



Administration Handbook

Install. Configure. Monitor.



1 IMPRINT

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1 Imprint



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2 INTRODUCTION

This document provides information for system administrators on how to administer the FACTON 9.2 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)



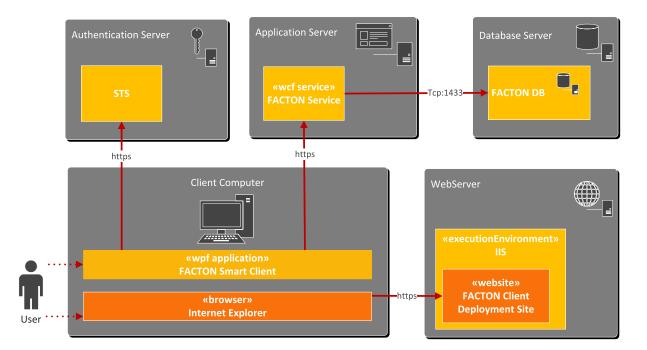
3 SYSTEM OVERVIEW

This chapter describes the FACTON System components in detail.

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3.1 System Architecture

The software architecture of FACTON is based on the advanced three-layer model (see figure <u>»Advanced Software Architecture</u>.) 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.



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 Webserverthat 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		
	A WCF (Windows Communication Foundation) service with two tasks		
	 Providing meta data for the client on the client-server connection Enabling access to the FACTON database only for authenticated clients 		
FACTON EPC Application	There are two endpoints ¹ :		
Service	https:// <serverip:>:<serverport>/facton/server/mex (Metadata Exchange)</serverport></serverip:>		
	https:// <serverip:>:<serverport>/facton/server/secured (Application Communication)</serverport></serverip:>		
FACTON EPCIdentity Broker	The FACTON Identity Broker is an intermediary service that connects an external identity provider with the FACTON Clients using one of the following protocols:		
	OpenID Connect 1.0WS-Federation 1.2		

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 paramter 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 physiscal 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.

3.2 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)

3.2.1 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:

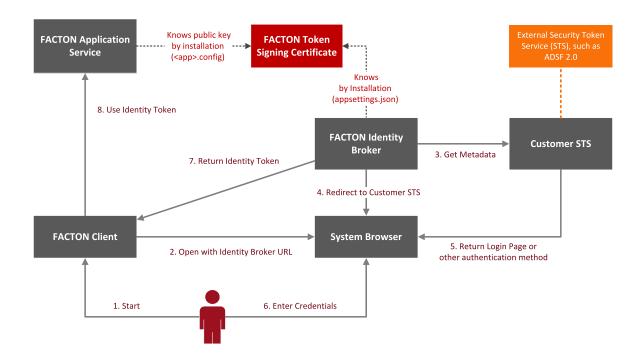
- All browser-based authentication methods of the external identity provider are supported
- Federation scenarios are supported



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:

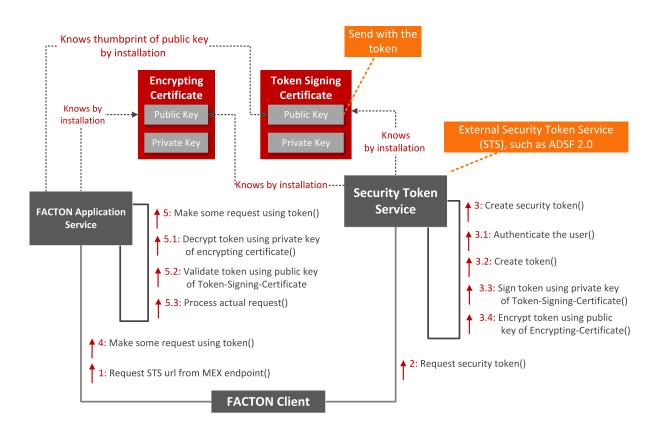


Authentication flow by the FACTON Identity Broker

3.2.2 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:





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 tokenencrypting 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.



4 PREPARE THE INSTALLATION

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

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4.1 System Requirements

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

FACTON Component	Operating System	Certificates	Additional Soft- ware
FACTON Application Service	Microsoft Windows Server 2012 R2	SSL certificate for https communication. Token-encryption certificate and Token-signing certificate for authentication (only required for WS-Trust authentication).	.NET Framework 4.6.2
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: Inter- net Explorer 9.0
FACTON Identity Broker	Microsoft Windows Server 2012 R2	Token-signing certificate	.NET Framework 4.6.2

Overview of System Requirements



4.1.1 Certificates

FACTON services need the followingcertificates, 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 FACTONIdentity 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 tokenencrypting 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«.



According to the current best practices, the recommended size for encryption keys is 2048-bit RSA and the recommended hashing algorithm is SHA-256.

The current version of the FACTON services do not support Cryptographic New Generation (CNG) Storage Providers (see https://social.technet.microsoft.com/wiki/contents/articles/962.how- to-determine-if-a-certificate-is-using-a-capi1-or-cng-key.aspx for determining which storage provider is used).

Though if you already have a CNG cert, and does not want to re-request a legacy cert from your provider, it's possible to import a CNG as a Legacy cert by using this command.

```
certutil.exe -csp "Microsoft Enhanced RSA and AES Cryptographic Provider" -user -importpfx "My" cng_certificate.pfx
```

You can use the following procedure to create a self-signed certificate that also creates and installs a private key:

Create a Certificate

- 1. Start a PowerShell Command Prompt as administrator.
- 2. Enter the appropriate New-SelfSignedCertificate syntax.
 - Example command:

New-SelfSignedCertificate -certstorelocation cert:\CurrentUser\My -dnsname appserver.domain.local -NotAfter (Get-Date).AddYears(5) -KeySpec KeyExchange -HashAlgorithm SHA256 -FriendlyName "Identity Broker tokensigning certificate"

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

4.2 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

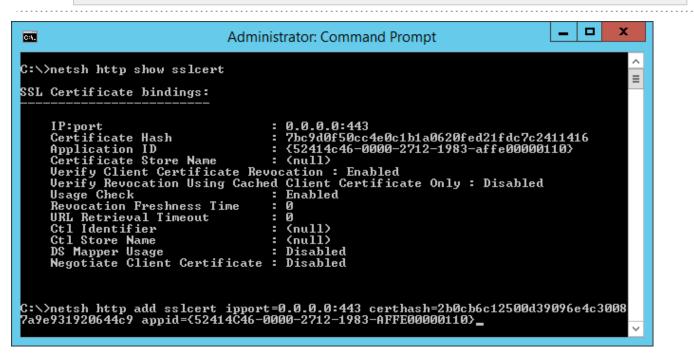
4.2.1 Register SSL Certificate

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

\oplus 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}



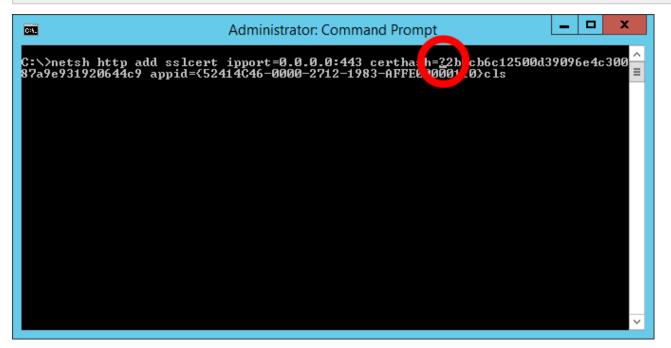
Example of the Installation of the SSL Certificate



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.



Registering the SSL Certificate

4.3 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	Default or example value	Relevant for	
Application Service: SERVICE_ACCOUNT	System	Application Service	
Description: 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.			
Application Service: SERVICE_PASSWORD		Application Service	
Description: The password of the specified Windows Service Account.			
Application Service:	https:// <dnshostname>/facton/</dnshostname>	Application Service	

4 Prepare the Installation



Parameter	Default or example value	Relevant for			
ENDPOINT_SERVICE	server/secured				
-	endpoint address of the FACTON Application e configuration of the security token service (
ENDPOINT_MEX	https:// <dnshostname>/facton/ server/mex</dnshostname>	Application Service, Client Deployment Site, FACTON Client			
Description: The applicati	ion service MEX endpoint address				
SERVICE_CERT_ THUMBPRINT		Application Service			
	int of the service certificate in case of WS-Tru use this certificate as token-encrypting certifi				
SERVICE_CERT_ STORELOCATION	LocalMachine	Application Service			
If you use the System Acco	ation of the service certificate ("LocalMachin ount as SERVICE_ACCOUNT use "LocalMach quired for WS-Trust authentication.				
APPDATAPATH	<usersappdatapath> Example: C:\Users\<service_ ACCOUNT>\AppData</service_ </usersappdatapath>	Application Service, FACTON Client			
machine specific settings	Description: 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.				
DB_SERVERNAME		Application Service, Configuration Update Client, Identity Broker			
Description: The name of	the FACTON database server.				
DB_DATABASENAME		Application Service, Configuration Update Client, Identity Broker			
Description: The name of	Description: The name of the FACTON database.				
DB_USERNAME		Application Service, Configuration Update Client, Identity Broker			
	e of the database connection. If no username red Security. This database user must be a me				



Parameter	Default or example value	Relevant for	
DB_PASSWORD		Application Service, Configuration Update Client, Identity Broker	
Description: The password of cannot be set.	of the given database user. If no username is speci	fied the password	
STS_ENDPOINT_ WSTRUST13	https:// <adfs-server>/adfs/services/ trust/13/windowstransport</adfs-server>	Application Service	
Description: The WS-Trust 1 required for WS-Trust authe	.3 endpoint address of the STS (e.g. ADFS). This p ntication.	parameter is only	
STS_ENDPOINT_MEX	https:// <adfs-server>/adfs/services/ trust/mex</adfs-server>	Application Service	
Description: The MEX endp WS-Trust authentication.	oint address of the STS (e.g. ADFS). This paramete	er is only required for	
STS_SIGNING_CERT_ THUMBPRINT		Application Service	
Description: The thumbprint only required for WS-Trust a	t of the token-signing certificate of the STS (e.g. A authentication.	DFS). This parameter is	
Identity Broker: ENDPOINT_SERVICE	https:// <dnshostname>/facton/identitybroker</dnshostname>	Identity Broker, Applic- ation Service (Setup parameter IDENTITYBROKER_ ENDPOINT)	
Description: The endpoint address of the Identity Broker. This parameter is only required in case of Identity Broker authentication.			
IDENTITYBROKER_ SIGNING_CERT_ THUMBPRINT		Identity Broker, Applic- ation Service	
Description: 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	CurrentUser	Identity Broker, Applic- ation Service	
"CurrentUser"). This is a par	ion of the Identity Broker token-signing certificate rameter in the settings file (SETTINGS_FILE) of the TON Application Service. This parameter is only r	Identity Broker and a	
AUTHENTICATION_	https:// <dnshostname></dnshostname>	Identity Broker, Applic-	



Parameter	Default or example value	Relevant for		
AUDIENCE		ation Service		
	r the token based authentication. It is used for Ic t for Service API OAuth authentication.	dentity Broker authen-		
API_ENDPOINT_SERVICE	https:// <dnshostname>/facton/ api/v1</dnshostname>	Application Service		
Description: The endpoint ac	ldress of the service API.			
API_OAUTH_ENDPOINT	https:// <adfs-server>/adfs/oauth2/ authorize</adfs-server>	Application Service		
Description: The OAuth endp parameter is only required fo	ooint address of the STS (e.g. ADFS) that authent r WS-Trust authentication.	ticates an API user. This		
API_OAUTH_ISSUERNAME	https:// <adfs-server>/adfs/services/ trust</adfs-server>	Application Service		
Description: The OAuth issue meter is only required for WS	r name of the STS (e.g. ADFS) that authenticates -Trust authentication.	s an API user. This para-		
API_OAUTH_CERT_ THUMBPRINT		Application Service		
	n-signing certificate thumbprint of the STS (e.g. , only required for WS-Trust authentication.	ADFS) that authenticates		
API_OAUTH_CERT_ STORELOCATION	LocalMachine	Application Service		
Description: The store location of OAuth token-signing certificate. This parameter is only required for WS-Trust authentication.				
SYSTEM_ENVIRONMENT		Client Deployment Site		
Description: Defines one of the System3,	ne supported system environments: Dev, QA, Pro	od, System1, System2,		
SYSTEM_ENVIRONMENT_ NAME		Client Deployment Site		
Description: Sets the name of the installed client.	f the chosen system environment. This is visible t	o all users in the UI of		
AUTHENTICATION_ CALLBACK_PORT_FROM		FACTON Client		
number is set, the client will k	t number of the authentication callback channel be use a free port number without reserving the p ity Broker authentication and if the setup should	port. This parameter is		
AUTHENTICATION_ CALLBACK_PORT_TO		FACTON Client		



Parameter	Default or example value	Relevant for
		tion callback channel reservation. This para- cation and if the setup should reserve a port
AUTHENTICATION_ CALLBACK_USER		FACTON Client
		ication callback channel reservation. This hentication and if the setup should reserve a
Identity Broker: SERVICE_ ACCOUNT	System	Identity Broker
	•	MAIN\ServiceUser«) of the Identity Broker. If his parameter is only required in case of Iden-
Identity Broker: SERVICE_ PASSWORD		Identity Broker
Description: The password of in case of Identity Broker aut		vice Account. This parameter is only required
SETTINGS_FILE		Identity Broker
-		cified component. This parameter is only are example files in the »config« folder of the
Overview of System Parameters		

4.4 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").

 \oplus 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.

