

GAMS/KESTREL - Remote Solver Execution on NEOS Servers

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1 Background

The Kestrel client/server is a way of sending your GAMS solve job to be solved via the NEOS Server from within your usual GAMS modeling environment and receiving results that can be processed as with any local solver. Starting with distribution 23.7 the Kestrel solver is part of the GAMS distribution. For older versions of GAMS a download can be found at the [Kestrel page on the NEOS Server](#). The solve statement using the GAMS/KESTREL solver invokes a client program that sends your problem to a solver running on one of the NEOS Server's remote computers. The results from the NEOS Server are eventually returned through Kestrel to GAMS, where you can view and manipulate them locally in the usual way. The introduction below covers everything you need to know to start using GAMS/KESTREL. Further information about more advanced features and other uses of Kestrel can be found at the [Kestrel page on the NEOS Server](#).

2 Using GAMS/KESTREL

The Kestrel solver can be used to solve a GAMS model remotely. For example, consider the trnsport model from [GAMS Model Library](#). It can be solved locally in GAMS through the following statements,

```
model transport /all/;
solve transport using lp minimizing z;
```

which specify the trnsport model and solve it with the default linear programming solver. We can add an option statement to the code to explicitly specify the solver. For example, if we change the linear programming solver to GAMS/MINOS, the code becomes

```
model transport /all/;
option lp=minos;
solve transport using lp minimizing z;
```

To solve the same problem remotely through the NEOS Server, we simply change the linear programming solver to Kestrel.

```
transport.optfile=1;
option lp=kestrel;
solve transport using lp minimizing z;
$echo kestrel_solver minos > kestrel.opt
```

The statement `transport.optfile=1` specifies that an options file, called `kestrel.opt`, will be used. The options file contains the remote solver name as well as any options for the remote solver. We instruct the Kestrel solver to use GAMS/MINOS as the remote solver by writing the following `kestrel.opt` file: `kestrel_solver minos`.

If you do not know what solvers are available via GAMS/KESTREL, submitting a job with a nonexistent solver set will return a list of enabled solvers.

A subsequent run of the code through the GAMS interpreter results in the transport model being solved through the NEOS Server with the GAMS/MINOS solver. Once the job is submitted to the NEOS Server, a job number, password, and Web address are displayed to the screen, which provide information on accessing the job and viewing the intermediate output, for example,

```
--- Executing KESTREL
Job has been submitted to Kestrel
Kestrel/NEOS Job number      : 93478
Kestrel/NEOS Job password    : utiwtxTK
Check the following URL for progress report :
    http://www-neos.mcs.anl.gov/neos/neos-cgi/check-status.cgi?job=93478&pass=utiwtxTK
In case of problems, e-mail: neos-comments@mcs.anl.gov
```

To look at the solver's output while it is running, point your browser at the URL given in the Kestrel output as shown above, and click on View Intermediate Results in the web page that appears. This will take you to another page that shows all of the output produced by the solver for your problem so far. To track the solver's progress, simply update this page periodically.

If the NEOS Server or the network becomes unavailable after the submission, a particular job can be retrieved by setting both the `kestrel` job and `kestrel` password in the options file.

```
kestrel_solver minos
kestrel_job 93478
kestrel_password utiwtxTK
```

Re-issuing the command `gams transport` with this options file will retrieve the results for the specified job number.