolicy>`
`<...></...>`
`</UserTokenPolicy>`
`...`
`</UserTokenPolicies>`
	Configuration of the user identification
	Use the "Anonymous" setting only for test and diagnostic purposes

`<Server Configuration`	

"SecurityPolicies" contains the list of all combinations of "Security Profile" and "Message Security Mode" that can be used by the server.

Security Profile	Message Security Mode	Description
http://opcfoundation.org/UA/SecurityPolicy#None	None	Unsecure communication
http://opcfoundation.org/UA/SecurityPolicy#Basic128Rsa15	Sign or SignAndEncrypt	Secure communication, signed or encrypted and signed messages
http://opcfoundation.org/UA/SecurityPolicy#Basic256	Sign or SignAndEncrypt	Secure communication, signed or encrypted and signed messages

When setting up the communication, the UA clients select the desired "SecurityPolicy" from this list.

Note

Secure communication between client and server

In production mode, use the following settings as a minimum for secure communication between client and server:

- SecurityPolicy: Basic 128Rsa15
- Message Security Mode: Sign

With the following configuration of user identities, the PH OPC UA server supports both anonymous users and the "UserTokenPolicy" "UserName".

Example of a configuration file with maximum functionality