

## ASAP REMOTE FAQ

### Frequently Asked Questions for ASAP 2010 V1R1

---

This Technical Support Note (TSN) addresses frequently asked questions for ASAP REMOTE in ASAP 2010, the Advanced Systems Analysis Program (ASAP®) from Breault Research Organization (BRO).

**NOTE** Before using this FAQ, be sure you have thoroughly read the technical publication, “ASAP REMOTE for Distributed Processing”, which may be viewed and downloaded from the BRO Knowledge Base:

<http://www.breault.com/k-base.php?kbaseID=15&catID=44>, and have viewed the movie at

<http://www.breault.com/multimedia-gallery.php?ID=191&mode=detail>.

**Conceptual, reference, and task-oriented topics on ASAP REMOTE are also available in ASAP Help.**

#### Q. What is the best way to scan for computers on the network?

- A. The easiest way to scan for available PCs on a domain local area network (LAN) is to use the option, **Search for Computers**, on the Remote tab of the User Interface Preferences dialog box. This option will search for all PCs on the LAN, and check that they are capable of running an ASAP REMOTE session. Once this process is completed, the returned list becomes the default for all future REMOTE sessions. For large networks, this process may take some time, especially for networks having hundreds of attached PCs.

If you have a list of available network computers for which ASAP is specifically installed to run REMOTE sessions, simply type the network names of each of the available PCs directly into the box labeled **Automatic Remote Selection List** on the Remote tab. You can also use IP addresses rather than network names. These computers will then show up as the default in the box, **Remote Computers**, on the Remote Process Startup dialog box.

If you are unsure which computers are available to run a REMOTE session, select **Search for Computers** on the Remote Process Startup dialog box. In this case, the option will return a list of all PCs found on the LAN. You can then test individual PCs or groups of up to 10 computers by selecting the appropriate check box(es) and using the option, **Test Computers**. Any PC that is unable to run a REMOTE session will have its checkbox deselected. All remaining PCs can

then be used for distributed processing when using the REMOTE feature in ASAP 2009 and later versions.

## Q. How is my CPU usage set up for maximum efficiency?

- A. The enhanced ASAP REMOTE feature in ASAP 2009 and later versions is configured to try to maximize efficiency across all available PCs. First, it will start one (1) session per PC; second, run additional sessions on additional CPUs (or cores) on each PC; third, start loading a second session on each core; and so on.

For example, if a user specifies ten (10) REMOTE sessions with four (4) dual-core PCs available:

- REMOTE starts one (1) session on each PC for a total of four (4).
- The next four (4) sessions are started on the second CPU (core) of each PC for a total of eight (8). This can be verified by checking the affinity settings for each Kernelserv.exe process on each PC (right-click on the Kernel process on the Processes tab of the Task Manager and choose **Set Affinity**.)
- The last two (2) sessions are started on CPU 0 of two PCs for a total of ten (10) sessions, essentially “doubling up” the REMOTE sessions on these particular CPUs (cores).

**NOTE** Before running two REMOTE sessions on a local computer with only two cores, first set “Affinity” for the main kernel process (Task Manager, Processes tab, Set Affinity) to BOTH CPU 0 and CPU 1. Otherwise, one REMOTE kernel will double up with the main kernel on one CPU and act very slowly.

## Q. How many sessions can be started per CPU if I need to double up?

- A. Users should start one (1) REMOTE session per available PC whenever possible, but can run up to two (2) sessions per CPU on each computer if a limited number of PCs are available. For really large ray traces, we have found that, as long as the total number of rays traced per REMOTE session is no more than 10 to 15 million, the CPU’s efficiency is okay for multiple sessions per CPU.

## Q. Can the \$GUI scripting method be used to run remotes with multi-core PCs?

- A. Yes, the enhanced REMOTE feature in ASAP 2009 and later versions still support the \$GUI script commands available in previous versions of ASAP, with some changes. A new syntax was added in ASAP 2009 for the naming of remote PCs, allowing you to select both the PC and CPU (core) to be used for the remote process. In ASAP 2010, the backslashes were removed from the \$GUI Remote commands. These are illustrated in the following example:

`$GUI RemoteStart pcname:0`

This syntax will start a REMOTE session on CPU 0 of the remote PC. Changing the syntax to `pcname:1` puts the next session on CPU 1. If additional CPUs (cores) are available on the remote PC, they can be accessed in sequential order by changing the specified CPU number.

Note that starting multiple sessions on a single core can also follow this same syntax; that is, for a single core computer, `$GUI RemoteStart pcname:0` (and `pcname:1`) will start two (2) sessions on the available core.

With ASAP 2010 and later versions, `$GUI RemoteGetFile` can retrieve remote files and place them in the associated folders on the local computer. For example:

```
$GUI RemoteGetFile PCNAME:0 FILENAME.DIS
```

Also with ASAP 2010, `$GUI RemoteSendFile` now sends a file back to the local computer, if it originates from the remote session script. The suggested syntax is:

```
$GUI RemoteSendFile . "FILENAME.DIS"
```

Double backslashes (\\) are no longer needed before the period (.). The filename must be specified in double quotes ("").

