



Petrel

Shared earth—critical insight

E&P SOFTWARE PLATFORM

Version 2019

INSTALLATION GUIDE

Schlumberger

Copyright Notice

Copyright © 2019 Schlumberger. All rights reserved.

This work contains the confidential and proprietary trade secrets of Schlumberger and may not be copied or stored in an information retrieval system, transferred, used, distributed, translated or retransmitted in any form or by any means, electronic or mechanical, in whole or in part, without the express written permission of the copyright owner.

Trademarks & Service Marks

Schlumberger, the Schlumberger logotype, and other words or symbols used to identify the products and services described herein are either trademarks, trade names or service marks of Schlumberger and its licensors, or are the property of their respective owners. These marks may not be copied, imitated or used, in whole or in part, without the express prior written permission of Schlumberger. In addition, covers, page headers, custom graphics, icons, and other design elements may be service marks, trademarks, and/or trade dress of Schlumberger, and may not be copied, imitated, or used, in whole or in part, without the express prior written permission of Schlumberger. Other company, product, and service names are the properties of their respective owners.

Petrel® is a mark of Schlumberger.

An asterisk (*) is used throughout this document to designate other marks of Schlumberger.

Security Notice

The software described herein is configured to operate with at least the minimum specifications set out by Schlumberger. You are advised that such minimum specifications are merely recommendations and not intended to be limiting to configurations that may be used to operate the software. Similarly, you are advised that the software should be operated in a secure environment whether such software is operated across a network, on a single system and/or on a plurality of systems. It is up to you to configure and maintain your networks and/or system(s) in a secure manner. If you have further questions as to recommendations regarding recommended specifications or security, please feel free to contact your local Schlumberger representative.

Contents

1	Information Resources	1-1
	Schlumberger Product Documentation	1-2
	About Schlumberger.....	1-2
	Online Documentation	1-2
	Typestyle Conventions.....	1-2
	Alert Statements	1-2
	Contacting Schlumberger.....	1-3
	Technical Support	1-3
2	Overview	2-1
	Introduction	2-2
	Audience	2-2
	Petrel 2019 Distribution	2-3
	About Petrel Licensing	2-4
3	Site Assessment	3-1
	System Requirements.....	3-2
	Operating Systems and Hardware Selections	3-3
	Operating Systems	3-3
	Processors.....	3-3
	Graphics Cards.....	3-5
	Disable NVIDIA Optimus	3-8
	Support for 4K (and Higher Resolution) Monitors	3-9
	Ergonomics and Alternative Input Devices.....	3-10
	Recommended Tested Hardware Solutions.....	3-11
	Petrel Geophysics Recommendations	3-12
	Network Storage Recommendation	3-13
	Remote Visualization Support.....	3-14
	Overview.....	3-14
	Schlumberger IaaS (Infrastructure as a Service)	3-14
4	Installation	4-1
	Downloading the Installation Package.....	4-2
	Installing Petrel 2019	4-3
	INTERSECT Connector.....	4-4
	Configuring the default INTERSECT Connector.....	4-4

Default SLB plugins	4-5
Deploying Petrel on a Network Shared Disk	4-7
Overview	4-7
Deploying Petrel 2019	4-7
Petrel Coordinate System Manager	4-9
Migrating 2015.1 Catalog Files.....	4-9
Re-migrating Catalog Files from Older Versions.....	4-10
Uninstalling Petrel	4-12
5 Petrel License Selection	5-1
Licensing Introduction	5-2
Licensing Terminology	5-3
License bundles (packages)	5-3
Stack on start (SOS).....	5-3
Profiles.....	5-3
License feature	5-3
Module.....	5-3
Expiry date	5-3
Maintenance date.....	5-4
License Selection	5-4
License Bundles	5-6
Stack on Start.....	5-7
Mixing Bundles and Stack on Start Licensing.....	5-8
Check Out SOS Licenses at Petrel Runtime	5-9
License Profiles	5-10
Configuring Global Petrel License Profiles	5-10
Updating Petrel Packages to Petrel 2019 Profiles and Copying Profiles between Petrel Versions	5-11
Copying Profiles between Petrel Installations	5-11
Tooltips.....	5-11
License information inside Petrel	5-12
Setting Up the License Server Environment	5-13
Connecting License Servers.....	5-13
Best Practices for Setting up a License Server.....	5-13
Licensing Issues and Solutions	5-15
Petrel does not detect license dongle after removal and reinsertion or after the computer wakes from sleep or hibernation.....	5-15

	Petrel disconnects from the license server or loses the license on a regular basis.....	5-16
6	Plug-ins	6-1
	Overview.....	6-2
	Installing and Uninstalling Plug-ins.....	6-2
	Plug-in Licenses	6-2
	Plug-in Manager.....	6-3
	Plug-in Manager Settings	6-3
	Customizing the Plug-in Manager interface	6-3
	Deploying Plug-ins from a Network Shared Folder	6-5
	Changing the Default [Plug-ins Home] Directory	6-8
A	Troubleshooting and Frequently Asked Questions.....	A-1
	What is the Petrel Startup Optimization Option?.....	A-2
	What is Ngen?	A-2
	How does it work?.....	A-2
	Can I run Ngen manually?.....	A-2
	Petrel Issues and Solutions	A-3
	Create a global configuration file to standardize system settings.....	A-3
	Failure messages when opening Petrel	A-4
	0xc0150002 error message when opening Petrel	A-5
	Plug-in Issue and Solution	A-6
	Access denied during plug-in installation	A-6
	System Settings	A-7
	Hyperthreading	A-7
	Can I run the installation executable (PetrelPlatformInstaller.exe) from the command line?	A-7
	Can I deploy the Petrel E&P software platform 2019 without using PetrelPlatformInstaller.exe?.....	A-7
B	Advanced Printing System (APS)	B-1
	Overview.....	B-2
	Examples	B-3
C	Studio Database Configuration	C-1
	Third-Party Software Configuration	C-2
	Single Sign On	C-2
	Connecting to the Database	C-3
	Automatic Connection to a Studio Repository.....	C-4

Enabling the Remember Password Feature.....	C-5
Changing the Configuration for Custom Coordinate Systems	C-6
D Enhanced Summary File Format.....	D-1
Overview.....	D-2
How does it work?.....	D-2
Conversion-related Worksteps in Petrel	D-2
Technical Details.....	D-4
The Preferred Workflow for Conversion	D-4
Stand-alone Enhanced Summary Converter Utility	D-6
General Considerations.....	D-8
Best Practice Guidelines	D-8
Performance Considerations	D-8

1 Information Resources

In This Chapter

Schlumberger Product Documentation	1-2
Contacting Schlumberger.....	1-3

Schlumberger Product Documentation

About Schlumberger

Schlumberger is the leading oilfield services provider, trusted to deliver superior results and improved E&P performance for oil and gas companies around the world. Through our well site operations and in our research and engineering facilities, we develop products, services, and solutions that optimize customer performance in a safe and environmentally sound manner.

Online Documentation

Documentation is provided in the following electronic formats on the Schlumberger product CD:

- Adobe® Acrobat® PDF files
- Online help

You must have Adobe® Reader® installed to read the PDF files. Adobe Reader installation programs for common operating systems are available for a free download from the Adobe Web site at www.adobe.com.

Typestyle Conventions

These conventions are observed throughout this guide:

- **Bold** text designates file and folder names, dialog titles, names of buttons, icons, and menus, and terms that are objects of a user selection.
 - *Italic* text emphasizes words, defined terms, and manual titles.
 - Monospace text (`Courier`) shows literal text as you would enter it, or as it would appear onscreen.
-

Alert Statements

The alerting statements are Notes, Cautions, and Warnings. These statements are formatted in these style:

Note: *Information that is incidental to the main text flow, or to an important point or tip provided in addition to the previous statement or instruction.*

Caution: *Advises of machine or data error that could occur should the user fail to take or avoid a specified action.*

Warning: *Requires immediate action by the user to prevent actual loss of data or where an action is irreversible, or when physical damage to the machine or devices is possible.*

Contacting Schlumberger

Technical Support

Schlumberger has sales and support offices around the world. For information about contacting Schlumberger, please refer to the information below:

For Technical Support information for Software Integrated Solutions (SIS) software:

- Software Support website: <https://www.software.slb.com/support>
- Customer Care Center e-mail: customercarecenter@slb.com
- Support Contact Details - Select your country to view support phone numbers. If your country is not listed, select the nearest location.
<http://www.software.slb.com/support/contact-details>

2 Overview

In This Chapter

Introduction	2-2
Petrel 2019 Distribution	2-3
About Petrel Licensing	2-4

Introduction

This guide explains how to install the Petrel E&P Software Platform 2019. These topics are discussed:

- Installing on a workstation using a local license
- Installing on a workstation using a license on a central license server

This guide also explains the procedures that are required after installation:

- Defining your license server environment
- Selecting your license package

Additionally, this guide includes detailed information about deploying Petrel 2019 on a network shared disk. Refer to ["Deploying Petrel on a Network Shared Disk"](#) on page 4-7.

Audience

This guide is useful for these people:

- An individual who installs Petrel on a workstation
- The system administrator who installs Petrel on a network shared disk or creates and distributes a global configuration file for Petrel

Petrel 2019 Distribution

The Software Download Center distributes Petrel 2019 at www.sdc.oilfield.slb.com

The Ocean* Store provides Petrel plug-ins at www.ocean.slb.com

Petrel 2019 requires a workstation with a 64-bit architecture and an operating system that supports this architecture.

About Petrel Licensing

Petrel 2019 requires the 2017 version of the Schlumberger License server, which is distributed with the Petrel DVD. The new server is backward compatible with all previous Petrel release versions. The Petrel 2019 **License selection** dialog will throw an error message if it attempts to connect to a previous Licensing tool.

Petrel 2019 requires a valid license. The license can be configured either locally on your computer or on a central license server.

Petrel 2019 uses a combination of Flexera™ FlexNet Publisher® licensing and a WIBU® CodeMeter® dongle. This provides a secure licensing solution.

-
- Notes:**
- *This version of Petrel requires a Petrel 2017 license file. Licenses for this release are backward compatible with all previous release versions.*
 - *For information about the Schlumberger Licensing Tool, refer to the Schlumberger Licensing User Guide, located in the installation folder of the Petrel installation files (for example, C:\Program Files\Schlumberger\Petrel 2019\Help).*

3 Site Assessment

In This Chapter

System Requirements.....	3-2
Operating Systems and Hardware Selections	3-3
Recommended Tested Hardware Solutions.....	3-11
Petrel Geophysics Recommendations	3-12
Network Storage Recommendation	3-13
Remote Visualization Support.....	3-14

System Requirements

Table 3-1 lists the minimum system requirements and the preferred system requirements for Petrel 2019. The preferred system includes the minimum requirements to efficiently support Geophysics workflows.

Table 3-1 Petrel 2019 System Requirements

Minimum System Recommendations	
Processor	Quad-core processor (best with a fast clock speed and high cache)
Memory	16 GB RAM (32+ GB recommended)
Display	The quality of the viewing experience increases with the size and number of monitors
Graphics Desktop	NVIDIA® Quadro® P4000 or NVIDIA Quadro P2000
Graphics Mobile	NVIDIA Quadro P3000 or NVIDIA Quadro M2200
Primary storage	Fast rotational speed HDD (10K, 15K RPM) or SSD
Secondary storage	Optional
Preferred Hardware	
Processor	Dual 4 to 8 core processor (best with a fast clock speed and high cache)
Memory	64 GB RAM
Display	The quality of the viewing experience increases with the size and number of monitors
Graphics Desktop	NVIDIA Quadro P6000 or P5000
Graphics Mobile	NVIDIA Quadro P5000 or P4000
Primary storage	PCIe based Flash or SSD
Secondary storage	SSD or Fast rotational speed HDD (10K, 15K)
Other Required Software	
Microsoft® .NET® Framework 4.6.2 minimum, 4.7 or newer recommended (Tech Alert #6858030)	

- Notes:**
- *Petrel has known issues with .NET Framework 4.6.0 and the installer will **not** install Petrel if this .NET version is detected (on Windows 10, .NET is an OS component installed by default).*
 - *Schlumberger continually tests the latest hardware available from major suppliers. In an attempt to minimize unexpected problems and costs, Schlumberger often uses branded solutions such as those offered by HP®, Dell®, Lenovo®, Intel®, and NVIDIA.*

Operating Systems and Hardware Selections

Operating Systems

Table 3-2 Petrel 2019 Supported Operating Systems

Operating System
64-bit Windows 10 (Professional and Enterprise editions)
64-bit Windows 7 with SP1 (Professional and Enterprise editions)

Note: *Windows 10 updates – Microsoft supports semi-annual update channel (includes .NET) – future Petrel versions will be supported on the current channel update at the Petrel release date.*

Note: *Support for virtual reality (VR) has been removed from Petrel 2017 onward.*

Processors

Processor speed improves performance for these types of tasks:

- Large calculation tasks, such as volume size, seismic attribute generation, property modeling, and upscaling
- Adding information to the graphics card

For general Petrel use, a processor that meets the minimum recommendations is sufficient. For better performance, use the best available configuration (refer to Table 3-1).

Several Petrel 2019 modules can benefit from multi-core processors.

Table 3-3 Petrel Modules that Benefit from Multi-Core Processors

	Parallel	Background
Geophysics: For more information, refer to "Petrel Geophysics Recommendations" on page 3-9.		
Seismic read access of ZGY	Yes	Yes
Volume attribute computation	Yes	Yes
Prefetch to cache 3D seismic data	Yes	Yes
Local 3D horizon – read access for	Yes	Yes
Multiresolution computation for viz <ul style="list-style-type: none"> Horizons for seismic 3D Seismic 2D lines 	Yes	Yes
Seismic 3D realization from any source – ZGY / SEG-Y / RAW	Yes	Yes
Seismic 3D read access for 3D viz using slice renderer – SEG-Y / RAW	Yes	Yes
Seismic 3D export to SEG-Y	Yes	No
Decompression of compressed ZGY	Yes	Yes
Prefetch to cache SEG-Y	No	Yes
Prefetch to cache RAW seismic	No	Yes
3D seismic interpretation	No	Yes
Seismic interpretation min/max queries	Yes	No
Seismic histogram scan	Yes	Yes
Seismic copy local	No	Yes
Make compressed ZGY	Yes	Yes
Ocean prestack seismic access	Yes	Yes
Geology and Modeling		
Data analysis	No	Yes
Facies and Petrophysical modeling	Yes	No
Geometrical modeling (incl seismic sampling)	Yes	No
3D grid volumetrics	Yes	No
Surface Volumetrics	Yes	No

	Parallel	Background
Gridding		
Structural gridding	Yes	No
Grid refinement process	Yes	No
Mesh skin extraction for 3D grid property visualization	Yes	Yes

Petrel Modeling Recommendations

Several modeling algorithms in Petrel 2019 take advantage of multi-core processing. Increasing the number of processors improves the runtime of these algorithms. This current trend of converting algorithms to run in parallel will continue, based on algorithm runtime.

Memory (RAM)

To run Petrel efficiently, Schlumberger requires at least 16 GB of RAM and recommends at least 32 GB (64 GB for Geophysics workflows). The total system memory must be greater than the memory used by the application. This ensures that your operating system has dedicated RAM so that you do not need use your page file (disk memory).

To estimate the required system size, follow these guidelines:

- For small- to medium-sized data sets (<5 GB): 32 GB of memory
- For large data sets (large 3D seismic volumes, regional seismic models, or large simulation [ECLIPSE] runs): 64 to 192+ GB of RAM

Graphics Cards

Table 3-4 lists the recommended, tested graphics cards for Petrel 2019. Your graphics card must meet these requirements:

- Run Pixel Shader 2.0 or later
- Be OpenGL compatible

For a better visualization experience, use a high-end graphics card and a good monitor (such as a 27–30-inch LCD monitor or Ultra High Definition 4K monitors).

Table 3-4 Petrel 2019 Recommended Graphics Cards

Level	Level	Dedicated RAM	GPU Cores
Workstation, Ultra High End	NVIDIA Quadro P6000	24 GB	3840
	NVIDIA Quadro P5000	16 GB	2560
Workstation, High End	NVIDIA Quadro P5000	16 GB	2560
Workstation, Mid-Range	NVIDIA Quadro P4000	8 GB	1792
Mobile Workstation, Ultra High End	NVIDIA Quadro P5000	16 GB	2048
Mobile Workstation, High End	NVIDIA Quadro P4000	8 GB	1792
Mobile Workstation Mid-Range	NVIDIA Quadro P3000	6 GB	1280

Note: Petrel is certified and supported on NVIDIA Quadro graphics cards only. Integrated graphics cards are not recommended. From Petrel 2017 onward, NVIDIA Quadro FX graphics cards are no longer supported.

Note: NVIDIA Quadro RTX GPUs are also recommended and supported for use with Petrel 2016 or later.

