

ADMINISTRATION HANDBOOK

INSTALL. CONFIGURE. MONITOR.

IMPRINT

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1. INTRODUCTION

This document provides information for system administrators on how to administer the FACTON EPC 10.1 product. It describes all activities and actions necessary to run the system, including starting, running and stopping the FACTON software.

The reader should understand, at least at a basic level, the following technologies or products:

- Microsoft Windows Server technologies and administrative tools (e.g. Event Logs, Performance Counter, Event Tracing for Windows, Certificate Management)
- Microsoft SQL Server
- Claim-based authentication and security token services (e.g. ADFS)

2. SYSTEM OVERVIEW

This chapter describes the FACTON System components in detail.

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2.1. SYSTEM ARCHITECTURE

The software architecture of FACTON EPC is based on the advanced three-layer model (see figure »Advanced Software Architecture«). This architecture guarantees that all users can cooperate with each other in a single system having access to a shared database and a standardized cost layout. Access to the system is controlled on the basis of the user's tasks and privileges.

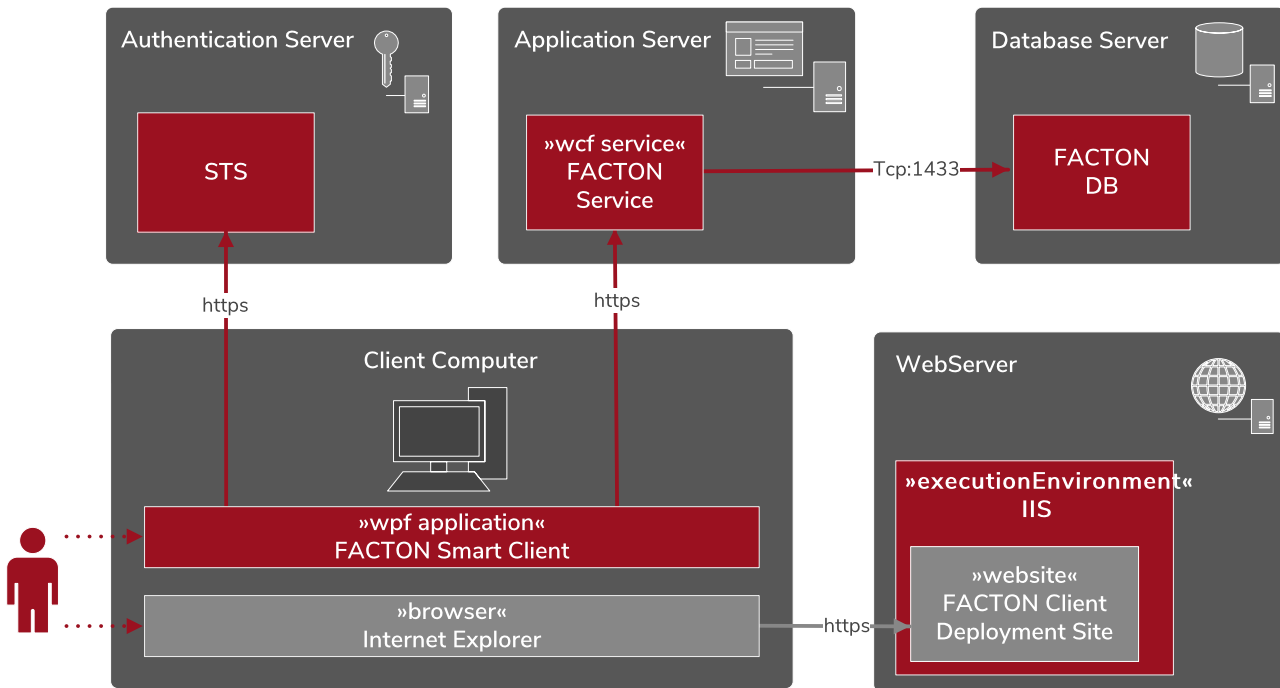


Figure 2.1: Advanced Software Architecture

The three-layer architecture consists of:

- **One Database Server** for secure storage of the essential calculation data,
- **1 ... n Application Server(s)** for fast access to calculations and results,
- **1 ... n Client(s)** that provide the user interface of the application whose tools are designed in line with standard office applications, such as MS Office, for user-friendliness and enhanced efficiency.
- **One Web server** that executes the MS Internet Information Services for client deployments via Click-Once.
- **One Authentication Server** that processes the authentication of users and hosts security token services.

All client computers are located in the customer's intranet. The authentication server, the application server and the database server are located either in the customers intranet, or on cloud services.

FACTON SERVICES

All FACTON services are HTTP/HTTPS services (see Table 1.1).

Service (Computer)	Description
	<p>A WCF (Windows Communication Foundation) service with two tasks</p> <ul style="list-style-type: none"> ■ Providing metadata for the client on the client-server connection ■ Enabling access to the FACTON database only for authenticated clients
FACTON EPC Application Service	<p>There are two endpoints¹:</p> <p>https://<ServerIP>:<ServerPort>/facton/server/mex (Metadata Exchange)</p> <p>https://<ServerIP>:<ServerPort>/facton/server/secured (Application Communication)</p>
FACTON EPC Identity Broker	<p>The FACTON Identity Broker is an intermediary service that connects an external identity provider with the FACTON Clients using one of the following protocols:</p> <ul style="list-style-type: none"> ■ OpenID Connect 1.0 ■ WS-Federation 1.2

Table 2.2: Overview of FACTON Services

¹All communication with a Windows Communication Foundation (WCF) service occurs through its endpoints. These endpoints contain four types of information: Protocol, machine name, port and endpoint path. This path is a virtual path that has no physical representation on the system.

FACTON CLIENT

The FACTON Client is the local FACTON installation on the users workstation. The configuration data transfer is carried out using the metadata exchange (system parameter ENDPOINT_MEX) endpoint. All other communication between the FACTON Client and the FACTON Application Service is carried out using the service endpoint (system parameter ENDPOINT_SERVICE).

Requests between the FACTON Client and the FACTON Application Service can take up to 20 minutes. Be sure that all physical components as well as software involved with network communication support those requests.

We suggest to set all relevant connection timeouts to at least 21 minutes.

FACTON EPC CLICKONCE WEBSITE

The FACTON ClickOnce website is based on one of the web servers that hosts the customer's website, which allows ClickOnce access to the client DLLs via a web link.

If a user clicks on a link on the corresponding page in Internet Explorer, the FACTON Client is automatically loaded onto the user's PC and launched.

2.2. AUTHENTICATION

FACTON users are authenticated via an external identity provider like e.g. ADFS. This identity provider is mandatory and must support one of the following standard protocols:

- OpenID Connect 1.0
- WS-Federation 1.2
- WS-Trust 1.3 with Windows Integrated Authentication (WIA)

OPENID CONNECT 1.0 AND WS-FEDERATION 1.2

The FACTON Identity Broker is required for the integration of an identity provider via OpenID Connect or WS-Federation. The FACTON Identity Broker is an intermediary service that connects an external identity provider with the FACTON Clients. It is responsible for creating a trust relationship with the external identity provider in order to use its identities to access the FACTON services.

The FACTON Identity Broker provides the following advantages over the direct connection of the FACTON client and the external identity provider via WS-Trust:

- All browser-based authentication methods of the external identity provider are supported
- Federation scenarios are supported
- Configuration changes of the external identity provider, e.g. certificate updates, are automatically detected and considered

Therefore this scenario is preferred over the authentication by WS-Trust with Windows Integrated Authentication. The following diagram shows the browser-based authentication flow supported by the FACTON Identity Broker:

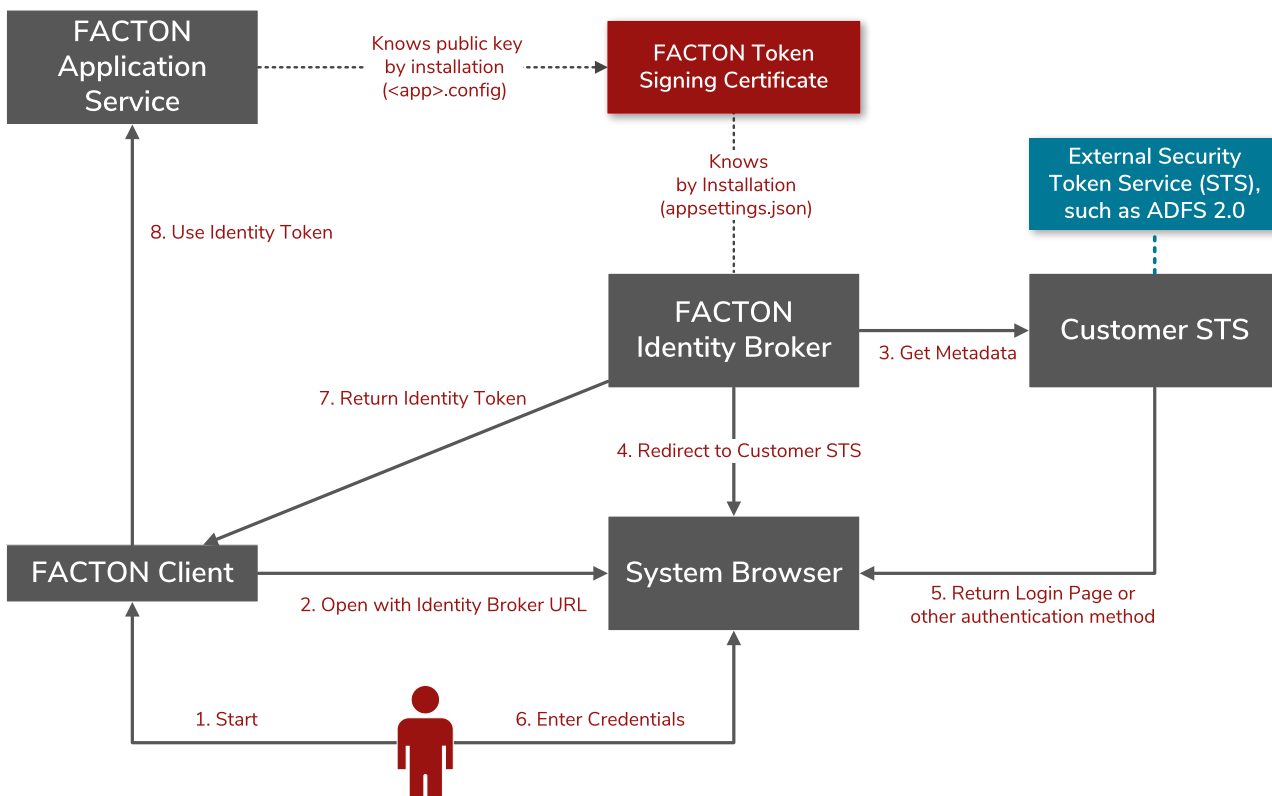


Figure 2.1: Authentication flow by the FACTON Identity Broker

WS-TRUST 1.3

An external Security Token Service (STS), such as ADFS 2.0, authenticates a user of the FACTON system via Windows Integrated Authentication and issues a token. This token represents the user identity and is used in the subsequent communication between the FACTON client and the FACTON Application Service:

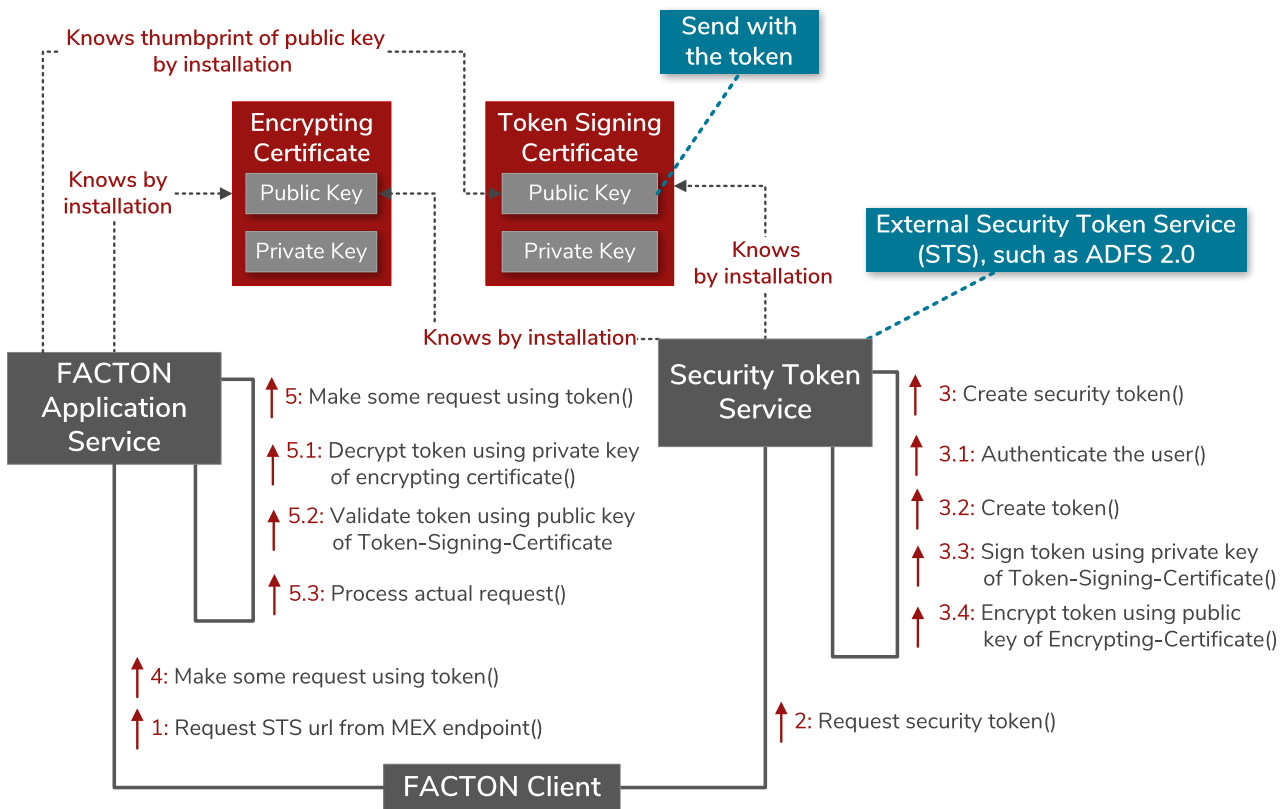


Figure 2.2: Authentication flow by the WS-Trust 1.3

The STS must have a token-signing certificate with a private key and must have access to the token-encrypting certificate (without the private key) to facilitate user authentication. The FACTON Application Service must have a token-encrypting certificate with a private key and must know the thumbprint of the token-signing certificate.

3. PREPARE THE INSTALLATION

This chapter describes in detail, the requirements and prerequisites for installing the FACTON Components.

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3.1. SYSTEM REQUIREMENTS

The following table shows an overview of the system components required to execute FACTON.

FACTON Component	Operating System	Additional Software
FACTON Application Service	Microsoft Windows Server 2012 R2	.NET Framework 4.6.2
Certificates: SSL certificate for https communication. Token-encryption certificate and Token-signing certificate for authentication (only required for WS-Trust authentication).		
FACTON Database Server	Any server supporting the required Microsoft SQL Server Version	Microsoft SQL Server 2012 SP3
FACTON Client Deployment Site	Microsoft Windows Server 2012 R2	Microsoft IIS Version 8.5
FACTON Client	Windows 7 - 64 bit - SP 1 or higher	.NET Framework 4.6.2 Web Browser: Internet Explorer 9.0
FACTON Identity Broker	Microsoft Windows Server 2012 R2	.NET Framework 4.6.2
Certificates: Token-signing certificate		

Table 3.1: Overview of System Requirements

CERTIFICATES

FACTON services need the following certificates, to support a secure communication between the FACTON Application Service, the FACTON Client and the external identity provider (e.g. ADFS 2.0):

SSL-CERTIFICATE

The FACTON Application Service and the FACTON Identity Broker use a SSL-Certificate to secure the communication with the FACTON clients.

Requirements

- Must contain a private key
- Has not expired
- Must include the server authentication enhanced key usage (EKU) extension
- The certificate revocation lists (CRLs) must be accessible for all the certificates in the chain from the SSL-Certificate to the root CA certificate
- The subject name of the SSL-Certificate must match the host part of the FACTON services URL.
- It must be signed by a trusted CA, because the SSL certificate must be trusted by client computers

TOKEN-SIGNING OR TOKEN-ENCRYPTING CERTIFICATE

The FACTON Identity Broker requires a token-signing certificate to sign the issued tokens. If you choose to use WS-Trust for authentication instead, the FACTON Application service requires a token-encrypting certificate to decrypt the token retrieved from the security token service (STS).

Requirements

- Must contain a private key
- Has not expired
- The certificate revocation lists (CRLs) must be accessible for all the certificates in the chain from the SSL certificate to the root CA certificate
- The FACTON Identity Broker or the FACTON Application Service account must have access to the private key of the certificate in the certificate store of the application server.

Depending on your security requirements, your certificates can be obtained by a public or a corporate CA. The FACTON services do not require that certificates be issued by a CA, so that self-signed certificates can be used in lab environments – but should not be used in production deployments.

Self-signed certificates can be created for free of charge using a wide variety of tools including OpenSSL, Microsoft Internet Information Services (IIS) or PowerShell cmdlet »New-SelfSignedCertificate«.

Track certificate expiration dates to make sure that certificates are replaced before they expire.

3.2. PREREQUISITES

The following prerequisites must be met to install FACTON successfully.

PRE-INSTALLATION WORK ITEMS

The following tasks must be complete prior to starting the installation of FACTON:

- Enroll SSL certificate on all application servers,
- Enroll token-signing certificate on all application servers (only required for Identity Broker installation)
- Enroll token-encrypting certificate on all application servers (only required for WS-Trust),
- Install .NET Framework 4.6.2 on all application servers,
- Install and configuring IIS on the deployment server.
- Define and document all relevant system parameters

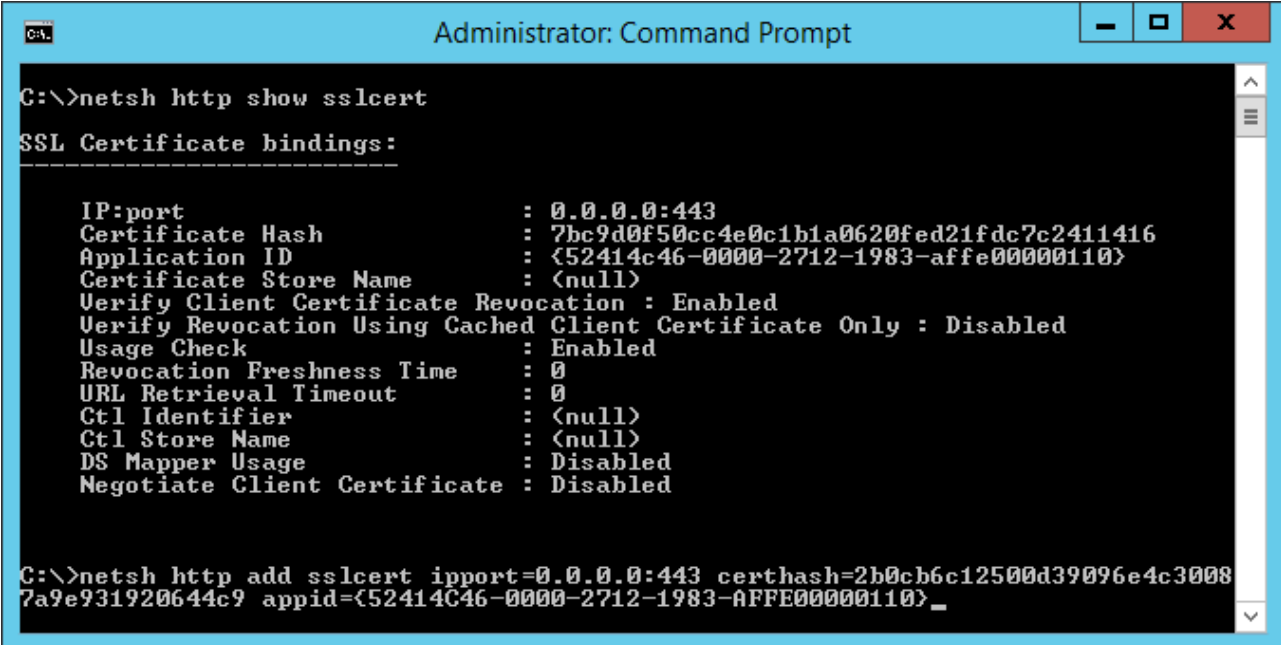
REGISTER SSL CERTIFICATE

Each environment (e.g. Productive, Development or QA) has a separate SSL certificate.

Installing an SSL Certificate

1. Start a Command Prompt as administrator (see Illustration »Example of the Installation of the SSL Certificate«).
2. Enter the following command:

```
netsh http add sslcert ipport=0.0.0.0:443 certhash=<thumbprint>
appid={52414C46-0000-2712-1983-AFFE00000110}
```



```
Administrator: Command Prompt
C:\>netsh http show sslcert
SSL Certificate bindings:
-----
IP:port                : 0.0.0.0:443
Certificate Hash       : 7bc9d0f50cc4e0c1b1a0620fed21fdc7c2411416
Application ID        : {52414c46-0000-2712-1983-affe00000110}
Certificate Store Name : <null>
Verify Client Certificate Revocation : Enabled
Verify Revocation Using Cached Client Certificate Only : Disabled
Usage Check           : Enabled
Revocation Freshness Time : 0
URL Retrieval Timeout : 0
Ctl Identifier        : <null>
Ctl Store Name       : <null>
DS Mapper Usage      : Disabled
Negotiate Client Certificate : Disabled

C:\>netsh http add sslcert ipport=0.0.0.0:443 certhash=2b0cb6c12500d39096e4c30087a9e931920644c9 appid={52414C46-0000-2712-1983-AFFE00000110}_
```

Figure 3.1: Example of the Installation of the SSL Certificate



Note

If you copy the thumbprint a special char may be copied and printed as question mark in the command line (see Illustration »Registering the SSL Certificate«).

Remove the question mark otherwise the command will fail.

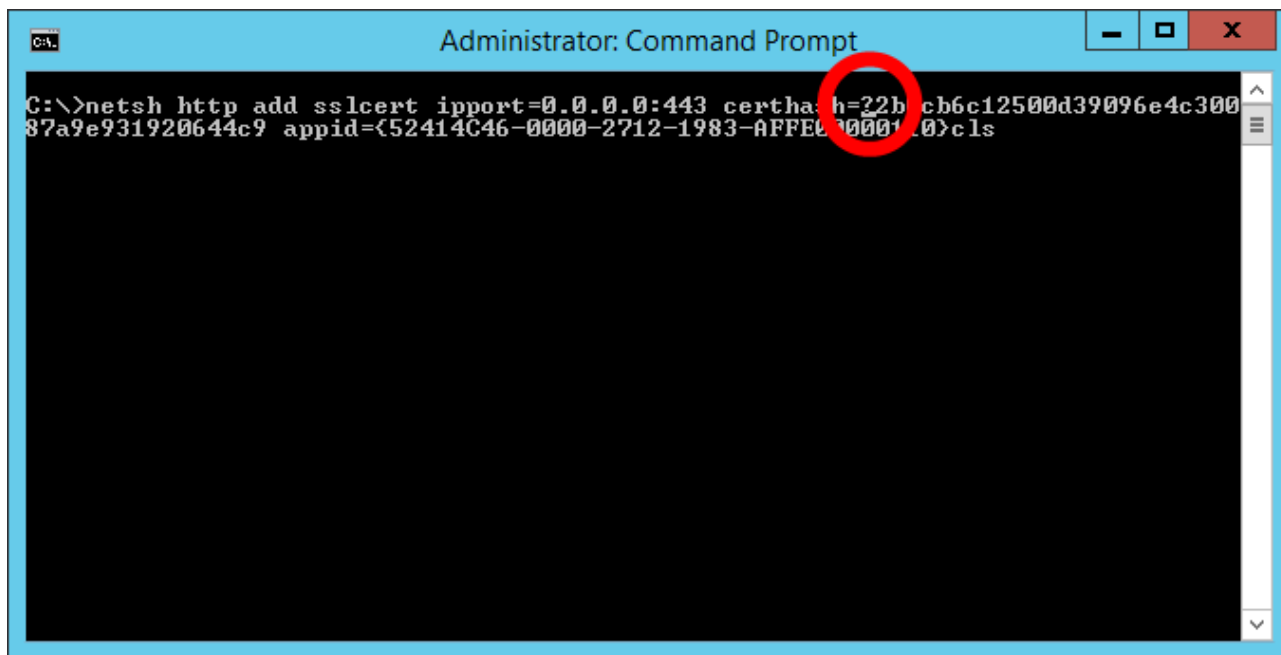


Figure 3.2: Registering the SSL Certificate

3.3. SYSTEM PARAMETERS

This chapter describes all required parameters of the FACTON components. The specific values for all relevant parameters should be defined before the configuration or installation is started.

Parameter	Relevant for	Description
Application Service: SERVICE_ACCOUNT	Application Service	The name of the service account (e.g. »DOMAIN\ServiceUser«) of the Application Service. If no user name is set, the SYSTEM account will be used. Default: System
Application Service: SERVICE_PASSWORD	Application Service	The password of the specified Windows Service Account.
Application Service: APPLICATION_SERVICE_ROOT	Application Service	The root address for all service endpoints of the FACTON Application Service Example: <code>https://<DnsHostName>/facton</code>
Application Service: ENDPOINT_SERVICE	Application Service	The service endpoint address of the FACTON Application Service. The setup generates this address based on the APPLICATION_SERVICE_ROOT parameter: <code><APPLICATION_SERVICE_ROOT>/server/secured</code> This address is one of the required values for the configuration of the security token service (e.g. ADFS) in case of WS-Trust authentication.
ENDPOINT_MEX	Application Service, Client Deployment Site,	The application service MEX endpoint address. The setup generates this address based on the APPLICATION_SERVICE_ROOT parameter:

Parameter	Relevant for	Description
	FACTON Client	<APPLICATION_SERVICE_ROOT>/server/mex
SERVICE_CERT_THUMBPRINT	Application Service	The thumbprint of the service certificate in case of WS-Trust authentication. The security token service (e.g. ADFS) use this certificate as token-encrypting certificate.
SERVICE_CERT_STORELOCATION	Application Service	The store location of the service certificate ("LocalMachine" or "CurrentUser"). If you use the System Account as SERVICE_ACCOUNT use "LocalMachine"; otherwise "CurrentUser". This parameter is only required for WS-Trust authentication. Default: LocalMachine
APPDATAPATH	Application Service, FACTON Client	The FACTON Application Service and the FACTON Client store additional data, e.g. machine specific settings or the column cache, in this directory. If no app data path is set, the service will be use the user app data path. <UsersAppDataPath> Example: C:\Users\<SERVICE_ACCOUNT>\AppData
DB_SERVERNAME	Application Service, Configuration Update Client, Identity Broker	The name of the FACTON database server.
DB_DATABASENAME	Application Service, Configuration Update Client, Identity Broker	The name of the FACTON database.
DB_USERNAME	Application Service,	The username of the database connection. If no username is set, the application service will

Parameter	Relevant for	Description
	Configuration Update Client, Identity Broker	use Windows Integrated Security. This database user must be a member of the 'db_owner' database role.
DB_PASSWORD	Application Service, Configuration Update Client, Identity Broker	The password of the given database user. If no username is specified the password cannot be set.
STS_ENDPOINT_WSTRUST13	Application Service	The WS-Trust 1.3 endpoint address of the STS (e.g. ADFS). This parameter is only required for WS-Trust authentication. Example: <code>https://<adfs-server- >/adfs/services/trust/13/windowstransport</code>
STS_ENDPOINT_MEX	Application Service	The MEX endpoint address of the STS (e.g. ADFS). This parameter is only required for WS-Trust authentication. Example: <code>https://<adfs-server>/adfs/services/trust/mex</code>
STS_SIGNING_CERT_THUMBPRINT	Application Service	The thumbprint of the token-signing certificate of the STS (e.g. ADFS). This parameter is only required for WS-Trust authentication.
Identity Broker: ENDPOINT_SERVICE	Identity Broker, Application Service (Setup parameter IDENTITYBROKER_ENDPOINT)	The endpoint address of the Identity Broker. This parameter is only required in case of Identity Broker authentication. Example: <code>https://<DnsHostName>/facton/identitybroker</code>

Parameter	Relevant for	Description
IDENTITYBROKER_SIGNING_CERT_THUMBPRINT	Identity Broker, Application Service	The token-signing certificate thumbprint of the Identity Broker. This is a parameter in the settings file (SETTINGS_FILE) of the Identity Broker and a setup parameter of the FACTON Application Service. This parameter is only required in case of Identity Broker authentication.
IDENTITYBROKER_SIGNING_CERT_STORELOCATION	Identity Broker, Application Service	The store location of the Identity Broker token-signing certificate ("LocalMachine" or "CurrentUser"). This is a parameter in the settings file (SETTINGS_FILE) of the Identity Broker and a setup parameter of the FACTON Application Service. This parameter is only required in case of Identity Broker authentication. Default: CurrentUser
AUTHENTICATION_AUDIENCE	Identity Broker, Application Service	The audience for the token based authentication. It is used for Identity Broker authentication or in case of WS-Trust for Service API OAuth authentication. Example: <code>https://<DnsHostName></code>
API_ENDPOINT_SERVICE	Application Service	The endpoint address of the service API. The setup generates this address based on the APPLICATION_SERVICE_ROOT parameter: <code><APPLICATION_SERVICE_ROOT>/api</code>
API_OAUTH_ENDPOINT	Application Service	The OAuth endpoint address of the STS (e.g. ADFS) that authenticates an API user. This parameter is only required for WS-Trust authentication. Example: <code>https://<adfs-server>/adfs/oauth2/authorize</code>
API_OAUTH_ISSUERNAME	Application Service	The OAuth issuer name of the STS (e.g. ADFS) that authenticates an API user. This para-

Parameter	Relevant for	Description
		meter is only required for WS-Trust authentication. Example: <code>https://<adfs-server>/adfs/services/trust</code>
API_OAUTH_CERT_THUMBPRINT	Application Service	The OAuth token-signing certificate thumbprint of the STS (e.g. ADFS) that authenticates an API user. This parameter is only required for WS-Trust authentication.
API_OAUTH_CERT_STORELOCATION	Application Service	The store location of OAuth token-signing certificate. This parameter is only required for WS-Trust authentication. Default: LocalMachine
SYSTEM_ENVIRONMENT	Client Deployment Site	Defines one of the supported system environments: Dev, QA, Prod, System1, System2, System3, ...
SYSTEM_ENVIRONMENT_NAME	Client Deployment Site	Sets the name of the chosen system environment. This is visible to all users in the UI of the installed client.
AUTHENTICATION_CALLBACK_PORT_FROM	FACTON Client	The minimal port number of the authentication callback channel reservation. If no port number is set, the client will be use a free port number without reserving the port. This parameter is only required in case of Identity Broker authentication and if the setup should reserve a port range.
AUTHENTICATION_CALLBACK_PORT_TO	FACTON Client	The maximal port number of the authentication callback channel reservation. This parameter is only required in case of Identity Broker authentication and if the setup should reserve a port range.

Parameter	Relevant for	Description
AUTHENTICATION_CALLBACK_USER	FACTON Client	The user or user group using of the authentication callback channel reservation. This parameter is only required in case of Identity Broker authentication and if the setup should reserve a port range.
Identity Broker: SERVICE_ACCOUNT	Identity Broker	The name of the service account (e.g. »DOMAIN\ServiceUser«) of the Identity Broker. If no user name is set, the SYSTEM account will be used. This parameter is only required in case of Identity Broker authentication. Default: System
Identity Broker: SERVICE_PASSWORD	Identity Broker	The password of the specified Windows Service Account. This parameter is only required in case of Identity Broker authentication.
SETTINGS_FILE	Identity Broker	The file with additional settings for the specified component. This parameter is only required in case of Identity Broker authentication. There are example files in the »config« folder of the FACTON delivery.

Table 3.1: Overview of System Parameters

3.4. CONFIGURE ADFS

The following chapter describes the configuration of the ADFS to use it as an STS for the FACTON Application Service in case of WS-Trust authentication.

Activate the WS-Trust 1.3 Endpoint

The FACTON Application Service needs an activated WS-Trust 1.3 endpoint which supports Windows Transport (e.g. “/adfs/services/trust/13/windowstransport”).

Activate the WS-Trust 1.3 Endpoint

1. Open your ADFS Management Console.
2. Select the **ADFS** ► **Service** ► **Endpoints** folder.
3. Check whether the WS-Trust 1.3 Windows Transport Endpoint is activated. If not, enable it.

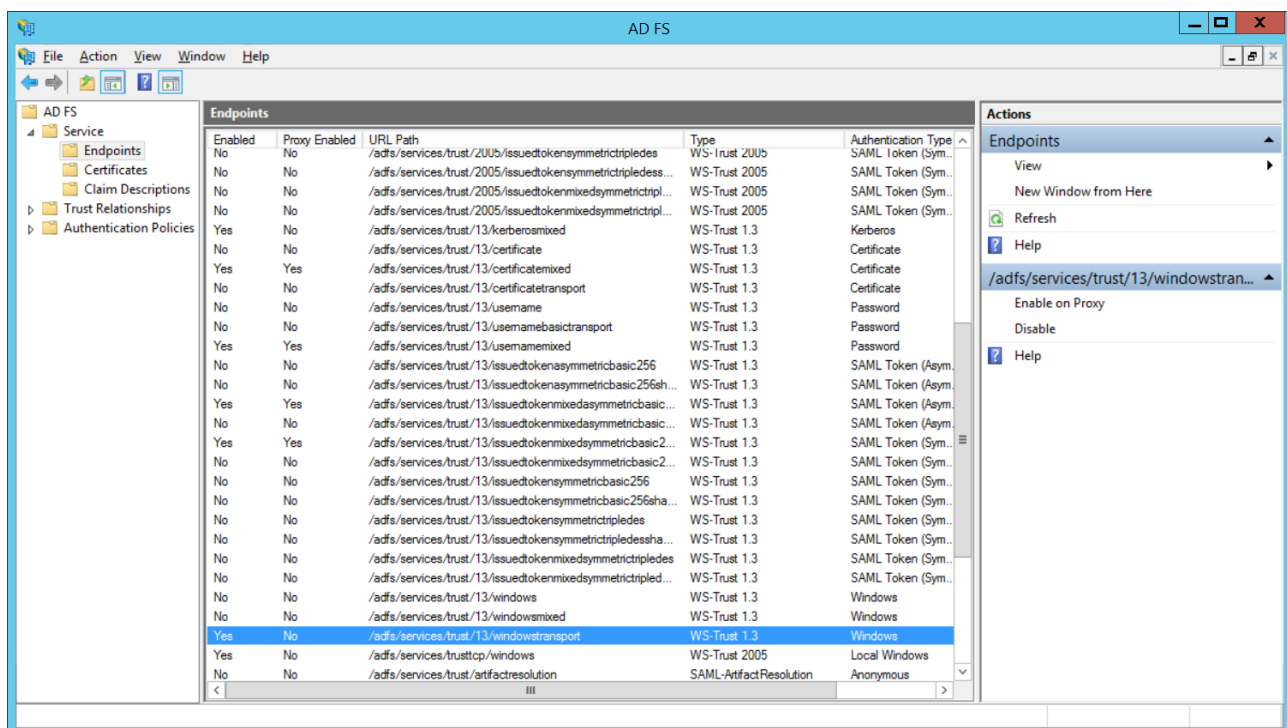


Figure 3.1: Enable the WS-Trust 1.3 Windows transport endpoint

Activate the OAuth2 Endpoint

The FACTON Service API (e.g. used for content import) needs an activated OAuth2 endpoint. The OAuth endpoint itself is enabled by default. (If not, it can be enabled using the PowerShell cmdlet `Enable-AdfsEndpoint`.) It automatically supports all relying parties configured in the ADFS configuration manager and also supports federated scenarios. It is not required to configure WS-Federation or other protocols for the relying party in order to be able to use it with OAuth.

Register the FACTON Client

In order for a client to authenticate the user via OAuth, the client needs to be registered via a so-called Client ID. This can currently not be done via the UI but only by the following PowerShell cmdlet:



Note

Copy code text into a text editor to remove line breaks. Check for any other syntax issues and then copy it into the command prompt.

```
Add-ADFSClient -Name "Facton Client" -ClientId "ADE421F2-0882-44CC-B840-4FFCC1447A00" -RedirectUri "https://<DnsHostName>/facton/api"
```

The RedirectUri have to be the same as the identifier in the relying party configuration.

Add a Relying Party Trust

The FACTON Application Service must registered as a Relying Party Trust in the ADFS.



Open the »Add Relying Party Trust Wizard«

1. Open your ADFS Management Console.
 2. Select the **ADFS ▶ Trust Relationships ▶ Relying Party Trusts** folder.
 3. Right-click on **Relying Party Trust**.
 4. Click »Add Relying Party Trust...« and follow the instructions of the wizard.
-

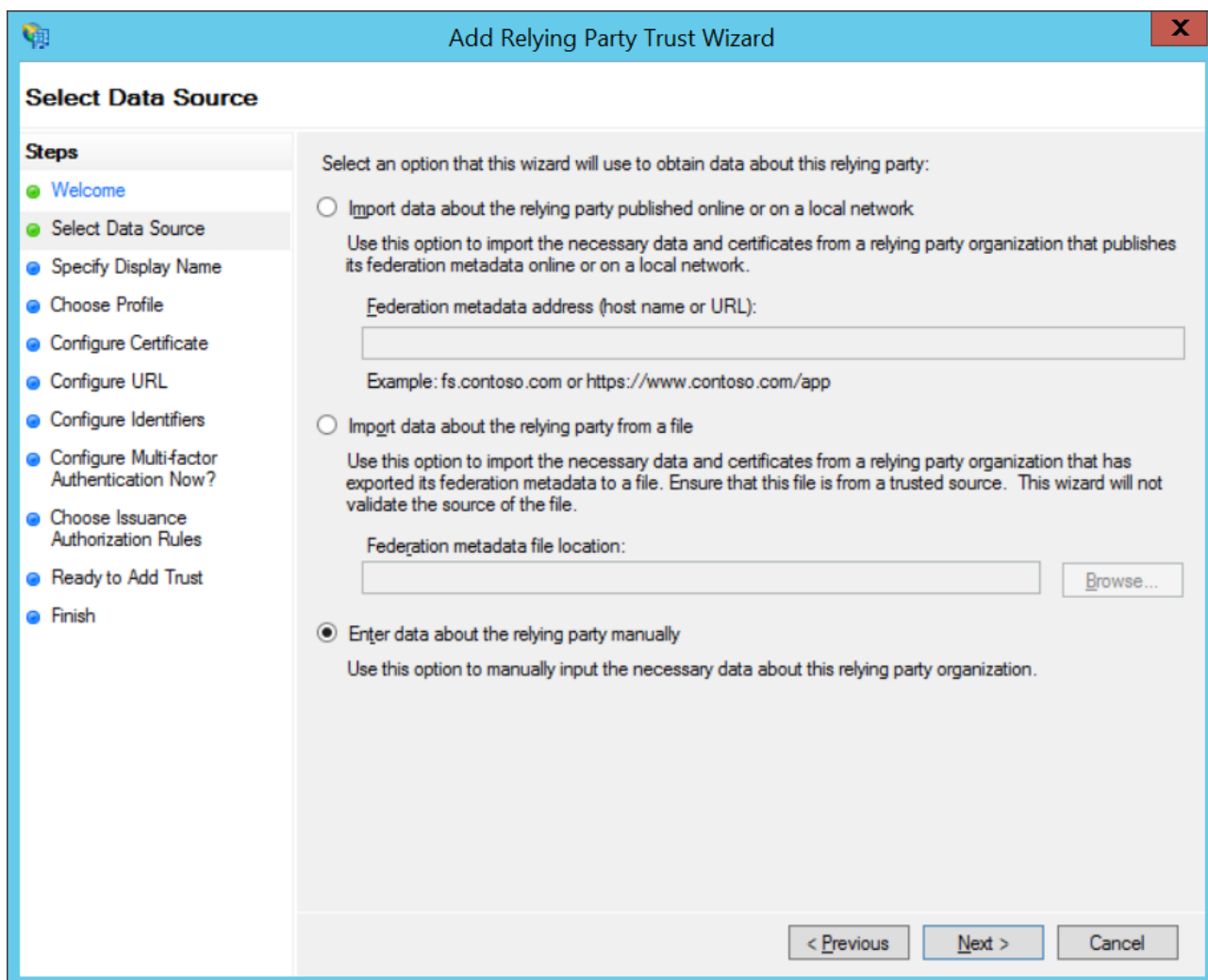


Figure 3.2: Select »Enter data about the relying party manually«

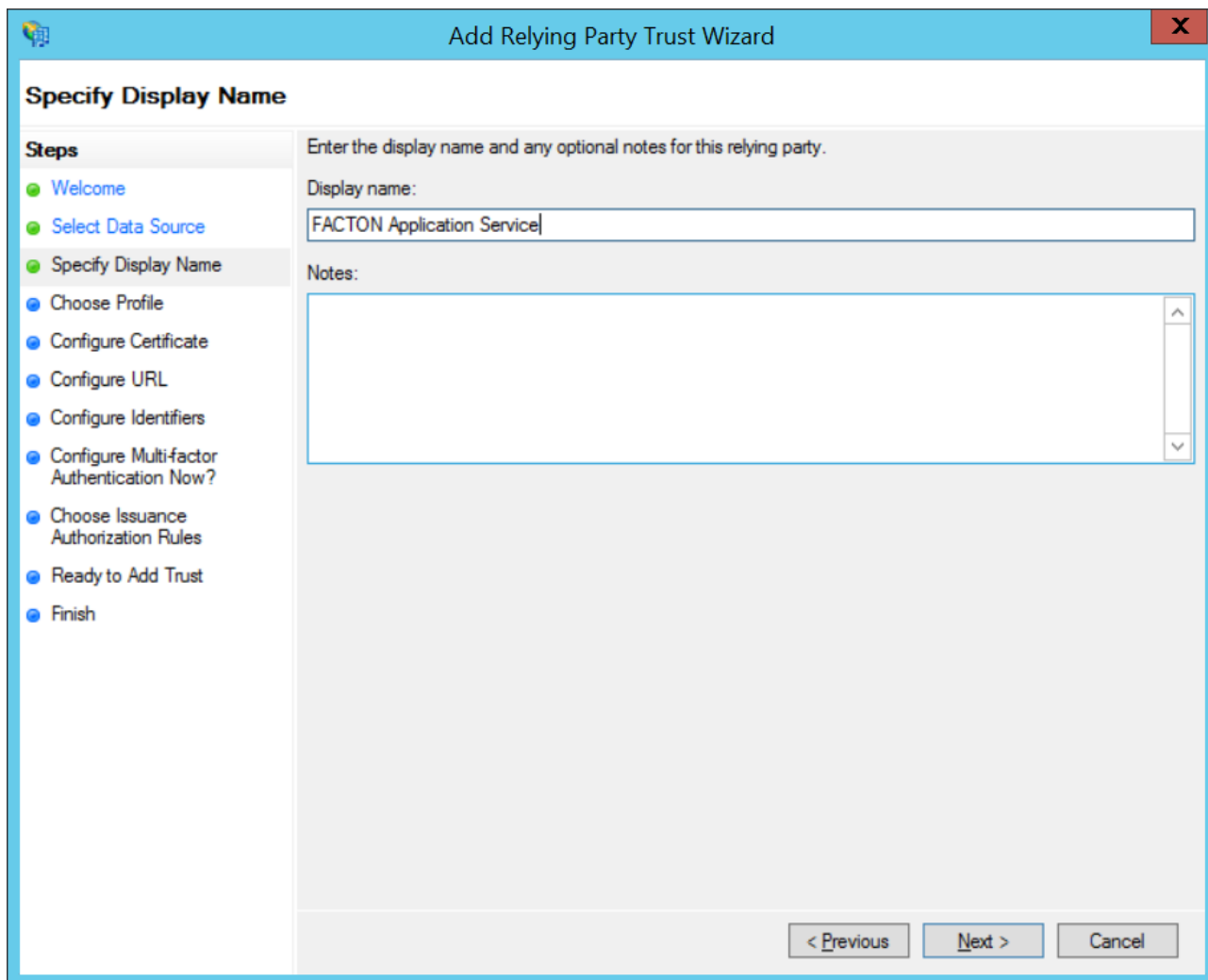


Figure 3.3: Enter the display name and optionally some notes for the relying party

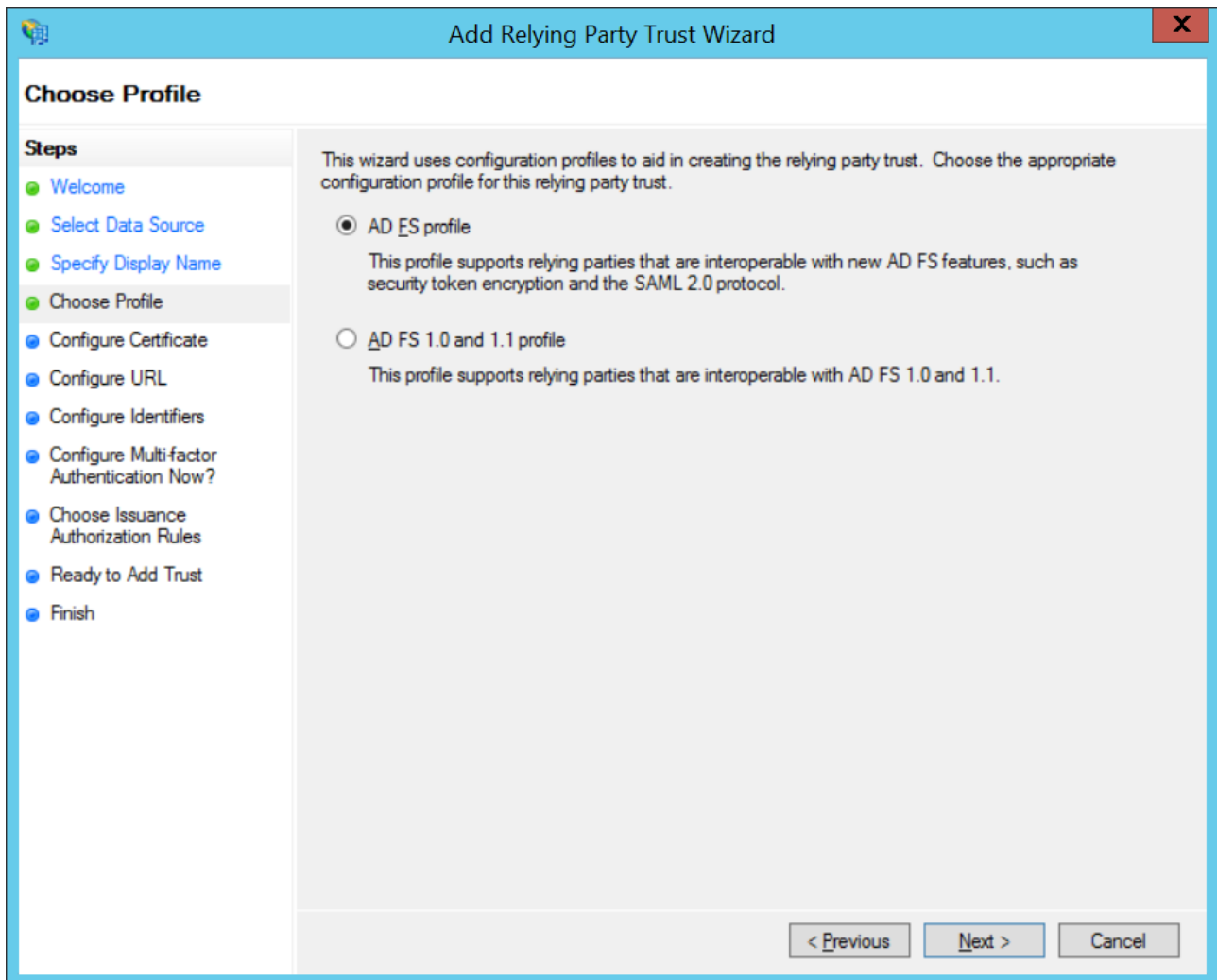


Figure 3.4: Select the ADFS Profile

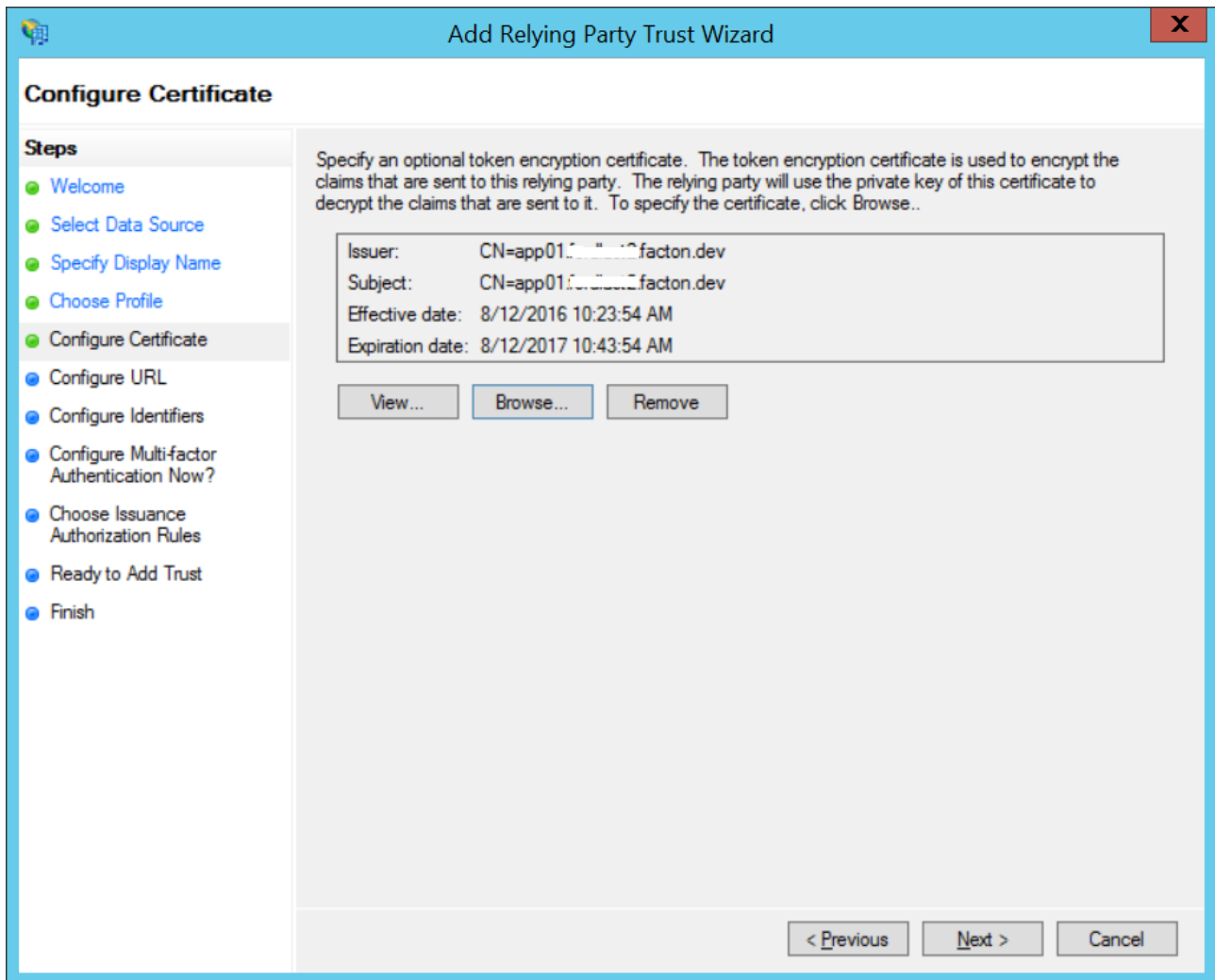


Figure 3.5: Specify the token-encrypting certificate (without the private key) of the FACTON Application Service

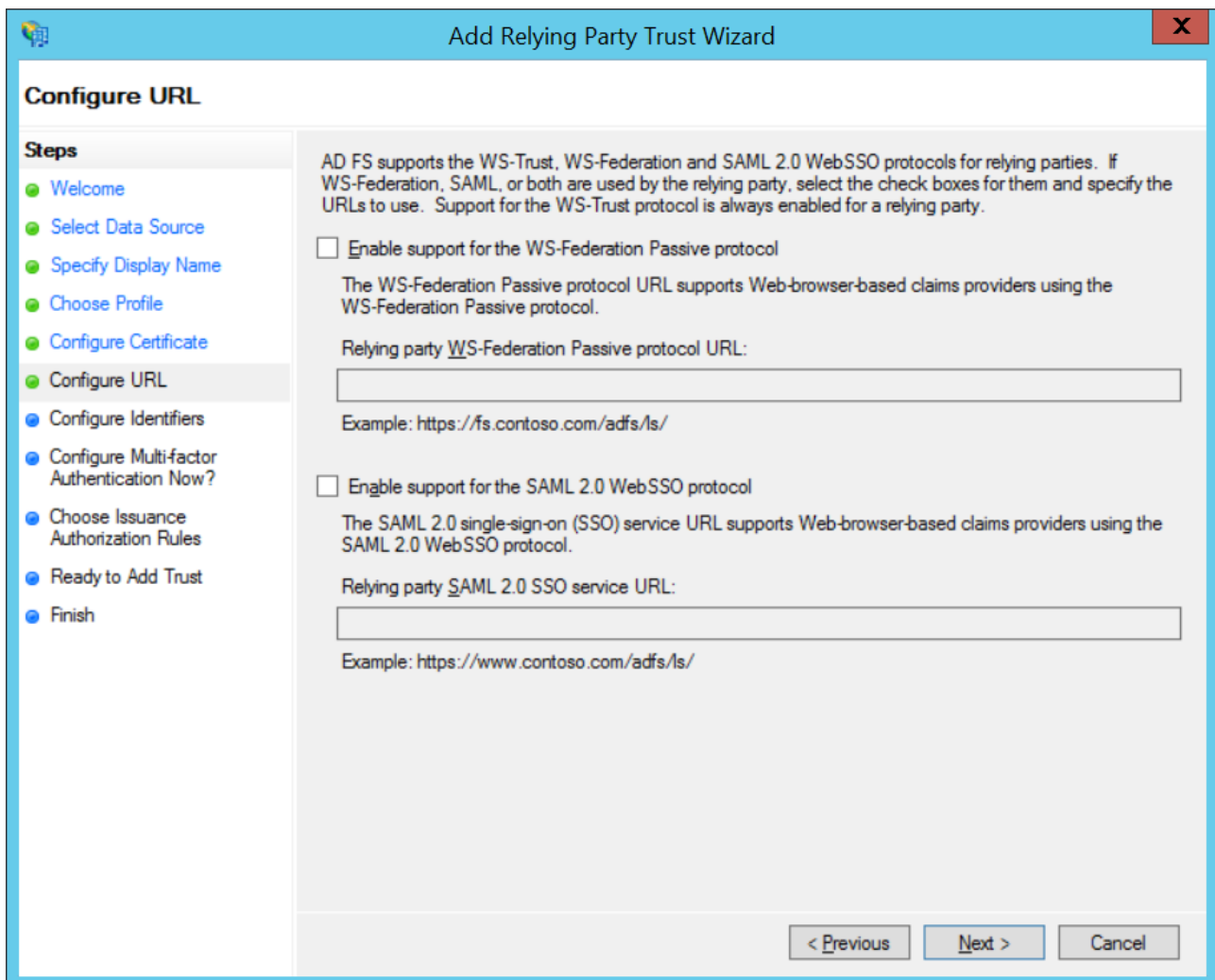


Figure 3.6: WS-Trust will always be supported

Add the following identifiers to the relying party configuration:

- URI of the FACTON Application Service (system parameter: ENDPOINT_SERVICE)

■ **Example:**

`https://<DnsHostName>/facton/server/secured`

- URI of the FACTON Service API (system parameter: API_ENDPOINT_SERVICE)

■ **Example:**

`https://<DnsHostName>/facton/api`

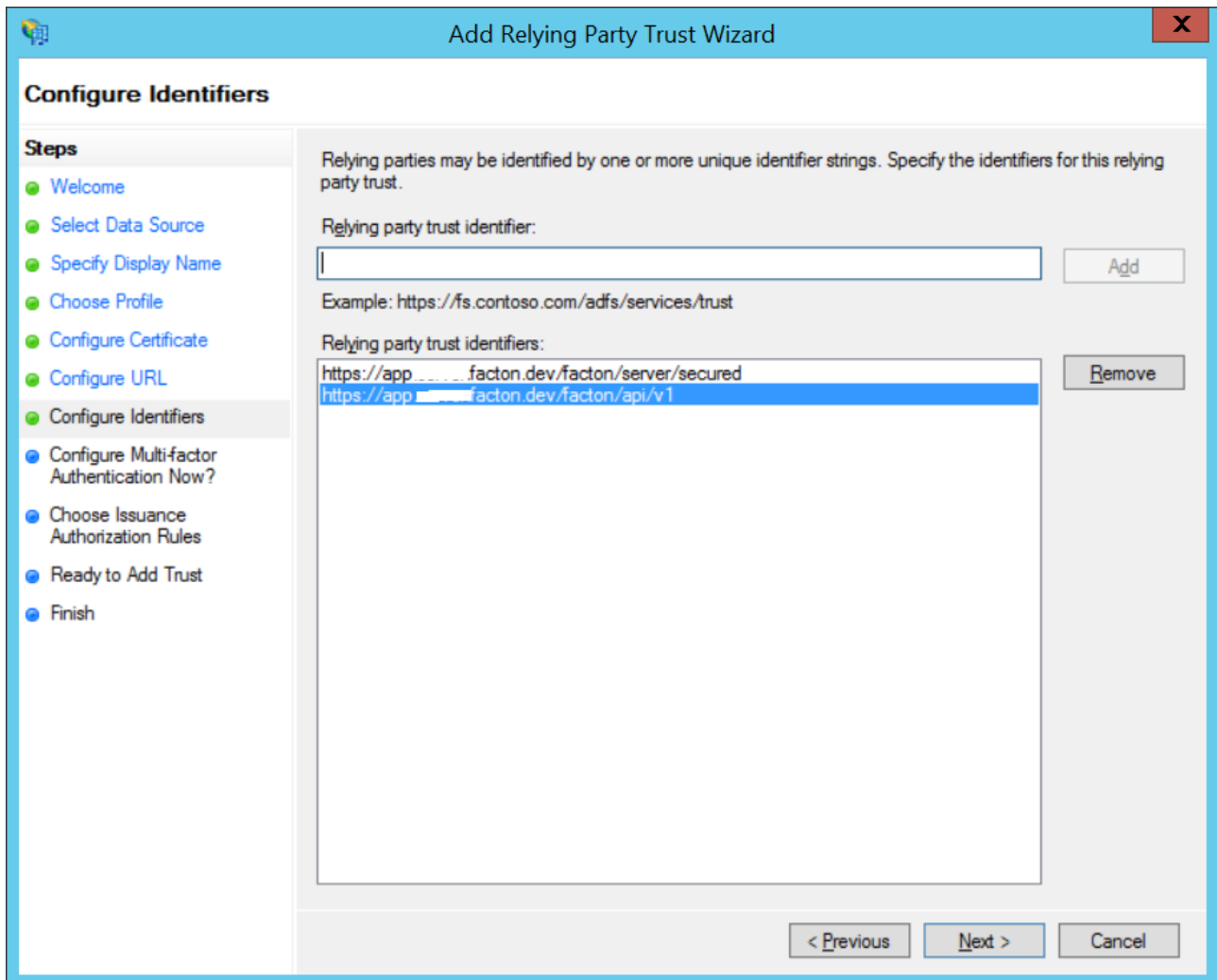


Figure 3.7: Enter the FACTON Application Service endpoint addresses

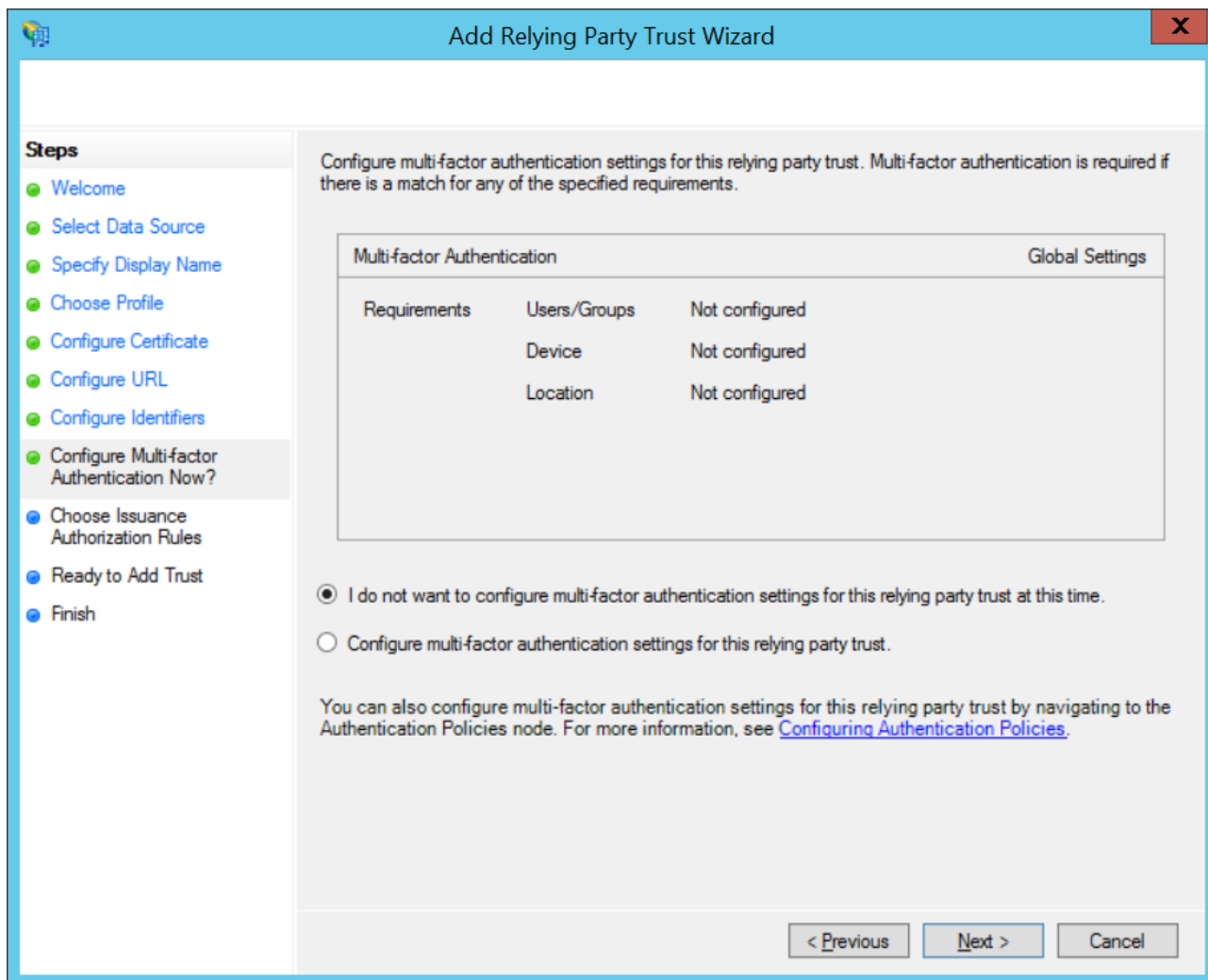


Figure 3.8: Disable the multi-factor authentication for the relying party trust (only on ADFS 2012 R2)

Set the issuance authorization rules to »Permit all users to access this relying party« or change issuance authorization rules according to your corporate security policy.

