Tesseral Technologies Inc.
#380, 1500-14th Street SW,
Calgary, Alberta, Canada T3S 1C9
Tel: (+1) 403 457-0555
Fax: (+1) 403 244-0544
Email: **tesseral@shaw.ca**
Web site: **www.tesseral-geo.com**

Multiparameter Numerical Medium for Seismic Modeling, Planning, Imaging & Interpretation Worldwide

Tesseral Farm Parallel Computations Engine in Windowk networks

PRODUCT INFORMATION AND
INSTALLATION NOTES

For more info about Tesseral and related products, and to download the latest updates, please check the Tesseral, Inc. web site at www.tesseral-geo.com

Contents

1 Product Description

Tesseral-Farm Computation Engine allows to implement clusters for high-performance full-wave modeling on Windows XP/Vista/7 and later computers. Compared to numerous Unix-based analogs, clusters organized with *Tesseral-Farm* require significantly less preparation efforts, flexible connection topology, and unmatched scalability. After connecting computers to a local network and defining some (or all) computers' cluster membership, you can run models against *Tesseral-Farm* to distribute the workload between cluster members, control calculations on individual *Tesseral* computer, and collect the result.

2 Network Cluster variants

Tesseral network clusters are organized using *Tesseral Workplace* product and one (or many) installation of *Tesseral-Farm*. The computer having *Tesseral-Farm* running (call it the control workstation, or host computer) is initiating and controlling other cluster member computers, call them servers, or nodes (with licensed *Tesseral* package or its computation module). Control workstation also can be used for running computations using *Tesseral-Farm.* Cluster membership is limited with existing local area network only; possible configurations can be quite flexible. In particular, permitted configurations are:

1. single control workstation, multiple servers;

2. multiple dedicated workstations and multiple servers.

3 Licensing policy

Tesseral-Farm variant license relates to control workstation (computer having *Tesseral-Farm* utility). In this license is also indicated maximum number of network PC's (servers), which may run parallel computations distributed through network. In present version any network PC with installed computation module and properly registered may run computations only and under direction of control workstation only.

4 Requirements

A Windows network must be set-up between computers that you want to use. File sharing over the network must be enabled in the network settings. Some over-reacting anti-virus software may block the functioning of this program; such software should be updated or disabled.

5 Installation steps

5.1 Choose a Control workstation (host computer) among the computers in the network

Any computer can be the host. The host computer may or may not participate in the computations, depending on your choice.

Download or use supplied from the installation disk the *TesseralFarmHost.exe*.

** For general installation instrustions, please see **"1_1_ReadMe for Installation of Tesseral products.pdf"**. If you have some particular questions, please, contact Client Service via tesseral.geo@gmail.com.

5.2 Prepare server computers (nodes of the network)

Download or use supplied from the installation disk the *TesseralFarmNode.exe*.

The following steps must be performed on **each** node:

1. Run the *TesseralFarmNode.exe*.

2. Follow the on-screen instructions. Choose a place for *TesseralFarm* folder (do not change name of folder), which will be used to hold temporary calculation results. The folder must be

on a drive with enough free storage space (usually not less than 1-5 Gb) for holding input data files and intermediate result files.

Note: The computational engine is always installed into "*Program Files\Common Files\tsrFarmService*", and always starts from remote *Control Workstation (host computer).*

5.3 Prepare the control workstation (host computer)

1. Run the –*WN-Host-\Setup.exe* from the installation disk.

2. Follow the on-screen instructions.

3. After the installation is completed, start the *TesseralFarm.exe* program.

When it runs for the first time, it displays a registration dialog (for general information, please see **"1_1_ReadMe for Installation of Tesseral products.pdf"**).

The program offers you to search your network for servers with installed computational engines. If you have a lot of computers on the network, this process may take a long time, but it is recommended that you continue. If the program automatically finds all your nodes, you are done with the installation. If you don't see some of your servers in the list, verify that you can access them in the *My Network Places* window. You can repeat the automatic search for computers as many times as you want by selecting *Actions>Add All Available Servers* (it never deletes the already listed servers even if they become unavailable; it just adds newly found ones). Alternatively, you may add servers manually.

To add a server manually, select *Add server* on the *Actions* menu.

In the *Remote server name* field type in the name of the remote server (node) that you prepared in step *3.1,* in the form "*NodeName*" or "*\\NodeName*". Click *Add Server*.

Repeat the step *8* for each node you want to add.

If you wish to add the local host computer to the cluster to make it perform the computations (if it's not already added automatically), perform the step *8* for the host computer too, and type in its network name (in this case, the host also plays the role of a node, and the preparation of nodes as described in step *3.1* must have been performed for it.) The host computer is listed as *<local>* in the list of servers.

To exclude a server from computations temporarily, uncheck it.

To remove a server from the cluster and thus permanently exclude it from computations, right-click on its name and choose *Remove server*.

6   Preparing data

Prepare the data by invoking the command *Run>CLUSTER: Create task…(or Run>Migration (Depth Domain)>CLUSTER: Create task…)* in Tesseral-2D PC package. In the dialog that opens, adjust all necessary options (see Tesseral-2D manual for details) and choose or create the folder for storing the data that you'll have to copy to the cluster.
The command prepares the *runtask.ini* file and several more files. The task file has a simple structure and can be edited manually if needed in any text editor and saved as plain ASCII text.
In addition to the runtask.ini, the data files are as follows:

for modeling, the *<modelname>.tam* file with polygon model and optionally the raster model *<modelname>-PQR-Complex.tgr* file if you are going to run complex model (see Tesseral-2D manual for details);
for migration, the raster model file *<modelname>+Modl-PQR.tgr*, the seismogram file *<modelname>+Gath<XX>.tgr,* optionally the time file *<modelname>+Time<XX>.tgr* and *aperture.bas* file with apertures.

7 Running computations

Start the *TesseralFarm.exe* program by navigating to its shortcut in *Tesseral-2D Launch* folder on *Desktop* (if installed) or do the same from *Start/Programs/Tesseral* folder. At startup, the program tests all active network connections.
If you do not want a certain node to take part in computations, uncheck it.
Choose File>Open, navigate to the folder created in step 6.0, and select the runtask.ini file.
The distribution of workload over the cluster nodes is shown in the column *Queue*. For modeling tasks, the range of shot point numbers is shown for each node. For migration, each node's load is indicated as a fraction number in the range 0 to 1. You can edit these numbers by right-clicking them and choosing *Edit calculation range*.
Click *START*. The program starts copying the task files to nodes (which can be nearly instantaneous or take several minutes, depending on the data files sizes and the speed of your network), then the computation starts. You can monitor the computations in individual nodes in the column *% done*.
If you want to terminate the computation on an individual node, right-click the node and choose *Break calculation*.
If you want to stop computations for all nodes, click *STOP*.

8 Collecting results

After the computation on each node completes, the resulting files are stored in the folder from which you started the computations (section 7).

If you ran modeling, you get resulting files for each source point in the model. You can use the **Tesseral-<variant> Workplace** product to merge the files, if necessary.