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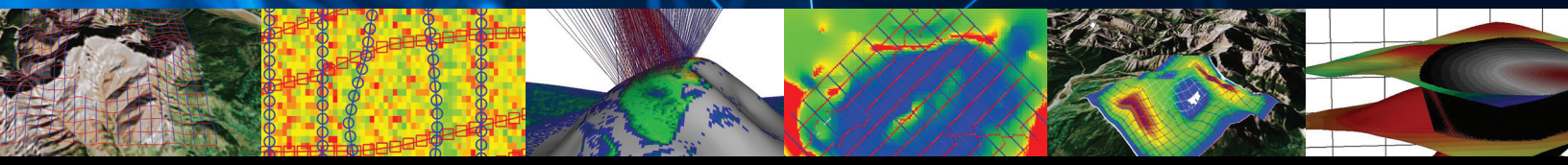


OMNI 3D

Seismic survey design software

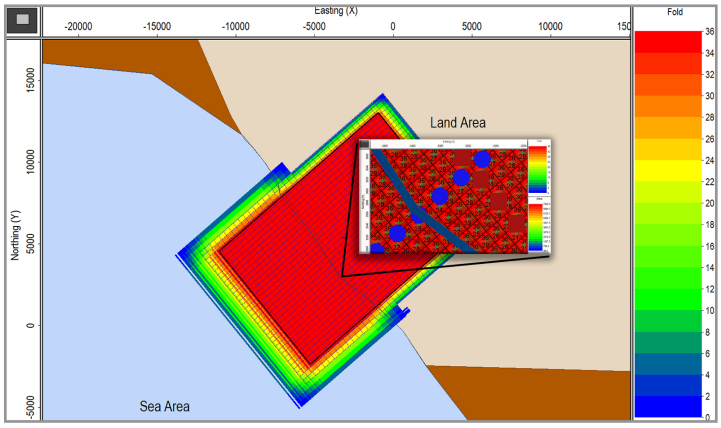
VERSION 2017

OMNI 3D

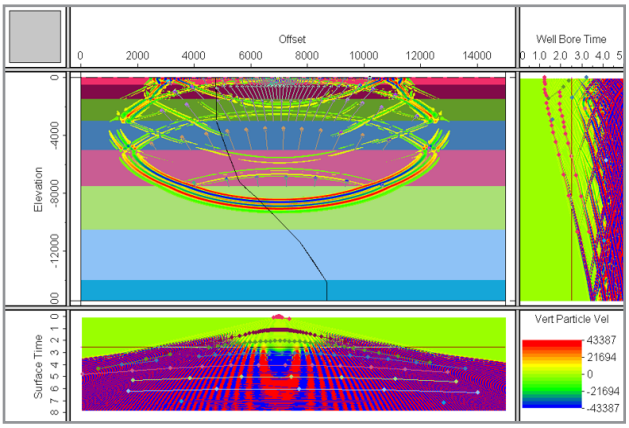
Seismic survey design software

Robust survey design and analysis software

OMNI 3D* seismic survey design software is the industry standard for seismic survey acquisition design, modeling, and analysis. OMNI 3D software delivers fully optimized designs for land, marine, transition zone, vertical seismic profile (VSP), and multicomponent surveys. Unleash the power of its advanced analysis modules to investigate potential geometry issues, resolution, or migration effects. Sophisticated tools, an easy-to-use interface, and versatile multiproject handling make OMNI 3D software the choice for geoscientists involved in survey planning, design, QC, and modeling worldwide.



Transition zone survey.



Finite-difference elastic wave equation 2D ray model.

Multiple applications

OMNI 3D software handles unlimited multisurvey project types with an intuitive project tree for easy management

