SEALSYSTEMS
THE DIGITAL PAPER FACTORY

SEALService

System Description

Version 2.0.0

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SEAL Systems

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Contents

1 Introduction

functionality

With SEALService from SEAL Systems, you start processes and process chains (for example, CAD applications or databases) at a specific time or event (for example, when booting the server) and in the background without interactive user logon.

Windows service

SEALService is a Windows service that is running under the local system account and that is started automatically.

command

In the configuration interface, you specify the commands and command chains, for example, the user under which the command will be started or the environment required by the command.

purpose

This documentation describes the installation, configuration, and usage of SEALService.

target group

This documentation is intended for use by administrators who want to install and use SEALService.

in this chapter

This chapter deals with the following topics:

Conventions in this Documentation

path specification

The path information given in this documentation is relative to the installation directory of SEALService.

typography

The following table lists the typographical conventions employed in this documentation for file names, paths, variables, etc.

Typographical Convention	**Meaning**
Courier	File names, paths, commands, menu items, keywords, special values, short scripts and examples
Courier italic	Parameters; variables that must be replaced by current values
`Courier small`	More extensive scripts and examples

Overview of Contents

structure

This documentation has two parts: a description and a reference. The first part describes the functionality and the installation of using figures, step-by-step-procedures and explanatory texts. The second part serves as a detailed reference work containing configuration settings, keywords etc.

description

The description deals with the following topics:

Chapter 2, *Requirements*, page 7, lists the requirements for the installation and the usage of SEALService.

Chapter 3, *Installation, Migration and Uninstallation*, page 14, describes how to install and uninstall SEALService and how to migrate from an already existing installation to an new version.

Chapter 4, *Configuration*, page 25, explains the basic configuration possibilities of SEALService and how to work with the configuration interface.

Chapter 5, *Extended Configuration*, page 49, describes the advanced configuration possibilities.

Chapter 6, *Information Sources and Tips*, page 54, describes where to find information about the processing in SEALService and provides solutions to some error situations.

Chapter 7, *Background Knowledge*, page 69, explains some basic processes in SEALService.

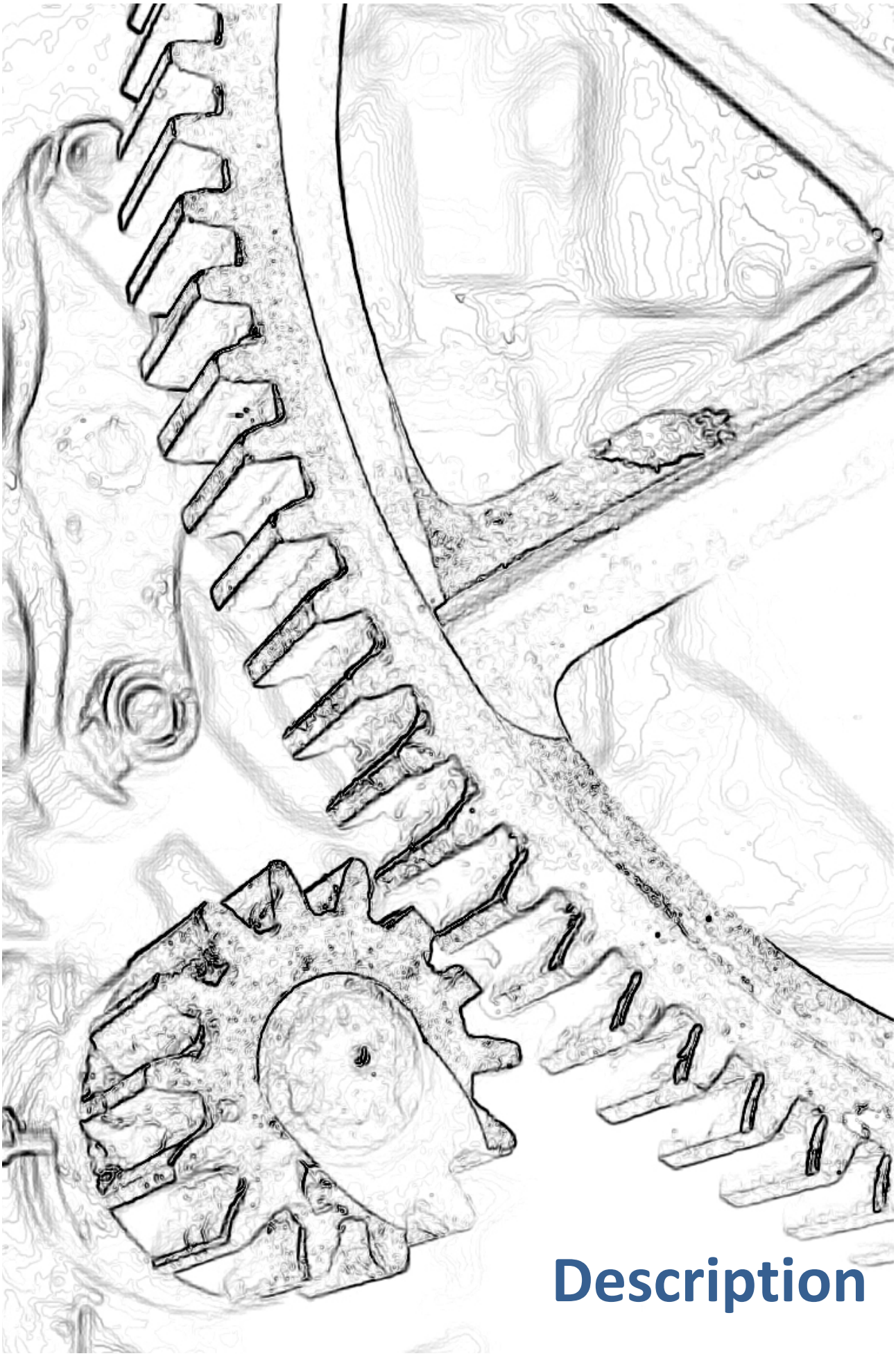
reference

The reference contains the following chapter:

- Chapter 8, *sealexecute.exe - Reference*, page 79, with a description of `sealexecute.exe` and its parameters.

lists

At the end of the documentation, a terminology list, abbreviation list and index are included.



Description

2 Requirements

This chapter deals with the following topics: in this chapter

Supported Platforms

supported platforms

SEALService is supported on the following platforms:

- Windows systems as of Windows XP/Windows Server 2003

Hardware Requirements

The current minimal requirements concerning the hardware are described on the following website of SEAL Systems:

hardware requirements

http://www.sealsystems.com/service/hard-software

User

installation

For the installation, migration and the uninstallation of SEALService, a local user with administrator privileges is required.

configuration

The users specified in the configuration of SEALService, must be configured as interactive users in the Windows system because they cannot start processes otherwise. The users must be valid and active.

command

If additional privileges are required by the command started via SEALService, the user specified for this command must have these privileges.

 hint - name

The user name and the server name must be different.

User Group SEAL Systems User

The user group `SEAL Systems User` is created by SEALService at the installation.

user group

When installing SEALService, the user executing the installation and the user specified as default user during the installation are entered into the user group `SEAL Systems User`.

user

The user group `SEAL Systems User` must be configured on the local server.

 hint - local

Only members of the user group `SEAL Systems User` are allowed to configure SEALService and to start processes via SEALService.

 hint - privileges

Network Drives

available

For the network drives to be available in SEALService, the following conditions apply:

- The user can use the network drives which were mounted via the Windows explorer persistently, that means the network drives which are saved in the Registry.
- The network drives which were mounted via `netuse` can be used when using single sign-on. For multiple sign on, it depends on if the user token which were generated at the first logon and then reused (still) knows the network drives.
- The persistent mounted Windows network drives under another user account must once be mounted manually in the Windows explorer in order that the password is saved to the password safe of Windows. `netuse` does not write the password to the password safe.
- Other network drives than Windows, for example, Novell network drives, cannot be mounted.

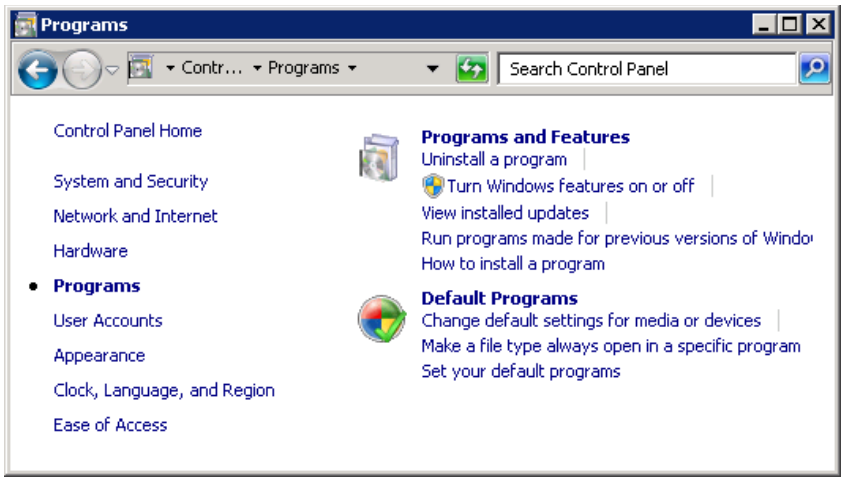
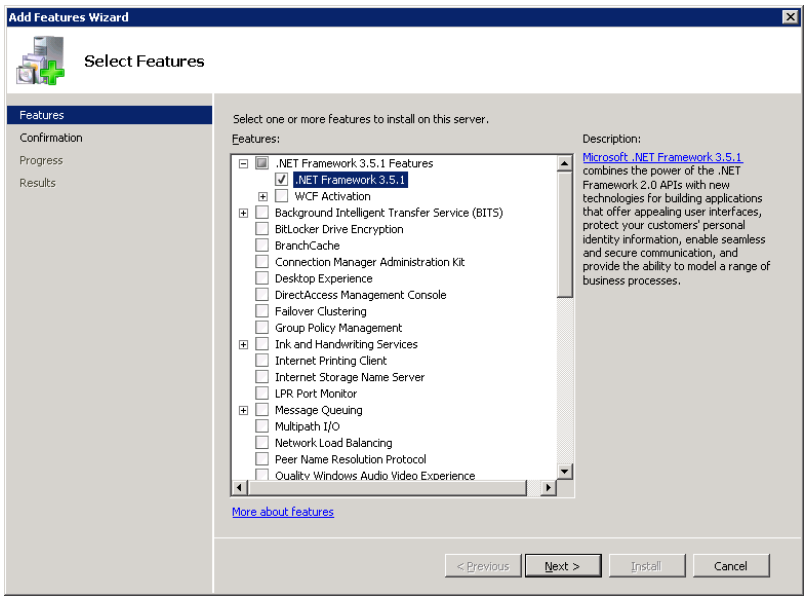
.NET Framework 3.5.1 (SP1)

.NET Framework 3.5.1 (SP1)

For SEALService, .NET Framework 3.5.1 (SP1) must be installed. As of Windows Vista/Windows Server 2008, you only have to activate the Windows feature for this.

