All that begins . . .

السلام عليكم

peace be upon you

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SCAE.Initiative
(Open Source Computer Aided Engineering)

Introduction to Linux

GUI via Ubuntu MATE 16.04 LTS

Abu Hasan 'ABDULLAH

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Outline

- Linux is an Open Source UNIX-like operating system. It consists of the Linux kernel, its utilities and a huge number of applications.
- There are various distributions of Linux which differ in the way these elements are packaged and presented.
- In our Open Source Computer-Aided Engineering Inititive (**OSCAE**.Initiative) Laboratories, we installed **Ubuntu MATE 16.04 LTS**.
- The graphical desktop in this distribution of Linux is called MATE, which is derived from (the now unmaintained) GNOME 2, a user-friendly interface for Linux.

- The name "MATE" comes from yerba maté, a species of holly native to subtropical South America. Its leaves contain caffeine and are used to make infusions and a beverage called mate. The name is pronounced like Mah-tay, not like Mait.

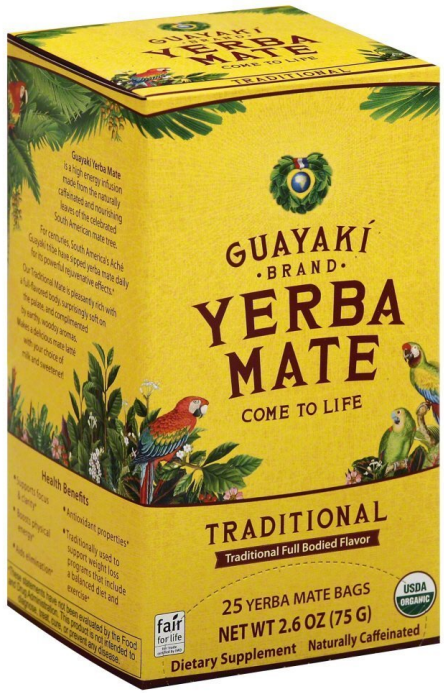

Figure 1: Yerba maté.

- **OSCAE**.Initiative at UTM has 45 Linux Graphical Workstations: 20 at UTM, Kuala Lumpur (in Postgraduate Computer Lab, Razak Tower), 10 in Computer Lab at the Marine Technology Centre and 15 in C24-407, the last two labs at UTM, Skudai.
- They are linked through the Campus network. User will login to `theuser` account and get connected to `theuser`'s home folder on whichever workstation he/she uses.