Selecting the Right Graphics Card

Petrel automatically manages graphics card memory for most data types and windows. Choosing the right graphics card optimizes Petrel visualization performance. Petrel enables rendering and computation on the graphics card for many data objects, such as seismic, well data, surfaces, point, and polygons. Therefore, it is important to scale your graphics card towards the expected needs.

Table 3-5 provides a basic overview and recommendation for selected data types.

Table 3-5 Workflow-Specific Graphics Card Recommendations

Data Type	Size	Recommended Graphics Card	Recommended GPU Memory and Cores	Recommend RAM
Seismic	1 GB	P2000 or better M2200 or better	Memory: 4 GB+ GPU cores: 700+	16 GB +
	>10GB	P5000	Memory: 8 GB+ GPU cores: 1500+	64 GB+
	>50 GB	P6000	Memory: 12 GB+ GPU cores: 3000+	128 GB+

Data Type	Size	Recommended Graphics Card	Recommended GPU Memory and Cores	Recommend RAM
Wells	1000	P2000 or better M2200 or better	Memory: 4 GB+ GPU cores: 700+	16 GB +
	>10000	P5000	Memory: 8 GB+ GPU cores: 1500+	32 GB+
	>250000	P6000	Memory: 12 GB+ GPU cores: 3000+	64 GB+
Surfaces (cells) or points	>1 mill	P2000 or better M2200 or better	Memory: 4 GB+ GPU cores: 700+	16 GB +
	>10 mill	P5000	Memory: 8 GB+ GPU cores: 1500+	32 GB+
	>100mill	P6000	Memory: 12 GB+ GPU cores: 3000+	64 GB+
3D grids (cells)	>1 mill	P2000 or better M2200 or better	Memory: 4 GB+ GPU cores: 700+	16 GB +
	>10 mill	P5000	Memory: 8 GB+ GPU cores: 1500+	32 GB+
	>100mill	P6000	Memory: 12 GB+ GPU cores: 3000+	64 GB+

Note: From Petrel 2016.1 onwards, the option **Workstation App – Dynamic Streaming** in the NVIDIA Control Panel under **3D settings > Manage 3D settings** is set by default through the application to ensure optimal performance for Petrel, when visualizing data in the **2D** or **3D** windows.

NVIDIA Tested Drivers

Release 412.16 is the latest recommended and tested official driver from NVIDIA for both workstations and mobile workstations. Schlumberger recommends upgrading to the latest official drivers from your PC vendor's home page or directly from NVIDIA.

Testing shows that NVIDIA drivers 362.56 and later fix many critical issues that support Petrel. Accordingly, release 362.56 is the minimum required driver for NVIDIA graphics cards.

-
- Notes:**
- According to NVIDIA, after release 375, any subsequent Windows driver release starting with release 378 will cease to support the following NVIDIA Quadro products:

Quadro	Quadro Blade/Embedded	Quadro Notebook
Quadro Plex 7000	Quadro 4000M	Quadro 5010M
Quadro 6000	Quadro 3000M	Quadro 5000M
Quadro 5000	Quadro 100M	Quadro 4000M
Quadro 4000	Quadro 500M	Quadro 3000M
Quadro 2000		Quadro 2000M
Quadro 2000 D		Quadro 1000M
Quadro 600		

The NVIDIA support team will continue to address critical driver issues for these products in Release 375 through March 1, 2018. However, future enhancements and optimizations in driver releases after Release 375 will not support these products.

- NVIDIA SLI™ technology currently does not benefit Petrel. However, this technology could be an advantage if you are using a large, high-resolution monitor such as 30-inch LCD monitors.

Disable NVIDIA Optimus

The NVIDIA Optimus feature is incompatible with Petrel.

► **To Disable Optimus**

- 1 Reboot the system.
- 2 Access the BIOS settings.
- 3 Go to the video section.
- 4 Disable Optimus.
- 5 Reboot the system.

To read more about NVIDIA's Optimus Technology, refer to http://www.nvidia.com/object/optimus_technology.html.

Support for 4K (and Higher Resolution) Monitors

4K (and higher resolution) monitors can be used with Petrel 2019 with low, medium, and high DPI settings, ranging from 100% to 200% DPI and possibly even higher. The advised display setting using 4K resolution (3840x2160) is 150-175% DPI. In this scenario, Petrel UIs should remain functional and usable and not prevent any user interactions.

Note: To set 175%, click **Set custom text size (DPI)**, make your selection and sign out/sign in.

Minor cosmetic side effects might be noticed at very high DPI settings. An option, if this is disturbing, is to reduce the resolution to e.g. 3K (2560x1440) in combination with 100% or 125% DPI. In that scenario, all UIs should scale correctly.

In Petrel 2019 it is no longer necessary to set the application Compatibility mode as Petrel now does this automatically.

Note for Windows 10: The Display settings dialog box has an option for dynamic display scaling. This is simply a monitor magnifier, and everything on the screen will be scaled. The scaling approach is sub-optimal. Sign out/Sign in is strongly recommended for the best display scaling quality and experience.

Note: *4K monitors have a significantly higher number of pixels which require sufficient graphics card support.*

Note: *In a multi-monitor setup, the best results are achieved where all the monitors have the same resolution (different scaling has no detrimental effect, for example, a 4K laptop @250% + a 4K 32" monitor @150%).*

Ergonomics and Alternative Input Devices

Petrel ribbons and other features are designed to improve the overall ergonomics. Data-centered workflows are supported through tools like Petrel Search, window toolbars, tool palettes, inspectors, object players, context menus and mini-toolbars. Furthermore, global and in-context keyboard shortcuts are available for direct action. Finally, ribbons can be navigated via key tips (invoked with the keyboard ALT key).

We are aware that people can have ergonomic issues, and that there are products out there, which can help to reduce such issues. Many of these products may work with Petrel, although we cannot guarantee that they will.

One product that has worked with Petrel is the **3Dconnexion Space Mouse joystick** (www.3dconnexion.com). Petrel has built-in support for space mouse joystick control of the 3D Window camera movements. See Schlumberger Customer Care Center for more info: [CCC Knowledge Article kb6948320](#).

Petrel should in principle work with any Microsoft Windows compatible input device. Below are some examples of other devices that may work with Petrel. Others may also work with Petrel.

Wacom Cintiq 27QHD pen and touch display (<http://www.wacom.com>)

- Pressure sensitive pen
- Remote control with customizable buttons
- Screen can be tilted

Evoluent Vertical Mouse (<https://evoluent.com>)

- Ninety degree rotation of the hand position
- Right-handed and left-handed versions

Sun-Flex ProTouch touch and button pad (<http://www.sun-flex.com/en/products/protouch/>)

- Placed in front of the keyboard
- Standard mouse features (mouse buttons and cursor control)

Recommended Tested Hardware Solutions

Schlumberger regularly tests hardware from a variety of vendors.

Table 3-6 and Table 3-7 list a sampling of the hardware products used in the Petrel commercialization cycle. For detailed information about the laptops and workstations listed here, contact the SIS organization.

-
- Notes:**
- *Schlumberger routinely tests the latest hardware available from major suppliers. To minimize unexpected problems and costs, contact your Schlumberger sales representative.*
 - *Most hardware vendors offer highly customizable options of each workstation model. To ensure that your workstation selection meets Petrel system requirements, note the individual workstation specifications instead of relying on a model number. As a general rule, the hardware used should not be more than two years older than the Petrel version running on it.*

Table 3-6 Laptops tested for Petrel 2019

High-End Laptops	Mid-Range Laptops
<ul style="list-style-type: none"> • Dell 7730/7530 • HP Zbook 17/15 • Lenovo P72/P52 	<ul style="list-style-type: none"> • Dell 5530 • HP Zbook Studio • Lenovo P52s

Table 3-7 Workstations tested for Petrel 2019

High-End Workstations	Mid-Range Workstations
<ul style="list-style-type: none"> • Dell T7920/T7820 • HP Z8/Z6 • Lenovo P920/P720 	<ul style="list-style-type: none"> • Dell T5820 • HP Z4 • Lenovo P520

Additionally, smaller platforms (desktop and laptop) in the 'workstation' ranges from the above manufacturers have shown to perform well in light geoscience workflows or with very small datasets:

- HP Z1 all-in-one workstation series
- HP Z240 desktop workstation series
- Lenovo P310 desktop workstation series
- Dell 3510 mobile workstation

Note: *Although the hardware listed here has been tested, it is not certified for use by Schlumberger. Problems beyond the control of Schlumberger (for example, driver bugs, BIOS bugs, operating system limitations) may affect individual experiences.*

Petrel Geophysics Recommendations

If you use the Geophysics module to view large 2D lines and 3D surveys and if you use the volume rendering feature, Schlumberger recommends that you use:

- A high-end graphics card with at least 4 GB memory (refer to Table 3-8)
- As much memory as your hardware and operating system permits and at least 32 GB RAM

Table 3-8 Petrel Geophysics Graphics Cards

Levels	Graphics Card
High	NVIDIA Quadro P6000 or P5000
Medium	NVIDIA Quadro P5000 or P4000
Minimum	NVIDIA Quadro P4000

For better performance, use multiples of serial-attached SCSI (SAS) 15K RPM, SSDs or PCIe based flash. Consider:

- Storage capacity (for example, 500 GB)
- Rotational speed (for example, 15K RPM)
- Interface (SATA, SAS, PCIe)

Table 3-9 lists setup scenarios for Petrel Geophysics.

Table 3-9 Petrel Geophysics Graphics Card Setup Scenarios

Operating System	RAM	Graphics Card RAM	Seismic Texture Cache	Seismic Cache
Seismic Interpretation				
64-bit system (Windows 7 with SP1 or Windows 10)	32 to 96 GB	1.5 to 4 GB	768 MB to 3 GB depending on graphics RAM	Up to 180 GB, depending on RAM
Seismic and Geobody Interpretation				
64-bit system (Windows 7 with SP1 or Windows 10)	32 to 192 GB	4 to 8 GB	2 to 4 GB	Up to 180 GB, depending on RAM

Network Storage Recommendation

Petrel projects and associated data may be stored on a network drive on a central file server. Often, access to these projects could become a performance issue due to network congestion or as a result of using an inadequate Windows network protocol.

To efficiently access project data stored on a network shared drive, use the Windows SMB2 or SMB3 network protocol. These protocols are available by default for Windows 7 and 10. Your network storage system must be able to support this protocol. Contact your storage provider if you need assistance.

The combination of the 64-bit Windows operating system with the SMB2 protocol can significantly enhance Reference Project workflows and access to Petrel data, in general.

Remote Visualization Support

Overview

Many organizations are moving to a centralized application delivery model using thin-client technology. Petrel can be used in this way if the environment is properly configured to meet application and workflow requirements.

Schlumberger IaaS (Infrastructure as a Service) is the SIS-supported solution for E&P application centralization and provides a full, dedicated infrastructure designed to provide optimal performance for SIS Platform technologies. The solution provides an end-to-end service option for customers.

Other solutions may work as well but are not supported. For customers implementing an internally developed converged infrastructure solution, we recommend validation of the specific solution through our Validation Framework service. This service helps define baseline performance characteristics and expectations of the environment. Please contact your account manager for further information on the validation framework service.

Schlumberger IaaS (Infrastructure as a Service)

Schlumberger IaaS provides a full E&P computing environment as a converged infrastructure, including systems, storage and networks. Extensive validation testing has been conducted to ensure the solution provides optimal performance[†] for SIS Platform technologies. The converged infrastructure approach means that the entire solution can be delivered as a managed service, taking the E&P workload off the shoulders of the internal IT organization.

A full Schlumberger IaaS solution can be defined through a simple requirements assessment process and delivered to the customer pre-loaded with standard virtual images and Schlumberger software, including Petrel.

If you are seeking to deploy Petrel in a centralized architecture, please contact your account manager for further information.

[†] Bandwidth, latency and network quality can impact the quality and performance of visualization technologies.

4 Installation

In This Chapter

Downloading the Installation Package.....	4-2
Installing Petrel 2019	4-3
INTERSECT Connector.....	4-4
Default SLB plugins	4-5
Deploying Petrel on a Network Shared Disk	4-7
Petrel Coordinate System Manager	4-9
Uninstalling Petrel	4-12

Downloading the Installation Package

The Petrel installation package is available on DVD or by download from the Software Download Center.

Note: *If you are a new user to the Software Download Center, you must register before you can download products.*

► **To Download Petrel 2019 from the Software Download Center**

- 1 Go to www.sdc.oilfield.slb.com.
- 2 Click **Software Download Center**.
- 3 Log in to the site.
- 4 On the **Welcome Message** page, click **Continue**.
- 5 In the **Product Group Name** list (in the upper-left corner), click **Petrel**.
The page updates to show all available Petrel downloads.
- 6 Locate the Petrel 2019 package that you need and click the associated **Download** icon. You can download a full version or you can download a specific upgrade, extension, or plug-in.

You are now ready to install Petrel 2019.

Installing Petrel 2019

Petrel 2019 is a complete package installation. Installation requires:

- A workstation that is running a supported operative system.
- At least 5 GB of free disk space in the installation directory to install Petrel
- 3 GB on the C: drive for system files
- Administrator rights on the local system

You can install Petrel 2019 on a system that already has previous versions of Petrel. However, if you want Petrel 2019 only, you must uninstall the older versions (refer to “Uninstalling Petrel” on page 4-12).

Note: *If you plan to install a future version of Petrel that includes plug-ins such as Production or Drilling, refer to the plug-in release notes for an installation overview and steps on verifying the installation.*

► **To Install Petrel 2019**

1 Insert the DVD or navigate to the location where you downloaded the installation files.

2 In the DVD browser, from the root folder, run **PetrelPlatformInstaller.exe**.
The **License Terms & Conditions** panel appears.

3 On the **License agreement** panel, read the agreement, select **I accept the terms in the license agreement**, and then click **Next**.

4 On the **Prerequisite Check** panel, inspect warnings or errors by hovering over the icon and then click **Next**.

Read the *Petrel Installation Guide* for additional details. For optimal performance, all checks should show a green check mark.

5 On the **Destination Folder** panel, accept the default folder, or click **Change** to select the folder where you want to install Petrel, and then click **Install**.

Note: *You must install Petrel on a local drive (a drive that is locally installed on your system). Please read the next section for the deployment of Petrel on a network-shared disk.*

6 When the installation completes, click **Finish**.

INTERSECT Connector

Contrary to earlier Petrel releases, with Petrel 2019, you do not need to choose the INTERSECT connector version during Petrel installation. Instead, multiple INTERSECT connectors will be installed simultaneously and you can select the INTERSECT connector you want to use in Petrel by accessing File>Options>Select INTERSECT Connector. Switching the connector only takes effect when Petrel is restarted. Petrel stores the selection details in the following file:

```
%APPDATA%\Schlumberger\Petrel\2019\IntersectConnector.xml
```

Configuring the default INTERSECT Connector

By default, the latest commercial version of INTERSECT connector is active the first time Petrel is started. System administrators can define a different default INTERSECT connector prior to roll-out. This can be configured by creating an IntersectConnector.xml file in Extensions\Schlumberger\INTERSECT subdirectory of the Petrel 2019 installation directory. For example:

```
C:\Program Files\Schlumberger\Petrel  
2019\Extensions\Schlumberger\INTERSECT\IntersectConnector.xml
```

The xml file must contain the following:

```
<IntersectConnector>  
    <intersect>INTERSECT version</intersect>  
    <iscommercial>True/False</iscommercial>  
    <override>True/False</override>  
</IntersectConnector>
```

For example, to define 2018.1 INTERSECT Connector as the default, you can specify the following:

```
<IntersectConnector>  
    <intersect>2018.1</intersect>  
    <iscommercial>True</iscommercial>  
    <override>False</override>  
</IntersectConnector>
```

`override = True/False`: If set to `False`, the users will not be able to change the INTERSECT connector through the Select INTERSECT Connector dialog box in Petrel.

`iscommercial = True/False`: Petrel will always attempt to load the latest commercial connector corresponding to the specified INTERSECT version. The `iscommercial` setting controls the behavior when no matching commercial connector is found, and a matching pre-commercial connector is available. If set to `True`, the pre-commercial connector will not be loaded. If set to `False`, the pre-commercial connector will be loaded.

