GUROBI OPTIMIZATION

gurobi.com Reference Manual Customer Support

WELCOME

You have successfully installed version 6.5 of the Gurobi Optimizer.

You'll find instructions for setting up your Gurobi license in this document, as well as a list of supported platforms, and Release Notes and guidelines for converting existing Gurobi code to run with this new version. Once you have finished browsing this document, you should refer to the Quick Start Guide, the Example Tour, or the Reference Manual to get started using the Gurobi Optimizer.

Obtaining Your License

Gurobi Optimizer 6.5 uses the same licenses as version 6.0, so if you already have a Gurobi 6 license, there's no need to obtain a new one. You may need to copy your existing license file to a new location, though. Consult the Quick Start Guide for information on where to store your license file.

If you don't already have a Gurobi 6 license, you will need to visit the Gurobi License Center. If you are a commercial user under maintenance, you should see your Gurobi 6 license under Current Gurobi Licenses. If you would like to request a free academic license, you can do so from the Free Academic License page. Once you have a license on the Gurobi web site, you will need to follow the instructions for installing a license in the Quick Start Guide.

Supported Platforms for Version 6.5

The following table lists the supported platforms for version 6.5:

Platform	Operating System	Compiler	Notes
	Windows Vista®, Windows 7, Windows 8.1, Windows 10	Visual Studio® 2010	Use gurobi_c++md2010.lib (e.g.) for C++
		Visual Studio	

Windows® 32-bit (win32)	Windows 7, Windows 8.1, Windows 10	2012	Use gurobi_c++md2012.lib (e.g.) for C++
	Windows 7, Windows 8.1, Windows 10	Visual Studio 2013	Use gurobi_c++md2013.lib (e.g.) for C++
	Windows 7, Windows 8.1, Windows 10	Visual Studio 2015	Use gurobi_c++md2015.lib (e.g.) for C++
Windows 64-bit (win64)	Windows Vista, Windows 7, Windows 8.1, Windows 10, Windows Server 2008 R2, Windows Server 2012 R2	Visual Studio 2010	Use gurobi_c++md2010.lib (e.g.) for C++
	Windows 7, Windows 8.1, Windows 10, Windows Server 2008 R2, Windows Server 2012 R2	Visual Studio 2012	Use gurobi_c++md2012.lib (e.g.) for C++
	Windows 7, Windows 8.1, Windows 10, Windows Server 2008 R2, Windows Server 2012 R2	Visual Studio 2013	Use gurobi_c++md2013.lib (e.g.) for C++
	Windows 7, Windows 8.1, Windows 10, Windows Server 2008 R2, Windows Server 2012 R2	Visual Studio 2015	Use gurobi_c++md2015.lib (e.g.) for C++
Linux® 64-bit (linux64)	Red Hat® Enterprise Linux 5.3-5.11, 6.0-6.7, 7.0-7.1	GCC 4.1/4.4	Use libgurobi_g++4.1.a for C++ in RHEL 5
	SUSE® Enterprise Linux 11, 12	GCC 4.3/4.4	
	Ubuntu® 12.04, 14.04, 15.04	GCC 4.2/4.3/4.4/4.6	
Mac OS 64-bit (mac64)	Mac OS X 10.9 (Mavericks), 10.10 (Yosemite), 10.11 (El Capitan)	Xcode 4/5/6	Use libgurobi_stdc++.a for -stdlib=libstdc++ in C++
AIX® 64-bit (power64)	AIX 6.1, 7.1	XL C/C++ 9	Due to limited Python support on AIX, this port does not include the Interactive Shell or the Python libraries.

Our MATLAB® interface supports MATLAB versions 2008b through 2016a. Our R interface supports R version 3.2.

