SeisSpace®/ProMAX®/ ProMAX® DepthCharge Version 5000.8.0.0

Release Notes

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Landmark Software & Services

What's In This Release

The **5000.8.0.0 release** of SeisSpace®/ProMAX®/ProMAX® DepthCharge software provides bug fixes and new functionality.

To go directly to the enhancements, fixed issues, and known issues for the applications, click on the blue links below:

Enhancements and New Functionality

Fixed Issues

Known Issues

A Release Letter for the SeisSpace®/ProMAX®/ProMAX® DepthCharge software release, Introduction, System Requirements, Installation Instructions, and Licensing information are also provided in this document.

Release Overview for SeisSpace®/ProMAX®/ProMAX® DepthCharge 5000.8.0.0 Release

January, 2012

Landmark is pleased to provide the SeisSpace® R5000.8.0.0 software version, ProMAX® R5000.8.0.0 software version, and ProMAX® DepthCharge R5000.8.0.0 software version.

This release includes the following major items:

- Make sure you update external SeisSpace etc directory for new files. (seisspace.properties and javaseis.properties plus GeomQC directory)
- There are many tools that have been moved to an obsolete status. This is an
 indication that these tools will not be available in future releases and when you
 see obsolete tools in your flows you should replace them with the appropriate
 production or development status tool. In most cases these tools are duplicated
 tools where we would prefer that you run the original ProMAX tool instead of the
 SeisSpace tool. The list of tools that have been set to an obsolete status can be
 found near the end of this document on page 57.
- Geom QC Quadrant Stacks were delivered in the 5000.0.3.1 update we but wanted to mention it again here.
- Disk Data Management Utilities driven from the navigator to help find large files and files that are in secondary with no primary parents. Introduction of dataset reports generation. This includes an interactive Orphaned Dataset list table and automated manufacturing of the flows to run to create the different reports. This is all in the MB3 options menu on Data_Homes in the navigator.
- SeisSpace/ProMAX 5000.8.0.0 is being delivered with a 64 bit runtime only.
- Navigator data copy /move now utilizes the archive/restore protocols when appropriate greatly enhances the ability to manage copying datasets, lines and areas within and between projects.
- Introduction of the 3D volume Regularization tool to build output traces on the LIN grid with limited interpolation to fill small gaps. This tool is designed to take input traces that lie at irregular X-Y positions and reconstruct new traces that fall on a regular grid.
- Velocity Analysis workflow improvements including adding hot keys for forward and backward navigation in the interactive Velocity Analysis tool as well as better identification of the current analysis location in the VVE map view.

- Introduction of the ProMAGIC replacement workflow using the 3D Viewer and the Velocity Autopicker in an interactive picking and Quality Control session. See the Velocity Autopicker documentation for workflow details.
- Addition of Hot Keys in Trace Display for first break picking snapping and smoothing. These are user configurable in the updated port/lib/X11/app-defaults/TraceDisplay file.
- Updates to the seismic data comparison tool including better amplitude annotation with cursor tracking, better ability to manage the header plot on zoomed panels and traces plotted in reverse order, updated capabilities in the spectral plots, updates to the options available in the MB3 and CNTRL MB3 option menus for shortcuts to display parameters. Ability to transpose 3D framework input files on read so that you can display inlines, crosslines, or time slices from stack data volumes or velocity models without having to make the transposed files.
- Updates to the parallel residual statics tool to provide some smoothing and better control of the statics around the low fold edges of the project.
- Added an Offset Vector Tile header generation tool to help with the generation of OVT's.
- Addition of the ability to run a batch job to archive a single dataset. This uses a
 combination of the tools "Build Dataset Archive Inventory*" and "Create Archive*". This
 allows you to build jobs using flow replication to manage archiving single datasets
 outside of the archive wizard.
- Performance updates to the generation of the coordinate QC map for entire volumes of frames from the foldmap. Also added scroll bars after zoom on the QC basemaps.
- There are new capabilities in the Archive/Restore wizards for look and feel as well as general functional improvements such as archiving and restoring Primary only. Restore will also do a better job of assigning extents to file systems in the secondary configuration that have more available space and ignore those that are almost full by honoring the min-global space values and hierarchical lists of available file systems to use from the project configuration.
- Introduction of a converted wave nmo option in NMO and Velocity Analysis workflows.
- Replacement of the original T132 (trace and frame) and T321 (time slice) transpose tools with Transpose V2 and introduction of the 3D and 4D transpose macro tools that wrap the Transpose V2 tool with the LDA and UDA so you can keep the flows simpler. This also introduces new transpose capabilities that can be used instead of a sort. For example, using a transpose to go back and forth between regularized CDP gathers and Common Offset Volumes.

- Ability to sort the traces in the frames that come out of the Merge Sort before writing the frames to the output file. Also improved the setting of the output context from common sorting operations by making better guesses based on the output volume, frame and trace headers.
- Improved memory usage in the Sortmap creation tool that will allow sort maps to be created on much larger data volumes more efficiently.
- Updates to the manner in which seisdata objects are managed in a capsule to better predict which order the objects are in after resetting the default object in the capsule (related to complex SeisSpace tool development).
- Introduction of the Frame Delete* Tool. This tool was added to allow you to delete a
 frame out of a dataset. This was a defect / upgrade request to help remove bad data
 in a file without having to reconstruct the whole file by skipping the bad frame in a read/
 write operation. NOTE: this tool has not been thoroughly exercised. It updates the map
 file by removing the address of the offending frame but does not actually delete the
 frame from disk.
- Introduction of the "like-named object" grouping in the navigator to support Datasets, Tables and Flows. This helps reduce the size of the main lists in the navigator by allowing you to group objects by common names and only show the root in the main lists and then expand the lists to see the individual objects.
- New color identification for selected cells in the Replica Job Table and the Job Viewer.
- Significant enhancements to the 3D viewer for large volume support, amplitude scaling and general usability. Caching updates to use a floating point cache to improve the display quality. Velocity semblance cube picking and integrated VAP.
- Introduction of a SeisSpace parallel shell tool called Shell Commands* as a standalone tool which can be used to run the same shell commands on all of the joblets (or just the foremand joblet if desired).
- Approximately 82 defect fixes in SeisSpace and ProMAX combined.

This release includes the following infrastructure changes:

- Removed ProMAX UI
- Removed ProMANAGER
- Intel Compilers run time libraries in ProMAX tree
- Sitemanager performance and lockup prevention

This release includes the following changes to the Development Toolkits:



The SeisSpace Software Development Kit

Landmark development staff have maintained forward compatibility for existing tools as much as possible. However, there are a few cases where changes in the infrastructure will require an update to customer developed tools before being able to compile and run with the 5000.8.0.0 release.

Do not attempt to take an existing development directory built against 5000.0.3.x and use it with 5000.8.0.0. There are a number of changes to the API and a switch from the GCC to the Intel compilers that may cause problems and the version of Java that SeisSpace/ ProMAX uses has been updated to "1.6.0_21". Developers will need to recompile existing tools using a newer JDK and against the 5000.8.0.0 infrastructure.

Landmark developers have deprecated old classes and/or methods instead of removing them immediately. If customer developed tools report any deprecation warnings during compilation please check the javadocs for information about the recommended updates. If the javadocs don't provide enough details please contact SeisSpace/ProMAX support for more information. These deprecated classes and methods will be removed in the next release.

There are a few cases where we were not able to maintain and deprecate the old classes or methods and they have been deleted. Normally this requires removing an old include and replacing it with the new one. If developers run into one of these scenarios please contact SeisSpace/ProMAX support for more details about what changes are necessary.

As always, feel free to contact the SeisSpace®/ProMAX®/ProMAX® DepthCharge Landmark Depth Imaging support team with any issues that you feel need to be addressed.

Sincerely,

Dan Grygier

Introduction

SeisSpace®/ProMAX®/ProMAX® DepthCharge 5000.8.0.0 Release

This is a full installation.

Overview

The Release Notes provide the necessary information to correctly install and configure SeisSpace®/ProMAX®/ProMAX® DepthCharge 5000.8.0.0. These notes also contain operating system requirements and descriptions of required third-party software, as well as information for setting up parallel configurations, network dependencies and tested hardware configurations.

See "Enhancements and New Functionality" on page 54 for a description of the changes associated with this release.

The processing portfolio is comprised of a combination of three major systems. SeisSpace® is the first major system that adds a new User Interface with combined Navigator, Flow Builder, and Flow Replicator and a new processing executive which runs in a different environment than that of the ProMAX® executive. ProMAX® is the second major system with subsystems of General Processing Tools, Tape Input/Output, Queuing, Plotting, and the Development kit. ProMAX® DepthCharge is the third major system that provide the 3D tomography and the Prestack Plane Wave Depth Migration, for iterative velocity model building.

The ProMAX® Flow Builder and ProMANAGER are no longer supported by development and you are advised to use the SeisSpace® user interface to build and manage all ProMAX® flows, all SeisSpace® flows, all Hybrid flows and use the built-in flow replication tools.

Hybrid Flows - Combining SeisSpace® and ProMAX® processes

Hybrid flows combine the parallel input/output of SeisSpace®/JavaSeis with a separate instance of ProMAX® running on each of the selected nodes.

Hybrid flows run as if you were physically running a separate ProMAX® job on each node. Hybrid flows allow you to distribute the work required to process a data volume over several nodes in parallel with each node receiving only a subset of the input traces.

Note: The hybrid flows are a combination of ProMAX® and SeisSpace® processes in between **JavaSeis Input** and/or **Output** modules. Some processes, such as those that write to the database, are disabled for running in a parallel environment. Other processes are not allowed in the hybrid environment at all. The Flow Builder indicates this information as you build the flow.

SeisSpace®/ProMAX® Version Compatibility

SeisSpace® and ProMAX® come as a matched set. You must make sure that the correct versions of ProMAX® and SeisSpace® are installed and configured to run together to ensure compatibility between the two systems.