- Land
- Marine
- Ocean-bottom cable (OBC)
- Transition zones
- VSP

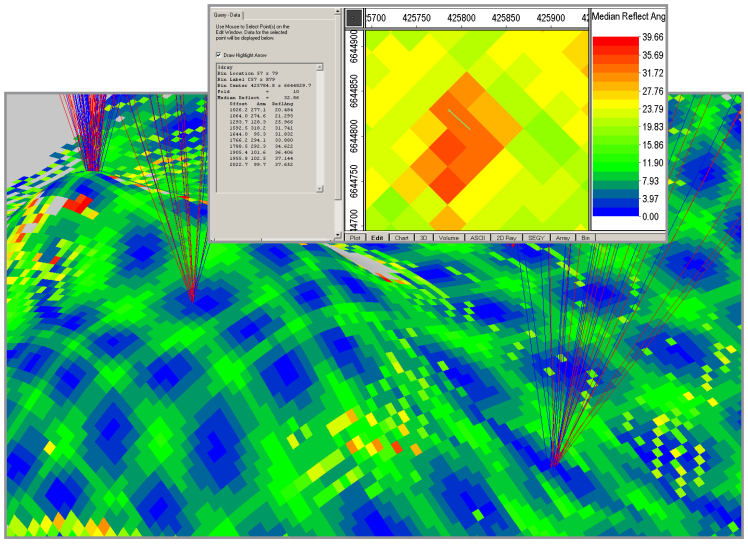
Compatible with land and marine projects.

Daily updates between design and acquisition teams.

Packages

OMNI 3D software is available in two packages to meet your project requirements

Component	OMNI 3D Layout	OMNI 3D Workshop
Land, marine streamer (including circular acquisition), OBC, and VSP	X	X
Survey layout and geometry	X	X
Scripts	X	X
Bin analysis and statistics	X	X
Design comparison	X	X
Target parameter analysis	X	X
2D ray models and ray tracing	X	X
Array response for sources and receivers	X	X
Status of acquisition progress	X	X
Theoretical, preplot, and postplot comparison	X	X
Plot montage	X	X
Footprint analysis		X
Target illumination		X
Depth cube		X
3D ray models and ray tracing with anisotropy		X
Synthetic SEG-Y volumes		X
5D interpretation, prestack time migration (PSTM), stack array, and velocity uncertainty		X
Fresnel zone binning		X
3D grid modeling		X



Reflection angle maps and QC tools for all 3D ray tracing algorithms.

Continuous improvement

Consistent product development cycle

- Annual software release
- Regular product updates
- Customer-driven development

Easy-to-learn application

Worldwide software training program

- Public and private training courses available
- Technical and theory courses available

Desktop-and web-based user resources

- Tutorials
- Videos
- New product features manuals
- Case studies, technical reports, and industry articles
- Worldwide customer support from dedicated OMNI 3D software specialists

System requirements

Operating systems

- 64-bit Microsoft® Windows® operating systems (7, 8, 8.1, 10)

Minimum system requirements

- Standard off-the-shelf hardware
- Optimized for multicore hardware

Data compatibility

- All common file formats

Licensing options

Versatile licensing options for individual or shared usage

- Portable USB license key
- Networked USB license key

Flexible license purchase or rental plans

- Flexible purchase options and annual maintenance
- Annual lease
- Short-term rental
- University donation available

OMNI 3D software advantage

Benefits

User-orientated design

- Get enhanced usability with easy-to-learn functionality and icon-drive interface

Data loading and data export

- Import field data from industry standard formats (SPS, INOVA Hawk®, SEG-P1, P1/90, and P1/11)
- Export designs for the field in industry standard formats

QC Tools

- Create summary reports of design parameters and survey statistics
- Generate 2D charts displaying statistical information about the design (rose diagrams, trace count, azimuth distribution, offset distribution, *Kx-Ky* plots, etc.)
- Compare surveys and their analyses using map boxes in plot view
- Overlay bin information on individual bins within the survey
- Toggle between survey or status files within bin view
- Compare statistical differences between designs
- Visualize effect of your design with interactive modules
- Create offset vector tiles (OVTs) and compare continuity between them to prevent artifacts from entering the data during processing
- Compare all OVTs as planes within a status file

Multiproject handling

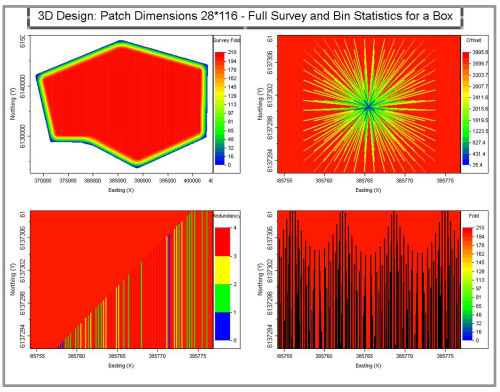
- Create multiple surveys or versions of the same survey within the same project for easy comparison and QC

