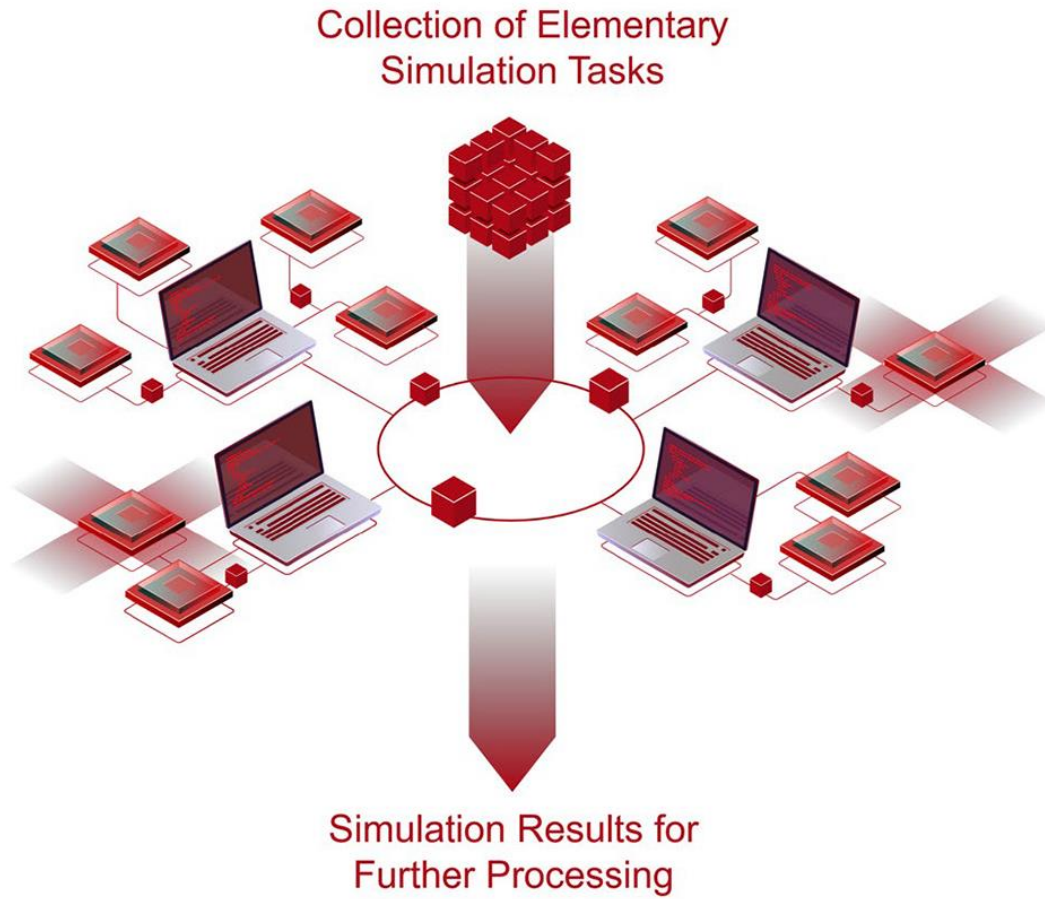


# Usage of Distributed Computing

# Abstract



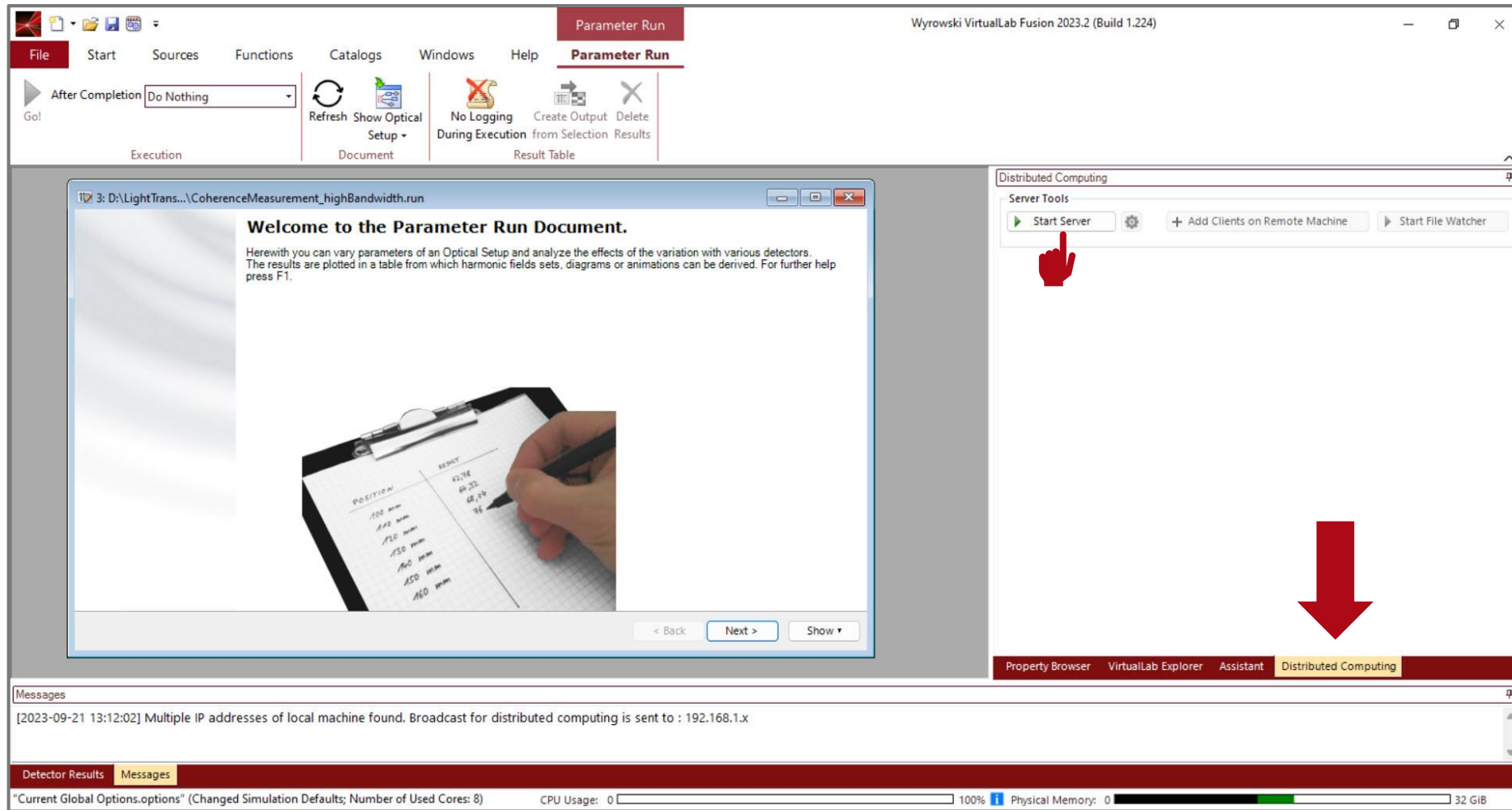
The fast delivery of accurate results from a given optical setup is the main task of any optical simulation software. Complex tasks that require the solution of many individual simulations, such as parameter sweeps or optimizations, can still require significant computation times. This can be drastically shortened by distributed computing, a concept where individual simulations of a larger package are computed in parallel with each other, using multiple computers and/or servers to speed things up. This use case demonstrates how distributed computing can be used in VirtualLab Fusion.

