



THE TIMES CLOUD SERVICE

SUMMER 2021 SEMI-ANNUAL ETSAP MEETING

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Agenda

- Background
- Status report
- Live demo

Background - TIMES Cloud Service

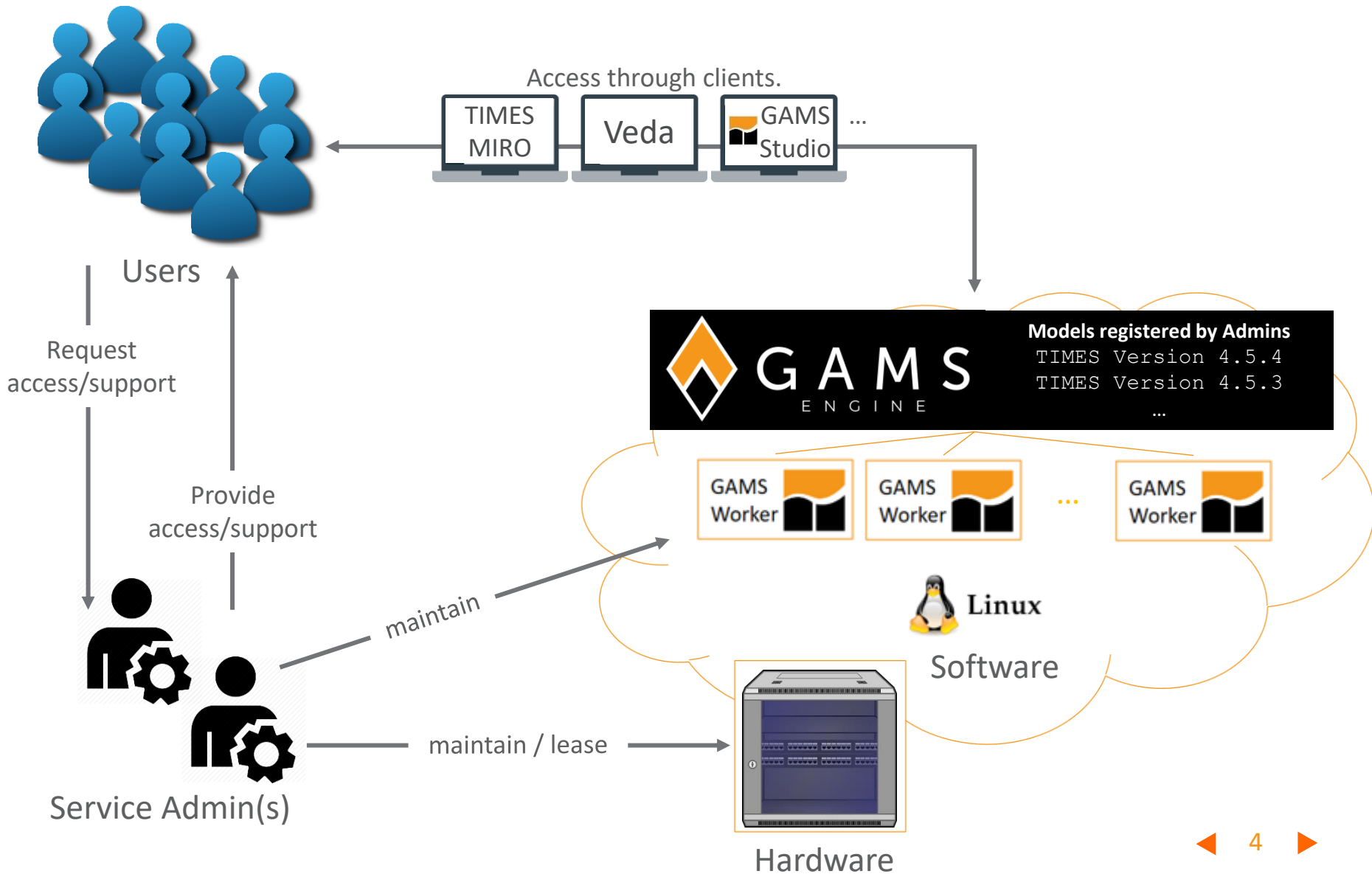
We have been asked for a solution allowing

- occasional/new TIMES users to solve TIMES models
 - without the need to purchase a GAMS/Solver license
 - without limitations imposed by free services such as NEOS (academic use only, resource restrictions)
- existing TIMES users to outsource certain computations to powerful hardware

→ Submitted a project proposal for a **TIMES Cloud Service** in 12/2020

- that allows to solve TIMES models “in the cloud”
- that is convenient to access
- that uses state of the art cloud technology (GAMS Engine)

Background – Roles & Components



Status Report

- TIMES Cloud Service ^{BETA} is up and running (Live demo about to follow)
- The Service runs on a dedicated server with 12 physical/24 logical cores, 128 GB RAM
- Up to 8 parallel Jobs allowed. Integrated job scheduler manages the queue of submitted jobs (currently on a first come, first serve basis)