1			AD FS			
<u>File Action View Win</u>	dow <u>H</u> elp					_ <i>5</i> ×
• 🔿 🖄 🖬 🚺 🖬	P. J. J. J.	_				
AD FS	Endpoints					Actions
Endpoints	Enabled	Proxy Enabled		Туре	Authentication Type A	Endpoints 🔺
Certificates	No No	No	/adts/services/trust/2005/issuedtokensymmetrictripledes	WS-Trust 2005 WS-Trust 2005	SAML Token (Sym., SAML Token (Sym.,	View
Claim Descriptions	No	No	/adfs/services/trust/2005/issuedtokensymmetrictripledess /adfs/services/trust/2005/issuedtokenmixedsymmetrictripl	WS-Trust 2005 WS-Trust 2005	SAML Token (Sym., SAML Token (Sym.,	New Window from Here
Trust Relationships	No	No	/adis/services/trust/2005/issuedtokenmixedsymmetrictripl /adfs/services/trust/2005/issuedtokenmixedsymmetrictripl	WS-Trust 2005 WS-Trust 2005	SAML Token (Sym., SAML Token (Sym.,	New Window from Here
Authentication Policies	Yes	No	/adis/services/trust/2005/issuedtokenimixed/symmetricitipi	WS-Trust 1.3	Kerberos	Q Refresh
	No	No	/adis/services/trust/13/certificate	WS-Trust 1.3	Certificate	Help
	Yes	Yes	/adfs/services/trust/13/certificatemixed	WS-Trust 1.3	Certificate	
	No	No	/adis/services/trust/13/certificatetransport	WS-Trust 1.3	Certificate	/adfs/services/trust/13/windowstran 🔺
	No	No	/adfs/services/trust/13/usemame	WS-Trust 1.3	Password	Enable on Proxy
	No	No	/adfs/services/trust/13/usemamebasictransport	WS-Trust 1.3	Password	Disable
	Yes	Yes	/adfs/services/trust/13/usemamemixed	WS-Trust 1.3	Password	
	No	No	/adfs/services/trust/13/issuedtokenasvmmetricbasic256	WS-Trust 1.3	SAML Token (Asvm.	👔 Help
	No	No	/adfs/services/trust/13/issuedtokenasymmetricbasic256sh	WS-Trust 1.3	SAML Token (Asym.	
	Yes	Yes	/adfs/services/trust/13/issuedtokenmixedasymmetricbasic	WS-Trust 1.3	SAML Token (Asym.	
	No	No	/adfs/services/trust/13/issuedtokenmixedasymmetricbasic	WS-Trust 1.3	SAML Token (Asym	
	Yes	Yes	/adfs/services/trust/13/issuedtokenmixedsvmmetricbasic2	WS-Trust 1.3	SAML Token (Svm., ≡	
	No	No	/adfs/services/trust/13/issuedtokenmixedsymmetricbasic2	WS-Trust 1.3	SAML Token (Sym.,	
	No	No	/adfs/services/trust/13/issuedtokensymmetricbasic256	WS-Trust 1.3	SAML Token (Sym.,	
	No	No	/adfs/services/trust/13/issuedtokensymmetricbasic256sha	WS-Trust 1.3	SAML Token (Sym.,	
	No	No	/adfs/services/trust/13/issuedtokensymmetrictripledes	WS-Trust 1.3	SAML Token (Sym	
	No	No	/adfs/services/trust/13/issuedtokensymmetrictripledessha	WS-Trust 1.3	SAML Token (Sym	
	No	No	/adfs/services/trust/13/issuedtokenmixedsymmetrictripledes	WS-Trust 1.3	SAML Token (Sym.	
	No	No	/adfs/services/trust/13/issuedtokenmixedsymmetrictripled	WS-Trust 1.3	SAML Token (Sym	
	No	No	/adfs/services/trust/13/windows	WS-Trust 1.3	Windows	
	No	No	/adfs/services/trust/13/windowsmixed	WS-Trust 1.3	Windows	
	Yes	No	/adfs/services/trust/13/windowstransport	WS-Trust 1.3	Windows	
	Yes	No	/adfs/services/trusttcp/windows	WS-Trust 2005	Local Windows	
	No	No	/adfs/services/trust/artifactresolution	SAML-Artifact Resolution	Anonymous 🗠	
	<		III		>	

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:

Add-ADFSClient -Name "Facton Client" -ClientId "ADE421F2-0882-44CC-B840-4FFCC1447A00" - RedirectUri "https://<DnsHostName>/facton/api/v1"

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.

$^{igodoldsymbol{ heta}}$ 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.

.....



\$	Add Relying Party Trust Wizard
Select Data Source	
Steps • Welcome • Select Data Source • Specify Display Name • Choose Profile • Configure Certificate • Configure URL • Configure Identifiers • Configure Nulti-factor Authentication Now? • Choose Issuance Authorization Rules • Ready to Add Trust • Finish	Select an option that this wizard will use to obtain data about this relying party: Import data about the relying party published online or on a local network Use this option to import the necessary data and certificates from a relying party organization that publishes its federation metadata address (host name or URL): Ederation metadata address (host name or URL): Example: fs.contoso.com or https://www.contoso.com/app Import data about the relying party from a file Use this option to import the necessary data and certificates from a relying party organization that has exported its federation metadata to a file. Ensure that this file is from a trusted source. This wizard will not validate the source of the file. Federation metadata file location: Erter data about the relying party manually Use this option to manually input the necessary data about this relying party organization.
	< <u>P</u> revious <u>N</u> ext > Cancel

Select »Enter data about the relying party manually«



\$	Add Relying Party Trust Wizard	X
Specify Display Name		
Steps	Enter the display name and any optional notes for this relying party.	
Welcome	Display name:	
Select Data Source	FACTON Application Service	
Specify Display Name	Notes:	
Choose Profile		
Configure Certificate		
Configure URL		
Configure Identifiers		
 Configure Multi-factor Authentication Now? 		<u>~</u>
 Choose Issuance Authorization Rules 		
Ready to Add Trust		
Finish		
	< Previous Next > Cancel	

Enter the display name and optionally some notes for the relying party



\$	Add Relying Party Trust Wizard
Choose Profile	
Steps	This wizard uses configuration profiles to aid in creating the relying party trust. Choose the appropriate
Welcome	configuration profile for this relying party trust.
Select Data Source	AD <u>F</u> S profile
Specify Display Name	This profile supports relying parties that are interoperable with new AD FS features, such as
Choose Profile	security token encryption and the SAML 2.0 protocol.
Configure Certificate	O AD FS 1.0 and 1.1 profile
Configure URL	This profile supports relying parties that are interoperable with AD FS 1.0 and 1.1.
Configure Identifiers	
Configure Multi-factor Authentication Now?	
 Choose Issuance Authorization Rules 	
 Ready to Add Trust 	
Finish	
	< <u>P</u> revious <u>N</u> ext > Cancel

Select the ADFS Profile



\$	Add Relying Party Trust Wizard	X
Configure Certificate		
Steps Welcome Select Data Source Select Data Source Choose Profile Configure Certificate Configure URL Configure Identifiers Configure Multi-factor Authentication Now? Choose Issuance Authorization Rules Ready to Add Trust Finish	Specify an optional token encryption certificate. The token encryption certificate is used to encrypt the claims that are sent to it. To specify the certificate, click Browse. Issuer: CN=app01ffacton.dev Subject: CN=app01ffacton.dev Effective date: 8/12/2016 10:23:54 AM Expiration date: 8/12/2017 10:43:54 AM View Browse	
	< <u>P</u> revious <u>N</u> ext > Cancel	

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



\$	Add Relying Party Trust Wizard
Configure URL	
 Steps Welcome Select Data Source Specify Display Name Choose Profile Configure Certificate Configure URL Configure Identifiers Configure Multifactor Authentication Now? Choose Issuance Authorization Rules Ready to Add Trust Finish 	AD FS supports the WS-Trust, WS-Federation and SAML 2.0 WebSSO protocols for relying parties. If WS-Federation, SAML, or both are used by the relying party, select the check boxes for them and specify the URLs to use. Support for the WS-Federation Passive protocol Image: Im

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, e.g. https://<DnsHostName>/facton/server/secured)
 URI of the FACTON Service API

(system parameter API_ENDPOINT_SERVICE, e.g. https://<DnsHostName>/facton/ api/v1)



\$	Add Relying Party Trust Wizard	X
Configure Identifiers		
Steps Welcome Select Data Source Specify Display Name Choose Profile	Relying parties may be identified by one or more unique identifier strings. Specify the identifiers for party trust. Relying party trust identifier: Example: https://fs.contoso.com/adfs/services/trust	r this relying A <u>d</u> d
 Configure Certificate Configure URL Configure Identifiers Configure Multifactor Authentication Now? Choose Issuance Authorization Rules Ready to Add Trust 	Relying party trust identifiers: https://app https://app facton.dev/facton/server/secured https://app facton.dev/facton/api/v1	<u>R</u> emove
 Finish 	<u>Previous</u> <u>Next</u> >	Cancel

Enter the FACTON Application Service endpoint addresses



\$	Add Relying Party Trust Wizard
Steps Welcome Select Data Source	Configure multifactor authentication settings for this relying party trust. Multifactor authentication is required if there is a match for any of the specified requirements.
 Specify Display Name Choose Profile Configure Certificate Configure URL Configure Identifiers Configure Multi-factor Authentication Now? Choose Issuance 	Multi-factor Authentication Global Settings Requirements Users/Groups Not configured Device Not configured Location Not configured
 Authorization Rules Ready to Add Trust Finish 	 I do not want to configure multi-factor authentication settings for this relying party trust at this time. Configure multi-factor authentication settings for this relying party trust. You can also configure multi-factor authentication settings for this relying party trust by navigating to the Authentication Policies node. For more information, see <u>Configuring Authentication Policies</u>.

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.

\$	Add Relying Party Trust Wizard
Choose Issuance Autho	prization Rules
Steps	Issuance authorization rules determine whether a user is permitted to receive claims for the relying party.
Welcome	Choose one of the following options for the initial behavior of this relying party's issuance authorization rules.
Select Data Source	Permit all users to access this relying party
Specify Display Name	The issuance authorization rules will be configured to permit all users to access this relying party. The relying
Choose Profile	party service or application may still deny the user access.
Configure Certificate	O Deny all users access to this relying party
Configure URL	The issuance authorization rules will be configured to deny all users access to this relying party. You must later add issuance authorization rules to enable any users to access this relying party.
Configure Identifiers	rater add issuance additionzation rules to enable any users to access this relying party.
Configure Multi-factor Authentication Now?	You can change the issuance authorization rules for this relying party trust by selecting the relying party trust and clicking Edit Claim Rules in the Actions pane.
 Choose Issuance Authorization Rules 	and clicking Edit Claim Hules in the Actions pane.
Ready to Add Trust	
 Finish 	
	< <u>P</u> revious <u>N</u> ext > Cancel

Set the issuance authorization rules



\$	Add Relying Party Trust Wizard
Finish	
Steps Welcome Select Data Source Specify Display Name Choose Profile Configure Cettificate Configure URL Configure Identifiers Configure Multi-factor Authentication Now? Choose Issuance Authorization Rules Ready to Add Trust Finish	The relying party trust was successfully added to the AD FS configuration database. You can modify this relying party trust by using the Properties dialog box in the AD FS Management snap-in. ✓ Open the Edit Claim Rules dialog for this relying party trust when the wizard closes
	Qlose

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...".

翰 🐘 Edit Claim Rules for FACTON Application Service	_ 🗆 X
Issuance Transform Rules Issuance Authorization Rules Delegation Authorization	ation Rules
The following transform rules specify the claims that will be sent to the relying p	oarty.
Order Rule Name Issued Claims	
	•
Add Rule	
OK Cancel	Apply

Claim rules of a replying party trust



\$	Add Transform Claim Rule Wizard
Select Rule Template	
Steps	Select the template for the claim rule that you want to create from the following list. The description provides details about each claim rule template.
 Choose Rule Type 	
Configure Claim Rule	Claim rule template:
	Send Claims Using a Custom Rule 🗸
	Claim rule template description:
	Using a custom rule, you can create rules that can't be created with a rule template. Custom rules are written in the AD FS claim rule language. Capabilities that require custom rules include: • Sending claims from a SQL attribute store • Sending claims from an LDAP attribute store using a custom LDAP filter • Sending claims from a custom attribute store • Sending claims only when 2 or more incoming claims are present • Sending claims only when an incoming claim value matches a complex pattem • Sending claims with complex changes to an incoming claim value • Creating claims for use only in later rules
	< Previous Next > Cancel