# Preconditions

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- The file "VirtualLab.DistributedComputing.ServerSupportService.exe", which is located in the corresponding zip archive, must be executed on all used workstations.
- All computers must be in the same local area network (LAN) or virtual private network (VPN)
- The following ports are required for the communication inside the network:
  - 23001 (TCP & UDP)
  - 23002 (TCP & UDP)
  - 23003 (TCP & UDP)

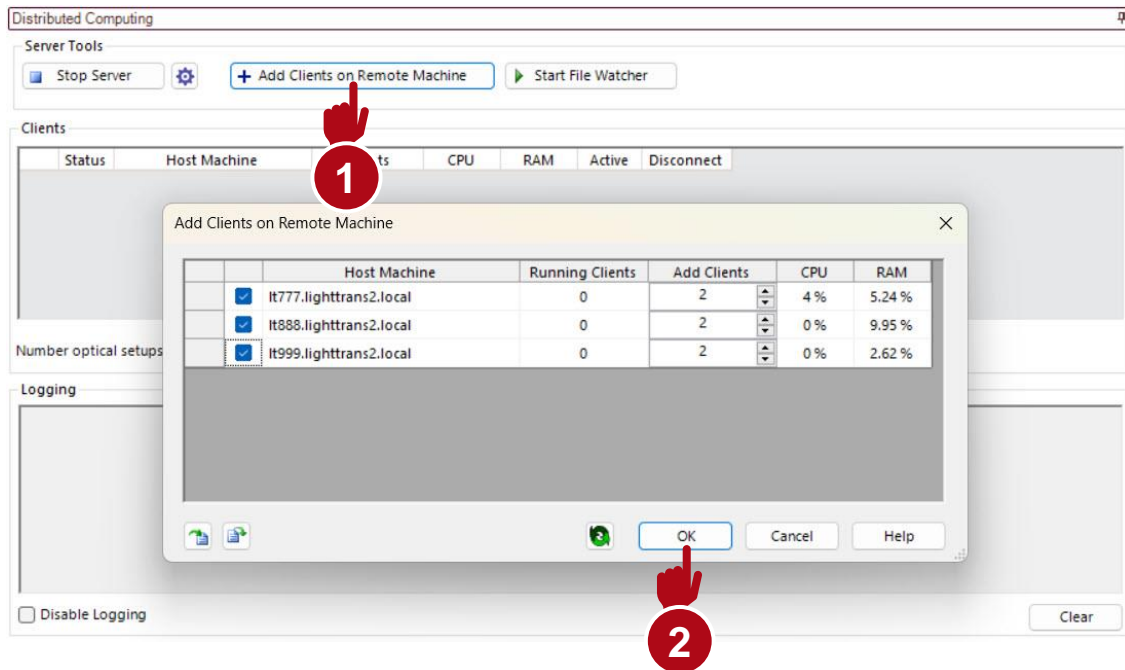
# How to Start Distributed Computing in VLF?