Full suite of editing tools

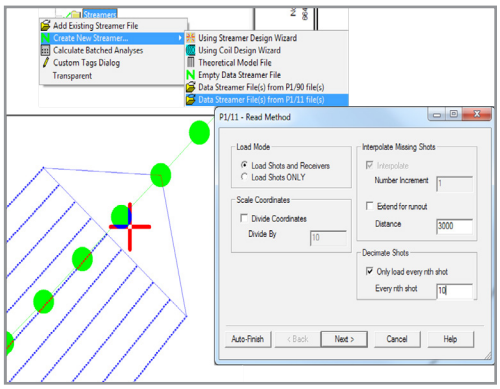
- Edit one or more station positions easily using editing tools and wizards
- Edit shot and receiver stations separately or concurrently
- Undo your changes within the wizards
- Create and update attributes
- Color-code stations based on attributes
- Import shapefiles into polyline and polygon wizards

Imagery and elevation data

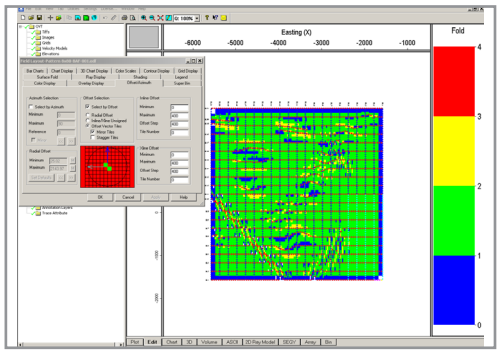
- Acquire aerial images and elevations with free download from Microsoft Bing® Maps or from private web map service
- Set station elevations from a variety of sources



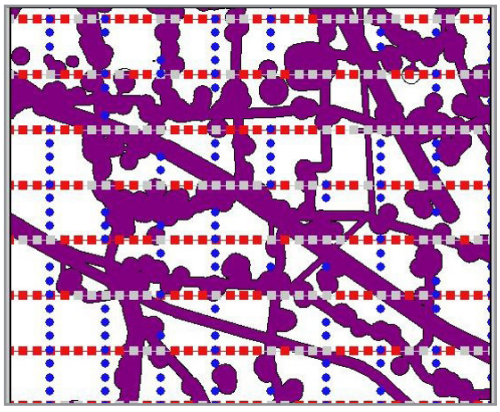
Daily comparisons using the plot-view map.



Data import from P1/11.



OVT gather combined with its reciprocal.



Full suite of editing tools.

OMNI 3D Layout

Essential tools for acquisition, design, editing, and monitoring

Design tools

- Use wizards to design land, VSP, streamer, OBC, and ocean-bottom node (OBN) survey geometries
- Design complex geometries using the complex tile, pattern tool, or empty survey
- Create scripts using simple or complex shooting schemes
- Edit surveys using advanced editing tools
- Analyze and compare multiple survey geometries
- Import and export data in all common formats
- Integrate TIFF, shapefile, and other culture data in multilayered projects
- Apply culture data properties to make survey edits
- Output complex scaled plots, including user-defined labels and annotation to any Windows printer

Target module

- Create 3D target horizon models using imported horizon data
- Calculate survey design parameters, such as bin size, maximum offset, and migration aperture required to illuminate the target horizon

Status module

- Monitor daily seismic acquisition progress
- Detect coverage gaps with real-time binning

Array module

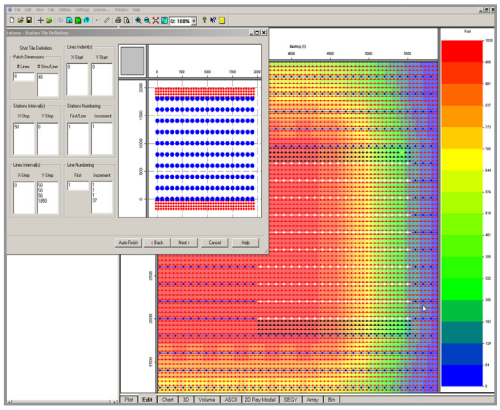
- Examine the horizontal and vertical effects of 1D or 2D geophone, shot, and stack arrays
- Calculate intra-array statics
- Analyze stack array effect on 3D survey geometries