Windows feature

This is how you activate .NET Framework 3.5.1 (SP1) as Windows feature:

Step	Action
1	In the Control Panel, open `Program and Features`.
2	 Click `Turn Windows features on or off`.
3	 Open the `.NET Framework 3.5.1 Features` item and activate the checkbox in front of `.NET Framework 3.5.1`.

3 Installation, Migration and Uninstallation

in this chapter

This chapter deals with the following topics:

Install SEALService

requirement

→ *Supported Platforms*, page 8

→ *Hardware Requirements*, page 9

→ *User*, page 10

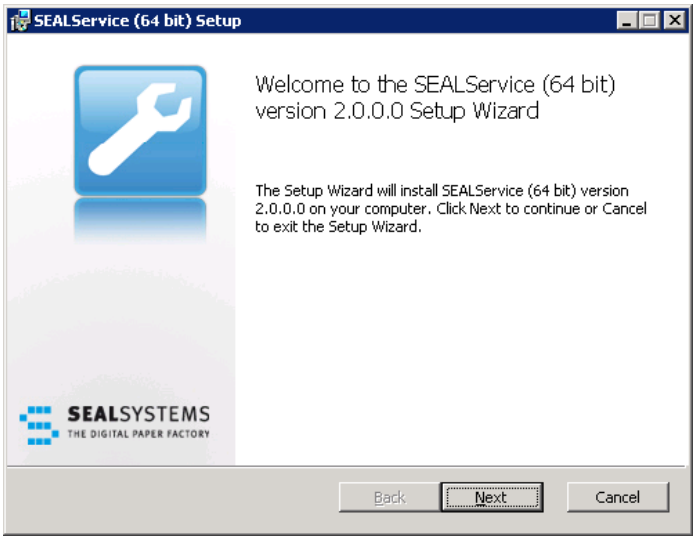
→ *.NET Framework 3.5.1 (SP1)*, page 13

instructions

This is how you install SEALService on your system:

Step	Action

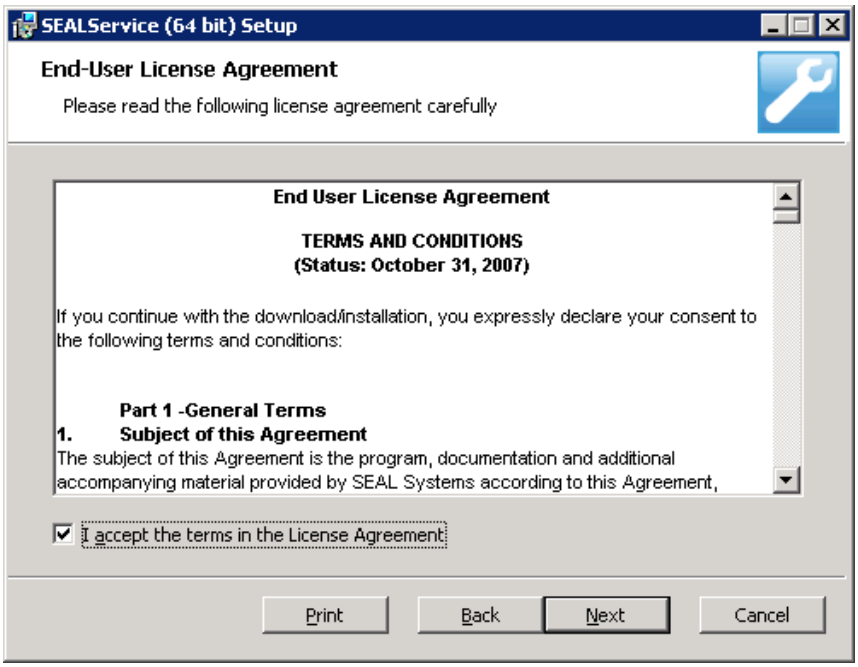
1	Double-click the following file in order to start the installation wizard:
	On a 32 bit system:
	`install\sealservice\sealserviceinstall_x86.msi`
	On a 64 bit system:
	`install\sealservice\sealserviceinstall_x64.msi`

2	 Click `Next`.

To be continued

Install SEALService, Continuation

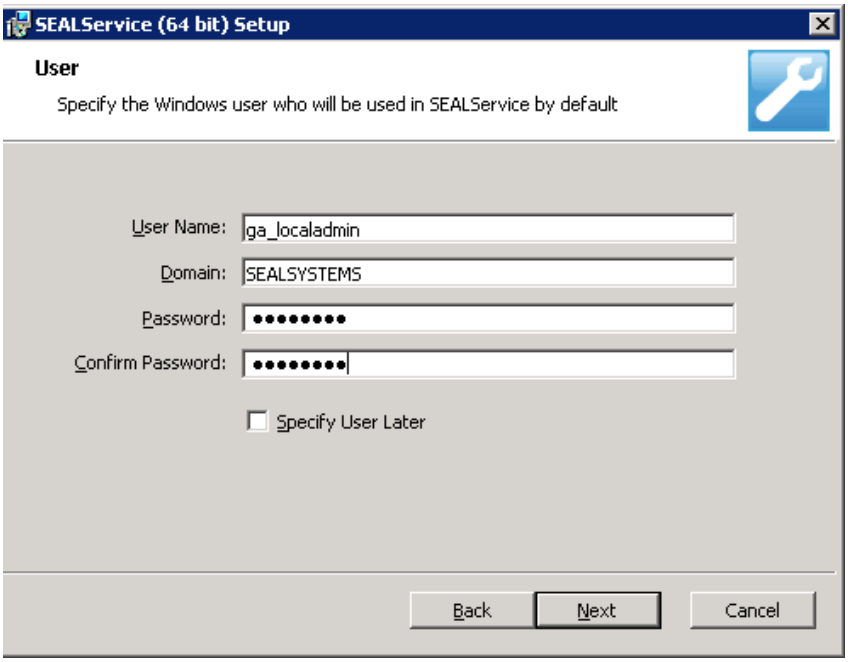
instructions, cont'd

Step	Action
3	 Read the license terms and activate the checkbox. Then click `Next`.

To be continued

Install SEALService, Continuation

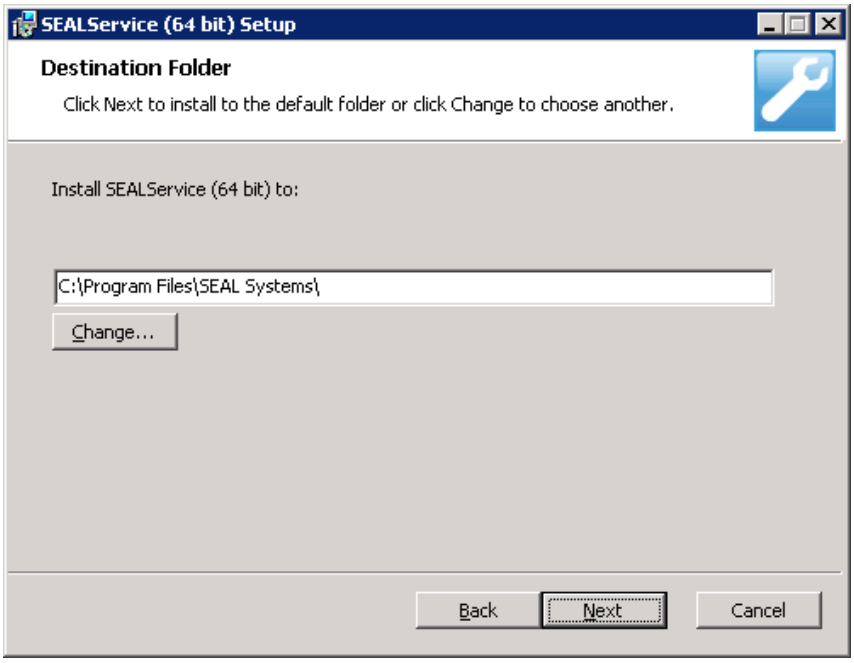
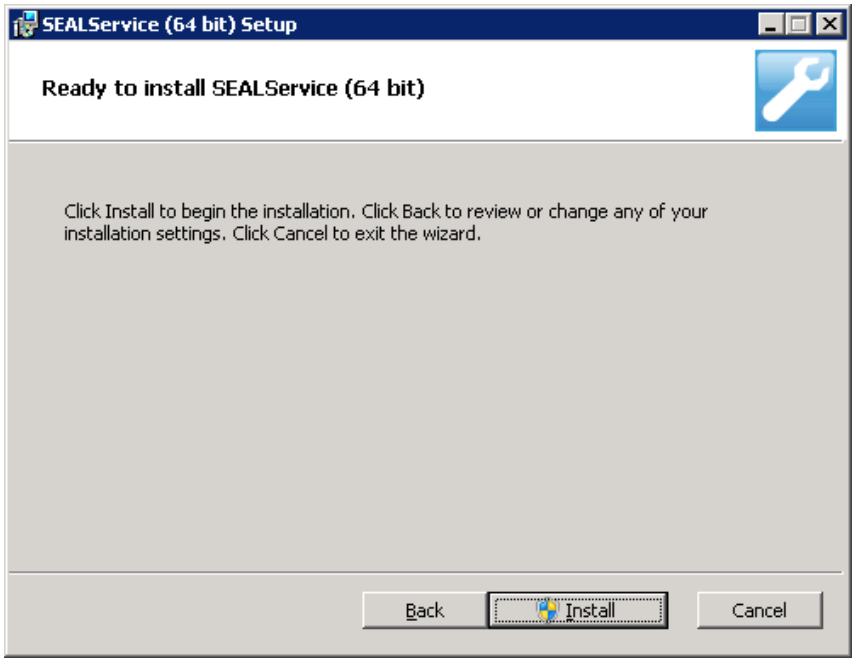
instructions, cont'd

Step	Action
4	 Specify the user who is to be used when starting the processes in SEALService unless another user is specified. Then click `Next`. hint - later: You can also specify the user later on before specifying and starting the first command.