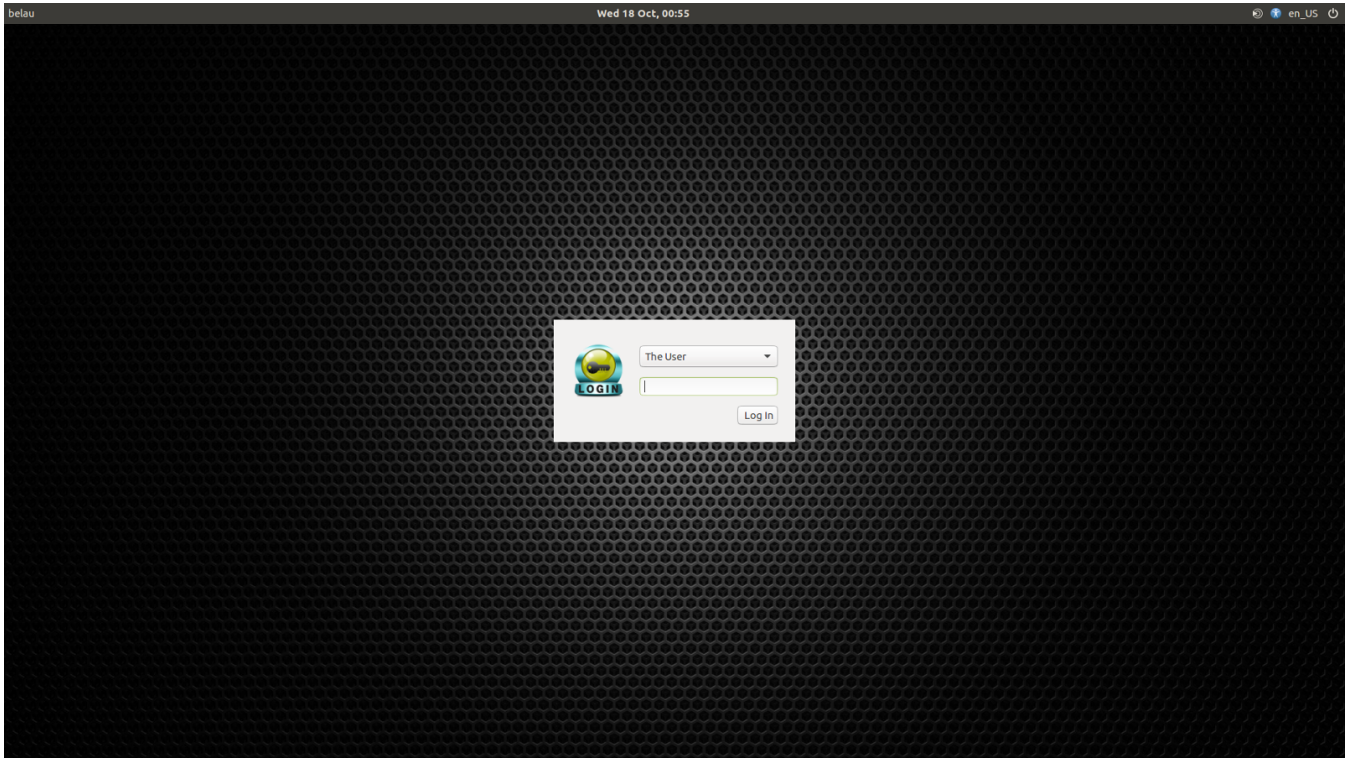

Figure 2: Login screen

MATE Applications

New names for common apps

- MATE provides an attractive, intuitive, easy-to-use and configurable desktop environment.
- MATE largely consists of GNOME 2 applications, utilities and applets, which have been forked and renamed to avoid conflicts with their GNOME 3 counterparts.
  - Alacarte is renamed Mozo;
  - Nautilus is renamed Caja;
  - Metacity is renamed Marco;
  - Gedit is renamed Pluma;
  - Eye of GNOME is renamed Eye of MATE;
  - Evince is renamed Atril;
  - File Roller is renamed Engrampa.

- Table 1 is a small list of Linux programs (on the right) that replaces their Microsoft Windows equivalent.

Table 1: Linux's equivalents to common Windows applications

MS Windows Software Title	Linux Software Replacement
File Explorer	Caja
Photos	Eye of MATE Image Viewer
MS Paint	Pinta
Notepad	Pluma
WordPad	LibreOffice Writer
Calculator	Galculator
Windows Media Player	VLC Media Player
Adobe PDF Viewer	Atril Document Viewer
Adobe Acrobat Professional	Master PDF Editor 4

Ubuntu MATE Desktop

After login

- When you first login, the desktop contains the Top Edge Panel and a background containing a link to the your home directory file browser. The Top Edge Panel has a calendar and a network monitor to the right, and at the left is the MATE Menu.