SeisSpace® tools directly access ProMAX® tables.

Defects and Known Problems

A Known Problems list for this release is available online through Landmark's website. This list is frequently updated.

System Requirements

Hardware Requirements

SeisSpace® is supported only on Linux. Landmark recommends the following hardware.

Platform	Processor (target)	Memory (minimum)	Memory (target)
Linux 64-bit AMD opteron	dual CPU 1.8 GHz or greater. (dual chip - single core)	1 GB/CPU	2 GB per chip or 4 GB per node
Linux 64-bit Intel	dual CPU 1.8 GHz or greater. (dual chip - single core)	1 GB/CPU	2 GB per chip or 4 GB per node
Linux 64-bit AMD opteron	multi core	1 GB/core	2 GB or greater per core
Linux 64-bit Intel	multi core	1 GB/core	2 GB or greater per core

NOTE: Intel Itanium chips are not supported.

Memory and Storage Requirements

- It is generally recommended to have a minimum of 2 gigabytes of memory per "core" For the purposes of SeisSpace®/ProMAX®, a computer such as a quad-core dual-CPU has effectively 8 CPU's, 4 CPU's on each of 2 "quad-core" chips. A minimum of 16 Gb of memory would be recommended per node of this type.
- Augment additions to the main memory by expanding the paging space; a *Main Memory: Paging Space ratio of 4:1* is recommended. For very high memory machines the 4:1 ratio can be relaxed somewhat. Monitor the swap space under normal load conditions to decide the amount of required swap space. It is critical to have more swap space available than the amount equal to main memory and this requirement can vary some from one node to another.
- The Manager node should have at least swap = main memory and a value of 1.5 to 2 times main memory is recommended.

- The Login-nodes or nodes where the navigator and a lot of interactive jobs will be running will require more swap. On these nodes you should allocate at least 3 times if not 4 times the amount of main memory as swap space.
- The Processing nodes should be set up to have at least 2 times the amount of swap as main memory but try to go to 3 times if possible.

Operating System Requirements

SeisSpace®, ProMAX® and ProMAX® DepthCharge are built on operating systems Linux RedHat AWS 4.4 using the 2.6.9-42.ELsmp #1 SMP kernal. SeisSpace®, ProMAX® and ProMAX® DepthCharge are not available for Windows, IRIX, Solaris or AIX.

For Linux, Landmark is prepared to support SeisSpace®/ProMAX®/ProMAX® DepthCharge R5000.8.0.0 where any node that is used for administrative purposes, such as running queue servers/schedulers, license managers, and the like as well as any node that runs the User Interface and interactive jobs if it is running a full RedHat AWS 5.x operating system. (Landmark will continue to support running on RedHat AWS 4.4 or later as well.)

For Linux compute nodes (nodes in a cluster that only do batch job processing) Landmark is prepared to support CentOS 4.x and 5.x. (Fedora is not supported).

Operating System - SELinux - disable

Security-Enhanced LINUX (SELinux) is a LINUX feature that provides a variety of security policies, including U.S. Department of Defense style mandatory access controls, through the use of LINUX Security Modules (LSM) in the LINUX kernel. It is not a LINUX distribution, but rather a set of modifications that can be applied to UNIX-like operating systems, such as LINUX and BSI.

Based on the Red Hat SELinux functionality for security by our understanding it is better marked "permissive" or "disabled" for all our apps.

Best practise would be to set SELinux as disabled if you encounter problems with installing and starting the Landmark software, then install and configure the machine with OpenWorks, GeoProbe and any related Landmark G & G application (e.g. SeisWorks, PowerView, PowerCalculator and Well Seismic Fusion).

You can set the SELinux after the Landmark software has been installed to permissive but again please note should you encounter issues while running GeoProbe it maybe appropriate to set SELinux to "disabled".

This solution is specifically for R5000 GeoProbe on Red Hat 5 and maybe applicable for Red Hat 4 as well if SELinux has been packaged in the operating system install.

To check if SElinux is enforcing in your system run "getenforce" from the command line. If it returns "Enforcing" then SElinux is enforced in your system and it should be disabled.

From the command line

Issue the following command to check if SElinux is active

"more /etc/selinux/config | grep SELINUX"

It will return the SELINUX status as below:

SELINUX=permissive/disabled/enforcing

Make sure the entry is change to

SELINUX=disabled

using any text editor, editing must be performed as root.

with GUI

As root, issue the following command in xterm

"system-config-securitylevel"

Under SELinux tab, change the setting the Disable

The machine need to be rebooted in order for the SElinux configuration changed take place.

Required System Libraries

The ProMAX/SS sys/lib/syslibs directory contained a number of run time libraries that were not immediately available from a "standard" RHEL install. Over time these were added to the ProMAX_HOME/sys/lib/syslibs directory to increase the chance that a ProMAX® install would run out of the box. Unfortunately Landmark is no longer able to package and deliver Linux system libraries due to export control. There are a couple of system libraries that you will need to make sure are installed on your systems for ProMAX®/SeisSpace® to work.

The sys/lib/syslibs directory has been removed from the ProMAX®/SeisSpace® installation and the locations of the libraries that are required are identified below in terms of their RHEL packages.

Library	Package	Version	Package Filename
libXm.so.3	openmotif	2.2.3-10	openmotif-2.2.3- 6.RHEL4.2.x86_64.rpm
libg2c.so.0	libf2c	3.4.6-3	libf2c-3.4.6-3.x86_64.rpm
libreadline.so.4 & libhis- tory.so.4	readline	4.3-13	readline-4.3-13.x86_64.rpm

•Red Hat Enterprise Linux 4

•Red Hat Enterprise Linux 5

Library	Package	Version	Package Filename
libXm.so.3	openmotif22	2.2.3-18	openmotif22-2.2.3- 18.x86_64.rpm
libg2c.so.0	compat-libf2c	3.4.6-4	compat-libf2c-34-3.4.6- 4.x86_64.rpm
libreadline.so.4 & libhis- tory.so.4	compat- readline43	4.3-3	compat-readline43-4.3- 3.x86_64.rpm

The package names are standard RHEL rpm names without the version numbers, yum (on RHEL 5) or up2date (on RHEL 4) will pick the current versions given the package names noted.

The Package File names are the files to be downloaded from the Red Hat RHEL website or read from the install media (CD or DVD). The names above are for the x86_64 architecture.

They can be installed using "rpm -i {package file}".



Directed Output O_DIRECT

Note: We have observed problems with the O_DIRECT flag for JavaSeis Input/Output and for general flow status tracking between different versions of Linux operating systems. Although we specify that you can use combinations of operating systems between the Manager/Login nodes and the compute nodes, you must ensure that the versions of these operating systems treat O_DIRECT the same.

For all Linux installations you should make sure that your /etc/hosts file does not have your machine name on the loopback address line. Most systems will have an /etc/hosts file similar to the example below after an O/S installation:

127.0.0.1 myhostname localhost.localdomain localhost

For MPI and most other networking operations to work, you should make sure that your etc/hosts file has the local machine name and constant ip address on a separate line.

127.0.0.1 localhost.localdomain localhost

my-ip-address myhostname.mydomain.com myhostname

For installations using DHCP you should make sure that the dhcp server always gives all of the machines the same "my-ip-address" all of the time.

For Linux, all file systems (especially the automounted filesystems) should use TCP rather than UDP.

Each user should have trusted status (i.e., no password required) to be able to rsh and/ or ssh from the head node to the compute nodes and from the compute nodes back to the head node. This also includes local workstations if they are being used as user machines for running the navigator and interactive jobs outside of the cluster.

Linux kernel versions and package requirements

Landmark recommends installing all packages of RedHat Linux as a custom installation. We also recommend to set up the system with *no firewalls*.

Linux Red Hat Version AWS4.x most recent Update with the following packages is needed for ProMAX® and SeisSpace®:

mt-st-0.8-1 (for tape devices)

Linux Red Hat Version AWS5.x most recent Update with the following packages is needed for ProMAX® and SeisSpace®:

mt-st-0.9b-2.2.2 (for tape devices)

and for the ProMAX® Dev Kit:

gcc4-4.1.0-18.EL4 gcc-g77-3.4.6-3 gcc-3.4.6-3 gcc4-c++-4.1.0-18.EL4 gcc-c++-3.4.6-3

There are a variety of kernel versions with various system patches as well. For RedHat, the minimum recommended kernel version is:

2.6.18-8.el5 #1 SMP for AWS 5.0 or 2.6.0-42.ELsmp #a for AWS 4.4

Linux System Configuration

We have found that you will probably need to edit 3 different files to get things to work on the more recent operating systems.

/etc/ssh/ssh_config

Add ForwardX11Trusted=yes at the bottom. For example:

EscapeChar ~

Host *

GSSAPIAuthentication yes

If this option is set to yes then the remote X11 clients will have full access

to the local X11 display. As virtually no X11 client supports the untrusted

mode correctly we set this to yes.

ForwardX11Trusted yes

letc/X11/gdm/gdm.conf in RH4 or /etc/gdm/custom.conf in RH5

Make sure that the DisallowTCP variable is set to false. You can either edit the line from true to false or add the line

DisallowTCP=false.

In RH5 this line goes in the [security] section.

You may find it easier to run the gdmsetup system command and make sure that the "Always disallow TCP connections to X server" is not selected. This will update the gdm.conf or custom.conf file for you.



You will need to restart X for this to take effect

/etc/profile.d/krb5*

either set the permissions on the krb5* files to r_____ or change their names to krb5*.orig.

Need to install an nVidia video driver and configure it for twinview and color depth of 24.

Microsoft Windows

SeisSpace®, ProMAX® and ProMAX® DepthCharge are not supported on or distributed for Windows.