***NOTE As of the ASAP 2010 V1R1 release, we recommend that you do NOT use double backslashes in any of the \$GUI Remote commands. While some \$GUI commands may work with double backslashes, others do not support the backslashes.***

While the `$GUI` commands are available for legacy scripts, the best practice is to use the Remote Process Startup dialog box to run REMOTE sessions. This user interface allows you to perform, in a few mouse clicks, the same operations that can take many lines of script.

## **Q. Where are the remote files stored on my local computer?**

- A. They are located in subfolders in your Working Directory and named after the computer name of the remote. For multiple sessions on multiple cores per computer, they will be appended by an underscore and number to designate which CPU or session. For example, a session that was labeled \\TUT9:0, a sub folder containing the retrieved files will be called TUT9\_0.

## **Q. How do I set how many sessions are started?**

- A. The user is in complete control of how many total sessions are started, using either of two methods in the Remote Process Startup dialog box. Here are two examples:
- Example 1: Check the option, **Auto-select computers**, on the Remote Process Startup dialog box. This automatically uses computers you selected on the Remote tab of the User

Interface Preferences dialog box. Entering, for example, a value of 50 in the option, **Total Sessions to Start**, tells ASAP to automatically start fifty (50) remote sessions across all available computers. You cannot directly control how the sessions are divided up among the individual PCs, but you will get 50 sessions.

- Example 2: Choose ten (10) dual-core PCs from the remote selection list and select four (4) sessions per computer. The user will get four (4) sessions per PC or forty (40) in total.

### Q. What happens if I get the error, “Max sessions already reached”?

- A. This error is reported if the maximum number of REMOTE sessions is already running on the particular PC. This may occur because you requested more REMOTE sessions than can be handled by the available CPUs (cores), or another user may also be using the same PC to run REMOTE sessions. This can be verified using the Task Manager and checking the *Kernelserv.exe* processes running on the remote computer.

### Q. Using the Remote Process Startup dialog box, how can we mix single core, dual-core, and quad-core computers?

- A. This is automatic and transparent to the user. ASAP will recognize the number of CPUs (cores) on each computer, and start a REMOTE process on each available CPU (core) before going back and doubling up on cores to meet the quota.

### Q. What is the difference between “Max Remotes per CPU” and “Sessions per Computer”?

- A. The question refers to a setting, **Max Remotes per CPU** on the Remote tab of the User Interface Preferences dialog box, and a setting, **Sessions per Computer** on the Remote Process Startup dialog box. The former lets you to set the number of allowed REMOTE sessions per CPU (core) with a maximum value of two (2). For computers having multiple CPUs (cores), the option, **Sessions per Computer**, lets you set the maximum number of remote sessions to start on any individual PC. An example might be a quad-core PC, where you can request up to eight (8) remote sessions but choose a maximum of four (4) so that only one (1) process will be assigned to each core.

### Q. How do I set “Max” users to be allowed to use my own computer?

A. This is set in the Remote tab of the User Interface Preferences dialog box. It concerns the maximum number of network users that can try to launch REMOTE sessions on your PC. You can select the option, **All Users**, to make your PC completely accessible to other ASAP users, or you can manually type a list of allowed users in the **User List** box. In fact, you should type your own network name into the box at a minimum if you want to run REMOTE sessions on your own PC. If you do not want anyone else using your PC, uncheck **All Users** and enter your

own network name in the **User List**. Set the option, **Max**, to at least the maximum number of REMOTE sessions you will run on your local computer when using the ASAP REMOTE feature.

**NOTE** To allow yourself to start REMOTE sessions on your own computer, you must check the box, **All Users**.

**TIP** To prevent access to your computer from network users including yourself, uncheck **Allow network users to run ASAP on your computer on the Remote tab of the User Interface Preferences dialog box**. Click the box twice to clear it — the box should not be gray; otherwise, the setting does not persist after you exit the dialog box.

## Q. How should I set the Flux and Rays of each source for each of the distributed remote sessions?

- A. Since you determine, *a priori*, the number of remote sessions to be used, simply divide the total number of rays and total flux by the number of REMOTE sessions. For example, if you have a raytrace with 10M rays and 10W total flux, and you want to split the run between ten (10) remote sessions, you would simply adjust the script to trace 1M rays with 1W total flux. You can also define a variable for number (#) of sessions within the file, and have it do the math for you.

## Q. How to set a random SEED so that each session trace is unique?

- A. At a minimum, the **SEED** command should be specified before an **EMITTING** source is created or random scatter is generated. This will use the local system clock (of the remote computer) to generate a random starting seed number. For a better, more statistically unique random number, use the **SET\_SEED** template (click the button for **Import Templates** on the Editor toolbar to select it). Insert the script at the top portion of your main file.