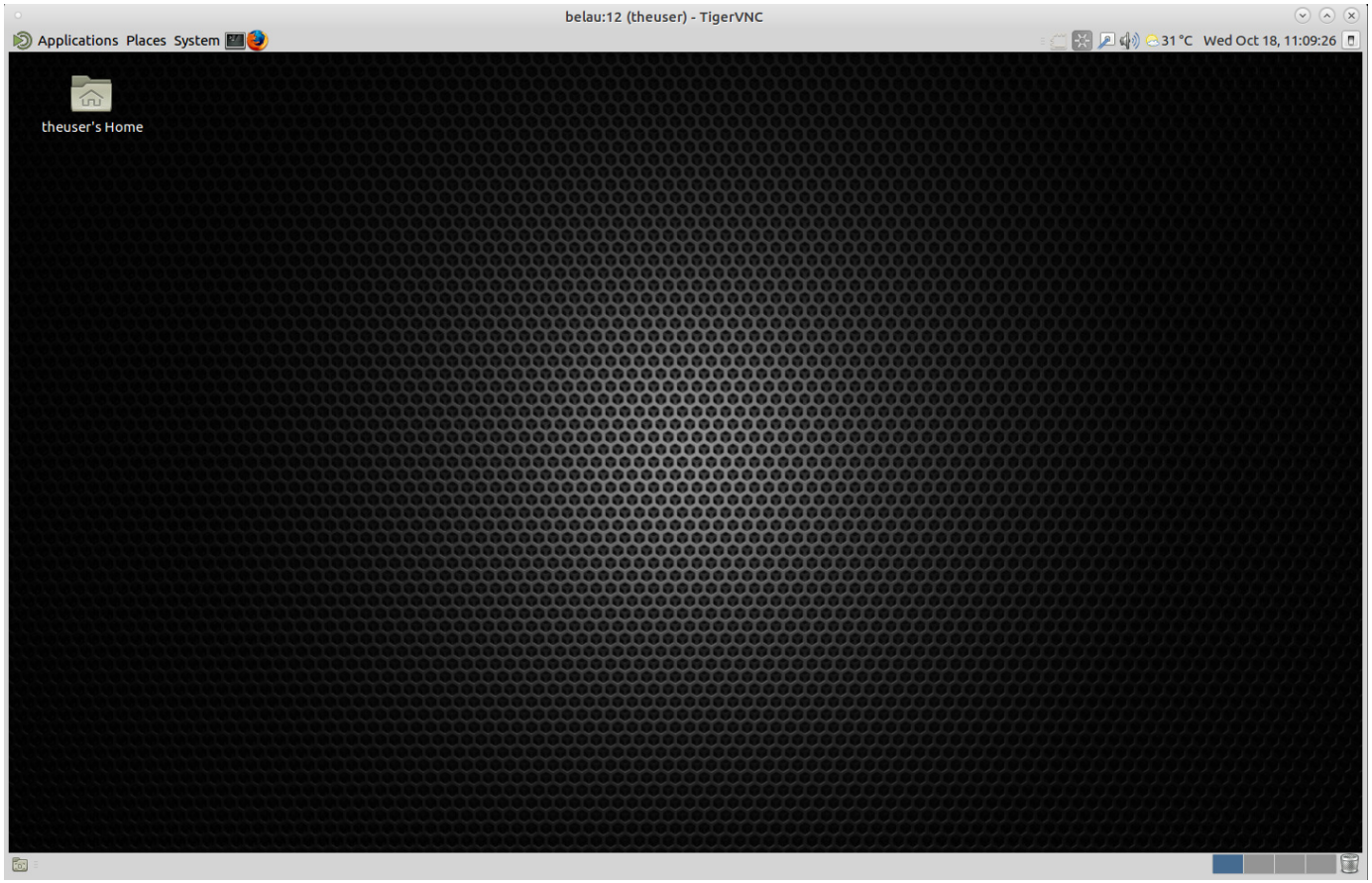

Figure 3: Ubuntu MATE desktop screen after login.

- Applications menu
- The MATE Menu in the top edge panel is where you find and launch applications.
- Move your mouse pointer over the word Applications and click the left mouse button to open the menu panel.
- As you click on Applications, a list of categories for all the installed applications appear. CAE Tools, and TeX & Friends are specially customized categories for **OSCAE**.Initiative's Linux workstations.

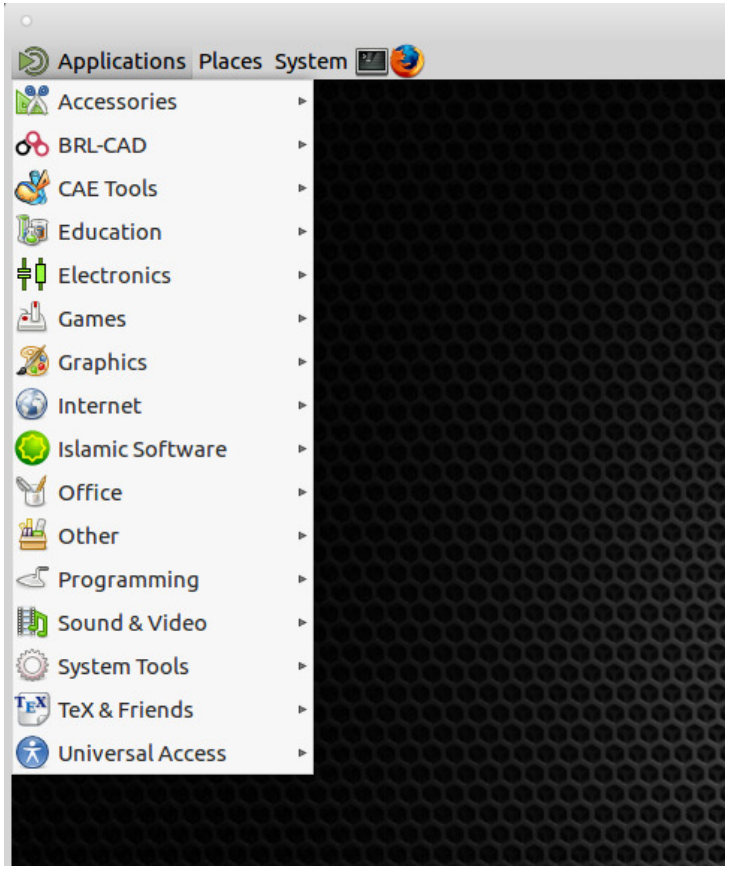

Figure 4: Applications menu.