4D module

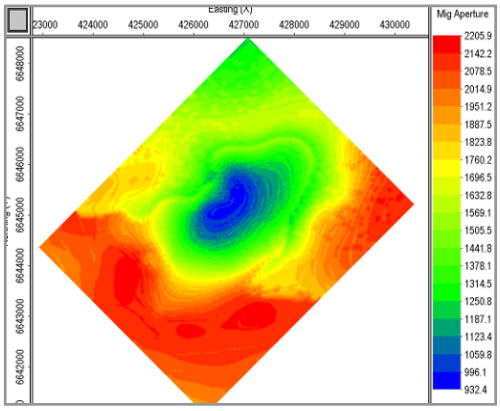
- Analyze the accuracy of time-lapse surveys using a flexible user-defined error function

2D ray model module

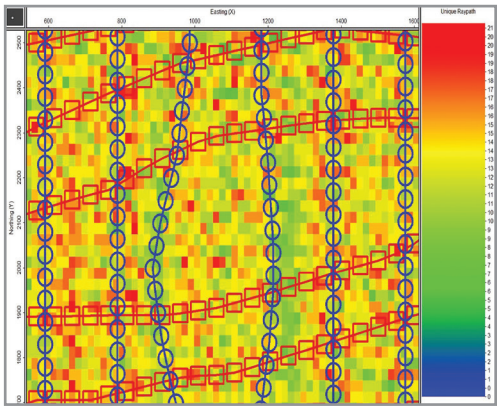
- Build multilayer 2D models from a variety of sources including ASCII, elevation, velocity, LAS, and manually digitizing the layers
- Specify and analyze amplitude losses and angle tolerance
- Specify source and ray types including P-wave, S-wave, and converted wave
- Generate multiples and critical refractions for specific horizons
- Investigate parameters such as bin size, offsets, resolution, and imaging effects, critical rays, migration aperture, NMO stretch, and common midpoint–common reflection point (CMP-CRP) displacement
- Model diffractions and reflections and perform ray tracing
- Analyze migration, absorption, and dip moveout (DMO) processing effects
- Create 2D synthetics using surface, VSP, OBC, and interwell geometries
- Model P-wave (PP), S-wave (PS), and converted-wave amplitude variation with offset (AVO), and multiples



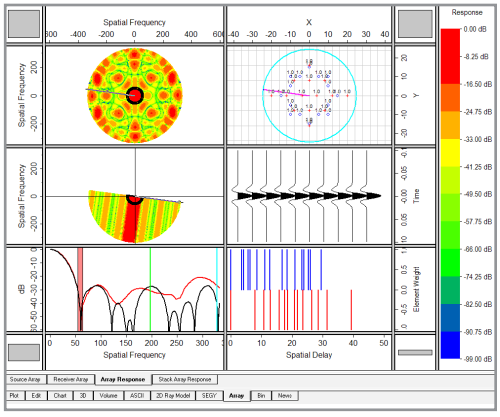
Flexible design and complex shooting schemes.



Map of migration aperture on target horizon.



Map of 4D survey showing quality of repeatability.



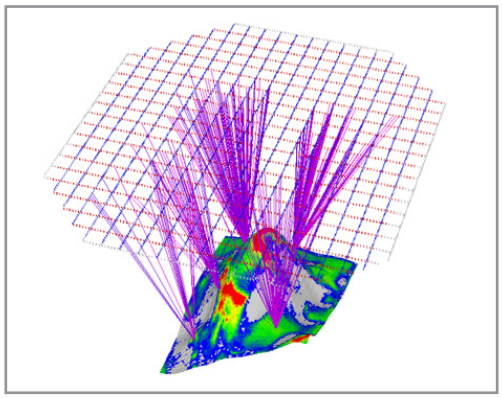
Interactive source and receiver array analyses.