Select »Send Claims Using a Custom Rule«

\oplus 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);
```

.....



\$	Add Transform Claim Rule Wizard
Configure Rule	
Steps • Choose Rule Type • Configure Claim Rule	You can configure a custom claim rule, such as a rule that requires multiple incoming claims or that extracts disuance statement using the AD FS claim rule language. Qlaim rule name: Domain qualified name Rule template: Send Claims Using a Custom Rule Custom rule: (i [Type == "http://schemas.xmlsoap.org/ws/2005/05/identity/claims/name"] = i ssue (claim = c);
	< <u>P</u> revious Finish Cancel

Add the domain to the identity claim

\oplus 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

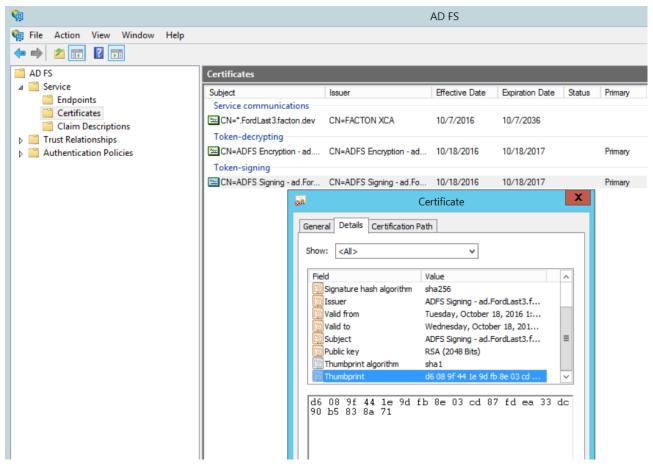
For other locales the locale-specific group name, e.g. »Jeder« for german, have to be used in this claim rule.



Edit Rule - Add everyone group	X
You can configure a custom claim rule, such as a rule that requires multiple incoming claims or that extracts claims from a SQL attribute store. To configure a custom rule, type one or more optional conditions and an issuance statement using the AD FS claim rule language.	;
Qaim rule name:	
Add everyone group	
Rule template: Send Claims Using a Custom Rule	
Custom rule:	_
<pre>=> issue(Type = "http://schemas.xmlsoap.org/claims/Group", Value = "Everyone"); </pre>	<
OK Cancel	
Cancel	

Add the special group »Everyone«





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

ADFS certificates view

4.5 Application Directory

FACTON Application Service stores additional data within its application directory: <APPDATAPATH>\Local\FACTON and <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



5 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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5.1 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«.

5.1.1 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_9.1.0.17277.exe«), to start the installation. The setup starts a wizard and analyzes the current state of the FACTON Component.



FACTON EPC Application Service 9	– × v9.1.0.17277
Initializing Setup	
	Cancel

Initializing the setup



2. The wizard shows the executable setup actions. Click on the **»Install...«** setup action.

FACTON EPC Application Service 9	– × v9.1.0.17277
Setup Action Please choose your setup action.	
Install Install 'FACTON EPC Application Service 9' on this con	iputer.
	Cancel

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 <u>»Uninstall FACTON«</u> 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 **»l accept the terms ...«** checkbox to accept the terms of the license agreement. Click on Next, to continue the installation.

		_ ×
	FACTON EPC Application Service 9	v9.1.0.17277
		_
	Agreement	
Please rea	ad the following License Agreement. You must accept the terms of this agreement before continuing with the i	nstallation.
	FACTON End User License Agreement This End User License Agreement is between FACTON GmbH, a German corporation with its principal place of business at Rudolf-Breitscheid-Str. 187, 14482 Potsdam (hereinafter "FACTON"), and the legal entity that has entered into this Agreement as Licensee (hereinafter "Licensee"). FACTON provides Licensed Programs under several different Brands. Licensee may order licenses for any Licensed Programs by accepting these General Terms. Each party acts exclusively in its own name and on its own behalf with respect to the rights and obligations pursuant to this Agreement.	
	GENERAL TERMS	
I accep	ot the terms in the license agreement.	
	Back Next	Cancel

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.

FACTON EPC Application Service 9			_ × v9.1.0.17277
Installation Location Specify the path for your installation.			
C:\Program Files\FACTON\FACTON EPC Application Service\			
	Back	Next	Cancel

Specifying an installation location



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

FACTON EPC Application Service 9		– × v9.1.0.17277
FACTON Application Service Configuration Configure the account to be used for running the FACTON Application Set System Account User Account User Name: domain\FactonUser Password: ********	ervice.	
	Back Next	Cancel

Service account configuration



6. Enter the addresses of the service endpoints and set the mode which the service has to use for its authentication. Choose between WS-Trust 1.3 for authentication via WS-Trust 1.3 with Windows Integrated Authentication (WIA) and Identity Broker for authentication via OpenID Connect or WS-Federation using the FACTON Identity Broker. Click on Next, to continue to the installation.

FACTON EPC Application Service 9			– × v9.1.0.17277
FACTON Application Service Endpoints Configure the endpoints of the FACTON Application Service. Service Endpoint: https://app.domain.local/facton/server/secured			
Service Endpoint MEX: https://app.domain.local/facton/server/mex			_
Authentication Mode: WS-Trust 1.3			
	Back	Next	Cancel

Configure of the service endpoints



7. 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.

			_ ×
FACTON EPC Application Service 9			v9.1.0.17277
FACTON Application Service Certificate			
Set the certificate of the FACTON Application Service.			
Service Certificate Store Location:			
User Account Store			-
Service Certificate Thumbprint:			
61 7a 93 9f cd 69 5d e1 74 1e 0d 95 3b c6 a6 78 43 e3 2d 75			
	Back	Next	Cancel

Setting the service certificates



8. 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.

			_ ×
FACTON EPC Application Service 9			v9.1.0.17277
Security Token Service Configuration			
Specify the Security Token Service configuration for the authentication u	sed by the FACTON A	Application Service.	
STS WS-Trust 1.3 Endpoint:			
https://adfs.domain.local/adfs/services/trust/13/windowstransport			
STS Endpoint MEX:			
https://adfs.domain.local/adfs/services/trust/mex			
Token-Signing Certificate Thumbprint:			
1b a7 a3 f6 86 74 d7 88 99 37 37 1d 62 cf 5f 17 9d bf 13 c2			
	Back	Next	Cancel

STS authentication settings



9. 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.

			_ ×
FACTON EPC Application Service 9			v9.1.0.17277
FACTON Identity Broker Settings			
Specify the Identity Broker configuration for the authentication used by	the FACTON Applica	tion Service.	
	and the roll ripping		
Identity Broker Endpoint:			
https://app.domain.local/facton/identitybroker			
Signing Certificate Store Location: User Account Store			Ŧ
			•
Signing Certificate Thumbprint: 7a cd 32 6a 75 89 b2 b4 3e 22 9a bd 76 74 d3 6d 3a cc 43 8c			_
			_
Authentication Audience:			_
https://app.domain.local			_
	Back	Next	Cancel

Identity Broker authentication settings



10. 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.

FACTON EPC Application Service 9		– × v9.1.0.17277
FACTON Database Connection Configuration Select the FACTON database connection used by the FACTON Application Database Server Name: dbserver Database Name: FACTON O Windows Authentication Cogin: Password:	n Service.	
	Back Net	xt Cancel

FACTON database connection

NOTE

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



11. 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.

FACTON EPC Application Service 9			_ × v9.1.0.17277
FACTON Data Directory Configuration Set the directory that will be used as data directory for the FACTON Applica Set a custom directory for the application data: If a custom directory is not set, the application data will be stored in the w		n data directory of the se	rvice user.
	Back	Next	Cancel

Setting an custom data directory

NOTE

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



12. Enter the address of the Service API¹.

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

FACTON EPC Application Service 9			_ × v9.1.0.17277
FACTON Service API Endpoint Configure the endpoint of the FACTON Service API. Service API Endpoint: https://app.domain.local/facton/api/v1			
	Back	Next	Cancel

Configure the service API endpoint

¹The FACTON Service API is an external interface to FACTON for importing and exporting data from other external tools.



13. 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 be 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.

FACTON EPC Application Service 9			– × v9.1.0.17277
FACTON Service API Authentication Specify the authentication settings of the FACTON Service API.			
OAuth Authentication OAuth Endpoint: https://app.domain.local/adfs/oauth2/authorize			
OAuth Issuer Name: https://app.domain.local/adfs/services/trust			
OAuth Certificate Store Location: User Account Store			•
OAuth Certificate Thumbprint: 7b bc a4 56 78 74 dc 86 49 32 27 1a cc ce 34 19 90 de 12 ca	_	_	
Authentication Audience: https://app.domain.local		_	
 Windows Authentication You can use Windows Authentication for the Service API under the follow (1) You require authentication only on a user name basis, not for user (2) Your server name is fully qualified. (3) The FACTON Application Service runs under the 'System Account'. 			
	Back	Next	Cancel

Service API authentication settings



14. 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.

FACTON EPC Application Service 9			v9.1.0.17277	×
Summary The setup is ready to install the following components.				
 Microsoft .NET Framework 4.5.2 [is already installed] 			v4.5.51209.34209	
FACTON EPC Application Service 9 [will be installed]			v9.1.0.17277	
	Back	Install	Cancel	

Summary of the installation components



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

FACTON EPC Application Service 9	– × v9.1.0.17277
Installing Please wait while the setup installs the selected components. Installing (85%)	
	Cancel

Installing the Application Service



16. 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.

		FACTON EPC Application Service 9	_ × v9.1.0.17277
		ompleted sted components have been successfully installed.	
Ŀ	!	Microsoft .NET Framework 4.5.2 The setup package 'Microsoft .NET Framework 4.5.2' was not changed.	^
Ŀ	•	FACTON EPC Application Service 9 The setup package 'FACTON EPC Application Service 9' was successfully installed.	_
L			_
L			_
L			_
Log	file pa	ath: C:_temp_Display_Install_Application_Service.log	
			Finish

Overview about the installed components



17. 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.

	FACTON EPC Application Service 9	_ × ∨9.1.0.17277
Setup Fa An error o	ailed due to the installation process occurred.	
8	FACTON EPC Application Service 9 Failed to grant 'logon as service' rights to user. (-2147023564 domain/User)	Â
8	FACTON EPC Application Service 9 > Could not add reservation for url 'https://win-2012-r2:443/facton/api/v1'	
Log file p	ath: C:\Users\ADMINI~1\AppData\Local\Temp\FACTON_EPC_Application_Service_9_20170816080524.log	
		Close

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.



5.1.2 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.

FACTON Identity Broker 1	– × v1.0.0.17311
Initializing Setup	
	Cancel

Initializing the setup



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

FACTON Identity Broker 1	_ X v1.0.0.17311
Setup Action Please choose your setup action.	
Install Install 'FACTON Identity Broker 1' on this computer.	
	Cancel

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 <u>»Uninstall FACTON«</u> 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 **»l accept the terms ...«** checkbox to accept the terms of the license agreement. Click on Next, to continue the installation.

FACTON Identity Broker 1		– × v1.0.0.17311
License Agreement Please read the following License Agreement. You must accept the	terms of this agreement before continuin	g with the installation.
FACTON End User License Agree This End User License Agreement is between its principal place of business at Rudolf-Breits "FACTON"), and the legal entity that has (hereinafter "Licensee"). FACTON provides Licensed Programs under s licenses for any Licensed Programs by accept exclusively in its own name and on its own beto pursuant to this Agreement. GENERAL TERMS	FACTON GrnbH, a German corporation cheid-Str. 187, 14482 Potsdam (herei entered into this Agreement as Lic everal different Brands. Licensee may ting these General Terms. Each party	order y acts
	Back Next	Cancel

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.

FACTON Identity Broker 1			_ × v1.0.0.17311
Installation Location Specify the path for your installation.			
C:\Program Files\FACTON\FACTON Identity Broker\			
	Back	Next	Cancel

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.

FACTON Identity Broker 1		– × v1.0.0.17311
FACTON Identity Broker Service Configuration Configure the account to be used for running the FACTON Identity Broke O System Account User Name: domain\FactonIBUser Password: ********	er Service.	
	Back Next	Cancel

Service account configuration



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

FACTON Identity Broker 1			_ X v1.0.0.17311
FACTON Identity Broker Endpoint Specify the endpoint of the FACTON Identity Broker. Service Endpoint: https://app.domain.local/facton/identitybroker			
	Back	Next	Cancel

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.

FACTON Identity Broker 1			_ X v1.0.0.17311
FACTON Identity Broker Settings Set the file which contains the additional settings of the FACTON Identity Settings File: D:\Data\AppSettings.json	/ Broker.		
	Back	Next	Cancel

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 Br Set the database configuration for load balancing: Database Server Name: Database Name:	roker.		
Windows Authentication SQL Server Authentication Login: Password:			
	Back	Next	Cancel

FACTON database connection

NOTE

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



 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.

FACTON Identity Broker 1			>	×
Summary The setup is ready to install the following components.				
 Microsoft .NET Framework 4.6.2 [is already installed] 			v4.6.1590.0	
FACTON Identity Broker 1 [will be installed]			v1.0.0.17311	
	Back	Install	Cancel	
	Back	Install	Cancel	

Summary of the installation components



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

FACTON Identity Broker 1	– × v1.0.0.17311
Installing Please wait while the setup installs the selected components. Installing (93%)	
	Cancel

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.

	FACTON Identity Broker 1	v1.0.0.1731	×
-	ompleted sted components have been successfully installed.		
(!)	Microsoft .NET Framework 4.6.2 The setup package 'Microsoft .NET Framework 4.6.2' was not changed.		
•	FACTON Identity Broker 1 The setup package 'FACTON Identity Broker 1' was successfully installed.		l
			l
			l