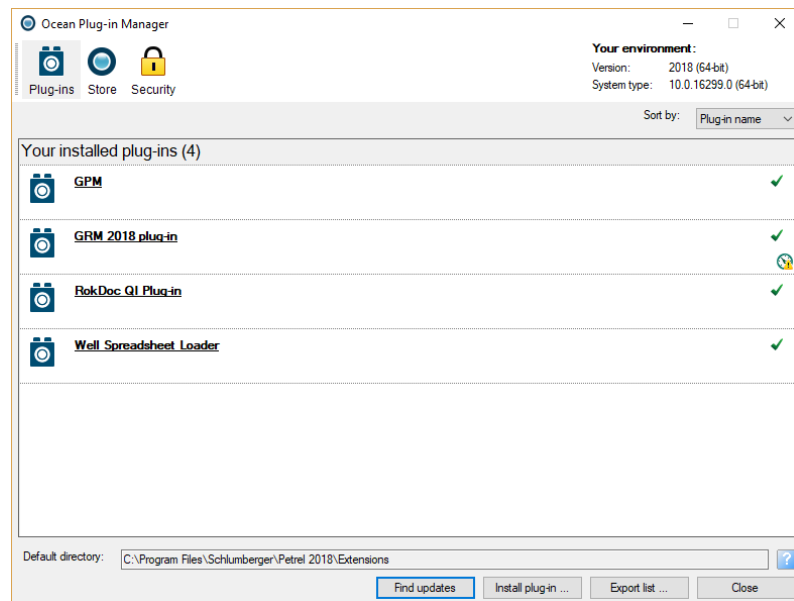
Default SLB plugins

The Petrel Installer now installs any plugins that reside in the Plugins folder of the Petrel distribution (you can add others to this folder). These are currently:

- GPM
- GRM
- RokDocQI
- Well Spreadsheet Loader

It will install each in turn and write the plugin install log in %temp% alongside the main installer log. If the plugin install fails, an error message is displayed in the installer GUI.

The plugins appear in the Plug-in Manager; however, they cannot be disabled or uninstalled from the Plug-in Manager.



All these plugins can be disabled using the command line format:

```
C:\Program Files\Schlumberger\Petrel 2019>PluginManager.exe /disable /allusers 'PluginID' Petrel.exe
```

Where 'PluginID' can be found using the command line format:

```
C:\Program Files\Schlumberger\Petrel 2019>PluginManager.exe /list Petrel.exe
```

'PluginID' is the second attribute in any line returned by the list command – examples highlighted below:

```
Command Prompt
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Users\parkerd2>cd c:\program files\schlumberger\petrel 2017

c:\Program Files\Schlumberger\Petrel 2017>PluginManager.exe /list Petrel.exe
GRM 2017 plug-in, //GRM/17.2.1844.1844,CommonAppData
Reservoir Elastic Modeling, //ReservoirElasticModeling.Plugin/17.1.1.0,CommonAppData
RokDoc QI Plug-in, //Isl.Plugin.RokDocQiPlugin/2017.4.0.58,CommonAppData
Scenes Maker, //OceanPlugin2.Plugin/5.2.0.0,CommonAppData
GPM, //Slb.Exploration.Gpm.Ocean.SedimentarySimulationAndVisualisation/1.0.7.431,CommonAppData

c:\Program Files\Schlumberger\Petrel 2017>
```

All the plugins can be uninstalled from Control Panel under 'Uninstall a program'. All the plugins can also be uninstalled using the command line format:

```
<C:\Program Files\Schlumberger\Petrel> 2019>PluginManager.exe /uninstall /allusers 'PluginID' Petrel.exe
```

MSI packages for the default plugins are available in the Plugins folder of the Petrel distribution for those running scripted installations (see also [Knowledge Base Content ID 6969918](#)).

Deploying Petrel on a Network Shared Disk

Overview

This section explains how a system administrator can deploy Petrel 2019 on a network shared disk.

Deploying Petrel 2019 on a network shared disk offers these advantages:

- Easy and efficient deployment of Petrel
- Single configuration file for all Petrel users
- Transparent configuration and installation of updates for all Petrel users

Deploying Petrel on a network shared disk reduces the management burden for system administrators. They can install, configure, and maintain the application in one location only.

Also, the system administrator can configure a single Petrel configuration file to standardize license packages and specific Petrel settings for all Petrel users. For detailed information, refer to Appendix A, "Create a global configuration file to standardize system settings" on page A-3. Please see Section 6 on how to deploy plug-ins from a network shared disk.

Deploying Petrel 2019

Before beginning this procedure, you must be familiar with installing Petrel and you must already have access to a functional Petrel license.

Note: *A system administrator must perform this procedure. Petrel users cannot launch Petrel 2019 directly from the network path where the distribution resides. Petrel users must map the network shared folder on their local workstation.*

- 1 From the workstation, install Petrel 2019.
- 2 Copy the entire installation folder where Petrel 2019 was installed (for example, C:\Program Files\Schlumberger\Petrel 2019) from the local workstation to a folder on the network shared disk (for example, P:\Global Petrel\Petrel 2019).

On each workstation that will run Petrel, complete these steps:

- 1 Go to the location on the shared disk where Petrel was copied and create a shortcut for the Petrel executable. Place the shortcut on the desktop.
- 2 Install all the applications from the **RuntimeEnvironment** folder (which is located in the **Petrel Installation** folder) if they are not already installed on the workstation:
 - NDP452-KB2901907-x86-x64-AIiOS-ENU.exe
 - Windows6.1-KB2533623-x64.msu
 - vcredist_x64.exe
 - vcredist_x86.exe

- vcredist_2008_ATL_x86.exe
- SQLSysClrTypes.msi (only to connect to Studio Database on SQL server)

3 Execute the **caspol.exe** command to configure the runtime security policy for the machine. Here is an example of a script you can modify for your use.

```
%windir%\Microsoft.NET\Framework64\v4.0.30319\caspol.exe -quiet
-machine -reset
```

```
%windir%\Microsoft.NET\Framework64\v4.0.30319\caspol.exe -quiet
-enterprise -reset
```

```
%windir%\Microsoft.NET\Framework64\v4.0.30319\caspol.exe -quiet
-machine -addgroup 1 -url "file:///your.server.com\Global
Petrel\Petrel2019\*" FullTrust -name "Petrel_fulltrust"
-description "Allow exe and dll from directory on Network drive to
run with full .NET trust, necessary for calling native code."
```

```
%windir%\Microsoft.NET\Framework64\v4.0.30319\caspol.exe -quiet
-enterprise -addgroup 1 -url "file:///your.server.com\Global
Petrel\Petrel2019\*" FullTrust -name "Petrel_fulltrust"
-description "Allow exe and dll from directory on Network drive to
run with full .NET trust, necessary for calling native code."
```

Modify **\\your.server.com\Global Petrel\Petrel2019** for your own environment.

Executing the caspol command updates system security at the machine and enterprise policy level. This allows .exe and .dll files on the shared folder to run Petrel 2019 with full .NET trust.

Resetting the policies removes existing policies that may have been configured at the site. Use caution when you reset a policy

- 4** Launch Petrel 2019 from the shortcut that you created.
- 5** Define the license server environment.

Note: *When running Petrel from a network shared disk performance is affected depending on network latency. Network shared installations cannot benefit from the Petrel startup optimization and caching, which has an impact on the Petrel startup performance.*

Petrel Coordinate System Manager

Installing Petrel 2019 also installs the Petrel Coordinate System Manager. The Petrel Coordinate System Manager enables you to manage and customize the Petrel Coordinate Reference System catalog.

A geodetic expert can use the Petrel Coordinate System Manager to manage and customize the enterprise and extension catalogs used by Petrel. These catalogs provide the coordinate reference systems that are available in Petrel in the **Coordinate reference system selection** dialog box. From the **Coordinate reference system selection** dialog box, a Petrel user can select the appropriate coordinate reference system for a Petrel project.

If the default catalog has not been changed, Petrel can be upgraded directly from Petrel 2010.1 to Petrel 2017.x.

If the default catalog has been customized or replaced, a migration must be performed in order to make the customizations available in Petrel 2017.x.

For more information about the Petrel Coordinate System Manager, refer to the Petrel 2019 Coordinate System Manager Online Help.

Migrating 2015.1 Catalog Files

If you used Petrel Coordinate System Manager 2015.x to customize the enterprise or extension catalog, you can migrate these catalogs to the 2016.1 catalogs that are used by Petrel Coordinate System Manager 2016.x and 2017.x.

- If you stored the 2015.1 enterprise or extension catalog in the default location %APPDATA%\Schlumberger\Petrel\CRSCatalogConfiguration\2015.1, the software migrates the catalogs for you.
- If you stored the 2015.1 catalogs in another location, for example, on a shared network drive, or if you want to migrate older catalogs, for example, 2013.1 catalogs, you must manually enter the catalog locations in the **CoordinateCatalogConfiguration.xml** file before you can open Petrel Coordinate System Manager 2017.x or the **Coordinate reference system selection** dialog box in Petrel 2017.x.

► *To Migrate 2015.1 Catalog Files*

- 1 Navigate to the **xml** directory in your Petrel 2019 installation directory and open the **CoordinateCatalogConfiguration.xml** file. For example, C:\Program Files\Schlumberger\Petrel 2019\xml.
- 2 Locate the section <!--Look-up path to previous catalogs --> and update the default enterprise and extension catalog file locations. For example, if you migrate 2015.1 catalogs, enter the location of the 2015.1 catalog files.
 - a. To update the enterprise catalog file location, update this value with catalog file location:

```
<Catalog name="CopyFromEnterpriseCatalog">
<value>%APPDATA%\Schlumberger\Petrel\CRSCatalog
Configuration\2015.1\CoordinateCatalogEnterprise.ct1
</value>
</Catalog>
```

- b. To update the extension catalog file location, update this value with the catalog file location:

```
<Catalog name="CopyFromUserdefinedExtensionCatalog">  
<value>%APPDATA%\Schlumberger\Petrel\CRSCatalogConfiguration  
\2015.1\CoordinateCatalogExtensions.ctl</value>  
</Catalog>
```

- 3 Save and close the configuration file.
- 4 Migrate the catalogs by performing one of these actions:
 - Launch Petrel Coordinate System Manager 2017.x.
 - Launch Petrel 2017.x and open an existing Petrel project or create a new one.

Re-migrating Catalog Files from Older Versions

Catalog files from previous versions (prior to 2015.1) are not automatically migrated. You must manually migrate them by modifying the **CoordinateCatalogConfiguration.xml** file (refer to "Migrating 2015.1 Catalog Files" on page 4-9).

However, as an example, if you opened the Petrel Coordinate System Manager or the Coordinate reference system selection dialog box in Petrel before you migrated your older catalog files, for example, your 2013.1 catalog files, you can use this procedure to re-migrate your older catalog files to 2016.1.

Note: *You can also use this remigration procedure if you opened Petrel Coordinate System Manager or the **Coordinate reference system selection** dialog box before you modified the **CoordinateCatalogConfiguration.xml** file with the location of your older catalog files stored on a network shared drive.*

► To Re-migrate Catalog Files from Older Versions

- 1 Delete the default location for the 2016.1 catalog files that are used by Petrel Coordinate System Manager 2017.x:

```
%APPDATA%\Schlumberger\Petrel\CRSCatalogConfiguration\2016.1
```

- 2 Navigate to the **xml** directory in your Petrel 2017.x installation directory and open the **CoordinateCatalogConfiguration.xml** file. For example, C:\Program Files\Schlumberger\Petrel 2017\xml.

3 Locate the section `<!--Look-up path to previous catalogs -->` and update the default enterprise and extension catalog file locations.

a. To update the enterprise catalog file location, update this value with the location of your catalog file from an older version, for example, 2013.1:

```
<Catalog name="CopyFromEnterpriseCatalog">
<value>%APPDATA%\Schlumberger\Petrel\CRSCatalogConfiguration
\2013.1\CoordinateCatalogEnterprise.ctl</value>

</Catalog>
```

b. To update the extension catalog file location, update this value with the location of your catalog file from an older version, for example, 2013.1:

```
<Catalog name="CopyFromUserdefinedExtensionCatalog">
<value>%APPDATA%\Schlumberger\Petrel\CRSCatalog
Configuration\2013.1\CoordinateCatalogExtensions.ctl</value>

</Catalog>
```

4 Save and close the configuration file.

5 Migrate the catalogs by performing one of these actions:

- Launch Petrel Coordinate System Manager 2017.x.
- Launch Petrel 2017.x and open an existing Petrel project or create a new one.

Uninstalling Petrel

You can uninstall Petrel from the **Control Panel**.

► **To Uninstall Petrel from the Control Panel**

- 1 Click **Start > Control Panel > Uninstall a program**.
- 2 In the list of currently installed programs, select the Petrel application, and then click **Uninstall**.

-
- Notes:**
- *The installer detects installed Ocean plug-ins and uninstalls the plug-ins before uninstalling Petrel.*
 - *If Ocean plug-ins were installed on a shared network disk, you may need to uninstall each plug-in separately before uninstalling Petrel, depending on how the plug-ins were initially installed.*

5 Petrel License Selection

In This Chapter

Licensing Introduction	5-2
Licensing Terminology	5-3
License Selection	5-4
License Profiles	5-10
Setting Up the License Server Environment	5-13
Licensing Issues and Solutions	5-15

Licensing Introduction

Petrel uses FlexNet-based licensing. This requires a continuous connection to a USB-based CodeMeter dongle that serves licenses through a remote- or local-license server. To use a local license, you must have the Schlumberger Licensing tool and CodeMeter runtime installed. Both of these tools come with Petrel.

Note: *Petrel 2019 requires a 2017 version of the Schlumberger Licensing Tool, which is shipped with Petrel. The 2017 version of the Schlumberger Licensing Tool is fully backwards compatible with previous Petrel versions and does not require new license files. An error message is issued in the Petrel license selection dialog when connecting to the license sever through the 2015 Schlumberger Licensing Tool. For more information, please see the Schlumberger Licensing User Guide.*

As a minimum, Petrel requires a core module license. Petrel supports six core module licenses:

- Geoscience core
- Reservoir engineering core
- Combined core (combines Geoscience core and Reservoir engineering core)
- Shale core
- Geophysics Core
- Data and results viewer core
- Ocean framework (enables Ocean development)

Each core module license enables a different set of Petrel features.

Core module licenses are offered in two types:

- License bundle or
- Stack on start

(The Shale core is available as a license bundle only.)

Petrel supports either license type in a standalone mode or mixing license types from multiple or a single license server provided through multiple or a single license file.

This section describes the license types, license selection, setup, and configuration.

Note: *When choosing your license type and license feature sets, consult your local SIS Account Manager or SIS Services team for guidance on an optimal configuration.*

Licensing Terminology

License bundles (packages)

A license bundle is a physical license. It must contain a Petrel core license and it may contain optional Petrel module licenses. Checking out a bundled license feature checks out all the licenses that the bundle contains.

In the **Petrel E&P Software Platform 2019 - License selection** dialog box, by default, license packages are listed under **Core licenses** as **Bundle + #**.

Stack on start (SOS)

A stack on start (SOS) license consists of individual licenses for each Petrel module. SOS licenses can be part of the same license file or exist as separate license files.

In the **Petrel E&P Software Platform 2019 - License selection** dialog box, Petrel core module SOS licenses are listed under **Core licenses**. All other Petrel modules are listed under **Petrel modules**. If multiple servers are connected, licenses are summed.

Profiles

A profile is a user-defined selection of licenses. This feature in Petrel allows you to check out a preselected set of licenses at startup.

License feature

A license feature, as used in FlexNet, is the actual licensed module or bundle of modules (in the case of bundled Petrel licenses).

Module

A module is a set of Petrel functionality that is usually tied to a license feature. Petrel modules are listed in the Petrel modules section of the License UI. There are dependencies between Petrel modules that are automatically honored during selection.

Expiry date

Each license bundle has an expiry date that defines when the license expires. All features that are part of the bundle expire on the same expiry date defined in the license file.

Each stack on start feature (increment) has an expiry date that defines when the feature license expires. Stack on start increments may have different expiry dates.

Petrel shows an expiration warning before the license expires.

Maintenance date

The maintenance date defines when the current maintenance contract must be renewed to obtain access to new Petrel releases. The maintenance date consists of a month and year. After the maintenance date passes, Petrel versions released after this date do not work until the maintenance date is renewed.

Each license bundle and SOS license feature has a maintenance date.

License Selection

You can use the **License selection** dialog box to manage all aspects of license selection independently of the license type or server. In addition, you can use the **License selection** dialog box to create and maintain user-defined license profiles to match individual end-user profiles or workflows. For more details about using the **License selection** dialog box, refer to the relevant section in the Petrel online Help.