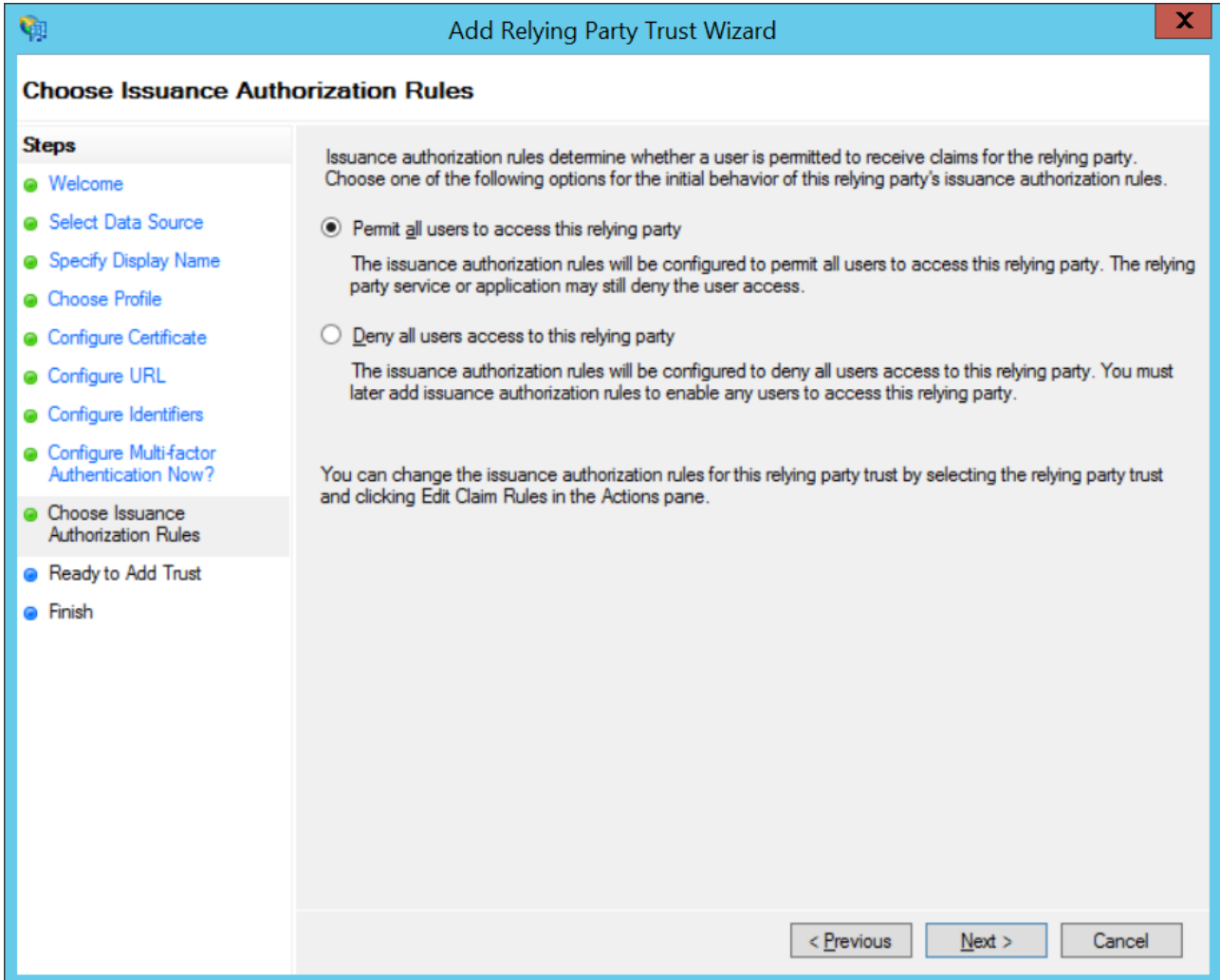


Figure 3.9: Set the issuance authorization rules

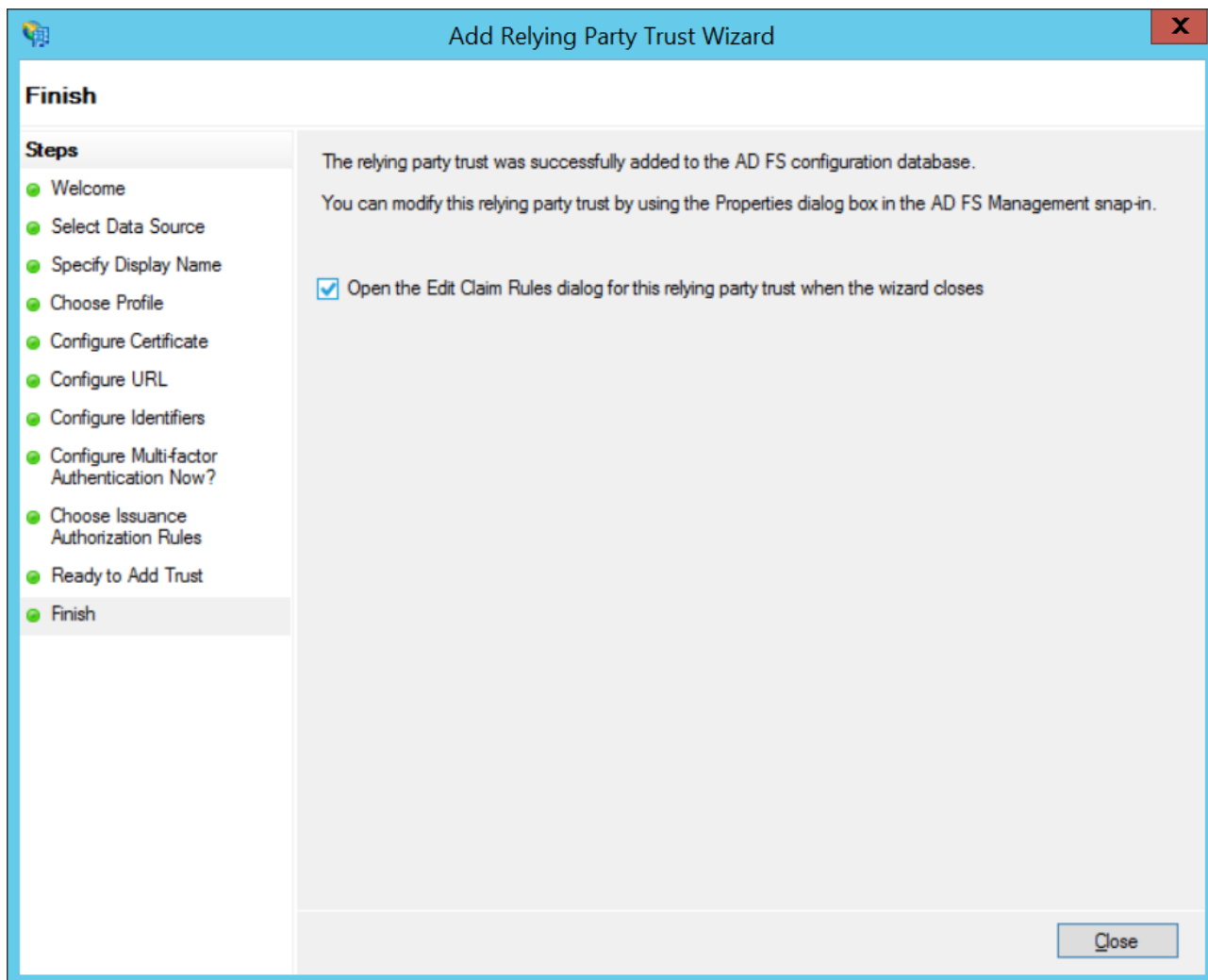


Figure 3.10: Close the wizard

Configure the Relying Party Trust

Now you can edit the Claim Rules of the new Relying Party Trust. To configure the Relying Party Trust later, open the context menu on your Relying Party Trust and select “Edit Claim Rules...”.

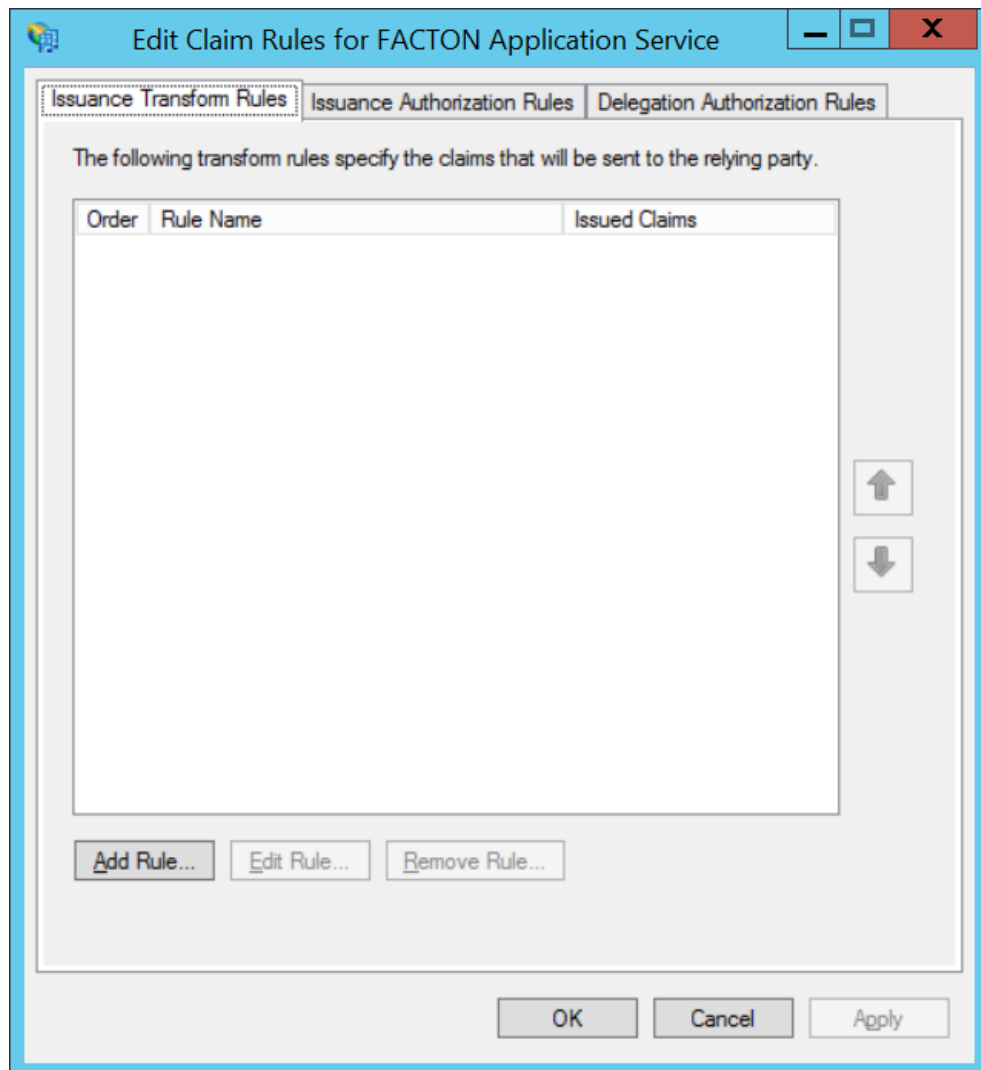


Figure 3.11: Claim rules of a replying party trust

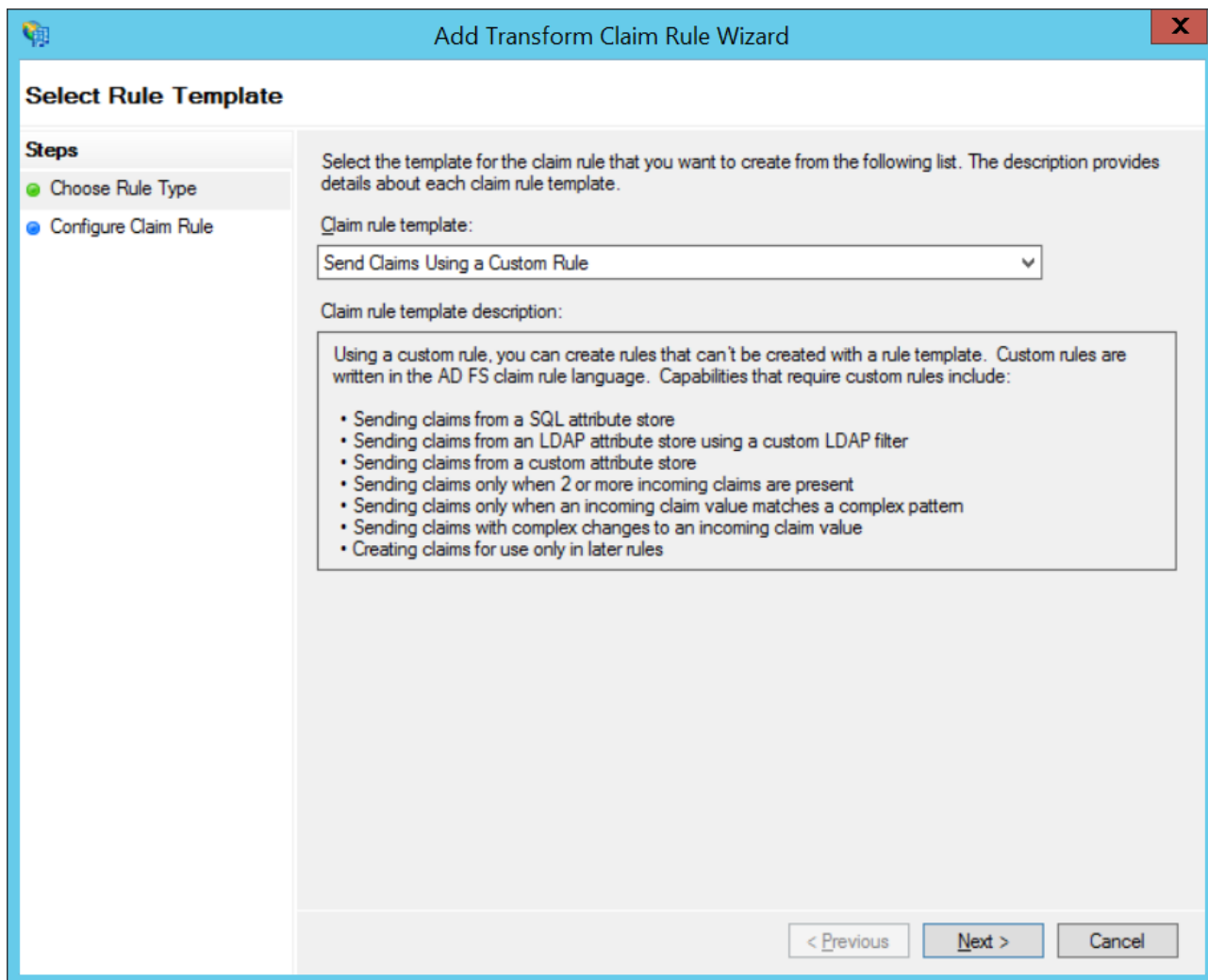


Figure 3.12: Select »Send Claims Using a Custom Rule«

Add Claim Rules

To add the domain to the identity claim define the following rule:

```
c:[Type == "http://schemas.xmlsoap.org/ws/2005/05/identity/claims/name"] => issue(claim = c);
```

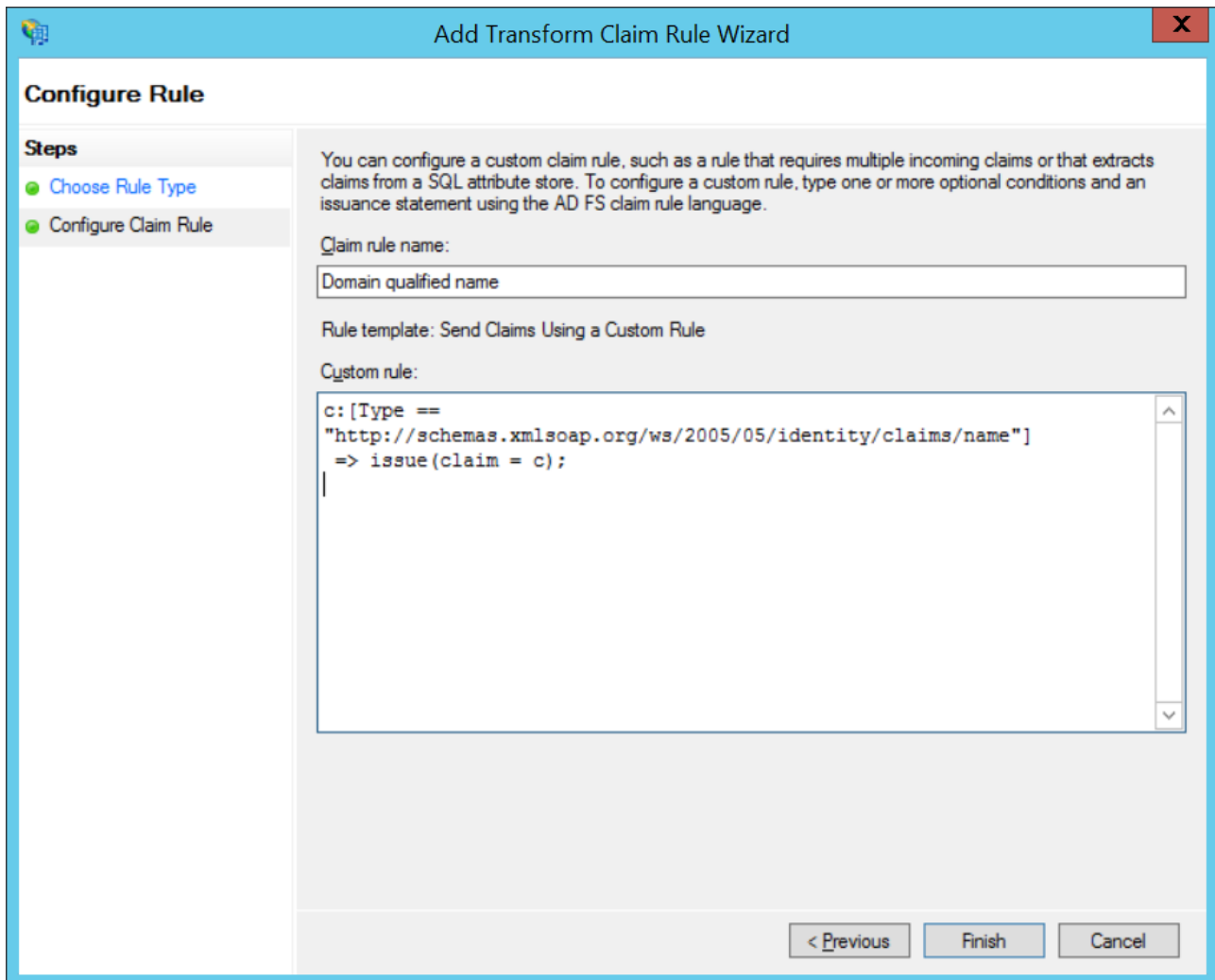


Figure 3.13: Add the domain to the identity claim

Add Claim Rules

Add the special group »Everyone« to the claims with the following rule:

```
=> issue(Type = "http://schemas.xmlsoap.org/claims/Group", Value= "Everyone");
```



Note

For other locales the locale-specific group name, e.g. »Jeder« for german, have to be used in this claim rule.

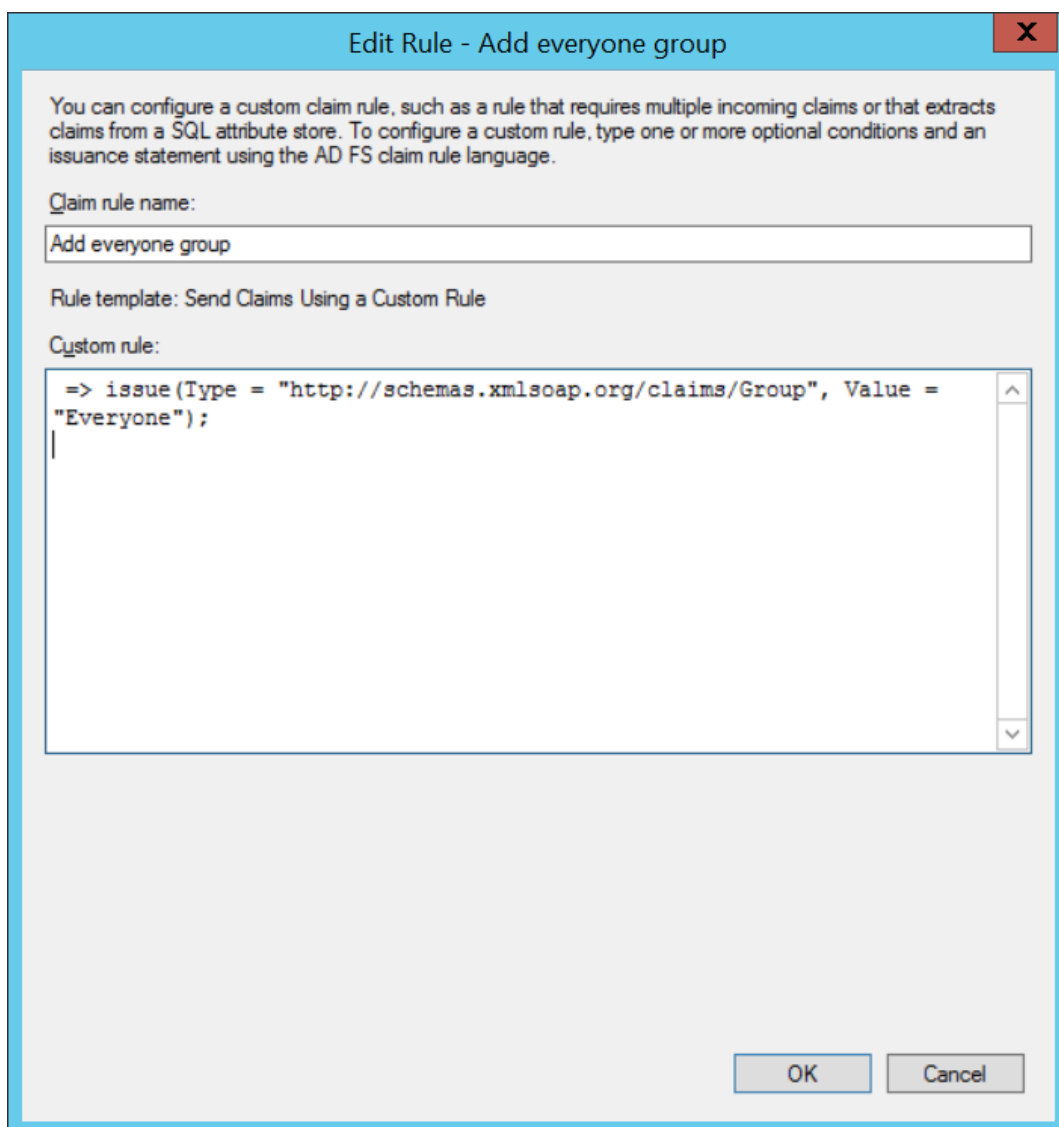


Figure 3.14: Add the special group »Everyone«

You can get the required thumbprint of the token-signing certificate from the ADFS Certificates View:

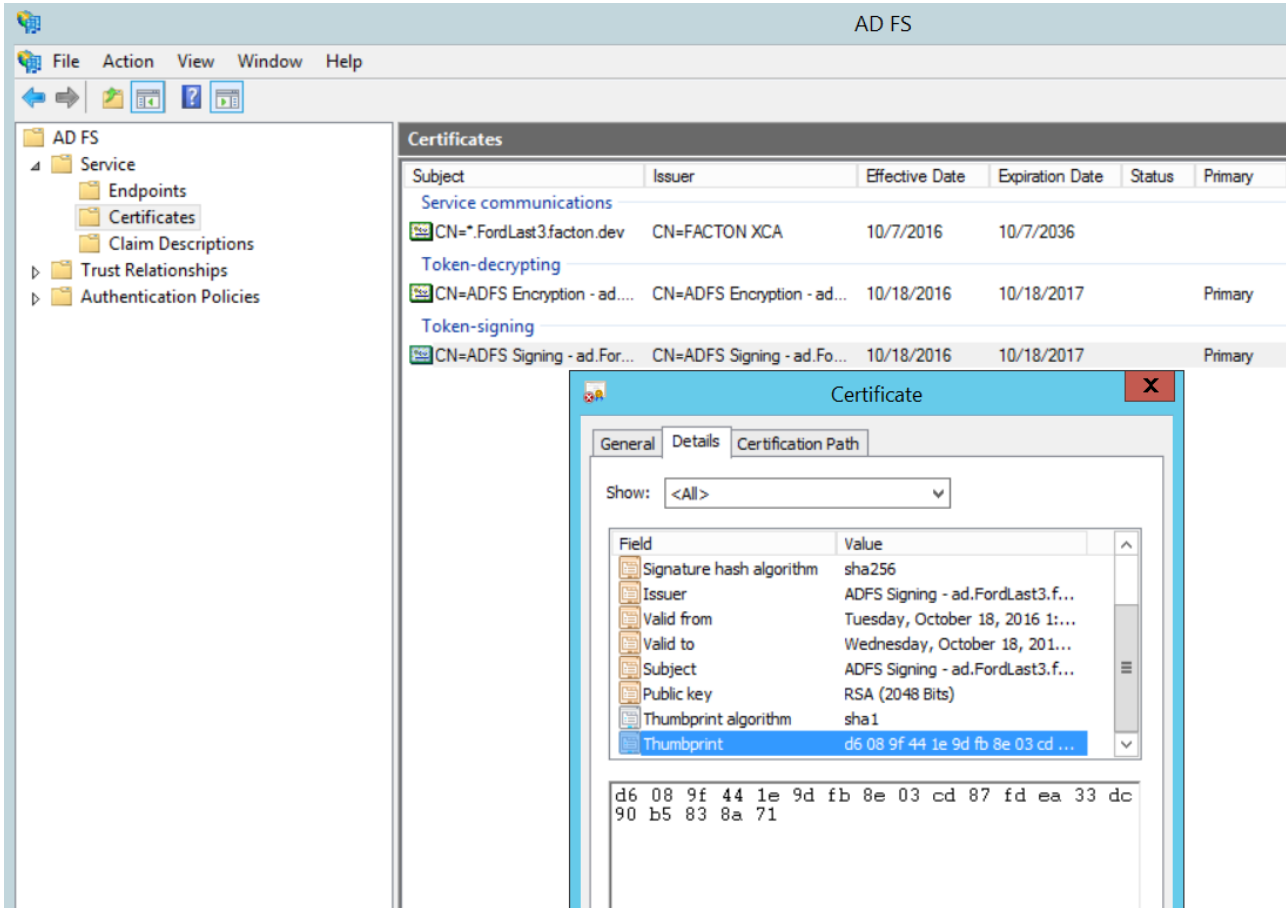


Figure 3.15: ADFS certificates view

3.5. APPLICATION DIRECTORY

FACTON Application Service stores additional data within its application directory:

- <APPDATAPATH>\Local\FACTON
- <APPDATAPATH>\Roaming\FACTON

The location depends on your installation:

Running as System Service:

If the FACTON Application Service runs as a system service the directory is located in:

```
<SystemBasePath>\System32\config\systemprofile\AppData
```

■ **Example:**

```
C:\Windows\System32\config\systemprofile\AppData
```

Running as a Special User:

If the FACTON Application Service runs as a special user the directory is located in:

```
<UsersAppDataPath>
```

■ **Example:**

```
C:\Users\FACTONEPCServiceAccount\AppData
```

Specifying your own AppData-Directory:

The locations outlined above are Windows default paths. You can also change the location during installation. The application service uses this directory when running as a system service as well as when running as a special user.

■ **Example:**

```
C:\FACTONEPC\AppData
```

4. INSTALL OR UNINSTALL FACTON

This chapter describes the installation and the uninstallation process of the FACTON Components. You can install or uninstall FACTON in to ways - via attended mode or via unattended mode. These two methods of installing or uninstalling FACTON are described in more detail in the subsections below.

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4.1. INSTALL FACTON VIA ATTENDED MODE

This chapter describes the installation process of the FACTON Components using attended mode. This installation process shows a screen, which navigates through the setup - step by step. As you navigate through this mode you enter all of the required values to set up the program.



IMPORTANT

Upgrading and downgrading is not supported in this version.

If you want to install an older or newer version, you have to uninstall the installed version first and then launch the setup for the version you wish to install.

See section [»Uninstall FACTON«](#)

4.1.1 Install the FACTON Application Service

This chapter describes the installation process of the **FACTON Application Service** via attended mode.

Install the Application Service via Attended Mode

1. Double-click on the setup file (e.g. »**FACTON_Application_Service_10.1.0.26653.exe**«), to start the installation. The setup starts a wizard and analyzes the current state of the FACTON Component. The wizard shows the executable setup actions. Click on the »**Install...**« setup action.

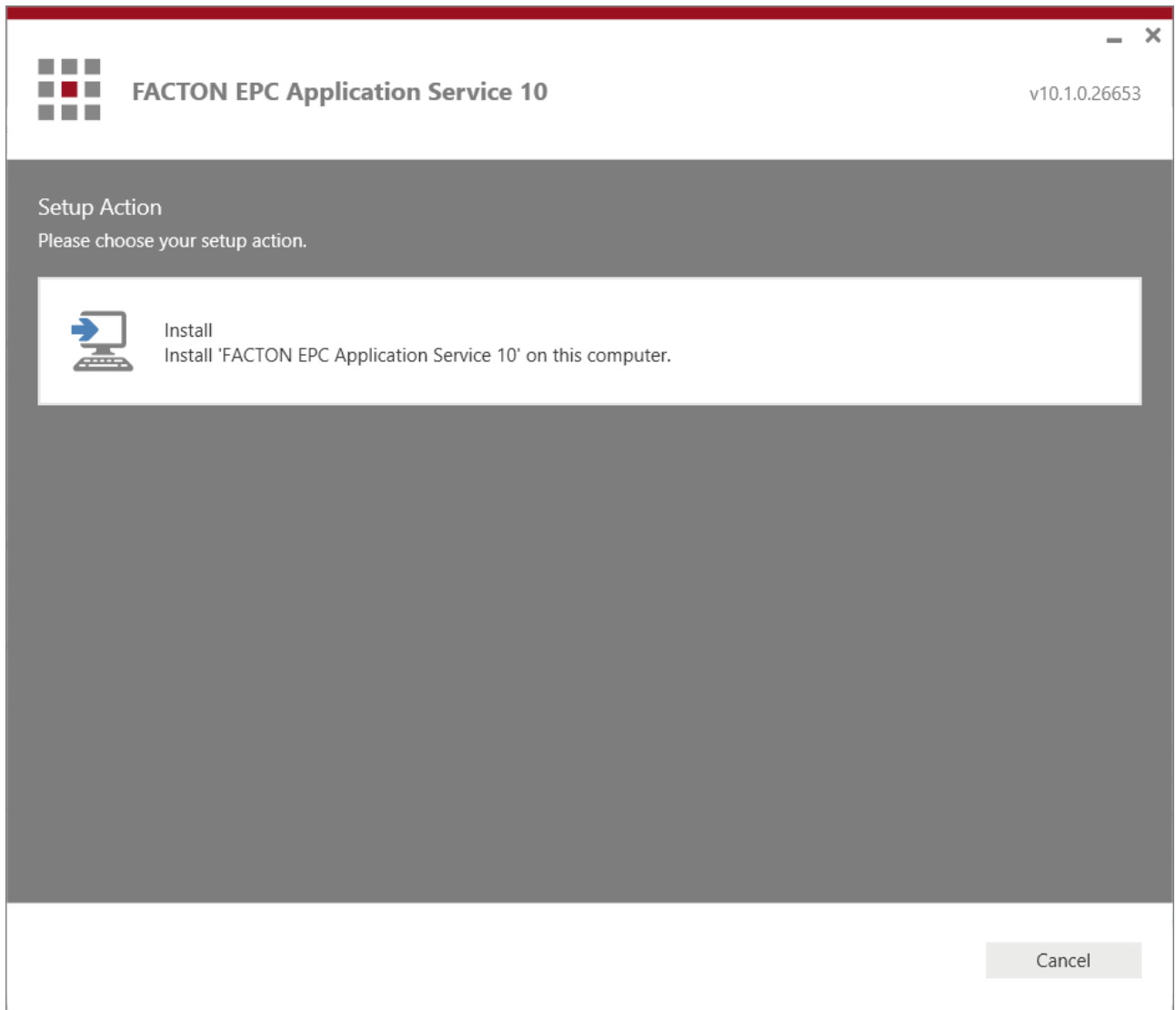


Figure 4.1: Choosing a setup action

**Note**

If the wizard shows the action **Uninstall**, the current version of the FACTON Component is already installed and could be uninstalled.

See section [»Uninstall FACTON«](#) for more information.

If the current version of the Component already installed, it is not possible to install an older or newer version. In this case the wizard shows a setup error with a corresponding message to uninstall the older or newer version first.

- 2. Please read the terms of the license agreement carefully. Activate the »I accept the terms ...« checkbox to accept the terms of the license agreement. Click on **Next**, to continue the installation.

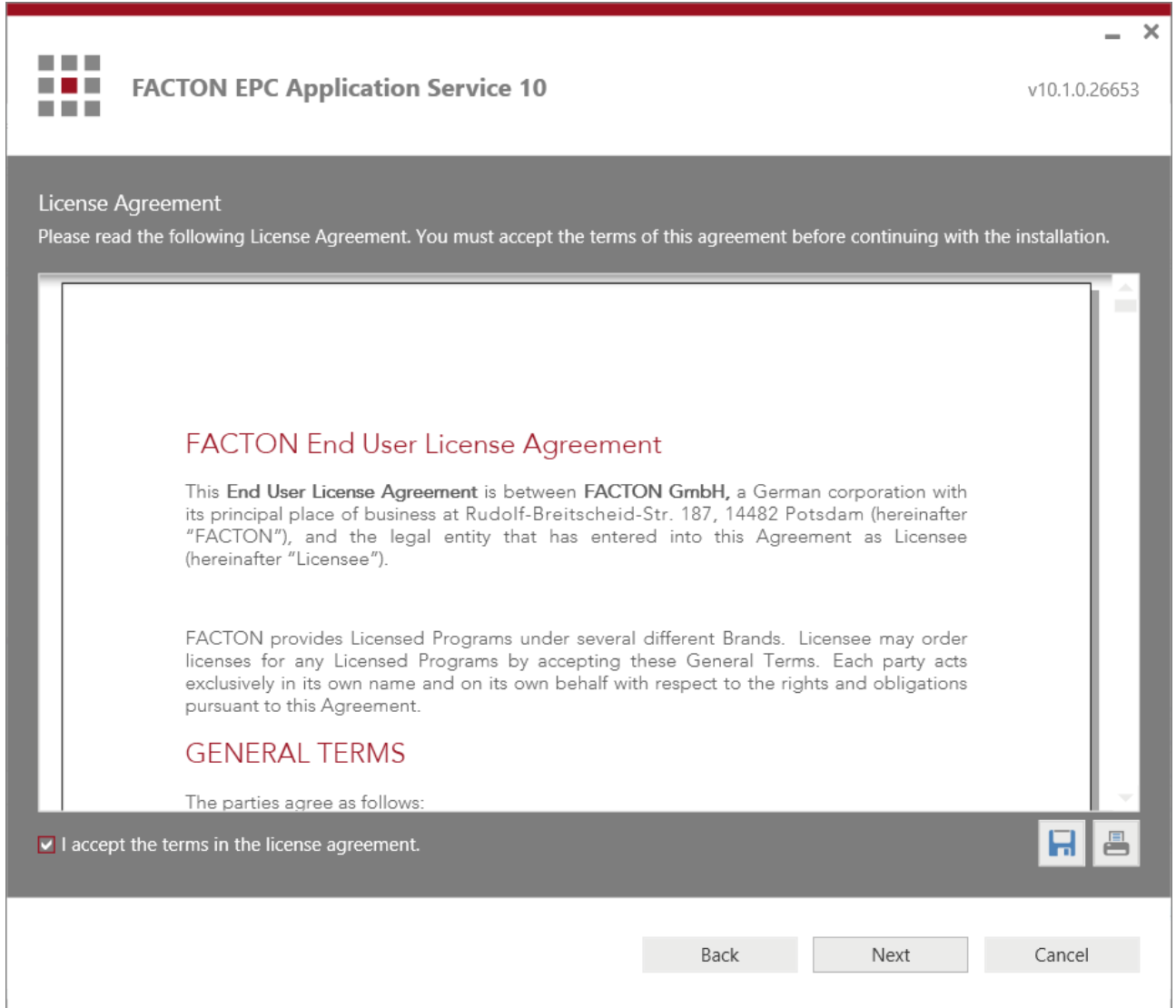


Figure 4.2: FACTON license agreement acceptance

3. Enter the installation folder path where you would like to store the FACTON Component files. Click on **Next**, to continue the installation.

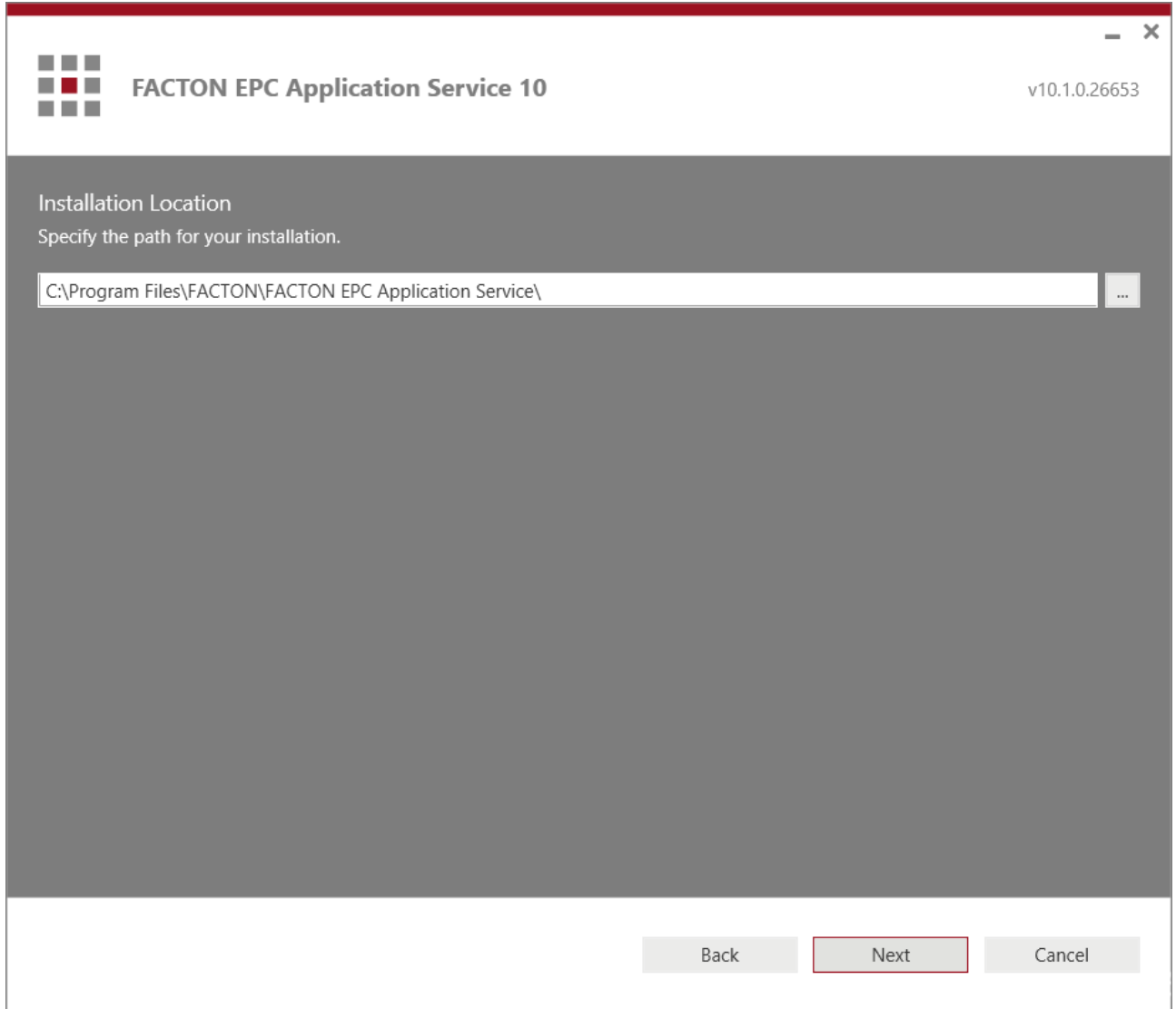


Figure 4.3: Specifying an installation location

- 4. Configure the service account to be used to run the FACTON Application Service. Click on **Next**, to continue the installation.

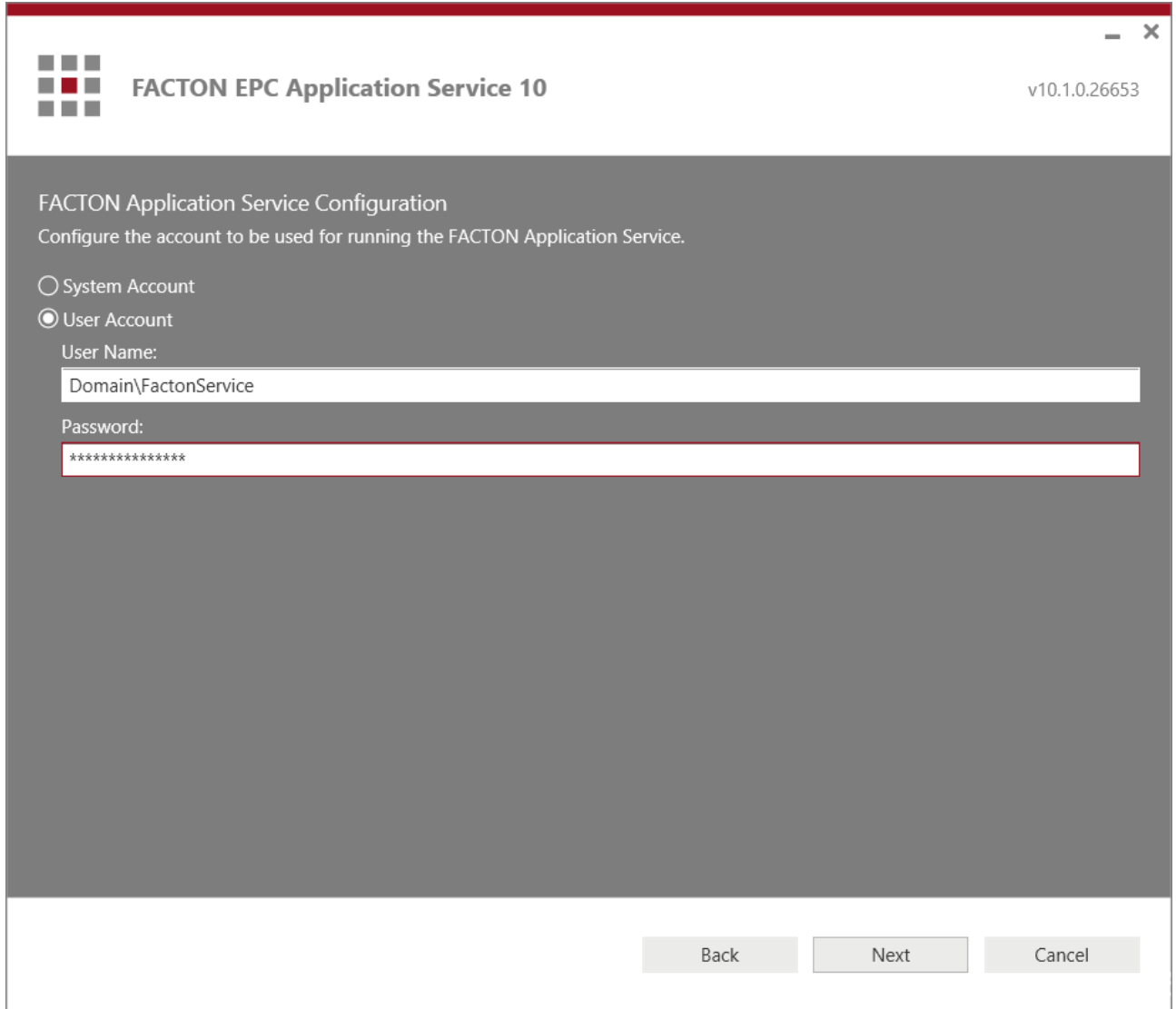
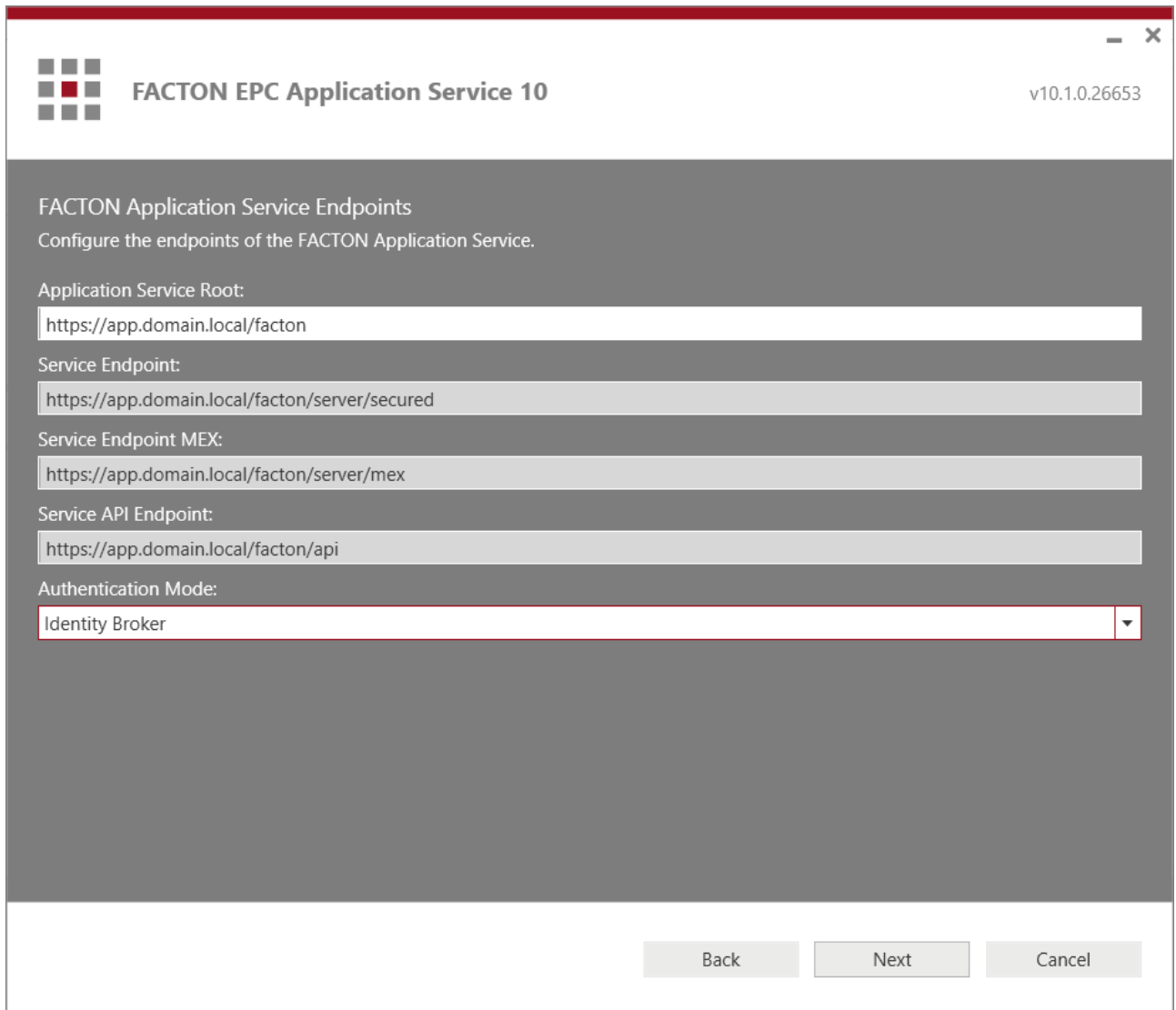


Figure 4.4: Service account configuration

5. Enter the address of the application service root. The endpoints of the application service and the service api will be derived based on the defined root address. Select one of the supported authentication modes: **WS-Trust 1.3** for authentication via WS-Trust 1.3 with Windows Integrated Authentication (WIA) or **Identity Broker** for authentication via OpenID Connect or WS-Federation using the FACTON Identity Broker.

Click on **Next**, to continue to the installation.



The screenshot shows a configuration window titled "FACTON EPC Application Service 10" with version "v10.1.0.26653". The window contains the following fields and options:

- Application Service Root:**
- Service Endpoint:**
- Service Endpoint MEX:**
- Service API Endpoint:**
- Authentication Mode:**

At the bottom of the window, there are three buttons: "Back", "Next", and "Cancel".

Figure 4.5: Configure of the service endpoints

- 6. In case of **WS-Trust 1.3** authentication mode, select the location of the service certificate in the **»Service Certificate Store Location«** combobox. This service certificate is used by the security token service (e.g. ADFS) to encrypt the token that is sent to the FACTON Application Service. Enter the thumbprint of the service certificate. Click on **Next**, to continue the installation.

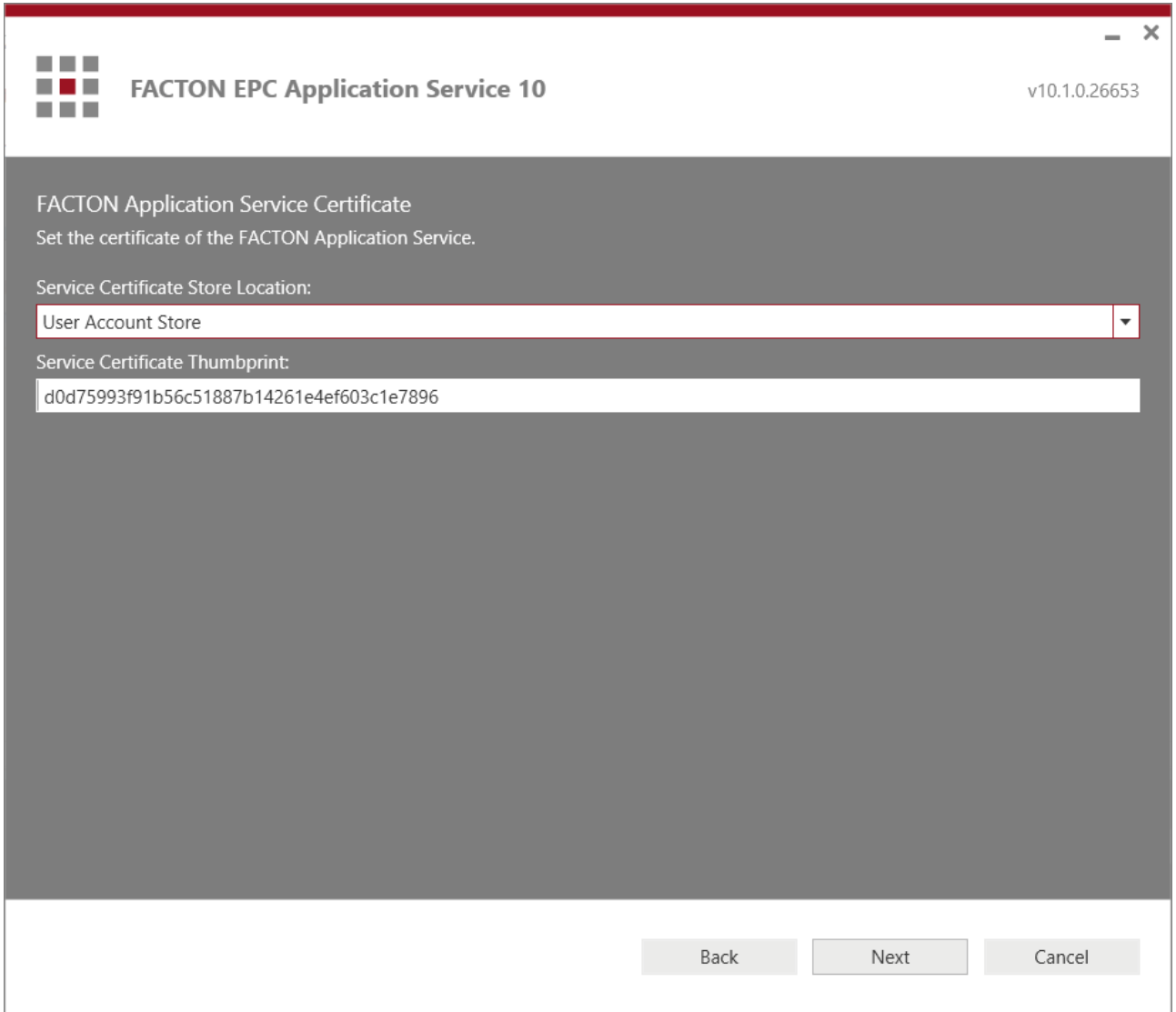


Figure 4.6: Setting the service certificates

- 7. Enter the metadata (MEX) and the WS-Trust 1.3 endpoint addresses of the Security Token Service. Enter the thumbprint of the token-signing certificate of the Security Token Service. Click on **Next**, to continue the installation.

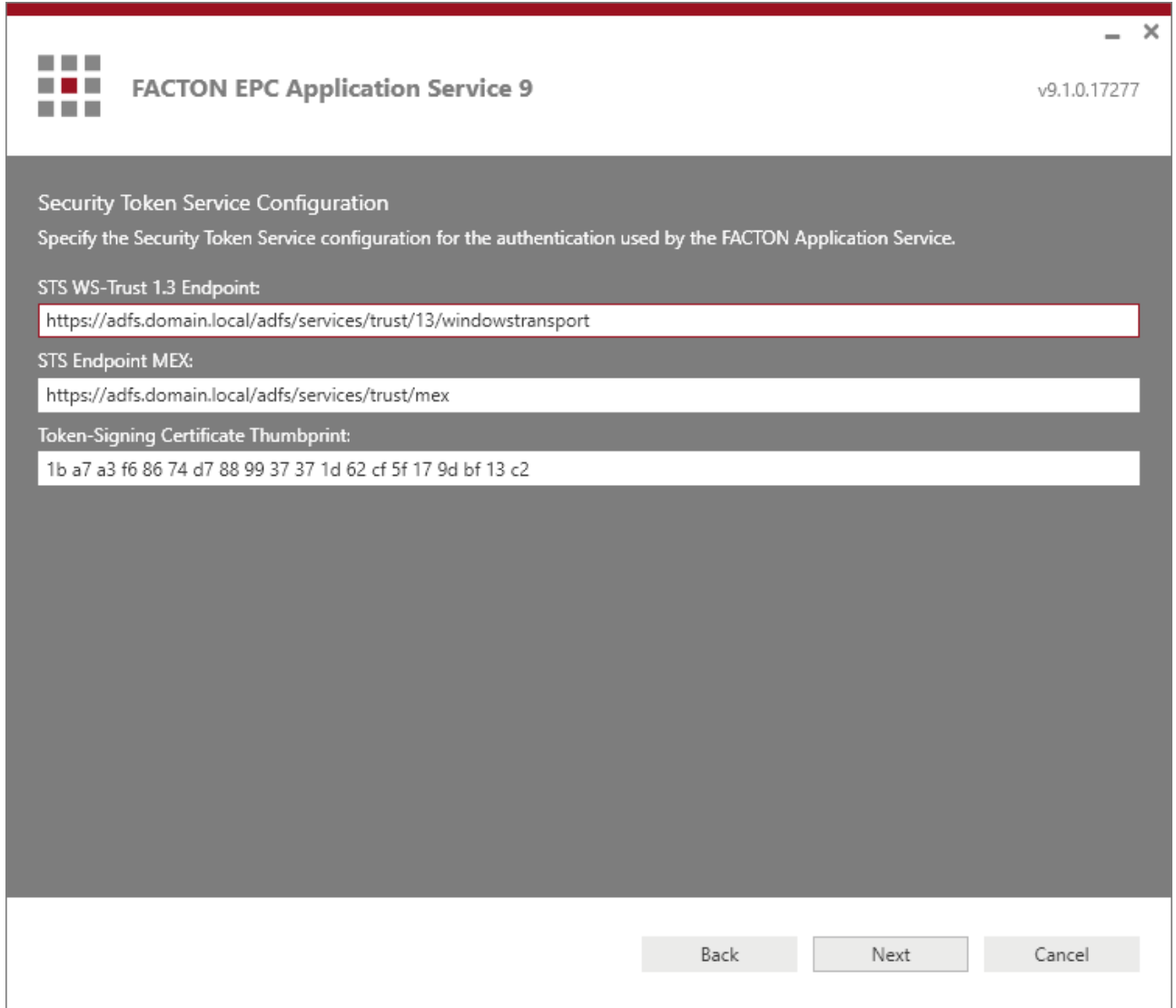
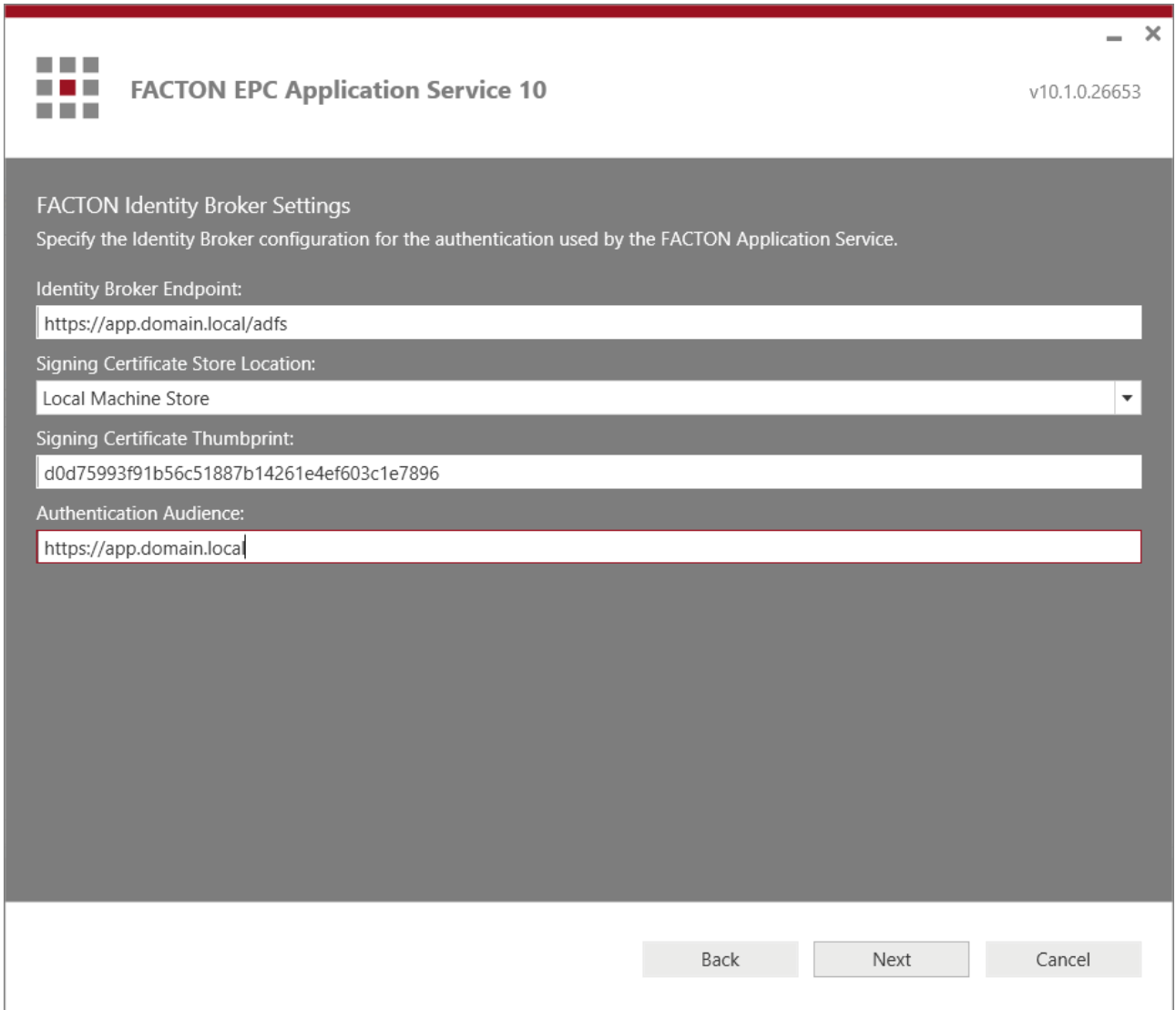


Figure 4.7: STS authentication settings

8. In case of **Identity Broker** authentication mode, enter the endpoint address of the FACTON Identity Broker.
- Define the signing certificate by select its location in the **Signing Certificate Store Location** combobox and enter its thumbprint.
- Enter the Authentication Audience of the Identity Broker.
- Click on **Next**, to continue the installation.



