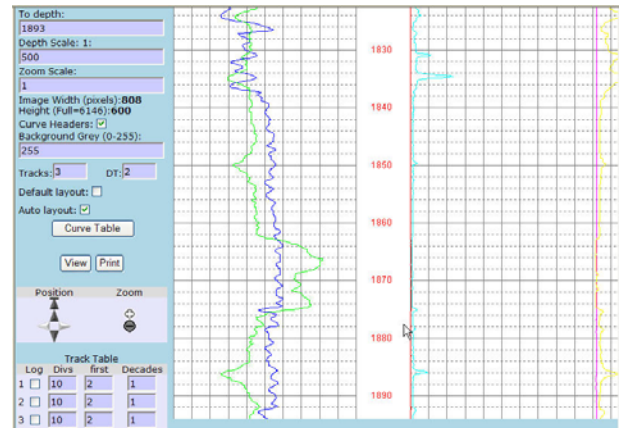


WLMS – An Overview

The PetrisWINDS® Well Log Data Management System (WLMS) provides well log data management from data loading to end-user distribution. It is an integrated, workstation-based data-loading system using the PetrisWINDS Enterprise web-based search, retrieval, and transfer system. Operating independently of petrophysical analytical systems, WLMS provides automated loading and transfer capability of data to



any geotechnical application equipped with the appropriate adapters. The WLMS archival data store is fully compliant with the PPDM 3.7 Well Log data model, and can be easily adapted to an existing PPDM database implementation.

Features and Benefits

- ▶ **Fully PPDM 3.7 Compliant** – easily adapted to an existing PPDM database implementation.
- ▶ **Integrated with your company's Well Master** – custom creation based on PPDM 3.7 modules also available.
- ▶ **Reads and writes all current and historic well log data formats** – helps bring all information assets into one data management system for easy access and sharing.
- ▶ **Most extensive format handling capability in the industry** - supports reading and loading of DLIS, LIS, BIT, WellLogML, LAS, and a large variety of common ASCII well log file formats.
- ▶ **Data can be extracted in DLIS, LIS, LAS, WellLogML and other common ASCII formats** regardless of the original format in which it was stored.
- ▶ **Stores and manages all data in its original form exactly as it came from the truck or data supplier** – all data is retained for future reprocessing or advanced processing.
- ▶ **Permits well log data to be directly loaded with simple mouse clicks into popular applications** – no export/import processing required.
- ▶ **Available with ArcIMS map search engine** - uses both spatial data stores and shape files, including company proprietary layers, allowing map views with layers.
- ▶ **Audit trail provides record of transfer events** – tracks who used what data to help optimize storage costs, enable resource calculations, and establish a record of the best practices for specific projects to compare against project outcomes.

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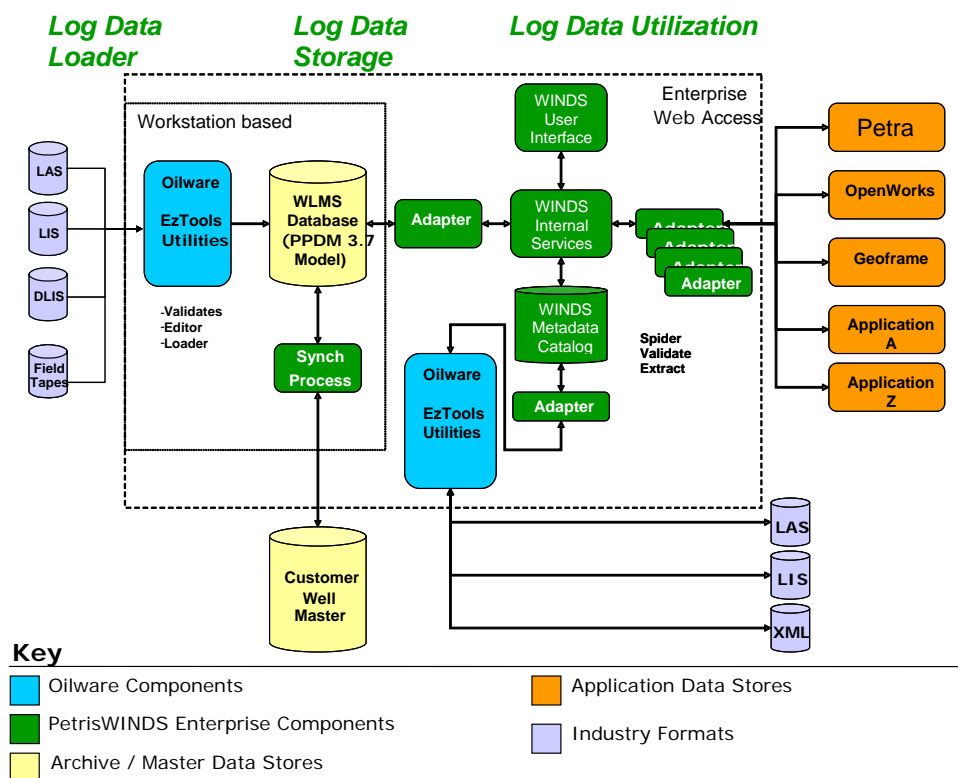
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High-Level Architecture

The WLMS system is composed of three primary elements:



Log Data Loader

The Log Data Loader is a workstation-based application with a graphical user interface (GUI), typically deployed in a company's well log-receiving department. The Log Data Loader is a suite of well log tape and file data conversion tools, and is able to read all of the common log file formats, including LIS, DLIS, BIT and ASCII (LAS), and WellLogML files.