If you do not know what operating system, windowing environment, and/or what release you are running, refer to the following table:

Platform	Command to Type
Linux	Operating System % uname -a Motif/X11 % grep -i revision /usr/include/X11/IntrinsicP.h

Installation Disk Space Requirements

The following table summarizes the disk space requirements when running the standard **InstallAnywhere** procedures:

R5000.8.0.0	Linux 64
PM/SS/DC	3.2 Gb

The ProMAX® tutorials continue to be delivered on a separate image. Because of the change to start using the LSM/ESD (Landmark Software Manager/Electronic Software distribution), the tutorials are being delivered as a single protar file that contains all of the areas and lines for all of the tutorials. To install the tutorials you must run the restore

wizard from the SeisSpace® Navigator. The flows in the tutorials are only viewable and editable in the SeisSpace flowbuilder.

Third Party Applications

Landmark uses various third-party applications in the development of its software.

Landmark acknowledges that certain third party code has been bundled with, or embedded in, Landmark's software. The licensors of this third party code, and the terms and conditions of their respective licenses, may be found at the following location:

\$PROMAX_HOME/port/help/rel_notes/third_party.pdf.

The following table describes the third-party software used in SeisSpace®/ProMAX®/ ProMAX® DepthCharge software version 5000.8.0.0:

Attribution List

CCpunit Copyright © Baptiste Lepilleur. All rights reserved.

Slf4j Copyright © 2004-2011 QOS.ch. All rights reserved.

XStream Copyright © 2003-2006, Joe Walnes

Copyright © 2006-2009, XStream Committers. All rights reserved

International Trade Compliance

This application is manufactured or designed using U.S. origin technology and is therefore subject to the export control laws of the United States. Any use or further disposition of such items is subject to U.S. law. Exports from the United States and any re-export thereafter may require a formal export license authorization from the government. If there are doubts about the requirements of the applicable law, it is recommended that the buyer obtain qualified legal advice. These items cannot be used in the design, production, use, or storage of chemical, biological, or nuclear weapons, or missiles of any kind.

The ECCN's provided in Release Notes represent Landmark Graphics' opinion of the correct classification for the product today (based on the original software and/or original hardware). Classifications are subject to change. If you have any questions or need assistance please contact us at mailto:FHOUEXP@halliburton.com

Under the U.S. Export Administration Regulations (EAR), the U.S. Government assigns your organization or client, as exporter/importer of record, responsibility for determining the correct authorization for the item at the time of export/import. Restrictions may apply to shipments based on the products, the customer, or the country of destination, and an export license may be required by the Department of Commerce prior to shipment. The U.S. Bureau of Industry and Security provides a website to assist you with determining the need for a license and with information regarding where to obtain help.

The URL is: http://www.bis.doc.gov

Definitions

CCATS (Commodity Classification Automated Tracking System) - the tracking number assigned by the U.S. Bureau of Industry and Security (BIS) to products formally reviewed and classified by the government. The CCATS provides information concerning export/re-export authorizations, available exceptions, and conditions.

ECCN (Export Control Classification Number) -The ECCN is an alpha-numeric code, e.g., 3A001, that describes a particular item or type of item, and shows the controls placed on that item. The CCL (Commerce Control List) is divided into ten broad categories, and each category is further subdivided into five product groups. The CCL is available on the EAR Website.



The ECCN Number, License Type, and the CCATS Numbers for this product are included in the table below. Also included is the date the table was last updated.

Product/Component/R5000	ECCN Number	License	CCATS Number	Last Date Updated
ProMAX®/SeisSpace®	5D002	ENC	G054429	2/11/2008

Patch List

Go To "What's in this Release?"

Not applicable.



Installation

SeisSpace®/ProMAX®/ProMAX® DepthCharge R5000.8.0.0

Landmark software will be made available on a server for customers to download, using the Landmark Software Manager (LSM). http://esd.halliburton.com

The software is delivered by Electronic Software Distribution from the internet. After downloading the installation instructions and setup.bin file, you can install the applications using the InstallAnywhere installation package.

This install media contains the shell script "setup" and the necessary tools to extract the application from the CD and transcribe the application to disk.

Note: The software installation starts from a script that prompts for input; you do not need root privileges.

Using the InstallAnywhere Installer

Use the following procedure install the Landmark applications onto your file system.

The following section explains:

- How to start the Release Manager program.
- How to select the file systems where the applications are to be installed.
- How to complete the installation procedure.
- 1. Locate the "setup.bin" file for the application you need to install. In a normal mode, you will have downloaded the file from the WEB site using the Landmark Software Manager from URL http://esd.halliburton.com
- 2. In a terminal window, change directories to the directory where the setup.bin file is. For a typical Linux installation, type the following command:

cd /a/b/c/whatever the path to the directory where setup.bin location

3. execute "setup.bin" :

./setup.bin

An informational message will appear:

After a few moments, this window will disappear and the following dialog will appear:



Click the **Next** button to proceed and the following dialog will appear:



Select "I accept the terms of the License Agreement" and click the **Next** button and the following dialog will appear:

😼 Install ProMax_SeisSpace m	ain		• ×
	andmark Software Services	' Open₩	orks location
Introduction	Please specify w	here OpenWorks is installed	
License Agreement	1		
OpenWorks location Choose Install Folder	[<u>R</u> estore Default Folder	Ch <u>o</u> ose
O Choose Install Sec			
O Pre-Installation Summary			
O Installing O un tall Complete			
InstallAnywhere			
Cancel		Previous	<u>N</u> ext

Enter (or Choose using the browser) the full path to your installation directory. This path is used to determine where to install the application. For example, if you want to install SeisSpace®/ProMAX®/ProMAX® DepthCharge in a subdirectory from /usr/ apps, then enter /usr/apps and SeisSpace® will be installed in /usr/apps/SeisSpace®. ProMAX® and ProMAX® DepthCharge will be installed in /usr/apps/ProMAX.

When installed, you should have a directory structure similar to the following:

- .../usr/apps/ProMAX
- .../usr/apps/revisions
- .../usr/apps/SeisSpace

After entering the installation directory, click the Next button and the following dialog will appear:



If ProMAX® and SeisSpace® are installed without OpenWorks[™], you will see the above dialog

Select Continue, post-install scripts may fail and then click the Next button and the



🗏 Install ProMax_SeisSpace m	ain			[• 🗙
HALLIBURTON	andmark Software Services	1	Choose li	nstall Fold	ler
Introduction	<u>C</u> hoose Install Fo	older			
✓ License Agreement	/panfs/pan1/dat	a/apps/r50003			
OpenWorks location		Restore Default	Folder	Choose	5
→ Choose Install Folder			Folder	ch <u>o</u> ose	
O Choose Install Sec					
O Pre-Installation Summary					
O Installing					
O nortall Complete					
InstallAnywhere					
Cancel			<u>P</u> revious	<u>N</u> ext	

following dialog will appear:

If the directory that is shown matches your desired installation directory, click the Next



button and the following dialog will appear:

Select Typical and then click the **Next** button.



The following dialog will appear

If the summary looks correct, click the Install button and the following dialog will



appear:



Next you will see a status bar indicating that the files are being extracted and untarred by the installer:



• X 🖫 Install ProMax_SeisSpace main Landmark Software HALLIBURTON Install Complete & Services Introduction Congratulations! ProMax_SeisSpace_main has been successfully installed to: License Agreement OpenWorks location /panfs/pan1/data/apps/r50003 Choose Install Folder Press "Done" to quit the installer. Choose Install Set Pre-Installation Summary 🖌 Installing... Install Complete InstallAnywhere Cancel Previous Done

When complete, the following dialog will appear:

Click on **Done** button and the installation dialogs will disappear.

Part of the installation includes the running of a post install script. For the SeisSpace®/ ProMAX®/ProMAX® DepthCharge product post installation the ProMAX/install/ ProMAX®Install script is run that performs a variety of operations in the ProMAX® and SeisSpace® installations.

4. Add a logs directory to the.../apps directory and set its permissions:

cd .../apps mkdir logs

chmod -R 700 logs (set the permission to be read/write by the user who will be running the sitemanager - generally root)

The **logs** directory is used to store the **netdir.xml** file. This file is the master configuration file for the SeisSpace® installations. Keep it in a directory outside of the main installation directories to avoid deleting it when you reinstall or update the installation version later. Log files from the sitemanager are also written to this

directory.

Note: You may also choose to move the ProMAX® etc directory outside of the ProMAX® installation tree for safe keeping.

It is advantageous to put the following directories together under the .../apps directory:

.../apps/ProMAX
.../apps/revisions
.../apps/SeisSpace
.../apps/logs
.../apps/etc
.../apps/bin

You can store the startup and maintenance scripts in the *.../apps/bin* directory.

DO NOT PROCEED UNTIL YOU HAVE RECEIVED A VALID LICENSE FILE FROM LANDMARK.

Licensing

License Manager

This release is licensed under the FLEXIm licensing software (LAM). SeisSpace® uses ProMAX® license features for the Navigator/Flowbuilder and for running ProMAX® and SeisSpace® jobs. If you have a ProMAX® 5000.0 license running against 5000.0 LAM

license software, then you will not need a new license file and you will not have to reinstall LAM.

Obtaining a license to run the software
After installing any point product, the following message will prompt you to obtain a proper licence:
Attention Landmark Customer
Please contact Landmark for your new software licenses. To receive your licenses, contact the license administration team via email (license@lgc.com), the World Wid Web (http://www.lgc.com), or phone (The America's 281-560-1110, and outsic the Americas at 44-1932-832100). Please refer to the LAM 2003.3.3 Release Guid for instructions on how to retrieve your Imhostid information.
Please have the following information in your email or available when you call:
Company name: Location:
Server Imhostid: Client Imhostid(s):
Server Hostname: Platform:
Model: Operating System
Version:
Site#: Reference#:
Send the license to:
Phone#:
Send the license via: email - email address diskette - shipping address fax - fax number
This window is for information only. Click on OK to continue.