OMNI 3D Workshop

The complete package

Advanced Analyses Module

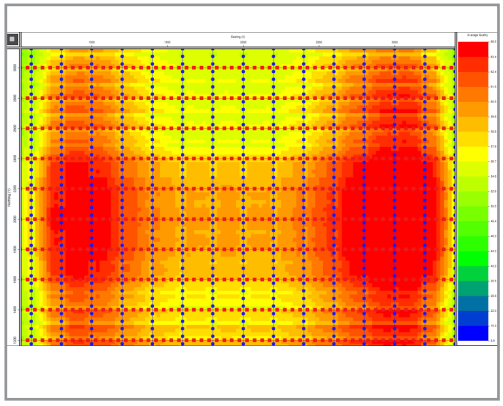
- Assess 3D geometry effects on DMO, poststack time migration, multiples, and noise
- Analyze potential 3D geometry artifacts (footprints) using existing 2D seismic traces
- Estimate poststack time migration illumination using Fresnel zone binning
- Generate synthetic SEG-Y data using survey geometry and a 3D model and zero amplitude of critically refracted rays
- Build a depth cube of stack fold to analyze illumination at depth
- Analyze illumination on a subsurface horizon using any survey geometry
- Review reflection angle maps and statistics for every 3D illumination analysis
- Estimate trace quality using 5D interpolation
- Investigate AVO response with data statistics and QC displays



Illumination results and ray trace viewed in 3D view.

3D ray model module

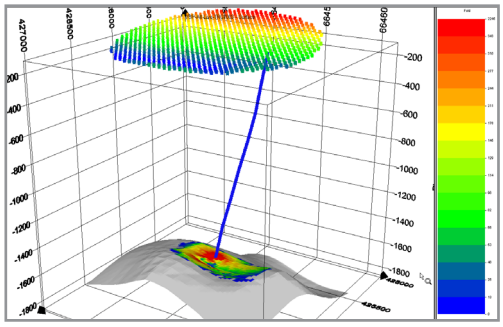
- Investigate parameters such as bin size, offset, resolution, and imaging (migration) effects
- Build multilayer 3D models, including surface topography
- Create horizons using theoretical parameters or imported horizons
- Model diffractions, reflections, and exploding horizons



Quality map of interpolated traces.

3D grid model module

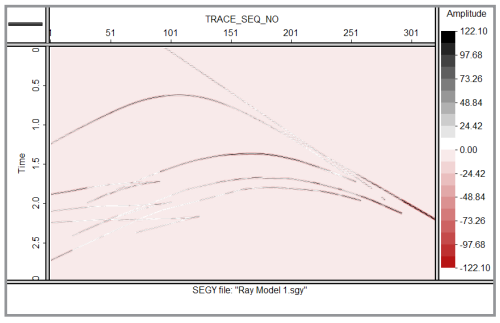
- Investigate parameters such as bin size, offsets, resolution, and imaging effects
- Build velocity cube with the target reflecting horizon
- Model diffractions, reflections, and shot-receiver ray paths
- Execute eikonal finite-difference ray tracing



3D view: VSP depth analysis.

Elastic wave equation module

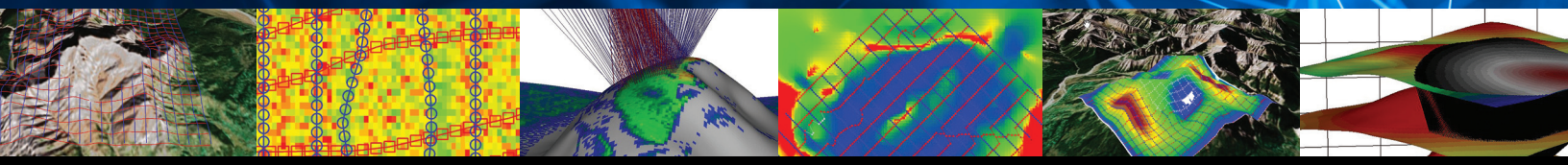
- Calculate elastic or acoustic wave equation response using a finite-difference solution
- Create full-waveform 2D synthetics using surface, VSP, OBC, and interwell geometries
- Import model parameters from 2D ray models
- Add user-defined velocity gradients and heterogeneity
- Output real-time movies of shot wavefronts in Microsoft AVI format
- Monitor calculations interactively
- Work on multinode clusters
- Spread work across your local network with the built-in cluster manager



Synthetic SEG-Y from 3D ray model.


Learn more at
slb.com/omni

Schlumberger



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