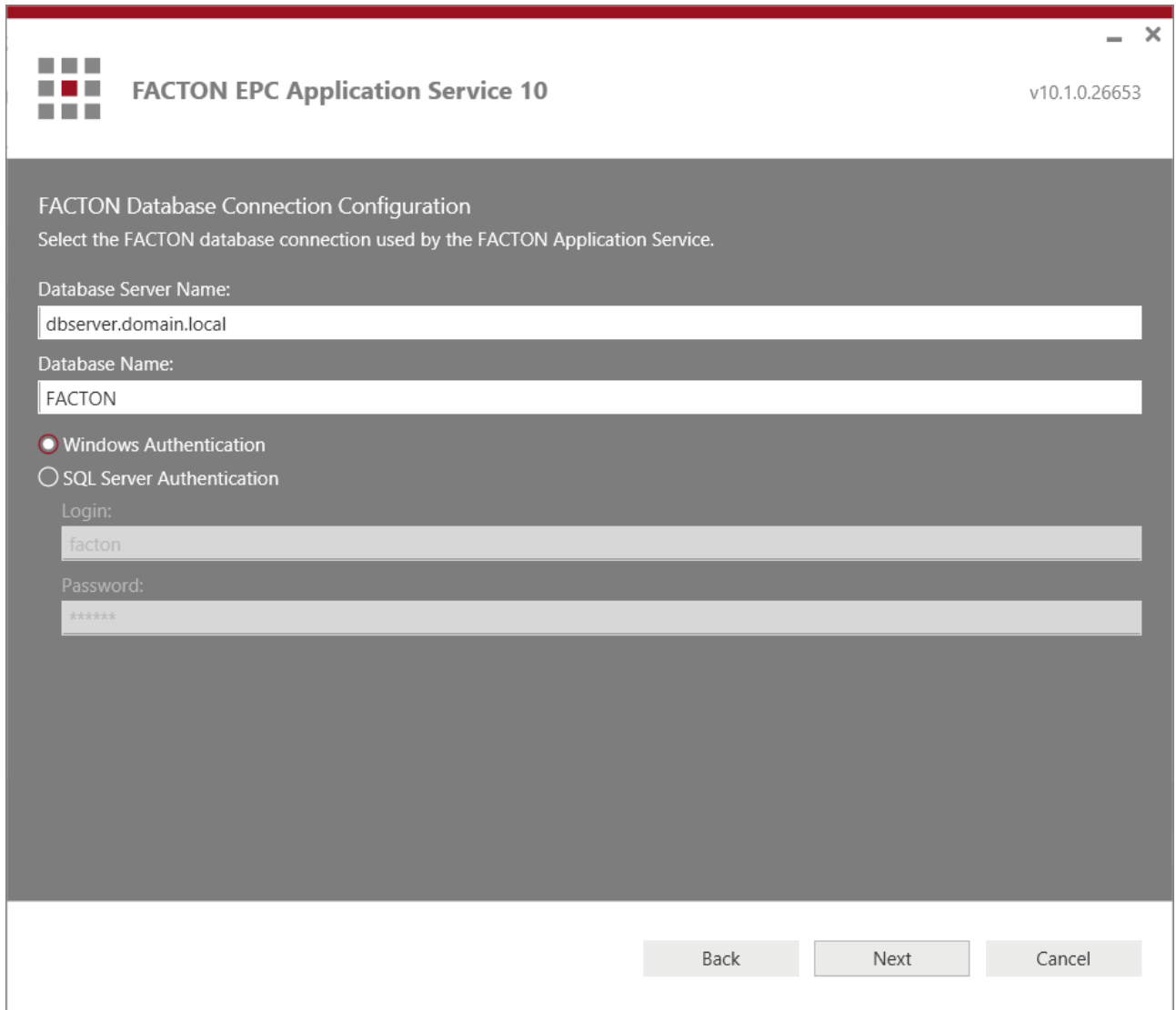
The screenshot shows a dialog box titled "FACTON EPC Application Service 10" with version "v10.1.0.26653". The dialog is titled "FACTON Identity Broker Settings" and contains the following fields:

- Identity Broker Endpoint:**
- Signing Certificate Store Location:**
- Signing Certificate Thumbprint:**
- Authentication Audience:**

At the bottom of the dialog, there are three buttons: "Back", "Next", and "Cancel".

Figure 4.8: Identity Broker authentication settings

9. Enter the database server and the database name.
Select the type of account and enter the login information, which should be used from the FACTON Application Service to log in to the database server.



The screenshot shows a dialog box titled "FACTON EPC Application Service 10" with version "v10.1.0.26653". The main heading is "FACTON Database Connection Configuration" with the instruction "Select the FACTON database connection used by the FACTON Application Service." The form contains the following fields and options:

- Database Server Name:
- Database Name:
- Authentication options:
 - Windows Authentication
 - SQL Server Authentication
- Login:
- Password:

At the bottom right, there are three buttons: "Back", "Next", and "Cancel".

Figure 4.9: FACTON database connection



Note

With Windows Authentication the configured service account is used to connect to the database.

- 10. To define a custom application data directory activate the »Set a special Directory...« checkbox and enter the directory of the Application Service Data. Use environment variables to set a machine- or user-specific path for the data directory, e.g. "c:\FACTON\%COMPUTERNAME%". Click on **Next** to continue to the installation.

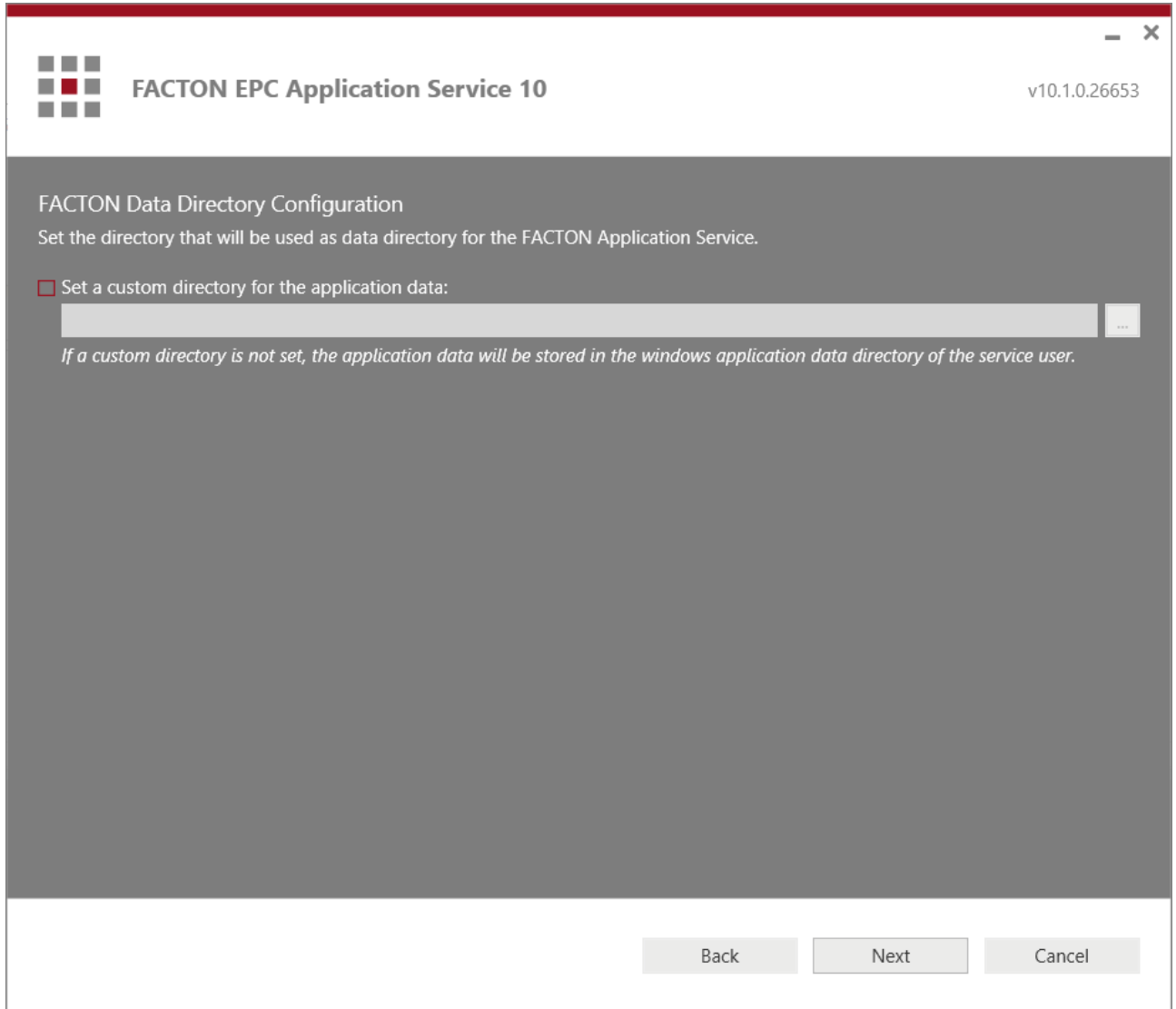


Figure 4.10: Setting an custom data directory



Note

A custom data directory can be configured in this optional step.

- 11. This step is only necessary for authentication via **WS-Trust 1.3**. In this case select the authentication type and enter the required configuration parameters, which have been used to login to the Service API. The OAuth certificate is the token-signing certificate of the STS that is used for authentication with OAuth. Click on **Next** to continue the installation.

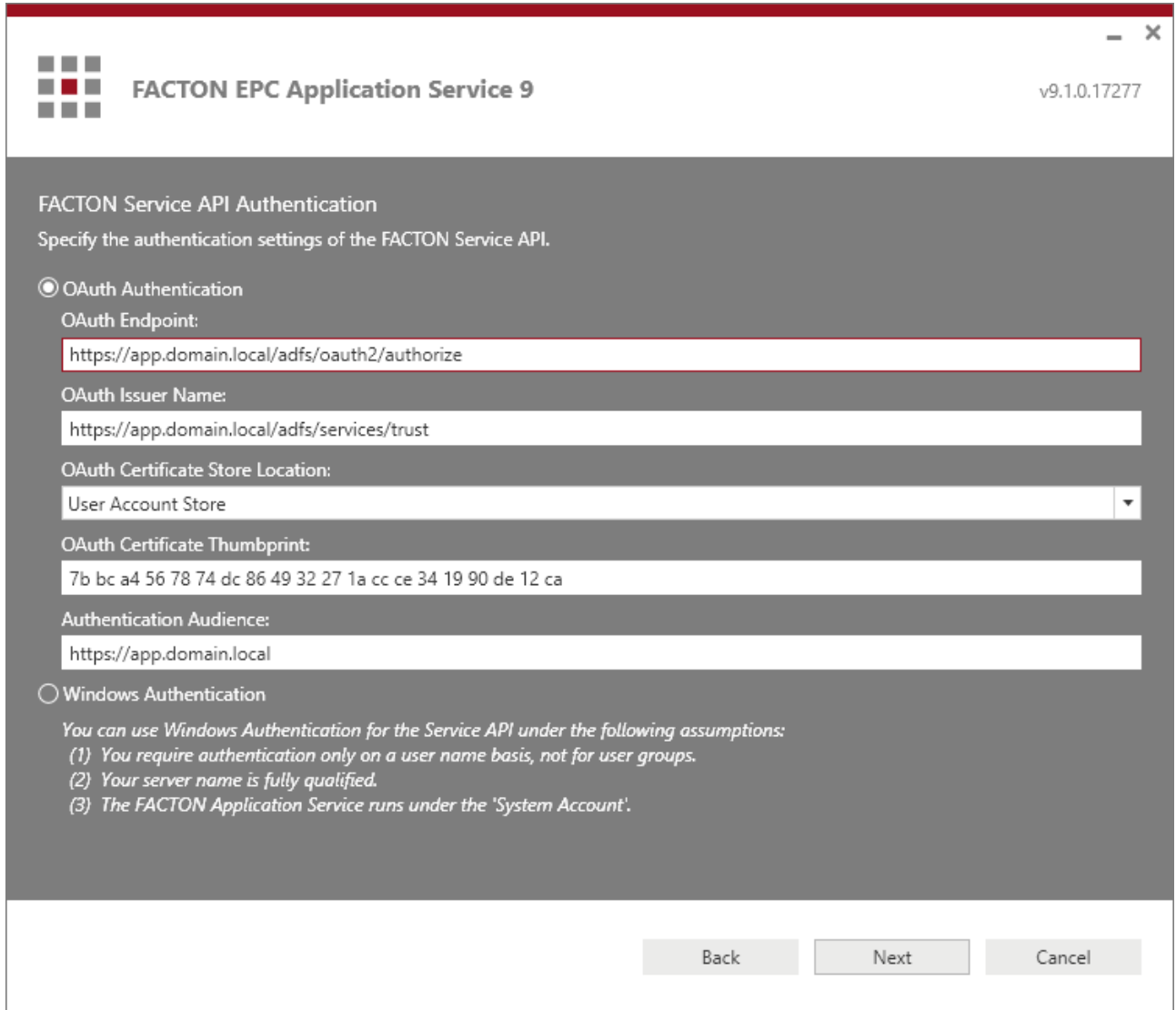


Figure 4.11: Service API authentication settings

12. A summary page opens and displays the previously installed prerequisites (in gray) and the current component you wish to install (in black). Click on the **Install** button to start the installation process.

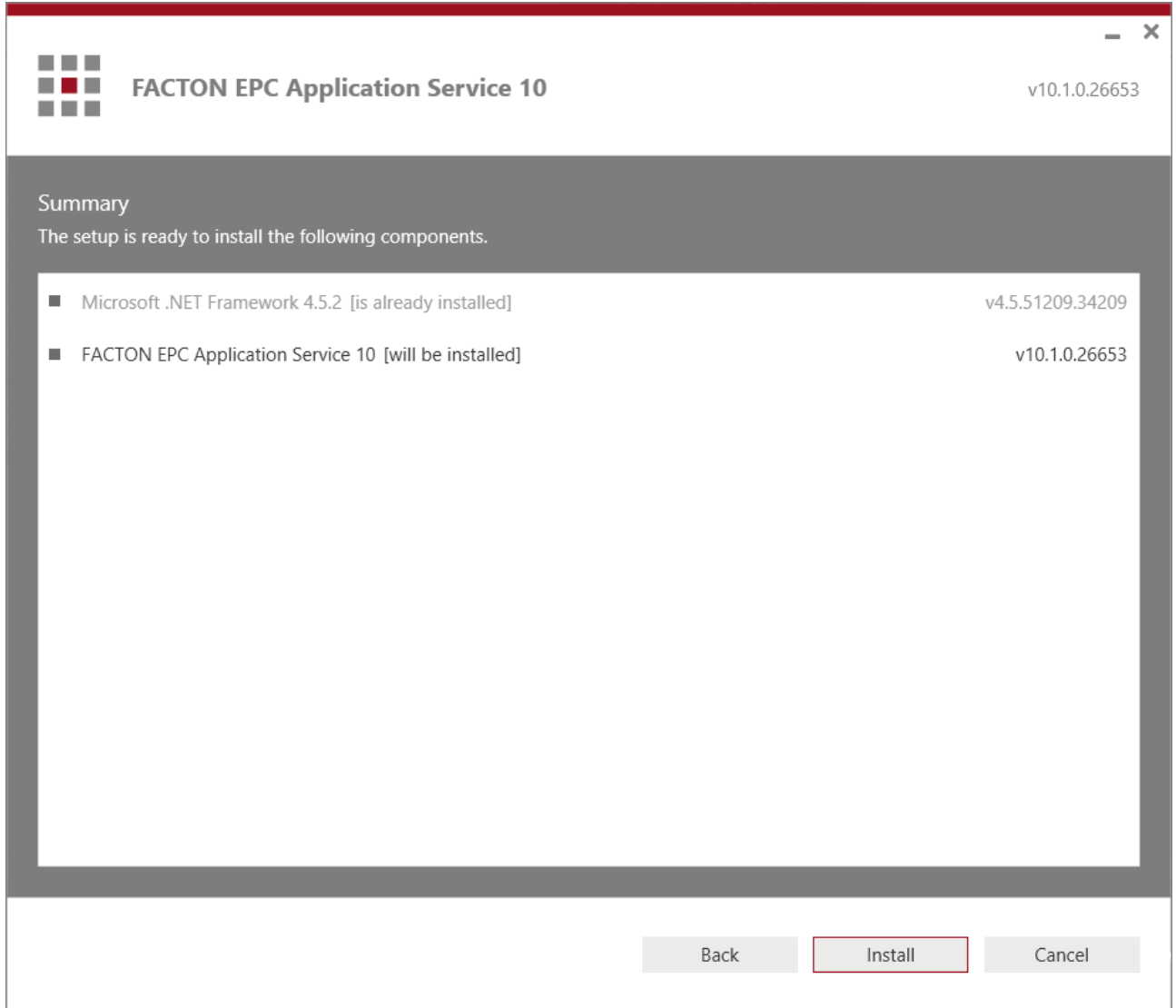


Figure 4.12: Summary of the installation components

13. The setup starts the installation and shows the progress of the installation.

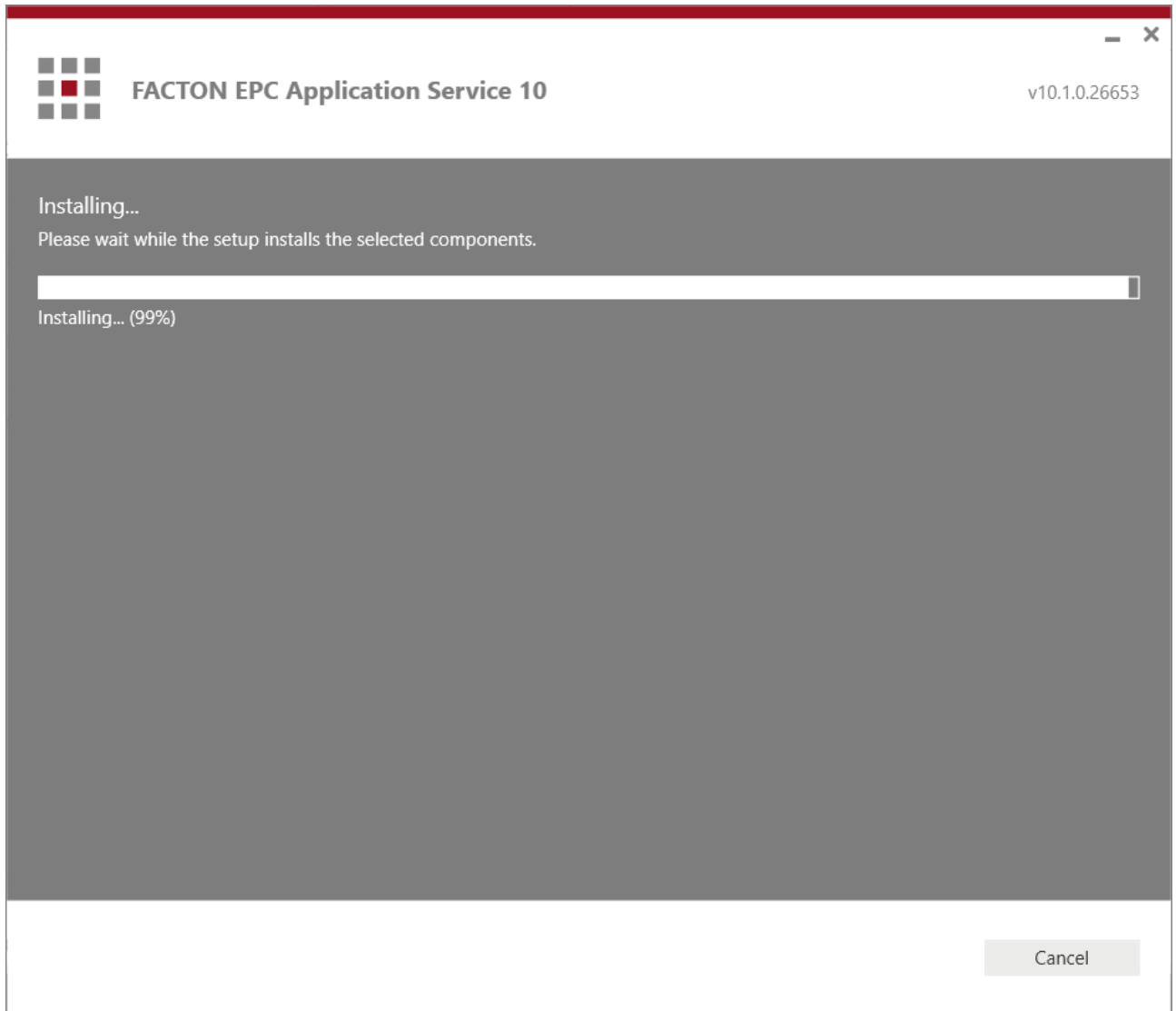


Figure 4.13: Installing the Application Service

- 14. If the installation process is successfully finished, a page with information about the installed components opens.

Click on the **Finish** button to finish the installation process and close the wizard.

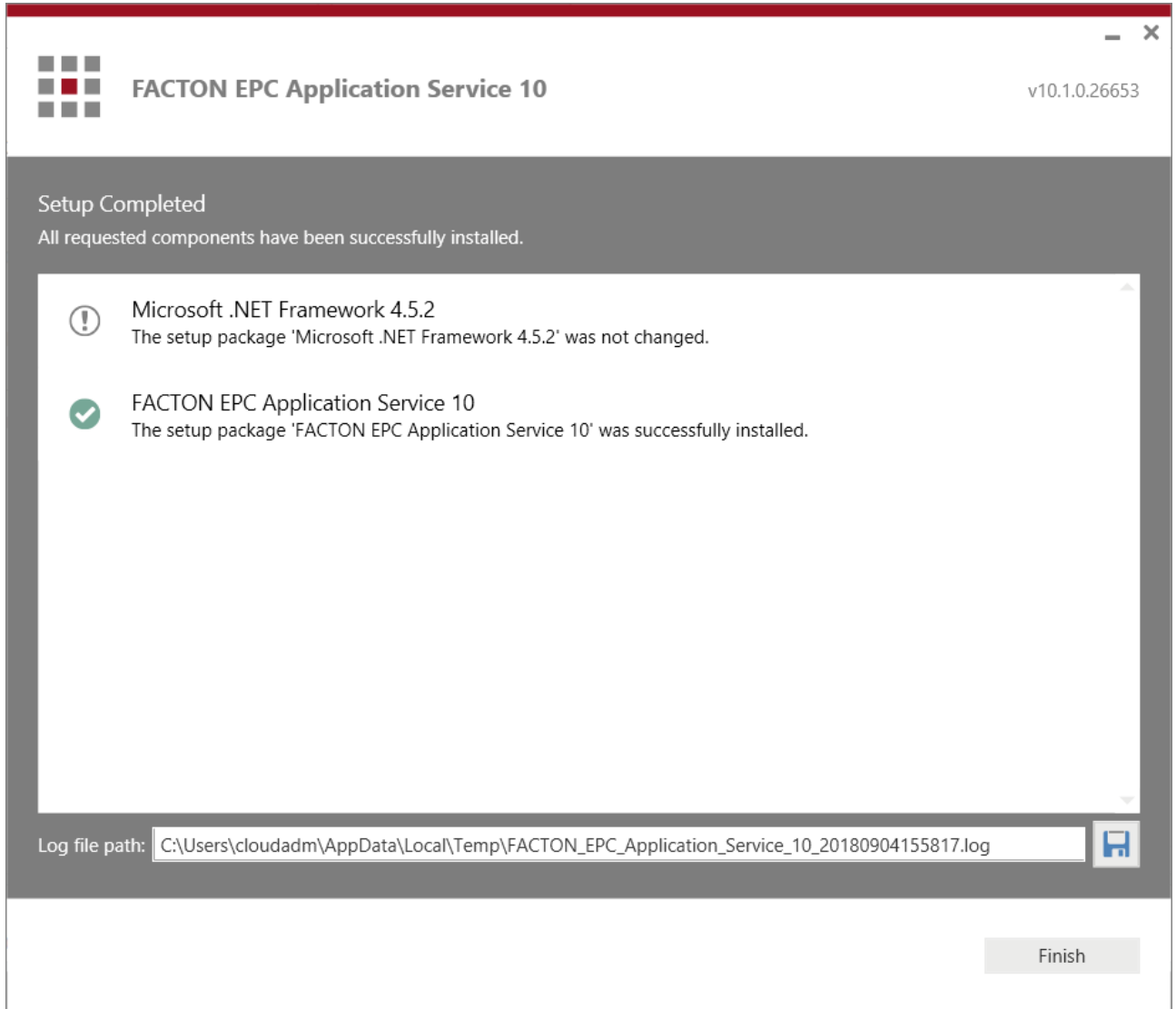


Figure 4.14: Overview about the installed components

15. If the installation process has canceled or failed, the setup wizard opens a page which shows one or more error messages about the unfinished installation.

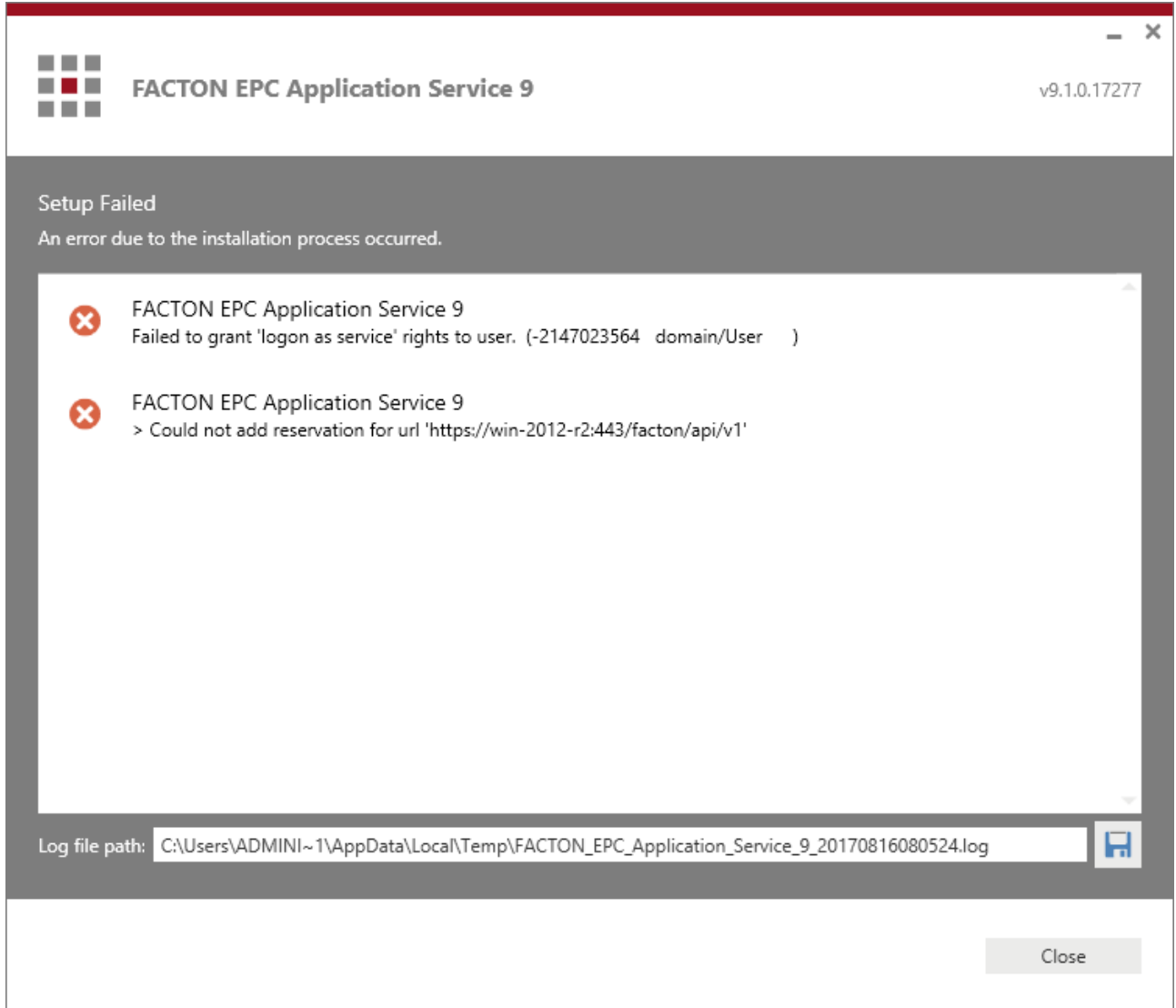


Figure 4.15: Errors occurring during the installation



Note

Click on the floppy disk button to store the log file of the failed installation. That information are useful in support of FACTON.

4.1.2 Install the FACTON Identity Broker

This chapter describes the installation process of the **FACTON Identity Broker** via attended mode.

Install the Identity Broker via Attended Mode

1. Double-click on the setup file (e.g. »FACTON_Identity_Broker_1.0.0.17311.exe«) to start the installation. The setup starts a wizard and analyzes the current state of the FACTON Component.

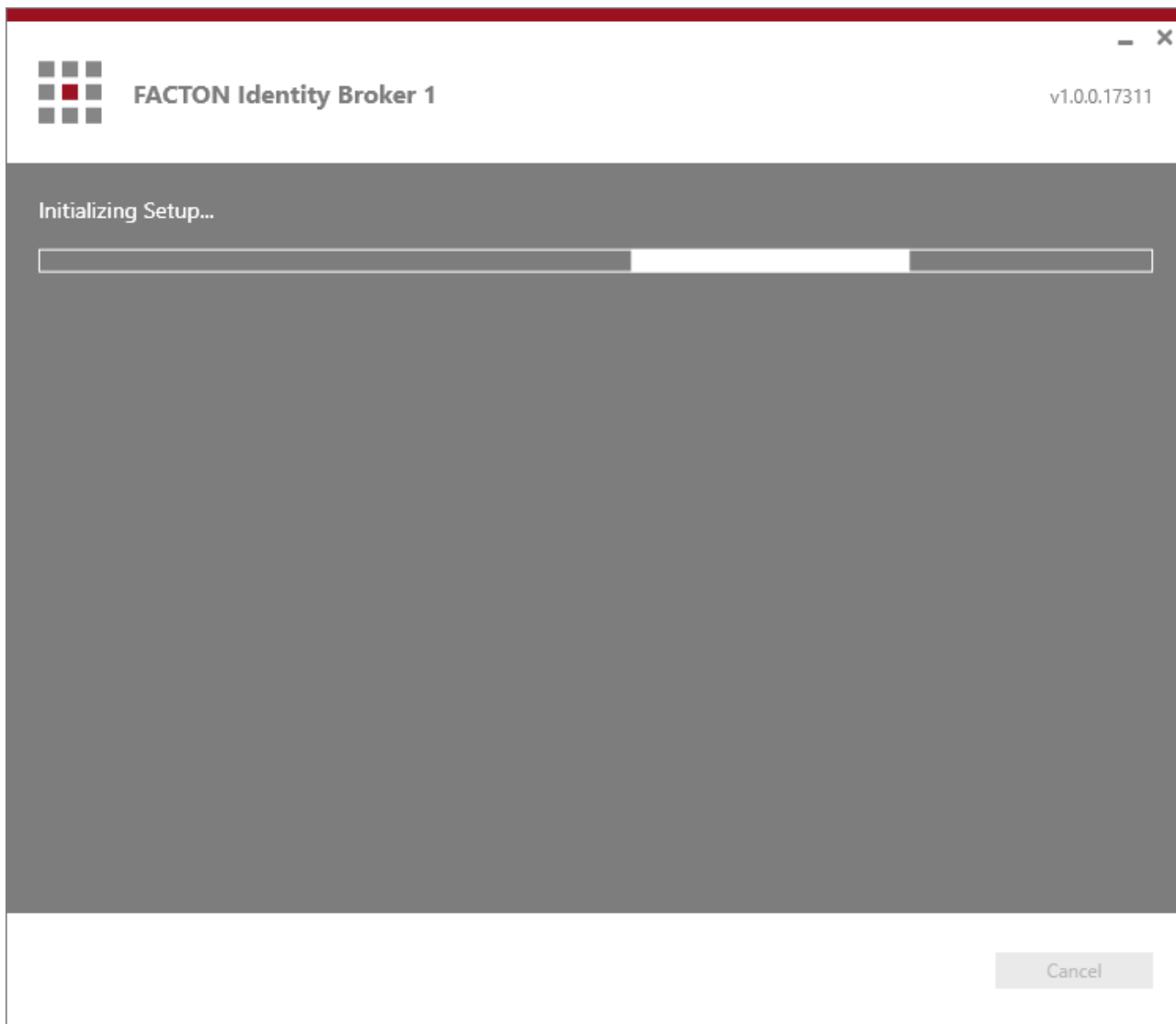


Figure 4.1: Initializing the setup

- 2. A wizard page opens and shows the executable setup actions. Click on the »Install...« setup action.

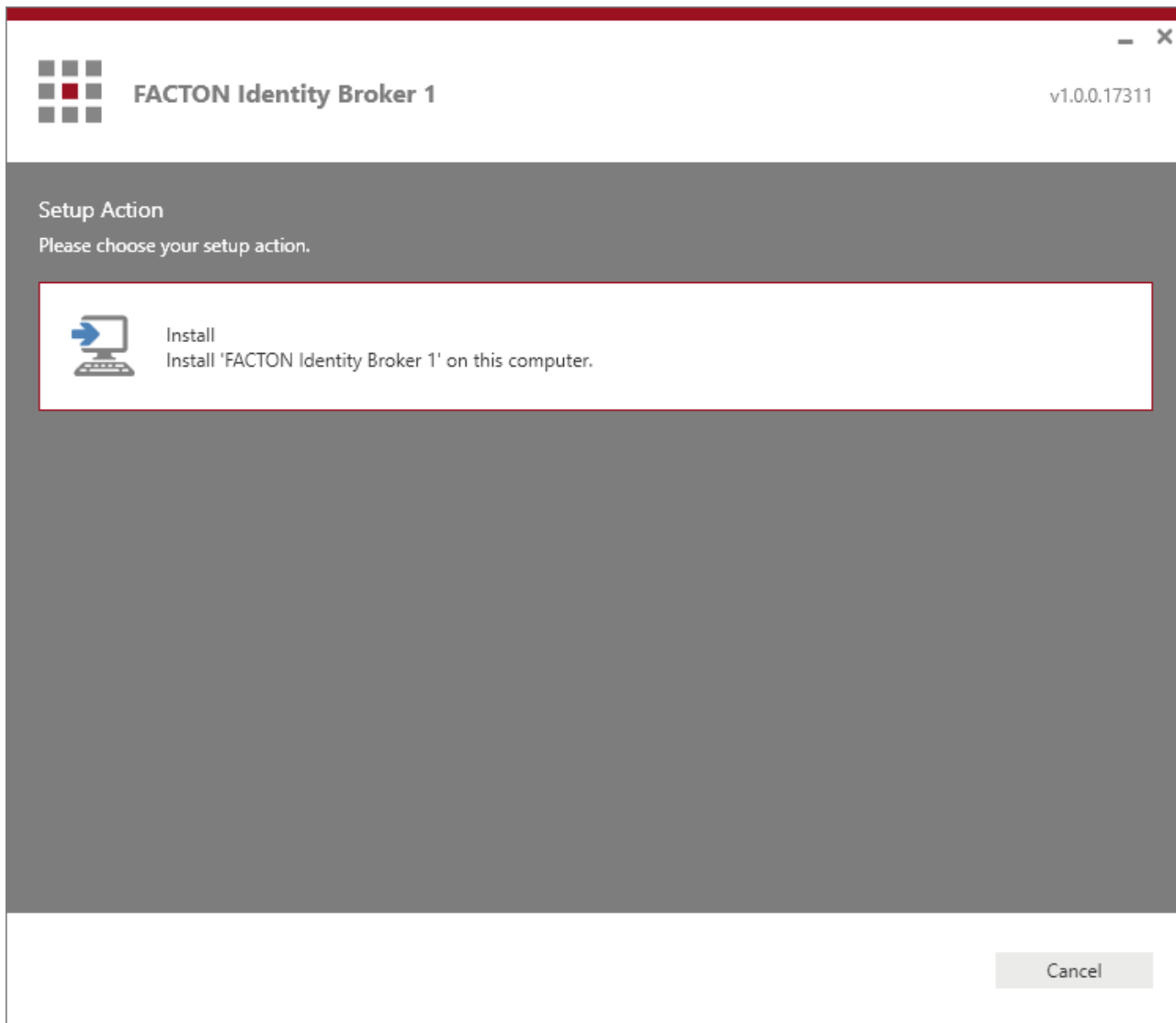


Figure 4.2: Choosing a setup action

**Note**

If the wizard shows the action **Uninstall**, the current version of the FACTON Component is already installed and could be uninstalled.

See section [»Uninstall FACTON«](#) for more information.

If the current version of the Component already installed, it is not possible to install an older or newer version. In this case the wizard shows a setup error with a corresponding message to uninstall the older or newer version first.

- 3. Please read the terms of the license agreement carefully. Activate the »I accept the terms ...« checkbox to accept the terms of the license agreement. Click on **Next**, to continue the installation.



Figure 4.3: FACTON license agreement acceptance

- 4. Enter the installation folder path where you would like to store the FACTON Component files. Click on **Next**, to continue the installation.

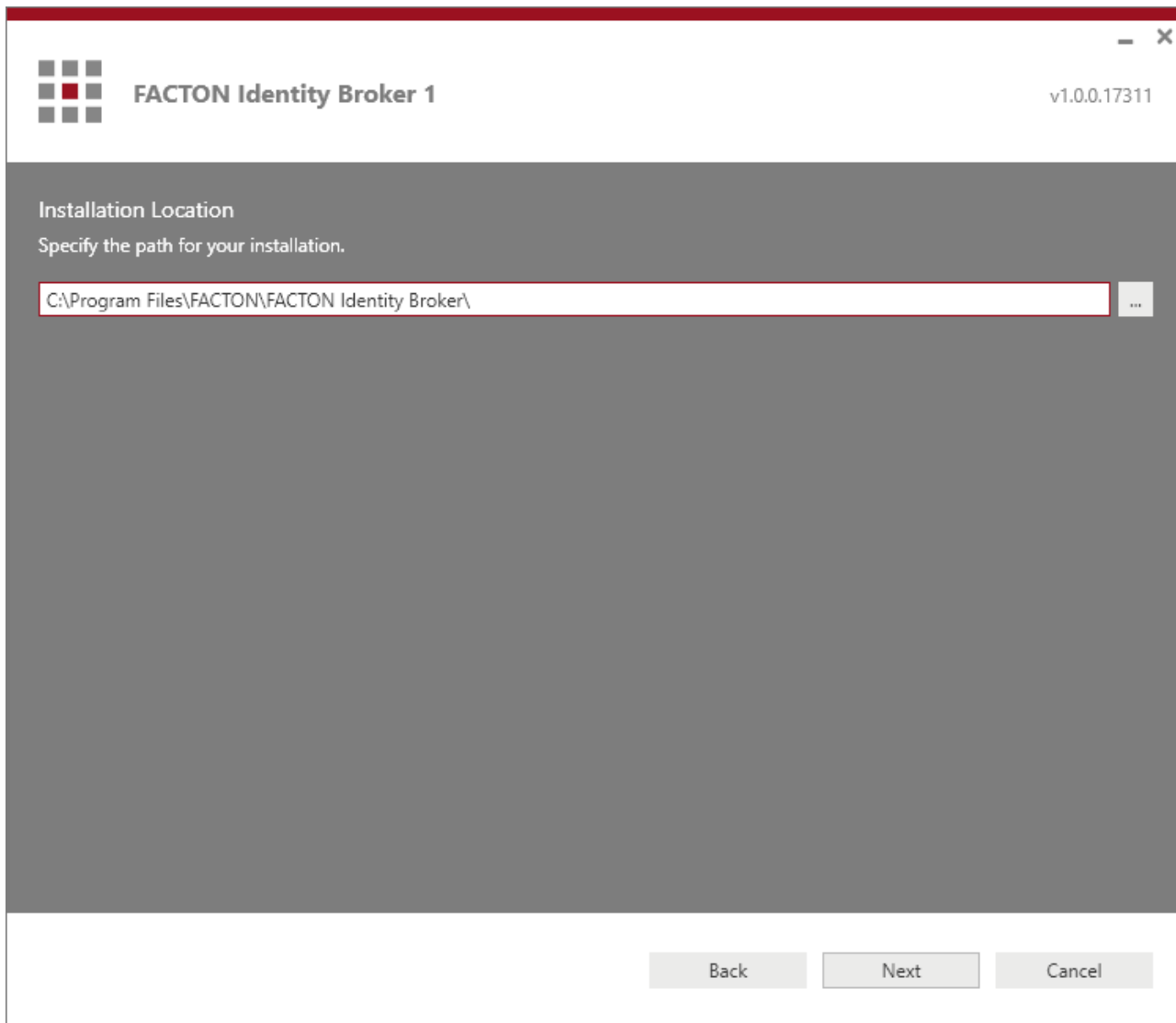


Figure 4.4: Specifying an installation location

- 5. Configure the service account to be used to run the FACTON Identity Broker. Click on **Next**, to continue the installation.

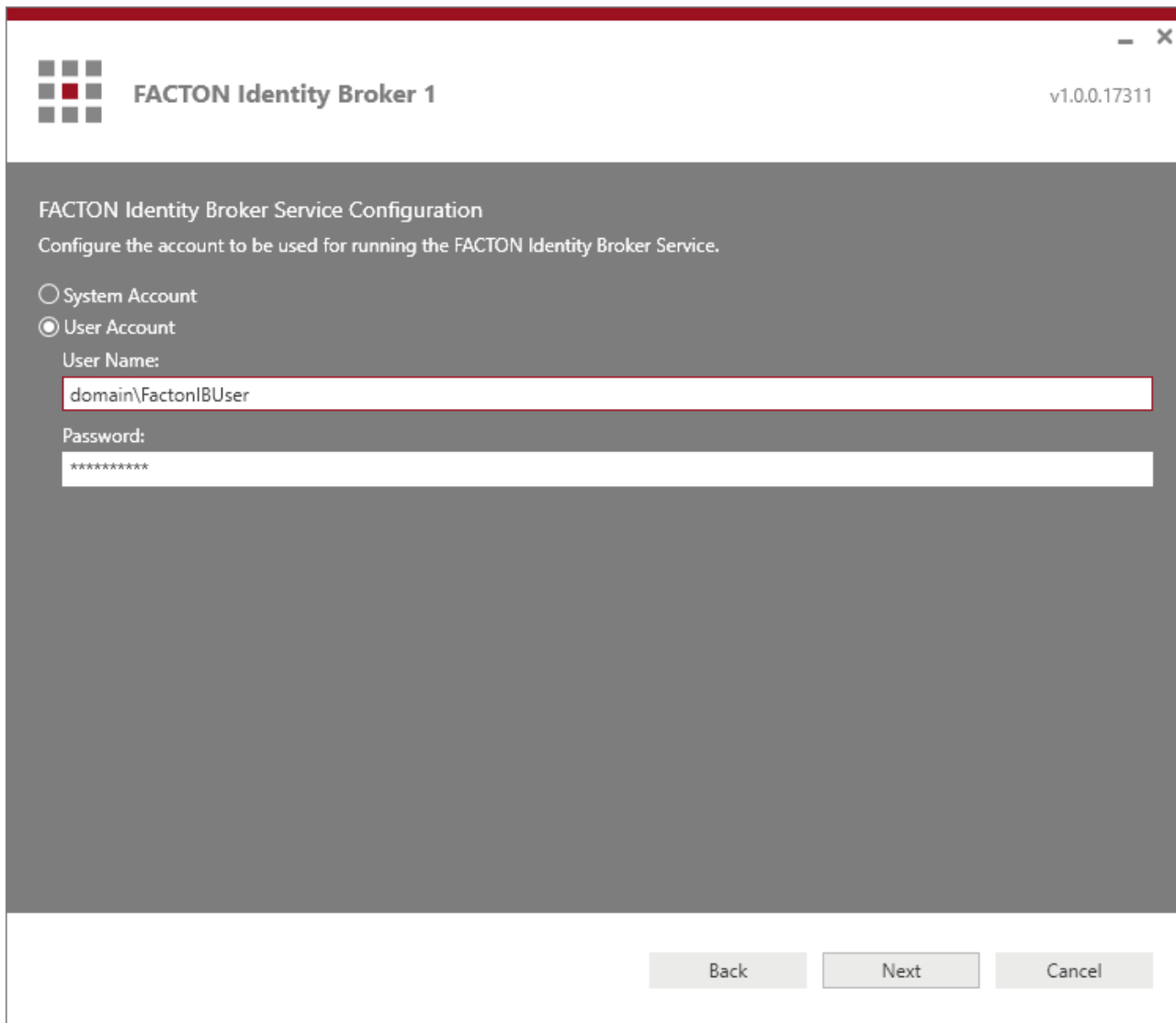


Figure 4.5: Service account configuration

- 6. Enter the endpoint address of the FACTON Identity Broker. Click on **Next**, to continue the installation.

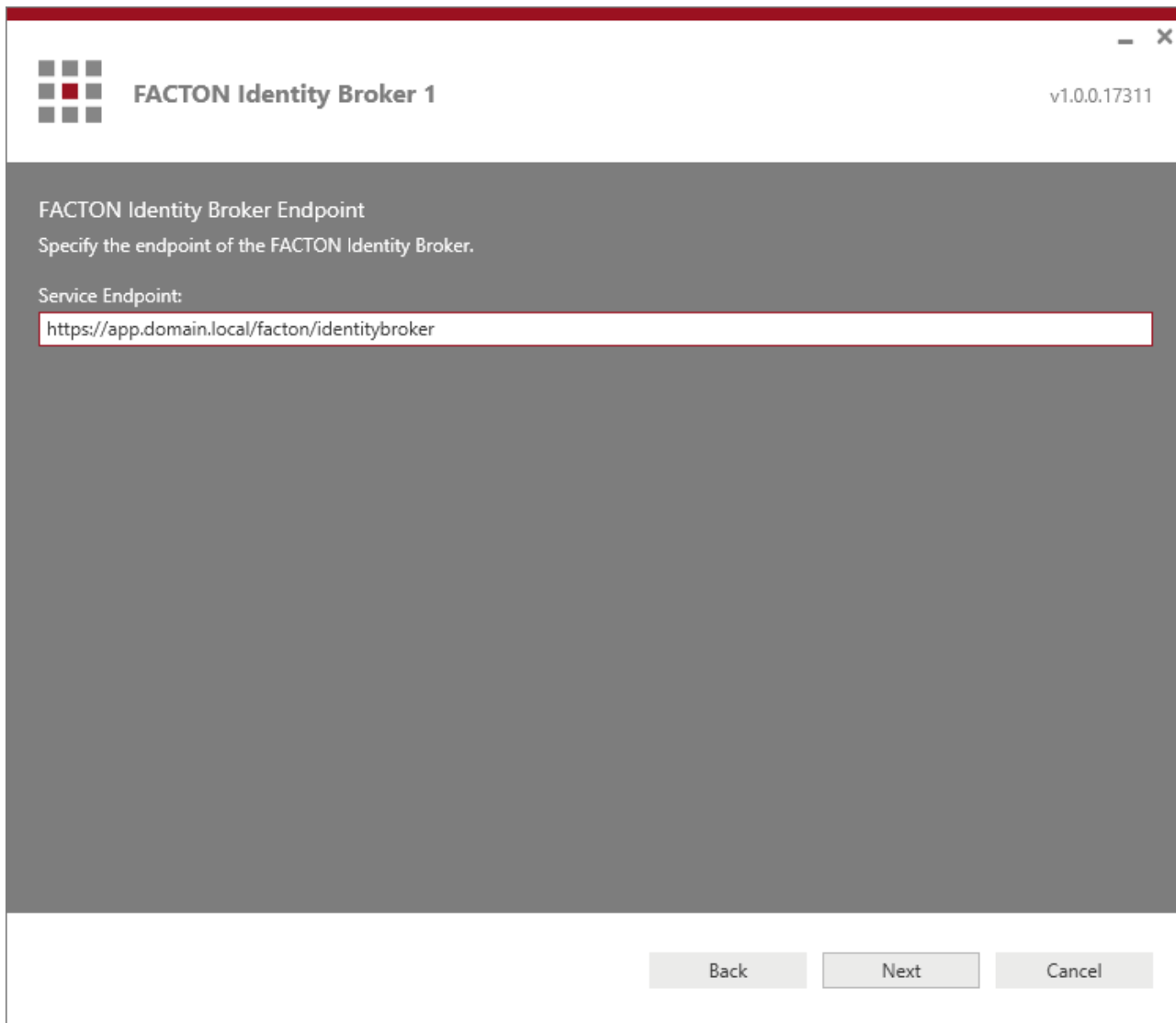


Figure 4.6: Configure the Identity Broker endpoint

- 7. Choose or set a file which contains additional settings of the FACTON Identity Broker. Click on **Next**, to continue the installation.

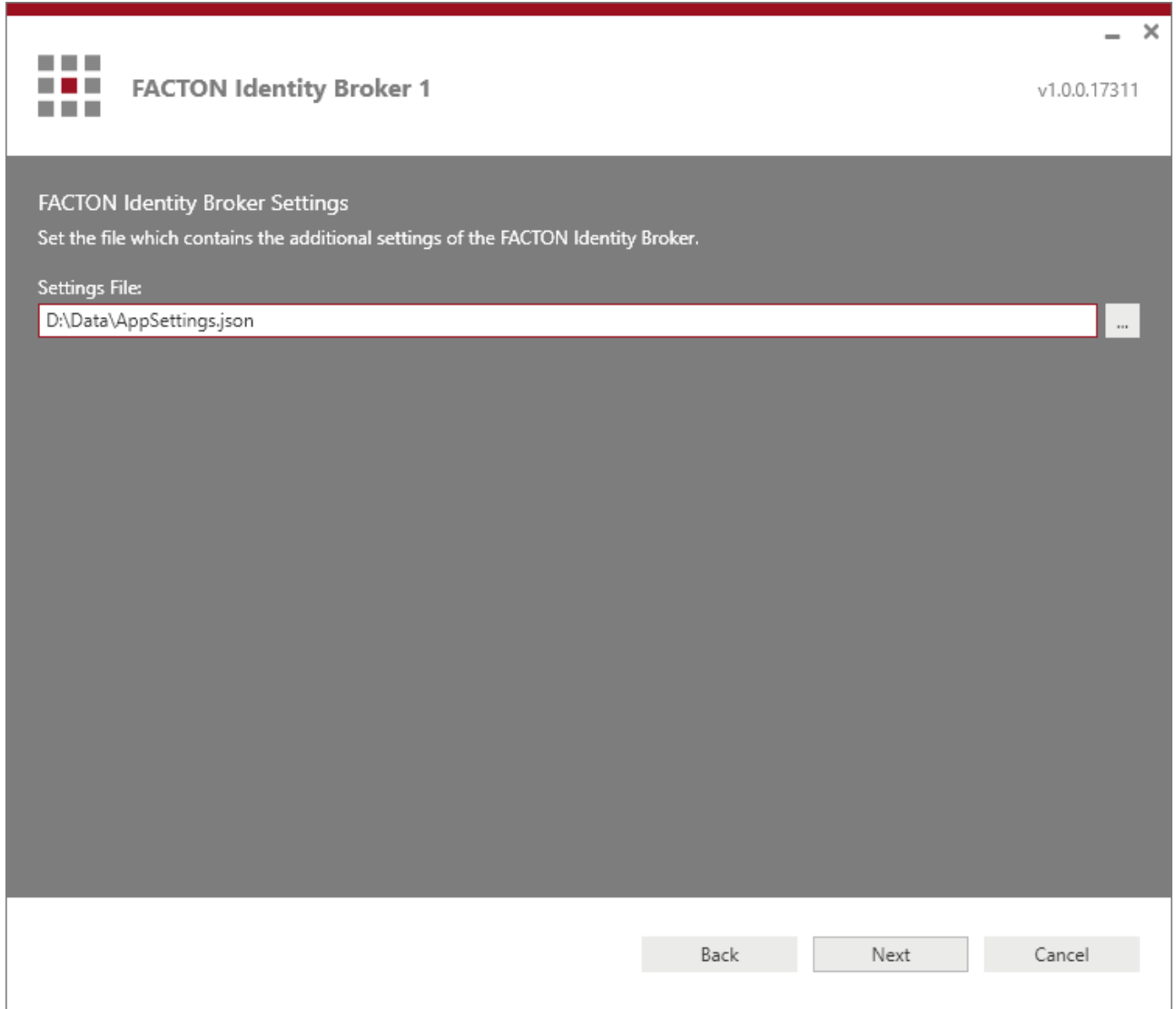


Figure 4.7: Settings file selection

8. Activate the »Set the database configuration...« checkbox to use the FACTON Identity Broker with load balancing. Enter the database server and the database name. Select the database authentication and enter the login information which should be used for the database connection. Click on **Next**, to continue the installation.

FACTON Identity Broker 1 v1.0.0.17311

FACTON Database Connection Configuration

Select the FACTON database connection used by the FACTON Identity Broker.

Set the database configuration for load balancing:

Database Server Name:

Database Name:

Windows Authentication

SQL Server Authentication

Login:

Password:

Back Next Cancel

Figure 4.8: FACTON database connection



Note

In case of Windows Authentication the configured service account is used to connect to the database.

9. A summary page opens and displays the previously installed prerequisites (in gray) and the current component you wish to install (in black). Click on the **Install** button to start the installation process.

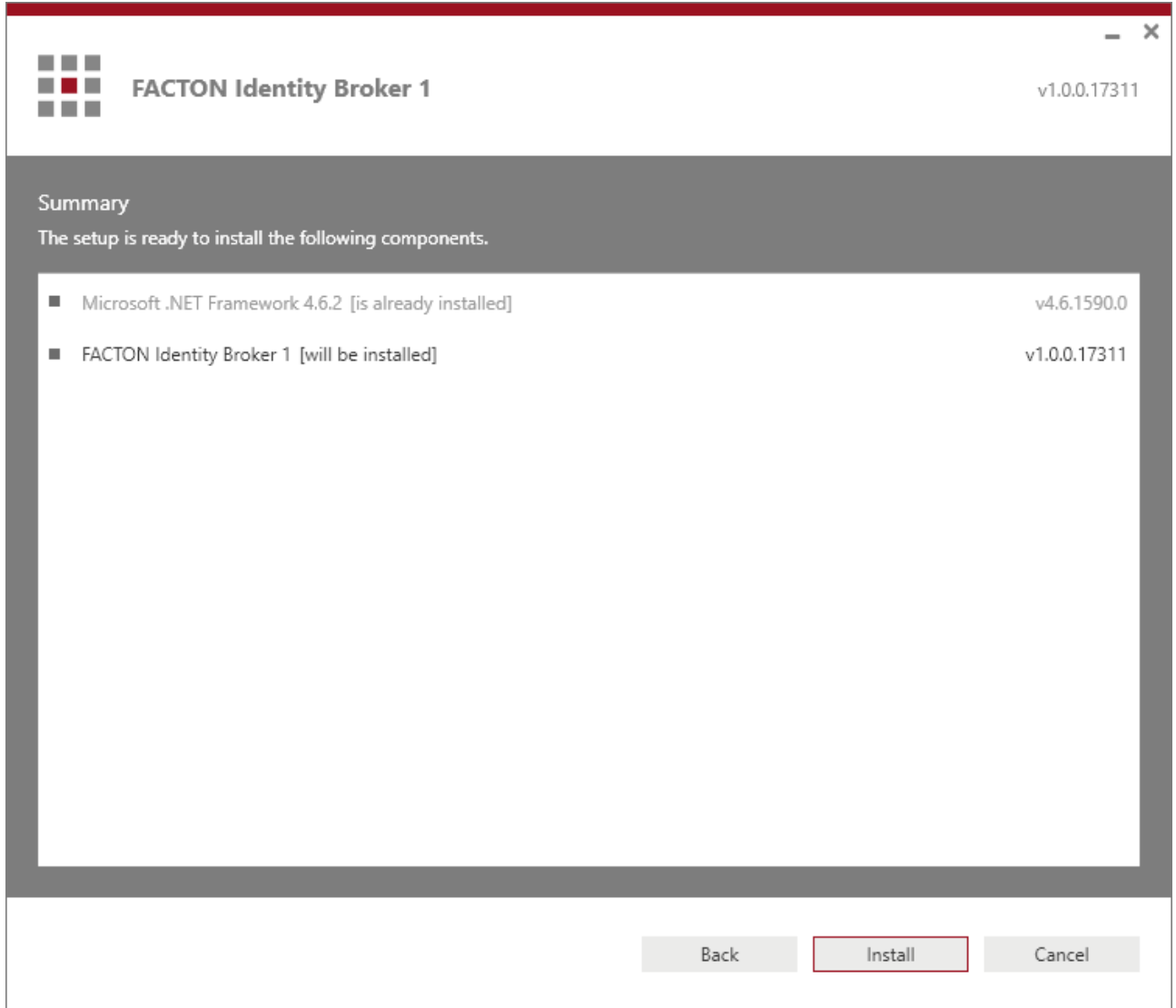


Figure 4.9: Summary of the installation components

10. The setup starts the installation and shows the progress of the installation.

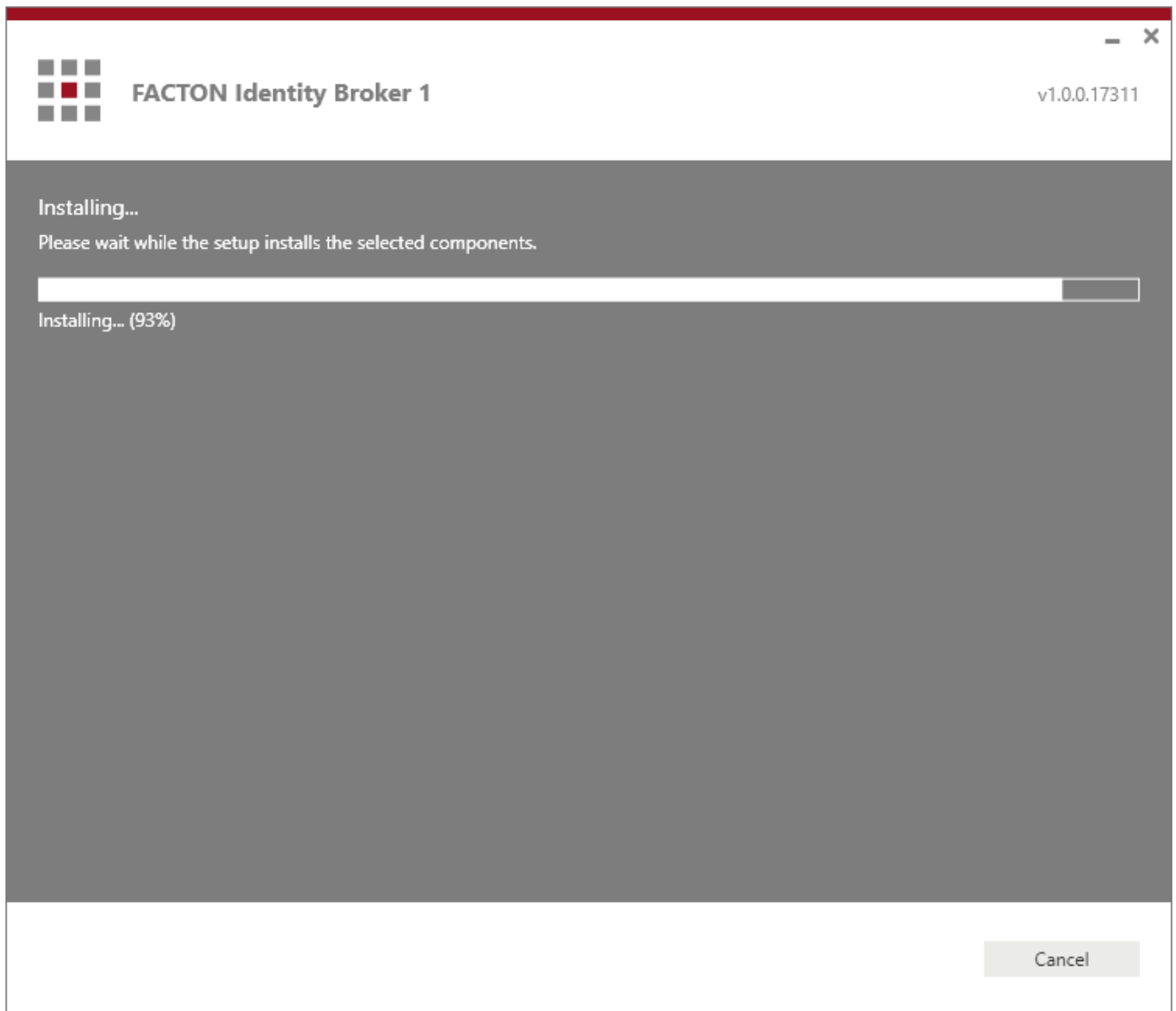


Figure 4.10: Installing the Identity Broker

11. If the installation process successfully finished, a setup page with information about the installed components opens.
Click on the **Finish** button to complete the installation process and close the wizard.