To be continued

Install SEALService, Continuation

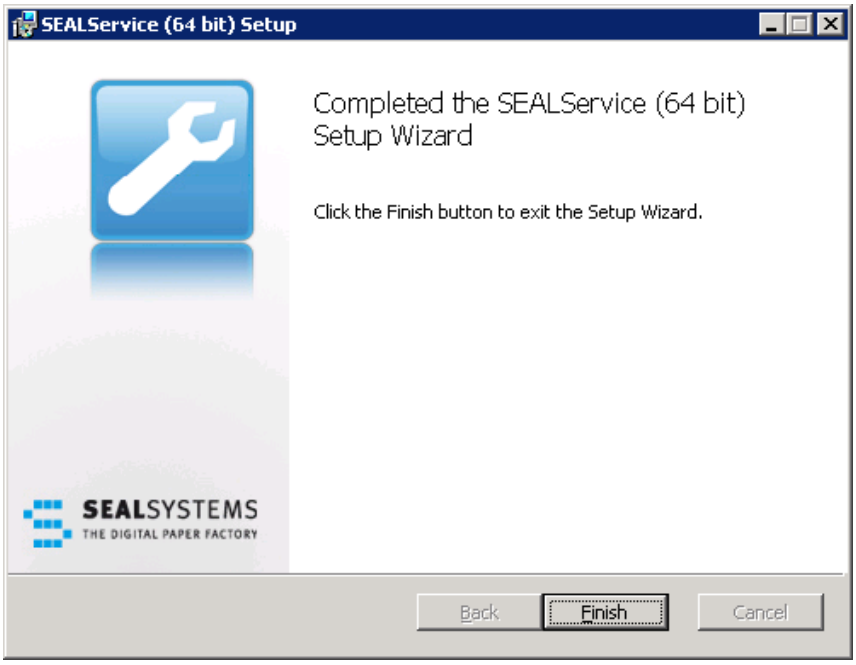
instructions, cont'd

Step	Action
5	 Specify the installation directory for SEALService. Then click `Next`.
6	 Click `Install` in order to start the installation.

To be continued

Install SEALService, Continuation

instructions, cont'd

Step	Action
7	 Click `Finish` in order to terminate the installation wizard.

hint - change

In the service manager, the installation program removes the privilege for changing the user account, the starting mode and other settings of the Windows service SEALService. This ensures that SEALService is running under the local system account.

hint - user

The installation program generates the user group `SEAL Systems User` and enters the user who is executing the installation and the user who has been specified as default user during the installation into the user group.

Migrate From SEALService 1.x.x

installation program

If the installation program of SEALService 2.0.0 finds an installation of SEALService 1.x.x on the server, it uninstalls SEALService 1.x.x and migrates the commands and user profiles into SEALService 2.0.0.

 **Caution** - administrator

Start the installation program of SEALService 2.0.0 as user with administrator privileges due to the uninstallation of SEALService 1.x.x does not work otherwise.

user profile

In the case of a migration, you have to specify a user profile during the installation because the commands must always be assigned to a user profile.

 **Caution** - do not uninstall manually

If you want to migrate from SEALService 1.x.x, you must not uninstall SEALService 1.x.x manually due to, otherwise, the installation program of SEALService 2.0.0 assumes an initial installation and does not migrate the commands and user profiles.

Preset Settings For the Installation

user

You can preset the settings of the default user which SEALService requests during the installation.

call

For this, when calling the msi file, specify properties as follows:

```
msiexec.exe <path>\sealserviceinstall_xnn.msi <prop>=<value>
```

properties

The following properties are available:

Property	In User Dialog
DOMAIN	Field Domain
PASSWORD	Field Password Here, the clear text is specified
PASSWORD_CONFIRM	Field Confirm Password Here, the clear text is specified
PASSWORD_CRYPT	Field Password Item encrypted with sealcrypt
USERNAME	Field User Name

installation directory

The value of the INSTALLDIR environment variable is used as installation directory.

Install Without User Interaction (Silent)

silent

SEALService can be installed without user interaction (silent installation).

For this, execute the msi file as follows:

```
msiexec.exe <path>\sealserviceinstall_xnn.msi /s <prop>=<value>
```

properties

For the properties available for presetting the dialog, refer to

→ *Preset Settings For the Installation*, page 21

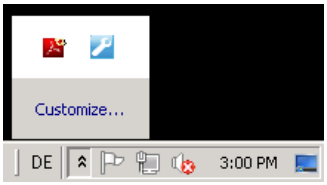
 **Caution** - silent migration

If no user was specified in SEALService 1.x.x when migrating without user interaction, the installation aborts without error message.

Tray Icon for Switching to SEAL Desktop

For switching to the SEAL desktop, the installation program generates a tray icon. tray icon

After the installation, the tray icon is displayed hidden: hidden



Via `Customize`, you specify that the tray icon is always visible: visible

→ *Switching to SEAL Desktop Via Tray Icon Does Not Work*, page 61 hint - error

Uninstall SEALService

requirement

→ *User*, page 10

instructions

This is how you uninstall SEALService from your system:

Step	Action
1	Select the following item in the start menu of the Windows system: `Start→SEAL Systems→SEALService→Uninstall SEALService`
2	Follow the instructions of the uninstallation wizard.

result

The uninstallation program uninstalls SEALService. The Registry items remain however.

hint - alternative

You also can remove SEALService via the software management of the Windows system.

4 Configuration

This chapter deals with the following topics: in this chapter

4.1 General Operations in the Configuration Interface

in this chapter

This chapter deals with the following topics:

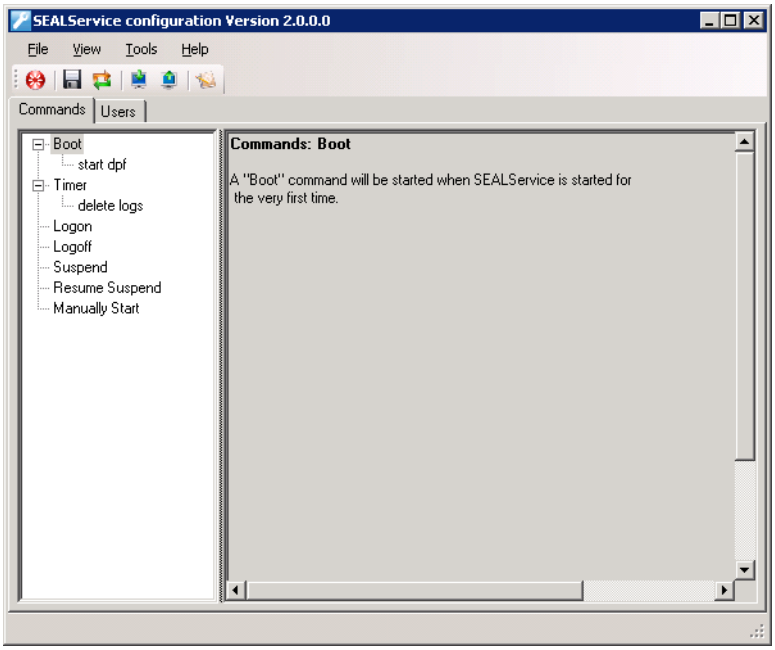
Open the Configuration Interface

→ *User Group SEAL Systems User*, page 11 requirement

This is how you open the configuration interface: instructions

Step	Action
1	Select the following item in the start menu of the Windows system: `Start→SEAL Systems→SEALService→SEALService Configuration` hint - not member of user group: If you are not yet member of the user group `SEAL Systems User`, you receive a message providing a link to the user management.

The configuration interface is opened. result



If no user profile has yet been specified, the `Users` tab is opened after opening the configuration interface. hint - `Users` tab

Save the Configuration

requirement

→ *Open the Configuration Interface*, page 27

instructions

This is how you save the configuration:

Step	Action
1	Click  or select `File→Save`.

result

The user profiles, the commands and other configuration settings are stored in the Registry.

 hint - load Registry

In order to load a stored configuration from the Registry and to overwrite the current setting in the configuration interface, click  or select `File→Reload From Registry`.

Export the Configuration to an XML File

→ *Open the Configuration Interface*, page 27

requirement

This is how you export the configuration of SEALService to an XML file:

instructions

Step	Action
1	Click  or select `File`→`Export To File`. The file selection dialog is opened.
2	Specify the XML file to which the configuration is to be exported and click `Save`.

 hint - `REG.BIN`

The previous `REG.BIN` files are no longer supported due to, in these, the access control list was exported beside the Registry items which then led to problems when importing on other systems.

4.2 Preliminary Considerations About the Command

decisions

Before adding a command, you have to think about some properties of the command:

When is the Command to be Started?

You can choose between the following specific times and events: selection

Category	Time or Event
`Boot`	The boot commands are started when SEALService is started when booting the server.  hint - delay: For the boot commands, you can specify a general delay. → *Specify A Delay For Starting Boot Commands*, page 50
`Timer`	The timer commands are started to a time specified with the command.
`Logon`	The logon commands are started when any user logs on to the Windows system.
`Logoff`	The logoff commands are started when any user logs off from the Windows system.
`Suspend`	The suspend commands are started when the server switches to the stand-by-mode.  **Caution** - order and resources: Here, the order of the command starts is arbitrary. Therefore, commands cannot longer access the resources under circumstances.
`Resume Suspend`	The resume suspend commands are started when the server comes back from the stand-by-mode.  **Caution** - order and resources: Here, the order of the command starts is arbitrary. Therefore, commands cannot longer access the resources under circumstances.
`Manually Start`	The manually start commands are interactively started by the user.