			l
Log file p	ath: C:\Users\ADMINI~1\AppData\Local\Temp\FACTON_Identity_Broker_1_20170815060318.log	F	ł
		Finish	

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.

FACTON Identity Broker 1	v1.0.0.17311	X
Setup Canceled The setup was canceled by the user.		
Setup Error The setup was canceled by the user. No components were installed.	~	
Log file path: C:\Users\ADMINI~1\AppData\Local\Temp\FACTON_Identity_Broker_1_20170821062850.log	H	
	Close]

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.



5.1.3 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.

FACTON EPC Client Website 9	– × v9.1.0.17277
Initializing Setup	
	Cancel

Initializing the setup



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

FACTON EPC Client Website 9	– × v9.1.0.17277
Setup Action Please choose your setup action.	
Install Install 'FACTON EPC Client Website 9' on this computer.	
	Cancel

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 <u>»Uninstall FACTON«</u> 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 **»l accept the terms ...«** checkbox to accept the terms of the license agreement. Click on Next, to continue the installation.

	FACTON EPC Client Website 9	_ × v9.1.0.17277
	Agreement ad the following License Agreement. You must accept the terms of this agreement before continuing with the	installation.
	FACTON End User License Agreement This End User License Agreement is between FACTON GmbH, a German corporation with its principal place of business at Rudolf-Breitscheid-Str. 187, 14482 Potsdam (hereinafter "FACTON"), and the legal entity that has entered into this Agreement as Licensee (hereinafter "Licensee"). FACTON provides Licensed Programs under several different Brands. Licensee may order licenses for any Licensed Programs by accepting these General Terms. Each party acts	
	exclusively in its own name and on its own behalf with respect to the rights and obligations pursuant to this Agreement.	
	GENERAL TERMS	
	The parties agree as follows:	~
I accept	ot the terms in the license agreement.	
	Back Next	Cancel

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.

FACTON EPC Client Website 9			_ X v9.1.0.17277
Installation Location Specify the path for your installation.			
C:\Program Files\FACTON\FACTON EPC Client Website\			
	Back	Next	Cancel

Specifying an installation location



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

FACTON EPC Client Website 9			– × v9.1.0.17277
FACTON Application Service Connection Specify the MEX Endpoint Address of the FACTON Application Service. FACTON Application Service Endpoint MEX: https://app.domain.local/facton/server/mex e.g. "https:// <servername>:<port>/facton/server/mex</port></servername>			
	Back	Next	Cancel

Spezifying 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.

FACTON EPC Client Website 9			_ × v9.1.0.17277
System Environment Settings Select the System Environment and specify a name for the FACTON insta FACTON System Environment: QA FACTON System Environment Name:	llation.		•
QA Test System The client identifier which is displayed in the status bar.			
	Back	Next	Cancel

Initializing the setup



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

			_ ×
FACTON EPC Client Website 9			v9.1.0.17277
Summary			
The setup is ready to install the following components.			
 Microsoft .NET Framework 4 Client Profile [is already installed] 			v4.0.30319.1
FACTON EPC Client Website 9 [will be installed]			v9.1.0.17277
			_
			_
			_
			_
			_
			_
			_
			_
	Back	Install	Cancel
	DUCK	matem	Cancer

Summary of the installation components



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

FACTON EPC Client Website 9	– × v9.1.0.17277
Installing Please wait while the setup installs the selected components. Installing (98%)	
	Cancel

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.

	FACTON EPC Client Website 9	v9.1.0.1727	× 7
	ompleted sted components have been successfully installed.		
(!)	Microsoft .NET Framework 4 Client Profile The setup package 'Microsoft .NET Framework 4 Client Profile' was not changed.		
•	FACTON EPC Client Website 9 The setup package 'FACTON EPC Client Website 9' was successfully installed.		I
			l
			I
			I
Log file p	ath: C:\Users\rast\AppData\Local\Temp\FACTON_EPC_Client_Website_9_20170825133933.log		ł
		Finish]

Overview about the installed components



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

FACTON EPC Client Website 9	– × v9.1.0.17277
Setup Failed An error due to the installation process occurred.	
S FACTON EPC Client Website 9 Invalid Drive: X\	
Log file path: C:\Users\rast\AppData\Local\Temp\FACTON_EPC_Client_Website_9_20170825134951.log	
	Close

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.



5.1.4 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.

FACTON EPC Configuration Update 9	– × v9.1.0.17277
Initializing Setup	
	Cancel

Initializing the setup



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

FACTON EPC Configuration Update 9	– × v9.1.0.17277
Setup Action Please choose your setup action.	
Install Install 'FACTON EPC Configuration Update 9' on this computer.	
	Cancel

Choosing a setup action

NOTE

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

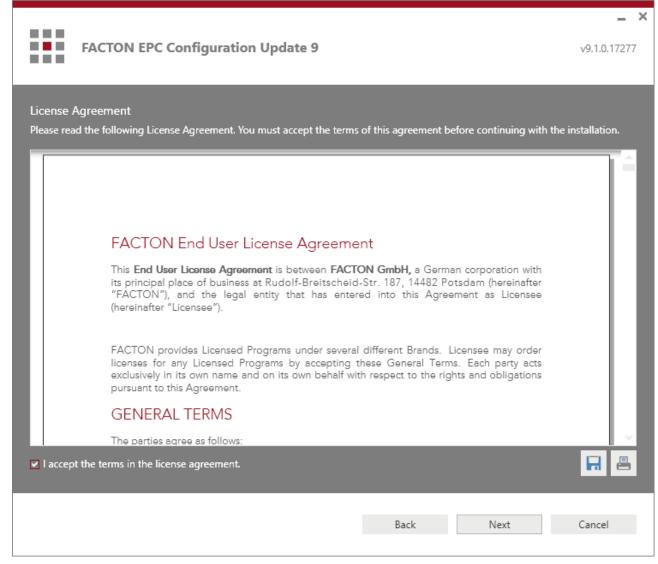
See section <u>»Uninstall FACTON«</u>.

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 **»l accept the terms** ... **«** checkbox to accept the term

Activate the **»I accept the terms ...«** checkbox to accept the terms of the license agreement. Click on **Next** to continue the installation.



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.

FACTON EPC Configuration Update 9		– × v9.1.0.17277
Installation Location Specify the path for your installation.		
C:\Program Files\FACTON\FACTON EPC Configuration Update\		
	Back Next	Cancel

Specifying an installation location



 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.

			_ ×
FACTON EPC Configuration Update 9			v9.1.0.17277
FACTON Database Connection Configuration			
Select the SQL Server, database and login information of the FACTON dat	abase.		
Database Server Name:			
dbserver			
Database Name:			
FACTON			
 Windows Authentication SQL Server Authentication Login: 			
Password:			_
	Back	Next	Cancel
	DACK	Ivext	Cancel

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.

			_ ×
FACTON EPC Configuration Update 9			v9.1.0.17277
Summary The setup is ready to install the following components.			
 Microsoft .NET Framework 4.5.2 [is already installed] 			v4.5.51209.34209
FACTON EPC Configuration Update 9 [will be installed]			v9.1.0.17277
	Back	Install	Cancel

Summary of the installation components



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

FACTON EPC Configuration Update 9	_ × v9.1.0.17277
Installing Please wait while the setup installs the selected components. Installing (91%)	
	Cancel

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.

	FACTON EPC Configuration Update 9	− v9.1.0.17277	×
-	ompleted sted components have been successfully installed.		
(!)	Microsoft .NET Framework 4.5.2 The setup package 'Microsoft .NET Framework 4.5.2' was not changed.		l
•	FACTON EPC Configuration Update 9 The setup package 'FACTON EPC Configuration Update 9' was successfully installed.		l
			l
			l
Log file p	ath: C:\Users\rast\AppData\Local\Temp\FACTON_EPC_Configuration_Update_9_20170825135440.log	H	
		Finish]

Overview about the installed components



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

	_ ×
FACTON EPC Configuration Update 9	v9.1.0.17277
Setup Failed An error due to the installation process occurred.	
FACTON EPC Configuration Update 9	^
Invalid Drive: X:\	
Log file path: C:\Users\rast\AppData\Local\Temp\FACTON_EPC_Configuration_Update_9_20170825140227.log	
	Close

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.



5.1.5 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.



FACTON EPC Client 9	– × v9.1.0.17277
Initializing Setup	
	Cancel

Initializing the setup



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

FACTON EPC Client 9	_ X v9.1.0.17277
Setup Action Please choose your setup action.	
Install Install 'FACTON EPC Client 9' on this computer.	
	Cancel

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 <u>»Uninstall FACTON«</u>.

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.

	FACTON EPC Client 9	_ × v9.1.0.17277
	Agreement ad the following License Agreement. You must accept the terms of this agreement before continuing with the	installation.
	FACTON End User License Agreement	
	This End User License Agreement is between FACTON GmbH , a German corporation with its principal place of business at Rudolf-Breitscheid-Str. 187, 14482 Potsdam (hereinafter "FACTON"), and the legal entity that has entered into this Agreement as Licensee (hereinafter "Licensee").	
	FACTON provides Licensed Programs under several different Brands. Licensee may order licenses for any Licensed Programs by accepting these General Terms. Each party acts exclusively in its own name and on its own behalf with respect to the rights and obligations pursuant to this Agreement.	
	GENERAL TERMS	
	The parties agree as follows:	~
✓ I acce	pt the terms in the license agreement.	
	Back Next	Cancel

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.

FACTON EPC Client 9	– × v9.1.0.17277
Installation Location Specify the path for your installation.	
C:\Program Files\FACTON\FACTON EPC Client\	
	Back Next Cancel

Specifying an installation location



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

FACTON EPC Client 9			– × v9.1.0.17277
FACTON Application Service Connection Specify the MEX Endpoint Address of the FACTON Application Service. FACTON Application Service Endpoint MEX: https://app.domain.local/facton/server/mex e.g. "https:// <servername>:<port>/facton/server/mex"</port></servername>			
	Back	Next	Cancel

Spezifying the Application Service MEX endpoint



6. 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.

FACTON EPC Client 9			– × v9.1.0.17277
FACTON Data Directory Configuration Set the directory that will be used as data directory for the FACTON Clien Set a custom directory for the application data:	ıt.		
If a custom directory is not set, the application data will be stored in the Client.	e application data dire	ctory of the user who	starts the FACTON
	Back	Next	Cancel

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:contended.compression and compression and compr

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

FACTON EPC Client 9			– × v9.1.0.17277
FACTON Client Authentication Settings Configure additional settings for Identity Broker authentication. Use additional authentication callback channel options Port Range User / Group: If additional authentication callback channel options are set, the setup wathenticationcallback/* in the specified port range for the given user of random port without reservation.			
	Back	Next	Cancel

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.

FACTON EPC Client 9			v9.1.0.17277	×
Summary The setup is ready to install the following components.				
 Microsoft .NET Framework 4.5.2 [is already installed] 			v4.5.51209.34209	1
FACTON EPC Client 9 [will be installed]			v9.1.0.17277	
	Back	Install	Cancel	

Summary of the installation components



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

FACTON EPC Client 9	– × v9.1.0.17277
Installing Please wait while the setup installs the selected components. Installing (92%)	
	Cancel

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.

	FACTON EPC Client 9	v9.1.0.1727	×
-	ompleted sted components have been successfully installed.		
(!)	Microsoft .NET Framework 4.5.2 The setup package 'Microsoft .NET Framework 4.5.2' was not changed.		
•	FACTON EPC Client 9 The setup package 'FACTON EPC Client 9' was successfully installed.		
Log file p	ath: C:\Users\ADMINI~1\AppData\Local\Temp\FACTON_EPC_Client_9_20170821052601.log	F	í
		Finish	

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.

FACTON EPC Client 9	– × v9.1.0.17277
Setup Failed An error due to the installation process occurred.	
S FACTON EPC Client 9 Invalid Drive: X-1	
Log file path: C:\Users\ADMINI~1\AppData\Local\Temp\FACTON_EPC_Client_9_20170821052952.log	
	Close

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.



5.2 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.

 \oplus 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.

NOTE

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

FACTON Setup Command Line Parameters

\oplus 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«):

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



5.2.1 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 Applic- ation 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.
ENDPOINT_SERVICE (optional)	Sets the service endpoint address. The default address is »https:// <dnshostname>/facton/server/secured« (e.g. »https://app.domain.local/facton/server/secured«).</dnshostname>
ENDPOINT_MEX (optional)	Sets the MEX endpoint address. The default address is »https:// <dnshostname>/facton/server/mex«.</dnshostname>
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 cer- tificate 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.



Parameter	Description
DB_SERVERNAME	Sets the name of the database server.
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 para- meter is only required in case of Identity Broker authentication.
IDENTITYBROKER_SIGNING_ CERT_THUMBPRINT (optional)	Sets the token-signing certificate thumbprint of the FACTON Iden- tity 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 Iden- tity 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 Ser- vice API OAuth authentication.
API_ENDPOINT_SERVICE (optional)	Sets the endpoint address of the service API. The default address is »https:// <dnshostname>]:443/facton/api/v1«.</dnshostname>
API_OAUTH_ENDPOINT (optional)	Sets the OAuth endpoint address of the STS (e.g. ADFS) that authen- ticates an API user. If no address set, the service API will be use win- dows 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 authen- ticates 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.
API_OAUTH_CERT_ STORELOCATION (optional)	Sets the store location of the OAuth token-signing certificate (»LocalMachine« or »CurrentUser«). The default is »LocalMachine«.



Parameter	Description
	This setting will be ignored if the service API uses Windows authen- tication. It is only required in case of WS-Trust authentication.

FACTON Application Service setup parameters

Examples

\oplus 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:
 - Example command:

```
"FACTON_Application_Service_9.1.0.17277.exe" -silent -log
"Install.log" FACTON_LICENSE_ACCEPTED="yes" SERVICE_
ACCOUNT="domain\FactonApp" SERVICE_PASSWORD="******"
ENDPOINT_
SERVICE="https://app.domain.local/facton/server/secured"
ENDPOINT_MEX="https://app.domain.local/facton/server/mex"
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" API_ENDPOINT_
SERVICE="https://app.domain.local/facton/api/v1"
```



5.2.2 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 pos- sible 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.

FACTON Identity Broker setup parameters



Examples

\oplus 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:
 - 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="https://app.domain.local/facton/identitybroker" DB_
SERVERNAME="dbserver" DB_DATABASENAME="FactonDB" SETTINGS_
FILE="d:\appSettings.json"
```

5.2.3 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 pos- sible 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.



Parameter	Description
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.

FACTON Client Deployment site setup parameters

Examples

 \oplus 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="https://app.domain.local/facton/server/mex" SYSTEM_
ENVIRONMENT="QA"
```



5.2.4 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 pos- sible 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 cli- ent will use Windows Integrated Security.
DB_PASSWORD (optional)	Sets the password of the given database username.

FACTON Configuration Update Client setup parameters

Examples

\oplus 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"

5.2.5 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 pos- sible 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 chan- nel 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	Sets the maximal port number of the FACTON authentication callback chan- nel reservation. This setting will be ignored, if no minimal port number



Parameter	Description
(optional)	given. This parameter is only relevant in case of Identity Broker authen- tication
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

FACTON Client setup parameters

Examples

igoplus 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"

5.3 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:

<APPDATAPATH>\Roaming\FACTON\SystemSettings.ini

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

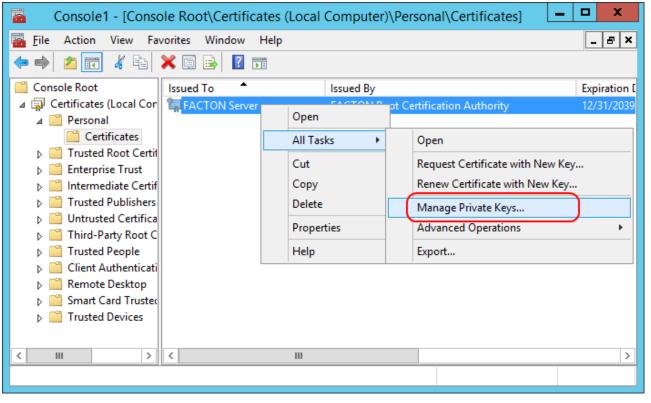


\oplus Make Post Installation Settings

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

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: appdatapathestreaming/factor
- 3. Copy the backup of the persisted columns to the Local directory: <appdatapath>\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 ... (Post Installation Settings & Post Installation Settings)
 - c. Add the user account and allow read access Post Installation Settings.



Post Installation Settings I



Permissions for FACTON Server privation	ite keys 🗙
Security	
<u>G</u> roup or user names:	
SYSTEM	
& Administrators (DOMAIN\Administrators)	
	Demons
A <u>d</u> d	<u>R</u> emove
Permissions for SYSTEM Allow	Deny
Full control	
Read Special permissions	
For special permissions or advanced settings, A	dyanced
click Advanced.	
OK Cancel	Apply

Post Installation Settings II



Permissions for FACTON Server private keys
Security
Group or user names:
SYSTEM
FactonApp (DOMAIN\FactonApp)
A <u>d</u> d <u>R</u> emove
Permissions for FactonApp Allow Deny
Full control
Special permissions
For special permissions or advanced settings, Advanced click Advanced.
OK Cancel <u>A</u> pply

Post Installation Settings III

5.3.1 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.

igodot 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.

5.3.2 Start the Application Service

After the completed installation, start the Application Service.

\oplus 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.



<u>Q</u>	2	Services	_ D X
<u>File</u> <u>A</u> ction <u>V</u> iew	Help		
🎑 Services (Local)	Services (Local)	Name	Decemination
(FACTON Application Service Start the service	DNS Client Encrypting File System (EFS)	Description ^ The DNS Client service (dnscach
	Description: This service provides the functionality	Extensible Authentication P FACTON Application Service Function Discovery Provide	This service provides the functio
	of the FACTON Application Service.	Group Policy Client	
			Provides X.509 certificate and ke Activates and maintains the use
			Provides a mechanism to exchan Provides an interface for the Hyp v
	Extended Standard	< III	>

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 state »Starting« in the Services Overview.





<u>File Action View</u>	/ <u>H</u> elp					
	Q 🐟 🛛 🖓 📷 📄 🕨 🖬 🖬	Þ				
🔍 Services (Local)	Services (Local)	_				
	FACTON Application Service	Name 📩	Description	Status	Startup Type	
		🔍 DNS Client	The DNS Client	Running	Automatic (
	Description:	🔍 Encrypting File System (EFS)	Provides the cor		Manual (Tri	
	This service provides	🌼 Extensible Authentication P	The Extensible A.,_		Manual	
	functionality of the FACTON Application Service.	RACTON Application Service	This service pro	Starting	Automatic	
	Application between	🔍 Function Discovery Provide	The FDPHOST s		Manual	
		🔍 Function Discovery Resourc	Publishes this c		Manual	
		🔍 Group Policy Client	The service is r	Running	Automatic (
		🔍 Health Key and Certificate	Provides X.509		Manual	
		🌼 Human Interface Device Ser	Activates and m		Manual (Tri	
		🔍 Hyper-V Data Exchange Ser	Provides a mech	Running	Manual (Tri	
		鵒 Hyper-V Guest Service Inter	Provides an inte		Manual (Tri	ŀ
		<	III		2	2
	Extended / Standard /					-

Error Mesage II

5.3.3 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.



9,	Service	_ 🗆 X	
<u>F</u> ile <u>A</u> ction <u>V</u> iew <u>H</u>	<u>l</u> elp		
	🗟 🔽 🖬 🕨 💷 💵 🕪		
Services (Local)	Services (Local)		
	FACTON Application Service	Name 📩	Description \land
		🔍 Encrypting File System (EFS)	Provides th
	Stop the service	🔍 Extensible Authentication Protocol	The Extensi
	Restart the service	FACTON Application Service	This service
		🔍 Function Discovery Provider Host	The FDPHO
	Description:	🔍 Function Discovery Resource Publi	Publishes th
	This service provides the functionality	🔍 Group Policy Client	The service
	of the FACTON Application Server.	🧠 Health Key and Certificate Manag	Provides X.5 🗸
		< 111	>
	Extended Standard		
		i i i i i i i i i i i i i i i i i i i	

Navigation Pane in the Service App

5.4 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.

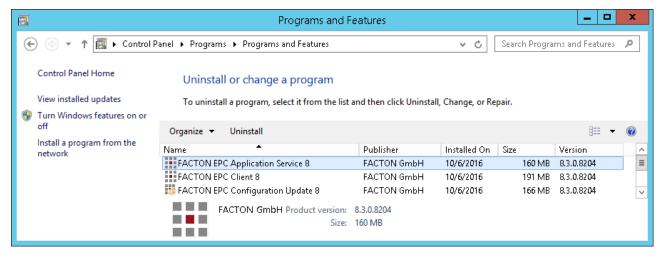
If you want to install an older or newer version, you have to uninstall the installed version first.



5.4.1 Uninstall via Attended Mode

Uninstall FACTON via Attended Mode

1. Use the »Programs and Features« via Windows to uninstall your installed FACTON Components (see Uninstall via Attended Mode).



Windows Programs and Features

Alternatively

1. Double-click on the setup file (e.g. »FACTON_Offline_Client_Website_9.1.0.17277.exe«) to start the uninstallation.

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



FACTON EPC Client Website 9	– × v9.1.0.17277
Initializing Setup	
	Cancel

Initializing the setup



2. A uninstall page opens and shows the executable setup actions. Click on the **»Uninstall...«** setup action. The uninstallation process starts.

FACTON EPC Client Website 9	_ × ∨9.1.0.17277
Setup Action Please choose your setup action.	
Uninstall Uninstall 'FACTON EPC Client Website 9' from this computer.	
	Cancel

Choosing a setup action



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.

FACTON EPC Client Website 9		_ × v9.1.0.17277
Summary The setup is ready to remove the following components.		
 Microsoft .NET Framework 4 Client Profile [is already installed] 		v4.0.30319.1
FACTON EPC Client Website 9 [will be removed]		v9.1.0.17277
Back	Uninstall	Cancel

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.

× _ FACTON EPC Client Website 9 v9.1.0.17277 Setup Completed All requested components have been successfully removed. Microsoft .NET Framework 4 Client Profile (!)The setup package 'Microsoft .NET Framework 4 Client Profile' was not changed. FACTON EPC Client Website 9 The setup package 'FACTON EPC Client Website 9' was successfully removed. H Log file path: C:\Users\ADMINI~1\AppData\Local\Temp\FACTON_EPC_Client_Website_9_20170829012045.log Finish

Overview about the uninstalled components

5. If the installation process failes, a page opens and displays an error message.



5.4.2 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"

\oplus 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"



\oplus 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"

\oplus 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"

igoplus 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 -
uninstall -log "Uninstall.log"
```



6 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.

6.1 Column Store	
6.2 Replacing a SSL Certificate	
6.3 Prefetching	
6.4 Changing SystemSettings.ini	
6.5 Database Purging	
6.5.1 Purging Process	