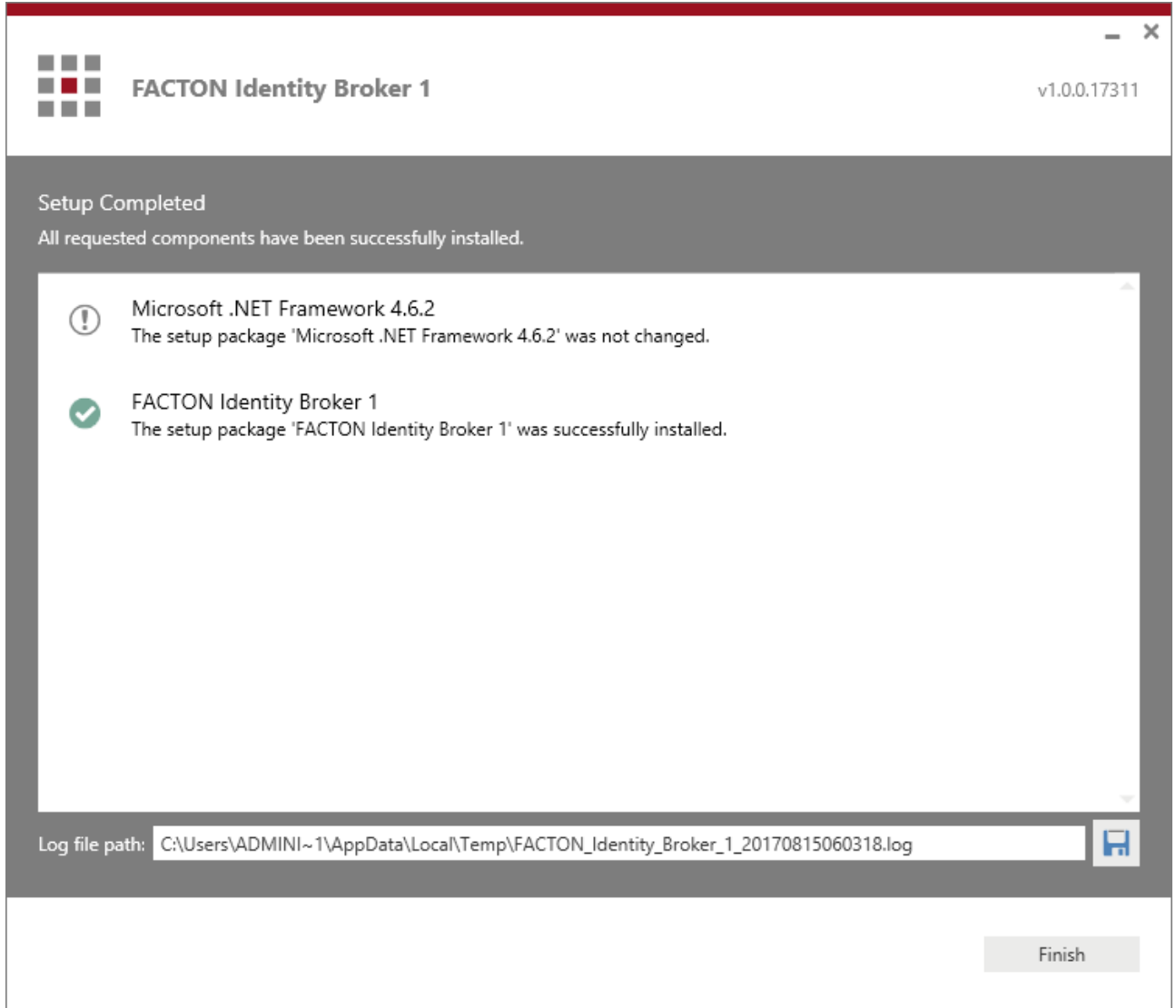


Figure 4.11: Overview about the installed components

12. If the installation process has canceled or failed, the wizard opens a setup page which shows one or more error messages about the unfinished installation.

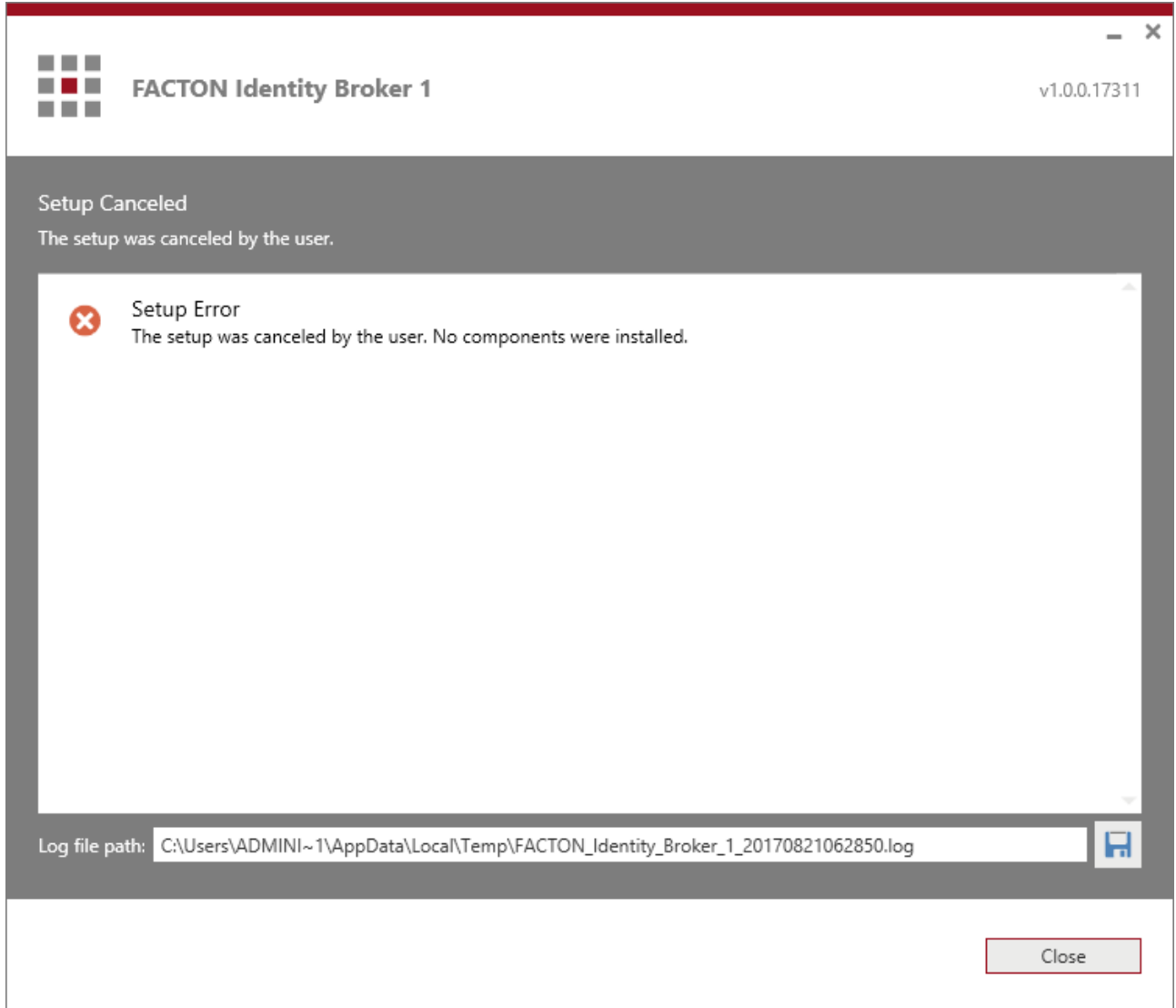


Figure 4.12: Errors occurring during the installation



Note

Click on the floppy disk button to save the log file of the failed installation. That information are useful in support of FACTON.

4.1.3 Install the FACTON Client Deployment Site

This chapter describes the installation process for the **FACTON Client Deployment Site** via attended mode.

The client deployment site contains the ClickOnce installation files of the FACTON Client. These files must be installed under a path, which is accessible by the IIS.

 Install the Client Deployment Site via Attended Mode

1. Double-click on the »FACTON_Offline_Client_Website_9.1.0.17277.exe« setup file, to start the installation.

The setup starts a wizard and analyzes the current state of the FACTON Component.

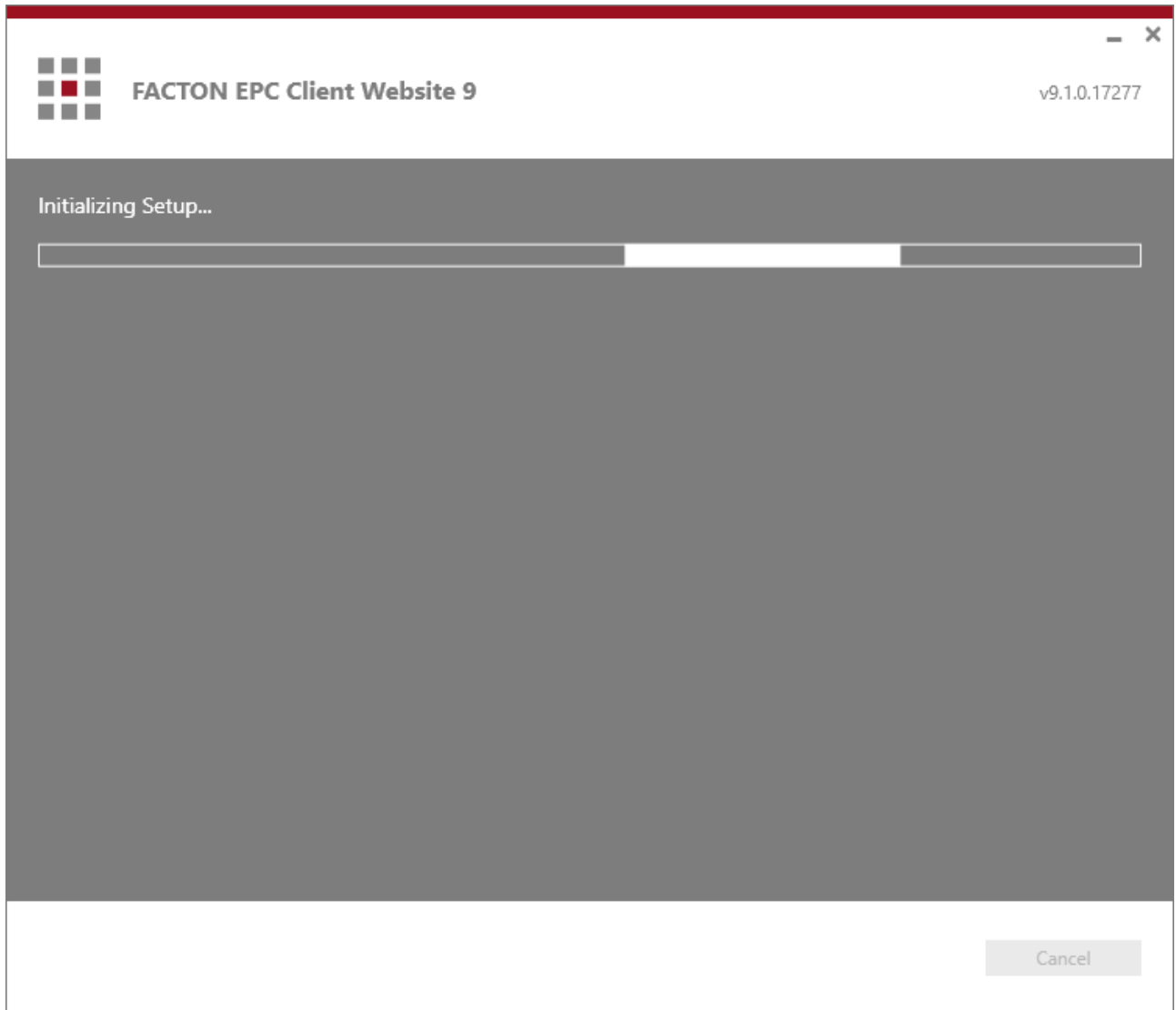


Figure 4.1: Initializing the setup

- 2. An install page opens and shows the executable setup actions. Click on the »Install...« setup action.

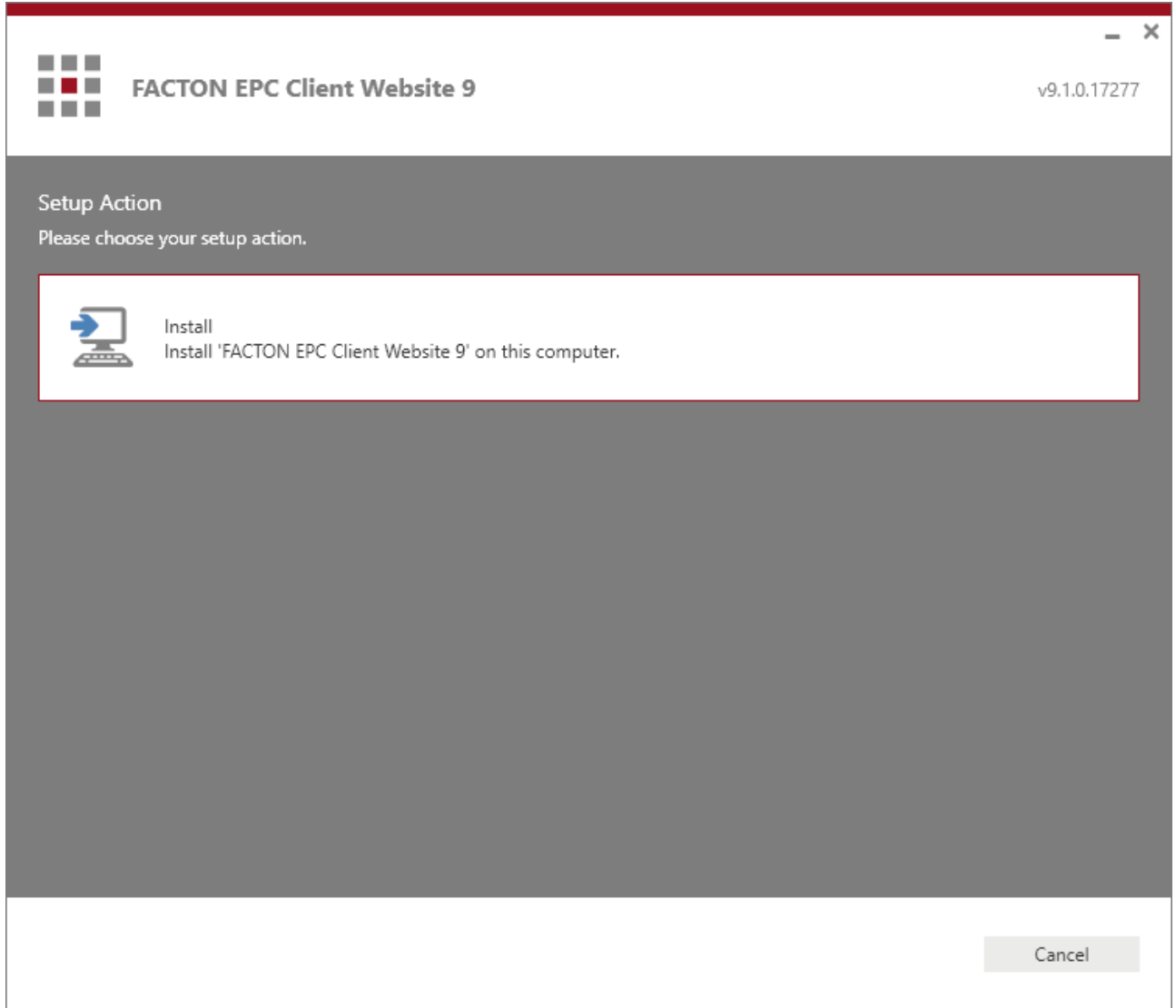


Figure 4.2: Choosing a setup action

**Note**

If the wizard shows the action **Uninstall**, the current version of the FACTON Component is already installed and could be uninstalled.

See section [»Uninstall FACTON«](#) for more information.

If the current version of the Component already installed, it is not possible to install an older or newer version. In this case the wizard shows a setup error with a corresponding message to uninstall the older or newer version first.

- Please read the terms of the license agreement carefully. Activate the »I accept the terms ...« checkbox to accept the terms of the license agreement. Click on **Next**, to continue the installation.

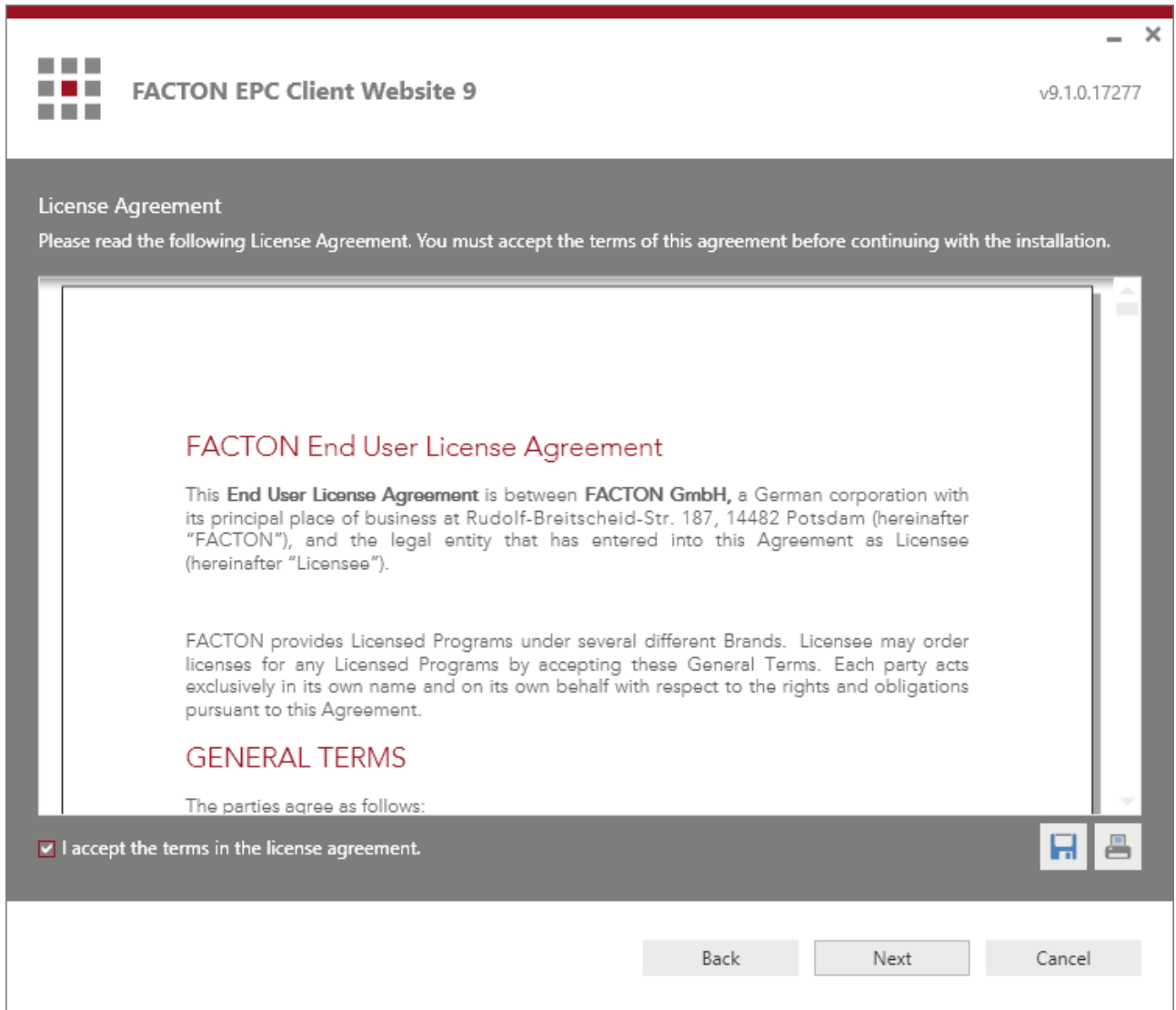


Figure 4.3: FACTON license agreement acceptance

4. Enter the installation folder path, where you wish to store the FACTON Component files.
Click on **Next** to continue the installation.

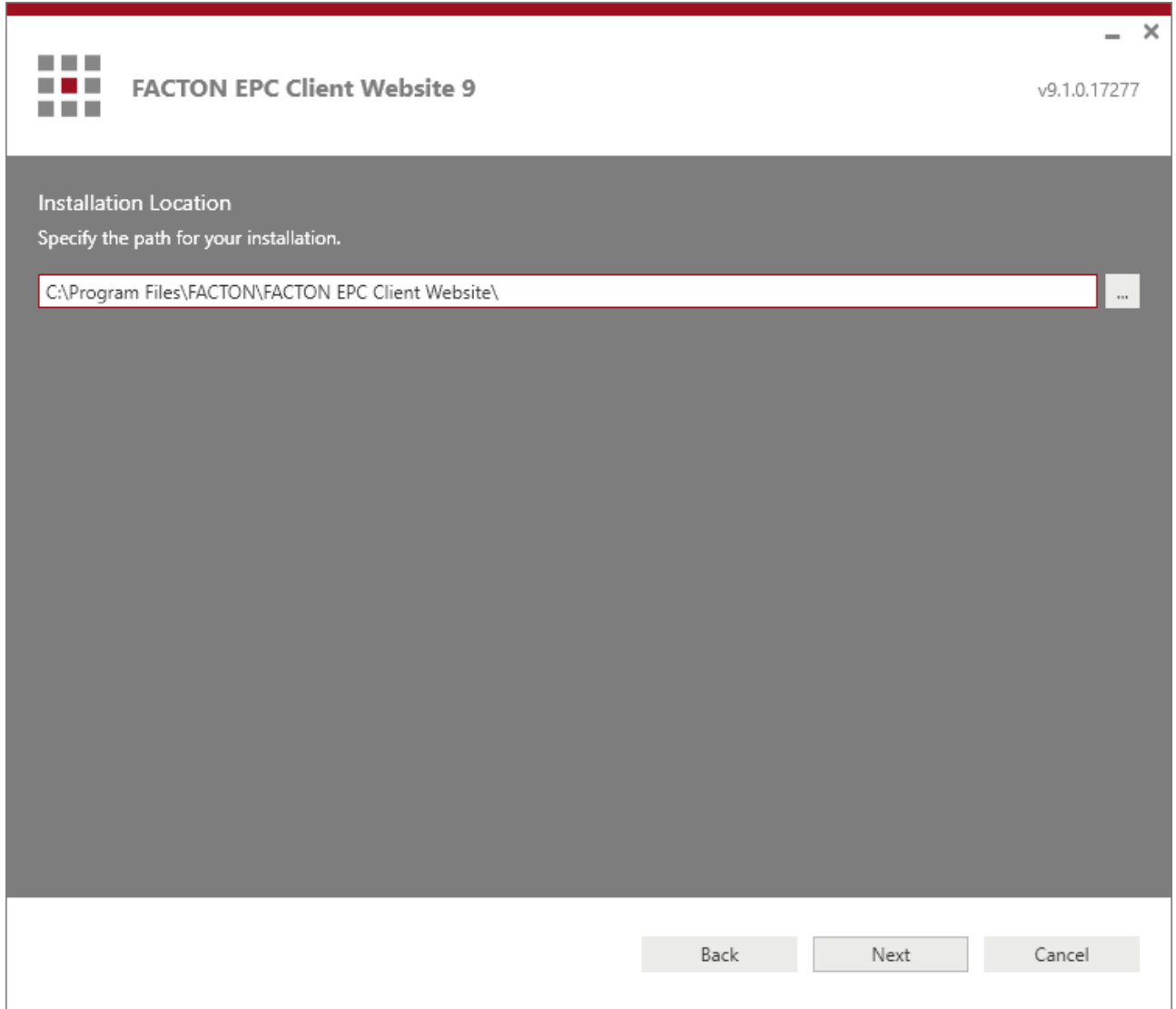


Figure 4.4: Specifying an installation location

- 5. Enter the metadata (MEX) address of the FACTON Application Service. Click on **Next** to continue the installation.

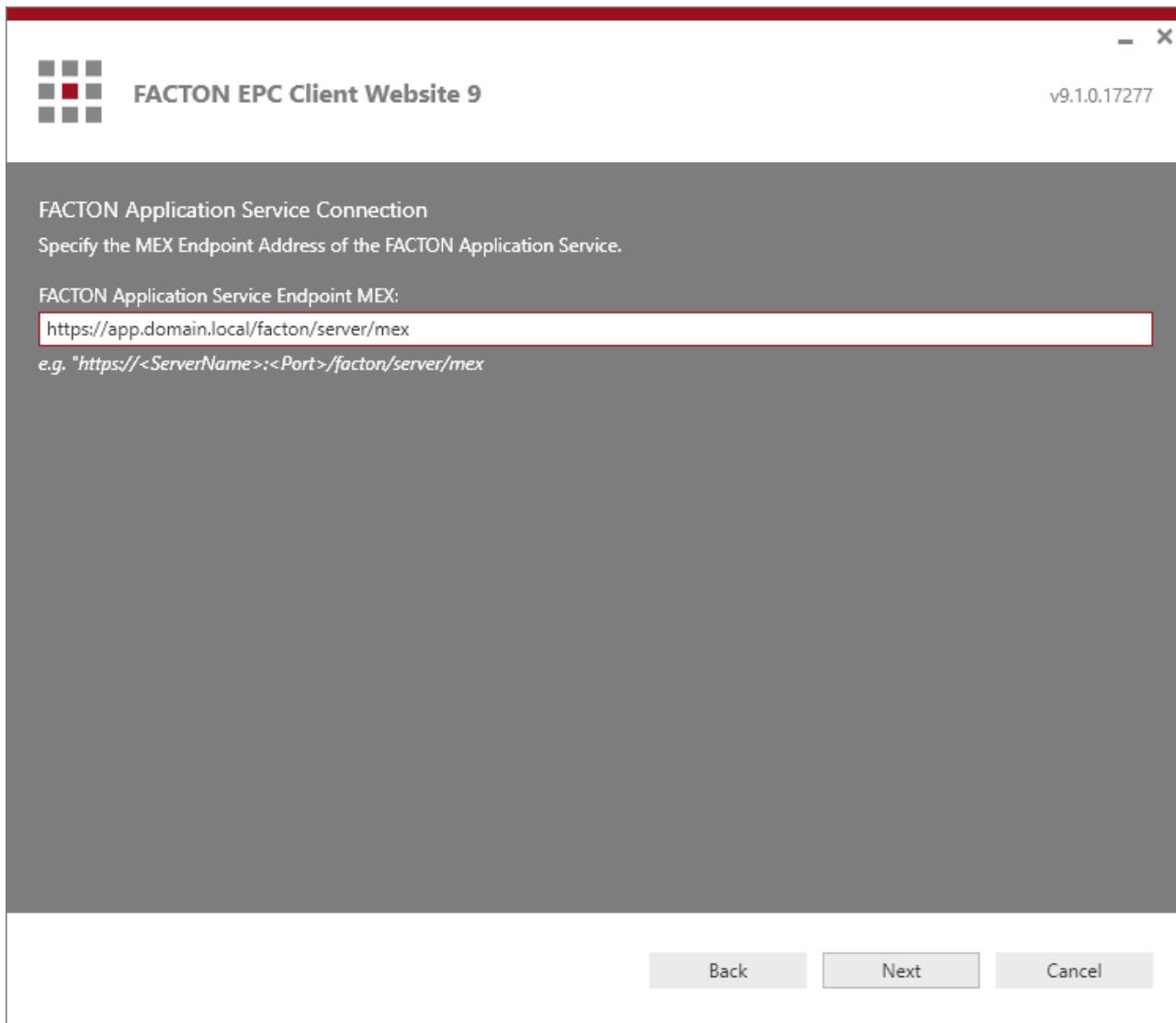


Figure 4.5: Specifying the Application Service MEX endpoint

- 6. Select the system environment type and enter a name of the system environment. The name is displayed in the status bar of the client.

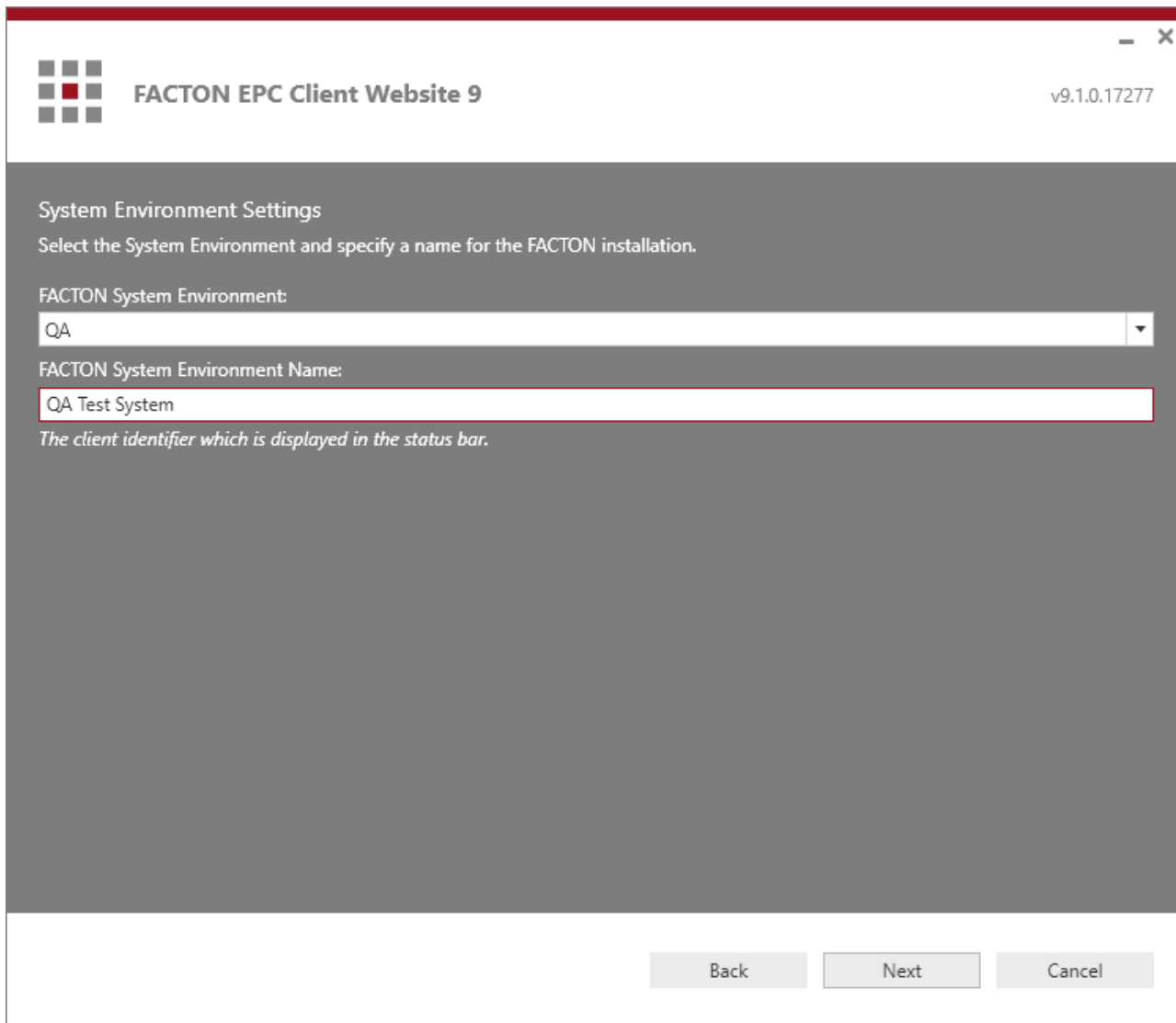


Figure 4.6: Initializing the setup

7. A summary page opens and displays the previously installed prerequisites (in gray) and the current component you wish to install (in bold). Click on the **Install** button to start the installation process.

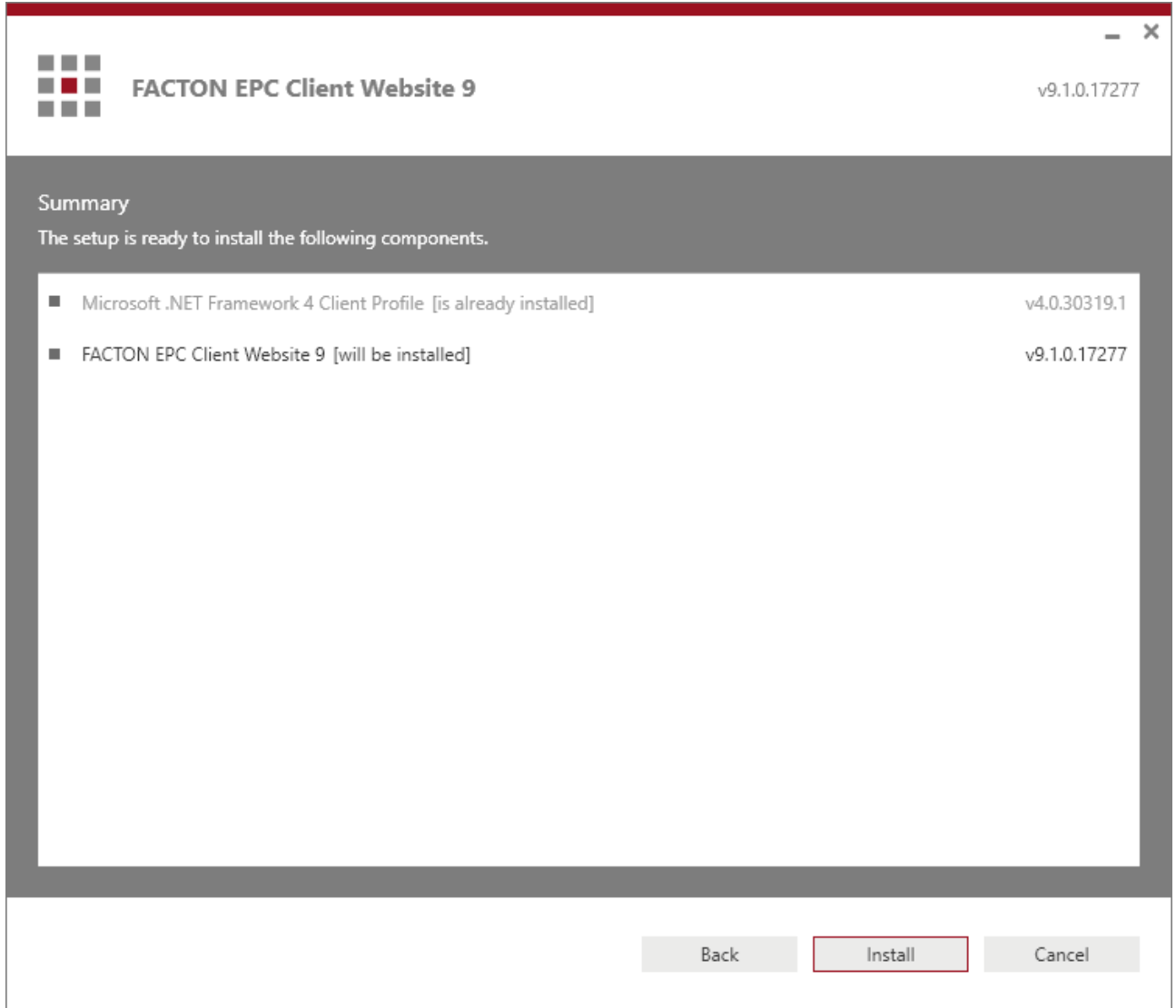


Figure 4.7: Summary of the installation components

8. The setup starts the installation and shows the progress of the installation.



Figure 4.8: Installing the Client Deployment Site

9. If the installation process finishes successfully, a page with information about the installed components opens.
Click on the **Finish** button to finish the installation process and close the wizard.

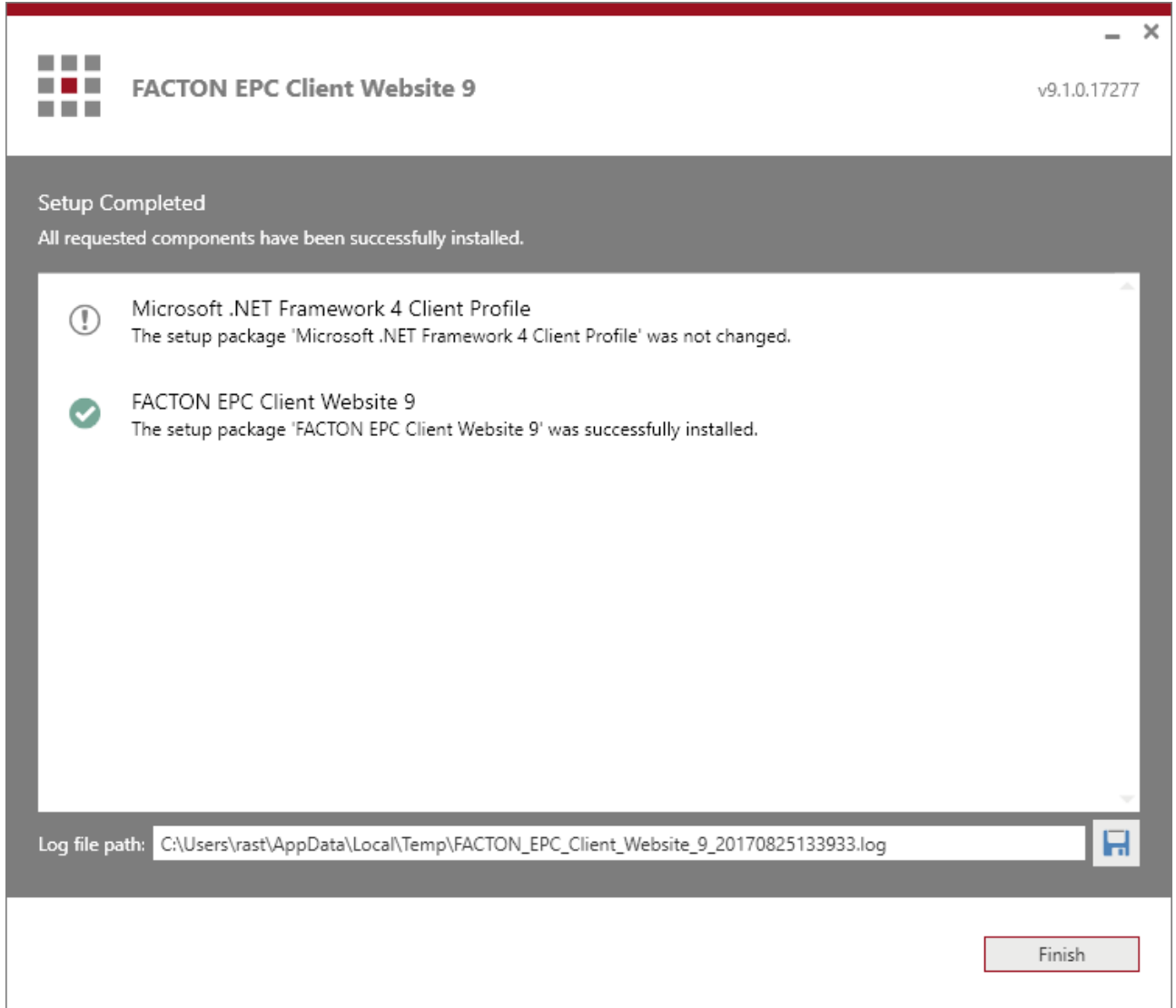


Figure 4.9: Overview about the installed components

10. If the installation process fails a page opens and displays an error message.

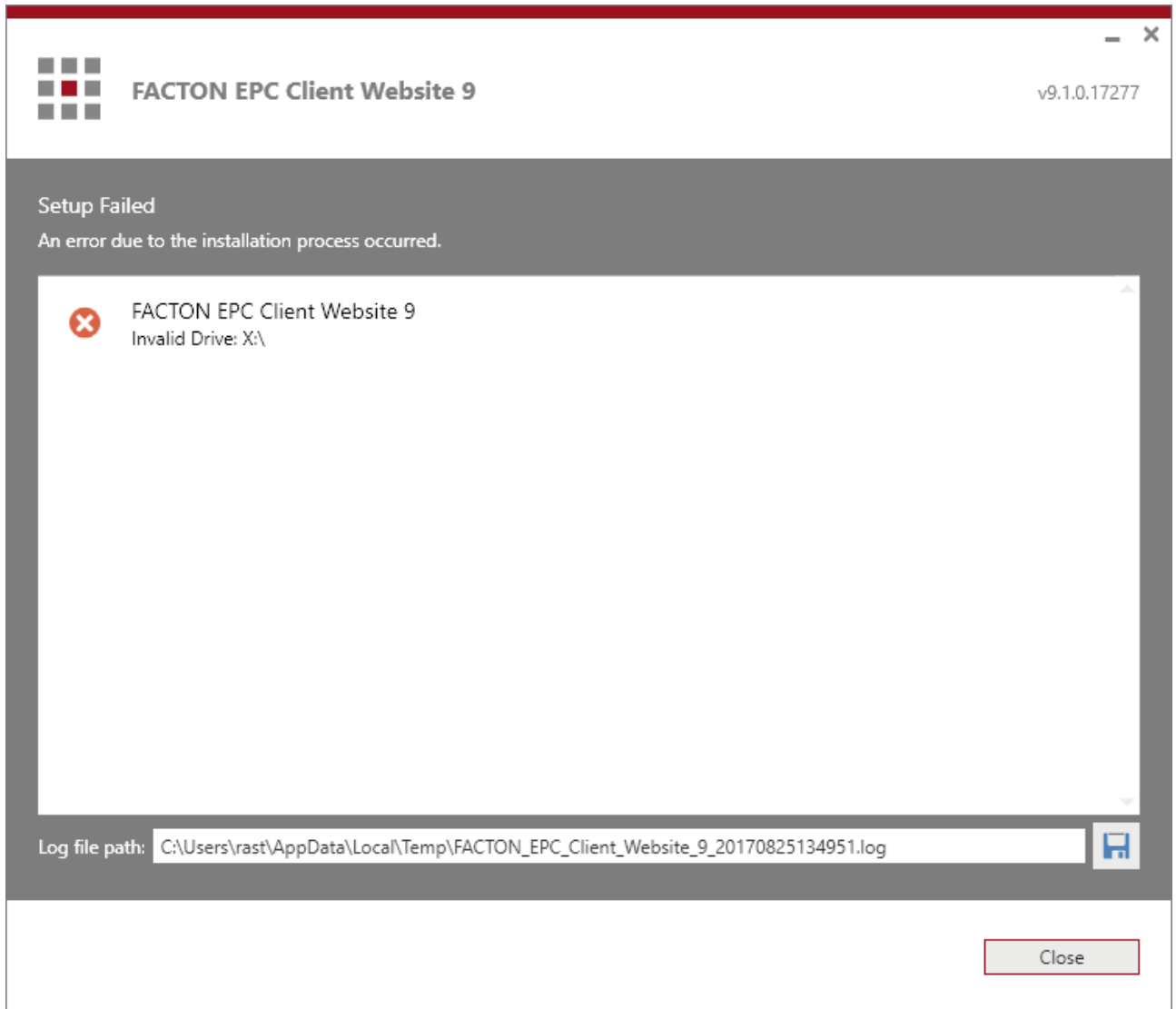


Figure 4.10: Errors occurring during the installation



Note

Click on the floppy disk button to store the log file of the failed installation. That information are useful in support of FACTON.

4.1.4 Install the FACTON Configuration Update Client

This chapter describes the installation process of the **FACTON Configuration Update Client** via attended mode.

Install the Configuration Update Client via Attended Mode

1. Double-click on the »FACTON_ConfigurationUpdate_Client_9.1.0.17277.exe« setup file, to start the installation. The setup starts a wizard and analyzes the current state of the FACTON Component.

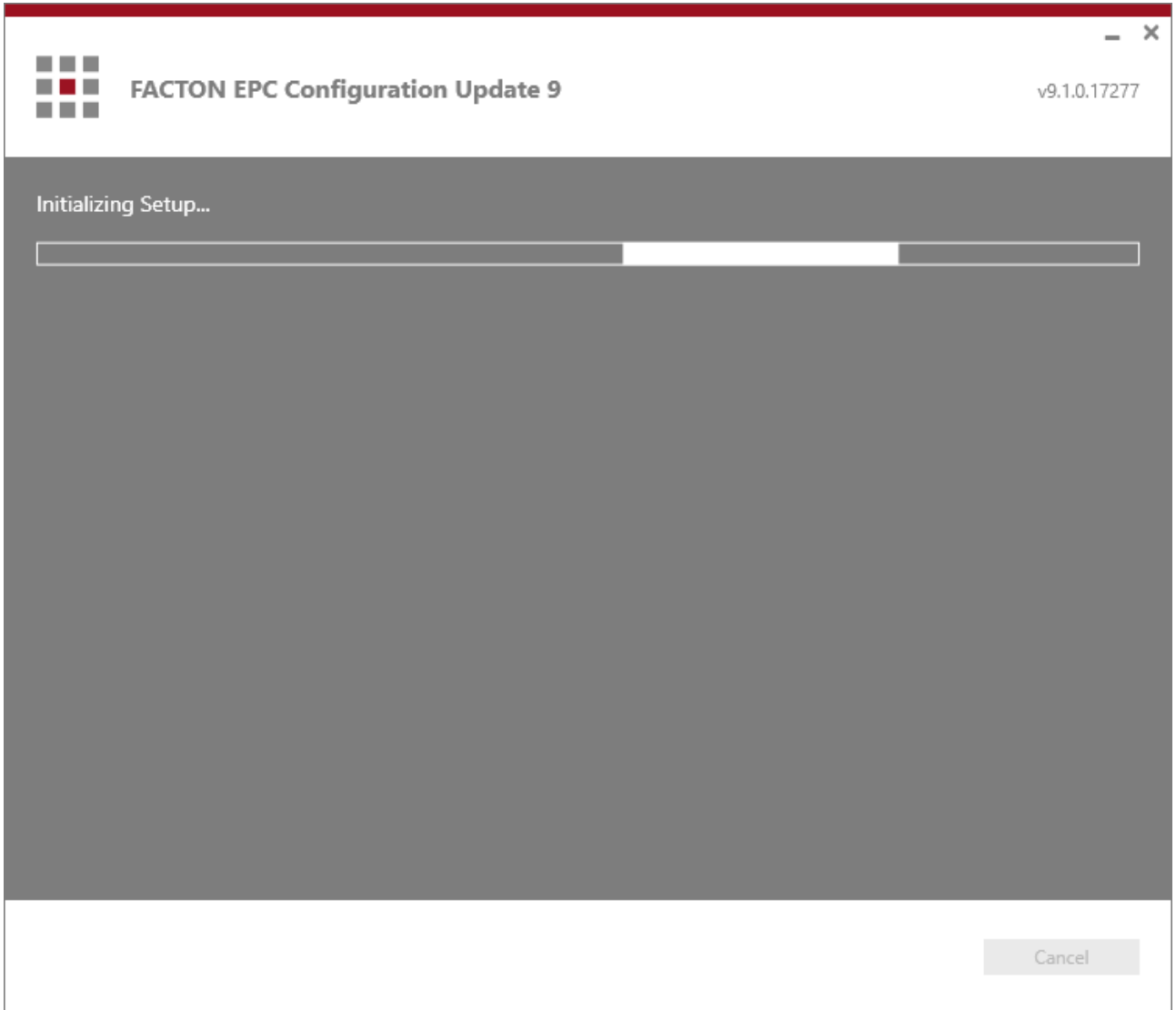


Figure 4.1: Initializing the setup

- 2. An install page opens and shows the executable setup actions. Click on the »Install...« setup action.

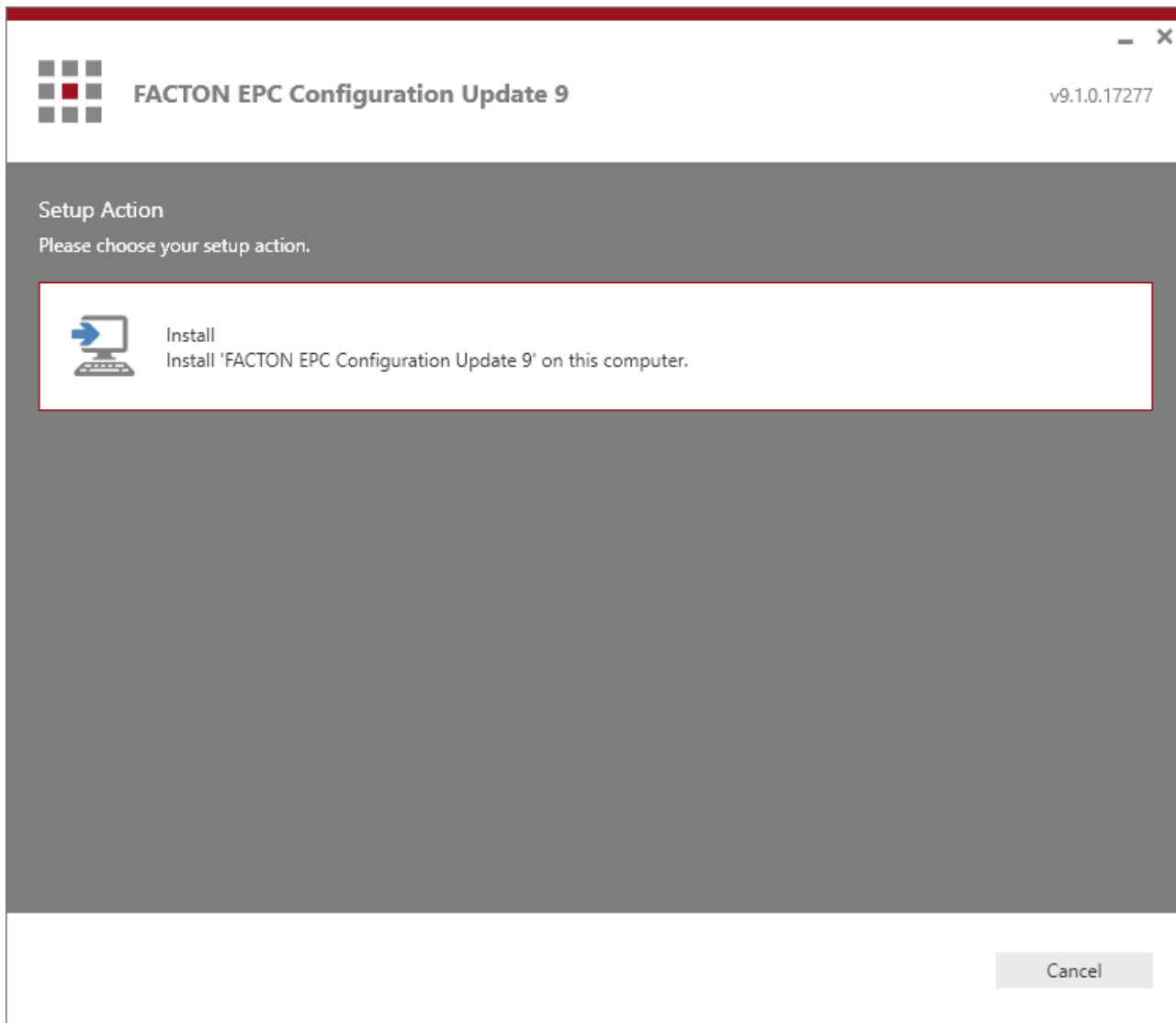


Figure 4.2: Choosing a setup action

**Note**

If the wizard shows the action **Uninstall**, the current version of the FACTON Component is already installed and could be uninstalled.

See section [»Uninstall FACTON«](#) for more information.

If the current version of the Component already installed, it is not possible to install an older or newer version. In this case the wizard shows a setup error with a corresponding message to uninstall the older or newer version first.

- 3. Please read the terms of the license agreement carefully. Activate the »I accept the terms ...« checkbox to accept the terms of the license agreement. Click on **Next** to continue the installation.

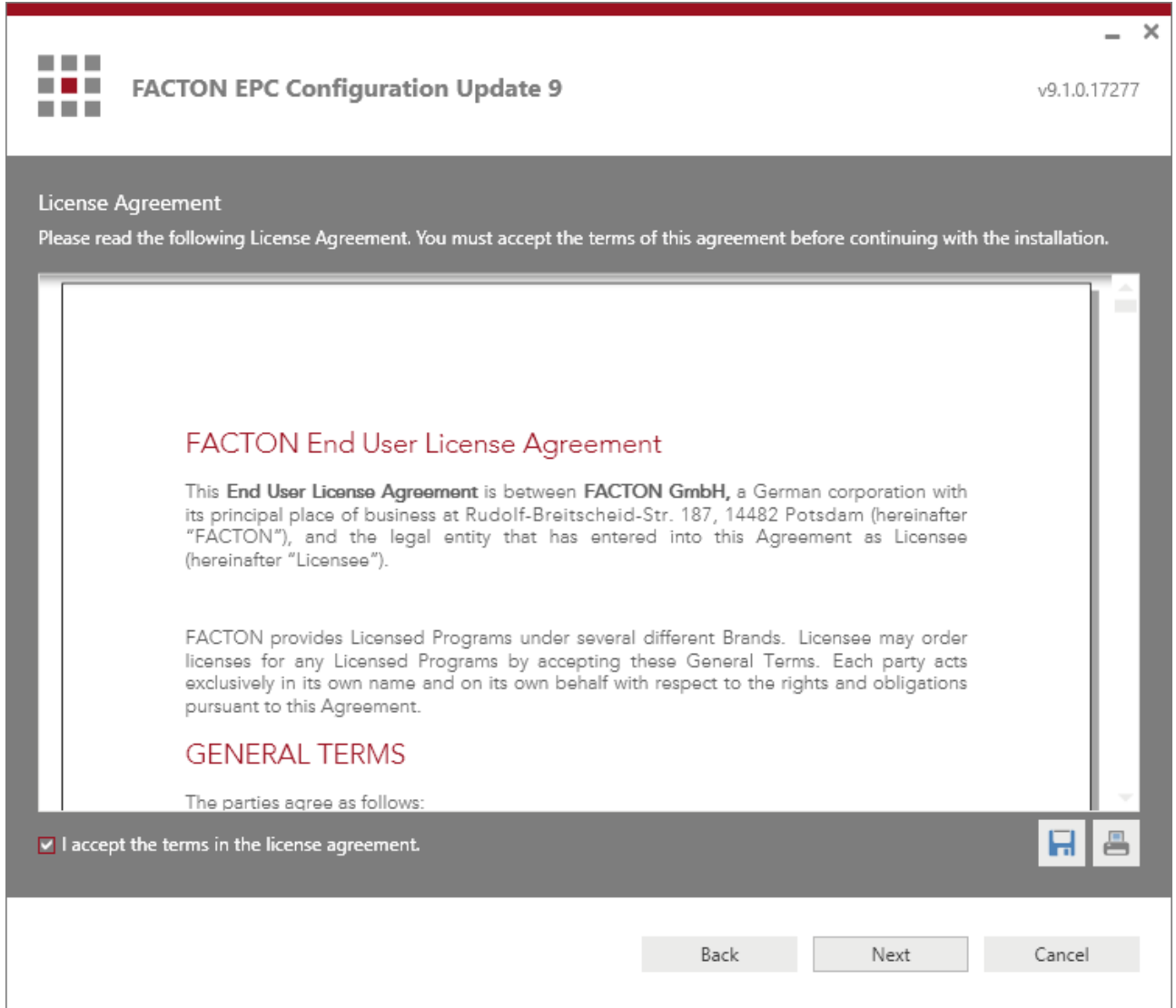


Figure 4.3: FACTON license agreement acceptance

- 4. Enter the installation folder path where you wish to store the FACTON Component files. Click on **Next** to continue the installation.

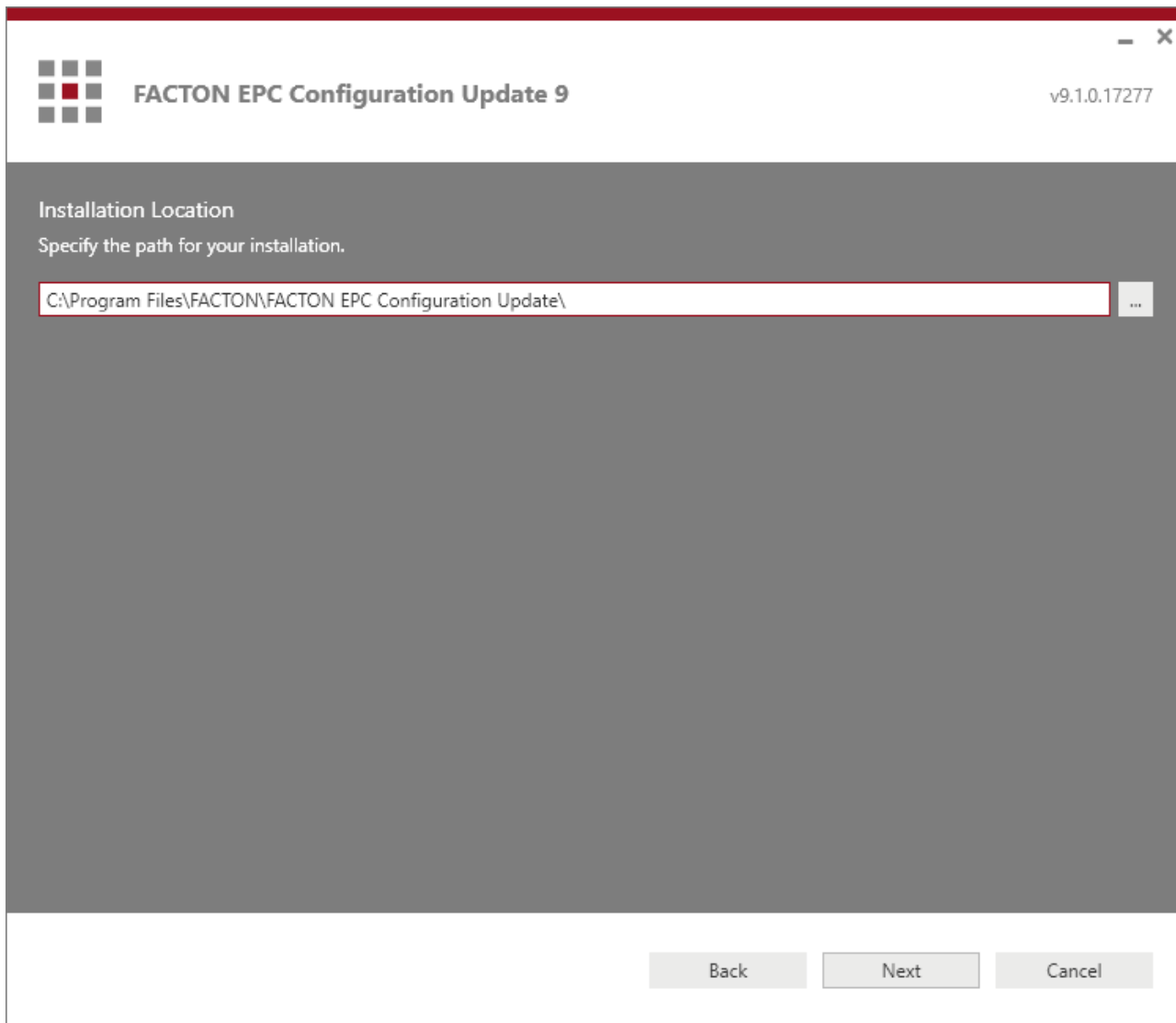
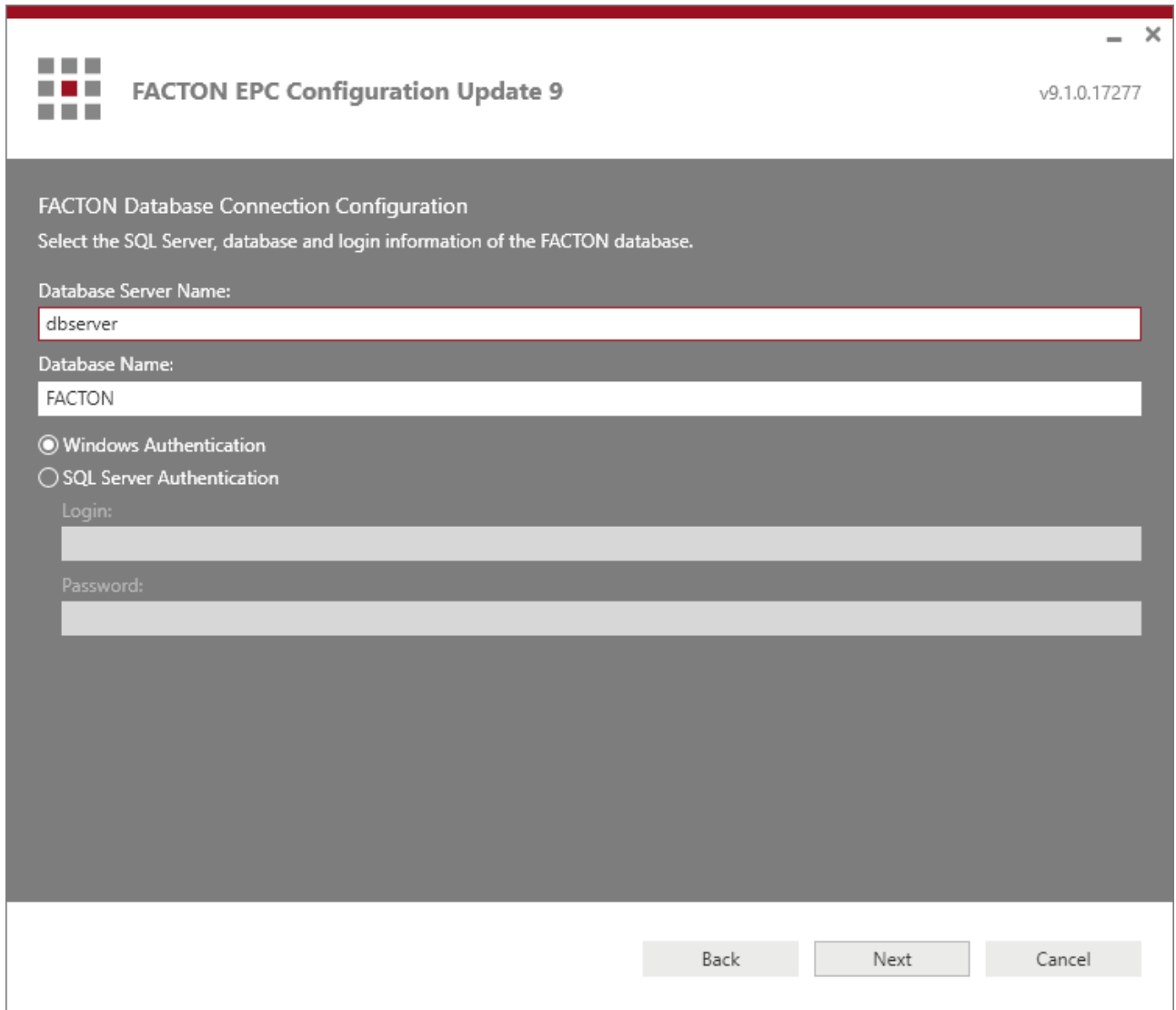


Figure 4.4: Specifying an installation location

5. Enter the name of the SQL Database Server and the name of the FACTON Database. Select the database authentication type and enter the login information, which should be used to log in to the FACTON SQL database. Click on **Next** to continue the installation.