Which User is to Start the Command?

selection

You can choose between the fix configured user profiles and `default`.

→ *Add a User Profile*, page 45

`default`

`default` is the user profile which has been set as default in the configuration.

→ *Specify a User Profile as Default*, page 48


hint - `sealexecute`

The correspondent parameter of `sealexecute.exe` is `-userprofile`.

Where and How is the Command to be Displayed?

selection

You can choose if the command is displayed visible or invisible on the SEAL desktop or the default desktop or if it runs under the local system account like a Windows service without user interaction.

hint - faster, more stable

Without interactive desktop, the processes are executed faster and more stable. But no GDI resources are available to the processes.

combinations

The following combinations are possible:

Display	Setting	Recommended
visible on SEAL desktop	`Start: Visible` `Desktop: SEAL Desktop`	for most commands in normal mode; default hint - sealexecute: The correspondent parameter of `sealexecute.exe` is `-v`.
visible on default desktop	`Start: Visible` `Desktop: Default Desktop`	for troubleshooting hint - sealexecute: The correspondent parameters of `sealexecute.exe` are `-v` and `-desktop Default`.
invisible on SEAL desktop	`Start: Hidden` `Desktop: SEAL Desktop`	for the batch processing hint - sealexecute: For `sealexecute.exe`, this is default.
invisible on default desktop	`Start: Hidden` `Desktop: Default Desktop`	with this, no windows are visible and the processes must be terminated by the Windows Task Manager. hint - sealexecute: The correspondent parameter of `sealexecute.exe` is `-desktop Default`.
start non-interactively without desktop	`Start: Non Interactive` `Desktop:` n/a	for starting Postgres, Apache and Tomcat for example hint - sealexecute: The correspondent parameter of `sealexecute.exe` is `-noninteractive`.

Which Environment is Required by the Command?

selection — You can choose if the process is started via a ghost process.

 hint - usage — The ghost process is required if the current directory of the command (`CurrentDir`) is located in the network or if the process is to be started using `ShellExecute` instead of `CreateProcess`.

settings — Activate `Start Without Ghost` if the process is not to be started using a ghost process.

default — By default, the command is started using a ghost process.

 hint - `sealexecute` — The correspondent parameter of `sealexecute.exe` is `-noghost`.

Is the Logon Required at Every Start?

You can choose if the logon is processed whenever the process is started. selection

For the single sign-on, the logon is processed whenever the process is started. single sign-on

For the multiple sign-on, the logon is processed when starting the command for the first time. The user token and the logon SID is then reused for the following starts. multiple sign-on

If the logon is processed (single sign-on), you can choose if the network drives of the user are connected. network drive


hint - usage

The logon takes a long time. Therefore, single sign-on makes only sense and is required if, for example, the processes and subprocesses are to run under the same logon SID in order that they can be aborted together.

To be continued

Is the Logon Required at Every Start?, Continuation

combinations The following combinations are possible:

Environment	Setting	Recommended
User environment with network drives; user token and logon SID are reused (multiple sign-on).	☐ `Force Login`	for most processes in normal mode; default  hint - sealexecute: For `sealexecute.exe`, this is default.
User environment with network drives; user token and logon SID are generated (single sign-on).	☑ `Force Login` ☑ `Establish Network Connection`	for processes that require the same logon SID  hint - sealexecute: The correspondent parameter of `sealexecute.exe` is `-forcelogin`.
User environment without network drives; user token and logon SID are generated.	☑ `Force Login` ☐ `Establish Network Connection`	for testing processes when no network drives are required  hint - sealexecute: The correspondent parameters of `sealexecute.exe` are `-forcelogin` and `-nonet`.

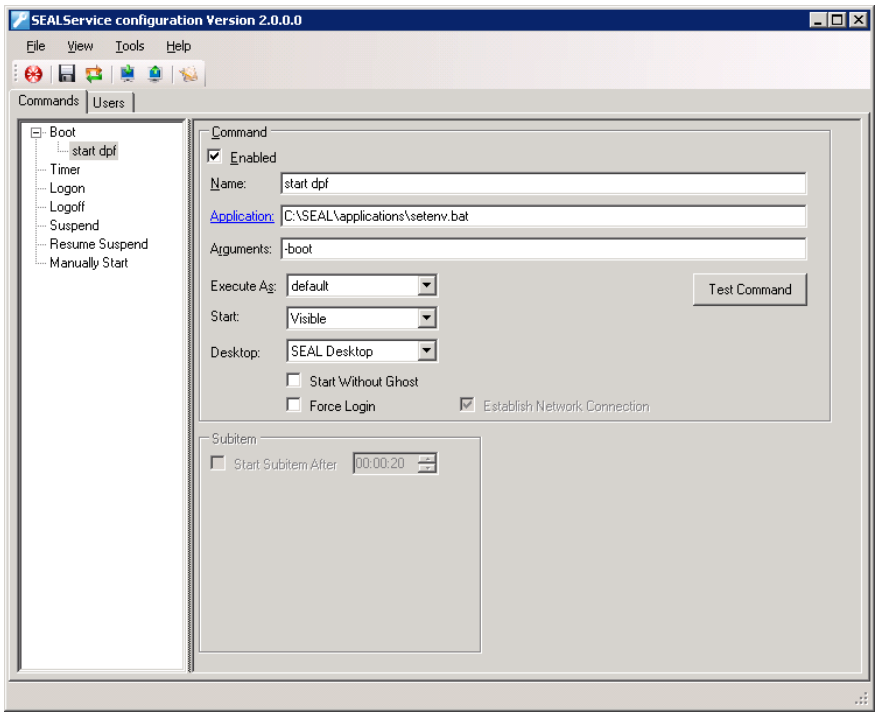
4.3 Operations With the Commands

This chapter deals with the following topics: in this chapter

Add a Command

requirement → *Open the Configuration Interface*, page 27

instructions This is how you add a command:

Step	Action
1	Select the `Commands` tab.
2	In the tree structure of the commands, select the time or the event when the command is to be started. → *When is the Command to be Started?*, page 31
3	Open the context menu and select Add. The command appears in the tree structure of the commands with a default name. On the right side, the settings of the commands are displayed. 
4	In `Name` on the right side, specify the name of the command.
5	In `Application` on the right side, specify the command or select the command using the link.

To be continued

Add a Command, Continuation

instructions, cont'd

Step	Action
7	In `Execute As` on the right side, select the user profile under which the command is to be started. → *Which User is to Start the Command?*, page 32
8	In `Start` and `Desktop` on the right side, select how the command is to be displayed. → *Where and How is the Command to be Displayed?*, page 33
9	On the right side, specify in which environment the command is to be started. → *Is the Logon Required at Every Start?*, page 35
10	For timer command, specify the weekdays and the time when the command is to be started. If the command is to be started regularly, specify the repeating interval and the end time.  hint - midnight: Timer commands do not run over midnight. If required, configure a second timer command for the following day.
11	Save the configuration. → *Save the Configuration*, page 28

result

The command appears in the tree structure of the commands with the specified name and will be started if the starting time is reached for the next time.

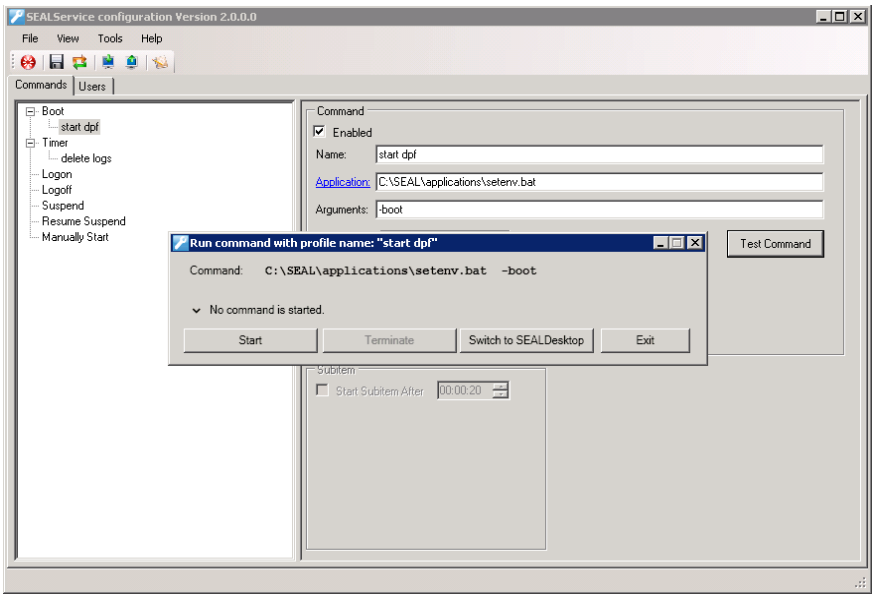
Test a Command

requirement

→ *Add a Command*, page 38

instructions

This is how you test a command:

Step	Action
1	In the tree structure of the commands, select the command you want to test.
2	Click `Test Command` on the right side. The dialog for starting the command is opened. 
3	Click `Start`.

result

The command is started and the result is displayed.

hint - details

Click ⌄ on the left side of the summary message in order to display details about the command execution.

Deactivate a Command

→ *Open the Configuration Interface*, page 27 requirement

This is how you deactivate a command: instructions

Step	Action
1	Select the `Commands` tab.
2	In the tree structure of the commands, select the command you want to deactivate.
3	Deactivate the `Enabled` checkbox on the right side.
4	Save the configuration. → *Save the Configuration*, page 28

The command will no longer be started but still remains visible in the configuration so that you easily can reactivate it. result

Rename a Command

requirement → *Open the Configuration Interface*, page 27

instructions This is how you rename a command:

Step	Action
1	Select the `Commands` tab.
2	In the tree structure of the commands, select the command you want to rename.
3	In `Name` on the right side, specify the new name of the command.
4	Save the configuration. → *Save the Configuration*, page 28

result The command appears in the tree structure of the commands with the new name.