Log Data Storage

Using a combination of a relational database and a file system, the Log Data Storage facility provides the ability to store the original log data in its entirety while retaining the capability for rapid retrieval. The archival log data storage model is based on and fully compliant with the 3.7 PPDM Well Log Modules, and has been certified at the 'Gold' level by PPDM.

Header data for the well log is stored in an ORACLE database server, while the actual log curve data (the digits) is stored in an organized archive file system. The database is capable of storing both depth- and time-based curves. In addition to single-sampled curves, WLMS also handles fast channels and array channel curves.

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High-level data for relevant well data is also stored in the database. A built-for-purpose process synchronizes the corporate well master identifiers with the incoming log data.

Log Data Utilization

Data is useless without the ability to find it and use it. Using PetrisWINDS adapter software, PetrisWINDS WLMS bridges the gap between log data and the numerous analytical applications that use the log data.

Adapters to applications such as Landmark OpenWorks®, Paradigm Geolog®, geoPLUS PETRA®, Schlumberger Information Solutions GeoFrame®, and others provide a seamless transfer between the end-user's search and use of the data. With WLMS, exports and imports are no longer required to use this data, and through the Desktop Adapter component, log data may be output to various industry standard formats for more effective sharing with other users.

Through an ArcIMS map search integrated with text search capabilities, spatial searches may be conducted for wells, logs, or curve data stored in the system, increasing the productivity of your geoscience staff by reducing the time spent searching for and collecting information.

Technical Overview

PetrisWINDS Enterprise Service-Oriented Architecture

PetrisWINDS Enterprise technology is based on a Service-Oriented Architecture (SOA) to enable distribution of services across multiple computers and operating systems. This approach yields a robust, scalable system based upon widely accepted industry standards that enable it to evolve to meet business needs. The power of the SOA enables integration of multiple components to solve business problems. These may be built by Petris and/or provided by 'best of breed' vendors of analytical, data capture and visualization applications.

PetrisWINDS WLMS has integrated three world-class technologies:

- ▶ Integrated log data loading system
 - The world-wide provider of expert well log format reading software
- ▶ The PetrisWINDS Enterprise data management system
 - The powerful data management solution
- ▶ PPDM Well Log Data Storage model
 - The industry-leading standard for well log curve digits, images and well records

The power of the architecture enables these world-class capabilities to operate seamlessly and synergistically to solve the well log data management business problem. PetrisWINDS WLMS is a non-invasive application, requiring no changes to existing customer applications or databases. All applicable customer technical and security standards are incorporated in the connections between the system and the customer network. The PetrisWINDS Enterprise Integration services may be delivered as an Appliance system or be deployed on an existing Oracle database server.



PPDM™
Gold Compliant

PPDM 3.7 Well Log Data Model Compliant

The PetrisWINDS Enterprise application data store is 100% compliant with the 3.7 PPDM Well Log Data model. This means that applications enabled to use the data in the PPDM model can use data that has been stored in the WLMS database. Because of the power of the PetrisWINDS Enterprise integration tools, the ability for the PetrisWINDS WLMS to remain consistent with the PPDM standards is easily accommodated, and upgrades can be made quickly and economically.

Product Options

Since WLMS is built on the PetrisWINDS technology base and a suite of data conversion and database loading applications, the system can be dedicated to well log data management exclusively **or** work as a part of a standard PetrisWINDS Enterprise System solution. The description that follows describes the functions of the Basic Version of WLMS, and then describes the relevant upgrade features that are included with the standard PetrisWINDS Enterprise system.

PetrisWINDS Well Log Data Management System (WLMS) Capabilities

Data Capture and Synchronization Functions (WLMS Stand-Alone)

- ▶ The Data Loader loads logs into the Petris log database and log curve data into the file system while providing a process for well master synchronization.
- ▶ A text-based search capability includes depth-range as well as well, log, and curve attributes.
- ▶ The log file export function can write data to files on the end-user's desktop, and supports LAS and LIS/DLIS formats.
- ▶ Web-based utilities allow spidering and validation synchronization as well as user access administration.
- ▶ An end-user Preferences setting capability allows customization of search attributes and personal datasource logon management.
- ▶ Tapes are encapsulated using the industry standard Tape Image Format (TIF), readable by virtually all commercial well log processing software.

End-User Search and Retrieve Functions (PetrisWINDS Enterprise)

- ▶ The web-based GIS search capability integrates the best features of text- and map-based searches, making it easy to find and access well log data.
- ▶ An insert-and-extract adapter to the Petris log database adds and synchronizes with company-specific UID and header information.
- ▶ You can insert data automatically into other data storage and applications by means of adapters to OpenWorks, Geolog, Petra, Geoframe, and many others.
- ▶ The Dynamic Common Model™ capability for enterprise data integration permits additional applications and data types to be added after installation – *without affecting* existing datasource connections.
- ▶ Separate Search-and-Order and Data Manager Roles protect your data store integrity. The Search-and-Order user can search for data and request transfers, while the Data Manager has the authority to review, approve, and complete requested transfers.
- ▶ Depending on your organizational needs, you may opt to provide the Desktop export function to Search-and-Order users.