Next steps

- Get users involved and collect user feedback
 - To request a registration code, send an email to timescloud@gams.com
- Explore need/potential for adjustments, e.g.
 - advanced user management options (e.g. usage quotas)
 - elastic cloud / make experiments (flexibility vs simplicity)

Live Demo

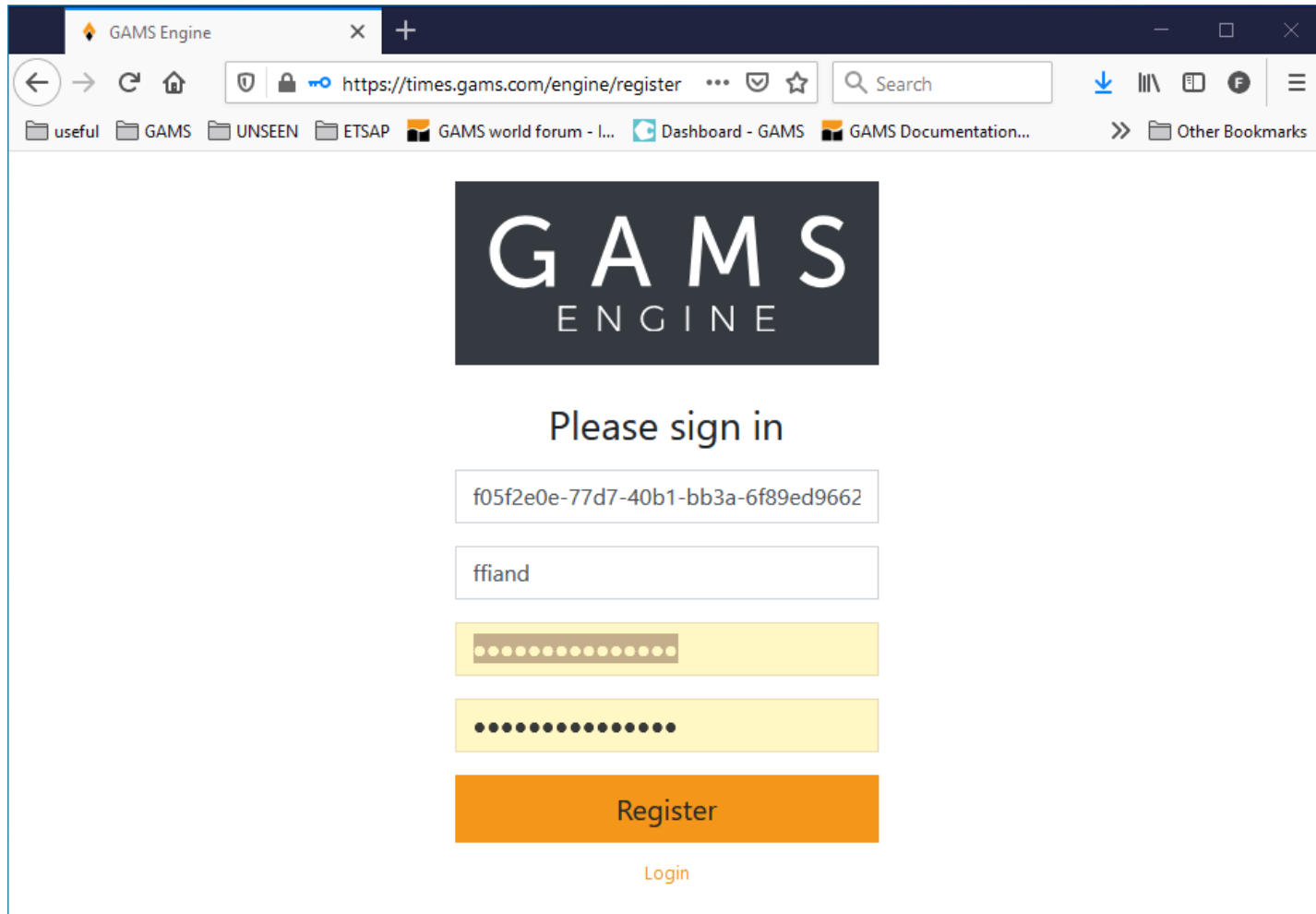
- How to get access?
- Clients
 - GAMS Engine Web UI
 - GAMS Studio
 - TIMES MIRO App
 - Custom clients based on OpenAPI
 - Veda
 - Veda online

How to get access?

1. Request registration code by sending an email to timescloud@gams.com

How to get access?