Add a Subordinate Command

Subordinate commands make sense for example in connection with CAD and SAP applications. The license server must be ready before the logons to the server and the conversions can be executed.

usage

→ *Add a Command*, page 38

requirement

This is how you subordinate a command to a existent command:

instructions

Step	Action
1	In the tree structure of the commands, select the superordinate command.
2	Open the context menu and select `Add`. The subordinate command appears intended in the tree structure of the commands with a default name.
3	Specify the properties of the subordinate command analog to a "normal" command. → *Add a Command*, page 38
4	If a certain time should be wait between starting the super- and the subordinate command, you specify the waiting time as hours, minutes and seconds in `Start Subitem After` at the superordinate command.
5	Save the configuration. → *Save the Configuration*, page 28

The subordinate command appears in the tree structure of the commands with the specified name and will be started after the superordinate command. Thereby, the specified waiting time is taken into account.

result

You can specify any number of subordinate commands. But notice that complex command chains complicate troubleshooting.

Caution - troubleshooting

SEALService does not check if the superordinate command has been started successfully, that means the subordinated command will be started even if starting the superordinate command failed.

Caution - no check

4.4 Operations With User Profiles

in this chapter

This chapter deals with the following topics:

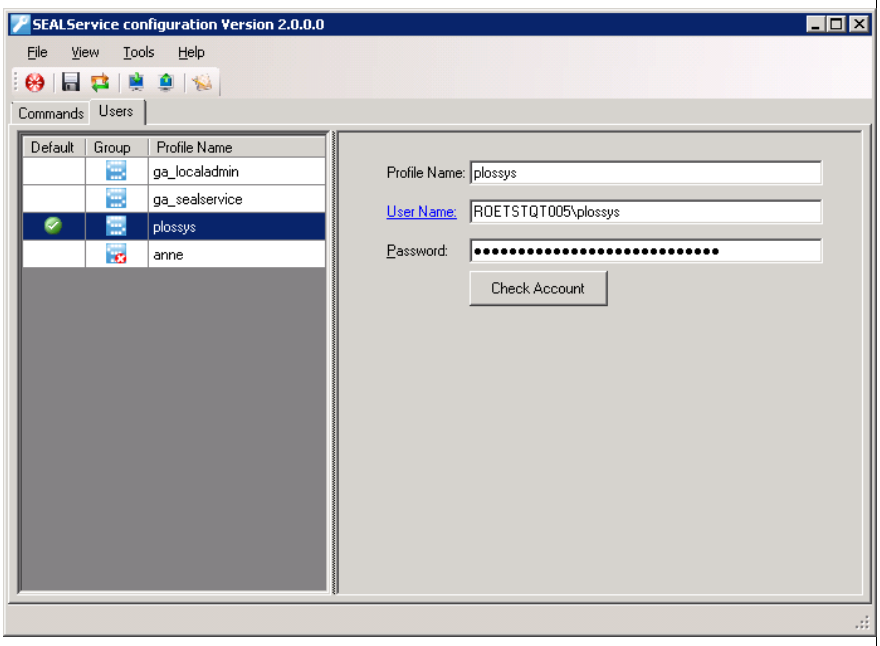

hint - Windows system

From the configuration interface of SEALService, you quickly get to the user management of the Windows system via `File→Open System Local User and Group Management`.

Add a User Profile

→ *Open the Configuration Interface*, page 27 requirement

This is how you add a user profile: instructions

Step	Action
1	Select the `Users` tab.
2	Open the context menu in the list of the user profiles on the left side and select `Add`. The user profile appears in the list of the user profiles with a default name. On the right side, the settings of the user profile are displayed. 
3	In `Profile Name` on the right side, specify the name of the user profile.
4	In `User Name` on the right side, specify the user name or select a user using the link. hint - domain user: You can specify domain users in all usual notations, for example, *`domain\user`* or *`user@domain`*.
5	In `Password` on the right side, specify the password of the user.
6	Save the configuration. → *Save the Configuration*, page 28

To be continued

Add a User Profile, Continuation

result

The user profile appears in the list of the user profiles with the specified name.

hint - SEAL Systems User

 and  in the `Group` column of the list of the user profiles whether the user is member of the user group `SEAL Systems User` or not.

hint - password

If possible, you should configure in the user management of the Windows system that the password never expands for the users specified in SEALService. Otherwise, you must keep in mind to change the configuration in SEALService whenever the password will be changed.

Rename a User Profile

→ *Open the Configuration Interface*, page 27 requirement

This is how you rename a user profile: instructions

Step	Action
1	Select the `Users` tab.
2	In the list of the user profiles, select the one you want to rename.
3	In `Profile Name` on the right side, specify the new name of the user profile.
4	Save the configuration. → *Save the Configuration*, page 28

The user profile appears in the list of the user profiles with the new name. result

Specify a User Profile as Default

requirement

→ *Open the Configuration Interface*, page 27

instructions

This is how you specify a user profile as default:

Step	Action
1	Select the `Users` tab.
2	In the list of the user profiles, select the user profile you want to set as default. Open the context menu and select `Set As Default User`.
3	Save the configuration. → *Save the Configuration*, page 28

result

In the `Default` column of the list of the user profiles,  is displayed at the default user profile.

commands

All command with `default` in `Execute As`, are started with the new default user profile as of now.

5 Extended Configuration

This chapter deals with the following topics: in this chapter

Specify A Delay For Starting Boot Commands

all boot commands

You can specify a period which is used as delay before starting the configured boot commands when booting the server

 hint - usage

For example, the delay when starting boot commands makes sense if the domain controller is too slowly for the logon of the domain user.

instructions

This is how you specify the delay for all boot commands:

Step	Action
1	Open the Registry and navigate to `HKEY_LOCAL_MA-CHINE\SOFT-WARE\SEAL Systems\SEALService`.
2	In the `BootDelayTime` item, enter the period in milliseconds.

result

When booting the server for the next time, the boot commands will be started with delay.

Specify the Default Desktop as Default

Caution - XP/Server 2003

The usage of the default desktop makes only sense for Windows XP/Windows Server 2003 because in newer Windows systems, with this, it is output to the default desktop of the terminal session `0` which is invisible to the user.

hint - usage

The usage of the default desktop might make sense when testing for making the output of the Perl debugger or interactive applications such as Word visible at once without switch.

default: SEAL desktop

By default, the SEAL desktop is used unless `-desktop` has been specified with `sealexecute.exe`. In the configuration interface, the menu item, `Tools→Use SEAL Desktop for SEALExecute`, is active.

instructions

This is how you specify the default desktop as default:

Step	Action
1	Open the Registry and navigate to `HKEY_LOCAL_MA-CHINE\SOFT-WARE\SEAL Systems\SEALService\Display`.
2	In the `Desktop` item, change the value from `SEALOpera-tionDesktop` to `default`.

result

Unless `-desktop` has been specified with `sealexecute.exe`, the default desktop will be used. In the configuration interface, the menu item, `Tools→Use SEAL Desktop for SEALExecute`, is inactive.

Make Network Drives Visible in the Administrator Mode

change into the administrator mode

You can specify that the user sees the connected network drives of the "simple" user when changing into the administrator mode.

instructions

This is how you specify that the network drives are visible:

Step	Action
1	Open the Registry and navigate to `HKEY_LOCAL_MA-SCHINE/Software/Microsoft/CurrentVersion/Policies/System`.
2	Insert the `EnableLinkedConnections` item of the `DWORD` type.
3	Enter `1` as values.
4	Restart the server.

result

The user in the administrator mode sees the network drives of the "simple" user.

 hint - default

The default of `EnableLinkedConnections` has been changed from `1` to `0` with Windows Vista/Windows Server 2008.

Support Nested Groups

SEALService supports nested groups in the domain environment. supported

This is how you specify that nested user groups are taken into account: instructions

Step	Action
1	Open the Registry and navigate to `HKEY_LOCAL_MA-CHINE\SOFT-WARE\SEAL Systems\SEALService`.
2	In the `NestedGroups` item, enter the number of levels which are to be taken into account when searching.

Nested user groups are searched for up to the configured level. result

The search of nested user groups can degrade the performance of SEALService dramatically due to for each search a network request is executed. **Caution** - performance

6 Information Sources and Tips

in this chapter

This chapter deals with the following topics:

6.1 Information Sources

information

You find information concerning SEALService in:

- Windows Task Manager
- Windows Event Log

Task Manager

The Windows Task Manager displays the processes running on the current desktop.

 hint - Process Explorer

With Process Explorer, `procexp.exe`, from Microsoft, you can display processes per desktop.

If the program is not available on your Windows system, you can download it from the following Web site:

→ `http:\\www.sysinternals.com`

Event Log

The Windows Event Log shows information about SEALService and the started processes.

 hint - Start

From the configuration interface of SEALService, you directly switch to the Windows Event Log via  or `File→Open System Event Log`.

filter items

→ *Filter SEALService Items in the Event Log*, page 56

Filter SEALService Items in the Event Log

sources

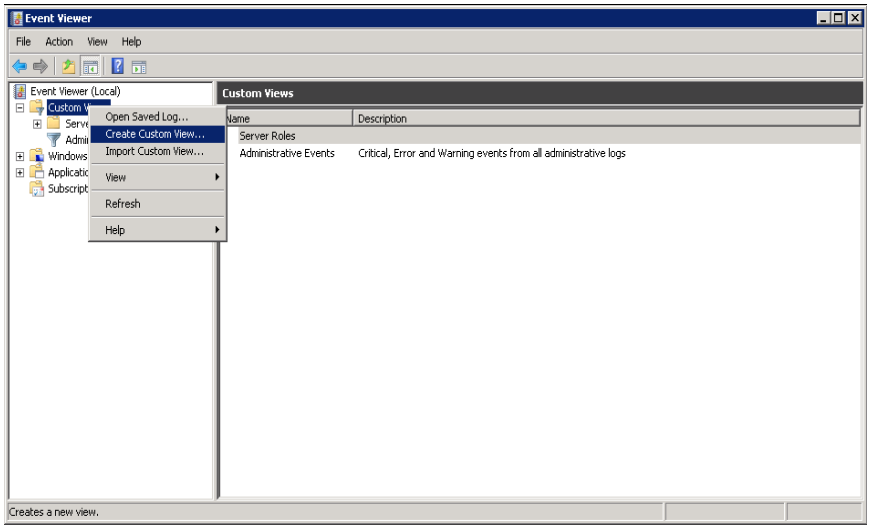
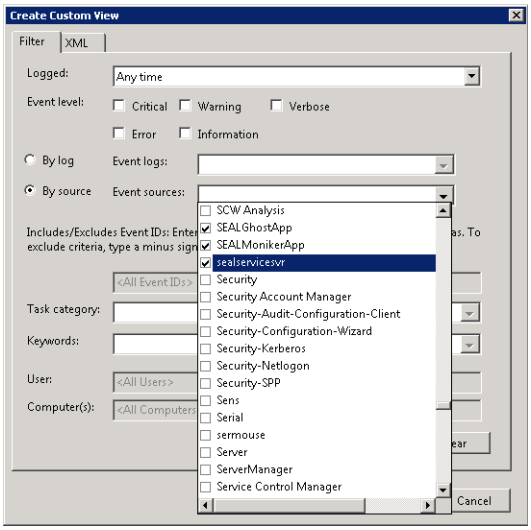
In the Windows Event Log, the items of the `SEALGhostApp`, `SEALMonikerApp` and `sealservicesvr` are relevant.