Activating the LAM Manager

The LAM (or FLEXIm) executables are delivered with ProMAX® in the PROMAX_HOME/ sys/bin/flexIm directory. You can start the license server using the Imgrd command as follows:

\$PROMAX_HOME/sys/bin/flexIm/Imgrd -c licensefile > /apps/logs/license.log

When you activate LAM, it creates a hidden file on your home directory called **.flexImrc**. This file contains a speed-optimization to help FLEXIm locate the license file and the license server. You need to remove the file before changing your configuration.

Landmark suggests that you disable the creation of this file by including the following line in your environment file:

FLEXLM_NO_CKOUT_INSTALL_LIC 1

You will still want to use the variable:

LM_LICENSE_FILE /your/license.dat

Configuring the System

This section discusses the system configuration items which must be verified prior to initiating a session, the ProMAX® startup routine, and ProMAX® PD troubleshooting.

ProMAX® config_file Entries

You can edit your site-level ProMAX® configuration file to reflect your system setup. Refer to the sample config_file or to Overriding Environment Variable Settings in the Customizing Your System chapter of the ProMAX® System Administration Guide for details.

Parallel Processing

Parallel processing from within the executive is available using Parallel Virtual Machine (PVM) technology. PVM requires a description of the network machines. This description will normally be kept in the file <PROMAX_HOME>/etc/pvmhosts. This file should be edited to provide your site specific configuration. The pvmhosts file included with this installation provides information on the entries found in that file. You have the option of specifying your own pvmhosts file. See Setting Up Parallel Processing in the Customizing a ProMAX® Installation chapter of the ProMAX® System Administration Guide for more information.

Services File

If ProMAX® has never been installed on your system, add two lines to the /etc/services file or your yp master services file. An example follows:

promax 1525/tcp lgc_pd 3006/tcp pd

The numbers (in this case 1525 and 3006) must be unique within the file. Also, the numbers should be greater than 1023 since numbers below 1023 are privileged and should not be used. The number for lgc_pd needs to be greater than 2011. If your machine or network is running NIS (Network Information Services or what used to be called Yellow Pages) you will need to include promax and lgc_pd as services on the NIS server.

The lgc_pd service is used by the Pointing Dispatcher (PD) for communication between many ProMAX® processes such as the Velocity Analysis and QC tools, Interactive Data Access, DBTools, Make Database Basemap, and within the MVA product.

If there is already an lgc_pd entry in the services file from other Landmark products, you do not need to add a second lgc_pd line.

After making the changes, the system manager needs to push the maps out on the network.

There are cases where you may want to run multiple PD instances that are independent. In this case you can add additional Igc_pd# lines to the services file and then address these via environment variables. For example, different PDs could be run by adding the following Igc_pd# lines:

promax	1525/tcp	
lgc_pd	3006/tcp	pd
lgc_pd1	3007/tcp	pd1
lgc_pd2	3008/tcp	pd2

These different PDs can be addressed using the following environment variables:

- LGC_PD_SERVICE lgc_pd1
- LGC_PD :lgc_pd1

Note: Do not forget to enter the colon.

These variables should be set in the Promax or SSclient startup scripts.

Forcing an execution to use a specific PD

ProMAX[®] uses the Pointing Dispatcher (PD) from OpenWorks[™] (\$OWHOME/bin/pd). If OpenWorks[™] is not installed on your machine, use ProMAX[®]'s Point Dispatcher (\$PROMAX_HOME/sys/exe/lgc/pd).

Plotters

For detailed information about how plot files are created and plotted from within the ProMAX® system, refer to the *Setting Up Plotting Software* chapter of the *ProMAX*® *system Administration Guide*.

Tape Catalog Directories

Refer to the *TopCat Guide* section in the *Total Tape Solution User Guide* for a discussion of tape catalog configuration.

Tape Device Configuration

The ProMAX® tape system allows you to import and export data. Processes such as **SEG-Y Input**, **Tape Data Input**, **Tape Data Output** and **SEG-Y Output** are the parts of the tape system that read and write the data. The tape configuration information, which drives the tape system, is another part of the tape system. The tape configuration information is embedded within ProMAX® and can be updated by editing the *device.tts* file.

ProMAX® MVA

After you have installed SeisSpace®/ProMAX/ProMAX® DepthCharge, ProMAX® MVA is visible only in the ProMAX® DepthCharge product processes list. ProMAX® MVA now uses the DEPTHCHARGE license features.

The \$PROMAX_HOME/port/menu/promax/Processes_MVA file and the Processes_MVA_extra which contains just the ProMAX® MVA processes are still available as before to update the processes lists.

ProMAX® 4D

All of the macros contain **Disk Data Output** processes; the default is to *not* skip primary disk storage. If you want to enable the use of secondary storage, edit the *Altstore_inc.menu* file setting the value variable to t instead of the default of nil. This will adjust the behavior of all of the 4D macros.

Configuration of required libraries to drive the EC (2003.12 OpenWorks) bridge ProMAX® tools.

The following steps can be followed to copy the required libraries from your existing 2003.19.1.x ProMAX® installation to the 5000.0.1.0 installation to enable the original ProMAX® tool SeisWorks IO bridges to work with a legacy 2003.12 OpenWorks database and the SeisWorks I/O tools which are compatible with the 2003.19 release of

SeisSpace/ProMAX

NOTE: you will need to install a patch to ProMAX 2003.19.1.1 to get the most recent libraries:

Additional setup is required, as mentioned in the helpfiles of the SeisWorks I/O tools (available from the SeisSpace/ProMAX UI).

There is one other patch you should be aware of which needs to be installed in the SeisSpace/ProMAX 2003.19.1.1 release prior to the copying of these libraries. This patch can be found on the customer support portal in solution doc 168832.

The size of a SeisWorks compressed seismic dataset output from ProMAX 2003.19.1 is much larger than that of Poststack 2003 or ProMAX 2003.12.1.

Download the patch file lgc_out.exe_809251.

cd \$PROMAX_HOME/sys/exe

cp lgc_out.exe lgc_out.exe_orig

cp lgc_out.exe_809251 lgc_out.exe

\${MKDIR} -p \${INSTALL_DIR}/ProMAX/sys/EC/lib

\${CHMOD} 775 \${INSTALL_DIR}/ProMAX/sys/EC/lib

if ["\${MACHTYPE}" = "linux"] ; then 32 bit install***********

```
$ECHO "Getting EC libraries from ${PM231911_32_INSTALL_DIR}/sys/lib and
syslibs"
#
```

cd \${INSTALL_DIR}/ProMAX/sys/EC/lib

```
${CP} ${PM231911_32_INSTALL_DIR}/sys/lib/libEMcarto.so .
${CP} ${PM231911_32_INSTALL_DIR}/sys/lib/libCDase.so .
${CP} ${PM231911_32_INSTALL_DIR}/sys/lib/libLGCbase.so .
${CP} ${PM231911_32_INSTALL_DIR}/sys/lib/libowdevkit.so .
${CP} ${PM231911_32_INSTALL_DIR}/sys/lib/syslibs/libstdc++.so.3.0.4 .
${LN} -s libstdc++.so.3.0.4 libstdc++.so.3
${CP} ${PM231911_32_INSTALL_DIR}/sys/lib/libwtc8.so .
${CP} ${PM231911_32_INSTALL_DIR}/sys/lib/syslibs/libXm.so.2 .
#${LN} -s libXm.so.2 libXm.so.2.1
```

fi

\$ECHO "Getting EC libraries from \${PM231911_64_INSTALL_DIR}/sys/lib/lib32 and \${OWHOME2312}/lib"

cd \${INSTALL_DIR}/ProMAX/sys/EC/lib

\${CP} \${PM231911_64_INSTALL_DIR}/sys/lib/lib32/libBMcarto.so .
\${CP} \${PM231911_64_INSTALL_DIR}/sys/lib/lib32/libLGCbase.so .
\${CP} \${PM231911_64_INSTALL_DIR}/sys/lib/lib32/libLGCbase.so .
\${CP} \${PM231911_64_INSTALL_DIR}/sys/lib/lib32/libowdevkit.so .
\${CP} \${PM231911_64_INSTALL_DIR}/sys/lib/lib32/libstdc++.so.3 .
\${CP} \${PM231911_64_INSTALL_DIR}/sys/lib/lib32/libwtc8.so .
\${CP} \${PM231911_64_INSTALL_DIR}/sys/lib/lib32/libwtc8.so .
\${CP} \${PM231911_64_INSTALL_DIR}/sys/lib/lib32/libwtc8.so .

fi

cd \${INSTALL_DIR}/ProMAX/sys/EC/lib

\${CP} \${OWHOME2312}/lib/libXm.so.2 .

fi

fi



Running ProMAX®, SeisSpace®, and ProMAX® DepthCharge Software

Starting the SeisSpace® software

Overview

This section discusses building startup scripts, starting the sitemanager, and starting the SeisSpace® software.

Below is a summary of the steps needed to start and run SeisSpace®:

- Build (or copy and edit) the startup scripts
- (Optionally) Start the sitemanager See details below
- Start the SeisSpace® Navigator
- Perform any shared administration functions, such as shared host lists, projects, and Queues

Note: SeisSpace® is dependent on ProMAX®. You must have a fully-functional ProMAX® installation prior to configuring SeisSpace®. This installation installs SeisSpace®, ProMAX® and ProMAX® DepthCharge in one step.

Starting the managers

One of the major changes for SeisSpace® R5000 relative to previous releases is that the use of a centralized sitemanager is now optional. The instructions below will still guide you through the steps to set up the sitemanager in the case where you would want to use it. You would still want to use the centralized sitemanager if you are working in a multi-user environment and you want the users to have access to each others job status information and have all of the jobs for all of the users managed in one central location. You would also want to run an external (centralized) sitemanager if you want to submit a series of chained jobs and then need to kill the navigator, but you want the chained jobs to submit when their precursors flows have completed. If you run in a single user environment and are not concerned with the other users or

completed. If you run in a single user environment and are not concerned with the other users or not concerned about having chained jobs run from one Navigator session to another, then you are not required to run the sitemanager and you can just run the Navigator with an internal (embedded) sitemanager that only exists while the navigator is running.