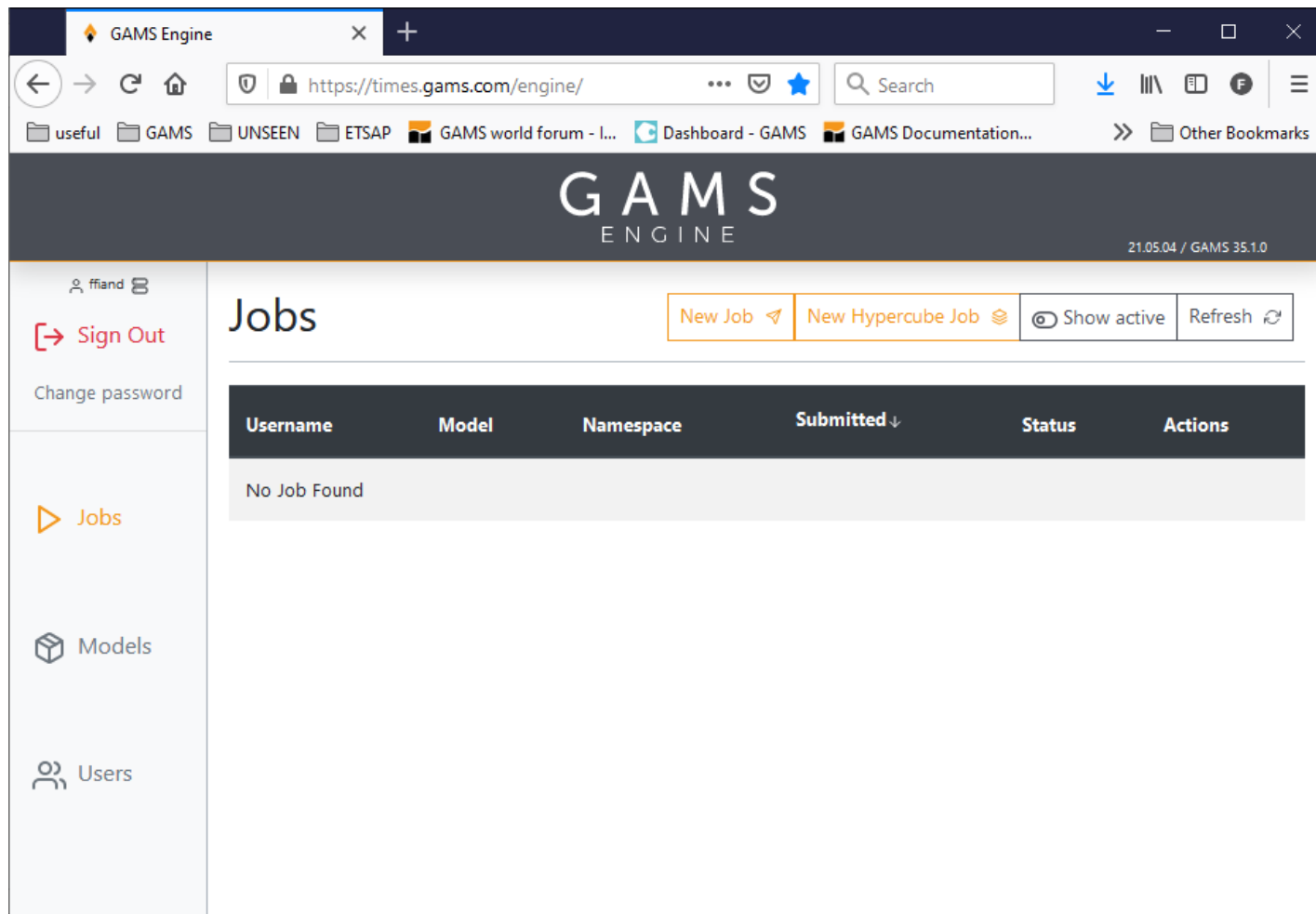
Goto <https://times.gams.com/engine/register> and use your registration code



The screenshot shows a web browser window with the address bar displaying <https://times.gams.com/engine/register>. The page features the GAMS ENGINE logo at the top. Below the logo, the text "Please sign in" is displayed. The registration form consists of several input fields: a text field containing the registration code "f05f2e0e-77d7-40b1-bb3a-6f89ed9662", a text field for the username "ffiand", a password field with a yellow background and a row of dots, and another password field with a yellow background and a row of dots. At the bottom of the form is an orange "Register" button. Below the "Register" button is a "Login" link.

How to get access?