user-specific view

In a custom view, you see all items of these sources at a glance. This functionality is available as of Windows Vista/Windows Server 2008.

instructions

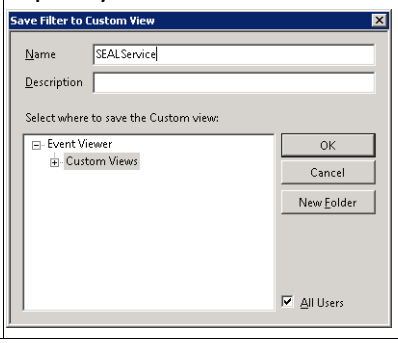
This is how you specify a custom view:

Step	Action
1	Via the computer management, open the dialog for creating custom views: 
2	Activate `By source` and select the `SEALGhostApp`, `SEALMonikerApp` and `sealservicesvr` sources in the selection list: 

To be continued

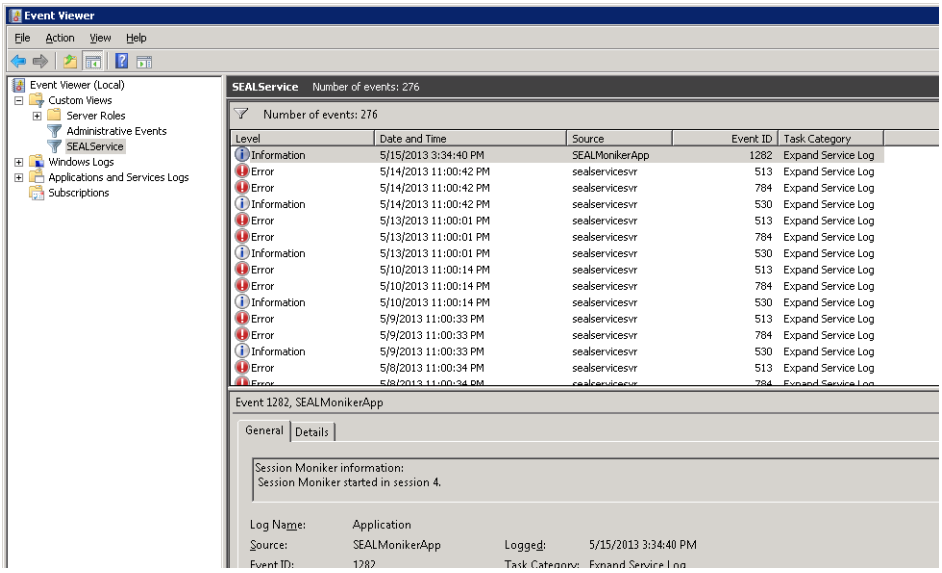
Filter SEALService Items in the Event Log, Continuation

instructions, cont'd

Step	Action
3	Specify a name for the custom view, for example, `SEALService`: 

result

The filter appears in the list of custom views. With one click, you see all items concerning SEALService.



6.2 Tips for Developing Scripts

`_INSIDE_SEAL_SERVICE`

When starting a process, SEALService sets the `_INSIDE_SEAL_SERVICE` environment variable that indicates how often the process is running in the SEALService environment. You can read this environment variable in order to avoid unnecessary process starts for example.

`libprocess.pl`

In customer-specific scripts, always call SEALService commands via `libprocess.pl` due to the correct SEALService version will be used automatically then.

command on SEAL desktop

In order to check for example which environment variables are set in the SEALService environment, you can quickly start a command prompt, `cmd.exe`, in `Run command` in the dialog for switching to the SEAL desktop without having to switch the desktop.

6.3 Error Scenarios and Their Solutions

This chapter deals with the following topics: in this chapter

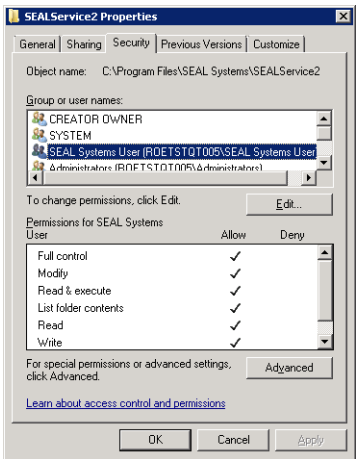
SEALService Does Not Work

error scenario

SEALService does not work. The commands are not started.

access rights

Check if the user group `SEAL Systems User` has write and execute access to the installation directories, `PLSROOT` and `SEAL_CUSTOMDIR`, and in the installation directory of SEALService. The access privileges must be recursive and inheritable in order that they also apply to files and directories generated during operation.



registration

If the registration of SEALService was not executed as user with administrator privileges during the installation (that means if the request of the User Account Control (UAC) had not been confirmed under Windows 7/Windows Server 2008 R2), the registration applies only to the user executing the registration. Due to SEALService is running under the system account, SEALService does not work correctly then.

This is how you reregister SEALService:

Step	Action
1	Start the shell and change to the installation directory of SEALService.
2	Execute `Unregister.bat`.
3	Close the shell.
4	Open the command prompt as administrator, confirm the request of the User Account Control (UAC) and change into the installation directory of SEALService.
5	Execute `Register.bat`.

Switching to SEAL Desktop Via Tray Icon Does Not Work

Nothing happens when switching to the SEAL desktop via the tray icon. error scenario

In order that you can switch to the SEAL desktop via the tray icon, the Windows service `Interactive Service Detection` (`UIODetect`) must be able to start. background

- Check if the key `NoInteractiveServices` is set to `0` in `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Windows` in the Registry. The default for Windows 8/Windows Server 2012 is `1` here. check
- Check if the starting mode of the Windows service `Interactive Service Detection` (`UIODetect`) is not set to `Disabled`.

Command Does Not Start

error scenario

The command specified in SEALService does not start. On the SEAL desktop an error message appears, for example, `Access denied` or `File not found`.

solution

- Check if the user who starts the command is member of the user group `SEAL Systems User`.
- If the user changes within a command chain, check if this user is member of the user group `SEAL Systems User`.
- Check if all configured network drives can be connected and if the user who starts the command has the privileges for this.
- Check if the current directory of the command (`CurrentDir`) is set and if the user can access it.

Command Start Takes a Long Time

Starting a command takes an unusual long time. error scenario

If problems occur when connecting the network drives, due to an incorrect user specification or an incorrect password for example, the call of the command can take an unusual long time. background

For a user who has never logged on to the system interactively, Windows generates a temporary profile. This can last very long.

- Log on interactively as user who is to start the command in order that a user profile is generated. solution
- Check the connections to the network drives used by the command.

Processes Do Not Run on SEAL Desktop

error scenario

Processes are not running on the SEAL desktop or are simply terminated.

solution

- Check if the program to be started is an interactive program. Check the log files of the program.
- Check if `Desktop` is set to `SEALOperationDesktop` in the Registry key `HKEY_LOCAL_MACHINE\SOFTWARE\SEAL Systems\SEALService\Display`.

SEAL Desktop Switches Back

On the SEAL desktop, commands are started. After a few seconds, it is switched to the interactive user desktop.

error scenario

As of Windows Vista, Windows automatically switches back to the default desktop or disconnects the remote desktop connection if no user interaction takes place. In this case, you cannot do anything due to Windows logs off the terminal session.

no interaction

In Windows XP, the `Acronis` program installs a scheduler which is responsible for the switching. Stop the `schedhlp.exe` scheduler.

solution for Windows XP

Remote Desktop Connection Does Not Work

error scenario

Under Windows XP and a remote desktop connection, the interactive desktop cannot be accessed.

solution

Start the RDP client with the following parameters:

```
mstsc.exe /admin -v servername
```

 hint - old version

Before Windows XP (SP2), the option is called `/console` instead of `/admin`.