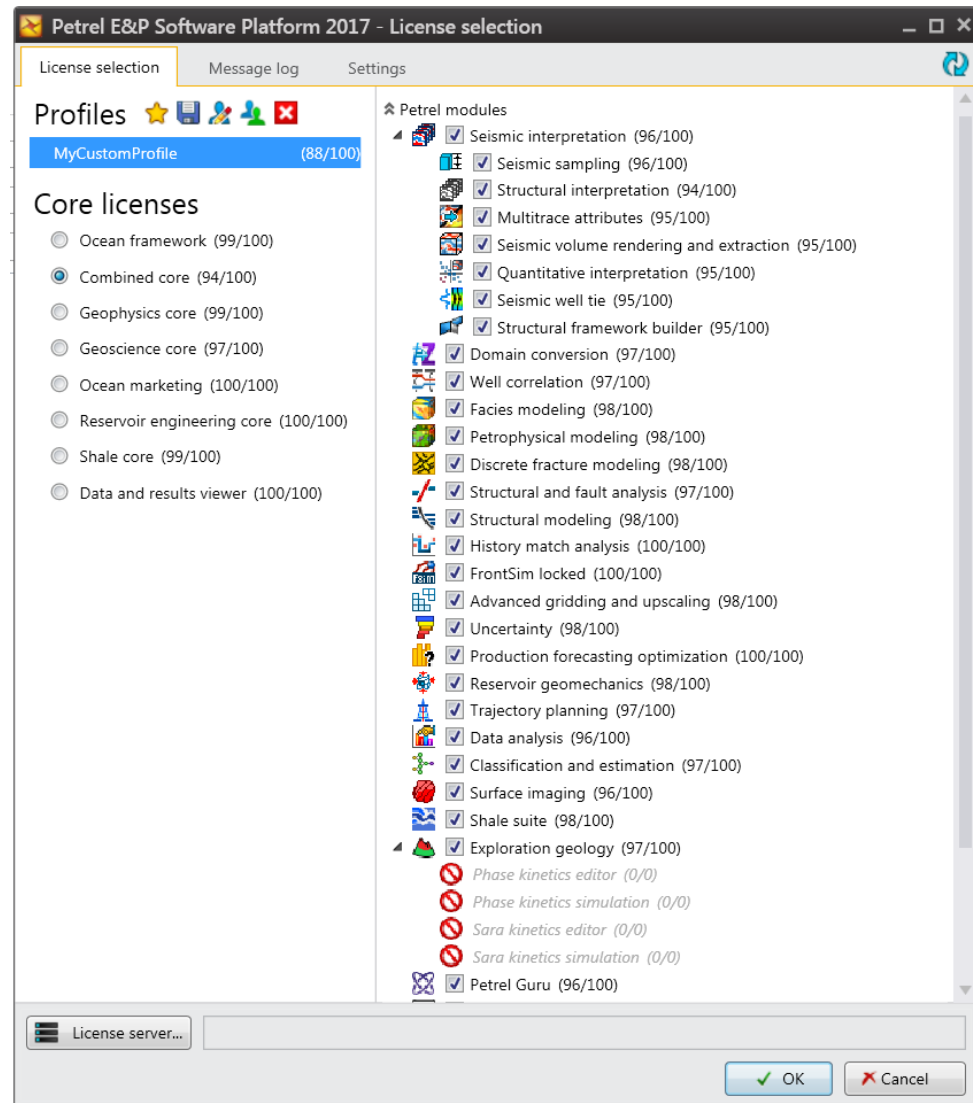


Figure 5-1 License selection dialog box

Color-coded information, warning, and error messages are captured and displayed at the bottom of the **License selection** tab. Multiple messages are stacked based on priority. For an overview of all messages, refer to the **Message log** pane in the **License selection** tab.

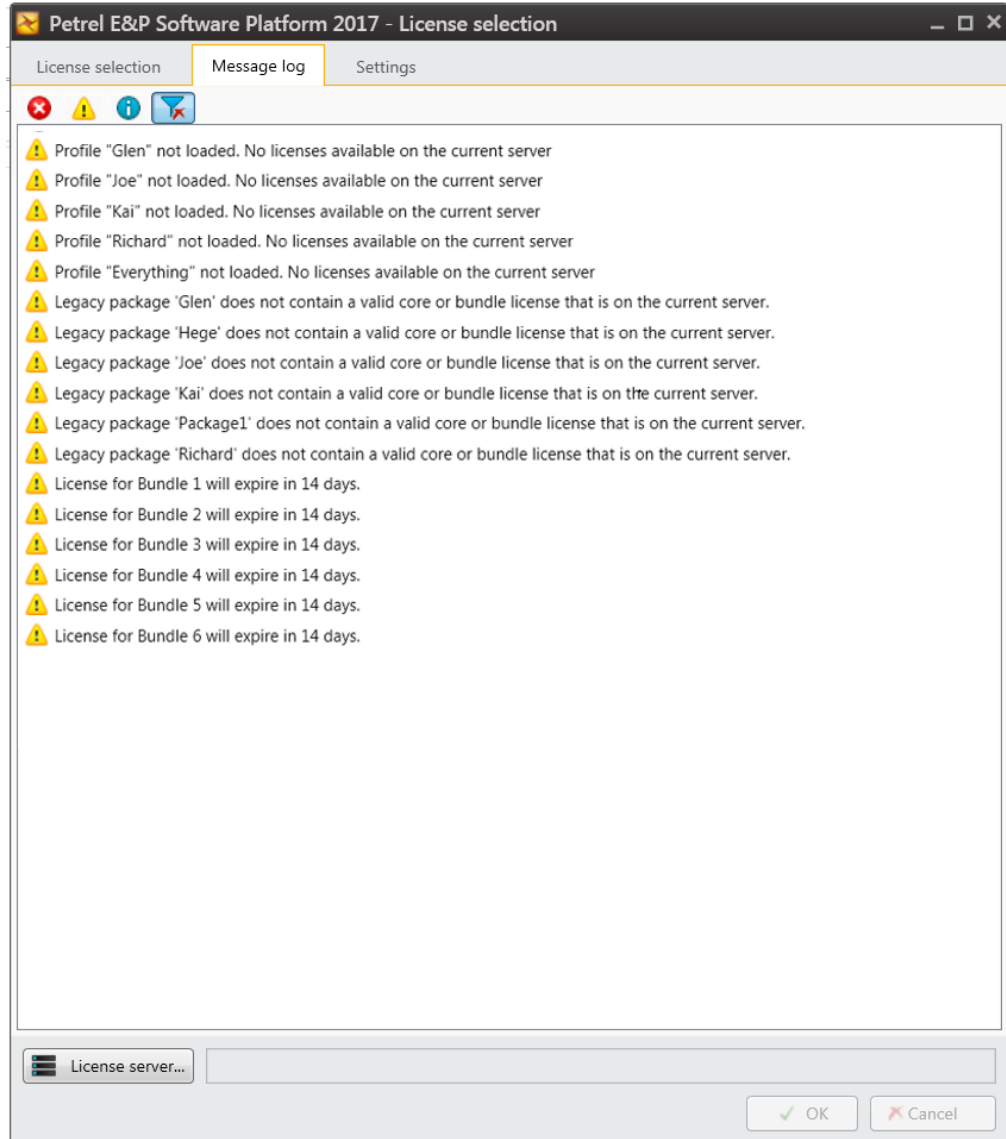


Figure 5-2 License message log showing color-coded information, warning, and error messages

License Bundles

When you use licensing bundling, you must check out the entire package bundle. Bundles must contain a Petrel core module. Individual modules cannot be selected or deselected from the bundle. Typically, you will have one or more package bundles with one or more seats of each package bundle. Checking out a bundled license enables all the functionality licensed by the modules that are part of the bundle.

For example, suppose you have purchased a single Petrel user license that consists of a **Geoscience core**, a **Reservoir engineering core**, and a set of Petrel modules (for example, Seismic interpretation, Facies modeling, etc.). Once the license file is generated by Schlumberger Information Solutions and installed at your site, when you log in to Petrel, the **License selection** dialog box opens.

If additional Ocean licenses are available, they are listed under the Ocean modules section and can be selected or deselected as needed.

Figure 5-3 shows multiple license bundles with **Bundle 7** selected. You can view the contents of a bundle by expanding it in the right pane.

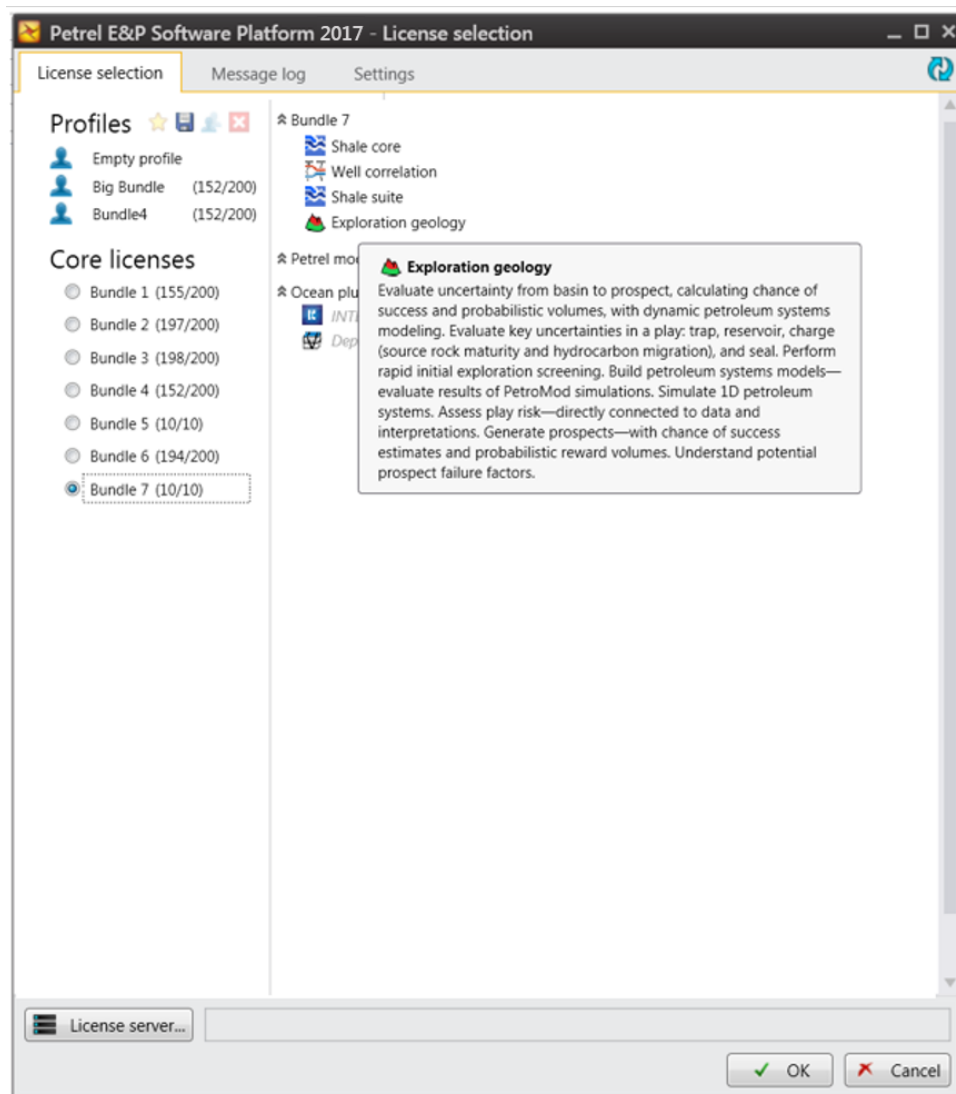


Figure 5-3 License bundles

Stack on Start

When you start Petrel with a stack on start license file, you can choose the Petrel core and module licenses that you want to use. Your selections become the stack of modules checked out and used during your Petrel session. The modules remain checked out throughout the session until you log off.

In the **License selection** dialog box, the dependencies between Petrel core licenses and Petrel modules are explicitly mapped. This ensures that you can select valid module combinations only.

If additional Ocean licenses are available, they are listed under the Ocean modules section. These licenses can be selected or deselected as needed.

Figure 5-4 shows multiple **Core licenses** with the **Geoscience core** license selected. You can view the available Petrel module licenses by expanding **Petrel modules** in the right pane. You can select and deselect stack on start licenses as needed during your Petrel session. The **Petrel modules** node also provides a right-click **Select All** option for quickly selecting all listed module licenses.

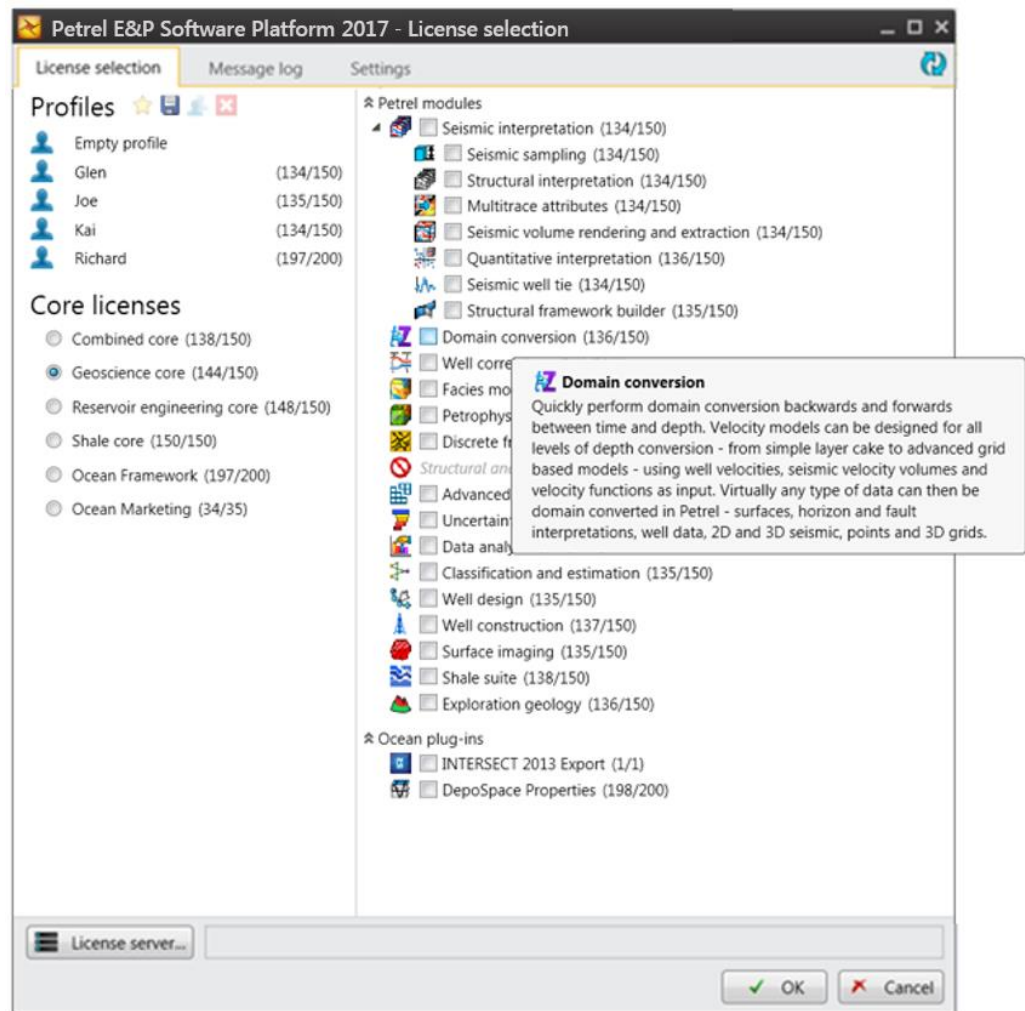


Figure 5-4 Stack on start licenses

Mixing Bundles and Stack on Start Licensing

Petrel 2019 supports the ability to connect to servers that provide both stack on start **and** bundled licenses. This allows you to mix bundles and stack on start licenses.

Any additional Ocean licenses that are available are listed under the Ocean modules section. You can select or deselect these licenses as needed.