The screenshot shows a window titled "FACTON EPC Configuration Update 9" with version "v9.1.0.17277". The main content area is titled "FACTON Database Connection Configuration" and contains the following fields and options:

- Database Server Name:
- Database Name:
- Authentication type: Windows Authentication, SQL Server Authentication
- Login:
- Password:

At the bottom right, there are three buttons: "Back", "Next", and "Cancel".

Figure 4.5: FACTON database connection

6. A summary page opens and displays the previously installed prerequisites (in gray) and the current component you wish to install (in bold). Click on the **Install** button to start the installation process.

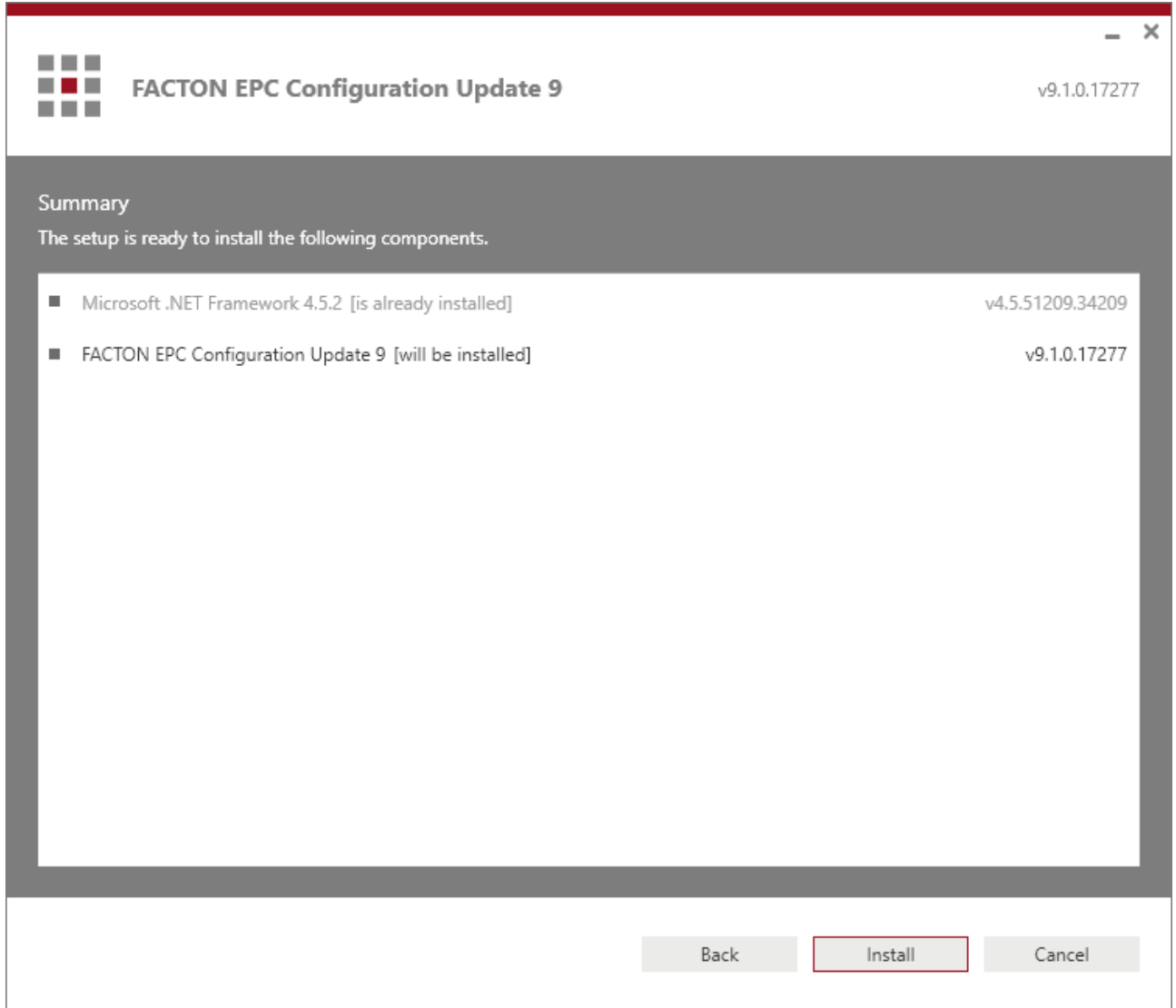


Figure 4.6: Summary of the installation components

7. The setup starts the installation and shows the progress of the installation.

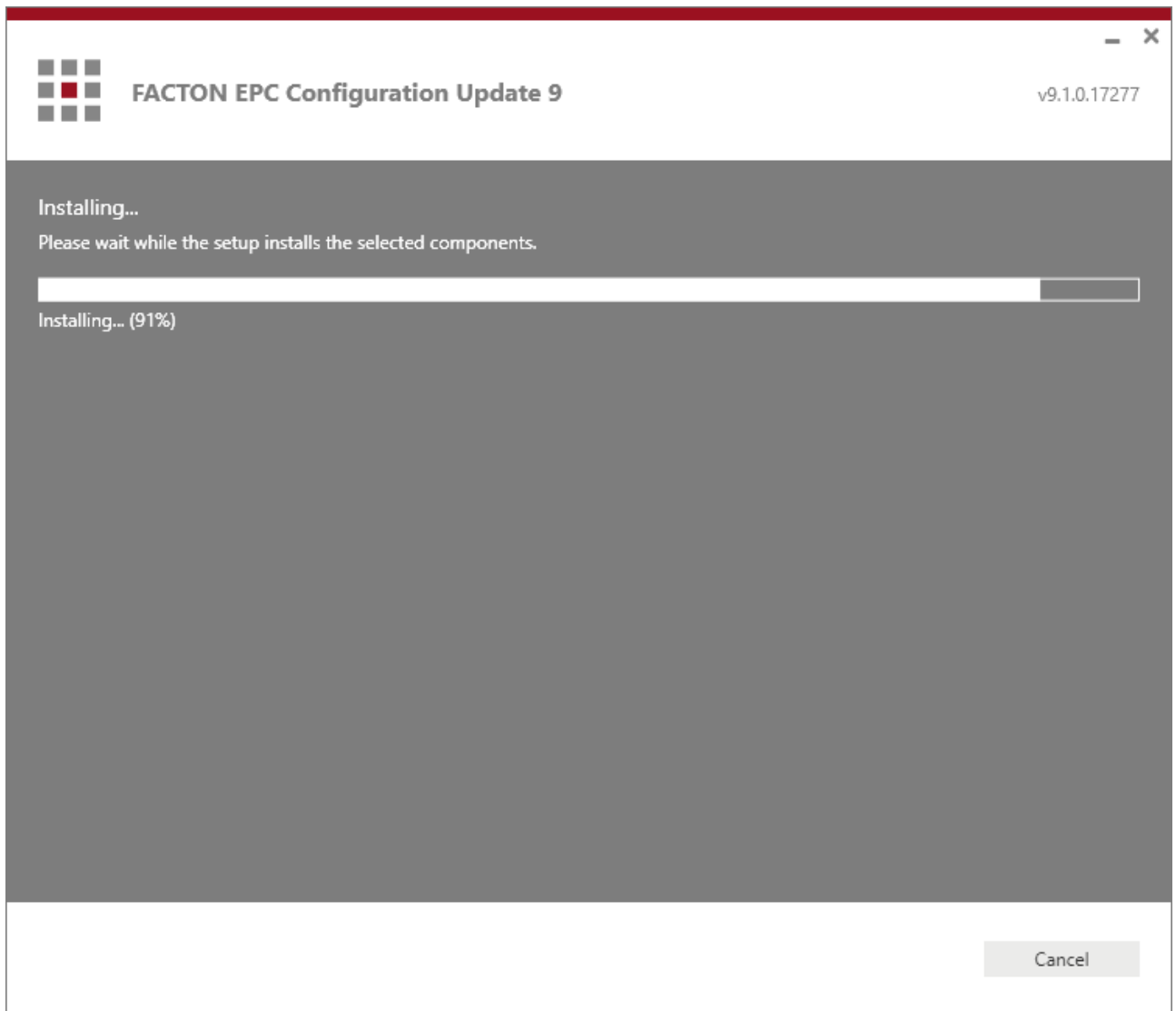


Figure 4.7: Installing the Application Service

- 8. If the installation process finishes successfully, a page with information about the installed components opens.
Click on the **Finish** button to finish the installation process and close the wizard.

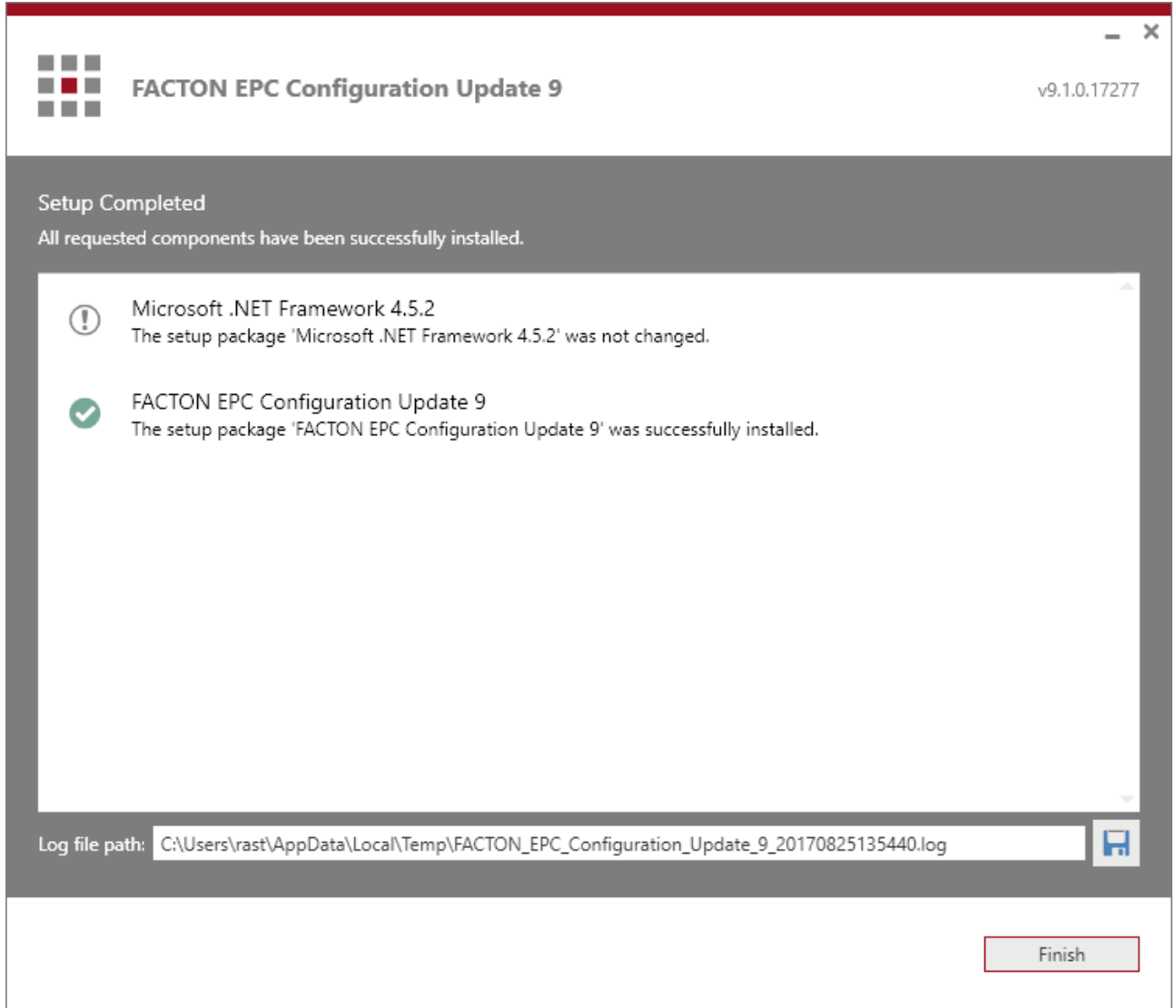


Figure 4.8: Overview about the installed components

9. If the installation process fails, a page opens and displays an error message.

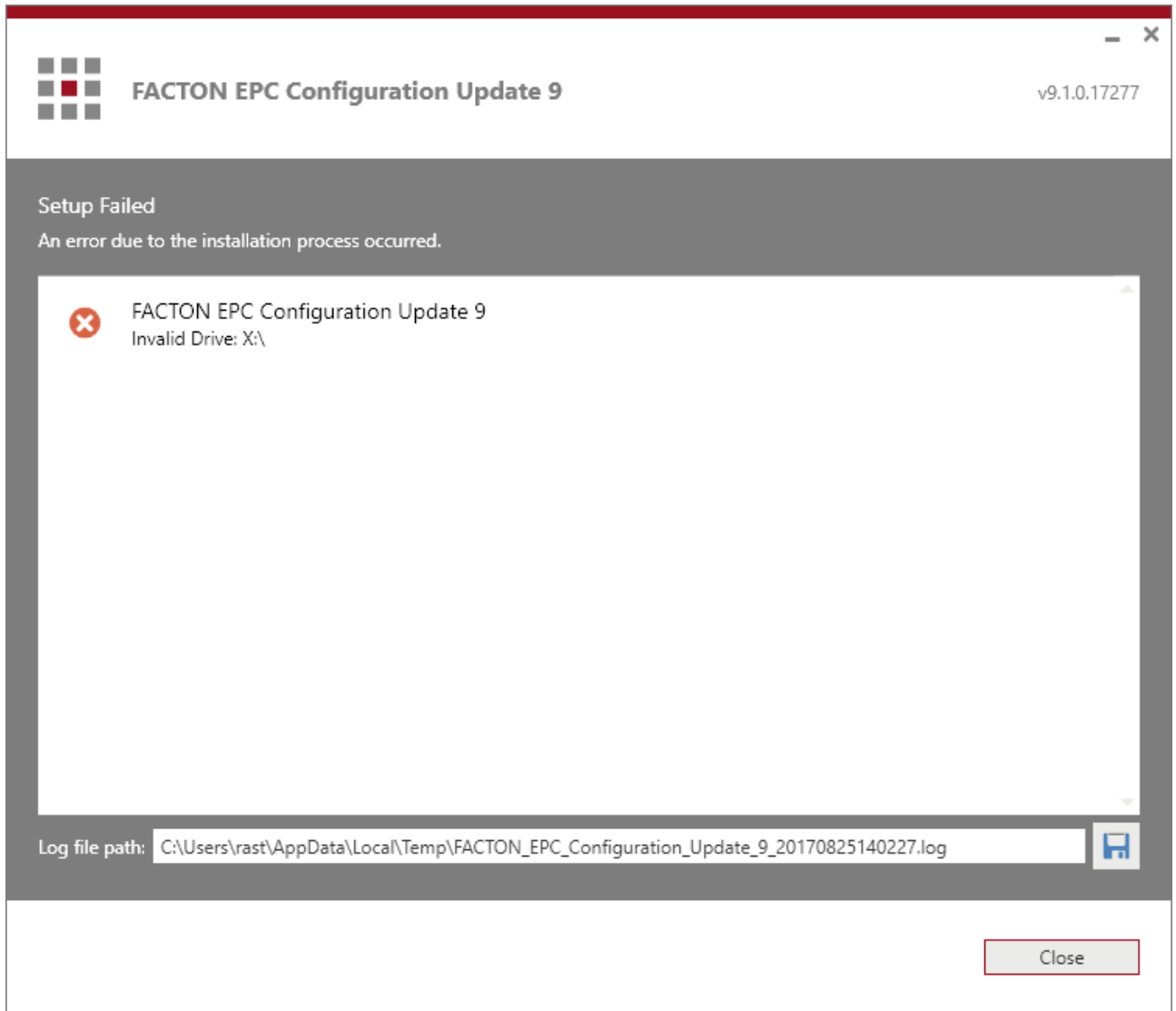


Figure 4.9: Errors occurring during the installation



Note

Click on the floppy disk button to store the log file of the failed installation. That information are useful in support of FACTON.

4.1.5 Install the FACTON Client



Note

You can use this setup as an alternative to the »FACTON Client Deployment Site« setup.

In scenarios where an installation of the FACTON client by ClickOnce is not supported, the client can be installed using this setup.

This chapter describes the installation process of the **FACTON Client** via attended mode.

 Install the Client via Attended Mode

1. Double-click on the »FACTON_Offline_Client_9.1.0.17277.exe« setup file to start the installation. The setup starts a wizard and analyzes the current state of the FACTON Component.

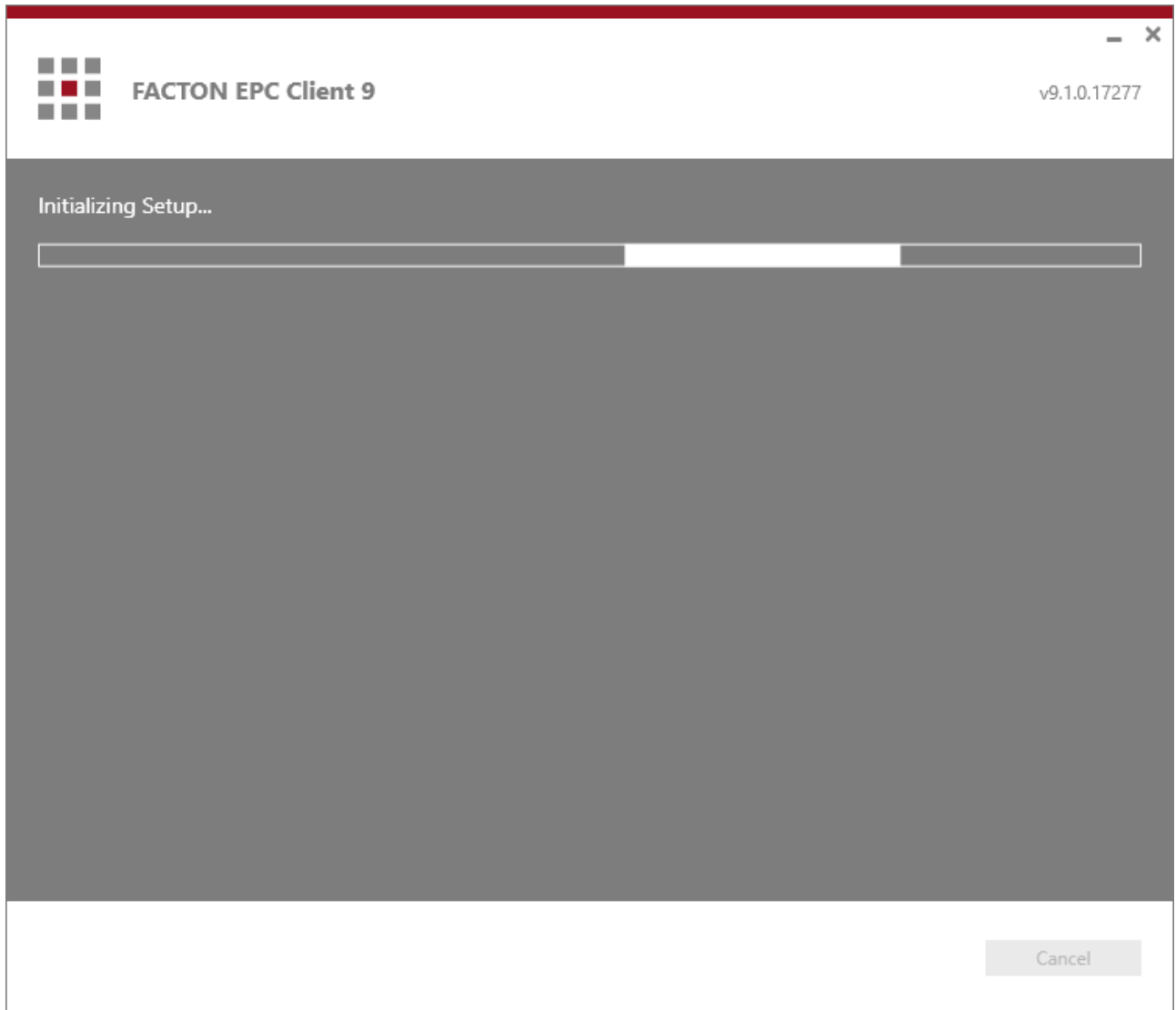


Figure 4.1: Initializing the setup

2. An install page opens and shows the executable setup actions. Click on the »Install...« setup action.

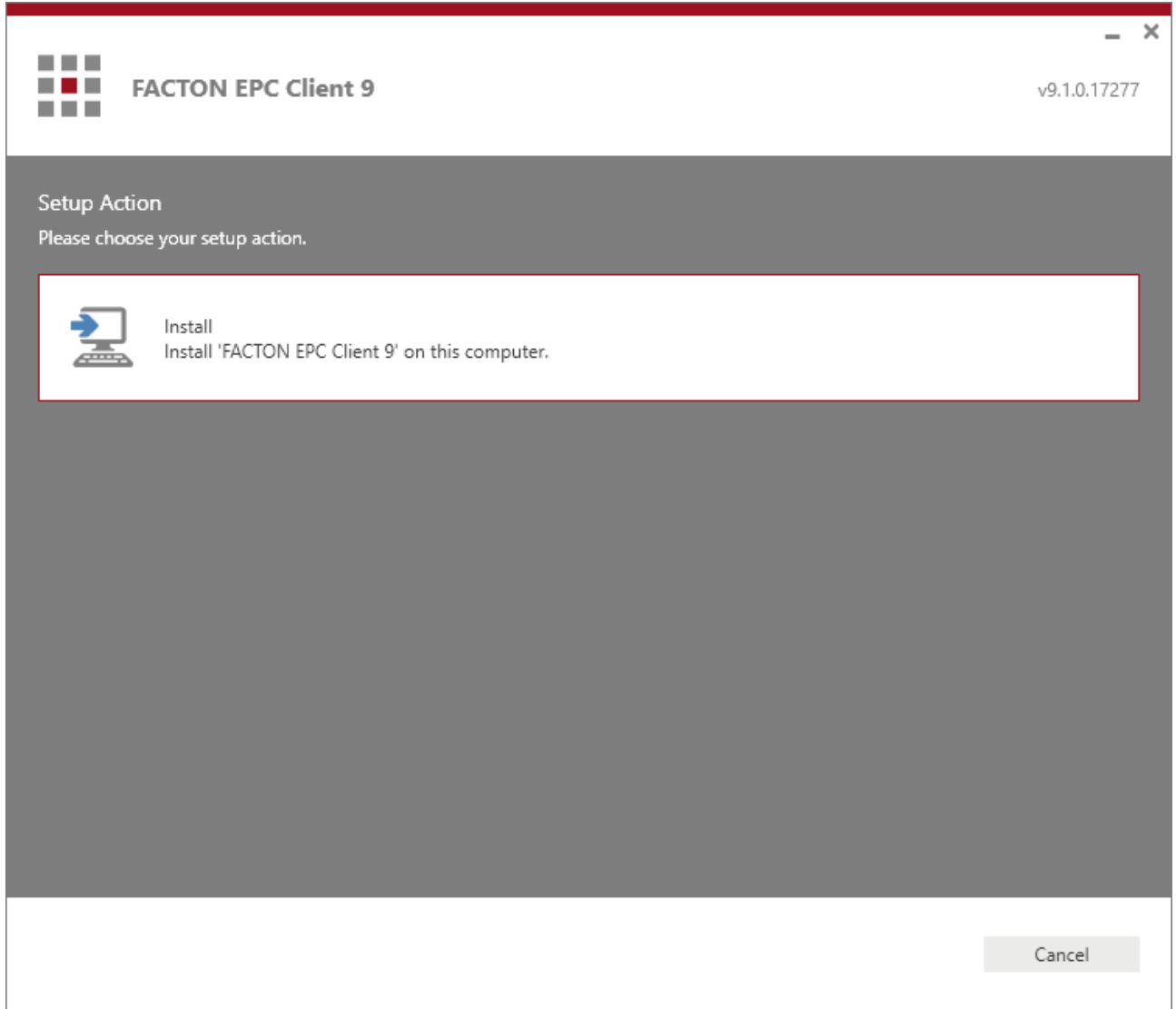


Figure 4.2: Choosing a setup action

**Note**

If the wizard shows the action **Uninstall**, the current version of the FACTON Component is already installed and could be uninstalled. See section [»Uninstall FACTON«](#).

If the current version of the FACTON Component already installed, it is not possible to install an older or newer version. In this case the wizard shows a setup error with a corresponding message to uninstall the older or newer version first.

- 3. Please read the terms of the license agreement carefully. Activate the »I accept the terms ...« checkbox to accept the terms of the license agreement. Click on **Next** to continue the installation.

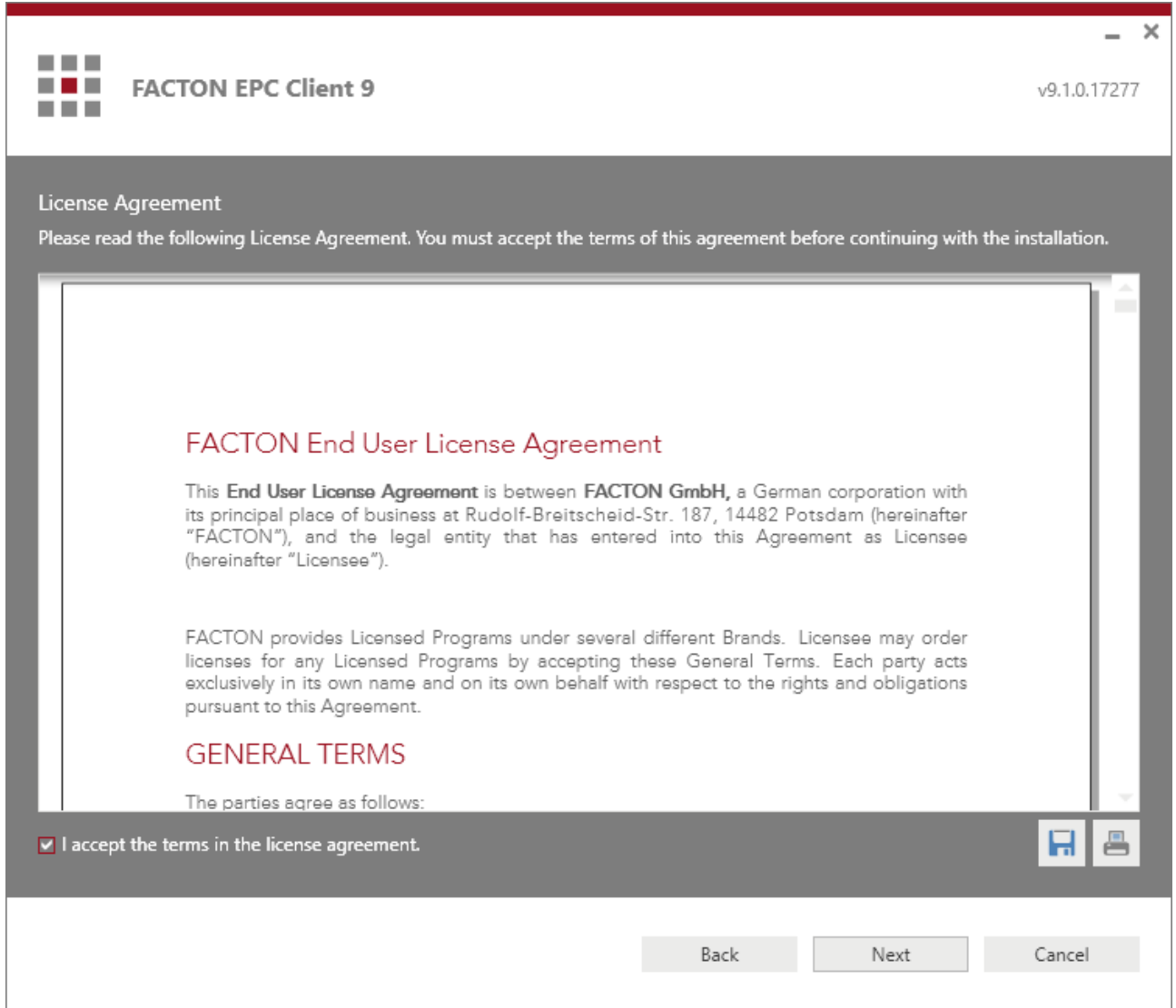


Figure 4.3: FACTON license agreement acceptance

4. Enter the installation folder path where you wish to store the FACTON Component files. Click on **Next** to continue the installation.

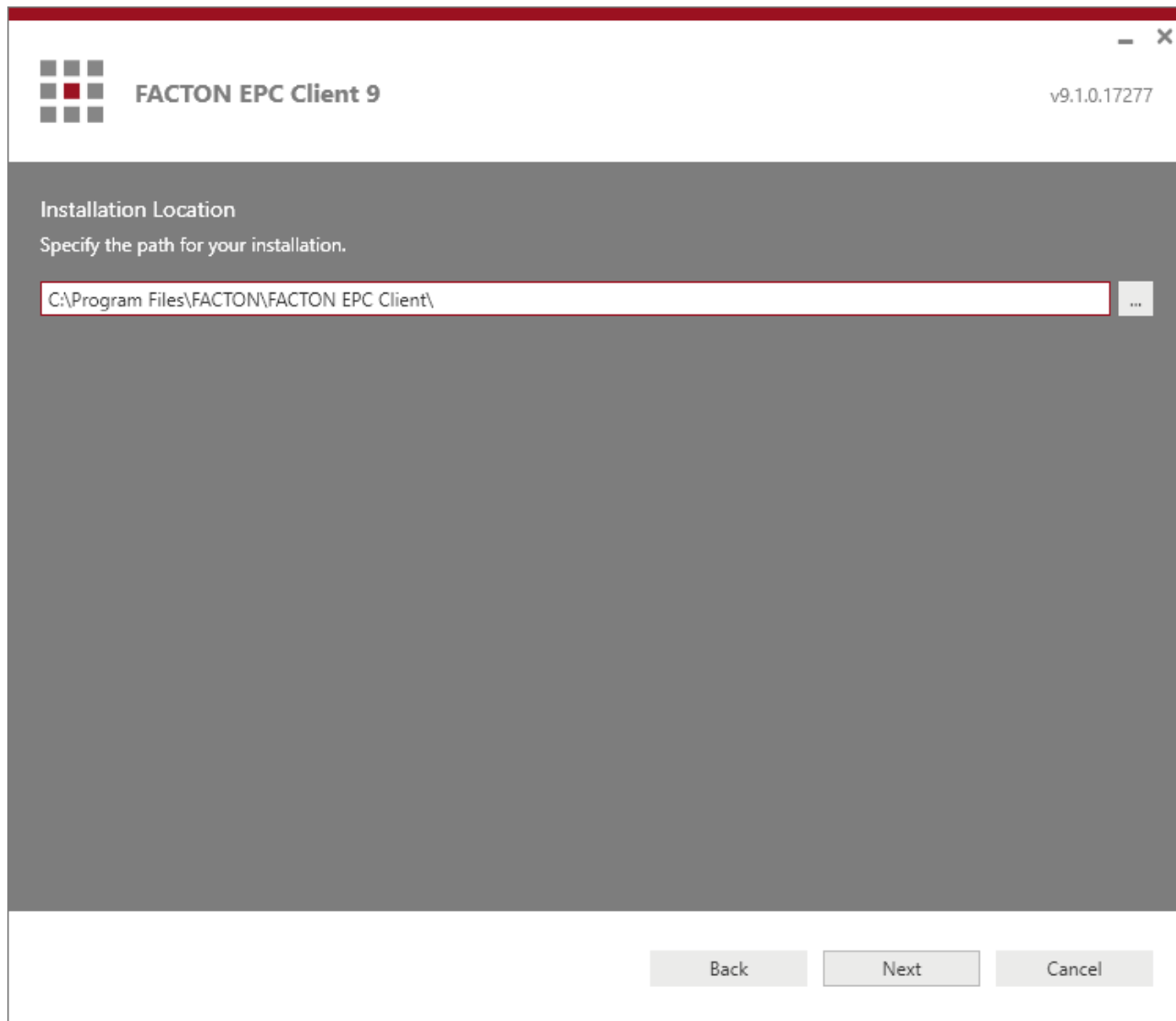


Figure 4.4: Specifying an installation location

5. Enter the metadata (MEX) address of the FACTON Application Service. Click on **Next** to continue the installation.

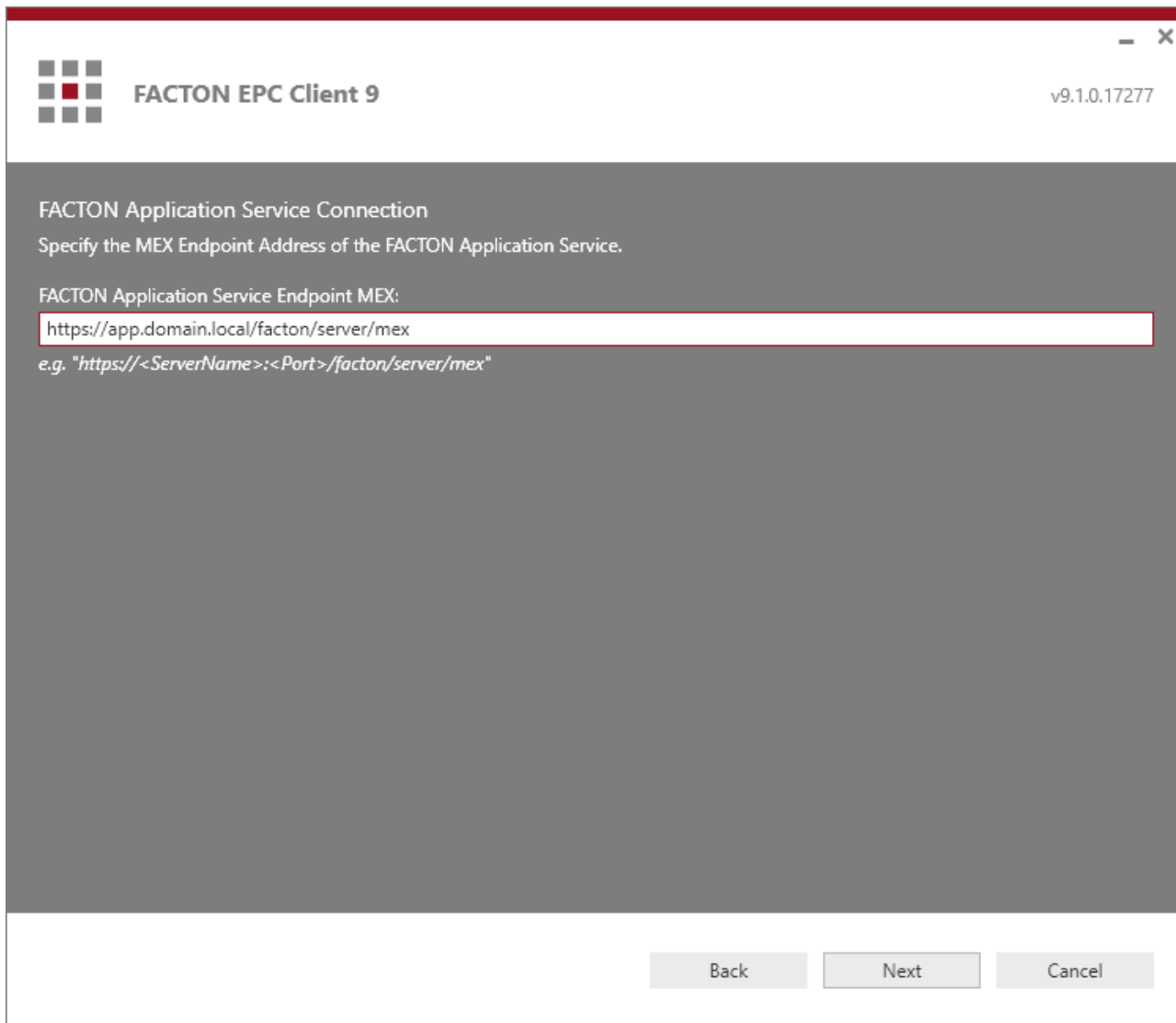


Figure 4.5: Specifying the Application Service MEX endpoint

- To define a custom application data directory activate the »**Set a custom directory...**« checkbox and enter the directory of the FACTON Client Data. Use environment variables to set machine- or user-specific path for the data directory, e.g. "c:\FACTON\%USERNAME%". Click on **Next** to continue the installation.

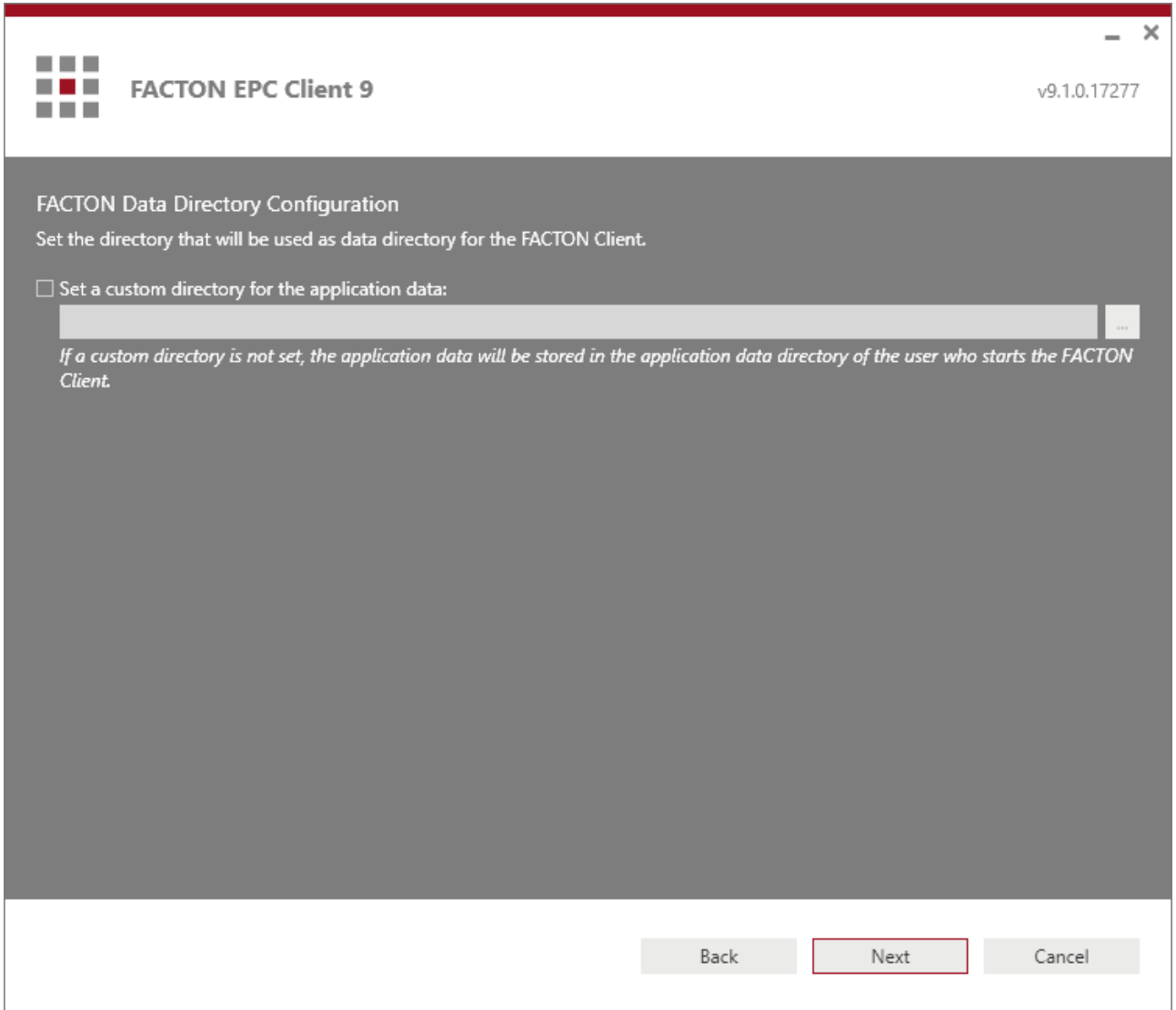
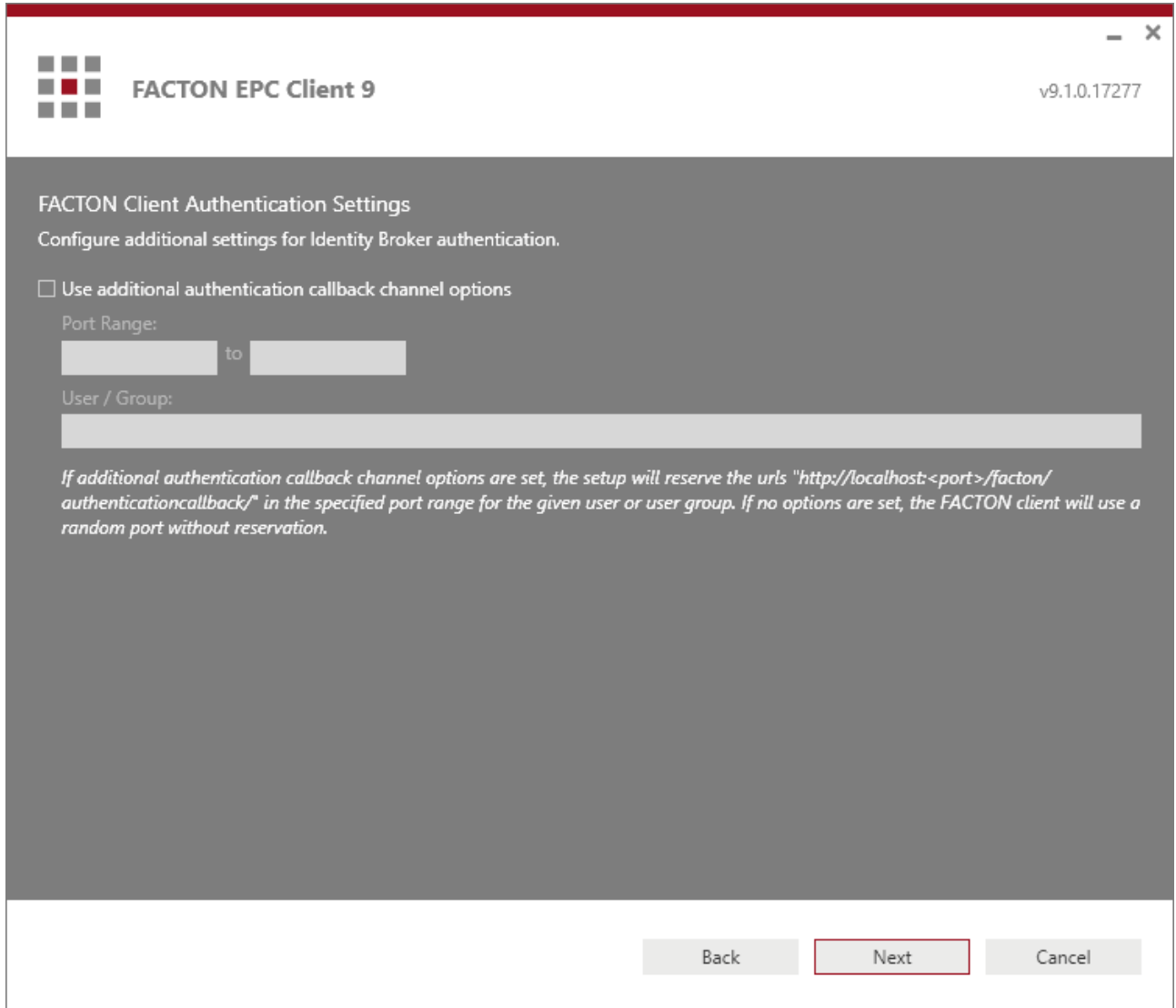


Figure 4.6: Setting an custom data directory

7. Check the »Use additional authentication...« checkbox to configure extra authentication settings for Identity Broker authentication. The setup will reserve the URLs "https://-localhost:<port>/facton/authenticationcallback/" in the specified port range for the given user or user group. If the option is not set, the FACTON Client will use a random port without URL reservation. Click on **Next** to continue the installation.



The screenshot shows a window titled "FACTON EPC Client 9" with version "v9.1.0.17277". The main content area is titled "FACTON Client Authentication Settings" and contains the following elements:

- A checkbox labeled "Use additional authentication callback channel options" which is currently unchecked.
- A "Port Range:" label followed by two input fields separated by the word "to".
- A "User / Group:" label followed by a single-line text input field.
- A paragraph of explanatory text: "If additional authentication callback channel options are set, the setup will reserve the urls "http://localhost:<port>/facton/authenticationcallback/" in the specified port range for the given user or user group. If no options are set, the FACTON client will use a random port without reservation."
- At the bottom, there are three buttons: "Back", "Next" (which is highlighted with a red border), and "Cancel".

Figure 4.7: Configure additional Identity Broker authentication settings

- 8. A summary page opens and displays the previously installed prerequisites (in gray) and the current component you wish to install (in black). Click on the **Install** button to start the installation process.

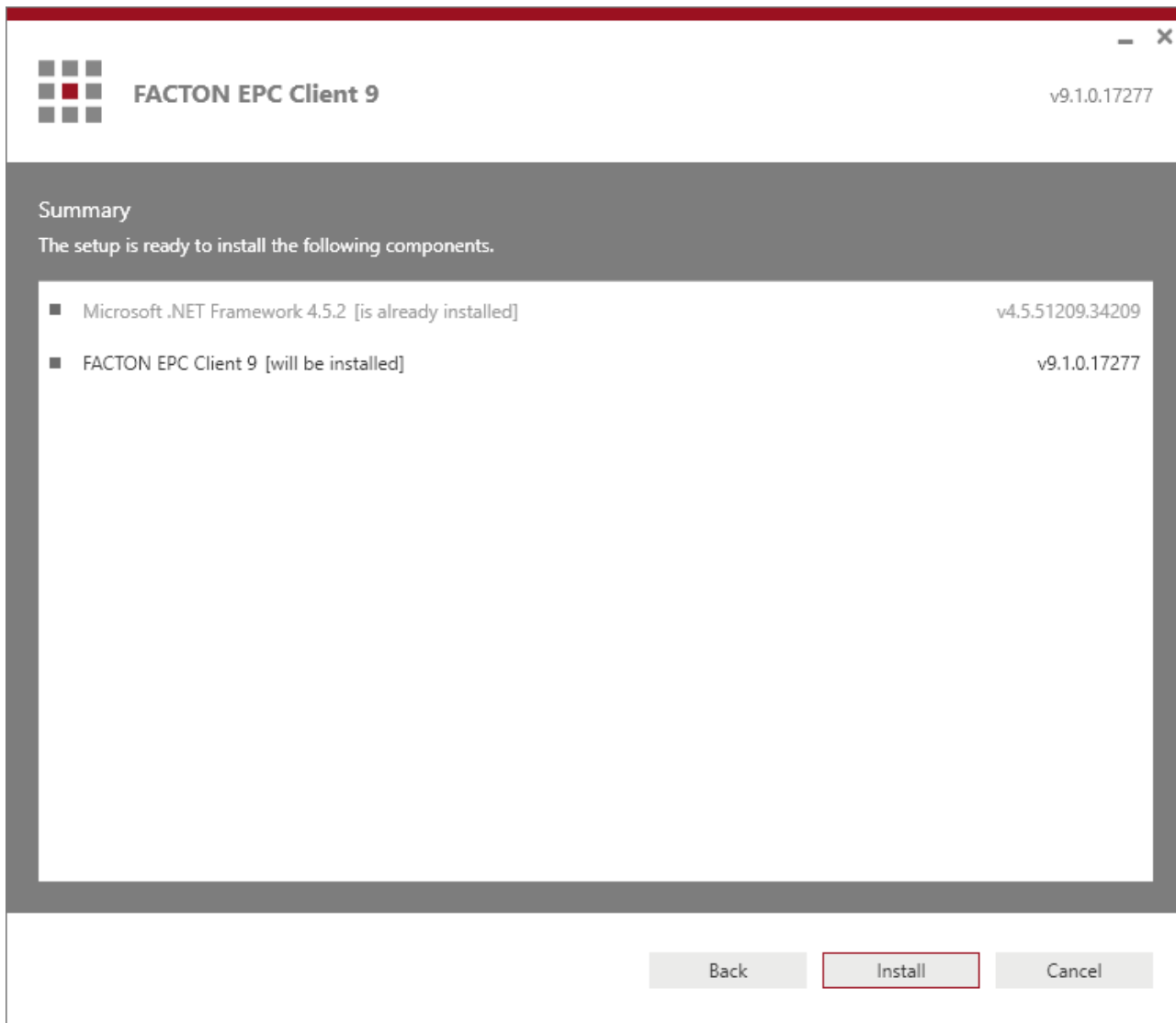


Figure 4.8: Summary of the installation components

9. The setup starts the installation and shows the progress of the installation.

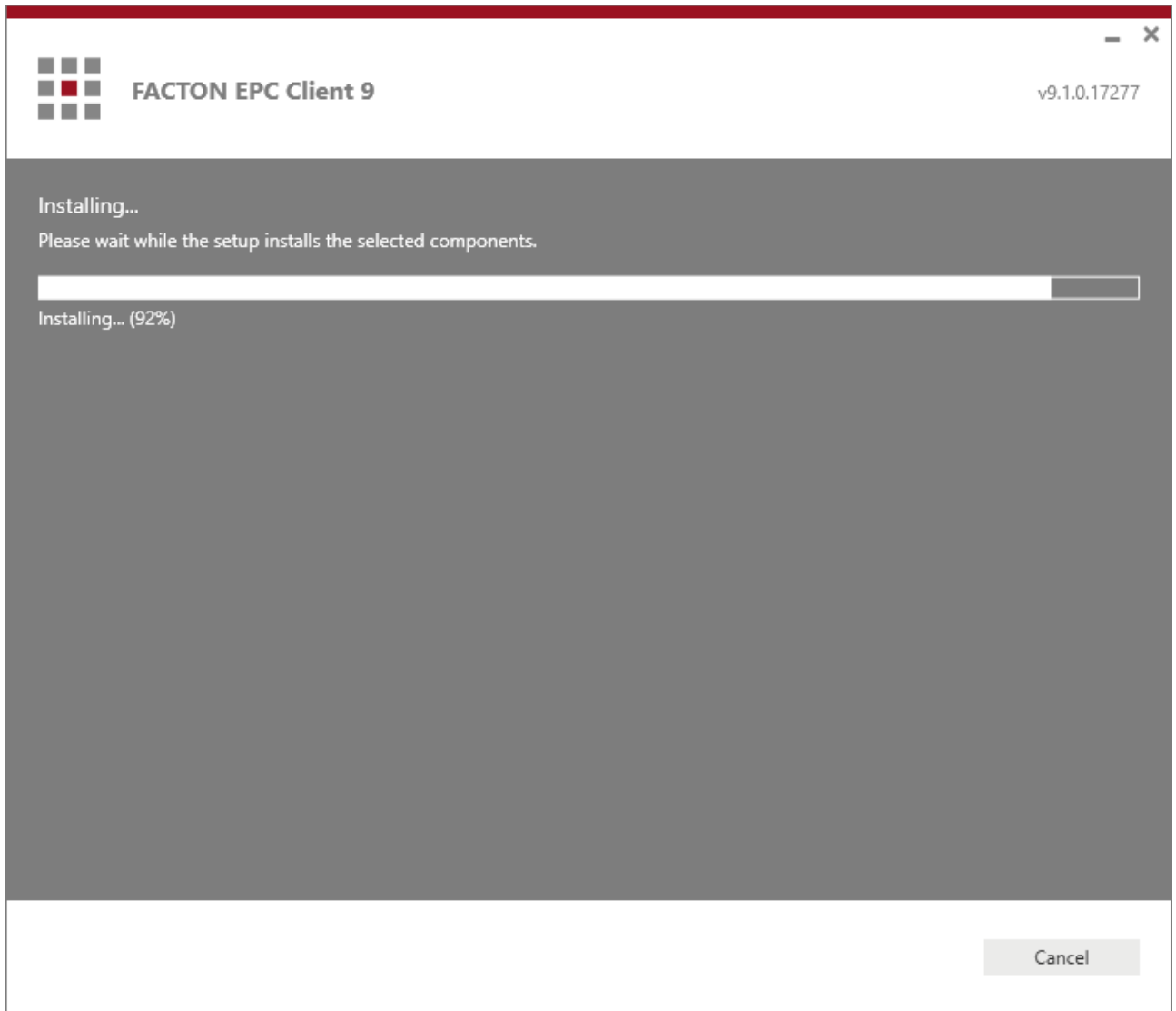


Figure 4.9: Installing the FACTON Client

10. If the installation process finishes successfully, a page with information about the installed components opens.
Click on the **Finish** button to finish the installation process and close the wizard.

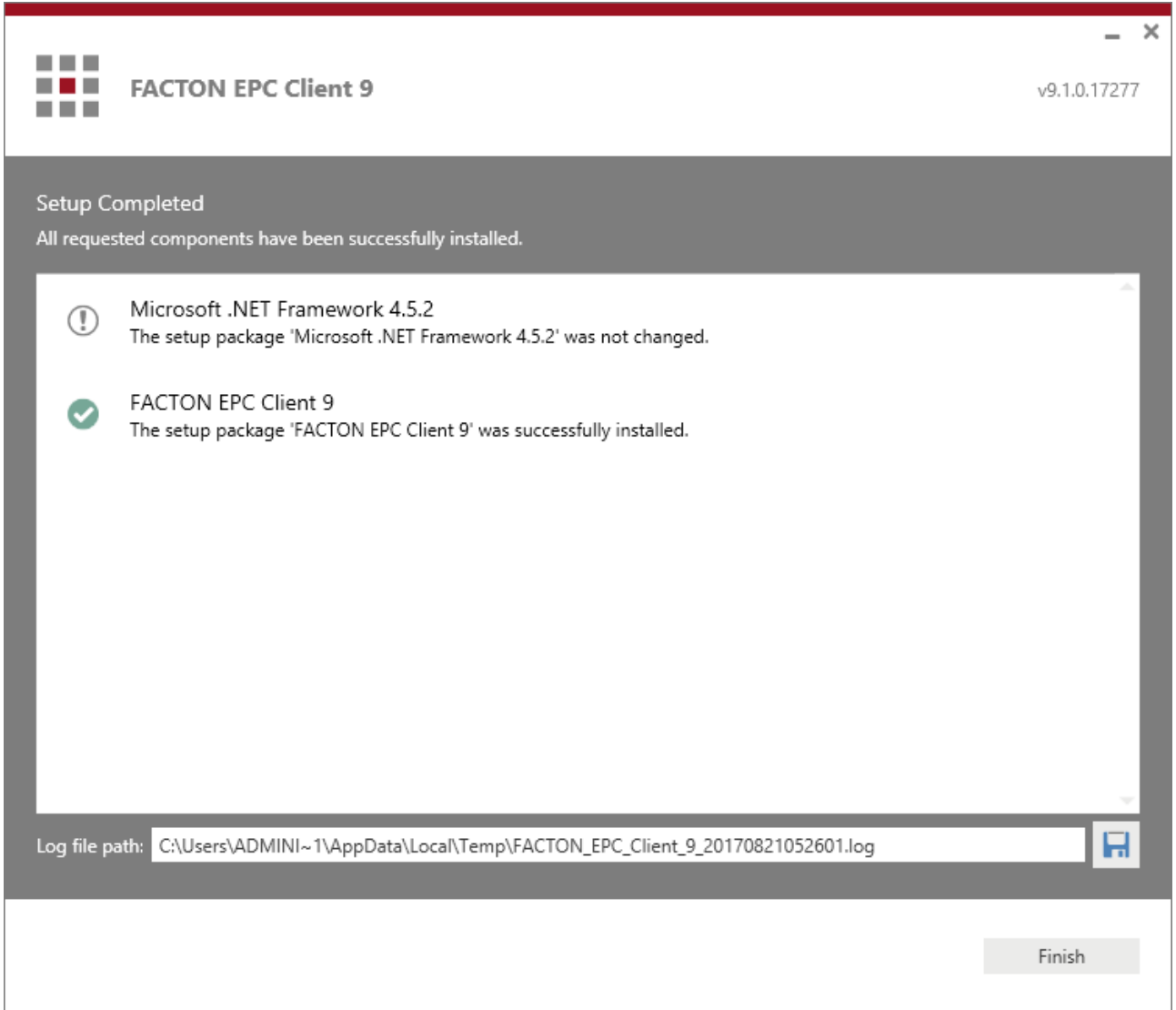


Figure 4.10: Overview about the installed components

- 11. If the installation process was canceled or failed, the setup wizard opens a page which shows one or more error messages about the unfinished installation.

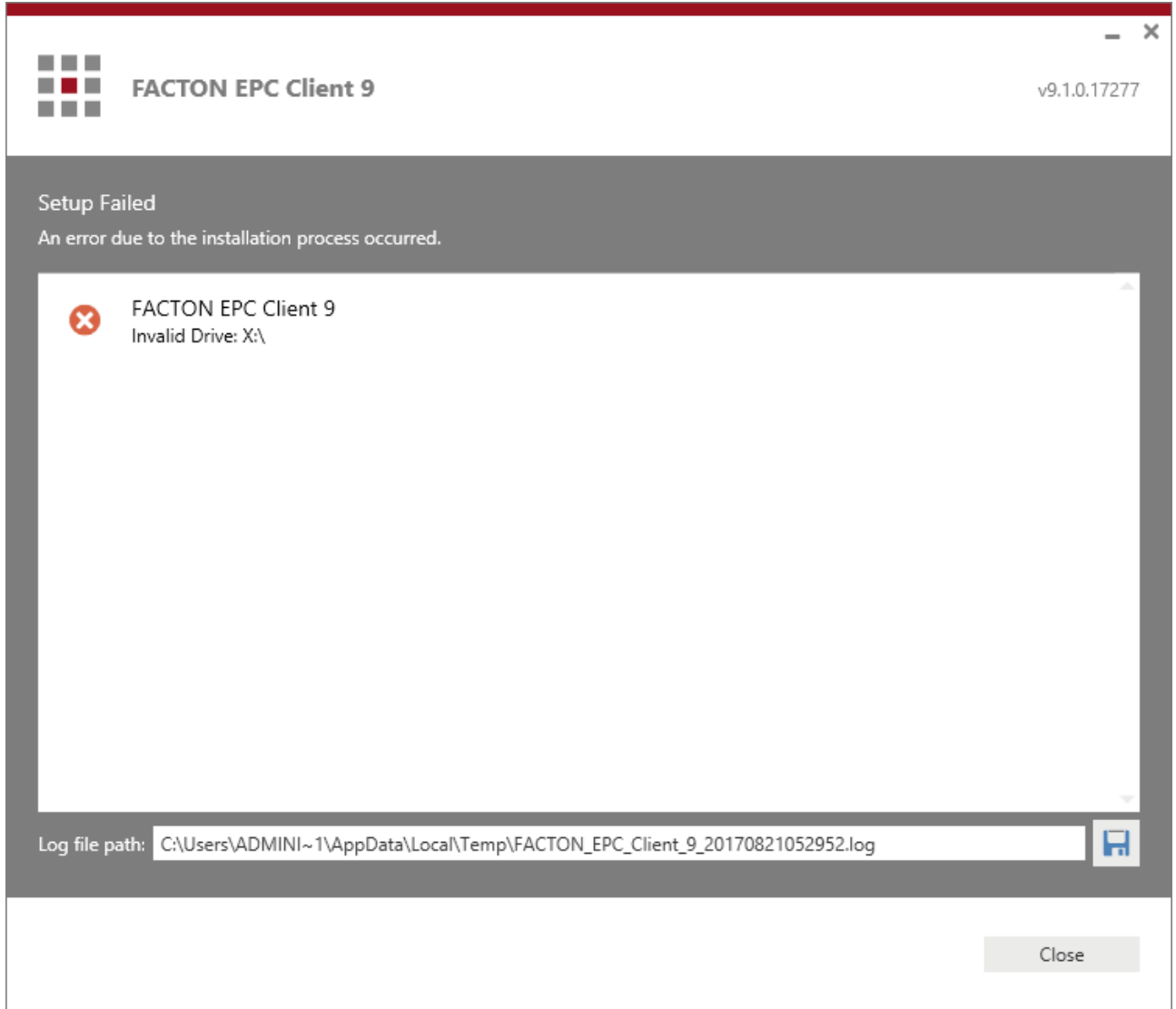


Figure 4.11: Errors occurring during the installation



Note

Click on the floppy disk button to store the log file of the failed installation. That information are useful in support of FACTON.