Network Drives Are Connected and Disconnected All the Time

single/multiple sign-on

This depends on if the command uses single or multiple sign-on and which network drives are known by the user token. With multiple sign-on, the network drives are connected only once. With single sign-on, SEALService behaves like the previous version 1.1.x

→ *Is the Logon Required at Every Start?*, page 35

Network Drive Is Not Available

error situation

In the SEALService environment, a network drive is not available.

solution

- Check the messages in the Windows Event Log. Note that with multiple sign-on connecting the network drive is tried only once, that means that a possible error message is logged only once and not at every start of the command.
- Check if the requirements for making a network drive available are fulfilled. → *Network Drives*, page 12

7 Background Knowledge

This chapter deals with the following topics: in this chapter

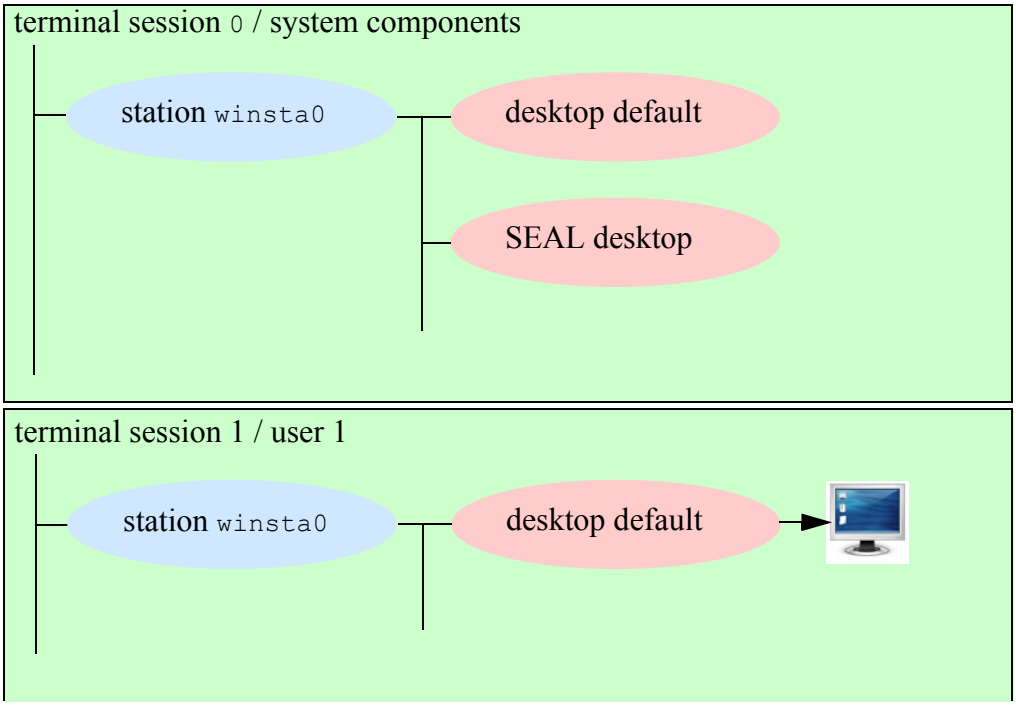
SEALService Components

`sealservices--vr.exe`	`sealservicesvr.exe` is the central process for controlling the processes. `sealservicesvr.exe` is started by the Windows system automatically and runs as service under the local system account.
configuration interface	In the configuration interface of SEALService, you specify the commands to be started.
`SEALMonikerApp`	SEALSvrSessionMoniker.exe provides an interface for redirecting processes to the SEAL desktop.
`SEALGhostApp`	SEALGhostCmd.exe establish the environment of the user and is necessary, for example, if other resources are required.
`sealexecute`	`sealexecute.exe` is the interface for starting processes via SEALService.

Terminal Session, Station, Desktop

process

The location of a process is determined by the terminal session, the station and the desktop:



SEALService

By default, the processes started by SEALService are running on the SEAL desktop of the station `winsta0` in the terminal session `0`.

terminal session

A terminal session in the Windows system contains processes, stations, desktops and other resources. A terminal session is specified by a session ID.

In the terminal session `0`, system components such as Windows services or drivers are running. The terminal session `0` is not interactive and exists while the server is running.

Each user who logs on to the Windows system gets an extra terminal session. It runs while the user is logged on.

The interactive desktop, that is the desktop where the user is working, is always in a terminal session different to 0.

display

You see the currently active terminal session (normally `1`) as tooltip at the tray icon of SEALService. The terminal session `0` will not be displayed.

You see the terminal session of a process in the Windows Task Manager (`Session ID` column) and in the Process Explorer (`Session` column).

To be continued

Terminal Session, Station, Desktop, Continuation

SEALService

SEALService starts the processes in the terminal session `0`.

station

In a terminal session, multiple stations are running. Stations have resources, Access Control Lists (ACL) and desktops.

The Windows systems provides the station `0` (`winsta0`). It exists in every terminal session. It looses its information when the user logs off. That means the desktops are still running and can be reached but all assignments to it are lost.

Only the station `0` (`winsta0`) has enough GDI resources for Office for example.

SEAL desktop

The SEAL desktop only runs in the station `0` (`winsta0`).

display

You see the station of a process in the Process Explorer.

desktop

A desktop represents a graphic device interface (GDI) and provides GUI objects. Multiple desktops are running in a station.

The desktop which are not interactive can not be displayed normally.

With SEALService, processes can be started as follows:

- Interactively with access to the desktop, that means on the default desktop of the terminal session `0`.
- Interactively without access to the desktop, that means on the SEAL desktop of the terminal session `0`; this way, the process remains invisible. By a context switch, the SEAL desktop and the process become visible.
- Non-interactively (as of SEALService 2.0.0); the non-interactively desktop survives the user's logon and logoff, but can only be used if the process does not require GDI resources.

display

You see the desktop of a process in the Process Explorer.

`UI0Detect`

The standard Windows service `Interactive Service Detection` (`UI0Detect`) recognizes events triggered on the default desktop of the station `0` (`winsta0`) of the terminal session `0`. The switch to the SEAL desktop (`SEAL Desktop change switch`) is such an event.

User Account and Environment

environment

SEALService is always running under the local system account. Primarily, only the environment variables and the network drives of the local system account are known. SEALService starts the commands under the configured user profiles.

user token

In the user token, the Windows system records the privileges of the process such as the user account and the network drives for example.

With `-forcelogin`, a new user token is generated for the current start of the process (single sign-on).

Without `-forcelogin`, a new user token is generated for the first start of the process. Then, the user token is reused for this user profile (multiple sign-on).

logon

During the logon, all user-specific files were processed, that means the complete user environment is available after the logon.

context switch

When switching the context, only a user switch is processed. The logon, including `netuse`, is not processed. The processes are started with the privileges of the new user. The network drives which were mounted persistently, that means which are stored in the Registry, can be used.

ghost process

The ghost process processes a complete logon when changing the user and, therefore, establishes the user environment. All environment variables of the user are known. The network drives which were mounted persistently by this user, that means which are stored in the Registry, can be used. The ghost process starts the actual command.

Processes

create process

Processes can be generated using the `ShellExecute` and `CreateProcess` functions. As of Windows Vista, processes that require more privileges only can be generated using `ShellExecute` and no longer using `CreateProcess`.

verb

With `ShellExecute`, a verb is specified. The verbs correspond to the actions in the context menu, for example, `edit`, `open`, `print` or `runas`. The available values depend on the file type and can be found in the Registry for example.

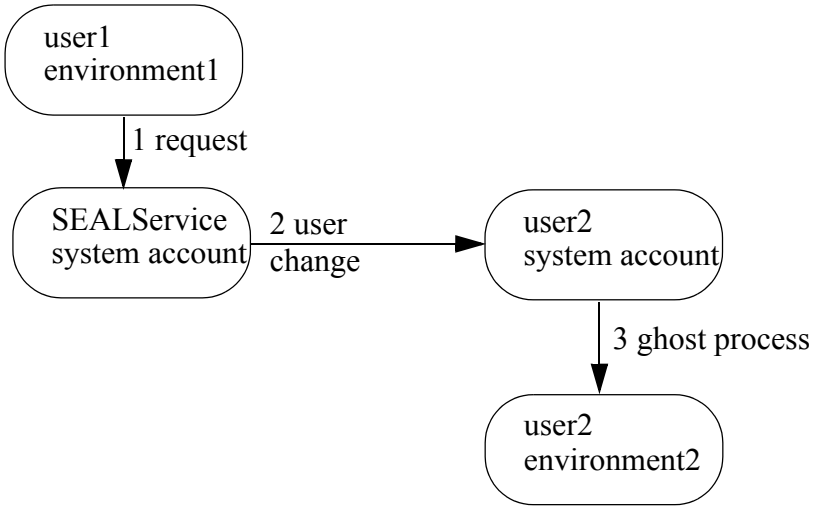
`runas`

The `runas` verb, starts the process with User Account Control (UAC). This makes only sense if the process is started visible.

Process and Environment Switch With SEALService

overview

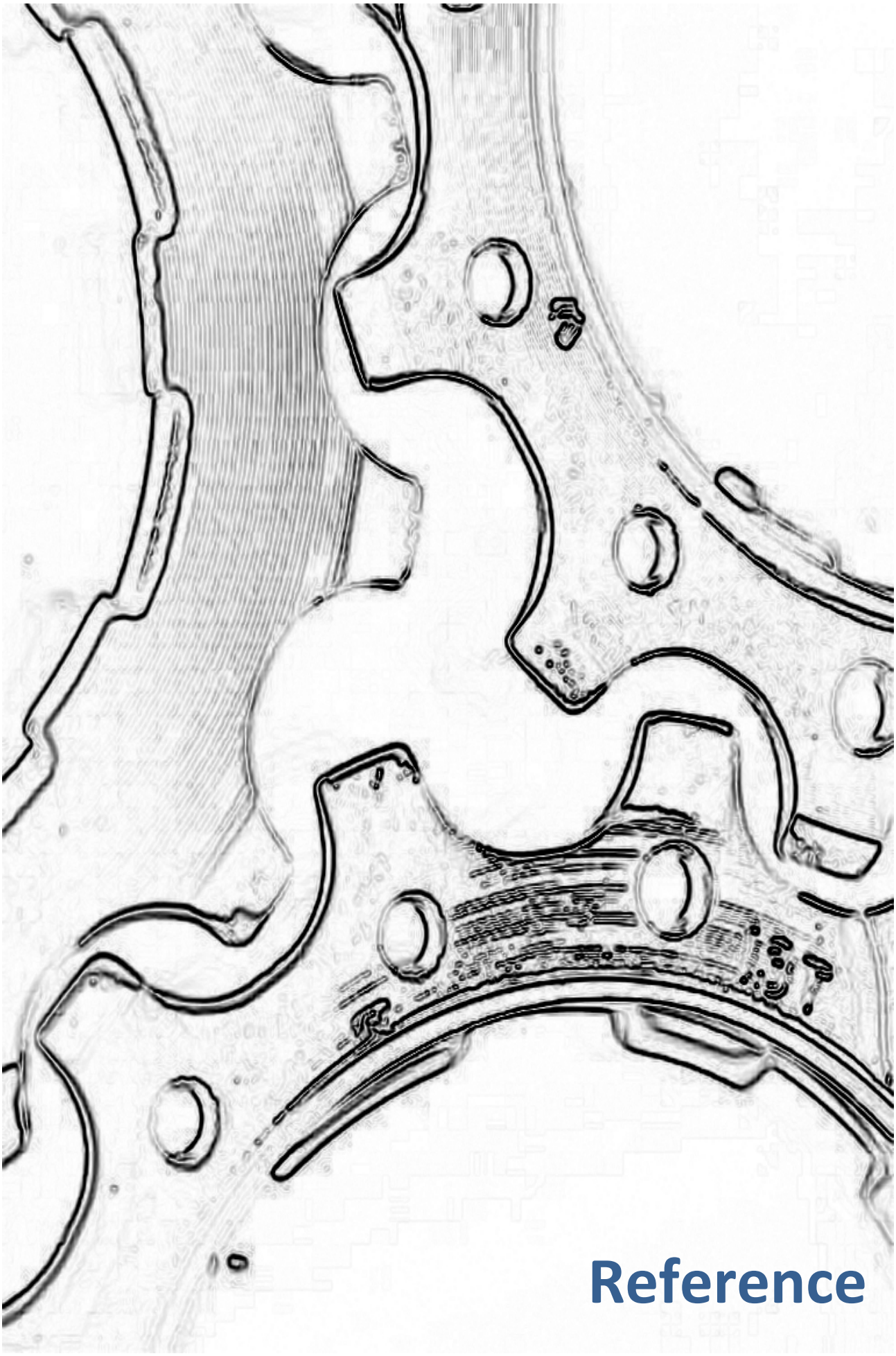
The following graphic shows the process and the switch of the environment when starting a process via SEALService:



steps

In the steps above, following is executed:

Step	Process
1	In his environment, user1 requests SEALService as Windows service for starting a process. Service Control Manager (SCM) starts SEALService automatically on request. SEALService starts under the local system account, that means the environment of user1 is unknown.
2	SEALService evaluates the configuration of the command and executes the user switch. When switching to user2 before starting the process, only a context switch is performed but no complete logon procedure. The process is started as user2 and is running in the environment of the local system account, that means the environments of user1 and user2 are unknown.
3	If configured, it is tried to establish the environment of user2 before starting the actual process by means of the ghost process.



Reference

8 sealexecute.exe - Reference

purpose

sealexecute.exe is an interface for starting processes via SEALService.

storage

The program is located in the following directory:

```
C:\Program Files\SEAL Systems\SEALService2
```

 hint - move with 2.0.0

`sealexecute.exe` was located in the `PLSTBIN` directory up to the version 2.0.0. Now, a dummy program with the same name is located there which outputs a hint to the new location.

call

`sealexecute.exe` is called in scripts or from the command line.

command line options

`sealexecute.exe` provides the following command line options:

Option	Description
`-currdir <dir>` (optional)	Start directory of the process Default: Directory of `sealexecute.exe`
`-desktop <desktop>` (optional)	Desktop where the process will be started Default: The desktop specified in the Registry; the SEAL desktop by default  **Caution** - not together with: `-desktop` cannot be specified together with `-useinteractivesession` or `-noninteractive`.  hint - configuration interface: The correspondent setting in the configuration interface is `Desktop`.
`-e <file>` (optional)	writes the error messages into the `<file>` file. Default: same as `-o`

To be continued

sealexecute.exe - Reference, Continuation

command line options, cont'd

Option	Description
`-forcelogin` (optional)	When starting the process, the logon will be processed. A new logon SID and a new user token will be generated for the current command start. Default: The logon will not be processed. hint - usage: The logon takes a long time and makes only sense and is required if, for example, the processes and subprocesses are to run under the same logon SID in order that they can be aborted together. hint - configuration interface: The correspondent setting in the configuration interface is `Force Login`.
`-h` (optional)	The usage is output.
`-noadmin` (optional)	will start the process as administrator without administrator privileges this means the privileges are taken from the user account (restricted token). Default: The process will be started under the current user and its privileges. hint - downward compatibility: `-noadmin` is only supported for downward compatibility. The configuration interface does not provide an correspondent setting. Under Windows 7/Windows Server 2008 R2, SEALS-ervice does not start processes with administrator privileges for security reasons.
`-noghost` (optional)	The process will not be started as ghost process. Default: The process will be started as ghost process. hint - configuration interface: The correspondent setting in the configuration interface is `Start Without Ghost`.

To be continued

sealexecute.exe - Reference, Continuation

command line options, cont'd

Option	Description
`-noninteractive` (optional)	The process will be started by SEALService under the system account and will not be assigned to an interactive desktop. The process behaves like a service without user interaction. For example, this is recommended for starting Postgres, Apache and Tomcat. Default: The process will be assigned to the specified interactive desktop. hint - faster and more stable: Without interactive desktop, the commands are executed faster and more stable. hint - configuration interface: The correspondent setting in the configuration interface is `Start`.
`-o <file>` (optional)	The messages will be written into the `<file>` log file. Default: No log file will be written.
`-ps` (optional)	lists the processes started by SEALService.
`-pwd <password>` (optional)	Password of the user specified with `-user`. **Caution** - order: `-pwd` must be specified after `-user`. **Caution** - priority: `-userprofile` takes higher priority over `-user` and `-pwd`.
`-q` (optional)	suppresses the output of messages. Default: Messages will be output.

To be continued

sealexecute.exe - Reference, Continuation

command line options, cont'd

Option	Description
`-s` (optional)	will start the process synchronously. Default: The process will be started asynchronously. **Caution** - no timeout: With synchronous processes, the timeout for the process does not work.
`-timeout <seconds>` (optional)	Waiting time in seconds after that the process will be terminated. Default: no timeout **Caution** - no timeout: With synchronous processes, the timeout for the process does not work.
`-tracelevel <level>` (optional)	Level of the debug messages Available values for `<level>` are: `0` Error messages `1` Warnings `2` Debug messages `3` Info messages `>3` Warnings Default: `1`
`-user <user>` (optional)	User under which the process will be started. Default: the user specified as default in the configuration interface **Caution** - priority: `-userprofile` takes higher priority over `-user` and `-pwd`. hint - configuration interface: The correspondent setting in the configuration interface is `Execute As`.

To be continued

sealexecute.exe - Reference, Continuation

command line options, cont'd

Option	Description
`-userpro-file <profile>` (optional)	User profile under which the process will be started. Default: The user profile specified in the configuration as default **Caution** - priority: `-userprofile` takes higher priority over `-user` and `-pwd`.
`-userinter-activeses-sion` (optional)	The process uses the current interactive desktop. An new user token will be generated. **Caution** - not together with: `-useinteractivesession` cannot be specified together with `-desktop` or `-noninteractive`.
`-v` (optional)	will start the process visible on the specified desktop. Default: The process will be started invisible on the specified desktop. hint - configuration interface: The correspondent setting in the configuration interface is `Start Visible`.

`-verb <verb>` (optional)	will start the process via `ShellExecute` and `<verb>` instead of `CreateProcess`; for example, `-verb runas` will start the process with the User Account Control (UAC).
	Available values for `<verb>` depend on the file type, for example:
	`edit`
	`open`
	`print`
	`runas`
	Default: The process will be started via `CreateProcess`.
	Caution - not together with:
	With -verb, the options such as -desktop, -e, -noghost or -o do not work.

To be continued

sealexecute.exe - Reference, Continuation


hint - `-nonet`, `-noprofile`

As of SEALService 2.0.0 `-nonet` and `-noprofile` are supported for downward compatibility only. When reusing the user token (multiple sign-on), they no longer make sense.

Terminology

The following section explains the most important terms that are used in this documentation. Terms marked by → refer to other terms within this section.

Access Control List	Windows feature that limits the access to data and features. It specifies which user may use which services and files.
Context switch	At a context switch, only a user switch takes place, that means that the →logon will not be processed. The processes are started with the privileges of the new user.
Desktop	A desktop represents a graphic device interface (GDI) and provides GUI objects. Multiple desktops are running in a →station.
Ghost process	The ghost process processes a complete →logon when changing the user and, therefore, establishes the complete user environment.
Logon	During the logon, all user-specific files were processed, that means that the complete user environment is available after the logon.
Multiple sign-on	For the multiple sign-on, the logon is processed when starting the command for the first time. The user token and the logon SID is then used for the following starts.
SEAL desktop	→Desktop used by →SEALService by default; the SEAL desktop is a non-visible (hidden) desktop. The process is started on the SEAL desktop and, therefore, remains invisible. Via a →context switch, the SEAL desktop and the process will be visible.
sealexecute.exe	Interface for starting processes via →SEALService
SEALService	Windows service from SEAL Systems starting commands and command chains (for example, CAD applications or databases) at a specific time or event (for example, when booting the server) and in the background without interactive user →logon.
`SEALSvrSessionMoniker.exe`	Provides an interface for redirecting interactive commands to the SEAL desktop.
Service control manager	Windows service for managing the starts and stops of Windows services.
Single sign-on	For the single sign-on, the logon is processed whenever the process is started.
Station	In a →terminal session, multiple stations are running. Stations have resources, →access control lists and →desktops. The Windows systems provides the station 0 (`winsta0`). It exists in every terminal session.
Terminal session	A terminal session in the Windows system contains processes, stations, desktops and other resources. A terminal session is specified by a session ID.
User Access Control	Windows feature for preventing non-authoricated changes to the server; for the changes, the user must be specify the password of the administrator.

To be continued

Terminology, Continuation

User profile	A user profiles contains the environment of a user, user-specific settings and configuration. The changes made by the user on the desktop or in other settings remain invisible to the other users. A user profile is generated when the user →logs on for the first time.
User token	In the user token, the Windows system records the privileges of the process such as the user account and the network drives for example.
Verb	Command that corresponds to an action in the context menu and that can be specified with `ShellExecute`, for example, `runas`. The available verbs depend on the file type.

Abbreviations

ACL	Access Control List
CAD	Computer-Aided Design
GDI	Graphic Device Interface
GUI	Graphical User Interface
RDP	Remote Desktop
SCM	Service Control Manager
SID	Security Identifier
UAC	User Account Control

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Symbols

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