Building startup scripts

To start the sitemanager, you must build the startup script *.../apps/bin/sitemgr* where you will add in some environment variables and then call the production start up scripts from the installation directory.

DO NOT COPY THE sitemanager SCRIPTS from your PROWESS_HOME/port/bin directories as a starting point. These are the production startup scripts that will probably change from release to release and with patches. Make new scripts as described below. You can easily make these new scripts by copying the examples provided in the \$PROWESS_HOME/etc directory. These scripts are called .../SeisSpace/etc/sitemgr, and .../SeisSpace/etc/SSclient or SSclient-InternalSm.

- Change directory to the *.../apps/bin* directory and copy the \$PROWESS_HOME/etc/ sitemgr, SSclient and SSclient-InternalSM scripts here. You will build the scripts in this directory.
- 2. The example *sitemgr* script in .../SeisSpace/etc is shown below:

Note: Lines beginning with "#change#" indicate variables whose value you will need to supply. Lines beginning with "#default#" indicate variables that have a default value that you may want to change. Lines beginning with "#optional#" are optional and do not have a default value.

#!/bin/bash

This script sets up some environment variables, then calls the # system sitemanager script to start and stop a sitemanager for # SeisSpace. There is usually only one sitemanager. Multiple # clients can connect to this sitemanager. # Usage: sitemgr [start|stop|restart] [purge -age value] # Job status information is stored in perpetual files so that when a sitemanager # is restarted it will show the jobs that were submitted before. # The list of jobs can become quite long. If you want to you can recycle (restart) the # sitemanager use the purge option to delete any completed jobs older than # "value" days hours or minutes using the 100d 100h or 100m syntax as an example. # Lines beginning with "export" indicate variables whose value you'll # need to supply. Lines beginning with "#default#" indicate variables # that have a default value that you may want to change. Lines beginning # with "#optional#" are optional and do not have a default value. #______

export PROWESS_HOME=/a/b/c/apps/r5000-64bit/SeisSpace

```
# Specify where SeisSpace was installed.
**********
export PROMAX_HOME=/a/b/c/apps/r5000-64bit/ProMAX
# Specify where ProMAX was installed.
*****
#default# export PROWESS PORT=5006
# You can run multiple sitemanagers by using different port numbers.
# Use higher numbered ports to avoid conflicts eq. you can run
# SeisSpace R5000.0 on port 5000.
****
#default# export PROWESS LOGDIR=$PROWESS HOME/../logs
# Specify the path to the logs directory. This is where you'll find
# log files as well as the netdir.xml file for the sitemanager.
***********
#optional# export PROWESS_ETC_HOME=$PROWESS_HOME/../SSetc
# Specify the path to the SeisSpace etc directory.
# If you moved the etc dir from PROWESS_HOME/etc
****
# SM XMX (Maximum Java Heap Size)
# The default value for the SiteManager is 1024m but
# can be modified with the export below.
#export SM XMX=4096m
****
# Execute the system sitemanager script. Do not change this line!
$PROWESS HOME/port/bin/sitemanager $@
```

3. The **SSclient** script in .../SeisSpaceClient/etc is shown below:

Note: Lines beginning with "#change#" indicate variables whose value you will need to supply. Lines beginning with "#default#" indicate variables that have a default value that you may want to change. Lines beginning with "#optional#" are optional and do not have a default value.

#!/bin/bash

```
\# THIS SCRIPT IS FOR WHEN RUNNING WITH AN EXTERNAL/CENTRALIZED SITEMANAGER export SM_STATE=EXTERNAL
```

```
# This script sets up some environment variables, then calls the
# system client script to start the SeisSpace client. The client
# connects to a sitemanager.
```

Usage: SSclient [-o product ID] # Lines beginning with "export" indicate variables whose value you'll # need to supply. Lines beginning with "#default#" indicate variables # that have a default value that you may want to change. Lines beginning # with "#optional#" are optional and do not have a default value. #______ export PROWESS_HOME=/panfs/pan1/data/apps/r5000-64bit/SeisSpace # Specify where SeisSpace was installed. This should # should already be set to the installation directory you specifed to # the CD installer. This variable is used internally by this script to # determine the location of the system SeisClient.sh script. ****** export PROMAX_HOME=/panfs/pan1/data/apps/r5000-64bit/ProMAX # Because the client accesses ProMAX data, it needs to know where to # find the associated ProMAX installation. The ProMAX and SeisSpace # versions need to be compatible. ****** export PROWESS HOST=<hostname> export PROWESS PORT=5006 # When working with centralized sitemanager that is running as root # it is the combination of PROWESS_HOST and PROWESS_PORT that tells the navigator # which centralized sitemanager to connect to. The port is defined in the sitemgr # script. When you are connecting to a centralized sitemanager you need to set # PROWESS_HOST and PROWESS_PORT to match the host and port where the sitemanager # is running ****** #export PROWESS_ETC_HOME=\$PROWESS_HOME/etc # You can change where the navigator looks for: # site-wide submit parameter files (etc/SeisSpace/*.submitXML) # menu parameter defaulting flow files (etc/defaultdatahom/defaultarea/ defaultline/*) # properties files (e.g. etc/prowess.properties) new table types (etc/flowbuilder/TableTypes.txt) # # This can be multi-pathed. The navigator will always add # \$PROWESS_HOME/etc to the end of this path. The properties files # under your PROWESS_ETC_HOME do not need to be complete copies of # the originals under \$PROWESS_HOME/etc; they need only contain # changes that differ from the originals. Although it is also possible to

redefine the basic list of SeisSpace processes (etc/flowbuilder/PROWESS.xml)
this is not recommended because you will fail to receive any updates to this
list from future installations of SeisSpace.

The default is \$PROWESS_HOME/etc.

The directory that contains the SeisSpace preferences file .seisspace
and the archive_state.xml file

The system default is \$HOME/SeisSpace. This variable allows you to # use different .seisspace files for different versions

of SeisSpace. You will find that the .seisspace file for 2003.19.1.1
and r5000 are different and incompatible.

You may put the user preference file in a centralized location # by setting this to \$PROWESS_HOME/../userprefs/`whoami`/SeisSpace for example.

Specify the full path to the license file that serves ProMAX UI license # features. The client checks out ProMAX UI license features.

The SS_0_DIRECT variable controls whether or not DIRECT_IO is used # when reading and writing JavaSeis datasets. If stripes are showing # up in the foldmap for a JavaSeis dataset that was written on multiple # nodes or if there are parts of the dataset missing then set SS_0_DIRECT # to 'true'. If writing to a JavaSeis dataset fails immediately with # an error about not being able to write then set SS_0_DIRECT=false.

ProMAGIC uses this variable, if it is set, to automatically populate
its menus.

Specify where OpenWorks is installed. Or use it to
change where the SeisWorks bridges (eg. SeisWorks input) look for
configuration files.

Specify a default path to write Archive files from the Archive Wizard

the default is PROMAX_HOME/archive which does not exist so you should # change this to some directory set aside specifically for writing # archive files to disk ****** #optional# export PROWESS_DDF=\$OWHOME/conf/dir.dat #optional# export OW_DDF=\$OWHOME/conf/dir.dat #default# export OW PMPATH=\$OWHOME/conf # Specify the location of the JavaSeis secondary storage dir.dat file # By default, this will be discovered from these environment variables in this # order of precedence: \$PROWESS_DDF \$OW_DDF OW_PMPATH/dir.dat \$OWHOME/conf/ dir.dat # The SeisSpace navigator will optionaly search for a file in the data_home directory # defined by the environment variable: #optional# JAVASEIS DOT SECONDARY OVERRIDE=.secondary test # This is a method where an administrator can change the secondary storage # specification for a DATA_HOME for testing to do things like test new disk partitions # before putting them into production without affecting the users. ****** #optional# export PROMAX TOPCAT HOME=<tape catalog location> # Set this if you plan to access data from a tape catalog set. # Also use "ProMAX Data Home->Properties" to specify this # environment variable to a tape job during runtime. ****** #optional# export PBS BIN=/usr/local/bin # Set the location of the PBS binaries (eq qsub) if they are NOT in # the default location of /usr/local/bin. ****** #optional# export LGC_JAVA_XMX=256m # Set the memory allocation for the navigator. 256 meg is the default if not # specified. You may need to increase this value if you submit jobs with a # lot of processes in them or if you try to do fold maps on large 3D framework # JavaSeis datasets. Typical values you could use would be 512m or 1024m ****** # export ACRO INSTALL DIR=/a/b/c/adobe/bin # set the installation directory for Acrobat if you have it installed # and want to use it as the pdf viewer for help files ******

The alternative Client start up script for running with the Internal sitemanager is shown below. The difference is in the setting of the PROWESS_PORT variable. In this script the port value is automatically set based on a random number method to minimize the change that multiple users from getting the same port for their individual internal sitemanagers. #!/bin/bash

THIS SCRIPT IS FOR WHEN RUNNING WITH AN INTERNAL SITEMANAGER export SM_STATE=INTERNAL

This script sets up some environment variables, then calls the # system client script to start the SeisSpace client. The client # connects to a sitemanager.

Usage: SSclient-InternalSM [-o product ID]

export PROWESS_HOME=/panfs/pan1/data/apps/r5000-64bit/SeisSpace

Specify where SeisSpace was installed. This should # should already be set to the installation directory you specifed to # the CD installer. This variable is used internally by this script to # determine the location of the system SeisClient.sh script.