4.2. INSTALL FACTON VIA UNATTENDED MODE

An unattended or silent setup is an installation without user interaction. The installation process does not show any messages or windows. The silent setup obtains all of the necessary information at the start of the installation.

Install or Uninstall FACTON in Unattended Mode

1. Start a Command Prompt as administrator.
2. Start the FACTON setup with the command line parameter `-silent`.

If the installation fails the FACTON setup will return an error code.

Installing FACTON in Unattended Mode

To install a FACTON setup »FACTON_Setup.exe« in unattended mode, you need to use the following command line arguments:

Parameter	Description
<code>-silent</code>	Uses the silent mode for installation.
<code>-log "Install.log"</code>	Writes a log during the installation in the file "Install.log".
<code>PARAMETER="Value"</code>	Sets the setup properties for the installation. The parameter names must be uppercase and unique.

Table 4.1: FACTON Setup Command Line Parameters

Install FACTON Setup in Unattended Mode

1. Open a command prompt as an administrator.
2. Navigate to the folder which contains the setup file »FACTON_Setup.exe«.
3. Execute the following command line to start the silent installation with the necessary parameters (e.g. »PARAMETER1« and »PARAMETER2«):



Note

Copy code text into a text editor to remove line breaks. Check for any other syntax issues and then copy it into the command prompt.

```
"FACTON_Setup.exe" -silent -log "Install.log" PARAMETER1="Value1"
PARAMETER2="Value2"
```

4.2.1 Install the FACTON Application Service

This chapter describes the setup parameters and the installation process of the FACTON Application Service via unattended mode.



Note

If a setup parameter is marked as »optional«, the parameter is not necessary for the installation and the setup uses a default value if no other value is given.

Parameter	Description
FACTON_LICENSE_ACCEPTED (yes no)	Sets the flag to »yes« to accept the FACTON License Terms. It is not possible to install any FACTON component without accepting the License Terms.
INSTALLPATH (optional)	Sets the target installation path of the setup. The default path is »%ProgramFiles%\FACTON\FACTON EPC Application Service« (e.g. »C:\Program Files\FACTON\FACTON EPC Application Service«).
SERVICE_ACCOUNT (optional)	Sets the name of the service account (e.g. »DOMAIN\ServiceUser«) of the application service. If no user name is set, the SYSTEM account will be used.
SERVICE_PASSWORD (optional)	Sets the password of the specified application service account.
APPLICATION_SERVICE_ROOT	The root address for all service endpoints of the FACTON Application Service. Example: <code>https://<DnsHostName>/facton</code>
SERVICE_CERT_THUMBPRINT (optional)	Sets the thumbprint of the service certificate in case of WS-Trust 1.3 authentication. The security token service (e.g. ADFS) uses this certificate as token-encrypting certificate.
SERVICE_CERT_STORELOCATION (optional)	Sets the store location of the service certificate (»LocalMachine« or »CurrentUser«). The default is »LocalMachine«. If you use the System Account as SERVICE_ACCOUNT use "LocalMachine"; otherwise "CurrentUser". This parameter is only required for WS-Trust authentication.
APPDATAPATH (optional)	Sets the app data path of the service. If no app data path is set, the service will use the user app data path.
DB_SERVERNAME	Sets the name of the database server.

Parameter	Description
DB_DATABASENAME	Sets the database name.
DB_USERNAME (optional)	Sets the username of the database connection. If no username is set, the application service will use Windows Integrated Security.
DB_PASSWORD (optional)	Sets the password of the given database username.
STS_ENDPOINT_WSTRUST13 (optional)	Sets the WS-Trust 1.3 endpoint address of the STS (e.g. ADFS). It is only required for WS-Trust authentication.
STS_ENDPOINT_MEX (optional)	Sets the MEX endpoint address of the STS (e.g. ADFS). It is only required for WS-Trust authentication.
STS_SIGNING_CERT_THUMBPRINT (optional)	Sets the thumbprint of the token-signing certificate of the STS (e.g. ADFS). It is only required for WS-Trust authentication.
IDENTITYBROKER_ENDPOINT (optional)	Sets the endpoint address of the FACTON Identity Broker. This parameter is only required in case of Identity Broker authentication.
IDENTITYBROKER_SIGNING_CERT_THUMBPRINT (optional)	Sets the token-signing certificate thumbprint of the FACTON Identity Broker. This parameter is only required in case of Identity Broker authentication.
IDENTITYBROKER_SIGNING_CERT_STORELOCATION (optional)	Sets the token-signing certificate store location of the FACTON Identity Broker ('LocalMachine' or 'CurrentUser'). This parameter is only required in case of Identity Broker authentication.
AUTHENTICATION_AUDIENCE (optional)	Sets the audience for token based authentication. This settings is used for Identity Broker authentication or in case of WS-Trust for Service API OAuth authentication.
API_OAUTH_ENDPOINT (optional)	Sets the OAuth endpoint address of the STS (e.g. ADFS) that authenticates an API user. If no address set, the service API will be use windows authentication. It is only required in case of WS-Trust authentication.
API_OAUTH_ISSUERNAME (optional)	Sets the OAuth issuer name of the STS (e.g. ADFS) that authenticates an API user. This setting will be ignored, if the service API uses windows authentication. It is only required in case of WS-Trust authentication.
API_OAUTH_CERT_THUMBPRINT (optional)	Sets the OAuth token-signing certificate thumbprint of the STS (e.g. ADFS) that authenticates an API user. This setting will be ignored if the service API uses windows authentication. It is only required in case of WS-Trust authentication.

Parameter	Description
API_OAUTH_CERT_STORELOCATION (optional)	Sets the store location of the OAuth token-signing certificate (»LocalMachine« or »CurrentUser«). The default is »LocalMachine«. This setting will be ignored if the service API uses Windows authentication. It is only required in case of WS-Trust authentication.

Table 4.1: FACTON Application Service setup parameters

■ Examples

Install the Application Service

1. Start a Command Prompt as administrator.
2. Navigate to the folder which contains the application service setup file.
3. Start the installation with the required command line parameters:



Note

Copy code text into a text editor to remove line breaks. Check for any other syntax issues and then copy it into the command prompt.

■ Example command

```
"FACTON_Application_Service_9.1.0.17277.exe" -silent `
  -log "Install.log" FACTON_LICENSE_ACCEPTED="yes" `
  SERVICE_ACCOUNT="domain\FactonApp" SERVICE_PASSWORD="*****" `
  APPLICATION_SERVICE_ROOT="https://app.domain.local/facton" `
  DB_SERVERNAME="dbserver" DB_DATABASENAME="FactonDB" `
  IDENTITYBROKER_ENDPOINT=
  "https://app.domain.local/facton/identitybroker" `
  IDENTITYBROKER_SIGNING_CERT_THUMBPRINT=
  "1b a7 a3 f6 86 74 d7 88 99 37 37 1d 62 cf 5f 17 9d bf 13 c2"
```

4.2.2 Install the FACTON Identity Broker

This chapter describes the setup parameters and the installation process of the **FACTON Identity Broker** via unattended mode.



Note

If a setup parameter is marked as »optional«, the parameter is not necessary for the installation and the setup uses a default value if no other value is given.

Parameter	Description
FACTON_LICENSE_ACCEPTED (yes no)	Sets the flag to "yes" to accept the FACTON License Terms. It is not possible to install any FACTON component without accepting the License Terms.
INSTALLPATH (optional)	Sets the target path of the setup. The default path is '%ProgramFiles%/FACTON/FACTON Identity Broker/'
SERVICE_ACCOUNT (optional)	Sets the name of the service account (e.g. »DOMAIN\ServiceUser«) of the Identity Broker. If no user name is set, the SYSTEM account will be used.
SERVICE_PASSWORD (optional)	Sets the password of the specified Identity Broker account.
ENDPOINT_SERVICE (optional)	Sets the Identity Broker endpoint address. The default address is 'https://[DnsHostName]/facton/identitybroker'.
DB_SERVERNAME (optional)	Sets the name of the database server. The database settings are necessary to use the Identity Broker with load balancing.
DB_DATABASENAME (optional)	Sets the database name.
DB_USERNAME (optional)	Sets the username of the database connection. If no username is set, the application service will use Windows Integrated Security.
DB_PASSWORD (optional)	Sets the password of the given database username.
SETTINGS_FILE	Sets the file 'appsettings.json' to configure the Identity Broker.

Table 4.1: FACTON Identity Broker setup parameters

■ Examples

Install the Identity Broker

1. Start a Command Prompt as administrator.
2. Navigate to the folder which contains the Identity Broker setup file.
3. Start the installation with the required command line parameters:



Note

Copy code text into a text editor to remove line breaks. Check for any other syntax issues and then copy it into the command prompt.

■ Example command:

```
"FACTON_Identity_Broker_1.0.0.17311.exe" -silent -log "Install.log"  
FACTON_LICENSE_ACCEPTED="yes" SERVICE_ACCOUNT="domain\FactonApp"  
SERVICE_PASSWORD="*****" ENDPOINT_SERVICE-  
E="https://app.domain.local/facton/identitybroker" DB_SERVERNAME-  
E="dbserver" DB_DATABASENAME="FactonDB" SETTINGS_  
FILE="d:\appSettings.json"
```

4.2.3 Install the FACTON Client Deployment Site

This chapter describes the setup parameters and the installation process of the **FACTON Client Deployment Site** via unattended mode. The client deployment site contains the ClickOnce Installation files for the FACTON Client. These files must be installed under a path which is accessible for the IIS.



Note

If a setup parameter is marked as »optional«, the parameter is not necessary for the installation and the setup uses a default value if no other value is given.

Parameter	Description
FACTON_LICENSE_ACCEPTED (yes no)	Sets the flag to "yes" to accept the FACTON License Terms. It is not possible to install any FACTON component without accepting the License Terms.
INSTALLPATH (optional)	Sets the target path of the setup. The default path is '%ProgramFiles% /FACTON/FACTON EPC Client Website/'.
SERVICE_ENDPOINT_MEX	Sets the MEX endpoint address of the FACTON application service.
SYSTEM_ENVIRONMENT (optional)	Sets one of the supported system environments: Dev, QA, Prod, System1, System2, System3, ... If no system environment is set, the setup will use the default system environment.

Table 4.1: FACTON Client Deployment site setup parameters

■ Examples

Install the Client Deployment Site

1. Start a Command Prompt as administrator.
2. Navigate to the folder which contains the client deployment site setup file.
3. Start the installation with the required command line parameters:

■ Example command:

```
"FACTON_Offline_Client_Website_9.1.0.17277.exe" -silent -log
"Install.log" SERVICE_ENDPOINT_MEX-
X="https://app.domain.local/facton/server/mex" SYSTEM_ENVIRONMENT-
T="QA"
```

4.2.4 Install the FACTON Configuration Update Client

This chapter describes the setup parameters and the installation process of the **FACTON Configuration Update Client** via unattended mode.



Note

If a setup parameter is marked as »optional«, the parameter is not necessary for the installation and the setup uses a default value if no other value is given.

Parameter	Description
FACTON_LICENSE_ACCEPTED (yes no)	Sets the flag to "yes" to accept the FACTON License Terms. It is not possible to install any FACTON component without accepting the License Terms.
INSTALLPATH (optional)	Sets the target installation path of the setup. The default path is "%ProgramFiles%\FACTON\FACTON EPC Configuration Update"
DB_SERVERNAME	Sets the name of the database server which hosts the FACTON database.
DB_DATABASENAME	Sets the name of the FACTON database.
DB_USERNAME (optional)	Sets the username of the database connection. If no username is set, the client will use Windows Integrated Security.
DB_PASSWORD (optional)	Sets the password of the given database username.

Table 4.1: FACTON Configuration Update Client setup parameters

■ Examples

Install the Client Deployment Site

1. Start a Command Prompt as administrator.
2. Navigate to the folder which contains the client setup file.
3. Start the installation with the required command line parameters:

■ **Example command:**

```
"FACTON_ConfigurationUpdate_Client_9.1.0.17277.exe" -silent -log  
"Install.log" DB_SERVERNAME="dbserver" DB_DATABASENAME="FactonDB">
```

4.2.5 Install the FACTON Client



Note

You can use this setup as an alternative to the »FACTON Client Deployment Site« setup.

In scenarios where an installation of the FACTON client by ClickOnce is not supported, the client can be installed using this setup.

This chapter describes the setup parameters and the installation process of the **FACTON Client** via unattended mode.



Note

If a setup parameter is marked as »optional«, the parameter is not necessary for the installation and the setup uses a default value if no other value is given.

Parameter	Description
FACTON_LICENSE_ACCEPTED (yes no)	Sets the flag to "yes" to accept the FACTON License Terms. It is not possible to install any FACTON component without accepting the License Terms.
INSTALLPATH (optional)	Sets the target path of the setup. The default path is '%ProgramFiles%/FACTON/FACTON EPC Client/'
SERVICE_ENDPOINT_MEX	Sets the MEX endpoint address of the FACTON application service.
APPDATAPATH (optional)	Sets the app data path of the client. If no app data path is set, the client will be used the user app data path. System Environment Variables are supported (e.g. c:\FactonData\%USERNAME%).
AUTHENTICATION_CALLBACK_PORT_FROM (optional)	Sets the minimal port number of the FACTON authentication callback channel reservation. If no port number is set, the client will be use a free port number without reserving the port. This parameter is only relevant in case of Identity Broker authentication.
AUTHENTICATION_CALLBACK_PORT_TO (optional)	Sets the maximal port number of the FACTON authentication callback channel reservation. This setting will be ignored, if no minimal port number given. This parameter is only relevant in case of Identity Broker authentication
AUTHENTICATION_CALLBACK_USER (optional)	Sets the user or user group using of the FACTON authentication callback channel reservation. This setting will be ignored, if no minimal and maximal port numbers given. This parameter is only relevant in case of Identity Broker authentication

Table 4.1: FACTON Client setup parameters

■ Examples

Install the Client

1. Start a Command Prompt as administrator.
2. Navigate to the folder which contains the client setup file.
3. Start the installation with the required command line parameters:

■ Example command:

```
"FACTON_Offline_Client_9.1.0.17277.exe" -silent -log "Install.log"
SERVICE_ENDPOINT_MEX="https://app.domain.local/facton/server/mex">
```

4.3. POST INSTALLATION SETTINGS

The default configuration of the FACTON Application Service should be adapted to the specific environment. To optimize the configuration, some system settings could be configured in a special file »SystemSettings.ini«. This configuration is read in, while the service starts.

The current best practice configuration will be delivered based on the current FACTON version, data volume and environment configuration. The SystemSettings.ini must be stored in the Roaming folder of the FACTON Application Directory:

```
<APPDATA>\Roaming\FACTON\SystemSettings.ini
```

Execute the following steps to finalize the installation of the FACTON Application Service.

Make Post Installation Settings

1. Start & Stop the application service once to create the folder structure in the application data directory.



IMPORTANT

Only if it is a first time installation, or if the data directory has been changed.

2. Copy the latest **SystemSettings.ini** into the Roaming directory:

```
<APPDATA>\Roaming\FACTON
```

3. Copy the backup of the persisted columns to the Local directory:

```
<APPDATA>\Local\FACTON\ColumnCaching
```

Only if the data directory has been changed!

4. If FACTON application service runs as a user account give access rights to the private key of the FACTON service certificate to that user if the certificate is stored in the LocalMachine store:
 - a. Open the Local Machine Certificate store.
 - b. Right click on one FACTON certificate ► **All Tasks ► Manage Private Keys ...** (see figure »Post Installation Settings I« & »Post Installation Settings II«)
 - c. Add the user account and allow read access »Post Installation Settings III«.

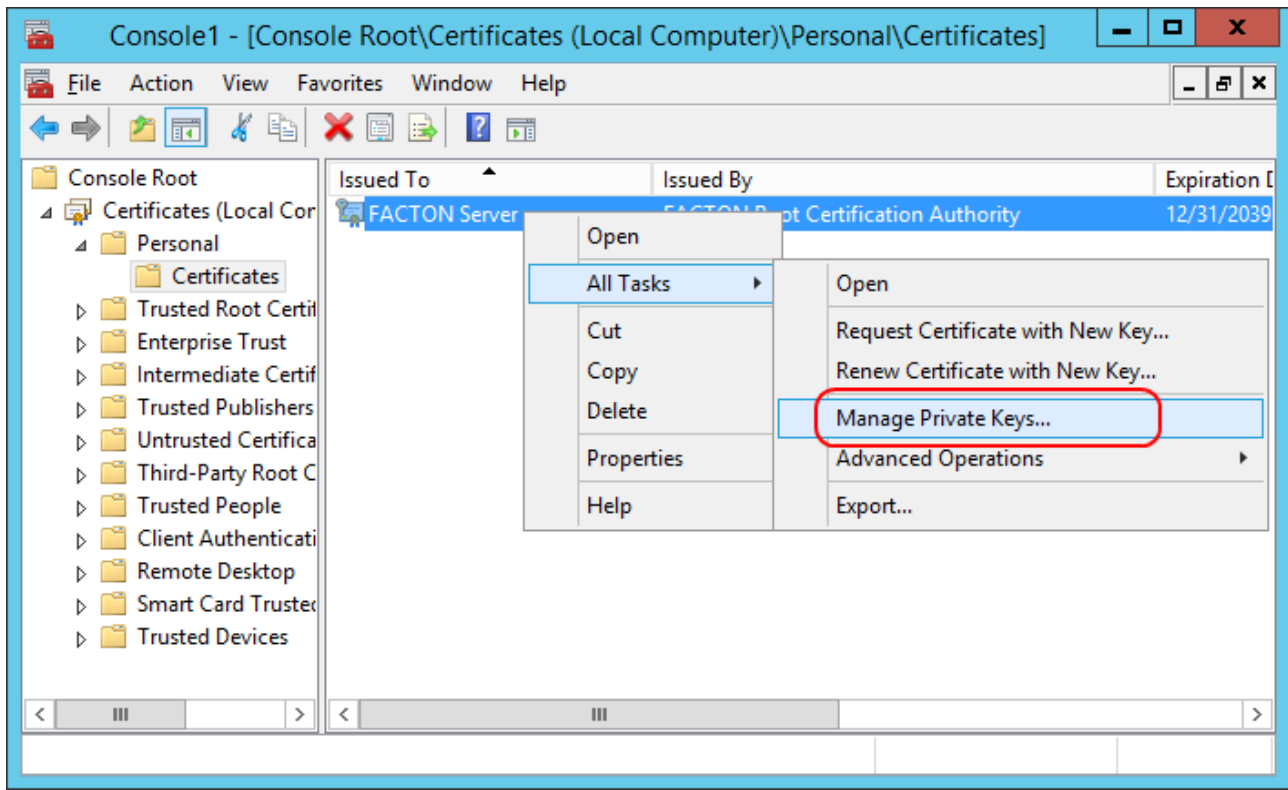


Figure 4.1: Post Installation Settings I

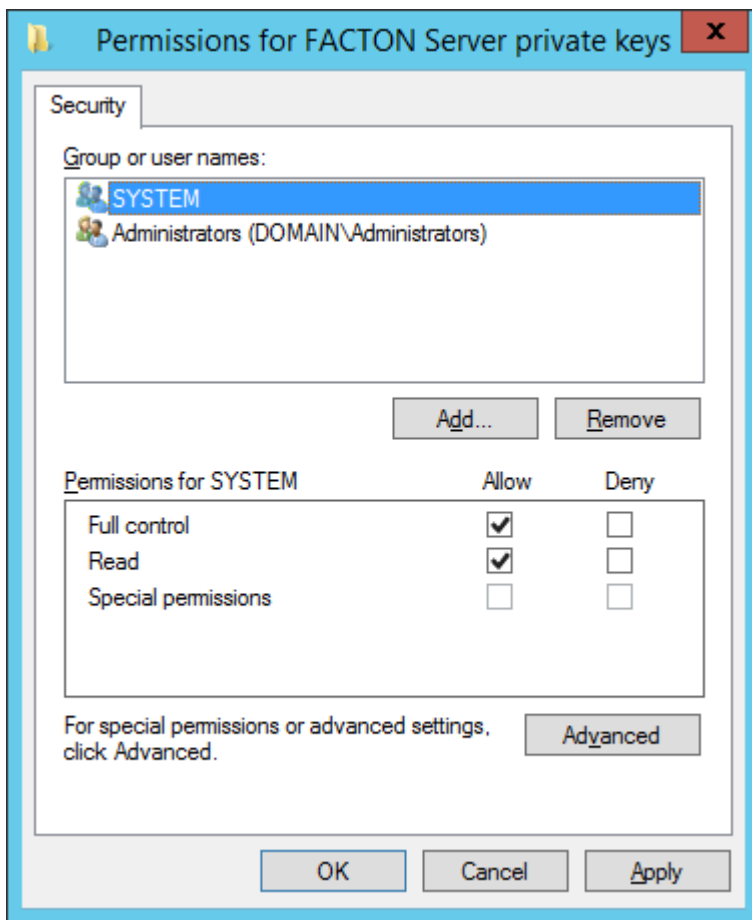


Figure 4.2: Post Installation Settings II

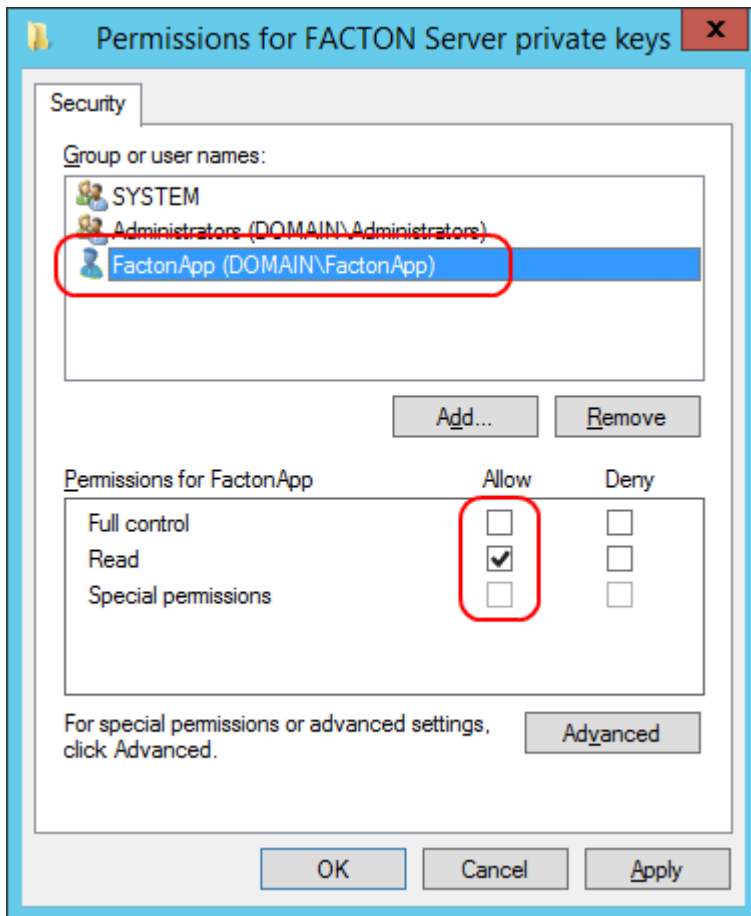


Figure 4.3: Post Installation Settings III

4.3.1 Checking Readiness of Services

After installation is finished and application service has been started, check whether application service is ready to use.

FACTON Application Service

FACTON uses an in-memory approach. Therefore the application services loads data from database to the servers main memory from time to time, thereby enabling FACTON to work faster. This functionality is called »Prefetching«. If you start the server first time, FACTON preloads the data. This functionality is called »Initial Prefetching«.

Initial prefetching is done automatically by the application service during startup. During initial prefetching, the service is not available and thus no connection can be established. Subsequent prefetchings operate during runtime and do not have an impact on performance. The application service stays available during that time.

Depending on the amount of master data and the amount of calculations, prefetching can take up to one hour.

Check Whether Prefetching is Still Running

1. Open **Performance Monitor**.
2. Left-Click on **Add** to open the **Add Counters** dialog.
3. Load FACTON EPC.
4. Select the counter »Active prefetching actions«.
5. Select the instance »facton.infrastructure.distribution.serverhost.wcfwindowsservice«.
6. Click on **Add**.



Note

If prefetching is active, the counter has the value **one**.

If prefetching is complete, the counter has the value **zero**.

The FACTON Application Server is ready to use once prefetching is complete.



Note

If the FACTON Application Service is running as a user account, the user must be a member of the »Performance Log Users« group, to get access to this counter.

4.3.2 Start the Application Service

After the completed installation, start the Application Service.

Start the Application Service

1. Open the **Windows Services Console** or App respectively.
2. Search for the »FACTON Application Service« in the list (see figure »[Navigation Pane in the Service App](#)«).
3. Click on the link »**Start** the service« or use the context menu and choose **Start** to start the service.

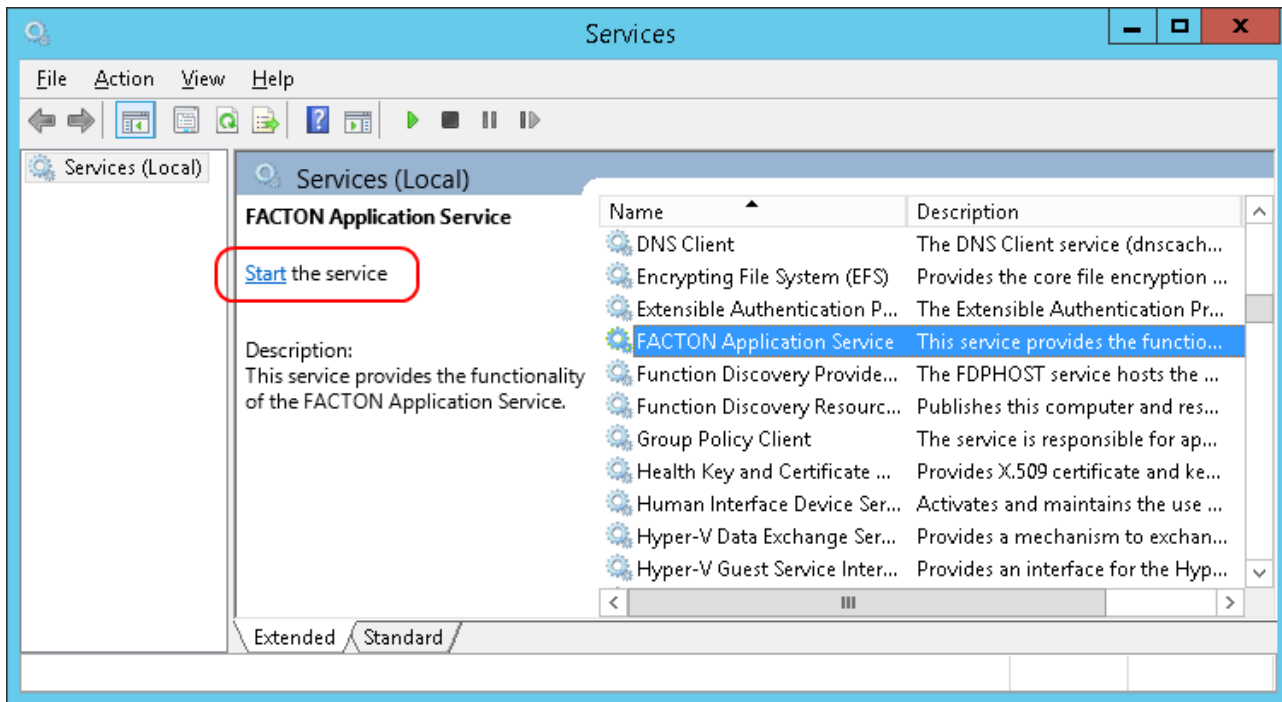


Figure 4.1: Navigation Pane in the Service App



Note

Because of the special startup behavior of the Application Service (see chapter »[Checking Readiness of Services](#)«) an error message may appear. This message means that the startup process needs more time than expected (see figure »[Error Message I](#)«).

Until the initial prefetching is completed you will see »Starting« in the Services Overview.

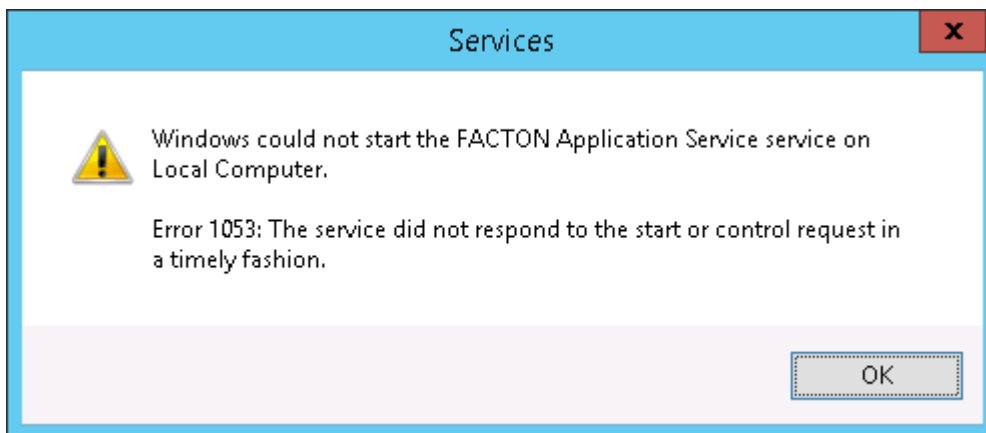


Figure 4.2: Error Message I

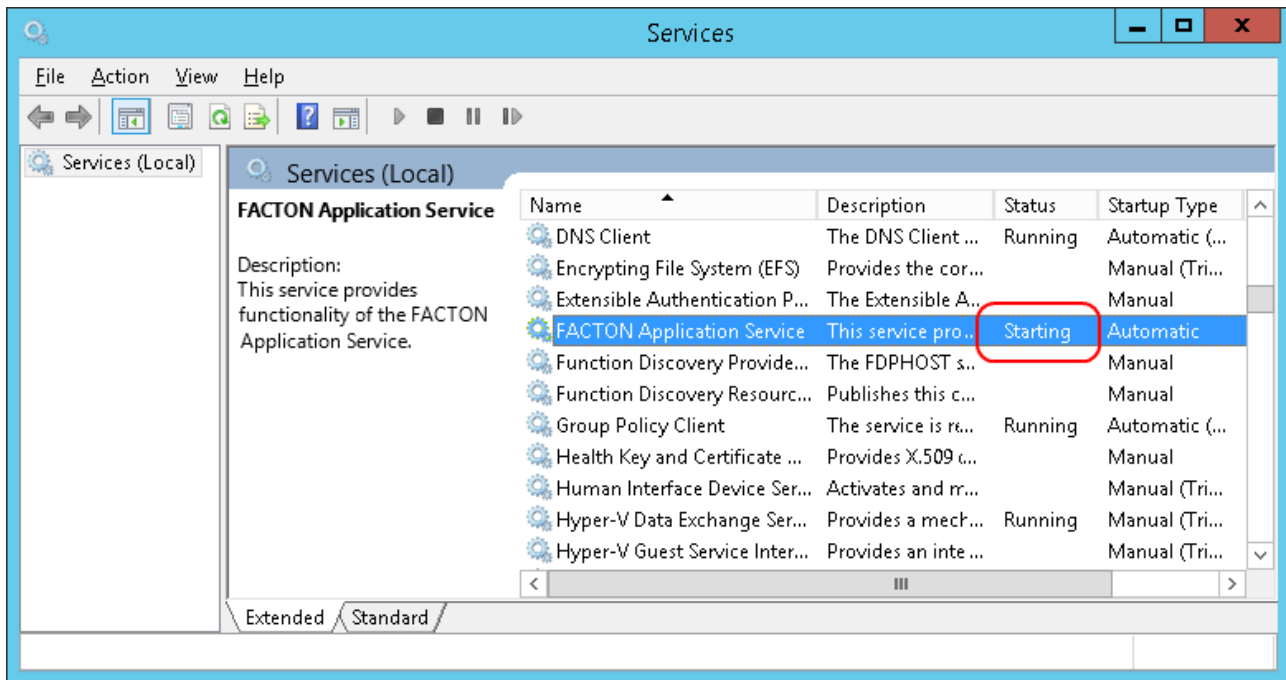


Figure 4.3: Error Message II

4.3.3 Stop the Application Service

Stop the Application Service

1. Open the **Windows Services Console** or App respectively.
2. Search for the »FACTON Application Service« in the list (see figure »Navigation Pane in the Service App«).
3. Click on the link »**Stop** the service« or use the context menu and choose **Stop** to stop the service.

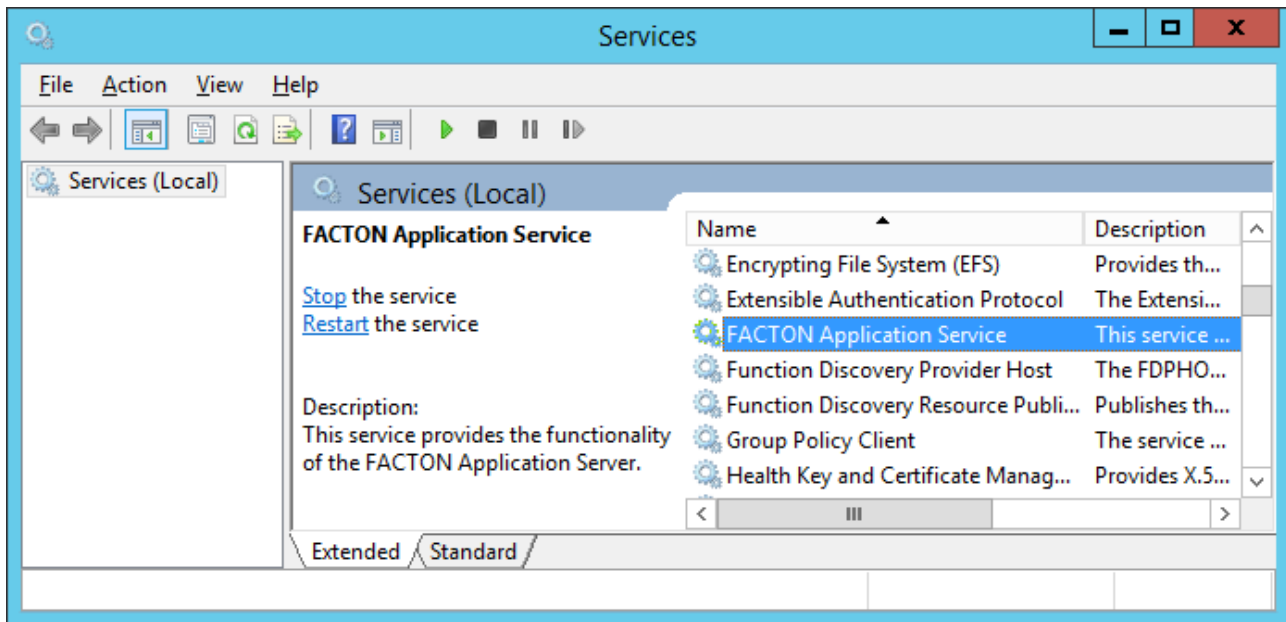


Figure 4.1: Navigation Pane in the Service App

4.4. UNINSTALL FACTON

This chapter describes the uninstallation process of the FACTON Components. You can uninstall FACTON in two ways - via attended mode or via unattended mode.



IMPORTANT

Upgrading and downgrading is not supported in this version.

If you want to install an older or newer version, you have to uninstall the installed version first.

4.4.1 Uninstall via Attended Mode

Uninstall FACTON via Attended Mode

- Use the »Programs and Features« via Windows to uninstall your installed FACTON Components (see »Windows Programs and Features«).

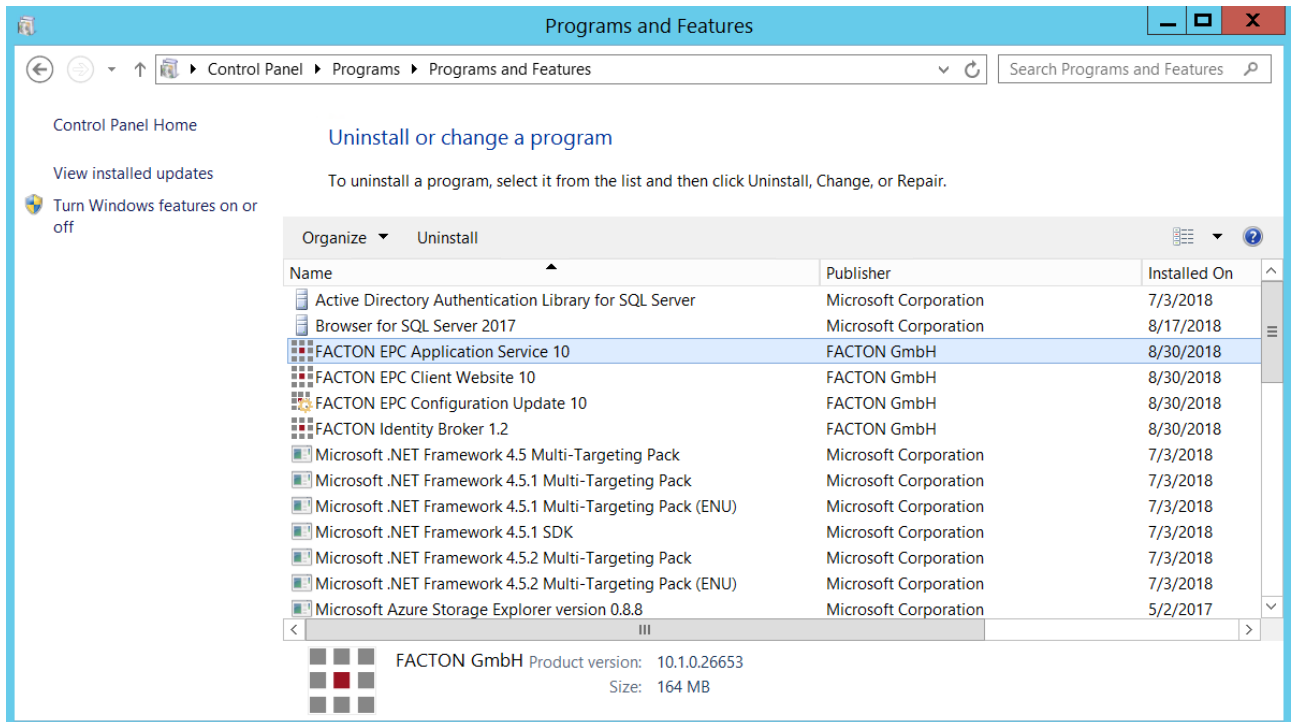


Figure 4.1: Windows Programs and Features

Alternative:

1. Double-click on the setup file (e.g. »FACTON_Application_Service_10.1.0.26635.exe«) to start the uninstallation.
The setup analyzes the current state of the FACTON Component and an uninstall page opens and shows the executable setup actions. Click on the »Uninstall...« setup action. The uninstallation process starts.

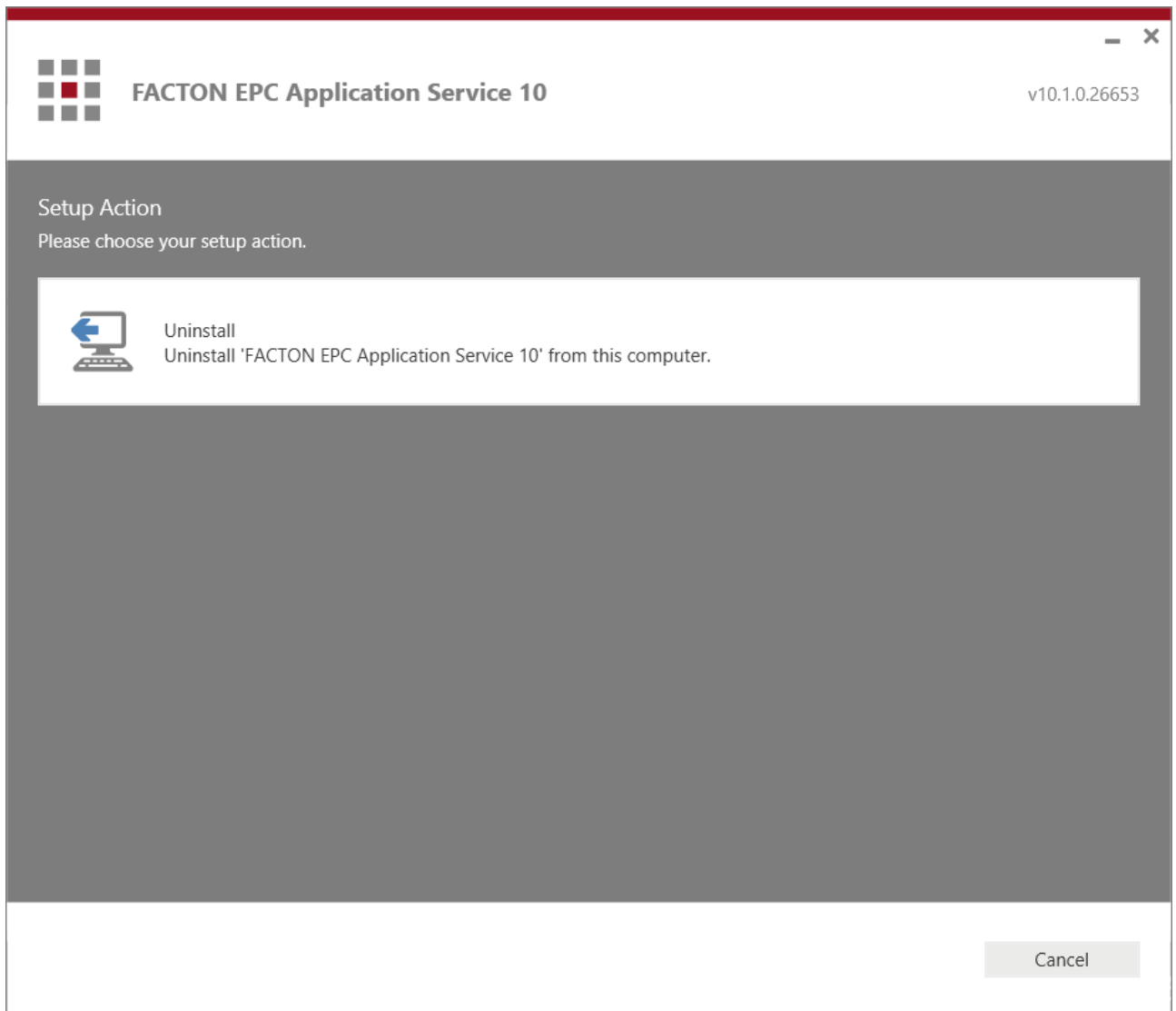


Figure 4.2: Choosing a setup action

2. A summary page opens and displays the previously installed prerequisites (in gray) and the current component you wish to uninstall (in red).
Click on the **Uninstall** button to start the uninstallation process.

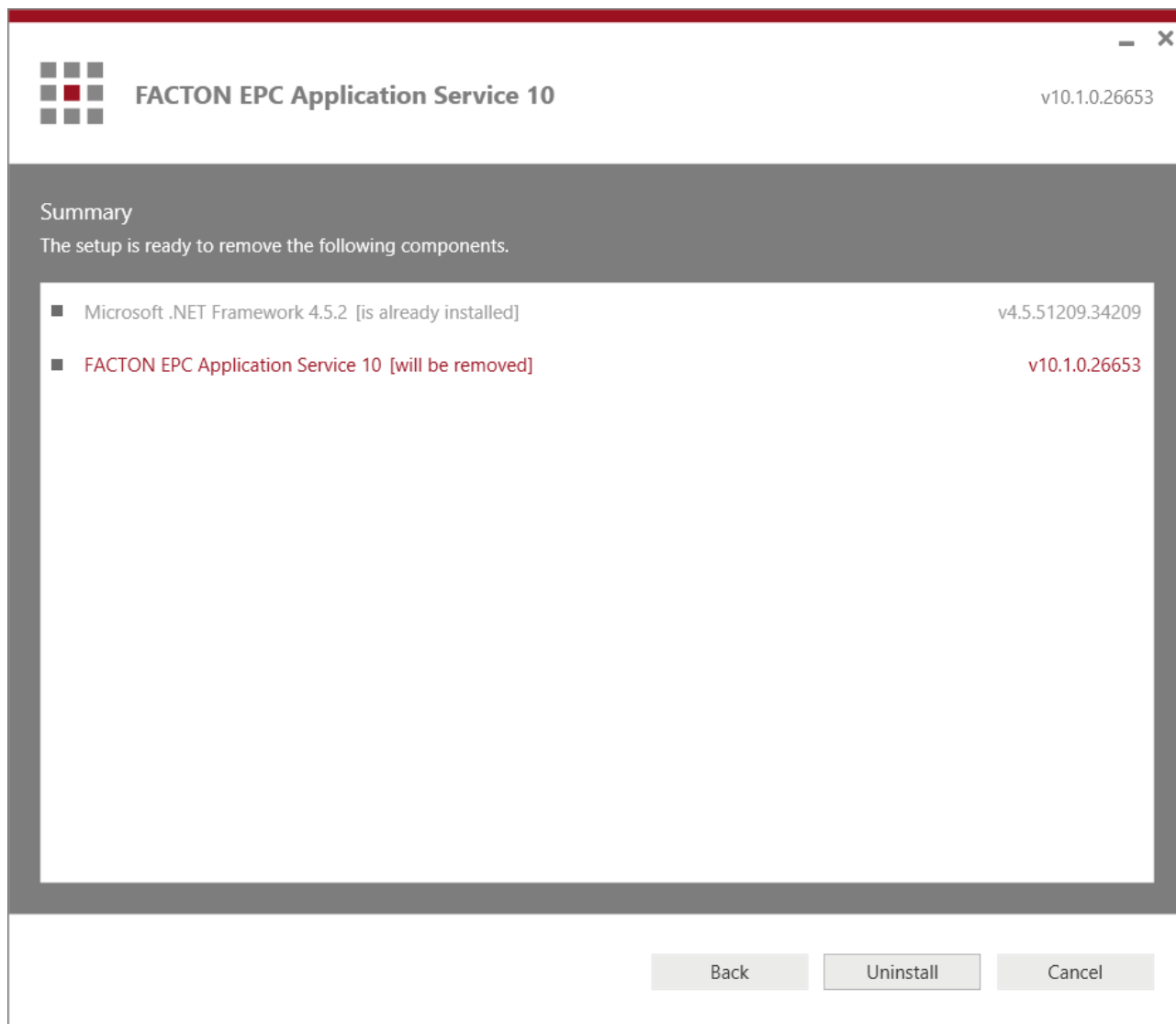


Figure 4.3: Summary of the installed components

- The setup starts the uninstallation. If the uninstallation process is successfully finished, a page with information about the uninstalled components opens. Click on the **Finish** button to finish the uninstallation process and close the wizard.

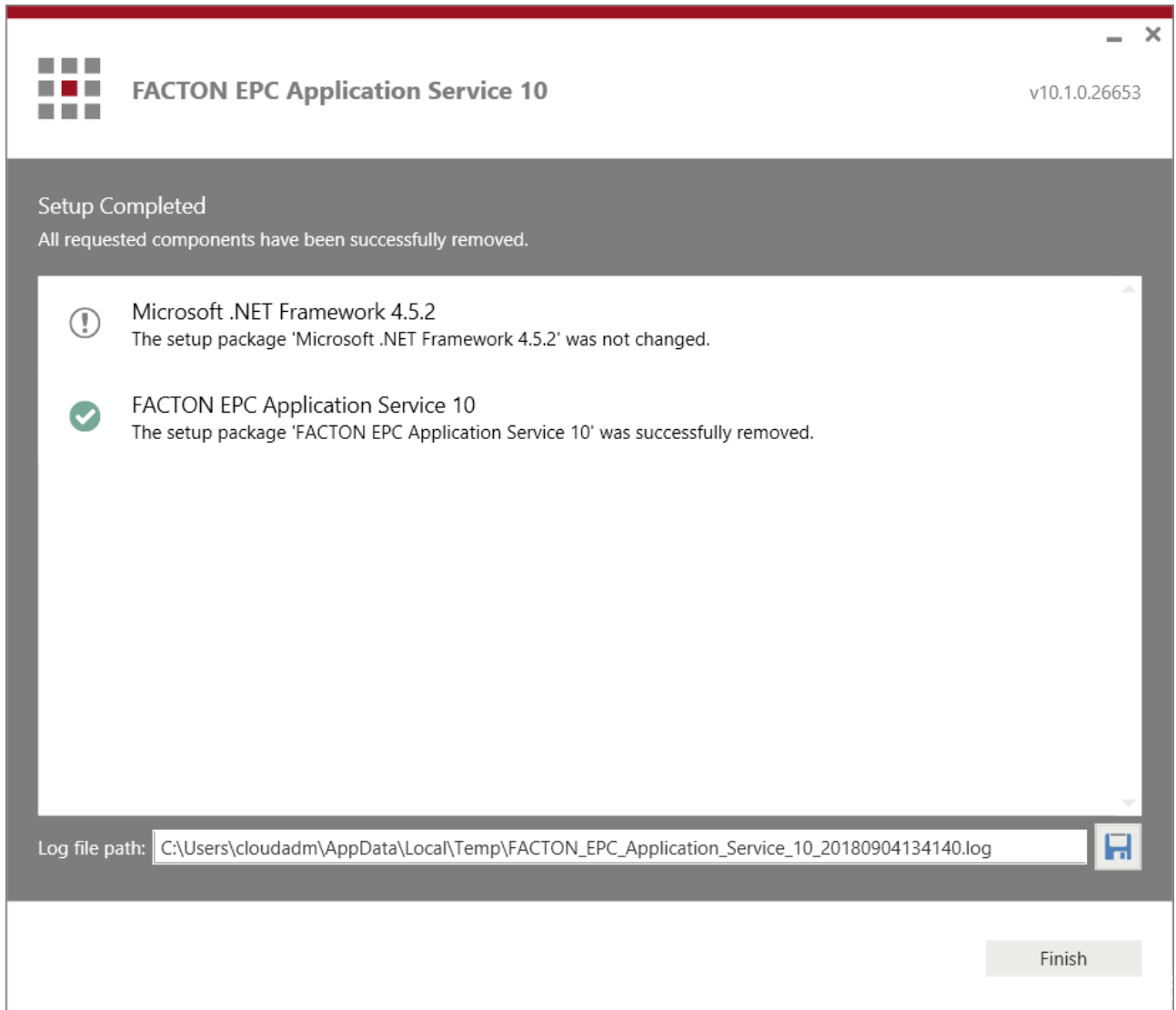


Figure 4.4: Overview about the uninstalled components

- If the installation process fails, an error message opens in a new page.
-

4.4.2 Uninstall via Unattended Mode

This chapter describes the uninstallation process of the FACTON Components using the unattended mode.

Uninstalling FACTON via Unattended Mode

To uninstall a FACTON component (e.g. »FACTON_Setup.exe«) via unattended mode, you need to use the following command line arguments:

FACTON Setup Command Line Parameters

Parameter	Description
-silent	Uses the unattended mode for uninstalling.
-uninstall	Uses the uninstalling mode of the setup.
-log "Uninstall.log"	Writes a log during the uninstalling in the file "Uninstall.log".

Uninstall Setup »FACTON_Setup.exe«

1. Start a Command Prompt as administrator.
2. Navigate to the folder which contains the setup file "FACTON_Setup.exe".
3. Enter the following command to start the silent uninstalling:

```
"FACTON_Setup.exe" -silent -uninstall -log "Uninstall.log"
```

Uninstall the Application Service

1. Start a Command Prompt as administrator.
2. Open the folder which contains the application service setup file.
3. Start the uninstallation with the required command line parameters:

■ **Example command:**

```
"FACTON_Application_Service_9.1.0.17277.exe" -silent -uninstall -log "Uninstall.log"
```

Uninstall the Client

1. Start a Command Prompt as administrator.
2. Open the folder which contains the client setup file.

3. Start the uninstallation with the required command line parameters:

■ **Example command:**

```
"FACTON_Offline_Client_9.1.0.17277.exe" -silent -uninstall -log  
"Uninstall.log"
```

Uninstall the Client Deployment Site

1. Start a Command Prompt as administrator.
2. Open the folder which contains the client deployment site setup file.
3. Start the uninstallation with the required command line parameters:

■ **Example command:**

```
"FACTON_Offline_Client_Website_9.1.0.17277.exe" -silent -uninstall -  
log "Uninstall.log"
```

Uninstall the Configuration Update Client

1. Start a Command Prompt as administrator.
2. Open the folder which contains the client setup file.
3. Start the uninstallation with the required command line parameters:

■ **Example command:**

```
"FACTON_ConfigurationUpdate_Client_9.1.0.17277.exe" -silent -unin-  
stall -log "Uninstall.log"
```

5. MAINTAINING THE SYSTEM

This chapter describes frequent tasks, that need to be executed in order to maintain the system. This includes maintaining the column store, changing passwords or replacing server certificates.

5.1. Column Store	132
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5.1. COLUMN STORE

The column store adds a second cache to the Application Service. It contains property values that would take some time to calculate and therefore speeds up reading those values. It also acts like database indexes and speeds up queries.

It contains only calculated data. This calculation needs time. To prevent full column calculation after each service start, the column store creates persistent data on the hard disk.

The persistent files of the column store are located in:

```
<APPDATA PATH>\Local\FACTON\ColumnCaching\<Base Folder>
```

The column cache base folder name depends on the SystemID which is stored in the database.

The process of column creation and saving is automatically started by the application service.



IMPORTANT

These files should also be included in the backup plan of each system.

Ensure that database version and column cache files correspond when restoring a backup. You can use column cache files that are older than the database backup. The system updates the entire column cache in that case (just as it does on restarting application service).

If column files are newer than the database backup, then the FACTON Application Service deletes them!

**IMPORTANT**

The column store is created when the system is running. After first installing application service, there is no column store at all. All directories and files are created during runtime.

5.2. REPLACING A SSL CERTIFICATE**IMPORTANT**

Replacing an SSL certificate requires a maintenance window.

The following preconditions must be fulfilled:

- New SSL certificate is enrolled
- Thumbprint of the new certificate is known

 **Replacing an SSL Certificate**

1. In the Server Manager, stop the **Application Service**.
2. Open a **cmd** as administrator.
3. Execute the command to unregister the certificate:

```
netsh http delete sslcert ipport=0.0.0.0:443
```

(see figure »[Command line to unregister the certificate](#)«).

4. Register the new certificate with the command:

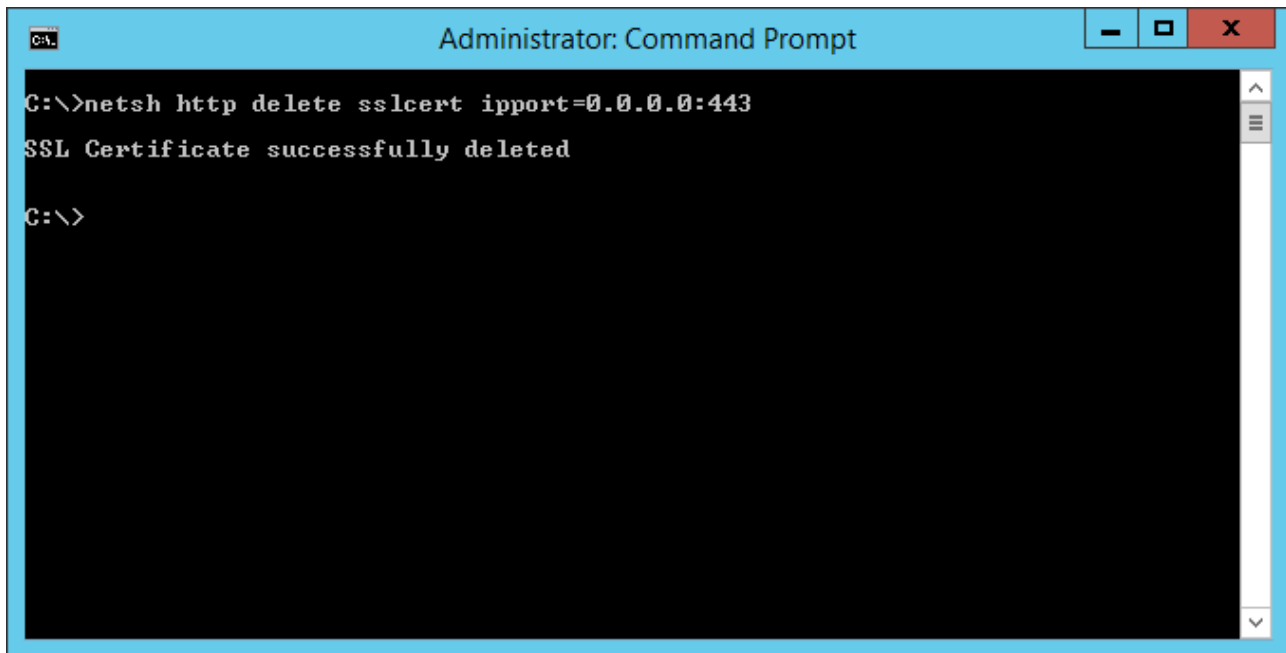
**Note**

Copy code text into a text editor to remove line breaks. Check for any other syntax issues and then copy it into the command prompt.

```
netsh http add sslcert ipport=0.0.0.0:443 certhash=<new thum bprint>  
appid={52414C46-0000-2712-1983-AFFE00000110}
```

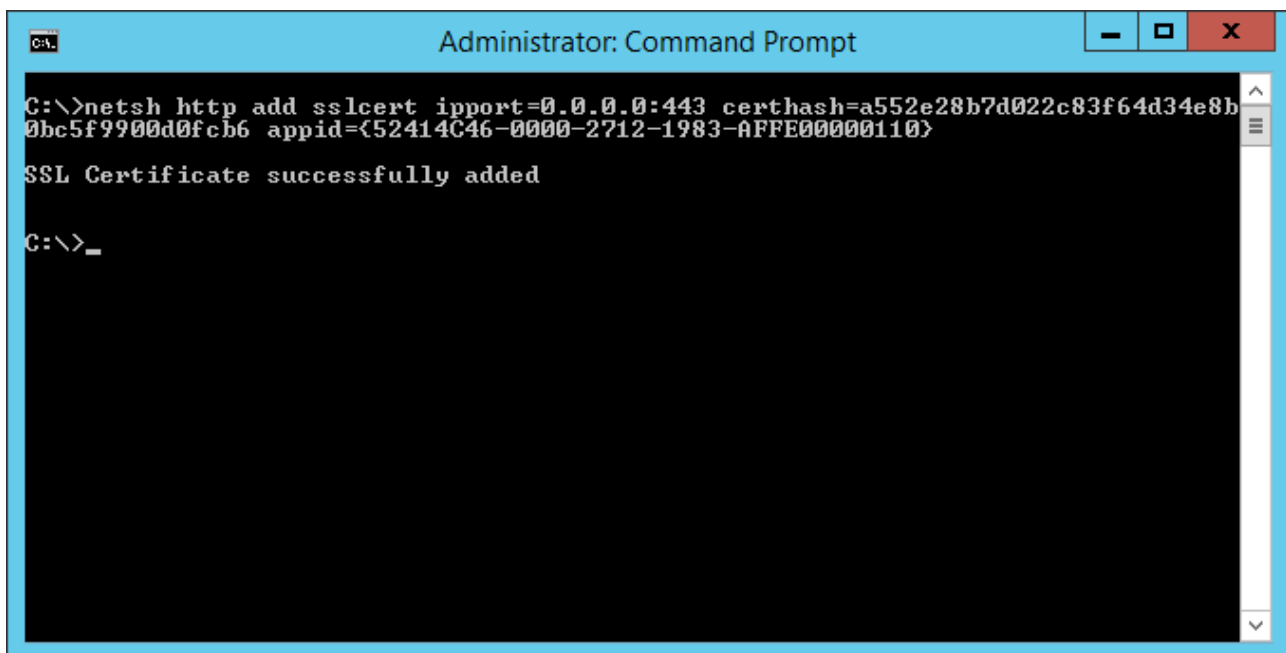
(see figure »[Command line to register the new certificate](#)«).

5. Restart the FACTON Application Services.
-



```
Administrator: Command Prompt
C:\>netsh http delete sslcert ipport=0.0.0.0:443
SSL Certificate successfully deleted
C:\>
```

Figure 5.1: Command line to unregister the certificate



```
Administrator: Command Prompt
C:\>netsh http add sslcert ipport=0.0.0.0:443 certhash=a552e28b7d022c83f64d34e8b
0bc5f9900d0fcb6 appid={52414C46-0000-2712-1983-AFFE00000110}
SSL Certificate successfully added
C:\>_
```

Figure 5.2: Command line to register the new certificate

5.3. PREFETCHING

General Information

Prefetching is a process that fills up caches with frequently used data. The whole system works without prefetching, but for performance reasons it is recommended to use it.

Each prefetching can contain multiple queries. They are separated by „;“. The required prefetching queries depend on the current Cost# configuration and queries (custom queries and system internal queries).



IMPORTANT

Do not change the queries unless you have professional knowledge of the Cost# configuration.

When Prefetching is running.

Prefetching is executed during service startup. The application service is ready after all prefetching operations are complete.

Prefetching is executed when a new client starts and a successful publishing operation was completed since the last prefetching. It updates all caches to ensure that new clients also perform optimally.