After registration, you will be logged in to the GAMS Engine Web UI

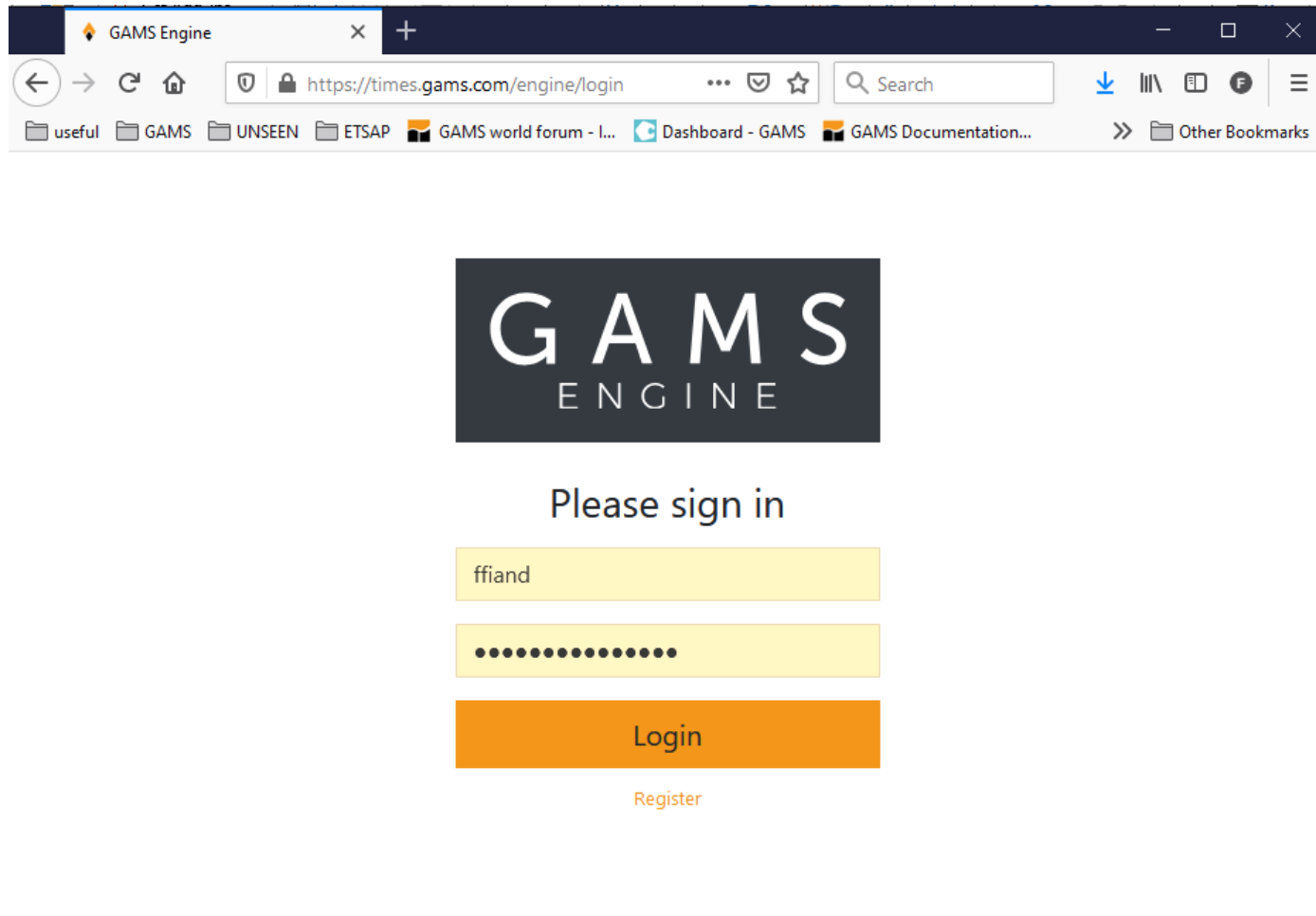


The screenshot displays the GAMS Engine Web UI interface. The browser address bar shows the URL <https://times.gams.com/engine/>. The page header features the GAMS ENGINE logo and the version information 21.05.04 / GAMS 35.1.0. The main content area is titled "Jobs" and includes buttons for "New Job", "New Hypercube Job", "Show active", and "Refresh". Below these buttons is a table with the following columns: Username, Model, Namespace, Submitted, Status, and Actions. The table currently displays "No Job Found". A left sidebar contains navigation options: "Sign Out", "Change password", "Jobs", "Models", and "Users".

Username	Model	Namespace	Submitted	Status	Actions
No Job Found					

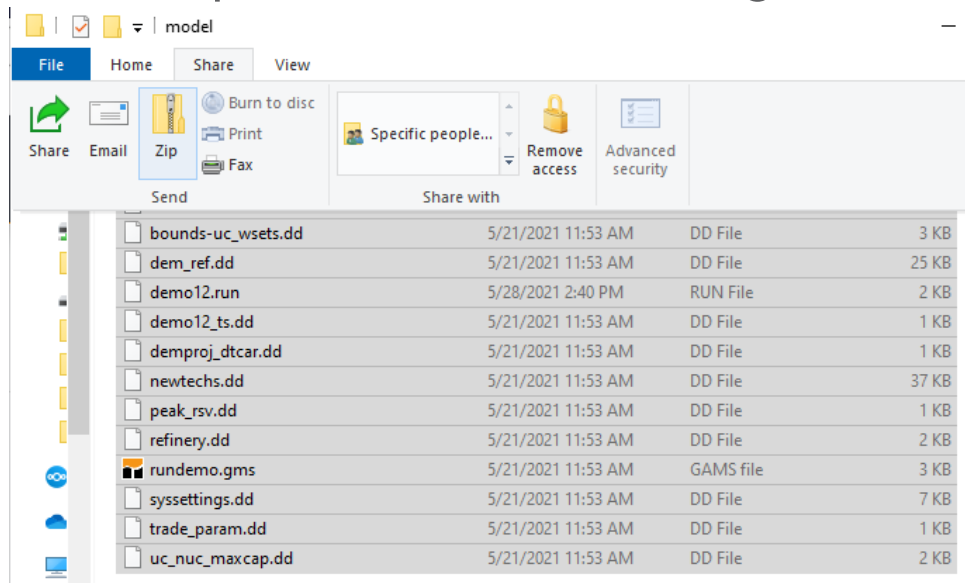
Client 1 – GAMS Engine Web UI

- Go to <https://times.gams.com/engine/login> and sign in



Client 1 – GAMS Engine Web UI

- Submit new Job (registered model)
 - Navigate to Jobs → New Job → TIMES namespace → use registered model → select a registered model (e.g. “latest”)
 - Create and upload a ZIP containing *.run and *.dd files