Because the client accesses ProMAX data, it needs to know where to # find the associated ProMAX installation. The ProMAX and SeisSpace # versions need to be compatible.

```
******
export PROWESS HOST='hostname'
# set this to localhost if you want to run with an embedded sitemanager
# i.e. there is no centralized sitemanager running as root anywhere
# and use the `whoami` extension to the log directory path for the user
# specific netdir files and logs.
## Generate a random PROWESS_PORT
****
## This will make it is unlikely that there will be a collision between this
## test run and another instance of SeisSpace also running on this machine.
myrand=$RANDOM
                    ## start with a random number between 0 and 32767
if [ "$myrand" = "" ] ; then
 myrand=`date +%S`
                   ## or a random number between 0 and 59
fi
myrand='expr $myrand % 100' ## get last two digits
PROWESS_PORT='expr 28000 + $myrand' ## get a port number in the 28000s
export PROWESS PORT
******
export PROWESS_LOGDIR=$PROWESS_HOME/../logs/`whoami`
# When running in a single user environment where there is no
# centralized sitemanager you will need to specify the path to a logs
directory.
# for the embedded sitemanager in each navigator.
# Landmark recommends that you add `whoami` to a consistent path as
# a way of separating the files for individual users.
******
#export PROWESS ETC HOME=$PROWESS HOME/etc
# You can change where the navigator looks for:
#
   site-wide submit parameter files (etc/SeisSpace/*.submitXML)
#
   menu parameter defaulting flow files (etc/defaultdatahom/defaultarea/
defaultline/*)
    properties files (e.g. etc/prowess.properties)
#
#
    new table types (etc/flowbuilder/TableTypes.txt)
# This can be multi-pathed. The navigator will always add
# $PROWESS_HOME/etc to the end of this path. The properties files
# under your PROWESS_ETC_HOME do not need to be complete copies of
# the originals under $PROWESS_HOME/etc; they need only contain
# changes that differ from the originals. Although it is also possible to
# redefine the basic list of SeisSpace processes (etc/flowbuilder/PROWESS.xml)
# this is not recommended because you will fail to receive any updates to this
# list from future installations of SeisSpace.
# The default is $PROWESS_HOME/etc.
```


The directory that contains the SeisSpace preferences file .seisspace. # This defaults to \$HOME/SeisSpace. This variable allows older versions # of SeisSpace to access their own .seisspace files for compatibility. # You may put the user preference file in a centralized location # by setting this to \$PROWESS_HOME/../userprefs/`whoami` for example.

Specify the full path to the license file that serves ProMAX UI license # features. The client checks out ProMAX UI license features.

The SS_O_DIRECT variable controls whether or not DIRECT_IO is used # when reading and writing JavaSeis datasets. If stripes are showing # up in the foldmap for a JavaSeis dataset that was written on multiple # nodes or if there are parts of the dataset missing then set SS_O_DIRECT # to 'true'. If writing to a JavaSeis dataset fails immediately with # an error about not being able to write then set SS_O_DIRECT=false.

ProMAGIC uses this variable, if it is set, to automatically populate
its menus.

Rpecify where OpenWorks is installed. Or use it to # change where the SeisWorks bridges (eg. SeisWorks input) look for # configuration files.

Specify a default path to write Archive files from the Archive Wizard # the default is PROMAX_HOME/archive which does not exist so you should # change this to some directory set aside specifically for writing # archive files to disk

Specify the location of the JavaSeis secondary storage dir.dat file

By default, this will be discovered from these environment variables in this # order of precedence: \$PROWESS_DDF \$OW_DDF OW_PMPATH/dir.dat \$OWHOME/conf/ dir.dat

#optional# JAVASEIS_DOT_SECONDARY_OVERRIDE=.secondary_test
This is a method where an administrator can change the secondary storage
specification for a DATA_HOME for testing to do things like test new disk
partitions

before putting them into production without affecting the users.

Set this if you plan to access data from a tape catalog set. # Also use "ProMAX Data Home->Properties" to specify this # environment variable to a tape job during runtime.

Set the location of the PBS binaries (eg qsub) if they are NOT in # the default location of /usr/local/bin.

Set the memory allocation for the navigator. 256 meg is the default if not # specified. You may need to increase this value if you submit jobs with a # lot of processes in them or if you try to do fold maps on large 3D framework # JavaSeis datasets. Typical values you could use would be 512m or 1024m

export ACRO_INSTALL_DIR=/a/b/c/adobe/bin

set the installation directory for Acrobat if you have it installed # and want to use it as the pdf viewer for help files

```
# export SEISSPACE_TRACE_DISPLAY_COLOR_PALETTE=Greyscale
# export SEISSPACE_TRACE_DISPLAY_COLOR_PALETTE=RedWhiteBlue
# export SEISSPACE_TRACE_DISPLAY_COLOR_PALETTE=2_BlueWhiteBrown
# export SEISSPACE_TRACE_DISPLAY_COLOR_PALETTE=BlackWhiteRed
# export SEISSPACE_TRACE_DISPLAY_COLOR_PALETTE=SEGPolar
# export SEISSPACE_TRACE_DISPLAY_COLOR_PALETTE=0_Spectrum
```

```
# Set one of these if you do not want the SeisSpace Trace Display
# tool to default to wiggle trace but rather prefer to use a
# variable density scheme. Names are case sensitive. Additional
# valid names can be obtained from the application itself --
# the color palette editor shows the names.
```

4. Add execute permission to these two files.

Note: The sitemanager script takes an input argument. This argument is passed to the main \$PROWESS_HOME/port/bin/sitemanager script. The argument can be **start**, **stop**, or **restart**.

Starting the sitemanager

If you plan to run in a multiple user environment then the sitemanager must be run as root. An individual user can run a separate sitemanager as that user on a different port than the root sitemanager and point to a different netdir.xml and logs directory. Start the sitemanager with the sitemgr script:

..../apps/bin/sitemgr start

Text similar to the following appears in the window:

```
[1] 380
--- Starting Sitemanager with:
PROWESS_HOST=hostname
PROWESS_PORT=port_number
PROWESS_HOME=/apps/SeisSpace
--- Sitemanager started with PGID 98765.
saved PGID to /apps/logs/sitemanager_root_hostname_port.pgid
output logged to /apps/logs/sitemanager_root_hostname_port.log
PROMAX_HOME=/apps/r5000-64bit/ProMAX
PROWESS_PORT=port
PROWESS_LOGDIR=/apps/r5000-64bit/logs
PROWESS_HOME=/apps/r5000-64bit/SeisSpace
```

Starting the SeisSpace® Navigator

5. As a non-root, administrative user, start the client by executing the SSclient script.

.../apps/bin/SSclient

The client should come up initially with an "empty" screen.

🌐 🧮 Navigator on h1:5122 user1	• • ×
<u>F</u> ile <u>E</u> dit <u>H</u> elp	
8	
Address	
Folders 😫 🗙	
N	Notification:

At this point you can continue the SeisSpace® configuration process by following the steps in the ProMAX® and SeisSpace® System Administration documentation which are available from the menu pulldown **Help>Contents and Index** in the SeisSpace® navigator. When the Help appears, select **SeisSpace® System Administration>Configuring SeisSpace** in the help system navigation pane.

Launching SeisSpace® from the OpenWorks™ Launcher

You can launch SeisSpace® from the Open Works launcher by following these steps:

1. Check your launcher.dat file in your user home directory. Under Applications, it should look like the following:

"SeisSpace/ProMAX 2D" run/SeisSpace.err 1>&2 &	"/apps/bin/SSclient -o 2D 2> \$HOME/
"SeisSpace/ProMAX 3D" run/SeisSpace.err 1>&2 &	"/apps/bin/SSclient -o 3D 2> \$HOME/
"SeisSpace/ProMAX 4D" run/SeisSpace.err 1>&2 &	"/apps/bin/SSclient -o 4D 2> \$HOME/
"SeisSpace/ProMAX DepthC \$HOME/run/SeisSpace.err	rge" "/apps/bin/SSclient -o DC 2> &2 &"
"SeisSpace/ProMAX VSP" \$HOME/run/SeisSpace.err	"/apps/bin/SSclient -o VSP 2> &2 &"



SSclient accesses the../port/bin/seisclient script. However, you can enter the path to a personal script. Make sure that the script points to the correct library paths.

2. Start OpenWorks[™] and Select Applications ->SeisSpace/ProMAX.....

Enhancements and New Functionality

New SeisSpace® Processes in 5000.8.0.0

The following list of SeisSpace® processes are new:

- Data Input/Output
 - •Generate Dataset reports*
 - •Build Dataset Archive Inventory*
 - •Foreign Dataset Input (dev)
- Geometry/Headers
 - .
- Trace/Header Utilities
 Offset Vector Tile Assignment
 Edge Padder (dev)
- Distributed Array Tools
 Transpose v2
 General 3D Transpose Macro
 General 4D Transpose Macro
 Header Replace v2 (dev)
- Distributed Array Utilities
- Editing/Muting/Noise
 - ٠
- Amplitude/AVO
- Deconvolution
- Multiples/Noise Removal
 •3D Regularizer
- Filtering/Transforms
 - •
- Velocity
- Statics
- Statics
- Stacking/Frames/Ensembles
 - •
- Migration
 - •
- Display
- Flow Control

- •Shell Commands*
- Miscellaneous
- QC Tools
 - •
- Reservoir Inference Group Tools
- CPS Tools
- Developers Examples

New ProMAX® Processes in 5000.8.0.0

The following list of ProMAX® processes are new in R5000.8.0.0 relateive to R5000.0.3.3

NONE

SeisSpace® Processes Promoted to Production status in 5000.8.0.0

The following list of SeisSpace® processes were promoted from Development status to Production status between R5000.0.3.3 and R5000.8.0.0

- Data Input/Output
- Geometry/Headers
- Trace/Header Utilities
- V2 Distributed Array Tools
- Distributed Array Utilities
- Editing/Muting/Noise
- Amplitude/AVO
 - •
- Deconvolution
- Multiples/Noise Removal
 Super Shot Formation
- Filtering/Transforms
 - •
- Velocity