Prefetching also occurs at regular intervals. By default it runs every 5 min. It ensures that updating caches is always fast.

5.4. CHANGING SYSTEMSETTINGS.INI

This file defines settings to fit the FACTON Application Service to your environment and your custom configuration.

Location of the SystemSettings.ini file

The SystemSettings.ini is located in the Roaming-folder of the FACTON application directory:

```
<FACTON-AppData>\Roaming\FACTON
```

Understanding the SystemSettings.ini file

The following variables are defined in the SystemSettings.ini - see the table below.

Variable	Customer maintainable
MemoryThresholds=98,70,35,25	yes
NumberOfGenerationsPerCache=6,4	no
NumberOfPooledGenerations=2	no
NumberOfPooledGenerations-BaseStatesSnapshotIndex=7	no
NumberOfPooledGenerations-ContextualStatesSnapshotIndex=7	no
NumberOfPooledGenerations-PublicStatesSnapshotIndex=3	no
NumberOfPooledGenerations-SpaceSnapshotIndex=3	no
CacheHitRatio-PropertyValues=9	no
CacheHitRatio-PropertySemantics=9	no
CacheHitRatio-PropertyColumns=95	no
CacheHitRatio-PublicStates=70	no
CacheHitRatio-PublicStatesSnapshotIndex=70	no
HashInitializeCount=1000000	no
CommandTimeout=0	no
MaxShownFinishedQueries=500	no
CacheMonitoringInterval=600	no
ColumnSetRecreationThreshold=900000	no
QueryTimeout=360000	yes
MaxQueryableEntities=100000	yes
ColumnCachingMaxSize=100000000000	yes
currentlanguage=1033	no
SpaceBasedIncomingReferencesBlackList=faccccc-2bf6-4e36-84e7-70710baa0101	no
ServerPrefetchingInterval=300	no
MaxConcurrentPrefetchingOperations=1	no

Variable	Customer maintainable
DatabaseValidation=false	no
PublishingTicketTimeout=600	no

Table 5.1: Variables in SystemSettings.ini

**Note**

Only settings the customer should maintain are described in the following sections.

ColumnCachingMaxSize

The setting defines the maximum size the column store can consume on the hard drive to persist columns. The size should be around 100GB. On exceeding this limit the Application service automatically removes old files. The unit is Byte. The default setting (100000000000) means 93GB.

MemoryThresholds

This variable contains four boundaries which influence the caching system and its behavior. The unit is Percent as Integer.

The second number (70) defines the maximum memory which is used for caching. So the Application service is allowed to increase its memory consumption up to 70% of the overall physical memory are used.

The other parameters influence the internal caching strategies. Those settings must not be changed.

QueryTimeout

This defines the maximum execution time (in milliseconds) of a query on the server. If this limit is reached, the system stops (cancels) the query.

MaxQueryableEntities

Defines the maximum amount of elements allowed to be filtered without columns. Also defines the maximum resulting set of a query.

The setting limits the load of the application service. Queries that handle too many elements without using columns cause too much load. Exceeding this threshold rejects the query. More filter criteria have to be set in this case.

**IMPORTANT**

Restart the FACTON Applications Service after changing the »SystemSettings.ini« file.

5.5. DATABASE PURGING

Purging allows you to permanently delete data from the system. You may purge any data that are deleted and unchanged since a configurable cut-off date with a few exceptions for system data and some master data.

So, deleting in FACTON only means marking for deletion. Purging then removes the data physically from the database. Purging is an explicit administrative step and needs a process.

Purging is currently not supported for the SC and DC solutions.

■ Purging Process

The purging process deletes data from the database, which also effects that some data outside of the database become invalid. This includes columns, as well as the users' unpublished data, so some preparation is required.

Follow these steps every time a new purging operation is scheduled.

The process itself consists of three phases:

- »Phase 1: Preparation«
- »Phase 2: Actual Purging«
- »Phase 3: Verification«

Phase 1: Preparation

Necessary steps to prepare a purging run and to collect data to verify the result of a purging run.

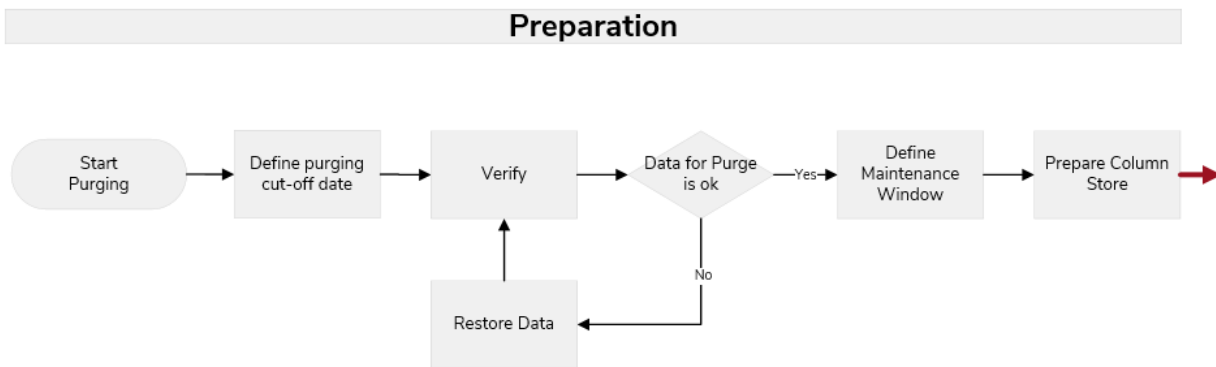


Figure 5.1: Purging Process - Phase 1: Preparation

Define purging cut-off date

Choose for a cut-off date. This will typically be defined as specific date. All elements that have been deleted before are potential candidates for purging and may then be purged from database. For example, 2011-01-01 has been defined as cut-off date. This will be interpreted as 2011-01-01 00:00:00+0 (UTC). So, all deleted elements before this moment will be purged. You can also define a specific date including time as UTC value.

Verification

During the verification you get an overview about the elements that will be purged. You have also the chance to retain some elements from purging.

To get the purging candidates, use the following FQL queries. If there are any elements, that you don't want to purge, you can restore those elements using the default restore functionality directly. If you have restored some elements you have to publish your changes and run the verification query again.

When you are done verifying the purging candidates, please export the query result which will be required later to verify the purge result.

```
// calculations

SELECT Label, _Id, _SpaceId

FROM TYPE calculation, LIFECYCLE DELETED

WHERE _EntityModificationTime < "<PurgingCutOffDate>"

ORDER BY Label
```

```
// versions

SELECT Label, _VersionInfo._Id as VersionId, _VersionNumber, _SpaceId

FROM TYPE calculation, HISTORY VERSIONED, LIFECYCLE DELETED

WHERE _VersionInfo._EntityModificationTime < "<PurgingCutOffDate>"

ORDER BY _SpaceId, Label
```

```
// master data resources

SELECT Label, _Id, _SpaceId

FROM TYPE resource, SPACE resourceMasterdata, LIFECYCLE DELETED

WHERE _EntityModificationTime < "<PurgingCutOffDate>"

ORDER BY Label
```

**Note**

Simply replace <PurgingCutOffDate> with your defined cut-off date.

Define Maintenance Window

Set the time when the purging operation is supposed to run. During this operation, no normal productive usage is possible.

By the purging time, all users must have published local changes. Unpublished changes will be lost after the purging is done.

Prepare Column Store

To avoid losing persisted columns after purging, which may require a complete recalculation, a base line should be created.

To achieve this, set the purging cut-off date as system setting with the name »PurgingCutOffDate« at all application servers (e.g. »PurgingCutOffDate=2011-01-01«).

After setting the cut-off date, restart the services. You may do this one by one at any time during production.

Observe the »Active prefetching actions« and »Active column generations« performance counter (see [»Application Server Health Monitoring«](#)). Wait for both to be »0 (zero)«. Shut down application service afterwards.

Phase 2: Actual Purging

The execution of purging itself.

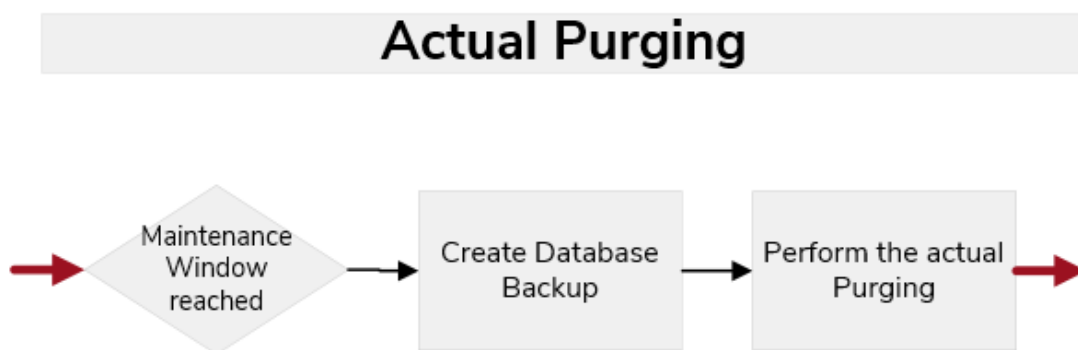


Figure 5.2: Purging Process - Phase 2: Actual Purging

Stop Application Services

Before you can execute the purging, you have stop all application services.

Create Database Backup

You should make a full database backup, otherwise purged data will be unrecoverable. This backup could be used to restore it fully in case of any other unexpected error.

Enable Purging

Enable purging for one application service by specifying the system setting **RunPurging=true**. Be sure that also the purging cut-off date is defined in the settings as described above.

Purging must run only on one server. Enable purging on multiple servers can lead to unexpected behavior.

Run purging

Start the service with enabled purging.

Wait until purging has finished. You can check this at the performance counter »Active Purging Operations« (see »Application Server Health Monitoring«) which has a value of »1« during purging and a value of »0 (zero)« after purging. You can also use the ETW events »PurgingStarted« and »PurgingFinished«.

Stop application service when purging has finished.

Purging will generate two result files (CSV) containing the purged and not purged data. These files will be stored under »<Facton.ApplicationDataDirectory>\Local\FACTON« and can be used to validate the result of the purging run. If no application directory has been defined during setup, the files will be stored in local application directory of that user which executes the application service.

Disable purging

After stopping the application service, which has executed the purging operation, disable the purging by setting **RunPurging=false** in the system setting or by removing the line entirely. Also remove the entry »PurgingCutOffDate« from System-settings file.

Phase 3: Verification

The verification of the purge result.

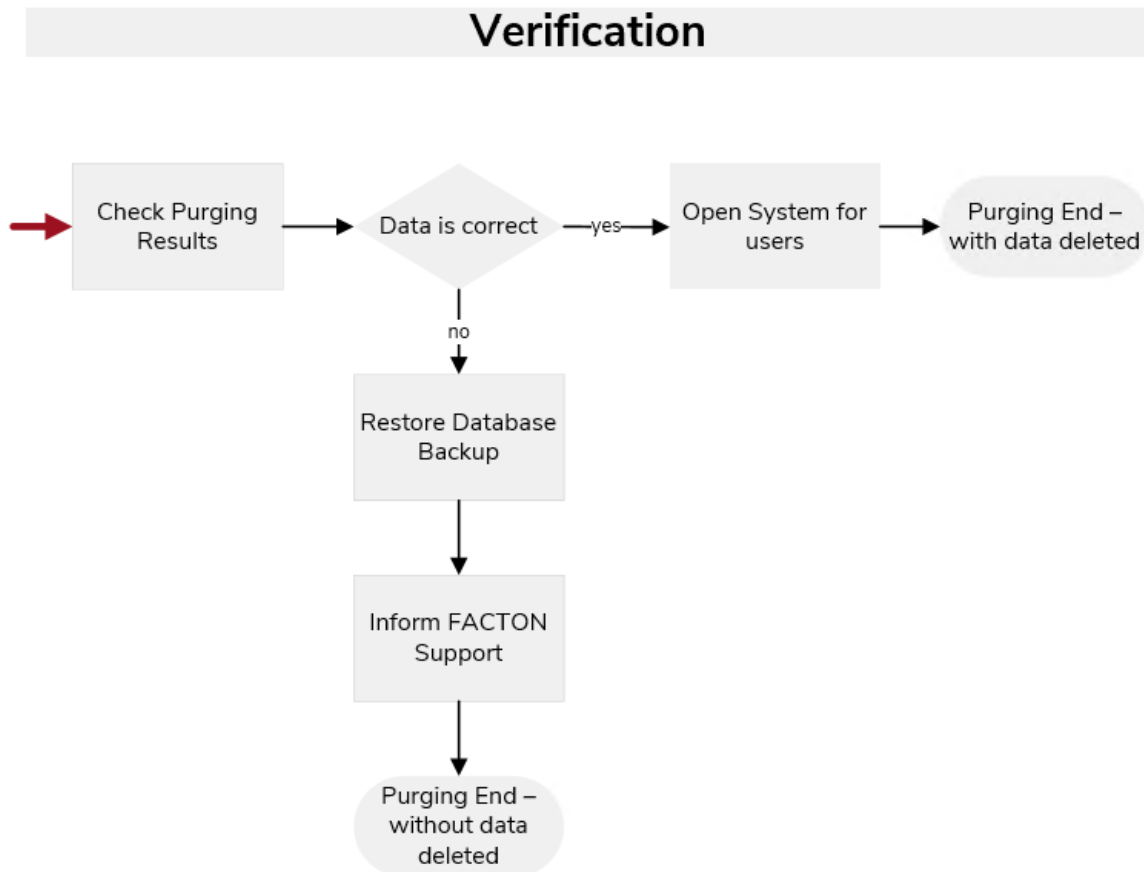


Figure 5.3: Purging Process - Phase 3: Verification

During the verification phase, the result of the purging operation will be verified by comparing the purging candidates with the result of the purge operation.

The candidates are contained in the csv-files that you have exported during preparation step. You should have three files:

- calculation candidates
- version candidates
- master data resource candidates

The result of the purge operation has been stored to your application directory. There should be a »Purge_Result-Snapshot_x.csv« and a »Purge_Result_Verbose-Snapshot_x.csv«.

- »Purge_Result_Verbose-Snapshot_x.csv« contains information about all data that were considered for purging.
- »Purge_Result-Snapshot_x.csv« contains information about all calculations, versions and master data resources that were considered for purging.

Snapshot_x refers to a technical version from the database which is directly derived from the configured purging cut-off date.

To validate the result, use the »Verify-Purge-Result« script, which is part of the FACTON delivery. Run this script and enter the candidate files and one of the purge result files as arguments.

```
Verify-Purge-Result.ps1 -calculationCandidates <Path> -versionCandidates  
<Path>  
-resourceCandidates <Path> -purgeResult <Path>
```

If the verification is successful, you get the message »Purging was successful«, otherwise you get an error message.

In case of the successful verification, you can restart all application services and open the system for users. If the verification was not successful, you should restore the database backup that you have created in preparation phase. Please verify that you have used exactly the same purging cut-off date on querying purging candidates as on purging itself. If you did use the same cut-off-date and the error still occurs, please contact the FACTON support.

Additional Steps

After a purging operation, rebuilding the indexes at the database is recommended.

6. MONITORING THE SYSTEM

FACTON EPC provides logging and monitoring methods and tools to check the system health, monitor server availability and performance. This section describes the methods and tools in detail.

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6.1. APPLICATION SERVER HEALTH MONITORING

The application server health can be monitored by performance counters using either standard server monitoring tools or the Windows Management Instrumentation (WMI) interface.

There are counters for monitoring and logging. Monitoring-counters describe the current status of the system. A system administrator can identify bottlenecks and obtain information about the overall performance of the system. There are thresholds defined that indicate what range of values to expect. Exceeding those limits usually results from poor system performance. Thus they can be used as a trigger for taking closer look at the system.

Logging-counters provide additional information for further performance-analysis.

Monitoring Performance Counters

1. Click on Windows **Start**.
2. Select **All Programs**.
3. Choose **Administrative Tools**.
4. Open **Performance Monitor**.



Note

For definition of thresholds and actions upon threshold violation see:

<http://technet.microsoft.com/en-us/library/cc722414.aspx>

6.1.1 Production environment

See the table below to get an overview on the counters that should be monitored in production-environments. It also shows the corresponding limits and the purpose of the counter.

■ .NET CLR Memory

Instance: Facton.Infrastructure.Distribution.ServerHosts.WcfWindowsService

Metric	Purpose	Sample Rate	Threshold
# Bytes in all Heaps	Logging	1 min	-
Description: Standard Microsoft .NET Counter - Intended for support only			
# of Sink Blocks in use	Logging / Monitoring	1 min	Warning: 10,000,000 Error: 50,000,000
Description: Standard Microsoft .NET Counter - Intended for support only			
Large Object Heap size	Logging	1 min	-
Description: Standard Microsoft .NET Counter - Intended for support only			
% Time in GC	Logging	1 min	-
Description: Standard Microsoft .NET Counter - Intended for support only			

Table 6.1: Production Environment: Health Monitoring Indicators for .NET CLR Memory

■ .NET Data provider for SQL

Instance: Facton.Infrastructure.Distribution.ServerHosts.WcfWindowsService

Metric	Purpose	Sample Rate	Threshold
NumberOfPooledConnections	Logging / Monitoring	1 min	Warning: 50 Error: 80
Description: The number of established database connections.			

Table 6.2: Production Environment: Health Monitoring Indicators for .NET Data provider for SQL

■ FACTON EPC Database

Metric	Purpose	Sample Rate	Threshold
Active Purging Operations	Logging	1 min	
Description: Counts the total number of active purging operations.			

Table 6.3: Production Environment: Health Monitoring Indicators for FACTON EPC Database

■ FACTON EPC Load

Metric	Purpose	Sample Rate	Threshold
% Outstanding Column Updates	Logging	1 min	-
Description: Counts the number of active outstanding column updates as a percentage of all outstanding column updates. This is an indicator of how long the cache update will take.			
% Rejected Publishing Operations	Logging	1 min	-
Description: The percentage of publishing operations rejected due to too many concurrent publishing operations per sample interval.			
Active Column Generations	Logging	1 min	-
Description: Counts the number of active column generations.			
Active Prefetching Actions	Logging	1 min	-
Description: Counts the number of active prefetching actions such as prefetching queries.			
Active Publishing Operations	Logging	1 min	-
Description: Counts the number of active publishing operations.			
Highest Publishing Ticket Waiting Time	Logging / Monitoring	1 min	Warning: 80% of the configured publishing timeout (default 80% of 18 min)
Description: The current highest waiting time for queued publishing tickets in seconds. Represents the state of the whole system.			

Metric	Purpose	Sample Rate	Threshold
Successful Publishing Duration	Logging	1 min	-
Description: Measures the average duration of successful publishing operations per sample interval in seconds.			
Failed Publishing Duration	Logging	1 min	-
Description: Measures the average duration of publishing operations failed due to business rules per sample interval in seconds.			
Successful Publishing Operations Delta	Logging	1 min	-
Description: Counts the number of successful publishing operations since the last sample.			
Failed Publishing Operations Delta	Logging	1 min	-
Description: Counts the number of publishing operations failed due to business rules since the last sample.			
Publishing Ticket Queue Size	Logging	1 min	-
Description: The size of the publishing ticket queue. Represents the state of the whole system.			
Queued Prefetching Actions	Logging / Monitoring	1 min	Warning: > 10
Description: Counts the number of prefetching actions that could not be executed due to "MaxConcurrentPrefetchingOperations"-Limit.			
Rejected Prefetching Actions Delta	Logging / Monitoring	1 min	-
Description: Counts the number of rejected prefetching actions since the last sample.			
Rejected Publishing Operations Delta	Logging / Monitoring	1 min	Warning: > 0
Description: Counts the number of publishing operations rejected due to too many concurrent publishing operations since the last sample.			

Table 6.4: Production Environment: Health Monitoring Indicators for FACTON EPC Load

■ Memory

Metric	Purpose	Sample Rate	Threshold
Available MBytes	Logging / Monitoring	1 min	Depending on size of Main Memory: With 256 GB Main Memory Warning: under 32GB longer than 30min; Error: under 25GB longer than 30min
Description: System Counter: Available MBytes is the amount of physical memory, in Megabytes, immediately available for allocation to a process or for system use. It is equal to the sum of memory assigned to the standby (cached), free and zero page lists.			

Table 6.5: Production Environment: Health Monitoring Indicators for Memory

■ Process

Instance: Facton.Infrastructure.Distribution.ServerHosts.WcfWindowsService

Metric	Purpose	Sample Rate	Threshold
% Processor Time	Logging	1 min	
Description: System Counter: % Processor Time is the percentage of elapsed time that all of the process threads using the processor to execute instructions. An instruction is the basic unit of execution in a computer, a thread is the object that executes instructions, and a process is the object created when a program is run. Code executed to handle some hardware interrupts and trap conditions are included in this count.			
Handle Count	Logging	1 min	
Description: System Counter: The total number of handles currently open by this process. This number is equal to the sum of the handles currently open by each thread in this process.			
IO Data Bytes/sec	Logging	1 min	
Description: System Counter: The rate at which the process reads and writes bytes in I/O operations. This counter counts all I/O activity generated by the process to include file, network and device I/Os.			
IO Other Bytes/sec	Logging	1 min	
Description: System Counter: The rate at which the process is issuing bytes to I/O operations that do not involve data such as control operations. This counter counts all I/O activity generated by the process to include file, network and device I/Os.			

Metric	Purpose	Sample Rate	Threshold
Thread Count	Logging	1 min	
<p>Description: System Counter: The number of threads currently active in this process. An instruction is the basic unit of execution in a processor, and a thread is the object that executes instructions. Every running process has at least one thread.</p>			

Table 6.6: Production Environment: Health Monitoring Indicators for Process

■ Processor

Instance: _Total

Metric	Purpose	Sample Rate	Threshold
% Processor Time	Logging	1 min	Warning: 75% longer than 5min
	Monitoring	5 min	Error: 90% longer than 5min
<p>Description: System Counter: % Processor Time is the percentage of elapsed time that the processor spends to execute a non-Idle thread. It is calculated by measuring the percentage of time that the processor spends executing the idle thread and then subtracting that value from 100%. (Each processor has an idle thread that consumes cycles when no other threads are ready to run). This counter is the primary indicator of processor activity, and displays the average percentage of busy time observed during the sample interval. It should be noted that the accounting calculation of whether the processor is idle is performed at an internal sampling interval of the system clock (10ms). On today's fast processors, % Processor Time can therefore underestimate the processor utilization as the processor may be spending a lot of time servicing threads between the system clock sampling interval. Workload based timer applications are one example of applications which are more likely to be measured inaccurately as timers are signaled just after the sample is taken.</p>			

Table 6.7: Production Environment: Health Monitoring Indicators for Processor

■ ServiceModelService 4.0.0.0

Metric	Purpose	Sample Rate	Threshold
Calls Duration	Logging Monitoring	1 min	Warning: 300s Error: 600s
Description: .NET Counter: The average duration of calls to this service. http://go.microsoft.com/fwlink/?LinkId=222537			
Calls Outstanding	Logging	1 min	
Description: .NET Counter: The number of calls to this service that are in progress. http://go.microsoft.com/fwlink/?LinkId=222532			
Calls Per Second	Logging Monitoring	1 min 5 min	- Warning: over 100 longer than 5 min
Description: .NET Counter: The number of calls to this service that are in progress. http://go.microsoft.com/fwlink/?LinkId=222532			
Percent Of Max Concurrent Calls	Logging Monitoring	5 min	Warning: 80 % longer than 5 min Error: 100 %longer than 5 min
Description: Number of calls waiting to be or being processed in the dispatcher as a percentage of max calls throttle. http://go.microsoft.com/fwlink/?LinkId=222540			
Percent Of Max Concurrent Sessions	Logging Monitoring	1 min	Warning: 85% Error: 90%
Description: .NET Counter: Number of active sessions and messages waiting for sessions as a percentage of max sessions throttle. http://go.microsoft.com/fwlink/?LinkId=222542			

Table 6.8: Production Environment: Health Monitoring Indicators for ServiceModelService 4.0.0.0

6.1.2 Test environment

In test environments we need all of the production counters along with the following additional counters.

■ **.NET CLR LocksAndThreads**

Instance: Facton.Infrastructure.Distribution.ServerHosts.WcfWindowsService

Metric	Purpose	Sample Rate	Threshold
# of current logical threads	Logging Monitoring	1 min	Warning: 1024
Description: Standard Microsoft .NET Counter - Intended for support only			
Contention Rate / sec	Logging	1 min	-
Description: Standard Microsoft .NET Counter - Intended for support only			
Current Queue Length	Logging	1 min	-
Description: Standard Microsoft .NET Counter - Intended for support only			
Queue Length / sec	Logging	1 min	-
Description: Standard Microsoft .NET Counter - Intended for support only			
Queue Length Peak	Logging	1 min	-
Description: Standard Microsoft .NET Counter - Intended for support only			

Table 6.9: Test Environment: Health Monitoring Indicators for .NET CLR LocksAndThreads

■ .NET CLR Memory

Instance: Facton.Infrastructure.Distribution.ServerHosts.WcfWindowsService

Metric	Purpose	Sample Rate	Threshold
# GC Handles	Logging	1 min	
Description: Standard Microsoft .NET Counter - Intended for support only			
# Gen 0 Collections	Logging	1 min	-
Description: Standard Microsoft .NET Counter - Intended for support only			
# Gen 1 Collections	Logging	1 min	-
Description: Standard Microsoft .NET Counter - Intended for support only			
# Gen 2 Collections	Logging / Monitoring	1 min	Warning: > 1/10 of Gen 1 Collections
Description: Standard Microsoft .NET Counter - Intended for support only			
# of Pinned Objects	Logging	1 min	-
Description: Standard Microsoft .NET Counter - Intended for support only			
% Time in GC	Logging / Monitoring	1 min	Warning: Average of 50 over 5 min, if cpu time is over 30% Error: Average of 80 over 10 min, if cpu time is over 30%
Description: Standard Microsoft .NET Counter - Intended for support only			
Allocated Bytes/sec	Logging	1 min	-
Description: Standard Microsoft .NET Counter - Intended for support only			
Gen 2 heap size	Logging	1 min	-
Description: Standard Microsoft .NET Counter - Intended for support only			

Table 6.10: Test Environment: Health Monitoring Indicators for .NET CLR Memory

FACTON EPC Database

Metric	Purpose	Sample Rate	Threshold
Executed Purging Iterations	Logging	1 min	
Description: Counts the total number of executed purging iterations within active purging operations.			
Get Version Duration	Logging	1 min	
Description: The average duration [in sec] for Version-requests during a sample interval.			
Total GetChangedSpaces Calls	Logging	1 min	
Description: Counts the total number of GetChangedSpaces calls.			
Total GetCount Calls	Logging	1 min	
Description: Counts the total number of GetCount calls.			
Total GetIn-comingReferences (by ID) Calls	Logging	1 min	
Description: Counts the total number of GetIncomingReferences (by id) calls.			
Total GetIn-comingReferences (by IDs) Calls	Logging	1 min	
Description: Counts the total number of GetIncomingReferences (by ids) calls.			
Total GetMaxVersion Calls	Logging	1 min	
Description: Counts the total number of GetMaxVersion calls.			
Total Physical Database Requests	Logging	1 min	
Description: Counts the total number of physical database requests.			
Total ReadByIdsInSnapshot Calls	Logging	1 min	
Description: Counts the total number of ReadByIdsInSnapshot calls.			
Total ReadByPartitionsInSnapshot Calls	Logging	1 min	
Description: Counts the total number of ReadByPartitionsInSnapshot calls.			

Metric	Purpose	Sample Rate	Threshold
Total ReadDeltaByPartitions Calls	Logging	1 min	
Description: Counts the total number of ReadDeltaByPartitions calls.			
Total ReadInSnapshot Calls	Logging	1 min	
Description: Counts the total number of ReadInSnapshot calls.			
Total TryRead Calls	Logging	1 min	
Description: Counts the total number of TryRead calls.			
Total Version Calls	Logging	1 min	
Description: Counts the total number of GetVersion (transaction version) calls.			

Table 6.11: Test Environment: Health Monitoring Indicators for FACTON EPC Database

■ FACTON EPC Load

Metric	Purpose	Sample Rate	Threshold
% Outstanding Prefetching Queries	Logging	1 min	-
Description: Counts the number of active outstanding prefetching queries as a percentage of all outstanding prefetching queries.			
Expensive Properties Cache Misses / sec	Logging	1 min	
Description: Counts the number of expensive properties per second failed to read from any cache. Those properties will be require calculating.			
Public State Cache Misses / sec	Logging	1 min	
Description: Counts the number of entities per second where reading the public state from cache failed for at least one property, which requires calculating the value for those properties.			

Table 6.12: Test Environment: Health Monitoring Indicators for FACTON EPC Load

■ FACTON EPC Network Requests

Metric	Purpose	Sample Rate	Threshold
Active Persist Requests	Logging	1 min	-
Description: Counts the number of active Persist requests.			
Total AcquireLock (by Entity) Requests	Logging	1 min	
Description: Counts the total number of AcquireLock (by entity) requests.			
Total AcquireLocks (by Query) Requests	Logging	1 min	
Description: Counts the total number of AcquireLocks (by query) requests.			
Total AcquireLocks (by Spaces) Requests	Logging	1 min	-
Description: Counts the total number of AcquireLocks (by spaces) requests.			
Total GetCurrentVersion Requests	Logging	1 min	
Description: Counts the total number of GetCurrentVersion requests.			
Total GetDelta Requests	Logging	1 min	
Description: Counts the total number of GetDelta requests.			
Total GetEntities Requests	Logging	1 min	
Description: Counts the total number of GetEntities requests.			
Total GetIdsOfIncomingReferences (by ID) Requests	Logging	1 min	
Description: Counts the total number of GetIdsOfIncomingReferences (by id) requests.			
Total GetIdsOfIncomingReferences (by IDs) Requests	Logging	1 min	
Description: Counts the total number of GetIdsOfIncomingReferences (by ids) requests.			
Total GetPublicStates Requests	Logging	1 min	
Description: Counts the total number of GetPublicStates requests.			
Total GetPublicStatesToReplicateForIds Requests	Logging	1 min	
Description: Counts the total number of GetPublicStatesToReplicateForIds requests.			

Metric	Purpose	Sample Rate	Threshold
Total GetPublicStatesToReplicateForQuery Requests	Logging	1 min	
Description: Counts the total number of GetPublicStatesToReplicateForQuery requests.			
Total GetSpaceModifications Requests	Logging	1 min	
Description: Counts the total number of GetSpaceModifications requests.			
Total GetState Requests	Logging	1 min	
Description: Counts the total number of GetState requests.			
Total GetStatesByIds Requests	Logging	1 min	
Description: Counts the total number of GetStatesByIds requests.			
Total GetStatesToReplicateForIds Requests	Logging	1 min	
Description: Counts the total number of GetStatesToReplicateForIds requests.			
Total GetStatesToReplicateForQuery Requests	Logging	1 min	
Description: Counts the total number of GetStatesToReplicateForQuery requests.			
Total GetVersionInformation Requests	Logging	1 min	
Description: Counts the total number of GetVersionInformation requests.			
Total HasUserLocks Requests	Logging	1 min	
Description: Counts the total number of HasUserLocks requests.			
Total Persist Requests	Logging	1 min	
Description: Counts the total number of Persist requests.			
Total ReleaseAllLocksExcept (by Entities and Spaces) Requests	Logging	1 min	
Description: Counts the total number of ReleaseAllLocksExcept (by entities and spaces) requests.			
Total ReleaseAllLocksExcept (by Entities) Requests	Logging	1 min	
Description: Counts the total number of ReleaseAllLocksExcept (by entities) requests.			

Metric	Purpose	Sample Rate	Threshold
Total ReleaseLocks (by Entities and Spaces) Requests	Logging	1 min	
Description: Counts the total number of ReleaseLocks (by entities and spaces) requests.			
Total ReleaseLocks (by Entities) Requests	Logging	1 min	
Description: Counts the total number of ReleaseLocks (by entities) requests.			
Total RevokeUserLocks Requests	Logging	1 min	
Description: Counts the total number of RevokeUserLocks requests.			
Total SystemInformation Requests	Logging	1 min	
Description: Counts the total number of SystemInformation requests.			
Total TryGetState Requests	Logging	1 min	
Description: Counts the total number of TryGetState requests.			

Table 6.13: Test Environment: Health Monitoring Indicators for FACTON EPC Network Requests

■ HTTP Service URL Groups

Metric	Purpose	Sample Rate	Threshold
AllRequests	Logging	1 min	-
Description: Total number of HTTP requests made for this site			
BytesReceivedRate	Logging	1 min	
Description: Rate of received data by HTTP service for this site			
BytesSentRate	Logging	1 min	
Description: Rate of sending data by HTTP service for this site			
CurrentConnections	Logging	1 min	-
Description: Number of current connections established for this site			

Table 6.14: Test Environment: Health Monitoring Indicators for HTTP Service URL Groups

■ Memory

Metric	Purpose	Sample Rate	Threshold
% Committed Bytes In Use	Logging	1 min	
<p>Description: System Counter: % Committed Bytes In Use is the ratio of Memory\Committed Bytes to the Memory\Commit Limit. Committed memory is the physical memory in use for which space has been reserved in the paging file should it need to be written to disk. The commit limit is determined by the size of the paging file. If the paging file is enlarged, the commit limit increases, and the ratio is reduced). This counter displays the current percentage value only; it is not an average.</p>			
Committed Bytes	Logging	1 min	
<p>Description: System Counter: Committed Bytes is the amount of committed virtual memory, in bytes. Committed memory is the physical memory which has space reserved on the disk paging file(s). There can be one or more paging files on each physical drive. This counter displays the last observed value only; it is not an average.</p>			

Table 6.15: Test Environment: Health Monitoring Indicators for Memory

■ Network Interface

Metric	Purpose	Sample Rate	Threshold
Bytes Received/sec	Logging	1 min	
<p>Description: Bytes Received/sec is the rate at which bytes are received over each network adapter, including framing characters. Network Interface\Bytes Received/sec is a subset of Network Interface\Bytes Total/sec.</p>			
Bytes Sent/sec	Logging	1 min	
<p>Description: Bytes Sent/sec is the rate at which bytes are sent over each network adapter, including framing characters. Network Interface\Bytes Sent/sec is a subset of Network Interface\Bytes Total/sec.</p>			
Bytes Total/sec	Logging	1 min	
<p>Description: Bytes Total/sec is the rate at which bytes are sent and received over each network adapter, including framing characters. Network Interface\Bytes Total/sec is a sum of Network Interface\Bytes Received/sec and Network Interface\Bytes Sent/sec.</p>			

Table 6.16: Test Environment: Health Monitoring Indicators for Network Interface

■ PhysicalDisk

Instance: _Total

Metric	Purpose	Sample Rate	Threshold
% Idle Time	Logging	1 min	
Description: % Idle Time reports the percentage of time during the sample interval that the disk was idle.			
Avg. Disk sec/Transfer	Logging	1 min	
Description: Avg. Disk sec/Transfer is the time, in seconds, of the average disk transfer.			
Disk Bytes/sec	Logging	1 min	
Description: Disk Bytes/sec is the rate bytes are transferred to or from the disk during write or read operations.			
Disk Read Bytes/sec	Logging	1 min	
Description: Disk Read Bytes/sec is the rate at which bytes are transferred from the disk during read operations.			
Disk Write Bytes/sec	Logging	1 min	
Description: Disk Write Bytes/sec is rate at which bytes are transferred to the disk during write operations.			

Table 6.17: Test Environment: Health Monitoring Indicators for PhysicalDisk

■ Process

Instance: _Total

Metric	Purpose	Sample Rate	Threshold
Working Set	Logging	1 min	
Description: Working Set is the current size, in bytes, of the Working Set of this process. The Working Set is the set of memory pages touched recently by the threads in the process. If free memory in the computer is above a threshold, pages are left in the Working Set of a process even if they are not in use. When free memory falls below a threshold, pages are trimmed from Working Sets. If they are needed they will then be soft-faulted back into the Working Set before leaving main memory.			

Table 6.18: Test Environment: Health Monitoring Indicators for Process

■ Process

Instance: Facton.Infrastructure.Distribution.ServerHosts.WcfWindowsService

Metric	Purpose	Sample Rate	Threshold
IO Read Bytes/sec	Logging	1 min	
Description: The rate at which the process is reading bytes from I/O operations. This counter counts all I/O activity generated by the process to include file, network and device I/Os.			
IO Write Bytes/sec	Logging	1 min	
Description: The rate at which the process is writing bytes to I/O operations. This counter counts all I/O activity generated by the process to include file, network and device I/Os.			

Table 6.19: Test Environment: Health Monitoring Indicators for Process Facton.Infrastructure.Distribution.ServerHosts.WcfWindowsService

■ System

Metric	Purpose	Sample Rate	Threshold
Processor Queue Length	Logging	1 min	
Description: Processor Queue Length is the number of threads in the processor queue. Unlike the disk counters, this counter shows ready threads only, not threads that are running. There is a single queue for processor time even on computers with multiple processors. Therefore, if a computer has multiple processors, you need to divide this value by the number of processors servicing the workload. A sustained processor queue of less than 10 threads per processor is normally acceptable, dependent of the workload.			

Table 6.20: Test Environment: Health Monitoring Indicators for Network Interface

6.2. SQL SERVER MONITORING

The health of the SQL server can be monitored by performance counters as well.

Category	Metric	Purpose	Sample Rate	Threshold
LocalDisk	% Idle Time	Logging	1 min	Should be nearly at 100% on a system under normal load.
Description: This counter provides a very precise measurement of how much time the disk remained in idle state, meaning all the requests from the operating system to the disk have been completed and there is zero pending requests.				

Category	Metric	Purpose	Sample Rate	Threshold
SQL server: SQL Statistics	Batches per Second	Logging	1 min	
Description: Number of batch requests received per second, and is a good general indicator for the activity level of the SQL server.				

Table 6.1: Health Monitoring Indicators and Counters for Logging for the SQL Server in a production environment and test environment

6.3. EVENT LOG


FACTON delivers log information for operational monitoring and error tracking. The way errors and events are logged differs between FACTON Client and FACTON Application Service.

6.3.1 Save Support Information

If the FACTON client was installed via Click-Once-Installation, events are logged in an XML log file.

If you wish to report a problem to FACTON EPC Support you will be asked to provide an event log file. Save this file and send it to: support@facton.com.

Save event log file

1. Start the FACTON Client.
2. Click on the **FILE** tab ► **Information**,  **Save Support Information**.
The »FACTON - Save Support Information« dialog opens.
3. Enter a file name and click **Save**.
The file is saved as a ZIP file.
4. Send the file to the FACTON Support Team.

6.3.2 FACTON Application Service

An overview of known messages is included in the attachment.



Note

If you find error messages which are not part of this list, please contact FACTON support (see [Support](#)).

Access Event Logs

The application service uses »Event Tracing for Windows« (ETW) technology for event logging. This is the standard logging and tracing system under Microsoft Windows.

The installation process of the application service registers five FACTON specific ETW providers under the FACTON category on the server system:

- Common
- Core
- Data
- Domain
- Entities

The installation of the FACTON Identity Broker register an additional ETW provider under Facton/Integration/IdentityBroker.

The installation of FACTON activates channels for important messages that are used for operational monitoring and error detection.

View Messages in the Event Viewer

1. Click on Windows **Start**.
2. Select **All Programs**.
3. Choose **Administrative Tools**.
4. Open **Event Viewer**.
5. Select **FACTON EPC** (see figure: »Event Viewer«).

Every ETW provider has an own folder (see figure: »Event Viewer«). Every message is sorted by the typical interest group (e.g. Admin).

These log messages are persistent but can be overwritten, if there are too many messages stored. The size of the message store can be separately configured for each leaf (lowest level of the menu tree).

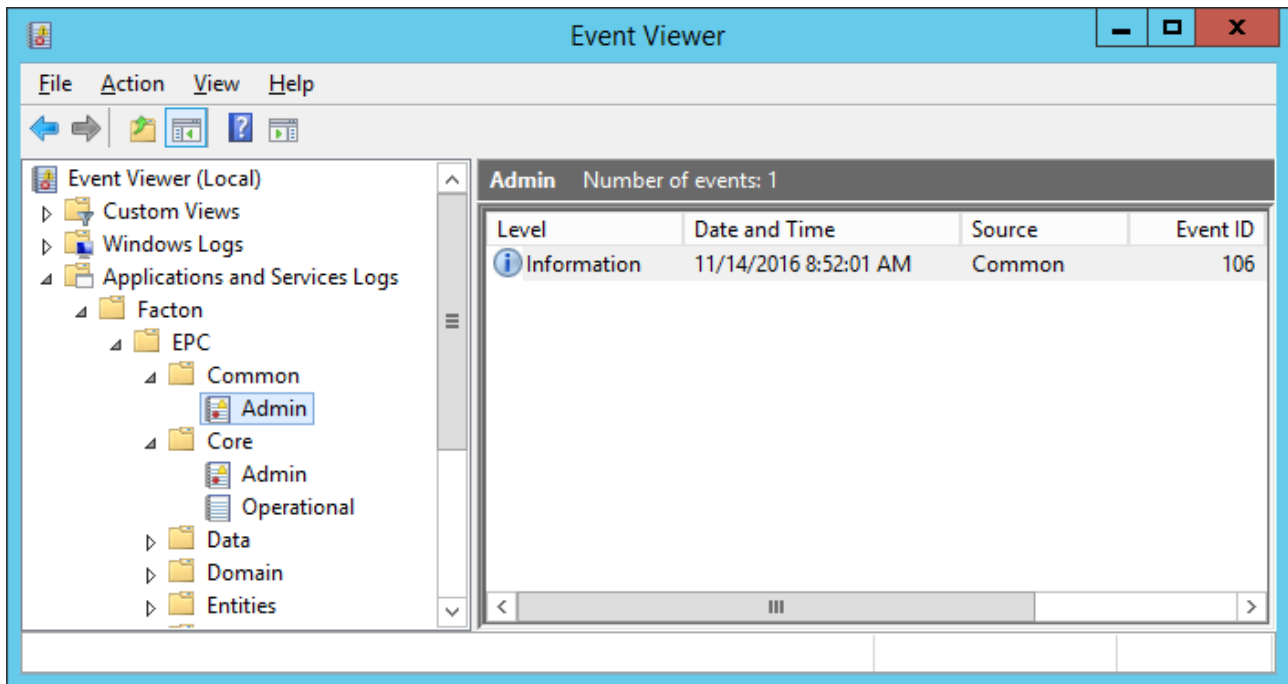


Figure 6.1: Event Viewer

 **Configuring Log Messages**

1. Right-click on a leaf.
2. Select **Log Properties**.
A new window opens, and shows the current log configuration (see figure: »Log Properties«).

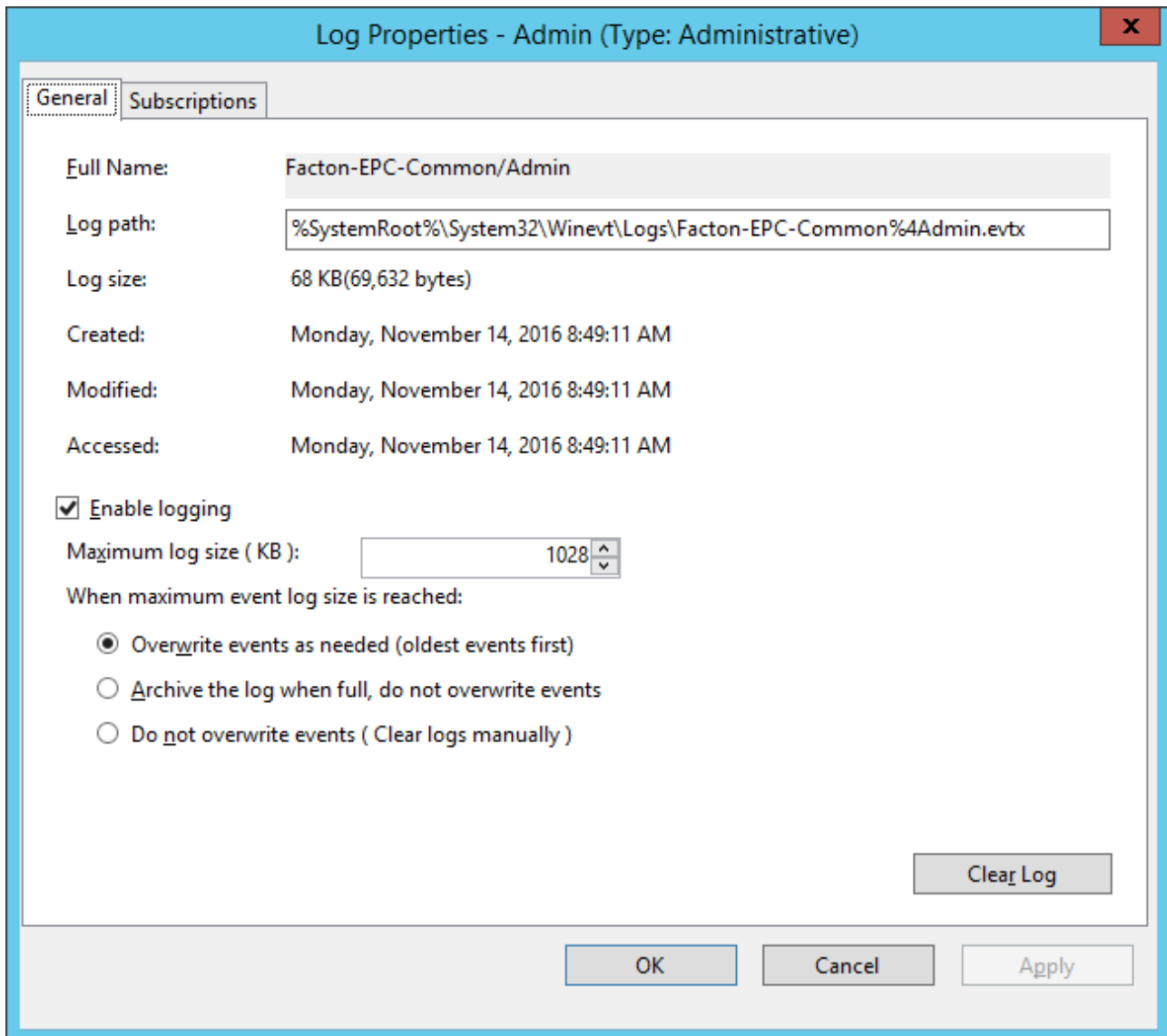


Figure 6.2: Log Properties

**Note**

More messages can be activated for debugging. Those detailed messages require knowledge of internal components. Pass log results to FACTON Support for further analysis.

Configuring Tasks for Certain Events

The »Event Tracing for Windows« infrastructure allows starting tasks on special events. A typical task could be sending an email when an error occurs. See an example of creating such tasks below.



Open the Task Scheduler

1. Click on Windows **Start**.
2. Select **All Programs**.
3. Choose **Administrative Tools**.
4. Open the **Task Scheduler**.
A new window showing the **Task Scheduler** opens.



Create a Task

1. In Task Scheduler, left-click on **Create Task**.
2. Enter a name and - if necessary - add a description (see figure: »[Create a New Task](#)«).
3. Switch between the tabs to set the following settings:
 1. Tab **General**: Check **Run whether user logged on or not** (see figure: »[Create a New Task](#)«).
 2. Tab **General**: Assign users or user groups to the task (depending on IT policy).
 3. Tab **Triggers**: Set trigger to **On an Event** and select **Custom Settings** (see figure: »[Define a Trigger](#)«).
 4. Tab **Triggers**: Click on **New Event Filter** and set the settings as in the figure »[Define a Custom Event Filter](#)«.
 5. Tab **Actions**: Click on **New** and define an action (see figure: »[Add an Action to the Event](#)«).
 6. Click **OK** to confirm. A new task is created.

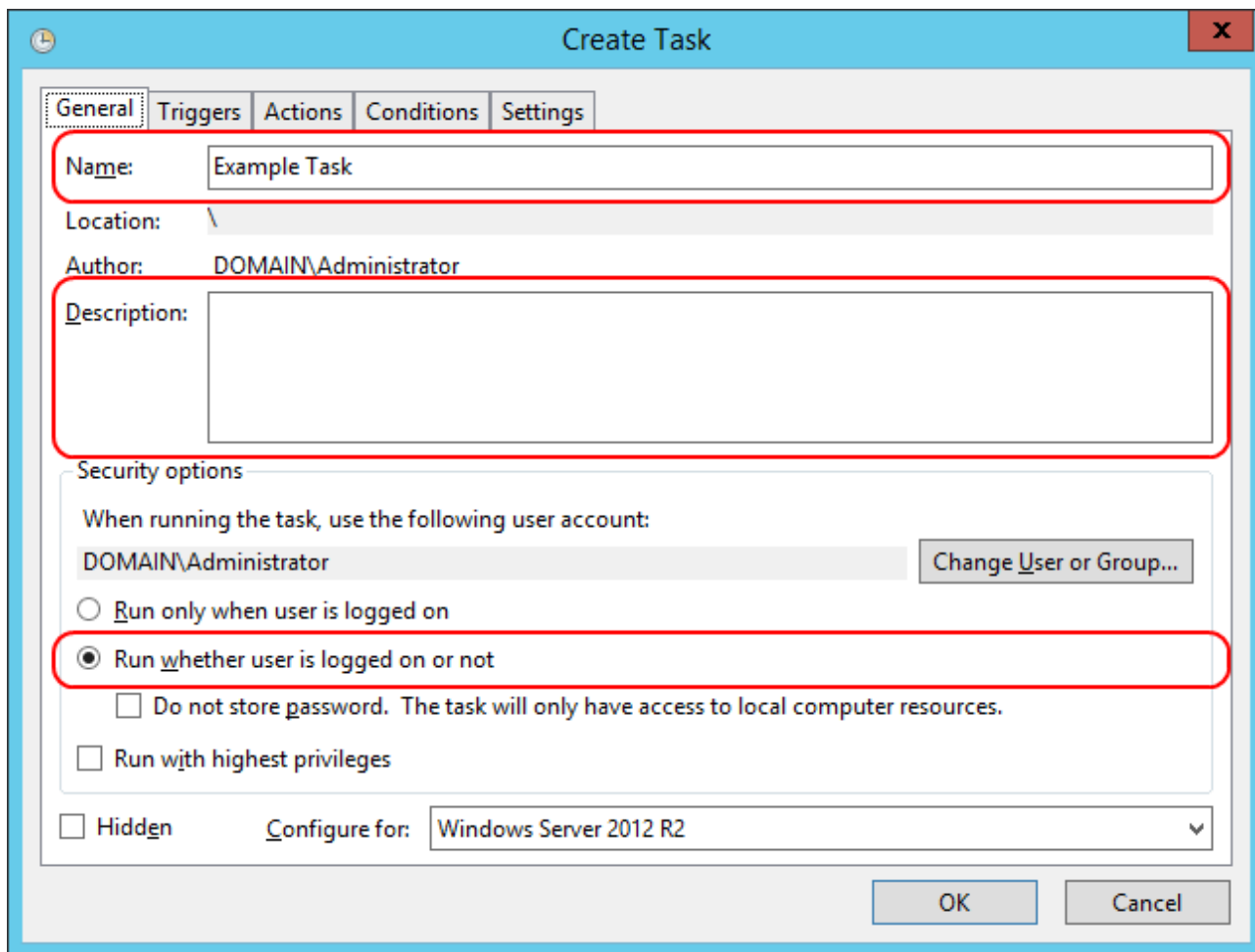


Figure 6.3: Create a New Task

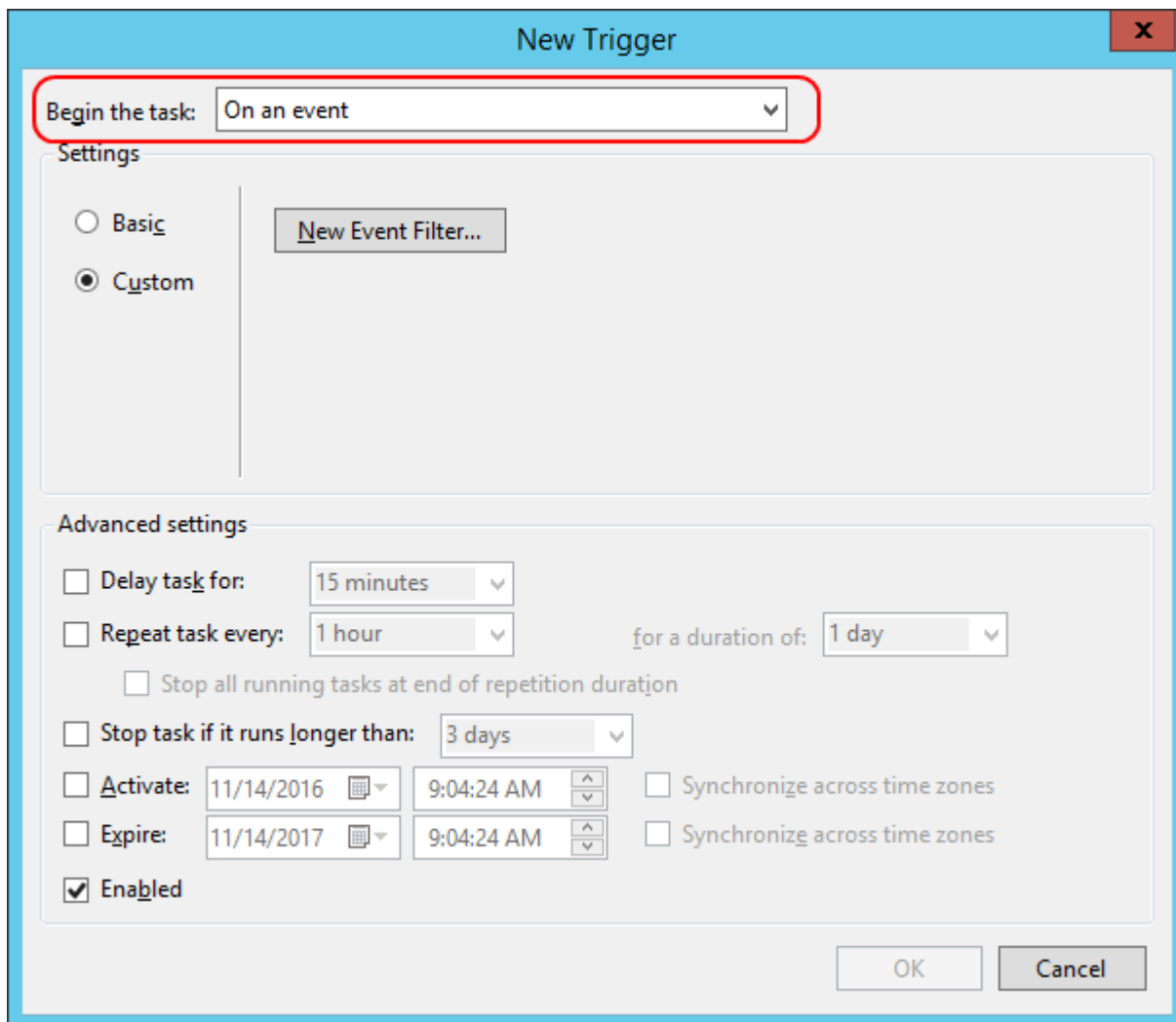


Figure 6.4: Define a Trigger

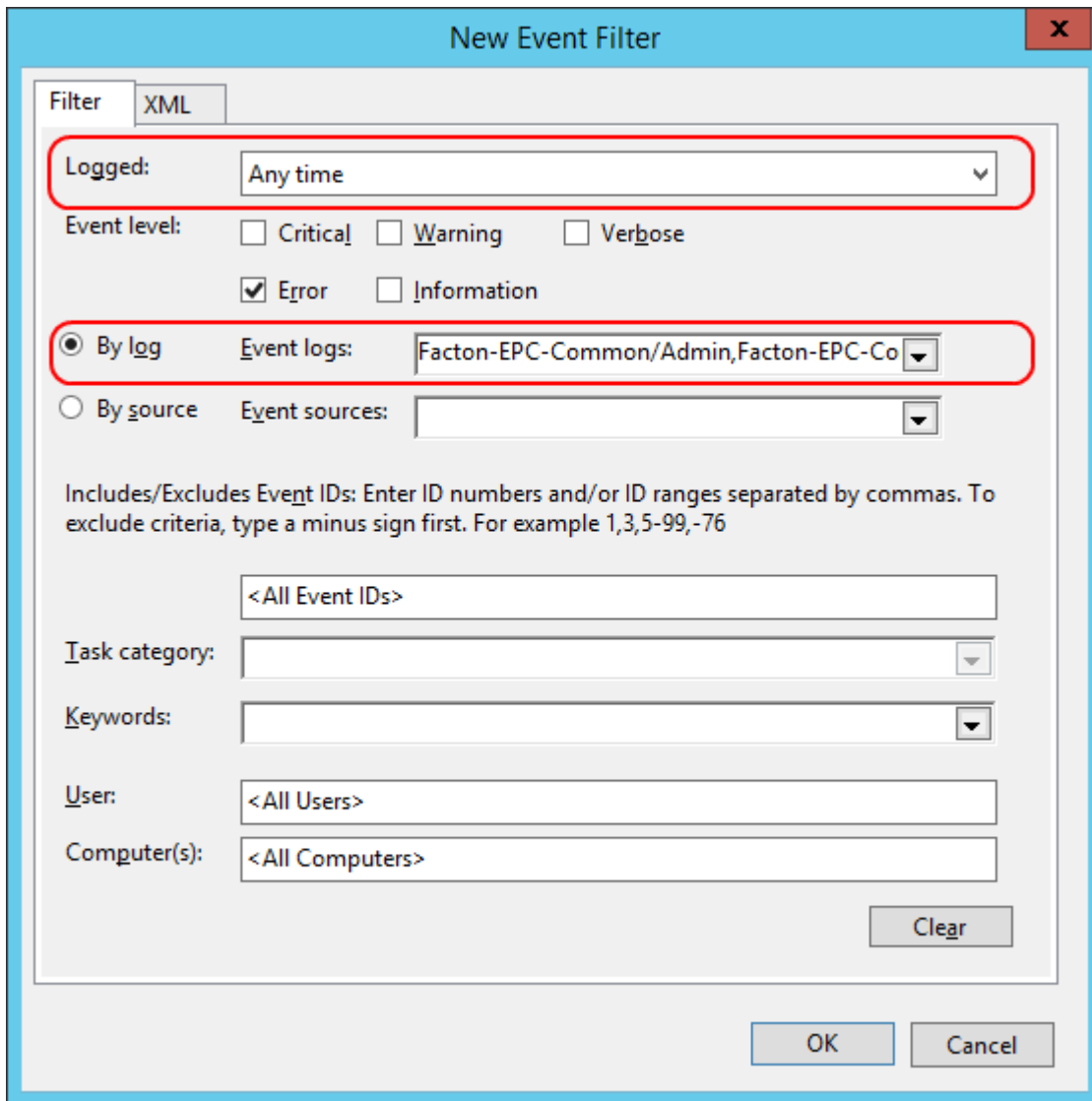


Figure 6.5: Define a Custom Event Filter

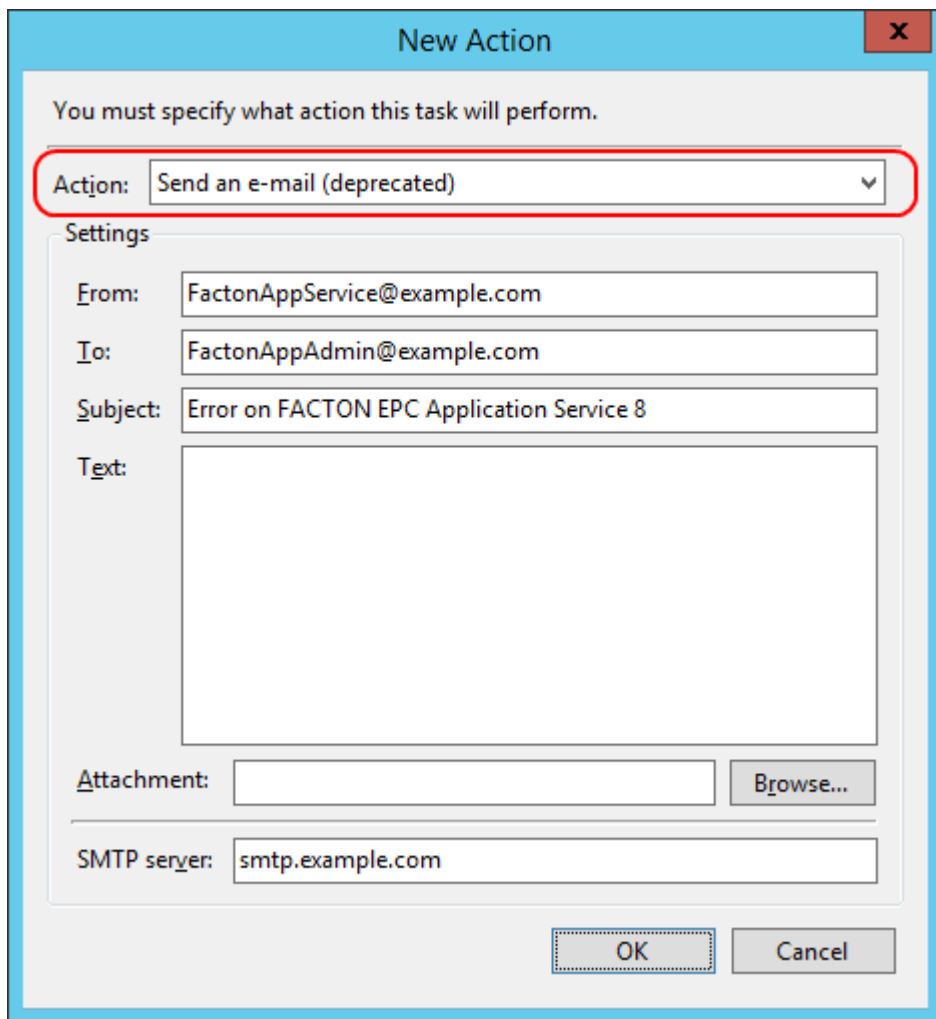


Figure 6.6: Add an Action to the Event

6.4. QUERY MONITORING

Use Data Collector Sets for monitoring queries over a defined period of time.

