

## B2|OpenWorks Well Monitor Integration Module

### Functional description

The **B2|OpenWorks Well Monitor Integration Module (IM)** connects to Landmark OpenWorks database via Landmark Openworks API (Linux).

The primary functionality of the **B2|OpenWorks Well Monitor IM** is to monitor active wells within the given field assigned to the Openworks db. To accomplish this task, the IM must first:

- List all wells in the database which are active. e.g.- wells which have at least one well log (either via Openwire or any other means). The resulting list is provided to the administrator as B2 IM projects which can be “subscribed” via the **B2|Project Administration** application for further observation/analysis.
- Once a given well is subscribed, the IM performs a number of data update and data monitoring tasks upon that well on a periodic basis. Primarily, the position log, picks, faults, and logs for the well are fetched and monitored while the well is actively subscribed in the B2 system. As with all other B2 IM implementations, these data types have meta representations which are stored in the **B2|Meta Model**. All of the datatypes monitored by the IM with the exception of pick are strictly “read-only” types, with the IM performing passive observation (polling) periodically. The IM creates, updates or deletes it’s own meta-representation of the data type upon creation, update, or deletion of the actual datatype in the Openworks database.

- Monitors the OpenWorks database for changes (24x7)

### General technical considerations

#### Clients to the IM

The B2|OpenWorks Well Monitor IM is utilized in several different B2 client products, including B2|Integrated Well Planning, B2|3dPos and B2|Integrated Operations, but the most important production level client is B2|Stratabugs. B2|Stratabugs make use of a OpenWorks Pick list for a given well, and to a lesser extent the OpenWorks Position Log. Most importantly, the B2|Stratabugs client requires the pick-creation services offered by the B2|OpenWorks Well Monitor IM.

#### Common data types – all clients

The **B2|OpenWorks Well Monitor IM** supports the following data types:

#### Well Picks

The current complete list of well picks for a given well is of interest to all clients and is extracted to hashtable and to treemap in the B2 metadata set. The additional hashtable is to the fact that multiple picks can have the same name (pick\_name) and thus the IM tree view of B2 metadata must prioritize the STAT interpreter pick for viewing, if available, otherwise the oldest pick in the table. The hashtable view (ALL\_PICKS) provides a means for applications (clients) to check and verify all known picks in the well. This is necessary, for example, when the Stratabugs client is going to insert new picks in a well - the biostratigraphy team may have multiple interpreters for the same zone. As usual, the picks are extracted via the API using the standard `gdiReadSubset(WELL,well, gdiPick_t)` call to the API.

### Position Log

Any given subscribed well from the IM has its position log extracted and updated periodically via the API. Anytime the position log lengthens (via new station), a message is sent to the **B2|Collaboration and Integration Server**, and thereafter to all clients on the B2 project. Updated position log is useful in realtime clients which wish to observe drilling in progress. The position log is extracted from Openworks well via the standard `gdiRead(POSITION_LOG, gdiPosLog_t)` call to the API. The endpoint on the position log is extrapolated via linear interpolation for B2 clients when MD on the well header is deeper than the last station.

### Well Fault Observations

The complete list of well observations for a given well is of interest to some newer pilot/prototype clients and is extracted directly to the B2 metadata set. These faults are then mapped to the corresponding fault segment in some applications such as B2|3DPos. As usual, the well fault observations are extracted via the API using the standard `gdiReadSubset(WELL, well, gdiWellFault_t)` call to the API.

### Well Log Curve

The complete list of well log curves for a given well is of interest to some newer pilot/prototype clients and is extracted directly to the B2 metadata set. Only the logcurve header is modelled within the metadata, the curve values can be retrieved as necessary by the client via the command interface described later. Extracting log curve data from openworks utilizes a separate (logX) component hierarchy within the Landmark Openworks system developer kit API, but primarily the `logCreateCurve()`, `logReadHeader()`, and (when necessary) `logReadValues()` calls are utilized.

### Command Interface for the IM

The **B2|OpenWorks Well Monitor IM** supports a limited set of direct remote commands which can be sent and delivered via the **B2|Collaboration and Integration Server** from any client. The following list describes these commands and their functionality in some detail.

Command	Function	Datatype TX	Datatype RX
SYNC	Resync against OW db	String	String OK
PING	Respond only with simple ACK	String	String OK
SENDPICKS	Receive a list of picks and save to OpenWorks	List of picks	List of error messages
GETLOG	Fetch and return the given well log from OW	String wellname	List of MD / value pairs

The SENDPICKS command in particular is one of the few instances where SCT creates data in the OW database. As with all other data-creation cases in use with the B2|Integrated Well Planning suite, the data is created with the system user's ownership (system user or common user in some implementations), and the appropriate interpreter as specified by the client when the pick is instantiated locally via the Stratabugs client interface. SENDPICKS requires, of course, manager access in the Openworks database and is only used in the BIOSTRAT database at this time.

It's important to note additionally that the pick-creation code within SCT uses only `gdiAdd()` and `gdiCommit()`. **Picks cannot be changed via any B2 implementation.**

## Supported data types

The **B2|OpenWorks Well Monitor IM** supports the following data types:

Datatype	Comments	Read	Write
Well picks	R2003+R5000	Y	Y
Position log	R2003+R5000	Y	N
Well fault observations	R2003+R5000	Y	N
Log Curve	R2003+R5000	Y	N

## Released versions

The following table lists the released versions of **B2|OpenWorks Well Monitor IM**:

Version	Supported B2 Collaboration Server	Supported OW version
V3.2	V3.2 and v4.0	OW R2003
V4.0	V4.0	OW R2003, R5000
V4.1	V4.0, V4.1	OW R2003, R5000

## Technical requirements

Operating system: Linux (RHEL) 64-bit

Software requirements: Requires Oracle Java

Other requirements:

- Requires a running instance of **B2|Collaboration and Integration Server**.
- Requires OpenWorks license and OW SDK (but this is shared between all OpenWorks IMs for each field / OW server)
- Requires a system user with "Interpreter" access to the relevant data in OW

## B2 infrastructure

The **B2|Integration Modules** are components in the B2 suite. The B2 suite also contains the required server and integration components, such as the **B2|Collaboration and Integration Server**, **B2|Meta Model** and **B2|Web Service**.

This common infrastructure serves end-user application clients such as the **B2|Integrated Well Planning**, **B2|Integrated Operations**, **B2|Virtual View** and **B2|Virtual Arena**.