## Q. Can I use EMITTING DATA as my source and still gain an advantage using multiple sessions in parallel?

- A. Note, if you are using an **EMITTING DATA** source from a **DUMP**, Radiant Imaging, or other rayset file, this is a fixed set of stored rays, and is not easily split up over multiple sessions to reduce tracing time. To make use of the **SEED** method to make the source unique, only a subset of the total rays should be requested. This limits you further on the number of rays you can trace in each session and still remain unique.

For example, if you know there are 5 million rays in the file, you might try something like:

```
EMITTING DATA FILE_NAME 4000000
```

This way, the 4M rays selected from the starting **SEED** may be randomized enough from one


session to the other. Possibly, a 2M ray chunk could give more random results, but then require more sessions to make up the quantity. Ideally, you would want a different rayset file created originally from a different starting **SEED** to use in each session, but this means copying a different file over to each computer, in order to use a different source. This approach would be a candidate for using the **\$GUI** method of using ASAP REMOTE. Remember, you are still limited to the maximum number of rays stored in the file.

However, **SEED** also affects any rough or scatter surfaces in a system that generates random ray distributions. In this case, you could trace the same source over multiple sessions and still gain an advantage.


**NOTE** For **EMITTING DATA sources using a SPOTS, BMP, or VOXELS display file, these are random emitters with no fixed limit on the number of rays. SEED will work fine with those and you can gain benefit from running multiple sessions.**

Another issue is the general size of stored rayset DIS files. They can be rather large and take some time to transfer over to each remote session folder. A better method would be to store the file in a common area out on the network and access the file from each session using the proper path. Access permissions across computers may be an issue here, and we are still doing further testing to see if this can reliably work.

## Q. How do I set up files to run in REMOTE sessions using the Remote Process Startup file list?

- A. Check all files you will need to perform your simulation. One will be your main file that uses all other files or runs by itself. This is the file that creates the geometry, source, traces the rays and saves the results. It can **\$READ** or use data from other files as needed. Click the checkbox next to this file *twice*. The check mark is replaced by the familiar ASAP run icon,  in the checkbox.

This file will now be set to start automatically on the REMOTE session once you select the **Start** button. You can also check the boxes above to retrieve all files to the local computer when finished, and also close all sessions when the session is completed. Once all REMOTE sessions have been started, select the **Done** button to close the Remote Process Startup dialog box.

**NOTE** If you want to close sessions manually at a later time, using the **Close All Remote Sessions** button on the REMOTE toolbar, , be sure to select first a computer other than LOCAL, or the button is not available.



## Q. How do I examine **STATS**, **PATHS** or other analysis functions that are not in files retrieved to the local computer?

- A. Leave the REMOTE sessions open when finished. You can view each session's output and files by clicking on the appropriate tab or drop-down menu on the REMOTE toolbar. Any plot links may be viewed on the local computer by double-clicking on the link in the remote's Command Output window.

Each remote session now behaves as a separate working copy of ASAP. You can modify scripts, execute commands on the Command Input window, or use any of the analysis options in the Analysis or Display menus, just as if you were working on your local PC. You literally have multiple copies of ASAP running simultaneously to use as you wish.

## Q. How do I retrieve all remote display files to combine and average them after all the runs are completed?

- A. On the REMOTE toolbar, click the down arrow next to **Get Remote Files**, and click **Perform COMBINE with Remote Data**. This opens the Remote Combine dialog box in which you can select all files you want to combine. Under **Combine Mode**, you can select **Sum** or **Average** and under **Combine File**, name the output file that is stored in your Working Directory on the local computer. Select **Update File List** to populate a list of available files — by default, only BRO009.dat files are displayed. Uncheck **Use BRO009.dat Files** if you want to select \*.dis files.

The COMBINE feature automatically combines all display files with a similar pixel structure, and divides the results by the total number of files retrieved. You may also include both local files and remote files. The latter are grouped at the end of the list. See the topic, "ASAP REMOTE - Combining File Data" in ASAP Help for more information.

**NOTE** *The above-mentioned buttons on the REMOTE toolbar are not available if the Remote Tab view is designated on the Input/Out tab of the ASAP User Interface Preferences dialog box. The Remote Tab view is provided for backward compatibility with older versions of ASAP; however, the Remote Toolbar view is recommended for all new projects.*

## Q. I have a dual-core computer and want to run 2 local instances of ASAP over 2 CPUs, plus run 5 remotes on other computers for a total of 7 sessions. How can I do this efficiently?

- A. Note that with ASAP 2009 and later versions, if you are using a dual-core computer, both instances of the Kernel will try to start on the same CPU. You will have to change the affinity settings yourself within the Task Manager by right-clicking the Kernelseve.exe process and selecting **Set Affinity**. Choose a CPU that is different from the other Kernel process listed. This will keep your local system from slowing down unnecessarily.

You can run the five (5) REMOTE sessions in the usual way from either instance of ASAP on the local computer. The REMOTE sessions will be correctly allocated to other available computers, before assigning a second session to a particular CPU (core). You have additional control of how ASAP uses your local computer in the **Max Users** setting on Remote tab of the User Interface Preferences dialog box, as described earlier.