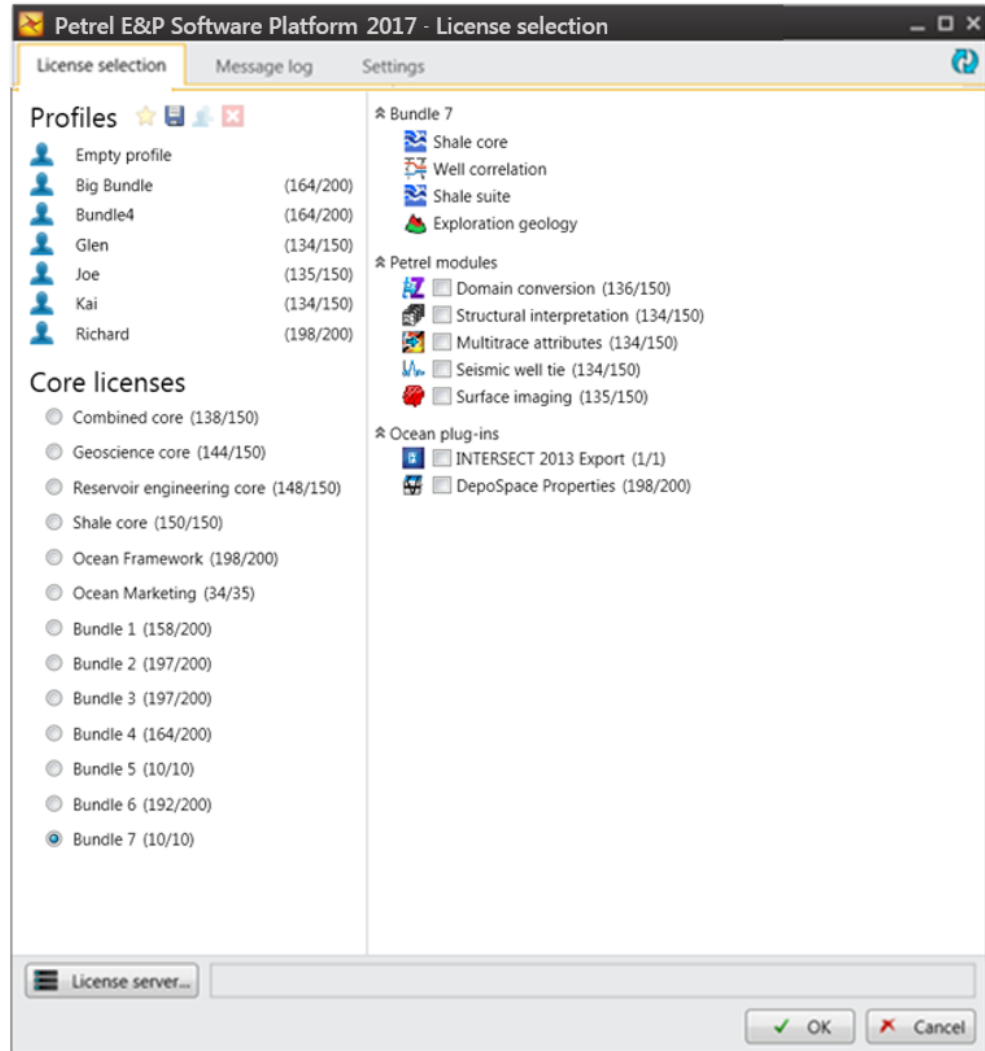


Figure 5-5 Mixing bundled and stack on start licenses

Figure 5-5 shows an example where the UI received licenses from a stack on start and bundled licenses server. In this example, the user selected **Bundle 7**, which represents the Shale bundle. The content of the Shale bundle can be inspected by unfolding the **Bundle 7** node in the right pane of the UI. The Shale bundle can be extended with additional features that (if the relevant stack on start licenses are present) are listed in the **Petrel modules** node.

Mixing stack on start licenses with bundled licenses allows you to select basic bundles and extend them with specific features that may be available in fewer quantities.

Check Out SOS Licenses at Petrel Runtime

Petrel 2019 provides the option to check out functional SOS license modules while Petrel is running. This enables easy access to additional functionality needed for the workflow at hand and avoids to exit and restart Petrel to select additional functional license modules.

- Notes:**
- *A prerequisite for checking out additional licenses at Petrel runtime is that license modules must be of type Stack on Start (SOS). License modules that are part of bundle licenses are not available for runtime checkout. The same applies to Ocean Plug-in licenses, which will be enabled with a later Petrel release.*
 - *It is not possible to connect additional license servers while Petrel is running. Additional licenses can only be added from the servers connected at startup.*

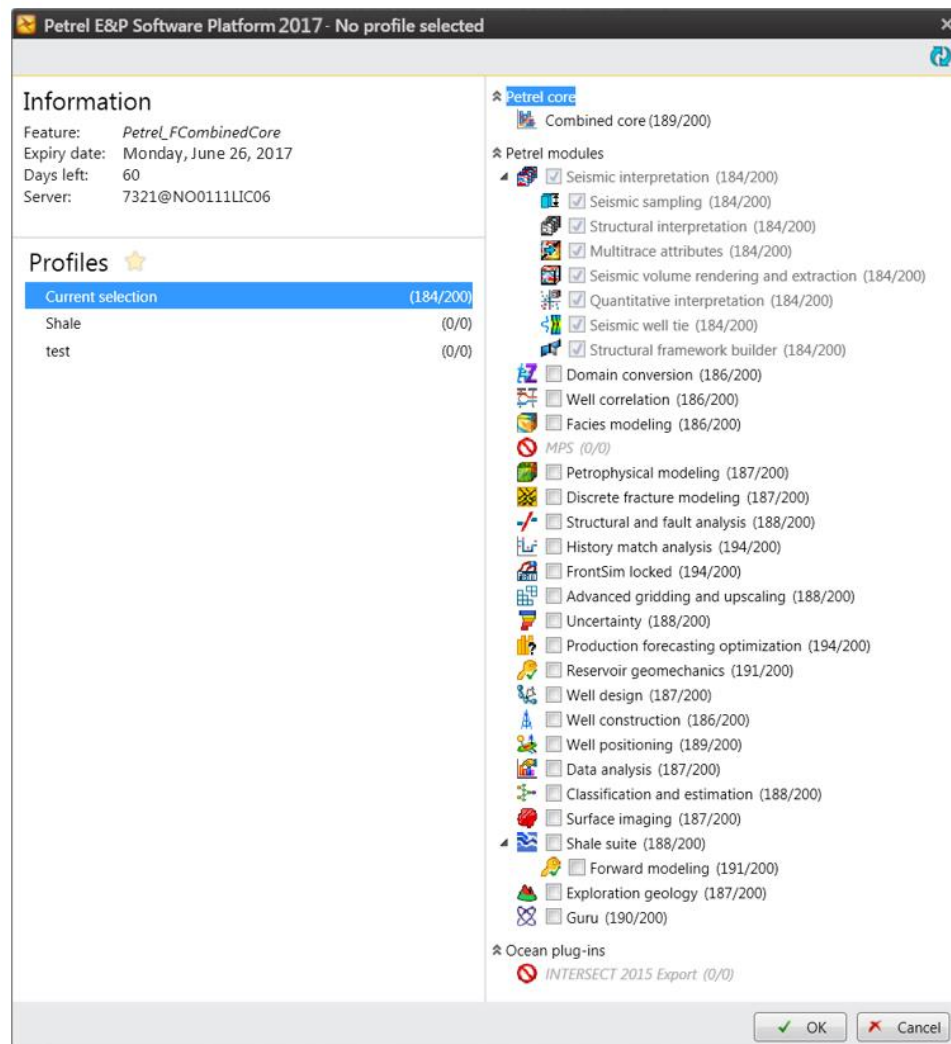
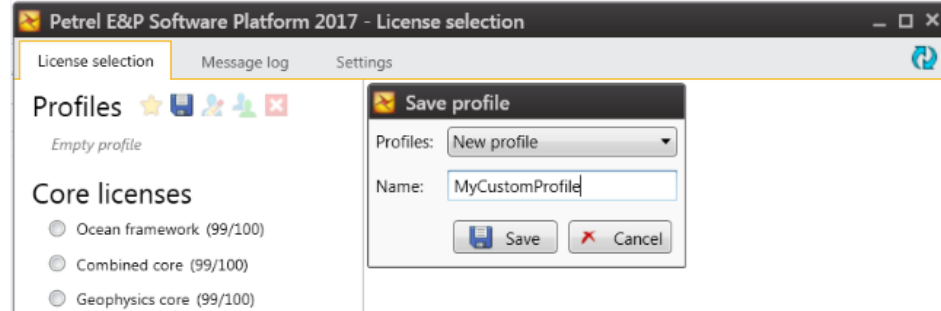


Figure 5-6 Checking out licenses at runtime

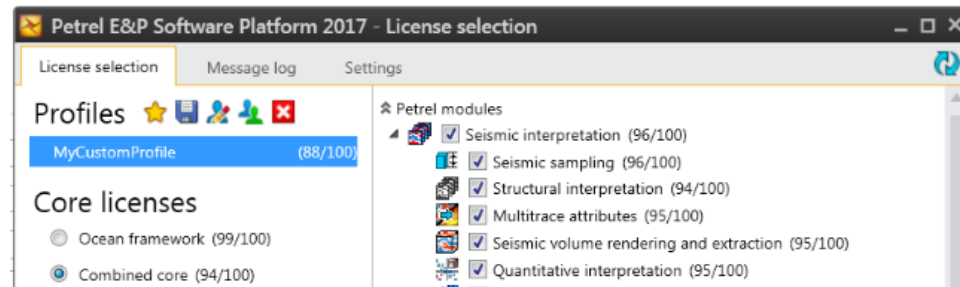
To check out additional license at runtime, click **File > License modules** and click the boxes for further licenses in the **License status** dialog box. Already selected licenses are marked and disabled (shown in gray text).

License Profiles

The license profiles feature replaces previous functionality that provided names for packages. To create a profile, select the combination of licenses that you need and save the selected combination as a profile with a name.



Saved profiles are listed under **Profiles**.



You can also perform these profile-related actions:

- Select a profile as a favorite that denotes the profile with a yellow star. To remove the favorite, open Petrel and click **File > License modules**.
- Save a new profile
- Rename a profile
- Delete a profile

Configuring Global Petrel License Profiles

Petrel supports global license profiles. To set up a global license profile add a path to the following setting in the **PetrelConfiguration.xml** file, which is located in:

```
%appdata%\Schlumberger\Petrel\2019
```

In the **PetrelConfiguration.xml** file, locate the following parameter:

```
<GlobalLicenseProfileFilePath Value="" />
```

Insert the full path and filename to your global license profile file, i.e.,

```
<GlobalLicenseProfileFilePath Value="D:\Global Petrel Profiles\Profiles2019.xml"/>
```

When using a global license profile the options to save, create, delete or favorite profiles are grayed out. Global license profiles supersede any local **Profiles.xml** file.

To create a global license profile launch Petrel and save all license configurations using the options in the License UI. This creates a file named **Profiles.xml** in %appdata%\Schlumberger\Petrel\2019

Use this file as your global license profiles file, copy it to the desired location and update the path for the setting in the **PetrelConfiguration.xml** file.

Updating Petrel Packages to Petrel 2019 Profiles and Copying Profiles between Petrel Versions

With Petrel 2014, the Profile feature replaced the custom License package available in earlier releases of Petrel. To transfer license package configurations from Petrel versions prior to Petrel 2014, follow these steps (using version 2013 as the example):

- 1 Go to %appdata%\Schlumberger\Petrel\2019 and rename the **PetrelConfiguration.xml** file to **PetrelConfiguration_orig.xml**.
- 2 Next, go to %appdata%\Schlumberger\Petrel\2013 and copy the **PetrelConfiguration.xml** file to %appdata%\Schlumberger\Petrel\2019.
- 3 If you want to retain specific settings from the original Petrel 2013 **PetrelConfiguration.xml** file, port them to the new file.

As an alternative, you could copy only the `PackageNames` line from the Petrel 2013 **PetrelConfiguration.xml** file to the Petrel 2019 **PetrelConfiguration.xml** file.

- 4 Start Petrel 2019. During startup, the Petrel 2013 defined packages are converted to Petrel 2019 profiles and stored in **Profiles.xml** in %appdata%\Schlumberger\Petrel\2019.

Copying Profiles between Petrel Installations

Use this method to copy profiles between Petrel 2019 installations:

- 1 Go to %appdata%\Schlumberger\Petrel\Petrel 2019.
- 2 Copy the **Profiles.xml** file and paste it in the %appdata%\Schlumberger\Petrel\Petrel 2019 directory of the new installation.

Note: *If the profiles are not available from the license server, the License UI shows a warning message in the message log to let you know that the Profile could not be loaded because no licenses are available on the current server.*

Tooltips

You can view detailed information about the functionality provided by a Petrel module in the **License selection** dialog box by hovering over the item. [Figure 5-3](#) shows an example.

This helps you to decide whether the module contains the features for the work to be executed and thus helps you to make the right selections.

License module expiry dates can be visualized in the tooltip by enabling the Show expiry date in license description option in the license settings tab of the license selection dialog.

Customers are able to add custom description to the license module tooltip using a custom description xml file enabled through a **PetrelConfiguration.xml** file. See the Petrel online Help on how to enable this option.

License information inside Petrel

To access license information within Petrel, select **File > License modules**. The dialog provides this license feature information for the licenses in the currently available profiles. Select a profile and then select the license module in the list shown in the right pane.

- Feature Name
- Expiry date
- Days Left
- Server ID

In addition the License module dialog to inspect the current selection and check out additional licenses for this selection.

Note: *Upon starting Petrel the next time, licenses added at runtime are not preserved in the current selection of profile.*

Setting Up the License Server Environment

Different license server environments are supported for different requirements. Petrel supports local servers, remote servers, and Quorum server configurations. Remote servers or Quorum server configurations are also supported on virtual windows systems using a USB network connector. However, any mentioned solution requires a dongle.

License servers can host both bundle and stack on start licenses simultaneously.

Note: Detailed information about setting up license servers, quorum servers, and troubleshooting can be found in the Schlumberger Licensing User Guide, located in the **Documentation** folder of the downloaded and extracted installation files. For more advanced license server configurations involving virtual or quorum setups, it is recommended to involve SIS services to help design a tailored system providing maximum performance and minimum IT maintenance. Contact your local account manager for more information.

Connecting License Servers

Local License Server Environment

When using a local dongle, the local system must be configured to serve as a license server. In this case, the Schlumberger licensing utility and the CodeMeter dongle software must be installed. Both are distributed with Petrel and can be found in the unzipped Petrel installation directory. These tools require Admin privilege to install. To achieve maximum performance, make sure the recommended versions of Schlumberger licensing software is installed.

Remote License Server Environment

When building a remote license server environment, it is important to consider that network latency impacts the license checkout time. Thus, it is critical that remote servers, independently of whether they are physical, virtual, or a Quorum setup, are well connected within the network. When serving a large number of users (500+ licenses), Quorum configurations usually offer better performance than single servers. However, specific knowledge and testing of the network infrastructure should always be considered and performed for larger license server setups.

Best Practices for Setting up a License Server

Checking out a license is a frequent task. When many users are running Petrel, the time to connect to a license server and select the correct license is significant. To have minimum nonproductive time, these tips may be considered:

- Always make sure the recommended/latest licensing software is used. This includes the Schlumberger licensing utility and CodeMeter driver. For information about the licensing software, refer to the *Petrel Installation Guide* and *Schlumberger Licensing User Guide*.
- Be sure that you are using the most recent type of dongle. To check, look at ID number imprinted on the dongle. Up-to-date dongles have IDs that begin with 2-xxxxxx. If the ID begins with 1-xxxxxx, contact your account manager to request a new dongle. The new dongle type delivers performance improvements over the old type and should therefore be preferred.

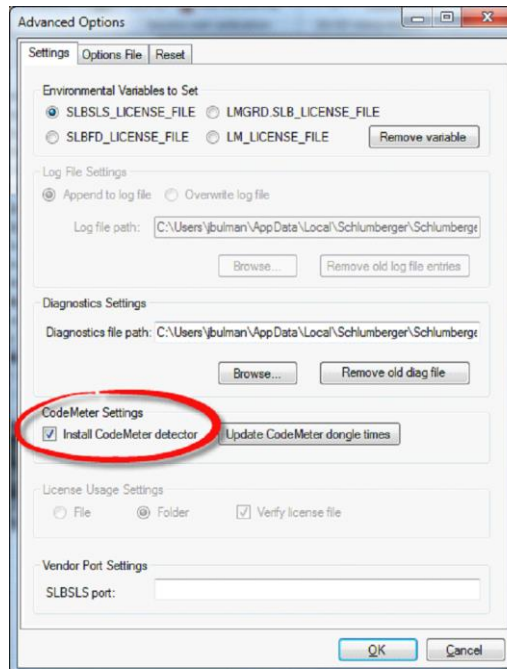
- Avoid connecting to multiple license servers, if possible. Adding multiple colon-separated license servers to the license selection reads the available licenses from all connected servers and linearly increases the time to populate the license UI based on the number of license features served by each server. Using a license quorum is the exception. When using a quorum, the license selection should include all 3 servers separated by a comma, for example, 27000@quorumServer1, 27000@quorumServer2, 27000@quorumServer3.
- Where possible, use Favorites. Favorite license packages can be created in the license UI by saving license selections as license profiles and denote one as a favorite using the Favorite option.
- Always use a static port, for example, 27000@server.com, which optimizes the communication with the license system.
- Set TCP_NODELAY. FLEX sends data between the client and server using TCP/IP packets. By default, the TCP/IP stack buffers small packets (< 147 bytes in FLEX), known as Nagle's algorithm, to coalesce a large number of packets before sending them across the network. This ACK delay (200 ms) results in artificially high latency times for small packets such as most FLEX licensing operations. For this reason, we recommend disabling the Nagle algorithm by defining the TCP_NODELAY system setting as a license server environment variable to overcome this behavior, and reduce the licensing wait period. For more information read the Flexera documentation.
- Use one license file only. Combining all licenses into one physical file improves communication with the license server and by eliminating the need to open and close multiple files to read license information.
- Validate through the codemeter control center that the certified time is close to the current time. Navigate to **Codemeter control center > File > Webadmin > Content > CmContainer** and if necessary, update the certified time.