6.1 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:

```
<APPDATAPATH>\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.

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.

6.2 Replacing a SSL Certificate

Replacing an SSL certificate requires a maintenance window.

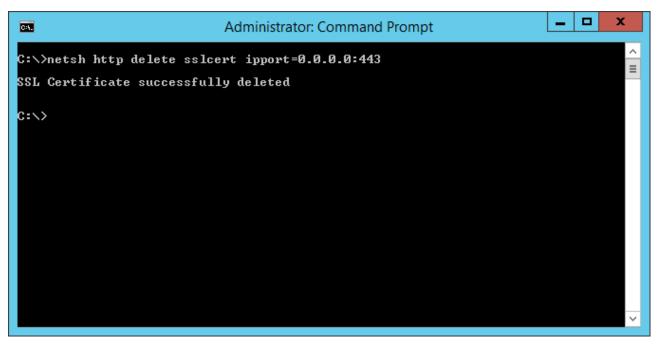
The following preconditions must be fulfilled:

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

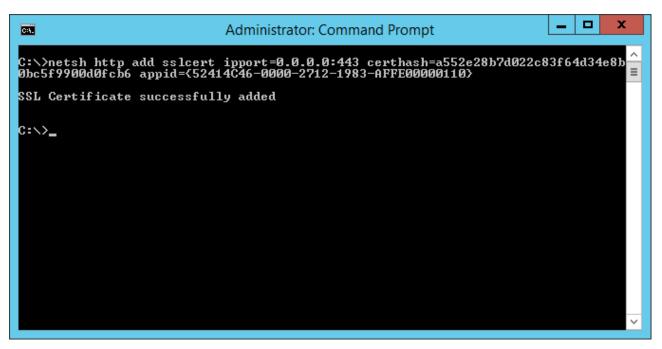
\ominus Replacing an SSL Certificate

- 1. In the Server Manager, stop the **Application Service**.
- 2. Open a **cmd** as administrator.
- 3. Execute the command: 'netsh http delete sslcert ipport=0.0.0.0:443' to unregister the certificate (see figure **Replacing a SSL Certificate**).
- 4. Register the new certificate with the command: netsh http add sslcert ipport=0.0.0.0:443 certhash=<new thumbprint> appid={52414C46-0000-2712-1983-AFFE00000110} (see figure Replacing a SSL Certificate).
- 5. Restart the FACTON Application Services.





Command line to unregister the certificate



Command line to register the new certificate



6.3 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 the current Cost# configuration and queries (custom queries and system internal queries).

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.

6.4 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=10000000000	yes
currentlanguage=1033	no
SpaceBasedIncomingReferencesBlackList=facccccc-2bf6-4e36-84e7-70710baa0101	no



Variable	Customer maintainable
ServerPrefetchingInterval=300	no
MaxConcurrentPrefetchingOperations=1	no
DatabaseValidation=false	no
PublishingTicketTimeout=600	no

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 (10000000000) 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 increases 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 miliseconds) 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.

A IMPORTANT

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

6.5 Database Purging

Purging allows you to permanently delete data from the system. You may purge data of any data that are deleted and unchanged of 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.

6.5.1 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.

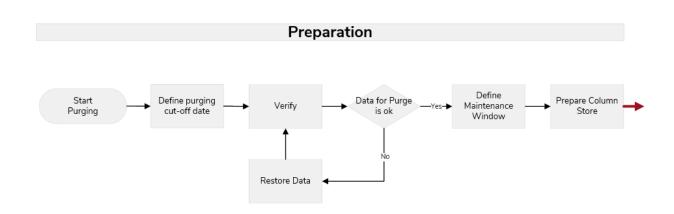
Follow these steps every time a new purging operation is scheduled.

The process itself consists of three phases:

Phase 1: Preparation

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





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 have 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

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.



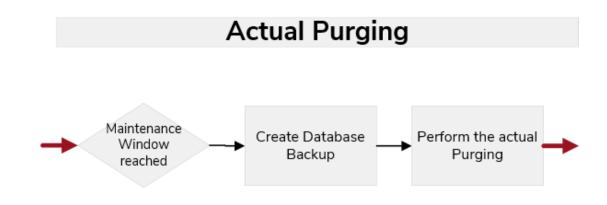
To achieve this, set the purging cut-off date as system setting with the name »PurgingCutOffDate« at all application servers (e.g. »PurgingCutOffDate=2011-01-01«).

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.



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.

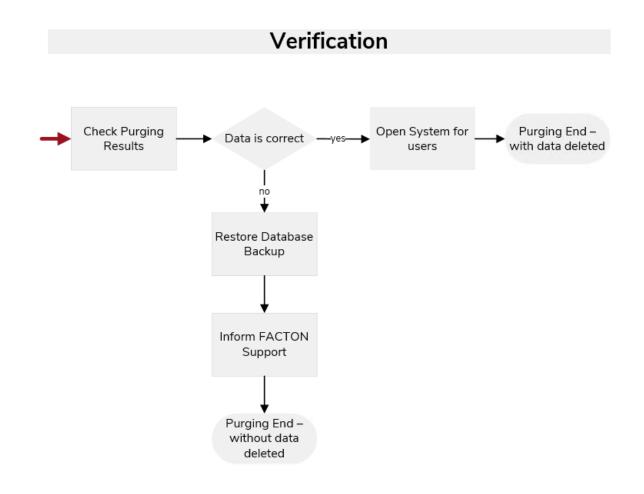
Disable purging

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.





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 the purge result file 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.



7 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.

7.1 Application Server Health Monitoring	
7.2 Event Log	
7.2.1 Save Support Information	
7.2.2 FACTON Application Service	
7.3 Query Monitoring	

7.1 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.

\oplus 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.



Production environment

See the table below to get an overview on the counters that should be monitored in productionenvironments. 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 M	icrosoft .NET Counter - In	tended for support only	
# of Sink Blocks in use	Logging/Monitoring	1 min	Warning: 10,000,000 Error: 50,000,000
Description: Standard M	icrosoft .NET Counter - In	tended 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			
Production Environment: Hea	alth Monitoring Indicators for .N	ET CLR Memory	

.NET Data provider for SQL

Instance: Facton.Infrastructure.Distribution.ServerHosts.WcfWindowsService

Metric Purpose	Sample Rate	Threshold		
NumberOfPooledConnections Logging / Mor	nitoring 1 min	Warning: 50 Error: 80		
Description: The number of established database connections.				
Production Environment: Health Monitoring Indicators for .NET Data provider for SQL				

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



FACTON EPC Database

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

Production Environment: Health Monitoring Indicators for FACTON EPC Database

FACTON EPC Load

Metric	Purpose	Sample Rate	Threshold	
% Outstanding Column Updates	Logging	1 min	-	
-	e number of active outsta es. This is an indicator of	C 1	s a percentage of all out- date will take.	
% Rejected Publishing Operations	Logging / Monitoring	10 min	Warning: average of 10 % over 10 min	
Description: The percer lishing operations per s		ations rejected due to to	oo many concurrent pub-	
Active Column Gen- erations	Logging	1 min	-	
Description: Counts the	e number of active colum	n generations.		
Active Prefetching Actions	Logging	1 min	-	
Description: Counts the	e number of active prefet	ching actions such as pre	efetching queries.	
Active Publishing Operations	Logging	1 min	-	
Description: Counts the	e number of active publis	hing operations.		
Estimated Publishing Duration	Logging / Monitoring	1 min	Warning: 60	
Description: The currently estimated duration of publishing operations in seconds. This value is based on the Publishing Ticket Queue Size counter and the average time required for the repeated val- idation and storage. The time required for the initial validation is not considered. This counter is always updated when a publishing operation is about to start. Its value will remain 0 until the required count of duration samples has been reached.				
Highest Publishing Ticket Waiting Time	Logging	1 min	-	



Metric	Purpose	Sample Rate	Threshold	
Description: The current state of the whole system		r queued publishing tick	ets in seconds. Represents the	
Publishing Duration	Logging / Monitoring	30 min	Warning: average of 60 sec over 30 min and the Pub- lishing Operations Delta > 10	
Description: Measures	the average duration of p	oublishing operations pe	er sample interval in seconds.	
Publishing Operations Delta	Logging / Monitoring	30 min		
Description: Counts the	e number of publishing o	perations since the last s	sample.	
Publishing Ticket Queue Size	Logging	1 min	-	
Description: The size of	f the publishing ticket qu	eue. Represents the state	e 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 "MaxCon- currentPrefetchingOperations"-Limit.				
Rejected Prefetching Operations	Logging / Monitoring	1 min		
Description:Counts the number of rejected prefetching actions since the last sample.				
Rejected Publishing Operations Delta	Logging	1 min		
Description: Counts the number of publishing operations rejected due to too many concurrent pub- lishing operations since the last sample.				

Production Environment: Health Monitoring Indicators for FACTON EPC Load



Memory

Metric	Purpose	Sample Rate	Threshold	
Available MBytes	Logging / Mon- itoring	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.				

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.				
Thread Count	Logging	1 min		
the basic unit of executic running process has at le	on in a processor, and a th	ds currently active in this p read is the object that exe		

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

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.

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 Con- current Calls	Logging Monitoring	5 min	Warning: 80 % longer than 5 min Error: 100 %longer than 5 min



Metric	Purpose	Sample Rate	Threshold
	f calls waiting to be or b ://go.microsoft.com/fwlir	01	spatcher as a percentage of
Percent Of Max Concurrent Sessions	Logging Monitoring	1 min	Warning: 85% Error: 90%
centage of max sessior		essions and messages wa	iting for sessions as a per-
Percent Of Max Concurrent Sessions	Logging Monitoring	1 min	Warning: 85% Error: 90%
centage of max sessior		essions and messages wa	iting for sessions as a per-

Production Environment: Health Monitoring Indicators for ServiceModelService 4.0.0.0

Test environment

In test environments we need all of the production counters along with the following additonal 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 M	1icrosoft .NET Counter - In	tended for support only		

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: Standarc	Microsoft .NET Count	er - Intended for suppo	rt only
# Gen 0 Collections	Logging	1 min	-
Description: Standarc	Microsoft .NET Count	er - Intended for suppo	rt only
# Gen 1 Collections	Logging	1 min	-
Description: Standarc	Microsoft .NET Count	er - Intended for suppo	rt only
# Gen 2 Collections	Logging / Mon- itoring	1 min	Warning: > 1/10 of Gen 1 Collections
Description: Standarc	Microsoft .NET Count	er - Intended for suppo	rt only
# of Pinned Objects	Logging	1 min	-
Description: Standarc	Microsoft .NET Count	er - Intended for suppo	rt only
% Time in GC	Logging / Mon- itoring	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: Standarc	Microsoft .NET Count	er - Intended for suppo	rt only
Test Environment: Health	Monitoring Indicators for .N	IET 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 est	ablished database connec	ctions.	

Test Environment: Health Monitoring Indicators for .NET Data provider for SQL

FACTON EPC Database

Metric	Purpose	Sample Rate	Threshold
Active Purging Oper-	Logging	1 min	
ations	Eogging	1 111111	

7 Monitoring the System



Metric	Purpose	Sample Rate	Threshold
Description: Counts th	ne total number of act	ive purging operations.	
Executed Purging Iter- ations	Logging	1 min	
Description: Counts th	ne total number of exe	ecuted purging iterations wit	thin active purging operations.

Test Environment: Health Monitoring Indicators for FACTON EPC Database

FACTON EPC Load

Metric	Purpose	Sample Rate	Threshold
% Outstanding Prefetch- ing Queries	Logging	1 min	-
Description: Counts the r standing prefetching que		ing prefetching queries as	a percentage of all out-
Expensive Properties Cache Misses / sec	Logging	1 min	
Description: Counts the n Those properties will be		erties per second failed to	read from any cache.
Public State Cache Misses / sec	Logging	1 min	
•	1	nd where reading the pub ulating the value for those	
Queued Prefetching Actions	Logging	1 min	-
Description: Counts the r	number of queued prefetcl	ning actions such as prefet	ching queries.

Test Environment: Health Monitoring Indicators for FACTON EPC Load



7.2 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.

7.2.1 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.
- Click on the File tab ► Information, Save Support Information (). The »FACTON - Save Support Information« dialog opens.
- Enter a file name and click Save.
 The file is saved as a ZIP file.
- 4. Send the file to the FACTON Support Team.

7.2.2 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 ETWproviders under the Faction/EPC category on the server system:

CommonCoreData



DomainEntities

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.

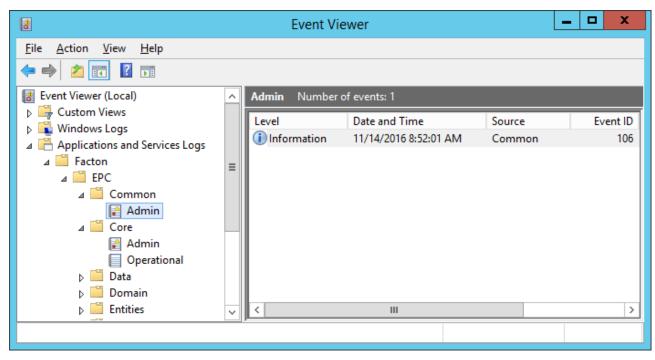
igodot View Messages in the Event Viewer

.....

- 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).



Event Viewer



\oplus 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).

	Log Properties - Admin (Type: Administrative)
General Subscriptions	
<u>F</u> ull Name:	Facton-EPC-Common/Admin
<u>L</u> og path:	%SystemRoot%\System32\Winevt\Logs\Facton-EPC-Common%4Admin.evtx
Log size:	68 KB(69,632 bytes)
Created:	Monday, November 14, 2016 8:49:11 AM
Modified:	Monday, November 14, 2016 8:49:11 AM
Accessed:	Monday, November 14, 2016 8:49:11 AM
✓ Enable logging	
Ma <u>x</u> imum log size (K	B): 1028 🔷
When maximum even	it log size is reached:
	ts as needed (oldest events first)
	when full, do not overwrite events
O Do <u>n</u> ot overwri	te events (Clear logs manually)
	Clea <u>r</u> Log
	OK Cancel Apply

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.

\oplus Open the Task Scheduler

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

Θ 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 Cus**tom 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. An new task is created.
 -



٩		Create Task	x
General Trig	gers Actions Condi	tions Settings	
Na <u>m</u> e:	Example Task		
Location:	١		
Author:	DOMAIN\Administra	tor	
<u>D</u> escription:			
- Security opt			
	ng the task, use the fo dministrator	ollowing user account:	Changes Users on Conver
			Change <u>U</u> ser or Group
	when user is logged o		
	ther user is logged on		
Do n	ot store <u>p</u> assword. Th	e task will only have access to local comput	er resources.
Run w <u>i</u> th	highest privileges		
🗌 Hidd <u>e</u> n	Configure for:	Windows Server 2012 R2	¥
			OK Cancel

Create a New Task



New Trigger	x
Begin the task: On an event	
Settings	
O Basi <u>c</u> <u>N</u> ew Event Filter	
● C <u>u</u> stom	
Adversed at time	
Advanced settings	
Delay tas <u>k</u> for: 15 minutes	
□ Repeat task every: 1 hour ∨ for a duration of: 1 day ∨	
Stop all running tasks at end of repetition duration	
□ Stop task if it runs longer than: 3 days	
□ Activate: 11/14/2016 ■▼ 9:04:24 AM □ Synchronize across time zones	
□ Expire: 11/14/2017 ■ 9:04:24 AM → Synchronize across time zones	
✓ Ena <u>b</u> led	
OK Cancel	

Define a Trigger



	New Event Filter
Filter XML	
Logged:	Any time 🗸
Event level:	Critical <u>W</u> arning Ver <u>b</u> ose
	Error Information
By log	Event logs: Facton-EPC-Common/Admin,Facton-EPC-Co
O By <u>s</u> ource	Event sources:
	es Eve <u>n</u> t IDs: Enter ID numbers and/or ID ranges separated by commas. To type a minus sign first. For example 1,3,5-99,-76
	<all event="" ids=""></all>
<u>T</u> ask category:	
<u>K</u> eywords:	
<u>U</u> ser:	<all users=""></all>
Com <u>p</u> uter(s):	<all computers=""></all>
	Cle <u>a</u> r
	OK Cancel

Define a Custom Event Filter



	New Action	x
You must s	pecify what action this task will perform.	
Act <u>i</u> on: S	end an e-mail (deprecated)	
Settings		
<u>F</u> rom:	FactonAppService@example.com	
<u>T</u> o:	FactonAppAdmin@example.com	
<u>S</u> ubject:	Error on FACTON EPC Application Service 8	
T <u>e</u> xt:]
Attachus]
<u>A</u> ttachm	ent: B <u>r</u> owse	-
SMTP set	r <u>v</u> er: smtp.example.com	
	OK Cancel	

Add an Action to the Event



7.3 Query Monitoring

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

\oplus 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«.

8	Performance	e Monitor	_ 🗆 🗙
No. Eile Action View Window Help	Name		_ & ×
 Monitoring Tools Performance Monitor Data Collector Sets User Defined 		There are no items to show in this vie	
 ▷ System Event Trac Startup Event New View New Window free Reports Refresh Export List 	► om Here	Data Collector Set	
Help		III	>
Create a new Data Collector Set.			

Creating a new Data Collector Set

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



💿 🔕 Create new Data Collector Set.	×
How would you like to create this new data collector	set?
Na <u>m</u> e: Query Monitor	
 Create from a <u>t</u>emplate (Recommended) <u>Create manually (Advanced)</u> 	
Next	Einish Cancel
Data Collector Set creation options	



\varTheta Configure the Data Collector Set

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

x
📀 🔊 Create new Data Collector Set.
What type of data do you want to include?
Oreate data logs
<u>Performance counter</u>
✓ Event trace data
System <u>c</u> onfiguration information
O Performance Counter A <u>l</u> ert
Next <u>F</u> inish Cancel
Data Collector Set with event trace data



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

Which event	trace providers would	you like to enable?
Providers:		
		A <u>d</u> d
		<u>R</u> emove
Proper <u>t</u> ies:		
Property	Value	<u>E</u> dit



3. Select the Facton-EPC-Entities provider.

Event Trace Providers	x
Choose Event Trace Provider:	
Facton-EPC-Common	~
Facton-EPC-Core	
Facton-EPC-Data	
Facton-EPC-Domain	
Facton-EPC-Entities	
Facton-EPC-UI	
Facton-Integration-DataExchange	
FD Core Trace	
FD Publication Trace	
FD SSDP Trace	
FD WNet Trace	
FD WSDAPI Trace	
FDPHost Service Trace	
File Kernel Trace; Operation Set 1	