Client 1 – GAMS Engine Web UI

- Submit new Job (registered model)
 - Navigate to Jobs → New Job → TIMES namespace → use registered model → select times452
 - Create and **upload a ZIP containing *.run and *.dd files**
 - **Define the *.run file through the options field**

The screenshot shows the GAMS Engine Web UI interface for submitting a new job. The header displays 'GAMS ENGINE'. The sidebar on the left shows the user 'fred_demo' with a 'Sign Out' button and a 'Change password' link. The main content area is titled 'Submit new job' and contains the following elements:

- Select a namespace:** A dropdown menu with 'TIMES' selected.
- Use a registered model?:** A checked checkbox.
- Select a model:** A dropdown menu with 'latest' selected.
- File upload:** A text input field containing 'model.zip' (circled in blue) and a 'Browse' button.
- Advanced options:** A text input field containing '--runfile=demo12.run|' (circled in red), with the label 'Advanced options' above it.
- Optional fields:** Text input fields for 'Log file name (optional)', 'Text entries (comma-separated, optional)', 'Stream entries (comma-separated, optional)', and 'Job dependencies'.
- Filter results:** An unchecked checkbox labeled 'Filter results (e.g. to reduce the size of the results archive)?'.
- Submit job:** A large orange button at the bottom.

Client 2 – GAMS Engine Web UI

- Job will be shown in the Jobs Overview

GAMS ENGINE

fred_demo

Sign Out

Change password

Jobs

New Job New Hypercube Job Show active Refresh

Model	Namespace	Submitted	Status	Actions
latest	TIMES	a few seconds ago	Running	Show Cancel
latest	TIMES	10 minutes ago	Finished	Show Download

- Click on Show and Download results

GAMS ENGINE

fred_demo

Sign Out

Change password

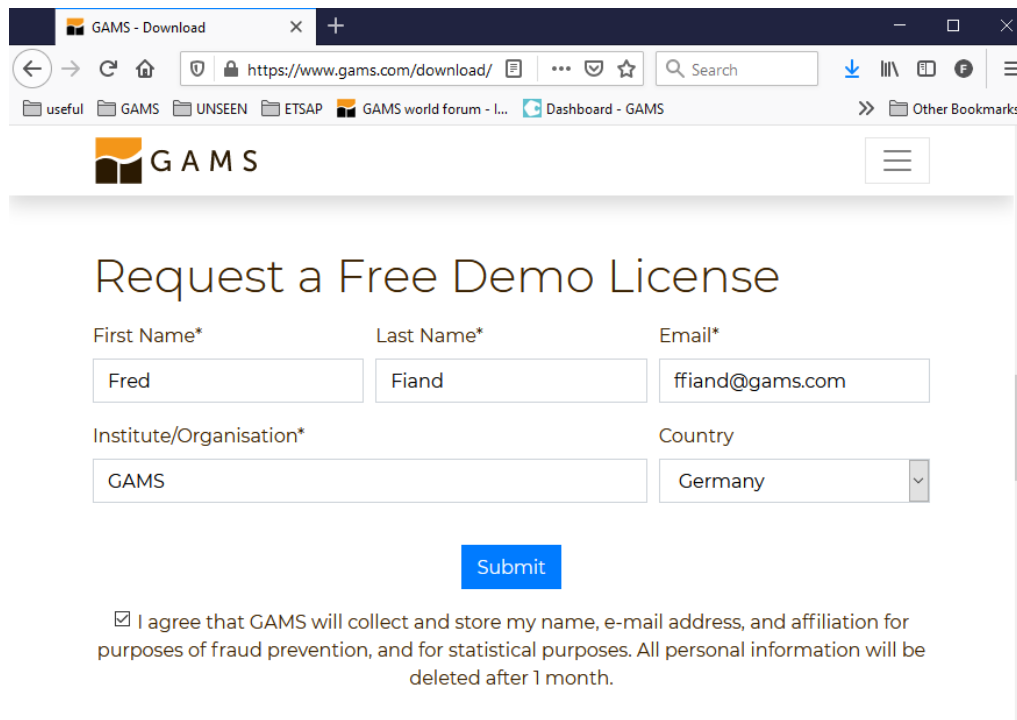
Jobs

Models

Request		Result	
Token	9083dfbb-78b3-4daf-acf6-9e0fe87ec779	Status	Finished
Submitted	a minute ago	Process status	0
Namespace	TIMES	Text entries	log_stdout.txt
Model Information		Result zip	Download Delete results
Model	latest		
Data provided	Yes		

Client 2 – GAMS Studio (local compilation/remote execution)