•

- Statics
 - •
- Stacking/Frames/Ensembles
 - •
- Migration
- Display
 - •
- Flow Control
 - •
- Miscellaneous
- QC Tools
- Reservoir Inference Group Tools
- CPS Tools
- Developers Examples

SeisSpace® Processes Demoted to Development from Production status in 5000.8.0.0

The following list of SeisSpace® processes were demoted from Production to Development status between R5000.0.3.3 and R5000.8.0.0

- Data Input/Output
- Geometry/Headers
- Trace/Header Utilities
- Distributed Array Tools
 •3D FFT
- Distributed Array Utilities
- •
- Editing/Muting/Noise
- Amplitude/AVO
 - •
- Deconvolution
- Multiples/Noise Removal
 - •
- Filtering/Transforms

- ٠
- Velocity
- Statics
 - •
- Stacking/Frames/Ensembles
- - Migration
- Display
 - ٠
- Flow Control
- Miscellaneous
 - ٠
- QC Tools
- Reservoir Inference Group Tools
- CPS Tools
- Developers Examples

SeisSpace® Processes Demoted to Obsolete status in 5000.8.0.0

The following list of SeisSpace® processes were demoted to Obsolete status between R5000.0.3.3 and R5000.8.0.0

- Data Input/Output
 - •SEG-Y Input •SEG-Y Output
 - •SegY Header Mapper*
- Geometry/Headers
 - •Header Math
 - •Trace Math
 - •Trace-Trace Math
- Trace/Header Utilities
 - •

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- Distributed Array Tools
 - •Transpose132-v2
 - •Time Slice Transpose (T321) -v2
- Distributed Array Utilities
- Editing/Muting/Noise

- •Add Noise
- •Trace Kill/Reverse
- Amplitude/AVO
 - •Automatic Gain Control
 - •True Amplitude Recovery
 - •Trace Equalization
 - •Time-Variant Scaling
 - •Q Compensation
 - •AVO Angle Mute
 - •AVO Angles of Incidence
 - •AVO Angle Gather
 - •AVO Attribute Stacks
 - •AVO Attribute Computations
- Deconvolution
 - •Spiking/Predictive Decon
 - •Designature
 - •Tau-P Demult Macro
- Multiples/Noise Removal
 - •Super Shot Assignment
 - Filtering/Transforms
 - •F-K Filter
 - •Radon Filter Macro
 - •F-X Decon
- Velocity

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- Normal Moveout Correction
- Statics
- Stacking/Frames/Ensembles
 - •
 - Migration
- Display
 - •Trace Display Label
 - Flow Control
 - •Split
 - •End Split
 - •Join
 - •Reproduce Traces
 - •lf
 - •Else If
 - •Else
 - •End If
- Miscellaneous

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QC Tools

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- Reservoir Inference Group Tools
- CPS Tools
- Developers Examples

SeisSpace® Processes Deleted in 5000.8.0.0

- Data Input/Output
- Geometry/Headers
- Trace/Header Utilities
- Distributed Array Tools
 •All original (Version 1) Distributed array tools
- Distributed Array Utilities
- Editing/Muting/Noise
- Amplitude/AVO
 •Ensemble Scale
- Deconvolution
 - ٠
- Multiples/Noise Removal
- Filtering/Transforms
- Velocity
 - veioc
- Statics

•

- Stacking/Frames/Ensembles
 - •
 - Migration
- Display
 - •3D Viewer Cache*
- Flow Control
- Miscellaneous
 - •
- QC Tools
- Reservoir Inference Group Tools

- CPS Tools
- Developers Examples

ProMAX® Processes Deleted in 5000.8.0.0

- Velocity

 Interactive Velocity Analysis*
- •

R5000.8.0.0 Development Status Processes

There are many processes in the SeisSpace® processes list that are in "development status" These processes can fall into a couple of different categories in this status for different reasons. Some processes will probably be adequate for general use, others are much less refined. You are welcome to try any of these tools except those listed below which are not recommended for use. NOTE: the dev status tools are not supported for use in production workflows. In many cases there is not documentation. Tools in this status mean that they either have known issues or they have not been adequately exercised and deemed production worthy by Landmark.

In cases where there are duplicate SeisSpace tools and ProMAX tools. AGC for example. Landmark generally recommends using the original ProMAX tool.

Hidden

There are some additional development status processes that are in comment blocks in the etc/flowbuilder/PROWESS.xml file. There will be no support for these processes at all and we would prefer that they not be used unless you are specifically instructed to do so.

Major Infrastructure Changes R5000.8.0.0

SeisSpace® R5000.8.0.0 software version

The upgrades include:

- Remove ProMAX UI
- Removed ProMANAGER
- Intel Compilers run time libraries in ProMAX tree

• Sitemanager redundancy and lockup prevention

ProMAX® R5000.8.0.0 software version

The upgrades include:

• Intel Compilers - run time libraries in ProMAX tree

ProMAX® DepthCharge R5000.8.0.0 software version

The upgrades include:

• Intel Compilers - run time libraries in ProMAX tree

Fixed Issues

SeisSpace/ ProMAX® R5000.8.0.0 software version

869397 Promax 5000.3.0.0 will not launch against a DEMO license due to missing SERVER line. Admin

871205 Problem: tape requests not showing PBS queue id anymore Admin Tape Device

868628 Updated to qsh for the node name list broke Chevron Houston because they use menu parms and not the gui parms Administration

782521 notify navigator if sitemanager goes down Administration Sitemanager

871337 add -user option to purge for sitemanager Administration Sitemanager

839201 Re:"Attenuation of Footprint" (See Notes) Data Enhancement 3D Vel-Az-Freq Filter

867045 Requested upgrade to F-XY Decon V2 to output noise rather than signal for subsequent adaptive subtraction. Data Enhancement F-XY Decon

845725 Archive Wizard will not find promax data if it has been moved to match the new config_file Data Input/Output Archive

855337 UPGRADE: include an option to archive dataset names without archiving the data Data Input/Output Archive

876620 Archive Wizard does not archive everything Data Input/Output Archive

870091 should fail init phase if DCE menu has any Unknown (unselected name) Data Input/Output Data Context Editor

866911 JavaSeis Data Input Arbitrary subset framework is not automatically compacting in JavaSeis Data Output Data Input/Output JavaSeis Data Output

869305 jdo uses file systems less than min global when allocating extents Data Input/ Output JavaSeis Data Output

868303 Product SeisSpace: Percent complete in job viewer Data Input/Output JavaSeis Synthetic Trace Generation

871344 support option to not add any amps to the synthetic. Data Input/Output JavaSeis Synthetic Trace Generation

871348 offset vs seqno as trace axis Data Input/Output JavaSeis Synthetic Trace Generation

868518 "Uom" (units of measurement) showing feet when it should be meters Data Input/Output OpenWorks Horizon to Table

807887 Problem: nothing restored from remote R5000 protar restore Data Input/ Output Restore

877766 SeisSpace "SeisWorks 3D Dataset Write" output doesn't follow default naming convention Data Input/Output SeisWorks 3D Dataset Write

863873 Ensemble Decon putting artifacts into the data at the lag time. Deconvolution Ensemble Decon

823206 Similiar icons for the functionalities 'Look' and 'Seimic Compare'. Display

853764 In the Header Graph Configuration up down arrow auto selects atts to headerdont want that - makes a mess Display

854683 Seismic Compare does not apply preprocessing if initial frame is empty Display

867335 SeismicCompare: NullPointerException when showing header plot for a dead ensemble Display

813429 In 3D viewer, the y-axis annotations and cursor tracking displaying the current location doesnot update after flipping the probe contents. Display 3D Viewer

855681 "process" button, the data gets processed but only the live traces in the frame are passed Display Seismic Compare

856364 What does the Axis Merge option do? Display Seismic Compare

857354 Seismic Compare problem with annotation when switching plot direction Display Seismic Compare

865627 add amp spectra as an option to power spectra in SComp Display Seismic Compare

871698 new sync feature - want to view same frame from multple volumes in the same dataset Display Seismic Compare

877829 Header read out does not change when switching the orientation (L-R, R-L)

in Seismic Compare Display Seismic Compare

878306 Header read out does not change when switching the orientation (L-R, R-L) in Seismic Compare Display Seismic Compare

306706 header icon crashes Trace Display using Disk data Insert and 1 dataset from SW Display Trace Display

860010 Want hot keys for the snap and pick options for fb picking Display Trace Display

866213 F-XY Decon V2 not giving correct results ie., introducing noise Distributed Array Tools F-XY Decon

866407 flow 08a from the 2D SRME tutorials outputs one less ensemble when run on an odd number of nodes. Distributed Array Tools Load Distributed Array

864047 Menu 3 of 5 original menu options missing Distributed Array Tools Spatial Mix

868434 IMS changes Physical Units on datasets from meters to feet. Flow Control Inline Merge Sort

869540 Inline Merge Sort - Problem in Template / Replica Jobs not honoring substitution parms but retaining original input values before templarization Flow Control Inline Merge Sort

876600 IMS outputs incorrect data/sortmap if run on two threads on a shared memory machine. Flow Control Inline Merge Sort

878394 IMS not setting ProMAX primary and secondary keys correctly in output context Flow Control Inline Merge Sort

847447 Incorrect CDP fold if the azimuth is between 270 and 360 degrees. Geometry / Headers 2D Marine Geometry Spreadsheet*

865850 Strmr Azimuth is computed incorrectly from Auto-Azimuth Geometry / Headers 2D Marine Geometry Spreadsheet*

868988 problems with 2D geometry - azimuth and cdp binning incorrect. Geometry / Headers 2D Marine Geometry Spreadsheet*

864067 Database Parameter Merge won't run in SeisSpace R5000.0.3 Geometry / Headers Database Parameter Merge*

853218 remove old Tierra processes from Third Party list Landmark Depth Imaging LDI