Licensing Issues and Solutions

Petrel does not detect license dongle after removal and reinsertion or after the computer wakes from sleep or hibernation

Follow these steps:

- 1 As a prerequisite, ensure that this software is installed on your system:
 - 2017 Schlumberger Licensing Tool
 - Latest CodeMeter drivers
 - Updated dongle firmware
- 2 Start the Schlumberger Licensing Tool.
- 3 Stop any license server that is running.
- 4 In Windows, select **Start automatically**.
- 5 Click **Apply**.
- 6 In Petrel, select **File > Advanced options**.
- 7 Make sure that **Install CodeMeter detector** is selected.



- 8 Click **OK**. A service is installed to detect when a dongle is removed or inserted.
- 9 Restart the License Server.
- 10 Start Petrel.

Note: If you switch between wireless and cable-based connections while Petrel is running or after hibernation, a reconnection with the license server may fail because of a network conflict.

Petrel disconnects from the license server or loses the license on a regular basis.

Follow these steps:

- 1** Upgrade CodeMeter to the latest version.
- 2** Swap a new Petrel dongle.
- 3** Update Petrel dongle Certified Time.
- 4** Use a different USB port.

6 Plug-ins

In This Chapter

Overview.....	6-2
Plug-in Manager.....	6-3
Deploying Plug-ins from a Network Shared Folder.....	6-5
Changing the Default [Plug-ins Home] Directory	6-8

Overview

The Ocean Plug-in Manager enables you to access, organize, and manage plug-ins within Petrel. Plug-ins can come from a variety of sources. They may be:

- Distributed from the Ocean Store (www.ocean.slb.com)
- Developed internally within your company
- Developed as third-party plug-ins

The Ocean Plug-in Manager uses a Petrel plug-in installer package (.pip) for packaging and distributing plug-ins. You do not need to run an installer application to install or uninstall a plug-in.

From the Ocean Plug-in Manager, you can access plug-ins from two locations:

- Plug-ins published in the Ocean Store
- Plug-ins developed by your own organization and available on your network

The information in this chapter is for system administrators. This chapter tells you how to customize the deployment of plug-ins and how to customize the Ocean Plug-in Manager interface to enable or disable features.

Installing and Uninstalling Plug-ins

Ocean for Petrel is a public, open API that sits on top of Petrel. You can use Ocean for Petrel to develop plug-ins that extend Petrel capabilities.

Each plug-in includes its own installer and targets a specific version of Petrel. When a plug-in is installed, it registers itself to let Petrel know that it exists and also to provide information on how it can be uninstalled. If the plug-in is uninstalled, it unregisters itself from Petrel.

If you uninstall Petrel, Petrel checks for plug-ins and prompts you to uninstall the registered plug-ins. Uninstalling all plug-ins is recommended if you uninstall Petrel.

Plug-in Licenses

When you order a Petrel plug-in from the Ocean Store, full instructions for installing and activating the plug-in license are included in the email that is sent to you. You can also find this information on the Ocean Store's Help page.

Plug-in Manager

Plug-in Manager Settings

The **Petrel.exe.config** configuration file contains the Ocean Plug-in Manager settings. You can find **Petrel.exe.config** in the Petrel installation folder. For example:

```
C:\Program Files\Schlumberger\Petrel 2019\Petrel.exe.config
```

Note: Back up the **Petrel.exe.config** file before editing.

Customizing the Plug-in Manager interface

Follow these steps to customize the Plug-in Manager interface.

► **To Customize the Plug-in Manager Interface**

- 1 If Petrel is open, close it.
- 2 Open the **Petrel.exe.config** file.
- 3 Find the `<configSections>` tag and add this section, if it is not there:

```
<sectionGroup name="applicationSettings" type="System.
Configuration.ApplicationSettingsGroup, System, Version=4.0.0.0,
Culture=neutral, PublicKeyToken=b77a5c561934e089">

    <section name="Slb.Ocean.Petrel.PluginManagerUiElements.
Properties.Settings"
type="System.Configuration.ClientSettingsSection, System,
Version=4.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089" requirePermission="false"/>

</sectionGroup>
```

This code enables configuration settings under a separate `<application Settings>` tag.

- 4 Inside the `<configuration>` tag, on the same level as the `<configSections>` tag, add this section if it is not there:

```
<applicationSettings>
    <Slb.Ocean.Petrel.PluginManagerUiElements.Properties.Settings>
    </Slb.Ocean.Petrel.PluginManagerUiElements.Properties.Settings>
</applicationSettings>
```

- 5 Inside the `<Slb.Ocean.Petrel.PluginManagerUiElements. Properties.Settings>` tag, add the settings you want to modify. Use this format:

```
<setting name="SettingName" serializeAs="Type">
    <value>Value</value>
</setting>
```

For example:

```
<setting name="StoreTabEnabled" serializeAs="String">  
    <value>True</value>  
</setting>
```

6 Use this same format to change these additional Plug-in Manager settings:

- `StoreTabEnabled`: Set as **True** if you want the Plug-in Manager's Store section enabled.
- `SecurityTabEnabled`: Set as **True** if you want the Plug-in Manager's Security section enabled and visible.
- `CorporateTabEnabled`: Set as **True** if you want the Plug-in Manager's **Corporate** section enabled and visible.
- `InstallPluginButtonEnabled`: Set as **True** if you want the Install Plugins feature enabled in the Plug-in Manager. This feature is available only for plug-ins packaged with a Petrel plug-in installer package (.pip file).
- `UpdatePluginButtonEnabled`: Set as **True** if you want the Update Plug-in feature enabled from the Plug-in Manager.
- `AddTrustedPublisherButtonEnabled`: Set as **True** if you want the Add Trusted Publisher feature enabled.
- `RemoveTrustedPublisherButtonEnabled`: Set as **True** if you want the Remove Trusted Publisher feature enabled.
- `ChangeSecurityLevelEnabled`: Set as **True** if you want the Change Security Level feature enabled.

7 Save the file.

Deploying Plug-ins from a Network Shared Folder

The Ocean Store is the designated website where scientists and engineers can access and download plug-ins to use with Petrel. Plug-ins developed by other companies for their internal use are not available in the Ocean Store.

A system administrator can use the Ocean Plug-in Manager to configure the internal source for plug-ins (for example, network shared folders) to distribute and deploy plug-ins within Petrel. These plug-ins are available in the **Corporate** section of the Ocean Plug-in Manager.

Note: *The Ocean Plug-in Manager cannot browse plug-ins directly from the network path where the plug-ins reside. Petrel users must map to the network shared folder on their local workstation.*

► **To Enable Deployment of Plug-ins from a Remote Folder**

- 1 If Petrel is open, close Petrel.
- 2 Open the **Petrel.exe.config** file.
- 3 Find the `<configSections>` tag and add this section, if it is not there:

```
<sectionGroup name="applicationSettings"
type="System.Configuration.ApplicationSettingsGroup, System,
Version=4.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089">
  <section name="Slb.Ocean.Petrel.PluginManagerUiElements.
Properties.Settings"
type="System.Configuration.ClientSettingsSection, System,
Version=4.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089" requirePermission="false"/>
</sectionGroup>
```

This enables the configuration settings under a separate `<applicationSettings>` tag.

- 4 In the `<configuration>` tag, on the same level as the `<configSections>` tag, add this section if it is not there:

```
<applicationSettings>
  <Slb.Ocean.Petrel.PluginManagerUiElements.Properties.Settings>
</Slb.Ocean.Petrel.PluginManagerUiElements.Properties.Settings>
</applicationSettings>
```

- 5 In the `<Slb.Ocean.Petrel.PluginManagerUiElements. Properties.Settings>` tag, make sure that this setting is set to **True**:

```
<setting name="CorporateTabEnabled" serializeAs="String">
  <value>True</value>
</setting>
```

- 6 In the `<Slb.Ocean.Petrel.PluginManagerUiElements. Properties.Settings>` tag, add this section if it is not there:

```
<setting name="LocalStoreDirectories" serializeAs="Xml">
  <value>
    <ArrayOfString xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
    </ArrayOfString>
  </value>
</setting>
```

- 7 Inside the `<ArrayOfString>` tag, add the folder locations where Ocean plug-ins can be located. You can add as many locations as you need. For example:

```
<string>H:\Corporate Plug-ins</string>
<string>D:\My Developed Plug-ins</string>
<string>I:\Asset Team Plug-ins</string>
<string>\\myServer\MyFolder</string>
```

-
- Notes:**
- Deploy your Ocean plug-in PIP files or assembly files into subfolders of the root folder configured in **Petrel.exe.config**.
 - Use PIP files for faster resolution of the plug-in list in the **Corporate** tab.
 - Plug-ins that are already installed locally will not show up in the **Corporate** tab.
 - You can use this procedure to set a local folder (for example, `C:\my developed plug-ins`) as the location of the plug-ins directory.

- 1 Find the `<runtime>` tag and add this section:

```
<loadFromRemoteSources enabled="true" />
```

Note: Refer to the Microsoft Knowledge Base article [http://msdn.microsoft.com/enus/library/dd409252\(VS.100\).aspx](http://msdn.microsoft.com/enus/library/dd409252(VS.100).aspx) for more information about this setting.

- 2 Save the file.

- 3 From a DOS shell, run the `caspol` command to configure the machine's runtime security policy. This command enables your system to trust the execution of .exe and .dll files from a network shared folder.

- a. Change to this directory:

```
C:\Windows\Microsoft.NET\Framework64\v4.0.30319
```

- b. From this location, run **caspol.exe**:

```
C:\Windows\Microsoft.NET\Framework64\v4.0.30319> caspol.exe -
quiet -machine -addgroup 1 -url "\\myServer\MyFolder\*"
FullTrust -name "Petrel_fulltrust"
-description "Allow_exe_and_dll_to_run_with_full_.NET_trust"
```

You can run the `caspol.exe` command from a DOS shell, but make sure that you change `\\myServer\MyFolder*` to the location where your plugin assemblies are. This location must be accessible when you execute the `caspol` command.

The `caspol` command updates your system security at the machine policy level. You can find the security policy updates at:

- `%WINDIR%\Microsoft.NET\Framework64\version directory\config\Security.config`
- `%WINDIR%\Microsoft.NET\Framework64\version directory\config\Security.config.cch`

Warning: *Do not open these files unless you are familiar with them. Incorrect changes to these files could make your system unstable.*

- 4 Repeat step 10 for each network shared folder that you want Ocean Plug-in Manager to browse for plug-ins.

Changing the Default [Plug-ins Home] Directory

Plug-ins are usually deployed or installed in a directory under [Petrel Home] called \Extensions (for example, C:\Programs Files\Schlumberger\Petrel\2019\Extensions). This folder is considered the default [Plug-ins Home] directory.

► **To change the default location of the [plug-ins home] directory**

1 If Petrel is open, close Petrel.

2 Open the **PluginManagerSettings.xml** file.

Find the <DefaultDirectory> tag (for example, <DefaultDirectory Name="Default" Location="C:\Program Files\Schlumberger\Petrel 2019\Extensions\" />).

3 Enter the address for the new [Plug-ins Home] location (for example, <DefaultDirectory Name="Default" Location="D:\My Documents\My Plug-ins\" />).

-
- Notes:**
- You must have read/write access to the new [Plug-in Home] directory.
 - The [Plug-in Home] directory may be located on a network shared folder. The system administrator must execute the *caspol.exe* command to configure the machine runtime security policy (refer to "Deploying Plug-ins from a Network Shared Folder" on page 6-5 for more details).

4 Save the file.

Warning: Plug-ins that use installers for deployment may be deployed under [Petrel Home]\extensions. Only plug-ins deployed or installed from the Plug-in Manager are guaranteed to be deployed automatically in the customized [Plug-in Home].

Note: There is a known issue when installing plug-ins into a restricted folder structure. For more information, refer to "Plug-in Issue and Solution" on page A-6.

A Troubleshooting and Frequently Asked Questions

In This Chapter

What is the Petrel Startup Optimization Option?.....	A-2
Petrel Issues and Solutions	A-3
Plug-in Issue and Solution	A-6
System Settings	A-7

What is the Petrel Startup Optimization Option?

The **Startup Optimization** setting runs a native image generator (Ngen) tool that improves the performance of managed applications. The installation process enables this setting by default.

What is Ngen?

Ngen is a **Native image generator** tool that improves performance of managed applications. Ngen.exe creates native images (files containing compiled processor-specific machine code) and installs them into the native image cache on your local computer. The runtime executable uses these images from cache instead of using the just-in-time (JIT) compiler to compile the original assembly.

How does it work?

Ngen compilation is on by default. After Petrel is installed and your system is idle, Ngen begins to create native images and store them in a hidden directory (C:\Windows\assembly\NativeImages_v4.0.30319_64). This process is transparent; the system controls when to create the native images and when to use them.

Never delete this directory. It contains many files; some belong to Petrel (these are identified by an **.slb** extension) and others belong to other applications. The files are removed when Petrel is uninstalled.

Can I run Ngen manually?

Yes. In order to run Ngen manually:

- 1 Open a Command prompt and change to the Petrel installation directory. (Usually, this directory is C:\Program Files\Schlumberger\Petrel 2019).
- 2 To install:
At the Command prompt, enter `ngenrun.bat install`
- 3 To uninstall:
At the Command prompt, enter `ngenrun.bat uninstall`

Both the install and uninstall process take several minutes.

Ngen significantly increases Petrel startup time. However, you must evaluate your own situation with your IT staff; in certain situations, startup optimization must be turned off.

Petrel Issues and Solutions

Create a global configuration file to standardize system settings

If you want to standardize Petrel 2019 system settings for multiple users, create a global configuration file. Petrel stores the user system settings in the **PetrelConfiguration.xml** file. The first time you run Petrel 2019 and exit, the file is created in the folder named %APPDATA%\Schlumberger\Petrel\2019.

For Windows 7, the application data and settings folder is C:\Users\

The **PetrelConfiguration.xml** file contains this information:

- Settings configured in the **Select license package** window, such as package name and favorite package
- Settings configured using **File > System > System Settings**.

Note: *If you change these settings, the changes are stored in the **PetrelConfiguration.xml** file each time you exit Petrel.*

For more information, refer to "System Settings" in the Petrel online Help.

► **To Create a Global Configuration File**

Note: *A system administrator or license administrator must perform this procedure.*

- 1 Open Petrel.
- 2 Configure your license packages in the **Select license package** dialog box.
- 3 Configure your system settings in Petrel.
- 4 Close Petrel.

Your **PetrelConfiguration.xml** file is updated with the settings that you selected, and it is ready to be distributed globally.

- 5 Copy the **PetrelConfiguration.xml** file to a shared disk drive that all users can access, and set it to read only.

Remove these lines from the global configuration file:

```
<UseGlobalSettingsFile Value="True"/>
```

```
<GlobalSettingsFile Value=""/>
```

- 6 To enable Petrel users to use the global configuration file, you need to set their local configuration file to point to the global **PetrelConfiguration.xml** file.

Make a copy of the **PetrelConfiguration.xml** file created in Step 5 and remove everything from the file except these lines:

```
<?xml version="1.0" encoding="us-ascii" standalone="no" ?>
<Configuration>
<SystemSettings>
<UseGlobalSettingsFile Value="True"/>
<GlobalSettingsFile Value="E:\PetrelConfiguration.xml"/>
</SystemSettings>
</Configuration>
```

Important: For the *GlobalSettingsFile* Value, replace *E:\PetrelConfiguration.xml* with the path to the shared folder where you place your global configuration file.

Copy the *new* **PetrelConfiguration.xml** file to the **%APPDATA%** folder on all Petrel user machines. Typically, you copy the *new* **PetrelConfiguration.xml** file to this default folder on Windows, which is

C:\users*<username>*\AppData\Roaming.

When Petrel starts, Petrel uses the settings defined in the global configuration file (**PetrelConfiguration.xml**). After completion of the first Petrel run, a new **PetrelConfiguration.xml** file is created (if it does not exist) in the user data and settings location. This file is identical to the global configuration file. It allows individual users to personalize their own Petrel environment for an individual session without modifying anyone else's settings. The settings in the global configuration file overwrite the personalized settings when Petrel is restarted.

Users can also select the global configuration file in the **Define license server environment** window. Refer to "Deploying Petrel on a Network Shared Disk" on page 4-7 for more information about selecting the global configuration file.

Lines can be deleted from the global configuration file, and only settings that correspond to the remaining lines in the global configuration file can be controlled globally. The user can control settings that do not have corresponding lines in the global configuration file.

Failure messages when opening Petrel

You may receive this error messages from the limited connection configuration in the file server that is serving the Petrel network folder:

- "The application failed to initialize properly."
- "Required Petrel module failed.... Not enough server storage is available to process this command."

You must modify the server's IRPStackSize in the registry table. If the subkey is not present, use Registry Editor to add it.