- Have your TIMES Model available locally, e.g. the TIMES Demo model available on GitHub: https://github.com/etsap-TIMES/TIMES_Demo
- Install GAMS: <https://www.gams.com/download/>
 - If you do not have a license, fill out the form to request a demo license



The screenshot shows a web browser window with the URL <https://www.gams.com/download/>. The page title is "Request a Free Demo License". The form contains the following fields:

First Name*	Last Name*	Email*
<input type="text" value="Fred"/>	<input type="text" value="Fiand"/>	<input type="text" value="ffiand@gams.com"/>
Institute/Organisation*	Country	
<input type="text" value="GAMS"/>	<input type="text" value="Germany"/>	

Below the form is a blue "Submit" button. At the bottom, there is a checkbox that is checked, with the text: "I agree that GAMS will collect and store my name, e-mail address, and affiliation for purposes of fraud prevention, and for statistical purposes. All personal information will be deleted after 1 month."

Client 2 – GAMS Studio (local compilation/remote execution)

- Install license
(https://www.gams.com/latest/docs/UG_License.html)

Your GAMS Demonstration license DL042220 Inbox x

noreply@gams.com

to me ▾

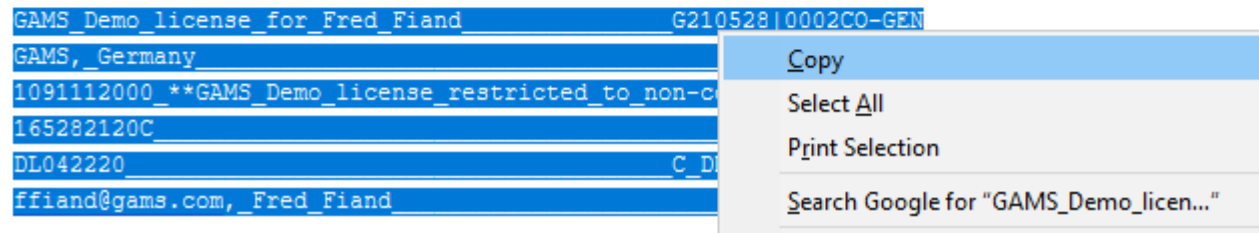
Ref: DL042220

Please find the requested demonstration license for GAMS below.

You can always download the latest distribution at <https://www.gams.com/download>

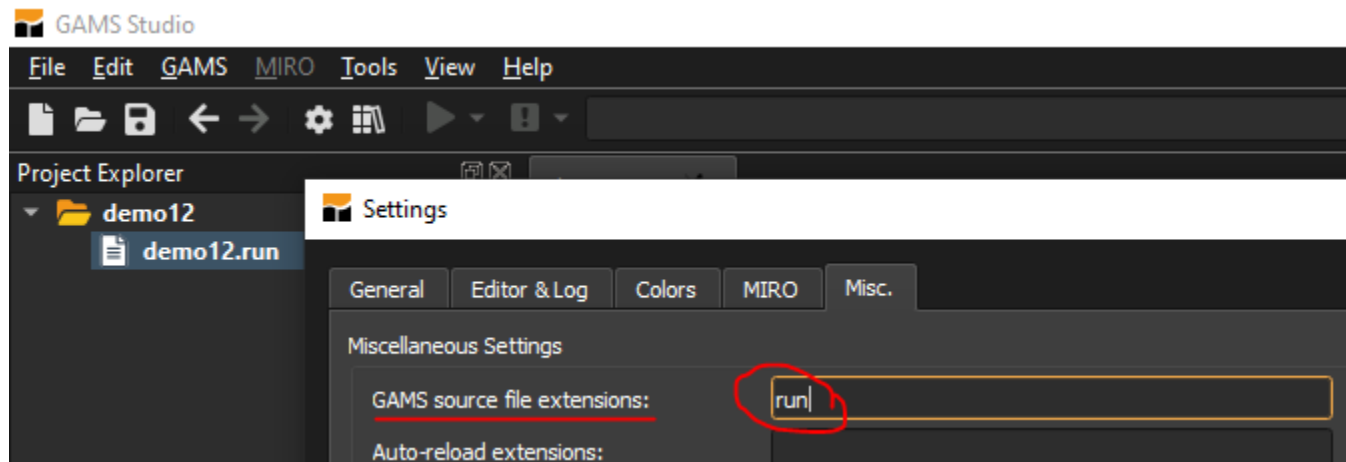
Important: This license requires at least distribution 30.0 to work - older distributions are not supported.

```
GAMS_Demo_license_for_Fred_Fiand      G210528|0002CO-GEN
GAMS, Germany
1091112000 **GAMS_Demo_license_restricted_to_non-c
165282120C
DL042220                               C_D
ffiand@gams.com, Fred_Fiand
```