Create a Data Collector Set

1. Open the **Performance Monitor** via your Windows.
2. Expand the **Data Collector Sets** group.
3. Right-click on **User Defined** ► **New** ► **Data Collector Set**, to create a new »User Defined Set«.

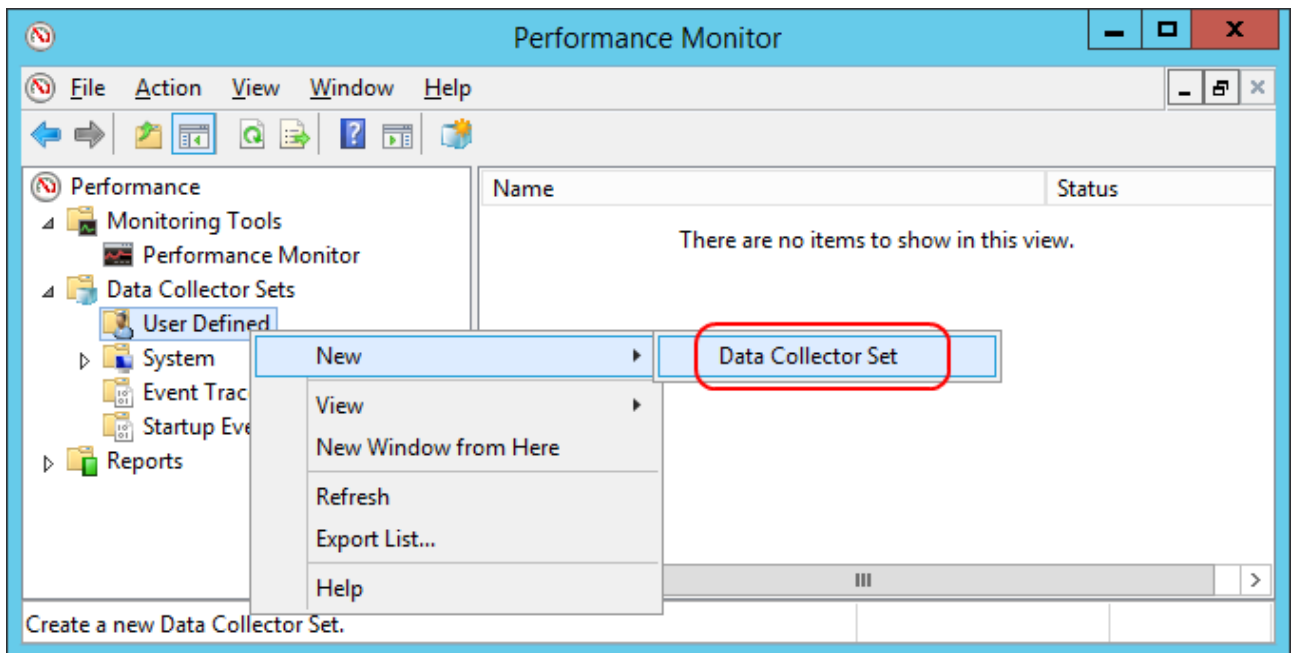


Figure 6.1: Creating a new Data Collector Set

4. Provide a name for the new Data Collector Set and choose the second option **Create manually (Advanced)**.
-

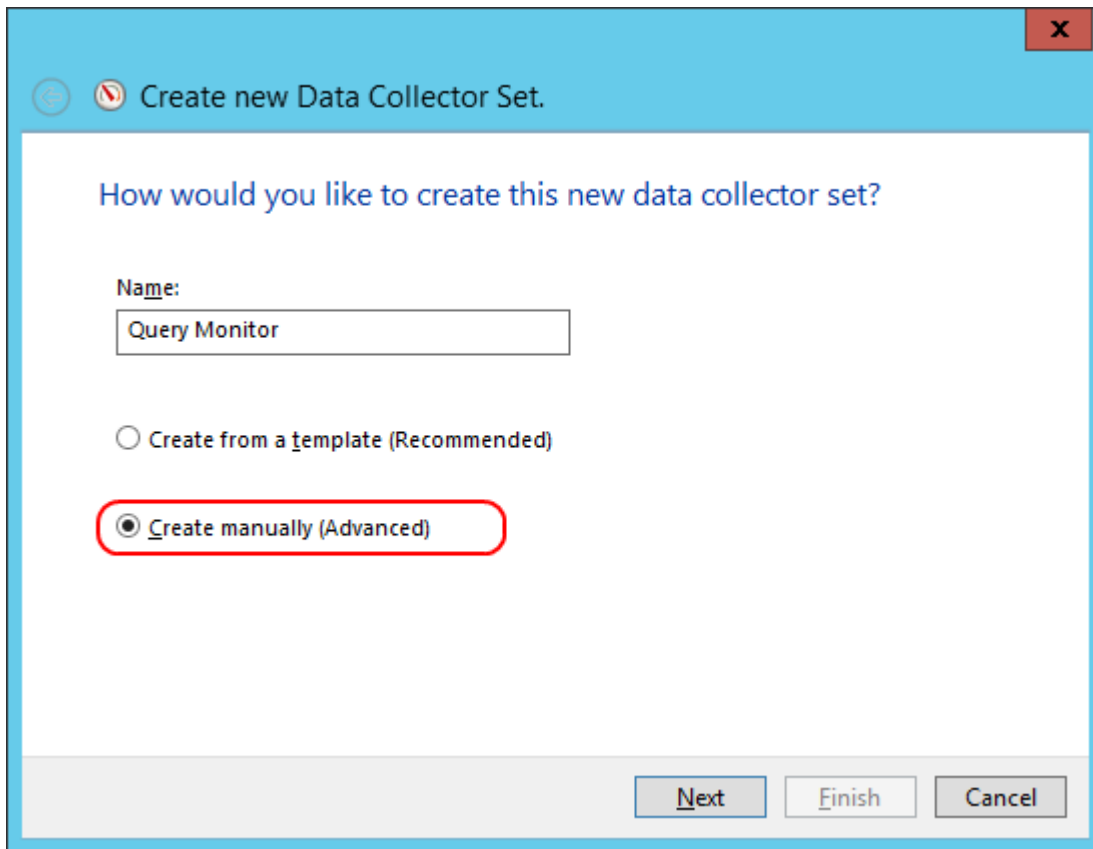


Figure 6.2: Data Collector Set creation options

 Configure the Data Collector Set

1. Click Next and select Create data logs and activate Event trace data.

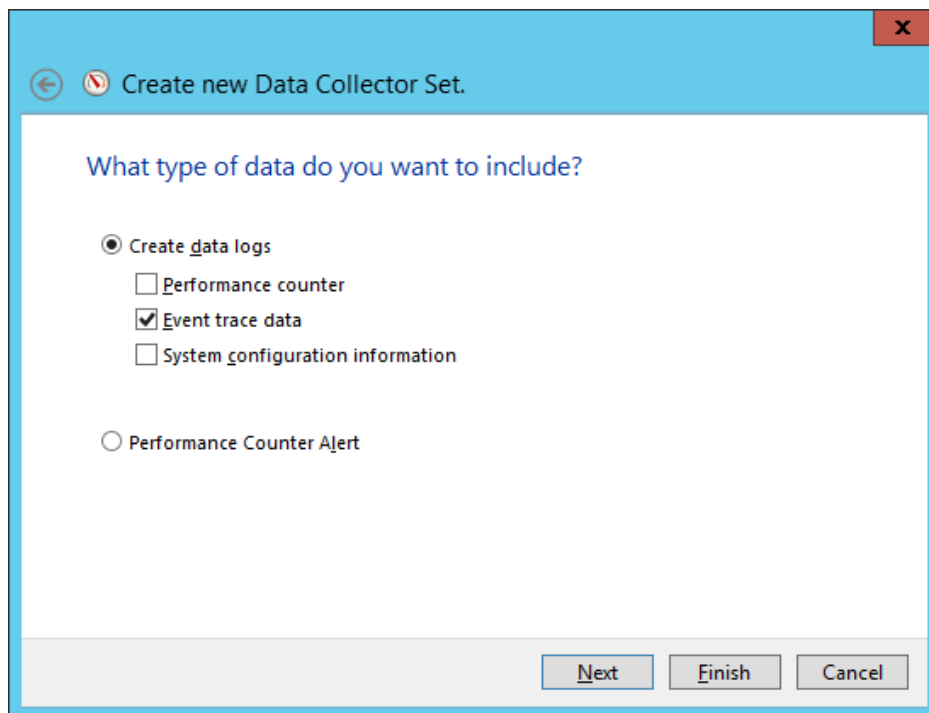


Figure 6.3: Data Collector Set with event trace data

- 2. Click on 'Add...!' to add a new »Event Trace Provider«.

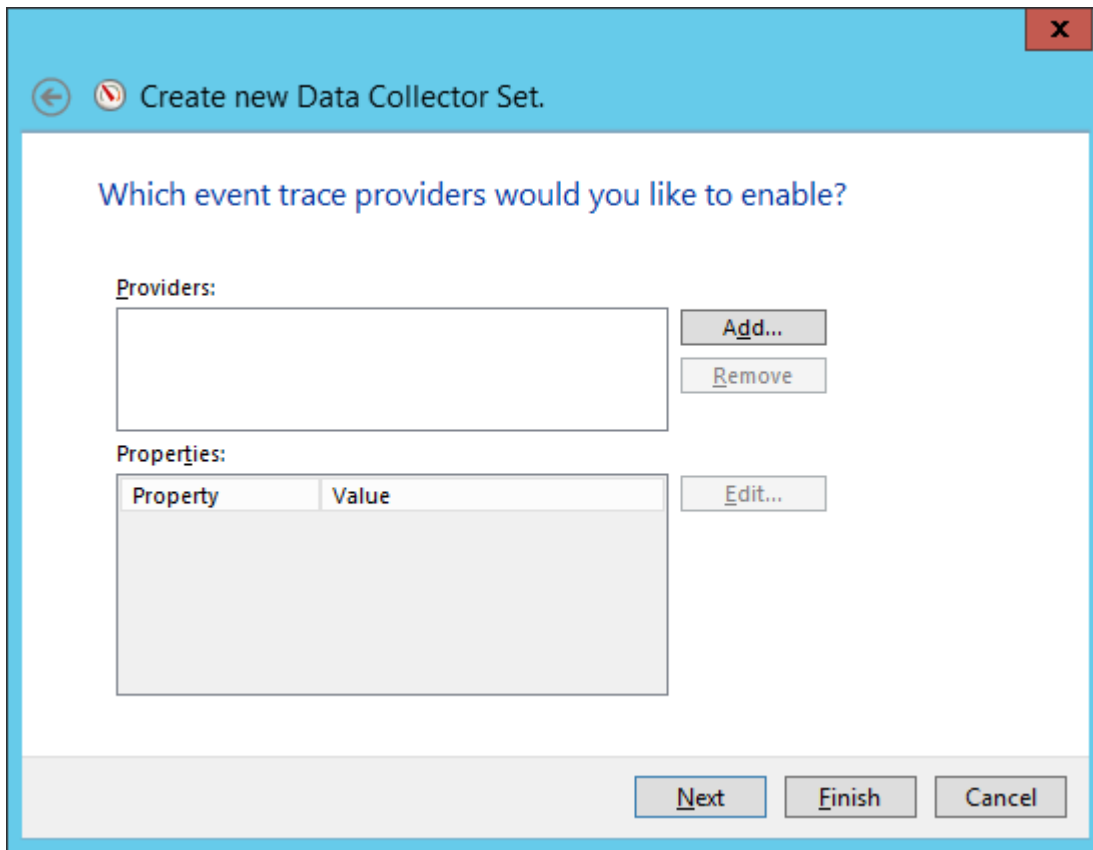


Figure 6.4: Monitored event trace providers

3. Select the Facton-EPC-Entities provider.

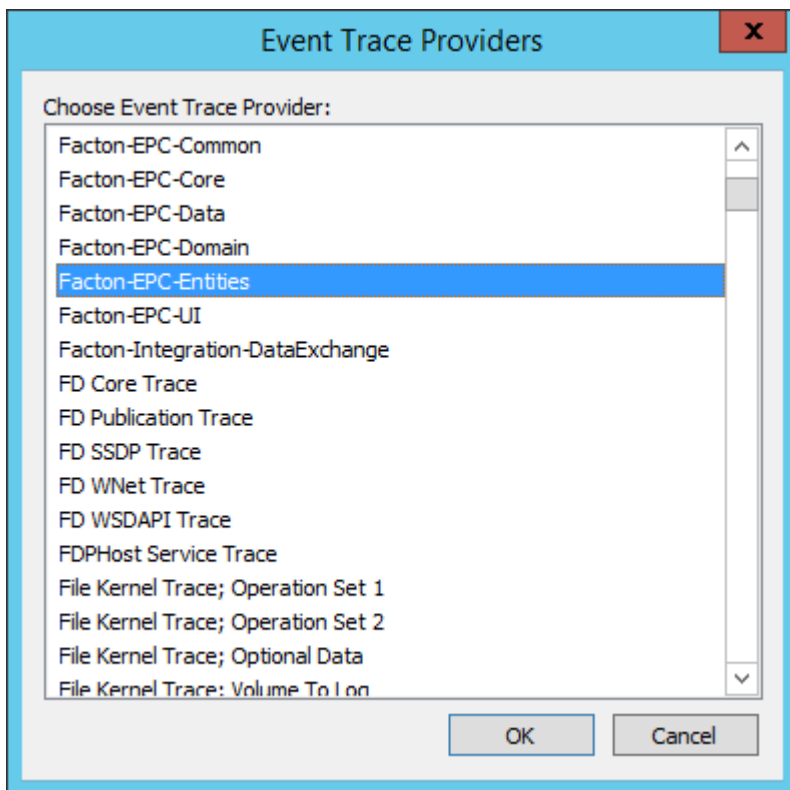


Figure 6.5: Event trace provider selection

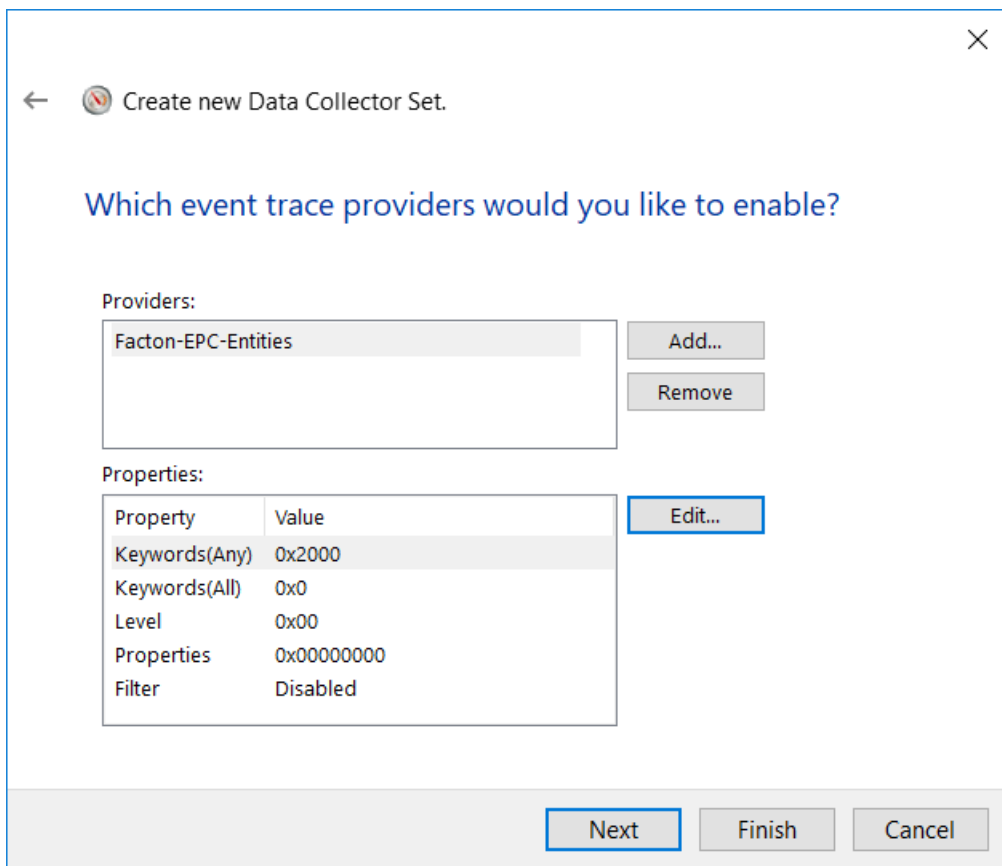


Figure 6.6: Monitored event trace provider II

- 4. Select a path to save the trace data.

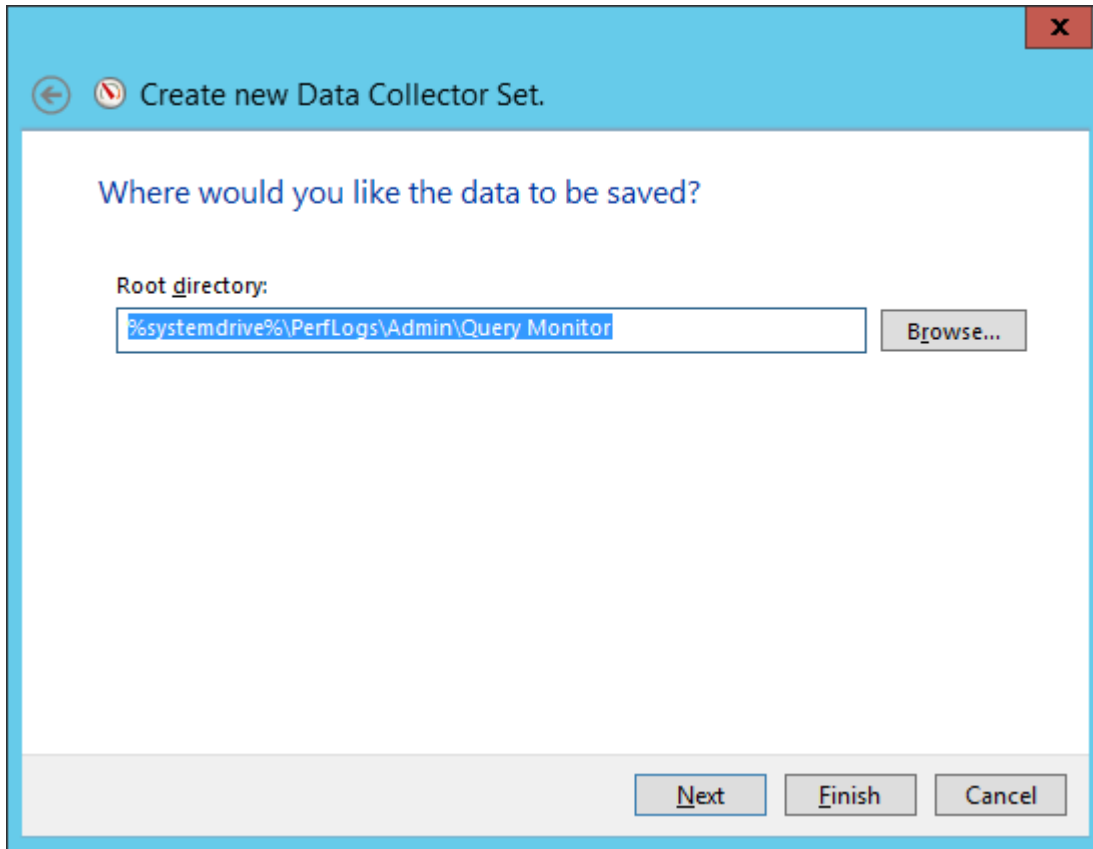


Figure 6.7: Data Collector Set store location

5. Run the Collector Set with default rights.

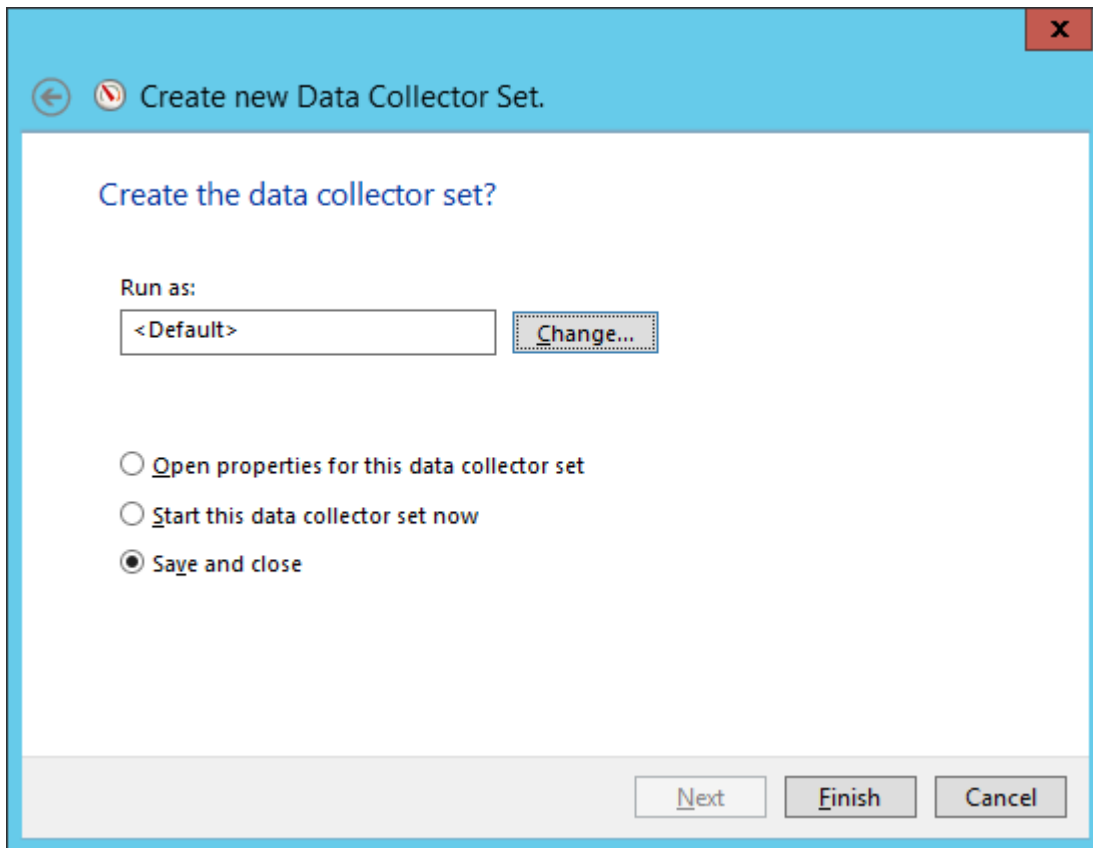


Figure 6.8: Finish Data Collector Set creation

Configure the Data Collector Set II

1. Open the Data Collector Properties from the set.

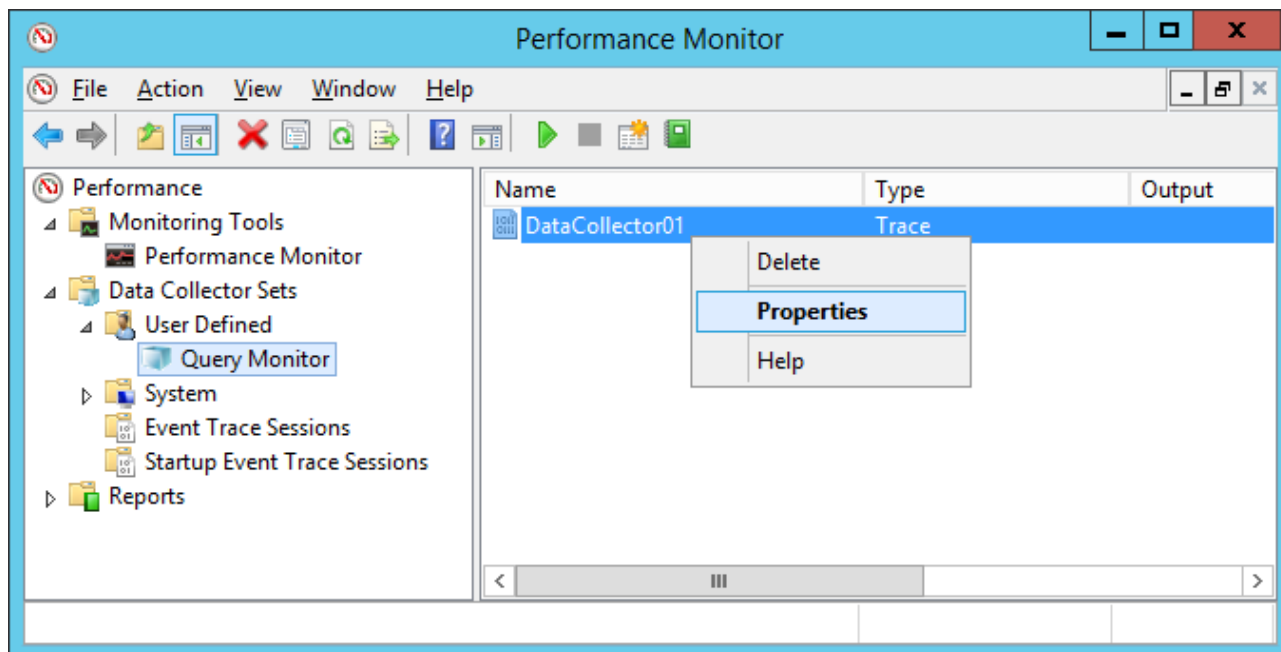


Figure 6.9: Open Data Collector properties

2. Switch to the **Trace Session** tab to change the settings for Clock type to 'System' and Stream mode to 'File and Real Time'.
-

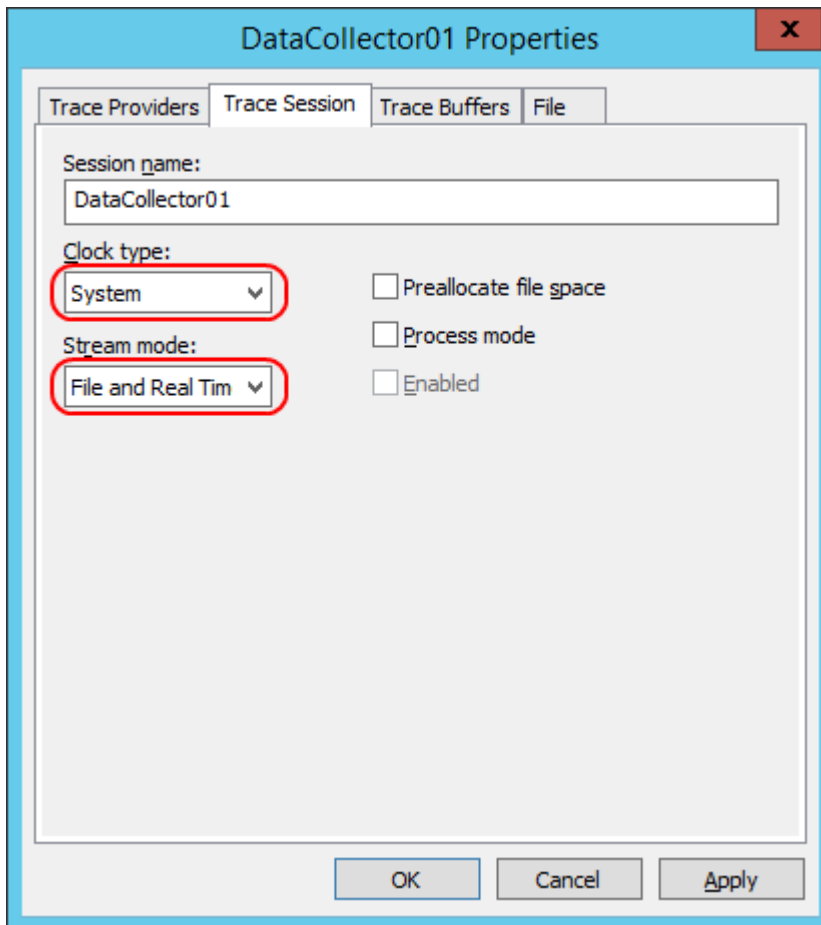


Figure 6.10: Data Collector trace session settings

3. Switch to the Trace Buffers tab.
 4. Set the Buffer size to 64KB.
-

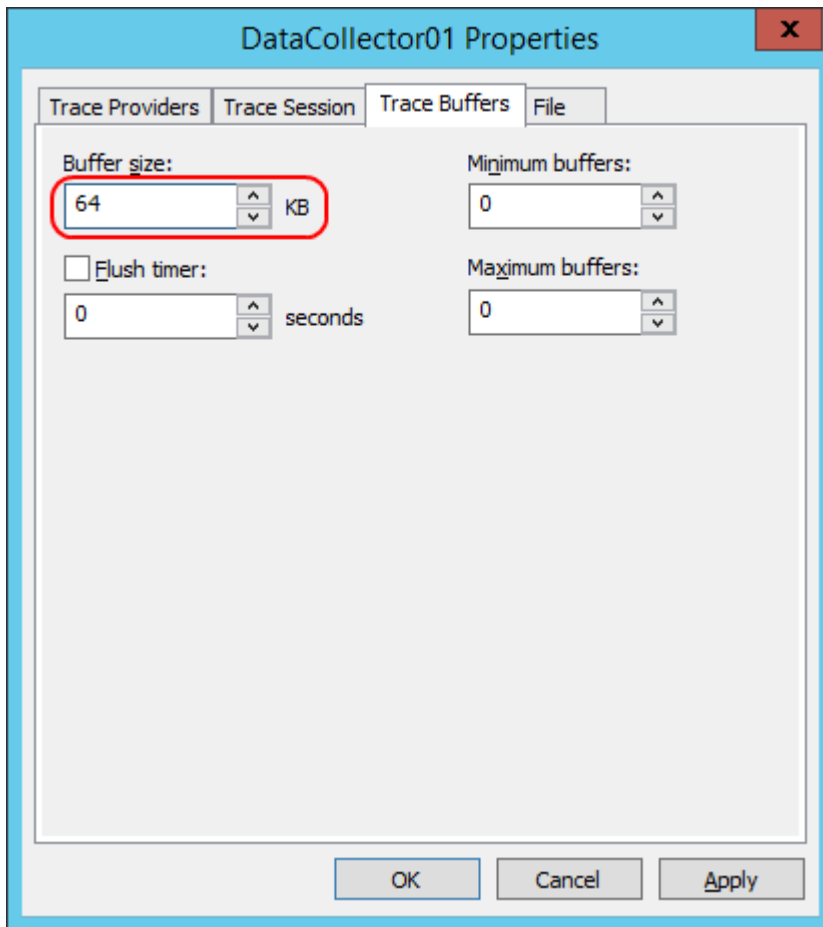


Figure 6.11: Data Collector trace buffers settings

The Data Collector Set is ready to use.

7. ATTACHMENTS

The tables and illustration below describes the schema of the FACTON database.

7.1. DATA DICTIONARY REPORT - TABLES

Schema	Table	Description
dbo	Blob	all blobs, for example attachments
dbo	DbVersion	version of the logical and physical structure of the database
dbo	EntityLock	locked entities for user
dbo	EntityReference	all references between entities
dbo	EntityType	mapping table to optimize database size
dbo	EntityVersion	the history of all entities including the specification of entities with the entity type (defined by infrastructure), signature (defined in Cost#) and space (master data, system or a calculation)
dbo	IdMapping	mapping table to optimize database size
dbo	MetadataItemIdMapping	mapping table to optimize database size
dbo	PrivateEntity	only used in the client, but available on the server in order to have an identical database scheme on client & server
dbo	PrivateEntityReference	only used in the client, but available on the server in order to have an identical database scheme on client & server

Schema	Table	Description
dbo	PrivateEntityVersion	only used in the client, but available on the server in order to have an identical database scheme on client & server
dbo	PrivatePropertyValue	only used in the client, but available on the server in order to have an identical database scheme on client & server
dbo	PropertyValue	all stored values for properties on entities
dbo	PublicStatePropertyValue	only used in the client, but available on the server in order to have an identical database scheme on client & server
dbo	PublicStateVersion	only used in the client, but available on the server in order to have an identical database scheme on client & server
dbo	ReplicationStatus	only used in the client, but available on the server in order to have an identical database scheme on client & server
dbo	SnapshotIndex	only used in the client, but available on the server in order to have an identical database scheme on client & server
dbo	SpaceIdMapping	mapping table to optimize database size
dbo	SpaceLock	completely locked calculations for user
dbo	SystemInformation	identifier to ensure clients work against the right server (database)
dbo	TransactionVersion	the highest version of all entities
dbo	Version	information about created versions like a timestamp and the user

Table 6.1: Data Dictionary Report Tables

7.2. DATA DICTIONARY REPORT - COLUMNS

Schema	Table	Number	Column	Data Type	Size	Nullable	IsPrimaryKey	IsForeignKey
dbo	Blob	1	Id	UniquelIdentifier	16	N	Y	N
dbo	Blob	2	Size	Int	4	N	N	N
dbo	Blob	3	Data	VarBinaryMax	-1	Y	N	N
dbo	Blob	4	CreateTime	DateTime	8	N	N	N
dbo	DbVersion	1	Version	BigInt	8	N	Y	N
dbo	EntityLock	1	EntityId	BigInt	8	N	Y	Y
dbo	EntityLock	2	SpaceId	Int	4	N	N	Y
dbo	EntityLock	3	UserId	UniquelIdentifier	16	N	N	N
dbo	EntityLock	4	LockTime	DateTime	8	N	N	N
dbo	EntityLock	5	IsCompleteSpace	Bit	1	N	N	Y
dbo	EntityReference	1	ParentVersion	BigInt	8	N	Y	Y
dbo	EntityReference	3	ParentId	BigInt	8	N	Y	Y
dbo	EntityReference	4	ChildId	BigInt	8	N	Y	Y

Schema	Table	Number	Column	Data Type	Size	Nullable	IsPrimaryKey	IsForeignKey
dbo	EntityReference	5	Version	BigInt	8	N	N	N
dbo	EntityReference	6	SameSpace	Bit	1	N	N	N
dbo	EntityReference	7	GroupId	VarChar (60)	60	N	Y	N
dbo	EntityReference	8	Position	Int	4	N	N	N
dbo	EntityTypeMapping	1	StoreId	SmallInt	2	N	Y	N
dbo	EntityTypeMapping	2	ConceptualType	VarChar (900)	900	N	N	N
dbo	EntityVersion	1	Version	BigInt	8	N	Y	Y
dbo	EntityVersion	2	Id	BigInt	8	N	Y	Y
dbo	EntityVersion	3	EntityType	SmallInt	2	N	N	Y
dbo	EntityVersion	4	SignatureId	SmallInt	2	N	N	Y
dbo	EntityVersion	5	SpaceId	Int	4	N	N	Y
dbo	EntityVersion	6	Deleted	Bit	1	N	N	N
dbo	IdMapping	1	StoreId	BigInt	8	N	Y	N
dbo	IdMapping	2	ConceptualId	VarChar (4000)	4000	N	N	N

Schema	Table	Number	Column	Data Type	Size	Nullable	IsPrimaryKey	IsForeignKey
dbo	IdMapping	3	ConceptualIdHash	Char (12)	12	Y	N	N
dbo	MetadataItemIdMapping	1	StoreId	SmallInt	2	N	Y	N
dbo	MetadataItemIdMapping	2	ConceptualId	UniqueIdentifier	16	N	N	N
dbo	PrivateEntity	1	Id	BigInt	8	N	Y	Y
dbo	PrivateEntity	2	EntityType	SmallInt	2	N	N	Y
dbo	PrivateEntity	3	SignatureId	SmallInt	2	N	N	Y
dbo	PrivateEntity	4	SpaceId	Int	4	N	N	Y
dbo	PrivateEntityReference	1	SourceId	BigInt	8	N	Y	Y
dbo	PrivateEntityReference	2	TargetId	BigInt	8	N	Y	Y
dbo	PrivateEntityReference	4	Version	BigInt	8	N	N	N
dbo	PrivateEntityReference	5	GroupId	VarChar (60)	60	N	Y	N
dbo	PrivateEntityReference	6	Position	Int	4	N	N	N
dbo	PrivateEntityVersion	1	Id	BigInt	8	N	Y	Y
dbo	PrivateEntityVersion	2	Version	BigInt	8	N	N	N

Schema	Table	Number	Column	Data Type	Size	Nullable	IsPrimaryKey	IsForeignKey
dbo	PrivateEntityVersion	9	FirstVersion	BigInt	8	N	N	N
dbo	PrivateEntityVersion	10	Deleted	Bit	1	N	N	N
dbo	PrivateEntityVersion	11	PublishingPending	Bit	1	N	N	N
dbo	PrivatePropertyValue	1	Id	UniquelIdentifier	16	N	Y	N
dbo	PrivatePropertyValue	2	EntityId	BigInt	8	N	Y	Y
dbo	PrivatePropertyValue	3	Value	NVarCharMax	-1	N	N	N
dbo	PropertyValue	1	Id	UniquelIdentifier	16	N	Y	N
dbo	PropertyValue	2	EntityVersion	BigInt	8	N	Y	Y
dbo	PropertyValue	3	Value	NVarCharMax	-1	N	N	N
dbo	PropertyValue	4	EntityId	BigInt	8	N	Y	Y
dbo	PublicStatePropertyValue	1	Id	UniquelIdentifier	16	N	Y	N
dbo	PublicStatePropertyValue	2	PublicStateId	BigInt	8	N	Y	Y
dbo	PublicStatePropertyValue	3	PublicStateVersion	BigInt	8	N	Y	Y
dbo	PublicStatePropertyValue	4	Value	NVarCharMax	-1	N	N	N

Schema	Table	Number	Column	Data Type	Size	Nullable	IsPrimaryKey	IsForeignKey
dbo	PublicStatePropertyValue	5	Attributes	Int	4	N	N	N
dbo	PublicStateVersion	1	Id	BigInt	8	N	Y	Y
dbo	PublicStateVersion	2	Version	BigInt	8	N	Y	N
dbo	PublicStateVersion	3	Snapshot	BigInt	8	N	N	N
dbo	PublishingTicket	1	Id	BigInt	8	N	Y	N
dbo	PublishingTicket	2	HostName	NVarChar (256)	256	N	N	N
dbo	PublishingTicket	3	UserName	NVarChar (100)	100	N	N	N
dbo	PublishingTicket	4	CreateTime	DateTime	8	N	N	N
dbo	PublishingTicket	5	LastHeartbeat	DateTime	8	N	N	N
dbo	ReplicatedSnapshot	1	ReplicationStatusId	UniquelIdentifier	16	N	Y	Y
dbo	ReplicatedSnapshot	2	Snapshot	BigInt	8	N	Y	N
dbo	ReplicationStatus	1	Id	UniquelIdentifier	16	N	Y	N
dbo	ReplicationStatus	2	ReplicationSpecification	NVarCharMax	-1	N	N	N
dbo	SnapshotIndex	1	Id	BigInt	8	N	Y	Y

Schema	Table	Number	Column	Data Type	Size	Nullable	IsPrimaryKey	IsForeignKey
dbo	SnapshotIndex	2	Version	BigInt	8	N	Y	Y
dbo	SnapshotIndex	3	Snapshot	BigInt	8	N	N	N
dbo	SpaceIdMapping	1	StoreId	Int	4	N	Y	N
dbo	SpaceIdMapping	2	ConceptualId	UniquelIdentifier	16	N	N	N
dbo	SpaceLock	1	SpaceId	Int	4	N	Y	Y
dbo	SpaceLock	2	UserId	UniquelIdentifier	16	N	N	N
dbo	SpaceLock	3	LockTime	DateTime	8	N	N	N
dbo	SpaceLock	4	IsCompleteSpace	Bit	1	N	Y	N
dbo	SystemInformation	1	Id	NVarChar (200)	200	N	Y	N
dbo	SystemInformation	2	Value	NVarChar (4000)	4000	N	N	N
dbo	TransactionVersion	1	Name	NVarChar (10)	10	N	Y	N
dbo	TransactionVersion	2	Version	BigInt	8	N	N	N
dbo	Version	1	VersionNumber	BigInt	8	N	Y	N
dbo	Version	2	CreateTime	DateTime	8	N	N	N

Schema	Table	Number	Column	Data Type	Size	Nullable	IsPrimaryKey	IsForeignKey
dbo	Version	3	CreatorId	UniqueIdentifier	16	N	N	N
dbo	Version	4	CreatorName	NVarChar (100)	100	N	N	N

Table 6.2: Data Dictionary Report Columns

7.3. DATA DICTIONARY REPORT - DATABASE DIAGRAM

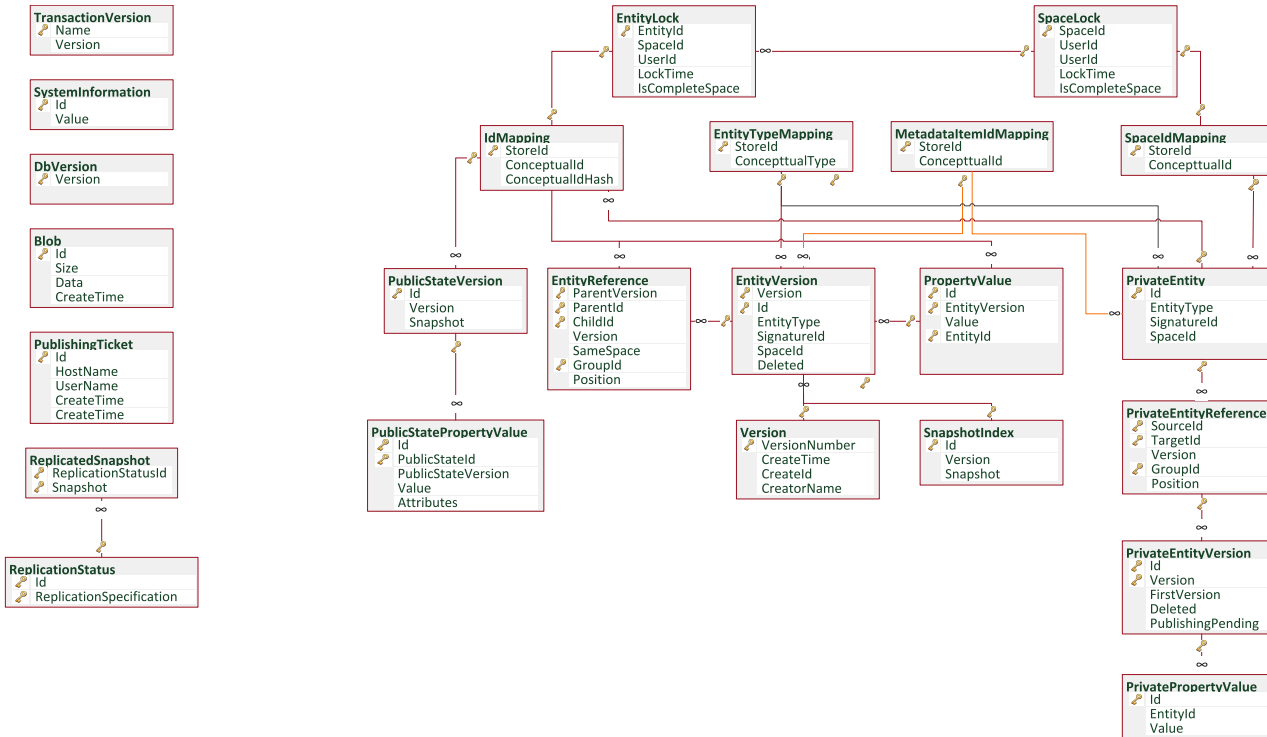


Figure 6.3: Database Diagram

7.4. FACTON EVENT LOGS

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
Facton-EPC-Common/Admin	Common	Error	31	AdminError	Could not publish Cost# sharp entity. [DETAILED INFORMATION]	Fix the issue shown in the detailed information of the message.
Facton-EPC-Common/Admin	Common	Error	31	AdminError	Asynchronously trying to get columns threw exception. - [EXCEPTION]	Can occur during the start of the application service but not during normal operation of the application server, contact your FACTON support in this case.
Facton-EPC-Common/Admin	Common	Error	31	AdminError	An Exception occurred while trying to read from persistence. - [EXCEPTION]	Check your file system or access rights.
Facton-EPC-Common/Admin	Common	Error	31	AdminError	Could not persist Cost# entity. - [EXCEPTION]	Check availability of application services and database.

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
acton-EPC-Common/Admin	Common	Warning	32	AdminWarning	A configuration was registered already!	Please contact the FACTON support.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Initial retry delay cannot be greater than total retry delay. Default values will be used. Initial: ...; Total:...	Check and fix your issues in the SystemSettings.ini file.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Caught exception while executing action. (Method ... declared in: ...) Retrying. Waiting ... ms. - [EXCEPTION]	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Caught exception while executing action. (Method ... declared in: ...) Retrying. - [EXCEPTION]	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Caught exception while executing action. (Method ... declared in: ...) Execution of action failed. - [EXCEPTION]	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Caught exception while executing action. (Method ... declared in: ...) Retrying. - [EXCEPTION]	Uncritical warning - no action required.

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	There was an error executing the optimized algorithm to recycle delegation entities. The user to set the delegate for: ... The delegates to set: ...	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Could not check out Cost# entity.	The Cost# template is still checked out by another user. Wait until the other user has checked in.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Errors in Cost# entity to activate: ...	Check and fix the Cost# template.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Could not compile predicate part of rule. Errors: ...	Can be fixed by correcting or removing the query.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Could not compile validation query for rule. Errors: ...	Can be fixed by correcting or removing the query.
Facton-EPC-	Common	Warning	32	AdminWarning	Could not find a rule factory for line: ...	Remove the integrity

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
Common/Admin						rule causing the issue.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Expecting 2 amounts of generation numbers instead of ... Using default.	Check and fix your issues in the SystemSettings.ini file.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Wrong number of thresholds given. Using default.	Check and fix your issues in the SystemSettings.ini file.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	A replace operation on a filtered list is not properly supported.	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	A move operation on a filtered list is not properly supported.	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	A replace operation on a sorted list is not properly supported.	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	A move operation on a sorted list is not supported.	Uncritical warning - no action required.
Facton-EPC-	Common	Warning	32	AdminWarning	Binding was no WSHttpBindingBase as expected.	Might be temporary

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
Common/Admin					ted.	or can be fixed by checking the client/server communication configuration.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	There was an error sending a message. The error involves tokens. The server may not have accepted the public key thumbprint.	Might be temporary or can be fixed by checking the client/server communication configuration.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	The maximum number of communication retrys has been reached.	Might be temporary or can be fixed by checking the client/server communication configuration.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	An exception occurred while executing a request. - [EXCEPTION]	Might be temporary

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
						or can be fixed by checking the client/server communication configuration.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Possible HTTP Proxy Exception that did not have an HttpWebResponse as response. - [EXCEPTION]	Might be temporary or can be fixed by checking the client/server communication configuration.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	No basic proxy authentication credentials given by the user.	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Trying to set default proxy credentials that are already set.	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	SingleOrDefault used in GetParentCollection() for entity: ... (...).	Uncritical warning - no action required.
Facton-EPC-	Common	Warning	32	AdminWarning	Found duplicate entities from Entity Store in	Uncritical warning -

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
Common/Admin					partition ..., snapshot ... with ids ;...	no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Shutting down. Now.	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Shutting down on error. ExitCode: ...	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Converting '... ...' failed, because an attempt was made to divide by zero.	Contact your Master Data Configurator to fix the exchange rate definition.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Converting '... ...' to '...' failed, because of: ...	No further action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	TransactionalPersist failed. Retrying the current persist operation.	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Unexpected current version after save: NextVersion: ... ActualNextVersion: ...	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Concurrent transaction detected: Actual transaction number is Last committed trans-	Uncritical warning - no action required.

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
					action number is	
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Publishing failed. There are too many parallel transactions. ErrorCode: MaxCon-currentPublishingOperationsExceeded	If this message occurs frequently this indicates there is a high publishing rate. Please check whether this is expected or whether the configured maximum count of parallel publishing operations is correct.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Publishing failed. There are too many parallel transactions. ErrorCode: InitialValidationTimeout	If this message occurs frequently this indicates there is a high publishing rate. Please check whether this is expected or whether the con-

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
						figured initial validation timeout is correct.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Publishing failed. There are too many parallel transactions. ErrorCode: MaxRetriesReached	This message indicates database connection problems or a timed out publishing ticket. Please check whether the FACTON-Server has connection to the database or whether the configured publishing ticket settings are correct.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Check privileges failed: [DETAILED INFORMATION]	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	PersistChanges was called with no changed targets to persist.	Uncritical warning - no action required.

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	There was a problem converting the group: ... to an NTAccount.	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Could not add claims to role. Role ... is not a predefined role.	Can be fixed by correcting the role assignments text.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	No log on permission found.	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Could not read settings file: ... Reason: [EXCEPTION]	Check file system or access rights.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Could not write file or create directory for: ... Exception: [EXCEPTION]	Check file system or access rights.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	The invalid character at setting-line ... has been removed.	Will be fixed automatically and does not require any action.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	The command line argument: ... was not recognized.	Check the command line parameters or

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
						the settings file and remove the invalid line.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Application.Current not set. This might be ok for tests.	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Shutting down on error. ExitCode: ...	Uncritical warning - no action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Caught metadata instantiation exception while parsing a unit: ...	No further action required.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	The current map was null.	Recover backup of database. If problem persists, contact FACTON support.
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Malformed XML in server Cost# map: ...	Recover backup of database. If problem persists, contact FACTON support.

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
Facton-EPC-Common/Admin	Common	Warning	32	AdminWarning	Could not create performance counter ... Instance 'facton.infrastructure.distribution.serverhosts.wcfwindowsservice' already exists with a lifetime of Process. It cannot be recreated or reused until it has been removed or until the process using it has exited. ...	The specified performance counter will not be instantiated and thus cannot be monitored. (It is likely that this message is logged for every performance counter). Restart the service to fix this. When restarting the service, wait for the previous process to end before starting the service again to avoid this problem.
Facton-EPC-Common/Admin	Common	Warning	101	BlobWarning VirusScanFailed	The virus scan has failed. Please check the virus scanner as well as the configuration file.	Please check the virus scanner as well

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
				NotFound		as the configuration file.
Facton-EPC-Common/Admin	Common	Error	102	BlobError	The file uploaded by the Client contains a virus. It has not been stored in the database and it has been deleted from the quarantine folder. Please follow the instructions of your company corresponding to an infected file on a client.	Please follow the instructions of your company corresponding to an infected file on a client.
Facton-EPC-Common/Admin	Common	Warning	103	BlobWarning VirusScanProgram NotFound	The program for the virus scan has not been found. Please check the installation directory of the virus scanner and adjust the configuration file where applicable.	Please check the installation directory of the virus scanner and adjust the configuration file where applicable.
Facton-EPC-Common/Admin	Common	Warning	104	BlobWarning VirusScanQuarantine DirectoryNotFound	The quarantine folder of the virus scanner "... " has not been found. Please review the quarantine folder of the virus scanner and adjust the configuration file where applicable.	Please review the quarantine folder of the virus scanner and adjust the configuration file where

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
						applicable.
Facton-EPC-Common/Admin	Common	Error	107	VirusScanConfigIncorrect	The virus scanner is not active because the configuration file is erroneous. Please check the configuration file.	Please check the configuration file.
Facton-EPC-Common/Admin	Common	Error	108	VirusScanTimeout	The virus scanner has timed out. The file uploaded by the client has not been stored in the database. Please check the virus scanner and adjust the configuration file, if necessary.	Please check the virus scanner and adjust the configuration file, if necessary.
Facton-EPC-Common/Admin	Common	Warning	200	MetadataDynamicIndexFillLevelWarning	The dynamic index cache is half-full. Please contact support.	Please contact the FACTON support.
Facton-EPC-Common/Admin	Common	Warning	300	PerformanceCounterInstallationFailed	Unable to install the performance counters. To install them run this application with administrator privileges once.	To install them run this application with administrator privileges once.
Facton-EPC-Common/Admin	Common	Error	400	InternalServerError	An unhandled exception has occurred in your	Please contact the FACTON support.

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
					application server. Please contact support. Exception detail information: Correlation Id: ... Exception type: ... Exception message: ...	
Facton-EPC-Core/Operational	Core	Warning	200	InvalidNumberSettingInRange	The configured value '...' for the setting '...' is not valid. The value must be in the range of <...>. The default value '...' is used instead. Please contact the solution configurator.	Check setting in SystemSettings.ini for FACTON Server.
Facton-EPC-Data/Admin	Data	Warning	108	IndexFragmentationRebuild	Index '...' on table '...' has a fragmentation of ... percent. Rebuild required.	The database should be rebuilt. Please contact your database administrator.
Facton-EPC-Data/Admin	Data	Warning	109	IndexFragmentationReorganize	Index '...' on table '...' has a fragmentation of ... percent. Reorganization required.	The database should be reorganized. Please contact your database administrator.

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
Facton-EPC-Data/Admin	Data	Error	110	DuplicateId Detected	Duplicate id detected: Please contact support.	Please contact the FACTON support.
Facton-EPC-Data/Admin	Data	Error	111	EntityDefinition OfEntitiesChanged	Entity definition (EntityType, SignatureId, SpaceId) was changed in history of the entities: Please contact support.	Please contact the FACTON support.
Facton-EPC-Data/Admin	Data	Warning	113	IdMapping Preloading NotPossible CacheMissing	Preloading id mapping is not possible because no id mapping cache is registered at the context. Activate id mapping cache and restart application.	Activate id mapping cache and restart application.
Facton-EPC-Data/Admin	Data	Warning	114	UnknownSignature	Could not convert to entity state. The signature is not registered. (Entity-Id: ..., Entity-Type: ..., Signature-Id: ...). This could be caused by changing the configuration. Please contact the solution configurator.	Please contact the FACTON configurator.
Facton-EPC-Data/Admin	Data	Warning	115	UnknownEntityType	Could not convert to entity state. The entity type is not registered. (Entity-Id: ..., Entity-Type: ..., Signature-Id: ...). This could be caused by changing the configuration. Please	Please contact the FACTON configurator.

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
					contact the solution configurator.	
Facton-EPC-Data/Admin	Data	Warning	116	UnknownProperty	Property with Id ... exists in database but not in current metadata. It will ignored. This could be caused by changing the configuration. Please contact the solution configurator.	Please contact the FACTON configurator.
Facton-EPC-Data/Admin	Data	Error	117	Database ConnectionFailed	The connection to your database is failed. Please check the connection settings to your database and the database access.	Please check the connection settings to your database and the database access.
Facton-EPC-Data/Admin	Data	Error	118	IndexMissing	The index '...' on the table '...' is missing. Please contact support.	Please contact the FACTON support.
Facton-EPC-Data/Admin	Data	Error	127	Predefined Mapping HasWrongIndex	Predefined mapping, which is part of database table '...', is mapped to the wrong index. This can have a negative impact on the performance of the system. Please contact support. Further information: Mapped conceptual value: ... Expected store id: ... Actual store id: ...	Please contact the FACTON support.

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
Facton-EPC-Data/Admin	Data	Error	128	Invalid TransactionVersion	The transaction version does not have a corresponding version entry. Please contact support.	Please contact the FACTON support.
Facton-EPC-Data/Admin	Data	Error	129	ReleaseAll EntityLocks ExceptLimitReached	<p>The user with the id '...' has attempted to release all single locks except ... locks which exceeds the limit of ... locks. No locks have been released. To release the locks, the user with the id '...' is required to publish or discard his changes and then release all locks manually.</p> <p>To obtain the user name run the following FQL query: SELECT FactonUserName FROM TYPE FactonUser, SPACE SYSTEM WHERE _Id="..."</p>	Please run the FQL query of the log message to obtain the name of the user who is required to publish or discard the changes and contact this user.
Facton-EPC-Data/Admin	Data	Error	130	ReleaseAllSpace LocksExcept LimitReached	The user with the id '...' has attempted to release all space locks except ... locks which exceeds the limit of ... locks. No locks have been released. To release the locks, the user with the id '...' is required to publish or discard	Please run the FQL query of the log message to obtain the name of the user who is required to

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
					his changes and then release all locks manually. To obtain the user name run the following FQL query: SELECT FactonUserName FROM TYPE FactonUser, SPACE SYSTEM WHERE _Id="..."	publish or discard the changes and contact this user.
Facton-EPC-Data/Admin	Data	Error	131	HostNameLength Exceeded	The host name '...' exceeds the size of ... and will be truncated. Please contact support.	Please contact the FACTON support.
Facton-EPC-Data/Admin	Data	Error	133	Purging CutoffDate HasNotBeenDefined	Purging cut-off date has not been defined.	Specify cut-off date system setting.
Facton-EPC-Data/Admin	Data	Error	134	CannotParse PurgingCutoffDate	Cannot parse purging cut-off date.	Specify a cut-off date using the format 'yyyy-MM-dd' or as UTC time using ISO 8610.
Facton-EPC-Data/Admin	Data	Error	135	CutoffDateMust UtcOrOffsetOfUtc	The purging cut-off date must be defined as UTC or as offset of UTC.	Use UTC or offset of UTC.

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
Facton-EPC-Data/Admin	Data	Error	136	CannotFindSnapshotForCutoffDate	Cannot find any snapshot for specified cut-off date.	Define another cut-off date or contact FACTON support.
Facton-EPC-Data/Admin	Data	Error	137	CutoffDateInlsRangeThatHasBeenAlreadyPurged	The specified cut-off date is in a range that has been already purged.	Specify a valid cut-off date.
Facton-EPC-Data/Admin	Data	Error	138	CannotCreatePurgeResultFile	Cannot create purge result file.	Please ensure that you have write privileges on your local application directory.
Facton-EPC-Data/Admin	Data	Informational	139	PurgeResultFileHasBeenWritten	The purge result has been written.	
Facton-EPC-Data/Admin	Data	Informational	140	PurgingStarted	The purging operation has started.	
Facton-EPC-Data/Admin	Data	Informational	141	PurgingFinished	The purging operation has finished.	

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
Facton-EPC-Domain/Operational	Domain	Warning	100	CostSharp FreezingDisabled	Cost# freezing is disabled. Please contact support.	Please contact the FACTON support.
Facton-EPC-Entities/Admin	Entities	Error	400	NoDiskSpace Available	No more disk space available - get more disk space.	Get more disk space.
Facton-EPC-Entities/Admin	Entities	Error	401	NoWriteAccess	Could not write to application directory ... - check file system or access rights.	Check file system or access rights.
Facton-EPC-Entities/Admin	Entities	Error	402	ErrorInaccessibleFile	Could not access file ... - check if file is in use by another process, or contact your support.	Check if the file is in use by another process, or contact your FACTON support.
Facton-EPC-Entities/Admin	Entities	Error	406	NoReadAccess	Could not read file or directory ... - check file system or access rights.	Check file system or access rights.
Facton-EPC-Entities/Operational	Entities	Warning	200	PrefetchingDisabled	The prefetching is disabled. Thus the loading of some data may take longer. For more information, please contact your system administrator.	Please contact the FACTON administrator.
Facton-EPC-	Entities	Warning	203	Start	The start of the prefetching in snapshot ...	Please contact the

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
Entities/ Operational				PrefetchingFailed	failed (Reason: '...').	FACTON support.
Facton-EPC- Entities/ Operational	Entities	Warning	204	Prefetching SnapshotConfigured	The configured snapshot ... is used for prefetching. This should only be used on a test system to generate Column Caching data for another system. Otherwise it is a configuration error. Please contact the solution configurator.	Check setting in SystemSettings.ini for FACTON Server.
Facton-EPC- Entities/ Operational	Entities	Warning	300	Publishing TicketTimeout	The publishing ticket ... on machine '...' of user '...' has timed out. It has last been refreshed at ... (UTC) and as a consequence reached the timeout of ... seconds. Check that the Application Service on machine '...' is still running and has a connection to the database or whether the configured timeout value is large enough.	Check that the FACTON-Server on machine '...' is still running and has a connection to the database or whether the configured timeout value is large enough.
Facton-EPC- Entities/ Operational	Entities	Warning	301	PublishingTimeout	A publishing request on machine '...' by user '...' has exceeded the maximum duration of ...	Check whether the frequency of pub-

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
					seconds. Check whether the frequency of publishing requests can be decreased or whether the configured publishing timeout should be increased.	lishing requests can be decreased or whether the configured publishing timeout should be increased.
Facton-EPC-Entities/Operational	Entities	Warning	403	Warn InaccessibleFile	File ... is currently being accessed by another process.	Check if the file is in use by another process, or contact your FACTON support.
Facton-EPC-Entities/Operational	Entities	Warning	405	CorruptedFile	File ... is corrupt and will be deleted.	Uncritical warning - no action required.
Facton-EPC-Entities/Operational	Entities	Warning	800	WarnQuery CompileError	Could not parse the defined query '...'and will be ignored. Parsing errors: ...	Please contact the FACTON support.
Facton-Integration-DataExchange/	DataExchange	Error	103	CostML ProcessFailed	The CostML-Process with ID '...' failed with the following error: ...	Please contact the FACTON support.

Log Name	Source	Level	Event ID	Task Category	Log Message	Instruction
Operational						
Facton-Integration-DataExchange/Operational	DataExchange	Error	201	OptionLoadingError	Error while loading the option with ScopeID '...'	Please contact the FACTON support.
Facton-Integration-DataExchange/Operational	DataExchange	Error	202	OptionParsingError	Error while parsing the option with ScopeID '...'. Message: '...'	Please contact the FACTON support.

Table 6.4: FACTON Event Logs