836588 KDMIG 2D migration from topography does not give the correct answer using synthetic data Migration KDMIG (Kirchhoff Depth MIGration)

869754 Doc bug: Traveltime calculation within anisotropic prestack mig. KTMIG is incorrect Migration KTMIG (Kirchhoff Time MIGration)

878977 Documentation: Add note that the 'Number of traces in the Radon domain' must be greater than the CDP fold. Multiples/Noise Removal Time Domain High-Resolution Radon Filter

851307 Upgrade: Enable use of directories for managing datasets within line Navigator

864903 Error window freezes navigator Navigator

867009 Archive Wizard Add clear option before selection of what to archive Navigator Archive Wizard

876676 upgrade - archive primary only Navigator Archive Wizard

876677 upgrade - ad batch dataset archive tool Navigator Archive Wizard

869917 jobs from one project inherit env vars from other projects - need to have all env vars in all projs Navigator Dataset Properties

857765 reset focus to Flow Editor of menu being edited Navigator Flow Editor Tab

860738 need "doubles" filter for header selector Navigator Flow Editor Tab

869714 make type in fields less sensitive to mouse position - make a preference for different behavior Navigator Flow Editor Tab

873704 ProMAX menus must force user to enter real or int within range limits Navigator Flow Editor Tab

877351 New preference behaviors for Flow editor not as expected Navigator Flow Editor Tab

840152 Promax comment can't be the first tool in a flow Navigator Flows Tab

845456 Grid geom wont work right on 3D frameworks Navigator Fold Map

869815 logviewer is slow for large log files Navigator Job Printout Viewer

855923 Don't allow JDI and Disk Data Insert to run in the same subflow together. Navigator Job Submission

824937 Restore Wizard Inventory Archive Menu confusing Navigator Restore Wizard

869379 Restore bombs if one secondary storage disk fills Navigator Restore Wizard

877367 Restore Wizard has lost functionality to maintain CIND tag so PMX DDI, DDO keep dataset names. Navigator Restore Wizard

867529 Upgrade: Seismic Compare Header Plot. Set display range to range of values contained in zoomed window. Navigator Seismic Compare

869816 Seismic Compare- overprinting headers at edges of tiles when zooming Navigator Seismic Compare

871053 Problem: preprocesing in SeisComp not working if the first volume is blank. Navigator Seismic Compare

871296 Sample tracking truncating digits Navigator Seismic Compare

853563 Parallel processing using Parallel Begin/End to a remote machine fails. Parallel Processing Parallel Begin

878039 Number of aux channels in the output binary header is a scrambled version of null instead of 0 SEG / 3rd Party I/O SEG-Y Output

856529 Trace Binning does not update the Header list - causes problems with header selection and Intelligent parameterization Stacking / Ensembles Trace Binning

861990 Problem: PartialImageOutput does not seem to work inside multiple IF loops Stacking/Frames/Ensembles

866371 SeisSpace: Deleting single frame of existing dataset Stacking/Frames/ Ensembles Frame Utilities

861611 Trace Selection with JavaSeis Trace/Header Utilities

873635 Header Math allows the user to enter an equation for sou_x but does not change the header value Trace/Header Utilities Header Math

873371 JS Sortmap Create fails with SocketTimeoutException: Read timed out Trace/Header Utilities JavaSeis Sortmap Create

848797 Velocity Transpose To Slices: re-run tool changing secondary storage from yes to no -- fails job Velocity

865162 3D Velocity Viewer/Editor creates the garbage output table name and leave the one you entered as a stub - same as the Velmanip problem a while ago Velocity



3D Velocity Viewer/Editor*

877058 confusion between amplitude and phase in paramterization Wavelet Processing / Inversion Derive Multiple Match Filters

ProMAX® DepthCharge R5000.8.0.0 software version

NONE



Known Issues

Known Issues for each processing tool are available from the Known Issues button at the bottom of each processing tool helpfile page.

Additional issues

There are a few issues that we want to let you know that we already know about. We did not feel that any of these issues were severe enough to prevent us from releasing, but you may encounter some of these as you work with the software. We are prioritizing how these issues will be addressed for a post release functional upgrade and future releases.

LGC_JAVA_XMX

There is an environment variable to the client startup called LGC_JAVA_XMX. You can set this to larger values to allow the Navigator to allocate and use more memory if required. The default value is "1024m" if you do not set it (the SSclient example script say 256m but with this line commented out the seisclient script uses a default of 1024m). You may want to set this up as high as about 3/4 of the available memory available on the node where you are running the Navigator. Other reasons why you may need to increase the memory allocation for the Navigator include:

- Large JavaSeis Dataset fold maps especially large 3D frameworks.
- Working in a mode where you select a lot of flows directly from the table for queued submission.without bringing the flows into the editor.
- Working with very large flows (i.e. flows with a lot of processes in them).

Contacting Support

Support information is always available on the Landmark Support internet page located at:

http://css.lgc.com/InfoCenter/index?page=home.

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Broader Understanding., Depth Team, Depth Team Explorer, Depth Team Express, Depth Team Extreme, Depth Team Interpreter, DepthTeam, DepthTeam Explorer, DepthTeam Express, DepthTeam Extreme, DepthTeam Interpreter, Design, Desktop Navigator, DESKTOP-PVT, DESKTOP-VIP, DEX, DIMS, Discovery, Discovery 3D, Discovery Asset, Discovery Framebuilder, Discovery PowerStation, DMS, Drillability Suite, Drilling Desktop, DrillModel, Drill-to-the-Earth-Model, Drillworks, Drillworks ConnectML, DSS, Dynamic Reservoir Management, Dynamic Surveillance System, EarthCube, EDM, EDM AutoSync, EDT, eLandmark, Engineer's Data Model, Engineer's Desktop, Engineer's Link, ESP, Event Similarity Prediction, ezFault, ezModel, ezSurface, ezTracker, ezTracker2D, FastTrack, Field Scenario Planner, FieldPlan, For Production, FZAP!, GeoAtlas, GeoDataLoad, GeoGraphix, GeoGraphix Exploration System, GeoLink, Geometric Kernel, GeoProbe, GeoProbe GF DataServer, GeoSmith, GES, GES97, GESXplorer, GMAplus, GMI Imager, Grid3D, GRIDGENR, H. Clean, Handheld Field Operator, HHFO, High Science Simplified, Horizon Generation, 12 Enterprise, iDIMS, Infrastructure, Iso Core, IsoMap, iWellFile, KnowledgeSource, Landmark (as a service), Landmark (as software), Landmark Decision Center, Landmark Logo and Design, Landscape, Large Model, Lattix, LeaseMap, LogEdit, LogM, LogPrep, Magic Earth, Make Great Decisions, MathPack, MDS Connect, MicroTopology, MIMIC, MIMIC+, Model Builder, Nexus (as a service), Nexus (as software), Nexus View, Object MP, OpenBooks, OpenJournal, OpenSGM, OpenVision, OpenWells, OpenWire, OpenWire Client, OpenWire Direct, OpenWire Server, OpenWorks, OpenWorks Development Kit, OpenWorks Production, OpenWorks Well File, PAL, Parallel-VIP, Parametric Modeling, PetroBank, PetroBank Explorer, PetroBank Master Data Store, PetroStor, PetroWorks, PetroWorks Asset, PetroWorks Pro, PetroWorks ULTRA, PlotView, Point Gridding Plus, Pointing Dispatcher, PostStack, PostStack ESP, PostStack Family, Power Interpretation, PowerCalculator, PowerExplorer, PowerExplorer Connect, PowerGrid, PowerHub, PowerModel, PowerView, PrecisionTarget, PressWorks, PRIZM, Production, Production Asset Manager, PROFILE, Project Administrator, ProMAGIC, ProMAGIC Connect, ProMAGIC Server, ProMAX, ProMAX 2D, ProMax 3D, ProMAX 3DPSDM, ProMAX 4D, ProMAX Family, ProMAX MVA, ProMAX VSP, pSTAx, Query Builder, Quick, QUICKDIF, Quickwell, Quickwell+, Quiklog, QUIKRAY, QUIKSHOT, QUIKVSP, RAVE, RAYMAP+, Real Freedom, Real Time Asset Management Center, Real Time Decision Center, Real Time Operations Center, Real Time Production Surveillance, Real-Time Surveillance, Realtime View, Reference Data Manager, Reservoir, Reservoir Framework Builder, RESev, ResMan, RTOC, SCAN, SeisCube, SeisMan, SeisModel, SeisSpace, SeisVision, SeisWorks, SeisWorks 2D, SeisWorks 3D, SeisWorks PowerCalculator, SeisWorks PowerJournal, SeisWorks PowerSection, SeisWorks PowerView, SeisXchange, Semblance Computation and Analysis, Sierra Family, SigmaView, SimConnect, SimConvert, SimDataStudio, SimResults, SimResults+3D, SIVA+, SLAM, SmartFlow, smartSECTION, Spatializer, SpecDecomp, StrataAmp, StrataMap, StrataModel, StrataSim, StratWorks, StratWorks 3D, StreamCalc, StressCheck, STRUCT, Structure Cube, Surf & Connect, SynTool, System Start for Servers, SystemStart, SystemStart for Clients, SystemStart for Servers, SystemStart for Storage, Tanks & Tubes, TDO, Team Workspace, TERAS, T-Grid, The Engineer's DeskTop, Total Drilling Performance, TOW/cs, TOW/cs Revenue Interface, TracPlanner, TracPlanner Xpress, Trend Form Gridding, Trimmed Grid, Turbo Synthetics, VESPA, VESPA+, VIP, VIP-COMP, VIP-CORE, VIPDataStudio, VIP-DUAL, VIP-ENCORE, VIP-EXECUTIVE, VIP-Local Grid Refinement, VIP-THERM, WavX, Web Editor, Well Cost, Well H. 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