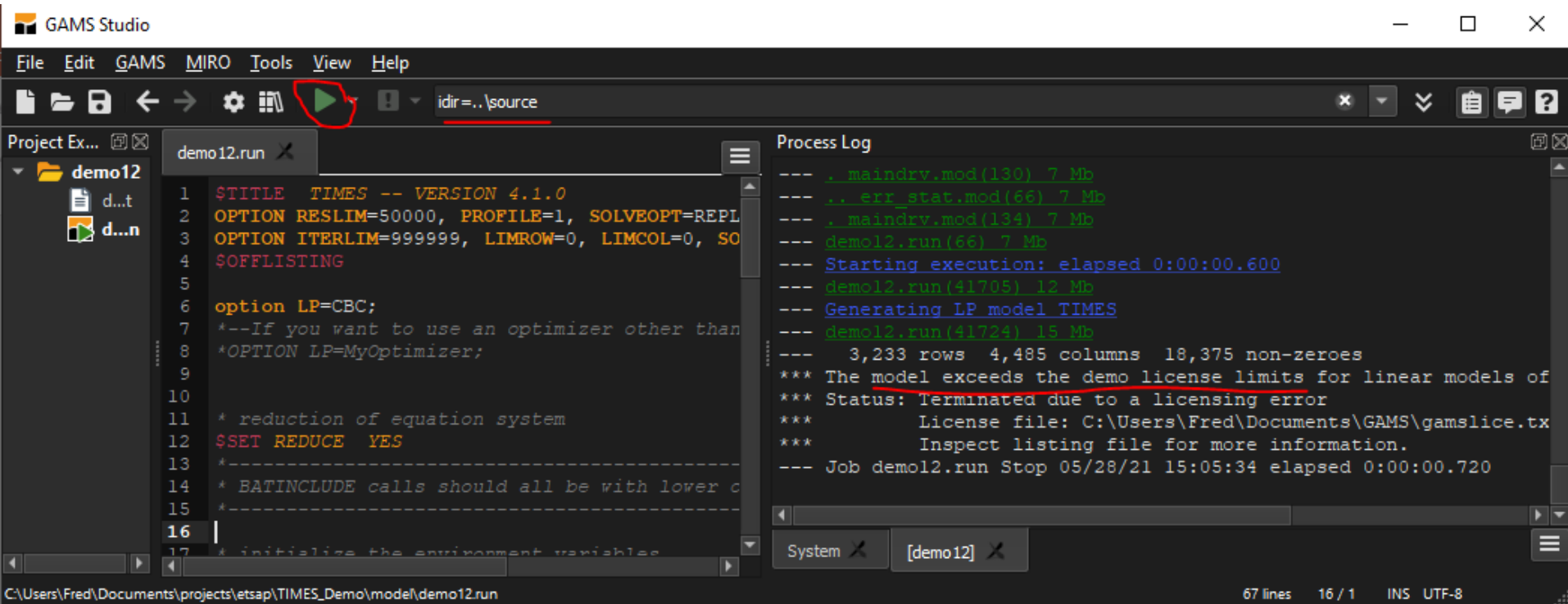
Client 2 – GAMS Studio (local compilation/remote execution)

- Open *.run file in GAMS Studio
- Make sure *.run file is recognized as executable GAMS file



Client 2 – GAMS Studio (local compilation/remote execution)

- Run TIMES locally (won't work with demo license)



The screenshot displays the GAMS Studio application window. The title bar reads "GAMS Studio". The menu bar includes "File", "Edit", "GAMS", "MIRO", "Tools", "View", and "Help". The toolbar contains icons for file operations and a green play button, which is circled in red. The main window is divided into three panes:

- Project Explorer:** Shows a project named "demo12" with sub-items "d...t" and "d...n".
- Editor:** Displays the GAMS model file "demo12.run" with the following code:

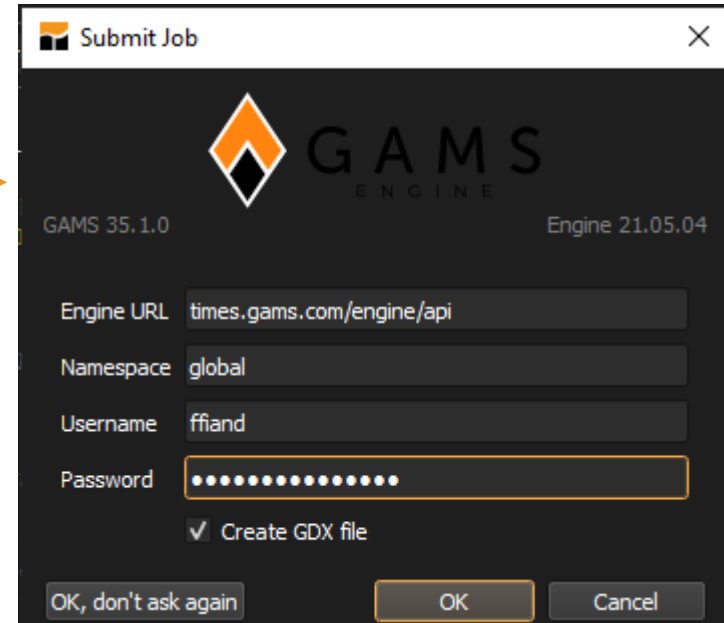
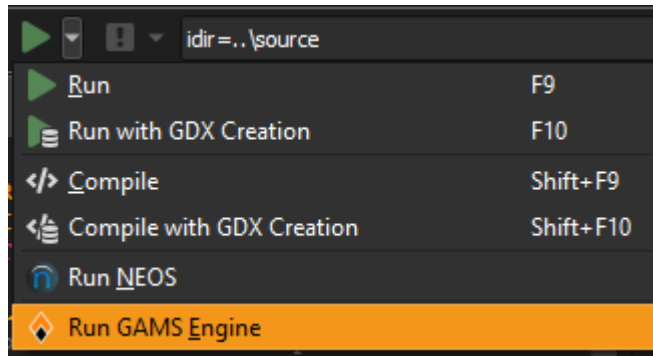
```
1 $TITLE TIMES -- VERSION 4.1.0
2 OPTION RESLIM=50000, PROFILE=1, SOLVEOPT=REPL
3 OPTION ITERLIM=999999, LIMROW=0, LIMCOL=0, SO
4 $OFFLISTING
5
6 option LP=CBC;
7 *--If you want to use an optimizer other than
8 *OPTION LP=MyOptimizer;
9
10 * reduction of equation system
11
12 $SET REDUCE YES
13 *-----
14 * BATINCLUDE calls should all be with lower c
15 *-----
16
17 * initialize the environment variables
```
- Process Log:** Shows the execution output:

```
--- ._maindrv.mod(130) 7 Mb
--- .._err_stat.mod(66) 7 Mb
--- ._maindrv.mod(134) 7 Mb
--- demo12.run(66) 7 Mb
--- Starting execution: elapsed 0:00:00.600
--- demo12.run(41705) 12 Mb
--- Generating LP model TIMES
--- demo12.run(41724) 15 Mb
--- 3,233 rows 4,485 columns 18,375 non-zeroes
*** The model exceeds the demo license limits for linear models of
*** Status: Terminated due to a licensing error
*** License file: C:\Users\Fred\Documents\GAMS\gamslice.tx
*** Inspect listing file for more information.
--- Job demo12.run Stop 05/28/21 15:05:34 elapsed 0:00:00.720
```

The status bar at the bottom indicates "67 lines 16 / 1 INS UTF-8".

Client 2 – GAMS Studio (local compilation/remote execution)

- Run TIMES through the cloud service



```
--- Job demol2.run Stop 05/28/21 15:10:37 elapsed 0:00:00.188
  adding: demol2.gms (164 bytes security) (stored 0%)
  adding: demol2.g00 (164 bytes security) (deflated 10%)

--- switch to Engine .\demol2\demol2.lst
TOKEN: c35d8038-f3f7-43e2-8a25-ad3477779bd8

--- Job demol2.gms Start 05/28/21 13:10:37 35.1.0 r82a9585 LEX-LEG x86 64bit/Linux
```

Client 3 – VEDA

The screenshot displays the VEDA software interface with three main panels:

- Settings Panel:**
 - GAMS Root:** Set GAMS Folders Path
 - Path:** C:\VEDA\Veda
 - Source Times:** GAMS_SrcTIMES.v4.5.4
 - Work Times:** GAMS_WrkTIMES
 - Max Runs:** 6
 - Study:** pilot_runs
 - Solver:** CPLEX
 - Solver Option:** CPLEX
 - Restart Option DD Writing Only **GAMS Engine** VRQ
 - Save
- Region Groups Panel:**
 - AllRegion
 - Filter
 - Region
 - REG1
 - REG2
- Logs Panel:**
 - Runs Status
 - Cas... Solv...
 - Demo... 00:00
 - Count: 1
 - DD writing
 - Creating zip file t...
 - DemoS_012
 - Submitting job to...
 - Waiting for job to...
 - Downloading res...
 - Importing files fo...
 - Trying to establis...
 - Server...
 - Database is acces...
 - Trying to establis...
 - Server...
 - Database is acces...
 - Reading LST file (...
 - \DemoS_012\Der...

At the bottom, a table shows the current configuration:

Scenario Gr...	Region Gro...	Parametric ...	Properties...	Periods Def...	Ending Year	GDX Refer...	Updat...
DemoS_012	AllRegion		Save sol infor...	pdef-11	2050	False	10-06-2...

Client 3 – VEDA

DD writing

```
Creating zip file to submit to GamsEngine for case:  
DemoS_012  
Submitting job to GamsEngine for case: DemoS_012  
Waiting for job to complete for case: DemoS_012  
Downloading results for case: DemoS_012  
Importing files for case: DemoS_012  
Trying to establish connection with local PostgreSQL  
Server...  
Database is accepting connections.  
Trying to establish connection with local PostgreSQL  
Server...  
Database is accepting connections.  
Reading LST file @C:\VEDA\Veda\GAMS_WrkTIMES  
\DemoS_012\DemoS_012.lst  
Processing completed for file DemoS_012_1006.vds @  
C:\VEDA\Veda\GAMS_WrkTIMES  
\DemoS_012\DemoS_012_1006.vds  
Processing completed for file DemoS_012_1006.vde @  
C:\VEDA\Veda\GAMS_WrkTIMES
```



Solve



Thank You!

Email: timescloud@gams.com

Documentation: [here](#)