The IRPStackSize parameter specifies the number of stack locations in I/O request packets (IRPs) that are used by a Windows Server 2003 and a Windows XP server. You may need to increase this number for these transports:

- Media access control (MAC) drivers
- File system drivers

Each stack uses 36 bytes of memory for each received buffer. This value is set in this registry subkey:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet
\Services\LanmanServer\Parameters
```

The default value of the IRPStackSize parameter is 15. The range is from 11 (0xb in hexadecimal) through 50 (0x32 in hexadecimal).

The Microsoft Support website has more information about this issue:

- Article 285089: "Description of the IRPStackSize parameter in Windows 2000, in Windows XP, and in Windows Server 2003" (<http://support.microsoft.com/kb/285089>)

Warning: *This action should be performed by IT engineers or system administrators. Do not make any changes to the registry unless you are familiar with the Registry Editor. If you make a mistake, it may harm your computer.*

► **To Add and Modify the Irpstacksize Subkey**

- 1 Select **Start > Run**.
- 2 Type `regedit`, and then click **OK**.
- 3 Select this subkey:

```
KEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\
LanmanServer\Parameters
```
- 4 Select **Edit > New > DWORD Value**.
- 5 Type `IRPStackSize` (this value is case sensitive) and then press **ENTER**.
- 6 Select **Edit > Modify**.
- 7 In the **Data Value** field, type the value that is appropriate for the network and then click **OK**.

If the problem persists after you complete this procedure, increase the IRPStackSize value more.

0xc0150002 error message when opening Petrel

You may receive a 0xc0150002 error if all necessary components are not installed.

Make sure these components are installed on the workstation:

- Visual C ++ libraries
- Microsoft .NET Framework 4.0
- Microsoft.VC80.MFC (64-bit) for a 64-bit workstation

Plug-in Issue and Solution

Access denied during plug-in installation

If you try to install a plug-in into a restricted location on your computer, the Plug-in Manager displays an Access Denied message.

Plug-ins are usually deployed or installed in this directory:

```
[Petrel Home]\Extensions
```

For example:

```
c:\Programs Files\Schlumberger\Petrel\2019\Extensions
```

The [Petrel Home]\extensions directory is the default [Plug-ins Home] directory. If you receive an Access Denied message while installing a plug-in, the access to [Petrel Home] and/or [Plug-ins Home] is most likely restricted.

To allow the Plug-in Manager to install plug-ins, change the default [Plug-ins Home] directory as described in “Changing the Default [Plug-ins Home] Directory” on page 6-8.

System Settings

Hyperthreading

Hyperthreading is an option that does not improve Petrel performance. Whether the option is ON or OFF has no impact on Petrel. If the option is turned ON for other reasons, be aware that this affects how Windows™ reports CPU utilization.

Can I run the installation executable (**PetrelPlatformInstaller.exe**) from the command line?

You can execute **PetrelPlatformInstaller.exe** from the Windows command line. The executable program supports these options:

Option	Description
/? or /Help	Lists available commands
/InstallFolder="C:\CustomInstallPath"	Identify the directory name for the installation
/Silent /Install	Install with no UI
/Silent /Uninstall	Uninstall with no UI

A log file is automatically created for each installation and stored in the user's %TEMP% directory.

Can I deploy the Petrel E&P software platform 2019 without using **PetrelPlatformInstaller.exe**?

Installing Petrel without using the **PetrelPlatformInstaller.exe** file is possible but not recommended and can lead to corrupted installation if attempted. Please contact your account manager for more information before creating a custom installer.

B Advanced Printing System (APS)

In This Chapter

Overview.....	B-2
Examples	B-3

Overview

Petrel uses the SDITM Advanced Printing System (APS®) for a plotting engine. With APS, Petrel provides native support for directly printing and exporting plot windows to .cgm and .pdf formats.

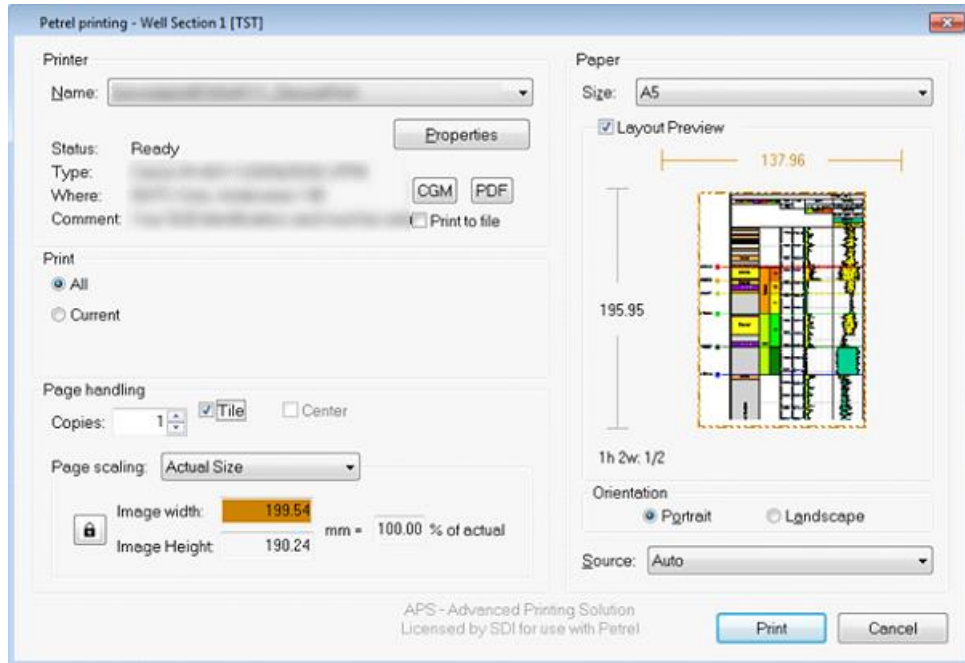
APS's integrated printing and plotting functionality provides these benefits:

- Improved options for page scaling (fitting to a page) and orientation (portrait and landscape)
- Support for large printers, with a thumbnail display for easy print orientation
- Support for roll plotters without the need to specify custom page sizes
- Options to generate .cgm and .pdf files directly from the **Petrel Printing** window
- Automatic detection and configuration of the printer setup from existing Windows print drivers
- Ability to produce large print jobs without the limits of the standard Windows GDI printing system

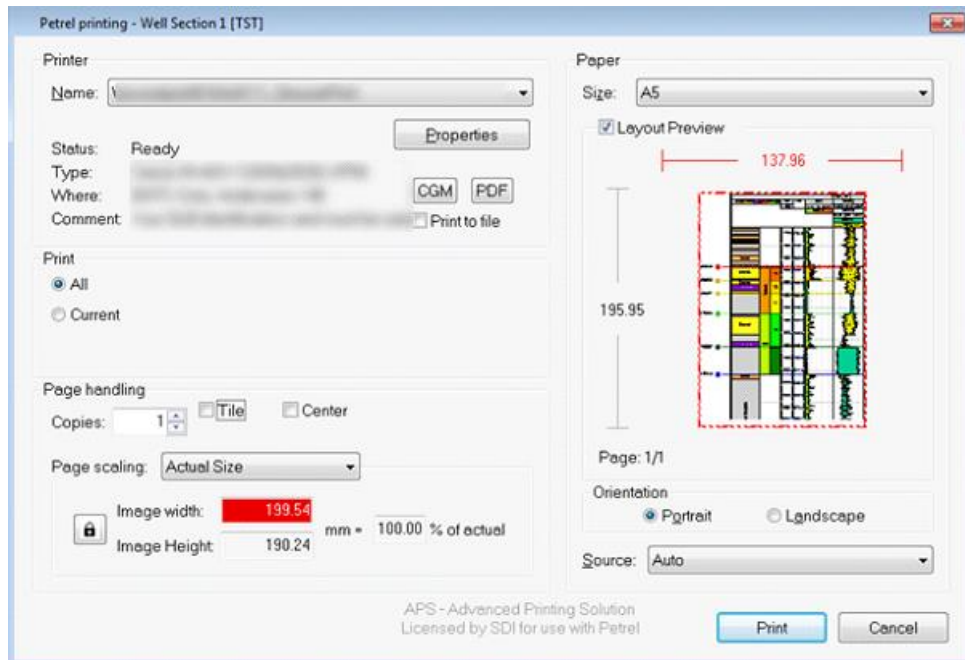
Note: *Petrel supports a large number of printers. For a full list, refer to www.sdicgm.com.*

Examples

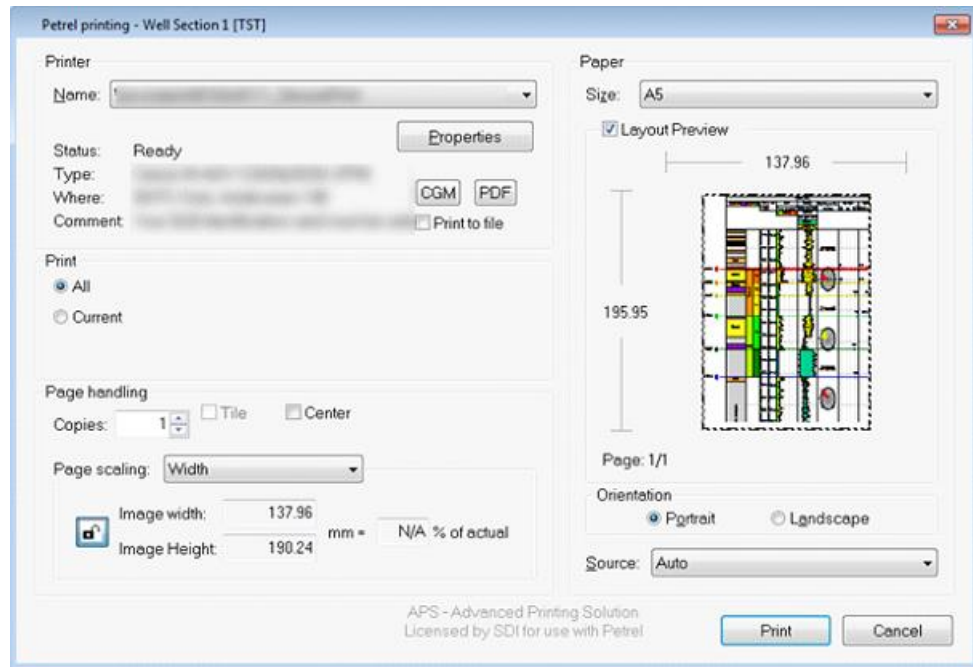
The measurements in this example show that the width of the selected file exceeds the width of the targeted media. Because the **Tile** check box is selected, the image width value is orange. Orange indicates that the image requires paneling and that Petrel can print multiple panels.



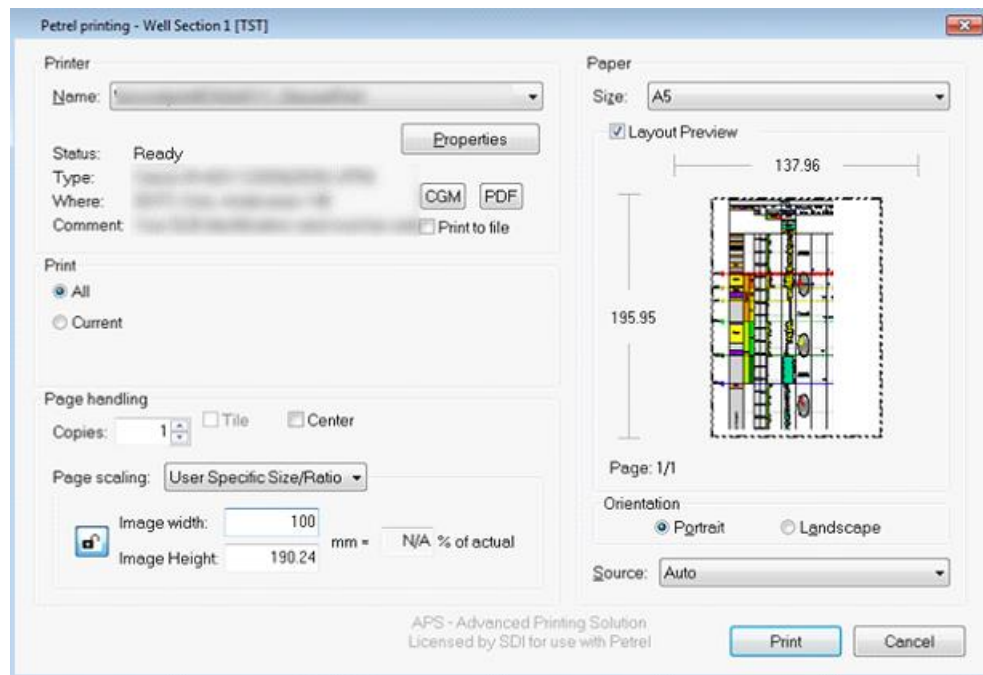
In the next example, the **Tile** check box is unchecked and the width value is red. In this case, Petrel prints only the portion of the image that fits on the initial panel.



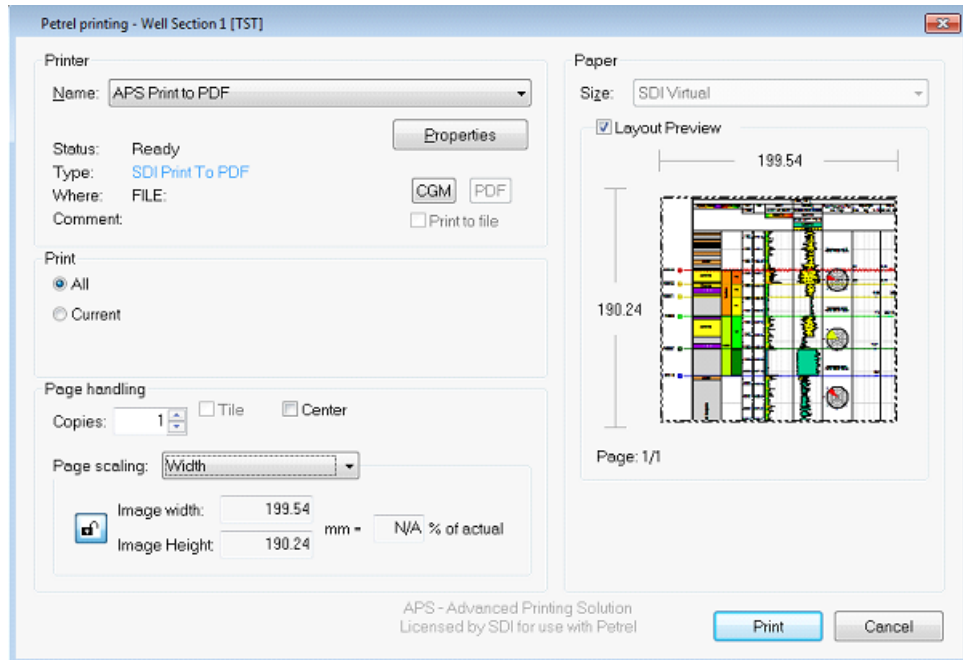
The next example shows the **Page Scaling** field using **Width** to unlock the image. When you select **Width**, Petrel automatically scales the image width to the maximum width of the media while maintaining depth scale. This gives depth accuracy while displaying the full width of the image.



You can also specify scale values, which alter length and width dimensions by the same percentage. If you need a specific width or height, you can enter that value and APS will alter the other axis appropriately.



As the next example shows, you can export to a .cgm or .pdf file on the **Petrel printing** window.



C Studio Database Configuration

In This Chapter

Third-Party Software Configuration	C-2
Connecting to the Database	C-3
Automatic Connection to a Studio Repository.....	C-4
Enabling the Remember Password Feature.....	C-5
Changing the Configuration for Custom Coordinate Systems	C-6

Third-Party Software Configuration

Single Sign On

Single Sign On Configuration

Configuring the Single Sign On authentication against Active Directory consists of three main procedures:

- 1 Configure the Active Directory service account.
- 2 Configure the Oracle database server.
- 3 Configure the client.

► *To Configure the Client*

- 1 Create a **krb5.conf** file.
- 2 Create Oracle net parameters (**sqlnet.ora**):
 - Add the following parameters to the **sqlnet.ora** file:

```
SQLNET.AUTHENTICATION_SERVICES=(KERBEROS5PRE,NONE)
```
 - Add KERBEROS5 to any other authentication services that you are using.

```
SQLNET.KERBEROS5_CONF=c:\oracle\network\krb5\krb5.conf
```
 - This parameter points to the krb5.conf file.