When the *Distributed Computing Package* is available, a new tab will appear on the right side of the main menu.

Activate *Distributed Computing* by clicking *Start Server*.

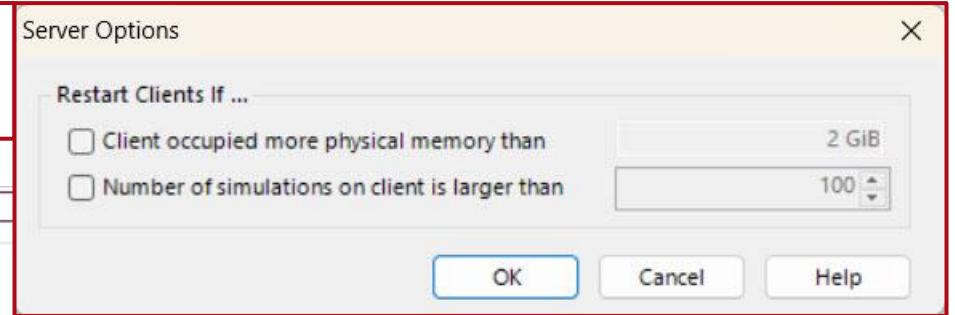
# Adding Clients



- To distribute the simulation task to different clients, click *Add Clients on Remote Machine*.
- A new window will appear listing all host computers running the `ServerSupportService.exe` file mentioned earlier.
- Specify how many clients to add to the different host machines, and then click *OK*.

# The Distributed Computing Control Panel

Additional server options for automatically restarting clients under certain circumstances can be defined here:



Server Tools

Stop Server + Add Clients on Remote Machine Start File Watcher

Clients

Status	Host Machine	Clients	CPU	RAM	Active	Disconnect
Green	It999.lighttrans2.local	(0 of 2)	0 %	2.67 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Green	It888.lighttrans2.local	(0 of 2)	5 %	9.92 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Green	It777.lighttrans2.local	(0 of 2)	1 %	5.35 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Disable Logging Clear