File Kernel Trace; Operation Set 2	
File Kernel Trace; Optional Data	
File Kernel Trace: Volume To Log	
OK Cancel	

Event trace provider selection



Some of the contract of the con			
Providers:			
_	Facton-EPC-Entities Add <u>R</u> emove		
Proper <u>t</u> ies:			
Property	Value	<u>E</u> dit	
Keywords(Any)	0x4000000000000000		
Keywords(All)	0x900		
Level	0x04		
Properties	0x0000000		
Filter	Disabled		
		Next <u>F</u> inish Cancel	
ored event trace pro	vider II		



4. Select a path to save the trace data.

€ (Create new Data Collector Set.		X
V	Where would you like the data to be	saved?	
	Root <u>d</u> irectory: %systemdrive%\PerfLogs\Admin\Query Monito	17	B <u>r</u> owse
		<u>N</u> ext <u>F</u> inis	h Cancel
ata Co	llector Set store location		



5. Run the **Collector Set** with default rights.

Create the data collec	or set?			
Run as: <default></default>	Chang	ıe		
O Open properties for this	data collector set			
○ <u>S</u> tart this data collector	set now			
Save and close				
			P ² • 1	
		Next	<u>F</u> inish	Cancel



\oplus Configure the Data Collector Set II

-
- 1. Open the **Data Collector Properties** from the set.

0	Performance Monitor			
No File Action View Window Help ← ➡ 2 □ X □ A □ A □	1		_ 8 ×	
 Performance Monitoring Tools Performance Monitor Data Collector Sets 	Name DataCollector01	Type Trace Delete Properties	Output	
 ✓ User Defined ✓ Query Monitor ▷ System Event Trace Sessions ✓ Startup Event Trace Sessions ▷ Reports 		Help		
	<	Ш	>	

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'.



	DataColle	ector01 Prop	perties	x
Trace Providers	Trace Session	Trace Buffers	File	
Session <u>n</u> ame:				_
DataCollector	01			
Clock type:		Preallocate f	file <u>s</u> pace	
Stream mode:		Process mod	le	
File and Real T	īm 🗸	<u>Enabled</u>		
		ОК	Cancel <u>A</u> ppl	у

Data Collector trace session settings

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



DataColle	ector01 Properties	x
Trace Providers Trace Session	Trace Buffers File	
Buffer <u>s</u> ize:	Minimum buffers:	
Elush timer:	Ma <u>x</u> imum buffers:	
	OK Cancel	Apply

Data Collector trace buffers settings

The Data Collector Set is ready to use.



8 ATTACHMENTS

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

8.1 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 entites 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 (defin- end in Cost#) and space (masterdata, 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 and server
dbo	PrivateEntityReference	only used in the client, but available on the server in order to have an identical database scheme on client and server
dbo	PrivateEntityVersion	only used in the client, but available on the server in order to have an identical database scheme on client and server
dbo	PrivatePropertyValue	only used in the client, but available on the server in order to have an identical database scheme on client and 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 and server
dbo	PublicStateVersion	only used in the client, but available on the server in order to have an identical database scheme on client and server
dbo	ReplicationStatus	only used in the client, but available on the server in order to have an identical database scheme on client and server
dbo	SnapshotIndex	only used in the client, but available on the server in order to have an identical database scheme on client and server



Schema	Table	Description
dbo	SpaceIdMapping	mapping table to optimize database size
dbo	SpaceLock	completly locked calculations for user
dbo	SystemInformation	identifier to ensure clients work against the right server (data- base)
dbo	TransactionVersion	the highest version of all entities
dbo	Version	information about created versions like a timestamp and the user
	[Data Dictionary Report Tables

8.2 Data Dictionary Report - Columns

Schema	Table	Number	Column	Datatype	Size	Nullable	InPrimaryKey	IsForeigenKey
dbo	Blob	1	Id	Uniqueldentifi er	16	Ν	Y	Ν
dbo	Blob	2	Size	Int	4	Ν	Ν	Ν
dbo	Blob	3	Data	VarBinaryMax	-1	Y	Ν	Ν
dbo	Blob	4	CreateTime	DateTime	8	Ν	Ν	Ν
dbo	DbVersion	1	Version	BigInt	8	Ν	Y	Ν
dbo	EntityLock	1	EntityId	BigInt	8	Ν	Y	Y
dbo	EntityLock	2	Spaceld	Int	4	Ν	Ν	Y
dbo	EntityLock	3	UserId	Uniqueldentifi er	16	Ν	Ν	Ν
dbo	EntityLock	4	LockTime	DateTime	8	Ν	Ν	Ν
dbo	EntityLock	5	lsCompleteSpace	Bit	1	Ν	Ν	Y



Schema	Table	Number	Column	Datatype	Size	Nullable	InPrimaryKey	lsForeigenKey
dbo	EntityReference	1	ParentVersion	BigInt	8	Ν	Y	Y
dbo	EntityReference	3	ParentId	BigInt	8	Ν	Y	Y
dbo	EntityReference	4	Childld	BigInt	8	Ν	Y	Y
dbo	EntityReference	5	Version	BigInt	8	Ν	Ν	Ν
dbo	EntityReference	6	SameSpace	Bit	1	Ν	Ν	Ν
dbo	EntityReference	7	GroupId	VarChar (60)	60	Ν	Y	Ν
dbo	EntityReference	8	Position	Int	4	Ν	Ν	Ν
dbo	EntityTypeMapping	1	Storeld	SmallInt	2	Ν	Y	Ν
dbo	EntityTypeMapping	2	ConceptualType	VarChar (900)	900	Ν	Ν	Ν
dbo	EntityVersion	1	Version	BigInt	8	Ν	Y	Y
dbo	EntityVersion	2	Id	BigInt	8	Ν	Y	Y
dbo	EntityVersion	3	EntityType	SmallInt	2	Ν	Ν	Y
dbo	EntityVersion	4	SignatureId	SmallInt	2	Ν	Ν	Y
dbo	EntityVersion	5	Spaceld	Int	4	Ν	Ν	Y
dbo	EntityVersion	6	Deleted	Bit	1	Ν	Ν	Ν
dbo	IdMapping	1	Storeld	BigInt	8	Ν	Y	Ν
dbo	IdMapping	2	ConceptualId	VarChar (4000)	4000	Ν	Ν	Ν
dbo	IdMapping	3	ConceptualIdHash	Char (12)	12	Y	Ν	Ν
dbo	MetadataltemId Mapping	1	Storeld	SmallInt	2	Ν	Y	Ν
dbo	MetadataltemId Mapping	2	ConceptualId	Uniqueldentifi er	16	Ν	Ν	N



Schema	Table	Number	Column	Datatype	Size	Nullable	InPrimaryKey	IsForeigenKey
dbo	PrivateEntity	1	Id	BigInt	8	Ν	Y	Y
dbo	PrivateEntity	2	EntityType	SmallInt	2	Ν	Ν	Y
dbo	PrivateEntity	3	SignatureId	SmallInt	2	Ν	Ν	Y
dbo	PrivateEntity	4	Spaceld	Int	4	Ν	Ν	Y
dbo	PrivateEntityReferen ce	1	Sourceld	BigInt	8	Ν	Y	Y
dbo	PrivateEntityReferen ce	2	TargetId	BigInt	8	Ν	Y	Y
dbo	PrivateEntityReferen ce	4	Version	BigInt	8	Ν	Ν	N
dbo	PrivateEntityReferen ce	5	GroupId	VarChar (60)	60	Ν	Y	N
dbo	PrivateEntityReferen ce	6	Position	Int	4	Ν	Ν	N
dbo	PrivateEntityVersion	1	Id	BigInt	8	Ν	Y	Y
dbo	PrivateEntityVersion	2	Version	BigInt	8	Ν	Ν	Ν
dbo	PrivateEntityVersion	9	FirstVersion	BigInt	8	Ν	Ν	Ν
dbo	PrivateEntityVersion	10	Deleted	Bit	1	Ν	Ν	Ν
dbo	PrivateEntityVersion	11	PublishingPending	Bit	1	Ν	Ν	Ν
dbo	PrivatePropertyValue	1	Id	Uniqueldentifi er	16	Ν	Y	N
dbo	PrivatePropertyValue	2	EntityId	BigInt	8	Ν	Y	Y
dbo	PrivatePropertyValue	3	Value	NVarCharMax	-1	Ν	Ν	Ν



Schema	Table	Number	Column	Datatype	Size	Nullable	InPrimaryKey	IsForeigenKey
dbo	PropertyValue	1	ld	Uniqueldentifi er	16	Ν	Y	N
dbo	PropertyValue	2	EntityVersion	BigInt	8	Ν	Y	Y
dbo	PropertyValue	3	Value	NVarCharMax	-1	Ν	Ν	Ν
dbo	PropertyValue	4	EntityId	BigInt	8	Ν	Y	Y
dbo	PublicStateProperty Value	1	Id	Uniqueldentifi er	16	Ν	Y	N
dbo	PublicStateProperty Value	2	PublicStateId	BigInt	8	Ν	Y	Y
dbo	PublicStateProperty Value	3	PublicStateVersion	BigInt	8	Ν	Y	Y
dbo	PublicStateProperty Value	4	Value	NVarCharMax	-1	Ν	Ν	N
dbo	PublicStateProperty Value	5	Attributes	Int	4	Ν	Ν	N
dbo	PublicStateVersion	1	Id	BigInt	8	Ν	Y	Y
dbo	PublicStateVersion	2	Version	BigInt	8	Ν	Y	Ν
dbo	PublicStateVersion	3	Snapshot	BigInt	8	Ν	Ν	Ν
dbo	PublishingTicket	1	Id	BigInt	8	Ν	Y	Ν
dbo	PublishingTicket	2	HostName	NVarChar (256)	256	Ν	Ν	Ν
dbo	PublishingTicket	3	UserName	NVarChar (100)	100	Ν	Ν	Ν
dbo	PublishingTicket	4	CreateTime	DateTime	8	Ν	Ν	Ν
dbo	PublishingTicket	5	LastHeartbeat	DateTime	8	Ν	Ν	Ν



Schema	Table	Number	Column	Datatype	Size	Nullable	InPrimaryKey	IsForeigenKey
dbo	ReplicatedSnapshot	1	ReplicationStatusId	Uniqueldentifi er	16	Ν	Y	Y
dbo	ReplicatedSnapshot	2	Snapshot	BigInt	8	Ν	Y	Ν
dbo	ReplicationStatus	1	Id	Uniqueldentifi er	16	Ν	Y	N
dbo	ReplicationStatus	2	ReplicationSpecificati on	NVarCharMax	-1	Ν	Ν	N
dbo	SnapshotIndex	1	Id	BigInt	8	Ν	Y	Y
dbo	SnapshotIndex	2	Version	BigInt	8	Ν	Y	Y
dbo	SnapshotIndex	3	Snapshot	BigInt	8	Ν	Ν	Ν
dbo	SpaceIdMapping	1	Storeld	Int	4	Ν	Y	Ν
dbo	SpaceIdMapping	2	ConceptualId	Uniqueldentifi er	16	Ν	Ν	N
dbo	SpaceLock	1	Spaceld	Int	4	Ν	Y	Y
dbo	SpaceLock	2	UserId	Uniqueldentifi er	16	Ν	Ν	N
dbo	SpaceLock	3	LockTime	DateTime	8	Ν	Ν	Ν
dbo	SpaceLock	4	IsCompleteSpace	Bit	1	Ν	Y	Ν
dbo	SystemInformation	1	Id	NVarChar (200)	200	Ν	Y	Ν
dbo	SystemInformation	2	Value	NVarChar (4000)	4000	Ν	Ν	N
dbo	TransactionVersion	1	Name	NVarChar (10)	10	Ν	Y	Ν
dbo	TransactionVersion	2	Version	BigInt	8	Ν	Ν	Ν

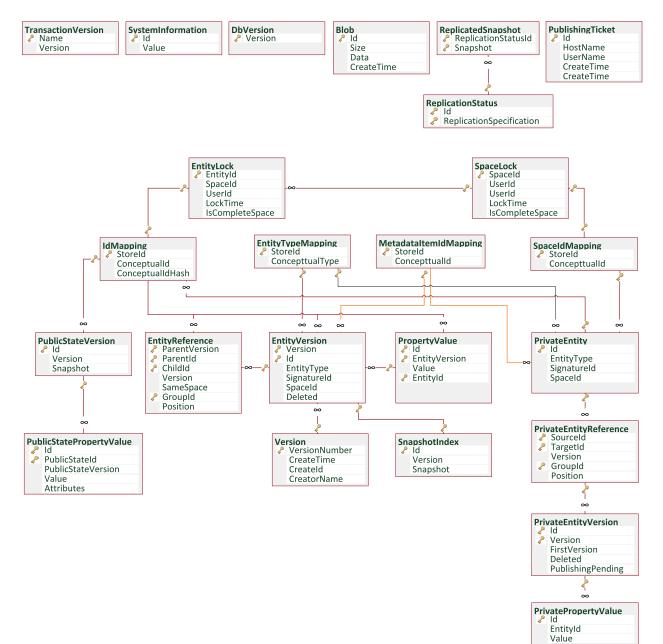


Schema	Table	Number	Column	Datatype	Size	Nullable	InPrimaryKey	lsForeigenKey
dbo	Version	1	VersionNumber	BigInt	8	Ν	Y	Ν
dbo	Version	2	CreateTime	DateTime	8	Ν	Ν	Ν
dbo	Version	3	Creatorld	Uniqueldentifi er	16	Ν	Ν	N
dbo	Version	4	CreatorName	NVarChar (100)	100	Ν	Ν	Ν

Data Dictionary Report Columns



8.3 Data Dictionary Report - Database Diagram



8.4 FACTON Event Logs

Parameter Va	alue
Source Level: Co	acton-EPC-Common/Admin ommon rror



Parameter	Value
Task Category: Log Message: Instruction:	AdminError Could not publish cost# entity. [DETAILED INFORMATION] Fix the issue shown in the detailed information of the message.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	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 oper- ation of the application server, contact your FACTON support in this case.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	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.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	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: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Common/Admin Common Warning 31 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.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction: Log Name:	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



Parameter	Value
Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Common Warning 32 AdminWarning Caught exception while executing action. (Method declared in:) Retrying. Waiting ms [EXCEPTION] Uncritical warning - no action required.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	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.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	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.
Log Name: Source Level: 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.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Common/Admin Common Warning 32 AdminWarning Could not check out Cost# entity.
Instruction:	The Cost# template is still checked out by another user. Wait until the other user has checked in.
Log Name:	Facton-EPC-Common/Admin



Parameter	Value
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Errors in Cost# entity to activate:
Instruction:	Check and fix the Cost# template.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Could not compile predicate part of rule. Errors:
Instruction:	Can be fixed by correcting or removing the query.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Could not compile validation query for rule. Errors:
Instruction:	Can be fixed by correcting or removing the query.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Didn't find a rule factory for line:
Instruction:	Remove the integrity rule that causes the issue.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Expecting 2 amounts of generation numbers instead of Using default.
Instruction:	Check and fix your issues in the SystemSettings.ini file.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Wrong number of thresholds given. Using default.
Instruction:	Check and fix your issues in the SystemSettings.ini file.
Log Name:	Facton-EPC-Common/Admin



Parameter	Value
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	A replace operation on a filtered list is not properly supported.
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	A move operation on a filtered list is not properly supported.
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	A replace operation on a sorted list is not properly supported.
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	A move operation on a sorted list is not supported.
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Binding was no WSHttpBindingBase as expected.
Instruction:	Might be temporary or can be fixed by checking the client/server communication configuration.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Common/Admin Common Warning 32 AdminWarning There was an error sending a message. Something with tokens. Maybe the server did not accept the public key thumbprint.



Parameter	Value
Instruction:	Might be temporary or can be fixed by checking the client/server communication configuration.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Common/Admin Common Warning 32 AdminWarning The maximum number of communication retrys has been reached.
Instruction:	Might be temporary or can be fixed by checking the client/server communication configuration.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Common/Admin Common Warning 32 AdminWarning An exception occurred while executing a request [EXCEPTION]
Instruction:	Might be temporary or can be fixed by checking the client/server communication configuration.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Common/Admin Common Warning 32 AdminWarning Possible HTTP Proxy Exception that did not have a HttpWebResponse as response. - [EXCEPTION]
Instruction:	Might be temporary or can be fixed by checking the client/server communication configuration.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Common/Admin Common Warning 32 AdminWarning No basic proxy authentication credentials given by the user. Uncritical warning - no action required.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Common/Admin Common Warning 32 AdminWarning Trying to set default proxy credentials that are already set. Uncritical warning - no action required.



Parameter	Value
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	SingleOrDefault used in GetParentCollection() for entity: ().
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Found duplicate entities from Entity Store in partition, snapshot with ids
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Could not delete corrupted column cache file "". Please delete it manually.
Instruction:	The requested file has to be deleted manually.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Cannot get query information to key '' from query information list.
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	The key '' cannot remove from the query information list.
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Shutting down. Now.
Instruction:	Uncritical warning - no action required.



Parameter	Value
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Shutting down on error. ExitCode:
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Converting '' failed, because attempted to divide by zero.
Instruction:	Contact your Master Data Configurator to fix the exchange rate definition.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Converting '' to '' failed, because of:
Instruction:	No further action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	TransactionalPersist failed. We now retry the current persist operation.
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Unexpected current version after save: NextVersion: ActualNextVersion:
Instruction:	Uncritical warning - no action required.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Common/Admin Common Warning 32 AdminWarning Concurrent transaction detected: Actual transaction number is Last committed transaction number is Uncritical warning - no action required.



Parameter	Value
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Common/Admin Common Warning 32 AdminWarning Publishing failed. There are too many parallel transactions. ErrorCode: MaxConcurrentPublishingOperationsExceeded
Instruction:	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.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Common/Admin Common Warning 32 AdminWarning Publishing failed. There are too many parallel transactions. ErrorCode: PublishingTimeout
Instruction:	(obsolete, see the 'PublishingTimeout' (ID 301) message for more details) If this mes- sage occurs frequently this indicates there is a high publishing rate. Please check whether this is expected or whether the configured publishing timeout is correct.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Common/Admin Common Warning 32 AdminWarning Publishing failed. There are too many parallel transactions. ErrorCode: MaxEstimatedPublishingDurationExceeded