Release Notes for Version 6.5

In addition to many performance enhancements, Gurobi 6.5 adds several new features:

- **Replay:** You can now record the sequence of Gurobi commands that your program executes to a file and play them back later. This feature can be quite useful for debugging performance issues, for identifying cases where your program leaks Gurobi models or environments, and for

relaying the exact sequence of commands your program issues to Gurobi technical support in case you run into a question or issue that is difficult to reproduce. This feature is controlled with the new **Record** parameter. For more details see the chapter on recording API calls in the reference manual.

- **Variable hints:** If you have a reasonable guess at a high quality solution to a MIP model (for example, from solving a related model), you can now pass the guess to Gurobi through the new variable hint feature. Hints are used in the Gurobi heuristics and in branching to guide the search. This feature is controlled with two new variable attributes:
  - **VarHintVal:** The value of the variable in the hint.
  - **VarHintPri:** Your level of confidence in the hint.
- **Update Mode:** Gurobi 6.5 provides a new lazy update mode. When you set the new **UpdateMode** parameter to 1, you can refer to newly created variables and constraints without having to call **update** first.
- **More control over Gurobi environments in the Python interface:** Users now have more precise control over when Gurobi environments are created and released in the Python interface. In particular, the default Python environment is not created until it is first used, and it can be released with the new **disposeDefaultEnv** method. This is particularly useful in iPython Notebook, where previously Gurobi would always consume a token as long as a notebook was open.
- **Compute an IIS directly from MATLAB:** You can now compute an IIS directly from the MATLAB interface using the new **gurobi_iis** function.
- **Access to best barrier iterate:** The new **BarX** attribute allows you to retrieve the best iterate computed by the barrier algorithm. Previously, this solution was unavailable when crossover was enabled.
- **String-based parameter modification routines in object-oriented interfaces:** Users can now set parameters from our object-oriented interfaces using string values. For example, env.set("Method", "2") will now set the **Method** parameter to 2.
- **Password protection for token servers:** Users can now set a password for their token server. Clients must provide the correct password to check out a token.
- **Single-use licenses no longer require a token server:** Users with single-use licenses will no longer have to set up and run a token server.
- **Enhanced distributed MIP logging:** Distributed MIP logging has been enhanced to look much more like single-machine MIP logging. In particular, the distribed log now gives much more intermediate progress information.
- **Compute Server encryption routines now in a separate executable:** The encryption routines used by Gurobi Compute Server are now packaged in a separate file (a separate DLL on Windows, and a separate shared object library on other platforms). User applications that don't use Compute Server don't need this file.
- **R interface extensions:** Our R interface now supports SOS constraints, quadratic constraints, piecewise-linear objectives, and new solution statistics.
- **Support for Visual Studio 2015:** We've added support for the latest Visual Studio release.
- **Support for C++11 on Mac:** We've added support for the latest C++ compiler on Mac (while also still supporting the old compiler).
- **New OPB file reader:** Users can now read OPB-format files, which are used to store pseudo-boolean models. Reading a file with a **.opb** suffix will create a MIP representation of the pseudo-boolean problem.
- **License file location command:** The new **gurobi_cl --license** command allows you to determine the location of the Gurobi license file that is currently being used.

- **Additional new parameter:**
  - **PreMIQCPForm:** Determines the type of model produced by MIQCP presolve. It can produce an MIQCP model, an MISOCP model, or a disaggregated MISOCP model.
  - **WorkerPort:** Allows the user to specify a non-default port for the distributed workers in a distributed algorithm.

Code Conversion from Version 6.0

Programs that were originally written for version 6.0 of the Gurobi Optimizer generally won't require any code changes to use version 6.5. If you'd like to use the new features, some code changes are required.

Customers who are using Gurobi Compute Server and are deploying the Gurobi library (gurobi65.dll or libgurobi65.so) with their application should now also include the new AES library (aes65.dll or libaes65.so).

Acknowledgements

We would like to thank Michael Helmling for his help with our Python interface. Python expression building is now dramatically faster thanks to his work.

License Agreement

Note that this software is covered by the Gurobi End User License Agreement. By completing the Gurobi installation process and using the software, you are accepting the terms of this agreement.

Thank you using Gurobi products!