Property Browser VirtualLab Explorer Assistant Distributed Computing

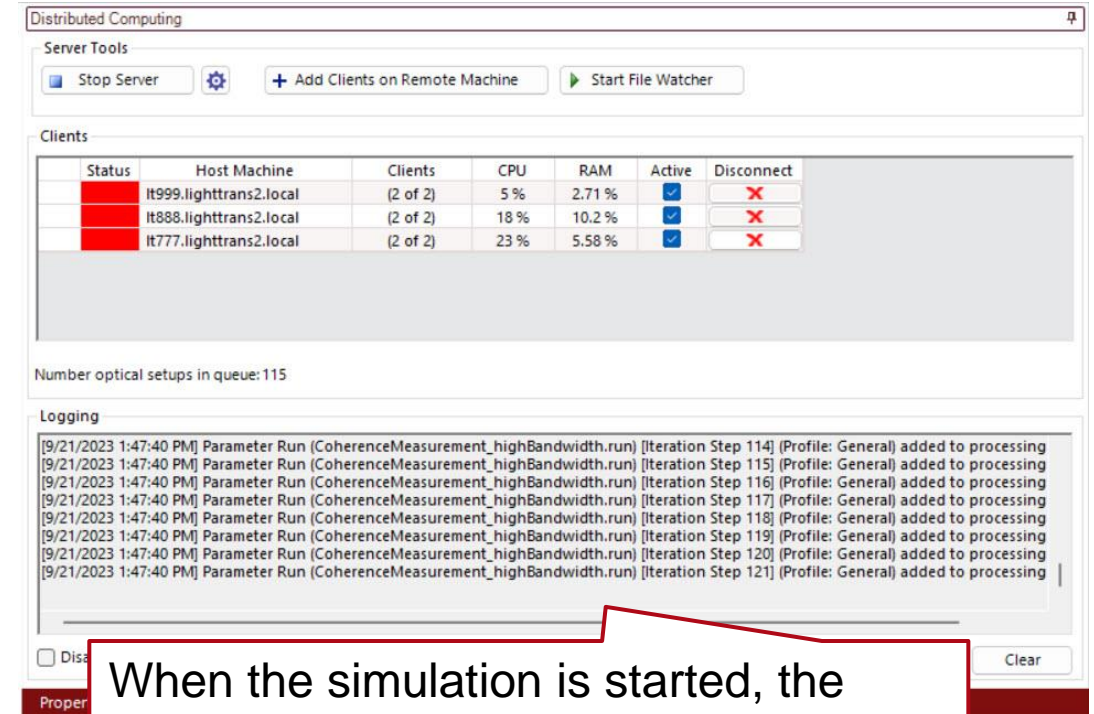
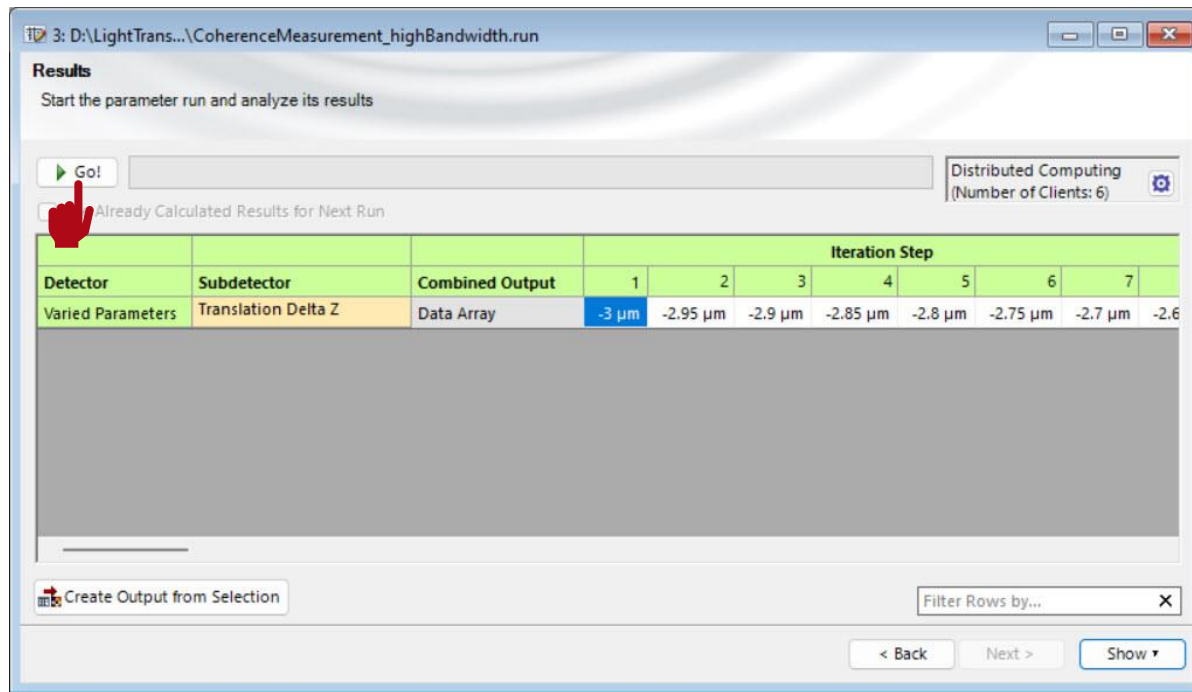
The *Status* column is coded by 4 colors:

- green: all clients are available
- yellow: some clients are calculating
- red: all clients are calculating
- grey: host machine is inactive

The clients are automatically listed in the *Distributed Computing Control Panel*, including helpful information such as the current RAM or CPU usage on the host machines.

# Starting a Simulation via Distributed Computing

The simulation is started similar to a usual one, using either the *Go!* – button in the main menu or in the *Parameter Run* document.



When the simulation is started, the progress is logged in the *Distributed Computing Control Panel*.

# Document Information

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title	Usage of Distributed Computing
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category	Feature Use Case
further reading	