Instruction:	If this message occurs frequently this indicates there is a high publishing rate. Please check whether this is expected or whether the configured maximum estim- ated publishing duration is correct.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Common/Admin Common Warning 32 AdminWarning Publishing failed. There are too many parallel transactions. ErrorCode: InitialValidationTimeout
Instruction:	If this message occurs frequently this indicates there is a high publishing rate. Please check whether this is expected or whether the configured initial validation timeout is correct.



Parameter	Value
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Common/Admin Common Warning 32 AdminWarning Publishing failed. There are too many parallel transactions. ErrorCode: MaxRetriesReached
Instruction:	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.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Check privileges failed: [DETAILED INFORMATION]
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	PersistChanges was called with no changed targets to persist.
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	There was a problem converting the group: to an NTAccount.
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Could not add claims to role. Role is not a predefined role.
Instruction:	Can be fixed by correcting the role assignments text.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32



Parameter	Value
Task Category:	AdminWarning
Log Message:	No log on permission found.
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Could not read settings file: Reason: [EXCEPTION]
Instruction:	Check file system or access rights.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Could not write file or create directory for: Exception: [EXCEPTION]
Instruction:	Check file system or access rights.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	The invalid character at setting-line has been removed.
Instruction:	Will be fixed automatically and does not require any action.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	The command line argument: was not recognized.
Instruction:	Check the command line parameters or the settings file and remove the invalid line.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Application.Current not set. This might be ok for tests.
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning



Parameter	Value
Event ID:	32
Task Category:	AdminWarning
Log Message:	Shutting down on error. ExitCode:
Instruction:	Uncritical warning - no action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Caught metadata instantiation exception while parsing a unit:
Instruction:	No further action required.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	The current map was null.
Instruction:	Recover backup of database. If problem persists, contact FACTON support.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning
Event ID:	32
Task Category:	AdminWarning
Log Message:	Malformed XML in server cost sharp map:
Instruction:	Recover backup of database. If problem persists, contact FACTON support.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	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
Instruction:	The specified performance counter will not be instantiated and thus cannot be mon- itored. (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 pro- cess to end before starting the service again to avoid this problem.
Log Name:	Facton-EPC-Common/Admin
Source Level:	Common
Level:	Warning



Parameter	Value
Event ID: Task Category: Log Message:	101 BlobWarningVirusScanFailed The virus scan has failed. Please check the virus scanner as well as the configuration file.
Instruction:	Please check the virus scanner as well as the configuration file.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Common/Admin Common Error 102 BlobErrorVirusFound The file uploaded by the Client contains a virus. It has not been stored in the data- base and it has been deleted from the quarantine folder. Please follow the instruc- tions of your company corresponding to an infected file on a client.
Instruction:	Please follow the instructions of your company corresponding to an infected file on a client.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Common/Admin Common Warning 103 BlobWarningVirusScanProgramNotFound The program for the virus scan has not been found. Please check the installation dir- ectory of the virus scanner and adjust the configuration file where applicable.
Instruction:	Please check the installation directory of the virus scanner and adjust the con- figuration file where applicable.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Common/Admin Common Warning 104 BlobWarningVirusScanQuarantineDirectoryNotFound 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.
Instruction:	Please review the quarantine folder of the virus scanner and adjust the con- figuration file where applicable
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	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.



Parameter	Value
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	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.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Common/Admin Common Warning 200 MetadataDynamicIndexFillLevelWarning The dynamic index cache is half-full. Please contact the FACTON support. Please contact the FACTON support.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Common/Admin Common Warning 300 PerformanceCounterInstallationFailed Unable to install the FACTON performance counters. To install them run this application with administrator privileges once. To install them run this application with administrator privileges once.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Common/Admin Common Error 400 InternalServerError An unhandled exception has occurred in your FACTON application server. Please contact the FACTON support. Exception detail information: Correlation Id: Exception type: Exception message: Please contact the FACTON support.
Log Name: Source Level: Level: Event ID: Task Category: Log 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 FACTON



Parameter	Value
Instruction:	configurator. Check setting in SystemSettings.ini for FACTON Server.
Log Name:	Facton-EPC-Data/Admin
Source Level:	Data
Level:	Warning
Event ID:	108
Task Category:	IndexFragmentationRebuild
Log Message:	Index '' on table '' has a fragmentation of percent. Rebuild required.
Instruction:	The database should be rebuilt. Please contact your database administrator.
Log Name:	Facton-EPC-Data/Admin
Source Level:	Data
Level:	Warning
Event ID:	109
Task Category:	IndexFragmentationReorganize
Log Message:	Index '' on table '' has a fragmentation of percent. Reorganization required.
Instruction:	The database should be reorganized. Please contact your database administrator.
Log Name:	Facton-EPC-Data/Admin
Source Level:	Data
Level:	Error
Event ID:	110
Task Category:	DuplicateIdDetected
Log Message:	Duplicate id detected: Please contact the FACTON support.
Instruction:	Please contact the FACTON support.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Data/Admin Data Error 111 EntityDefinitionOfEntitiesChanged Entity definition (EntityType, SignatureId, SpaceId) was changed in history of the entities: Please contact the FACTON support. Please contact the FACTON support.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Data/Admin Data Warning 113 IdMappingPreloadingNotPossibleCacheMissing Preloading id mapping is not possible because it is no id mapping cache registered at the context. Activate id mapping cache and restart application. Activate id mapping cache and restart application.
Log Name:	Facton-EPC-Data/Admin
Source Level:	Data
Level:	Warning



Parameter	Value
Event ID: Task Category: Log Message: Instruction:	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 con- figuration. Please contact the FACTON configurator. Please contact the FACTON configurator.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	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 con- figuration. Please contact the FACTON configurator. Please contact the FACTON configurator.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Data/Admin Data Warning 116 UnknownProperty Property with Id exists in database but not in current metadata. It's ignored. This could be caused by changing the configuration. Please contact the FACTON con- figurator. Please contact the FACTON configurator.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Data/Admin Data Error 117 DatabaseConnectionFailed 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.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Data/Admin Data Error 118 IndexMissing The index '' on the table '' is missing. Please contact the FACTON support. Please contact the FACTON support.
Log Name: Source Level: Level:	Facton-EPC-Data/Admin Data Error



Parameter	Value
Event ID: Task Category: Log Message: Instruction:	127 PredefinedMappingHasWrongIndex Predefined mapping, which is part of database table '', is mapped to a wrong index. This can have a negative impact on the performance of the system. Please contact the FACTON support. Further information: Mapped conceptual value: Expected store id: Actual store id: Please contact the FACTON support.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Data/Admin Data Error 128 InvalidTransactionVersion The transaction version does not have a corresponding version entry. Please contact the FACTON support. Please contact the FACTON support.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Data/Admin Data Error 129 ReleaseAllEntityLocksExceptLimitReached 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 '' must publish or discard his changes and then release all locks manually. To get the user name run the following FQL query in FACTON: SELECT Fac- tonUserName FROM TYPE FactonUser, SPACE SYSTEM WHERE _Id=""
Instruction:	Please run the FQL query of the log message to get the user name who must pub- lish or discard his changes and contact him to do it.
Log Name: Source Level: Level: Event ID:Task Category: Log Message:	Facton-EPC-Data/Admin Data Error 130 ReleaseAllSpaceLocksExceptLimitReached 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 '' must publish or discard his changes and then release all locks manually. To get the user name run the following FQL query in FACTON: SELECT FactonUserName FROM TYPE FactonUser, SPACE SYSTEM WHERE _ Id=""
Instruction:	Please run the FQL query of the log message to get the user name who must pub- lish or discard his changes and contact him to do it.
Log Name:	Facton-EPC-Data/Admin



Parameter	Value
Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Data Error 131 HostNameLengthExceeded The host name '' exceeds the size of and will be truncated. Please contact the FACTON support. Please contact the FACTON support.
Log Name:	Facton-EPC-Data/Admin
Source Level:	Data
Level:	Error
Event ID:	133
Task Category:	PurgingCutoffDateHasNotBeenDefined
Log Message:	Purging cut-off date has not been defined.
Instruction:	Specify cut-off date system setting.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Data/Admin Data Error 134 CannotParsePurgingCutoffDate Cannot parse purging cut-off date. Specify a cut-off date using the format 'yyyy-MM-dd' or as UTC time using ISO 8610.
Log Name:	Facton-EPC-Data/Admin
Source Level:	Data
Level:	Error
Event ID:	135
Task Category:	CutoffDateMustUtcOrOffsetOfUtc
Log Message:	The purging cut-off date must be defined as UTC or as offset of UTC.
Instruction:	Use UTC or offset of UTC.
Log Name:	Facton-EPC-Data/Admin
Source Level:	Data
Level:	Error
Event ID:	136
Task Category:	CannotFindSnapshotForCutoffDate
Log Message:	Cannot find any snapshot for specified cut-off date.
Instruction:	Define another cut-off date or contact FACTON support.
Log Name:	Facton-EPC-Data/Admin
Source Level:	Data
Level:	Error
Event ID:	137
Task Category:	CutoffDateInIsRangeThatHasBeenAlreadyPurged
Log Message:	The specified cut-off date is in a range that has been already purged.
Instruction:	Specify a valid cut-off date.



Parameter	Value
Log Name:	Facton-EPC-Data/Admin
Source Level:	Data
Level:	Error
Event ID:	138
Task Category:	CannotCreatePurgeResultFile
Log Message:	Cannot create purge result file.
Instruction:	Please ensure that you have write privileges on your local application directory.
Log Name:	Facton-EPC-Data/Admin
Source Level:	Data
Level:	Informational
Event ID:	139
Task Category:	PurgeResultFileHasBeenWritten
Log Message:	The purge result has been written.
Log Name:	Facton-EPC-Data/Admin
Source Level:	Data
Level:	Informational
Event ID:	140
Task Category:	PurgingStarted
Log Message:	The purging operation has started.
Log Name:	Facton-EPC-Data/Admin
Source Level:	Data
Level:	Informational
Event ID:	141
Task Category:	PurgingFinished
Log Message:	The purging operation has finished.
Log Name:	Facton-EPC-Domain/Operational
Source Level:	Domain
Level:	Warning
Event ID:	100
Task Category:	CostSharpFreezingDisabled
Log Message:	Cost# freezing is disabled. Please contact the FACTON support.
Instruction:	Please contact the FACTON support.
Log Name:	Facton-EPC-Entities/Admin
Source Level:	Entities
Level:	Error
Event ID:	400
Task Category:	NoDiskSpaceAvailable
Log Message:	No more disk space available - get more disk space.
Instruction:	Get more disk space.
Log Name:	Facton-EPC-Entities/Admin
Source Level:	Entities
Level:	Error



Parameter	Value
Event ID: Task Category: Log Message: Instruction:	401 NoWriteAccess Could not write to application directory check file system or access rights. Check file system or access rights.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Entities/Admin Entities Error 402 ErrorInaccessibleFile Could not access file check if file is in use by another process, or contact your FACTON support. Check if the file is in use by another process, or contact your FACTON support.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	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.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	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 FACTON administrator. Please contact the FACTON administrator.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Entities/Operational Entities Warning 203 StartPrefetchingFailed The start of the prefetching in snapshot is failed (Reason: ''). Please contact the FACTON support.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Entities/Operational Entities Warning 204 PrefetchingSnapshotConfigured 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 FACTON configurator. Check setting in SystemSettings.ini for FACTON Server.



Parameter	Value
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Entities/Operational Entities Warning 300 PublishingTicketTimeout 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 FACTON-Server on machine '' is still running and has connection to the database or whether the configured timeout value is large enough.
Instruction:	Check that the FACTON-Server on machine '' is still running and has connection to the database or whether the configured timeout value is large enough.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Entities/Operational Entities Warning 301 PublishingTimeout A publishing request on machine '' by user '' has exceeded the maximum dur- ation of seconds. Check whether the frequency of publishing requests can be decreased or whether the configured publishing timeout should be increased.
Instruction:	Check whether the frequency of publishing requests can be decreased or whether the configured publishing timeout should be increased.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Entities/Operational Entities Warning 403 WarnInaccessibleFile File is currently accessed by another process. Check if the file is in use by another process, or contact your FACTON support.
Log Name: Source Level: Level: Event ID: Task Category: Log Message: Instruction:	Facton-EPC-Entities/Operational Entities Warning 405 CorruptedFile File is corrupt and will be deleted Uncritical warning - no action required.
Log Name: Source Level: Level: Event ID: Task Category: Log Message:	Facton-EPC-Entities/Operational Entities Warning 800 WarnQueryCompileError Could not parse the defined query ''and will be ignored. Parsing errors:



Parameter	Value
Instruction:	Please contact the FACTON support.

FACTON Event Logs