```
SQLNET.KERBEROS5_CONF_MIT=TRUE
```

```
SQLNET.KERBEROS5_CC_NAME=OSMSFT://
```
- 3 Create an environment variable named `TNS_ADMIN` with a path that points to the location of the **sqlnet.ora** file.

Connecting to the Database

The first time you log in to Studio, you must have a connection to the database.

For instructions about connecting to the database, refer to the appropriate documentation for your role:

- **Database user:** Open the Petrel Help Center. Navigate to **Studio > Studio Database > Accessing Studio Database > Managing Database Connections > Creating a Connection to a Database**.
- **Database administrator:** Open the online Help in Studio Manager.

Automatic Connection to a Studio Repository

A Studio administrator can enable to automatically connect to the Studio repository for each Petrel workstation. If this option is enabled, when the Petrel project is opened, it will automatically reconnect to the last Studio repository that was accessed. This way, the Studio notifications, alerts, and synchronization workflows are immediately enabled, without having the Petrel user open a Studio dialog.

This option can be enabled at the application level (and deployed to all the Petrel workstations if this is the company policy).

A Petrel user can enable this option by clicking **File > Project setup > Project settings > Studio settings > Repository settings**.

If the option is defined from Petrel, it will take precedence over the application level.

The automatic connection is only available when connecting to a repository using Windows authentication with SQL Server or SSO with Oracle.

► *To Enable the Automatic Connection at the Application Level*

- 1** On the Petrel workstation, open the **Slb.P4E.Dbx.Config** file (in the Petrel installation directory, located at `...\Schlumberger\Petrel 2019\Extensions\Schlumberger\Studio`).
- 2** Look for `ConnectionOptionsSection` in the config file and set `EnableAutoConnect` to **True**.
- 3** Save the file.

Enabling the Remember Password Feature

A Studio administrator can enable the **Remember password** feature for each Petrel workstation. When enabled, a **Remember password** option appears in the Studio **Login** window. Selecting this option saves the user's password so that he or she does not need to log in when opening Studio.

► **To Enable the Remember Password Feature**

1 On the Petrel workstation, open the **Sib.P4E.Dbx.Config** file (in the Petrel installation directory, at `...\Schlumberger\Petrel 2019\Extensions\Schlumberger\Studio`).

2 Set `ProvideSavePasswordOption` to `True`.

The line is:

```
<ConnectionOptionsSection ProvideSavePasswordOption= "false" />
```

3 Save the file.

Changing the Configuration for Custom Coordinate Systems

Petrel provides coordinate reference systems from these standard authorities:

- European Petroleum Survey Group (EPSG)
- Esri®
- Software Integrated Solutions (SIS)

If your company’s geodesy group uses custom coordinate systems with internally developed codes, you can prevent your users from making changes to the standard authority coordinate reference systems, transforms, and conflation policies.

Important: If you **did not deploy Studio** and you want to make these configuration changes, change the configuration of the Coordinate System Manager. If you **did deploy Studio**, change the configuration of Studio Manager.

A flag in a configuration file controls this behavior. By default:

- The flag for the Coordinate System Manager’s configuration file is set to **True**
- The flag for the Studio Manager’s configuration file is set to **False**

Table C-1 Comparison of the true and false flags

AllowAdminOutOfBoxCatalog=True	AllowAdminOutOfBoxCatalog=False
Default flag for Coordinate System Manager	Default flag for Studio Manager
<i>Can</i> delete any coordinate reference system, transform, or conflation policy	<i>Cannot</i> delete any coordinate reference system, transform, or conflation policy
<i>Can</i> create any coordinate reference system, transform, or conflation policy, using any authority or code if there is no conflict with existing ones in the catalog	<i>Only</i> can create coordinate reference systems, transforms, or conflation policies with Petrel as the authority (that is, Source=Petrel) and with a code that is within the designated ranges
<i>Can</i> add a coordinate reference system or simple transform from the Esri catalog, using the code (for example, if a person deletes one and later wants to add it back)	<i>Cannot</i> add a coordinate reference system or simple transform from the Esri catalog, using the code (because it cannot be deleted)

► **To Change the Configuration**

- 1 Open the configuration file in a text editor:

Did you deploy Studio?	Open this file:
No	The Coordinate System Manager configuration file CoordinateSystemAdmin.exe.config
Yes	The Studio Manager configuration file StudioManager.exe.config Refer to the <i>Studio Installation and Configuration Guide</i> for the location of the file.

- 2 In the **ApplicationConfigurations** section, change the flag for **AllowAdminOutOfBoxCatalog** to **True** or **False**.
- 3 Save and close the configuration file.

D Enhanced Summary File Format

In This Chapter

Overview.....	D-2
Technical Details.....	D-4
General Considerations.....	D-8

Overview

The simulator output for summary results in the form of ***(.F)SMSPEC** and ***.A/Sxxx** files reflects the way the simulator solves the mathematical equations for increasing time. Accessing the data for a particular summary vector—usually for plotting against time—requires the entire data set. This access pattern is poorly supported by the simulator output mentioned previously, more so if the data is located on a network drive. In effect, accessing summary data often results in high access times over network connections. This is the primary motivation behind the introduction of a new, enhanced file format for storing summary data from Petrel 2017 onward. Requesting summary data in this new file format results in greatly increased access speed over network connections.

How does it work?

The recommended workflow is to make the conversion to the enhanced summary file format part of the simulation submission job rather than through Petrel. For more information, refer to “[Technical Details](#)” and “[General Considerations](#)”, which contain information about performance and resource requirements.

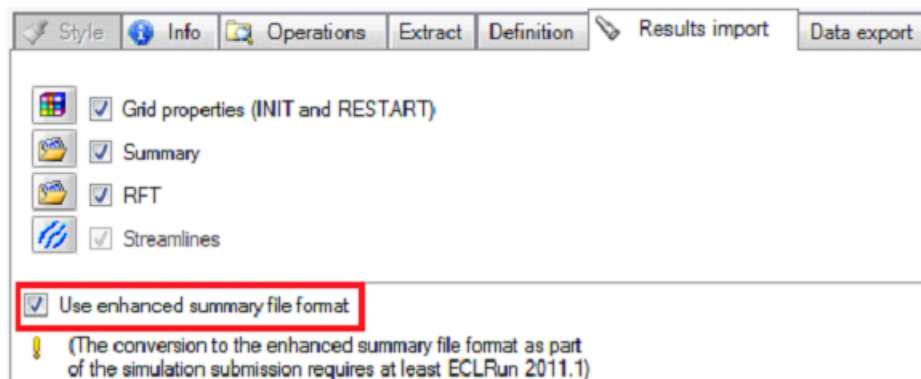
Conversion-related Worksteps in Petrel

When you load a Petrel project, whether it is a legacy project or not, Petrel checks whether conversion is needed. If so, the conversion process to the new file format is started in the background without impeding Petrel itself. Names of individual cases being converted appear in red font with the addition (summary conversion being active...) as seen in the figure:

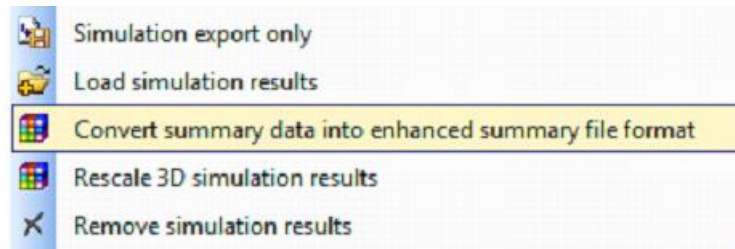
 BIG (summary data conversion active...)

Note: *If the data is stored on a network location, do not access summary data for a case during the conversion. Although you can access the data, you do not benefit from increased summary data performance until the end of the conversion.*

If you decide not to use the enhanced summary file format for a particular case, open its settings dialog by right-clicking the case. Then select the **Results import** tab and clear **the Use enhanced summary file format** option, as shown in the figure:



Generally, Petrel ensures that the enhanced summary file format is being used and kept up-to-date. However, you have the option to enforce conversion by right-clicking on a simulation case, case folder, or case collection and selecting **Convert summary data into enhanced summary file format** on the popup menu.



If this option is disabled (displayed with gray text), Petrel either has not found any summary data for the case or the option selection has been cleared in the **Results import** tab on the case.

The message log displays several messages that explain the process.

Technical Details

Conversion into the enhanced summary file format can occur in one of two ways:

1 As part for the simulation submission workflow

After successfully completing the simulation, the conversion to the enhanced file format is triggered as a post-processing step before the results are loaded back into Petrel. This is the recommended workflow because it hides the conversion time.

2 When importing the deck into Petrel or loading the results

Petrel checks whether conversion is needed. In this case, the conversion takes place on the machine where Petrel is installed. Although the conversion is done without impeding Petrel, it is not recommended that you allow Petrel to do the conversion because it can be expensive in terms of resources needed (time and memory).

The Preferred Workflow for Conversion

Conversion from the simulator output for the summary results into the enhanced summary file format may take a considerable amount of time, depending on the size of the summary data, network speed, and the load on the machine Petrel is running. Therefore, you are advised to make the conversion process part of the simulation submission system. This section describes three different methods for making the conversion part of the recommended post-simulation workflow.

ECLRun >= 2012

First consider ECLRun 2012, the first version of ECLRun aware of this new file format. If you submit a simulation run via ECLRun 2012, it triggers the simulation data conversion after successful completion of the simulation run. That means by the time the results are read back into Petrel, the enhanced summary file is already created so Petrel does not need to create it. You benefit from the advantages of this new file format immediately.

You can control certain aspects of the conversion by editing the **PetrelConfiguration.xml** file.

Note: *Before changing this file, close all instances of Petrel; otherwise, you will lose your changes when you close Petrel.*

Open the file and find the section <SimulationCommands>. It should look like this:

```
<SimulationCommands>

  <Command Name="ECLIPSE 100">

    <Submit>eclrun.exe [-v %VERSION%] [-s %SERVER%]
    [-q %QUEUE%] [--username %USERID%] [--passwd %PASSWORD%]
    [%OPTIONS%] eclipse %DATAFILE%</Submit>

    <Fetch>eclrun.exe [--passwd %PASSWORD%] check
    %DATAFILE%</Fetch>

    <Kill>eclrun.exe [--passwd %PASSWORD%] kill
    %DATAFILE%</Kill>

  </Command>

  <Command Name="ECLIPSE 300">

    <Submit>eclrun.exe [-v %VERSION%] [-s %SERVER%]
    [-q %QUEUE%] [--username %USERID%] [--passwd %PASSWORD%]
    [%OPTIONS%] e300 %DATAFILE%</Submit>

    <Fetch>eclrun.exe [--passwd %PASSWORD%] check
    %DATAFILE%</Fetch>

    <Kill>eclrun.exe [--passwd %PASSWORD%] kill
    %DATAFILE%</Kill>

  </Command>

  <Command Name="FrontSim">

    <Submit>eclrun.exe [-v %VERSION%] [-s %SERVER%] [-q
    %QUEUE%] [--username %USERID%] [--passwd %PASSWORD%]
    [%OPTIONS%] frontsim %DATAFILE%</Submit>

    <Fetch>eclrun.exe [--passwd %PASSWORD%] check
    %DATAFILE%</Fetch>

    <Kill>eclrun.exe [--passwd %PASSWORD%] kill
    %DATAFILE%</Kill>

  </Command>

</SimulationCommands>
```

The options are:

- hdf-converter-version
- summary-conversion

Suppose you are using ECLRun 2012 and you must support submissions from both Petrel 2012 and Petrel 2014. By default, ECLRun starts the newest converter it finds. It decides this based on the file system structure, for example \ecl\2012.1\, \ecl\2012 etc. If you do not tell ECLRun explicitly to start the 2012 converter for submission from Petrel 2014, the converted summary file is rejected by Petrel 2014 and regenerated locally into the new file format. This can be time-consuming. To avoid this, append the submission string of the Submit xml tag with [- - hdf-converter-version 2012.1] for all the simulators E100, E300, and Frontsim for the 2012 **PetrelConfiguration.xml** file. For example:

Enhanced Summary File Format D-5

```
eclrun.exe [-v %VERSION%] [-s %SERVER%] [-q %QUEUE%] [--username
%USERID%] [--passwd %PASSWORD%] [%OPTIONS%] [--hdf-converter-
version 2012.1] e300 %DATAFILE%
```

To suppress conversion into the new summary file format altogether, use [`--summary-conversion=no`]. For example,

```
eclrun.exe [-v %VERSION%] [-s %SERVER%] [-q %QUEUE%] [--username
%USERID%] [--passwd %PASSWORD%] [%OPTIONS%] [--summary-
conversion=no] e300 %DATAFILE%
```

The location of the xml file is system-dependent. For Windows 7, the default location is

C:\Users\UsernName\AppData\Roaming\Schlumberger\Petrel\Petrel-version\.

Pre-2012 ECLRun

In this case, ECLRun is unaware of the enhanced summary file format. To complete the conversion automatically at the end of the simulation run, use the stand-alone converter utility. Contact Schlumberger support to obtain the version you need. Once the converter is properly installed, ensure it runs after the end of a successful simulation before the simulation results are read back into Petrel. Refer to “[Stand-alone Enhanced Summary Converter Utility](#)” on page D-6 for additional details for using the converter.

Note: *If you have changed **PetrelConfiguration.xml** to include the hdf options, you should break simulation submissions from within Petrel 2014 with older ECLRun versions in case you should decide to downgrade.*

Custom remote submission systems

For successful summary conversion, obtain the stand-alone converter from Schlumberger support. Supported systems include Microsoft Windows and various Linux versions. Contact your system administrator for setup instructions. Refer to “[Stand-alone Enhanced Summary Converter Utility](#)” on page D-6 for additional details for using the converter.

Stand-alone Enhanced Summary Converter Utility

The Windows version of the stand-alone converter is installed with the Petrel installation. The executable is named **ConvertSummaryData2DataBase.exe** and is located in the same location as the Petrel application file **petrel.exe**.

Note: *Usually, the simulation run happens on a cluster. One way to make the summary conversion part of the submission workflow is to install the stand-alone converter on the same machine that runs the simulation. For this, you must obtain either the Windows or Linux version of the converter from Schlumberger support.*

The converter accepts two mandatory command line options:

- 1 Either a directory or a path to a specific **(F)SMSPEC** file
- 2 The directory for storing temporary files

If the first argument is a directory, the converter recursively looks for **(F)SMSPEC** files in that directory and converts the corresponding summary data into the new file format. In the case of a specific **(F)SMSPEC** file, only its summary data is converted. The second argument could, for example, be `C:\TEMP` for Windows and `/tmp` for Linux.

Examples for Windows include:

- `ConvertSummaryData2DataBase.exe C:\Users\hawaii\maui.SMSPEC C:\TEMP`
- `ConvertSummaryData2DataBase.exe C:\Users\hawaii\maui C:\Users\foo\AppData\Local\Temp`
- `ConvertSummaryData2DataBase.exe C:\Users\hawaii\maui %TEMP%`

Linux examples include:

- `ConvertSummaryData2DataBase.exe /home/hawaii\maui.SMSPEC /tmp`
- `ConvertSummaryData2DataBase.exe /home/hawaii /users/maui/tmp`
- `ConvertSummaryData2DataBase.exe /home/hawaii $TMPDIR`

If you see errors loading shared libraries when trying to run the Linux hdf converter, you might need add the path to the shared libraries installed with ECLRun to your `LD_LIBRARY_PATH` environment variable. When using shell `csh`, this could look like:

```
$ setenv LD_LIBRARY_PATH ${LD_LIBRARY_PATH}:/path/to/shared/libraries
```

To make this persistent, you must add this command to the shell config file, for example `.cshrc` for `csh`.

General Considerations

This page lists general comments about behavior, resources, and performance for the enhanced summary file format.

Best Practice Guidelines

- While Petrel is using the enhanced summary file (extension .h5), the file cannot be modified or deleted outside of Petrel. This ensures that the data Petrel works with and that the user sees are in sync with the data on the disk. If you still need to remove or change the file, you must first remove the simulation results for the particular case within Petrel (right-click the simulation case and select **Remove simulation results**).
- When a project loads, Petrel warns you if any of the enhanced summary files are read-only. This might become an issue after a simulation run. In this case, when the simulation results are pulled back, Petrel cannot update the enhanced summary file returned by the simulation submission. To prevent the display of incorrect summary results, Petrel falls back to the standard summary files ***(F)SMSPEC** and ***.A/Sxxxx**. A warning is written to the message log.
- If the option **Convert summary data into enhanced summary file format** (which appears after right-clicking a case) is grayed out, either:
 - Petrel has not found any summary data for this case or
 - The option to use the enhanced summary file format has been cleared on the **Results import** tab on the case
- When summary data is loaded into Petrel, the old-style summary data is in sync with the summary data in the new enhanced summary file. To keep them in sync, the converter writes the new keyword Timestmp (documented in the Eclipse File Format Reference Manual) into the **(F)SMSPEC** file. This means, for conversion to work reliably, that the **(F)SMSPEC** file cannot be *read-only*.

Performance Considerations

Performance can be an issue if you are working with large summary data sets. In any case, the enhanced summary file should be generated as part of the simulation run so it is available to Petrel by the time the results come back from remote submission. Performance considerations include:

- The bigger the summary data files, the longer the conversion takes.
- Make sure you have sufficient main memory. Conversion is faster if more memory is available. Roughly, make sure your #physical RAM = 2*size of summary files.
- If the project data is located on a network location, a fast network connection pays off
- You should request only the summary data and report steps you really need. The more data you request, the slower the conversion and import into Petrel.
- If a large amount of physical memory is available, consider setting the environment variable SLB_FAST_SUMMARY_READER on the machine that does the enhanced file format conversion. This can speed up conversion considerably.