- Applications ▷ CAE Tools was customized to highlight **OSCAE** tools.
- It collects and subcategorizes CAE tools further into
  1. CAD
  2. CAE Preprocessors
  3. CAE Solvers
  4. CAE xPostprocessors
- Open source scientific tools include GNU Octave, Scilab, FreeMat and Maxima whilst the commercial ones are Matlab and Maple.
- Other data analysis tools include SciDAVis, QtiPlot, g3data and Datacapture.
- GNU PSPP and R provide tools for statistical analysis.

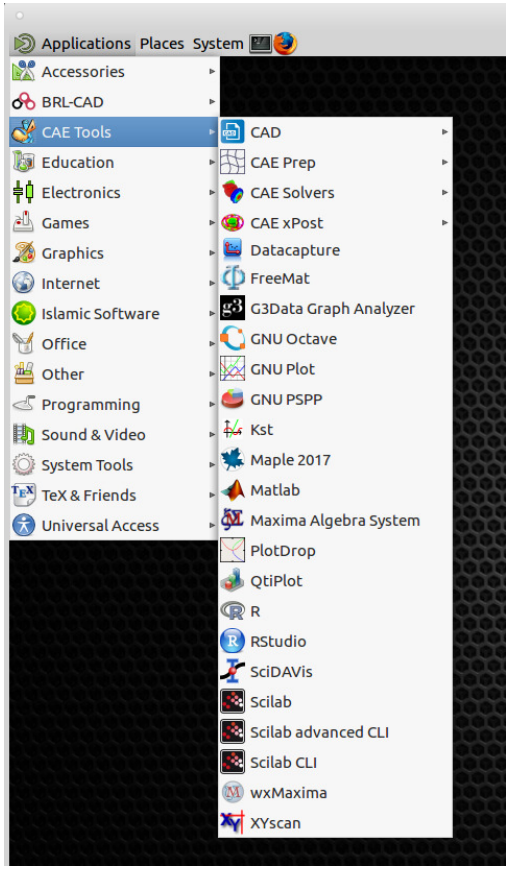

Figure 5: Applications ▷ CAE Tools.

- Applications ▷ CAE Tools ▷ CAD
- Open Source CAD tools
  - FreeCAD
  - QCAD
  - LibreCAD
  - gCAD3D

  3-D rendering, movie-making tools
  - Blender
  - Luxrender
- Commercial CAD tool(s)
  - VariCAD

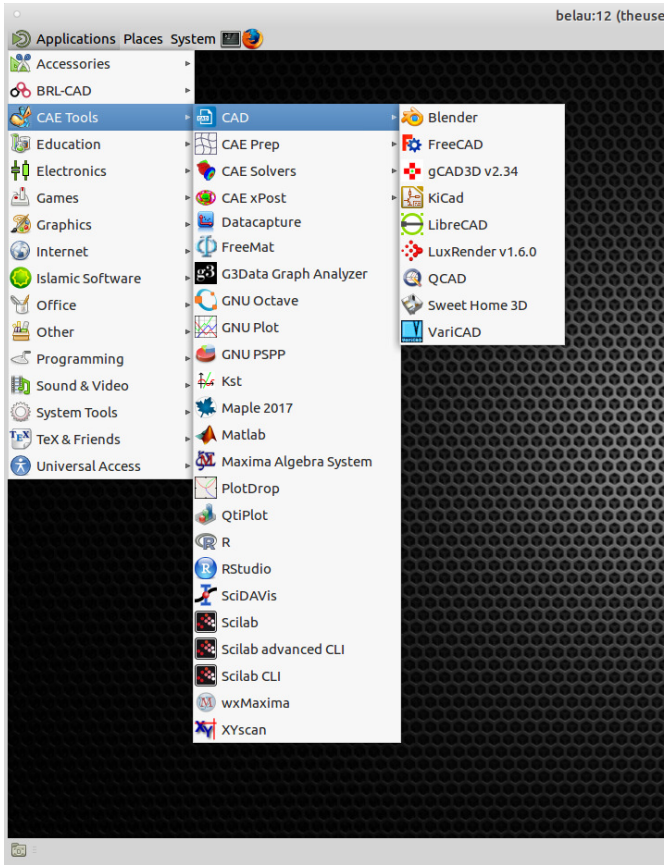

Figure 6: Applications ▷ CAE Tools ▷ CAD.

- Applications ▷ CAE Tools ▷ CAE Prep
- Open Source CAE preprocessing tools
  - Salome
  - gmsh
  - ElmerFront
  - NetGen
  - MeshLab
- Commercial CAE preprocessing tool
  - Pointwise

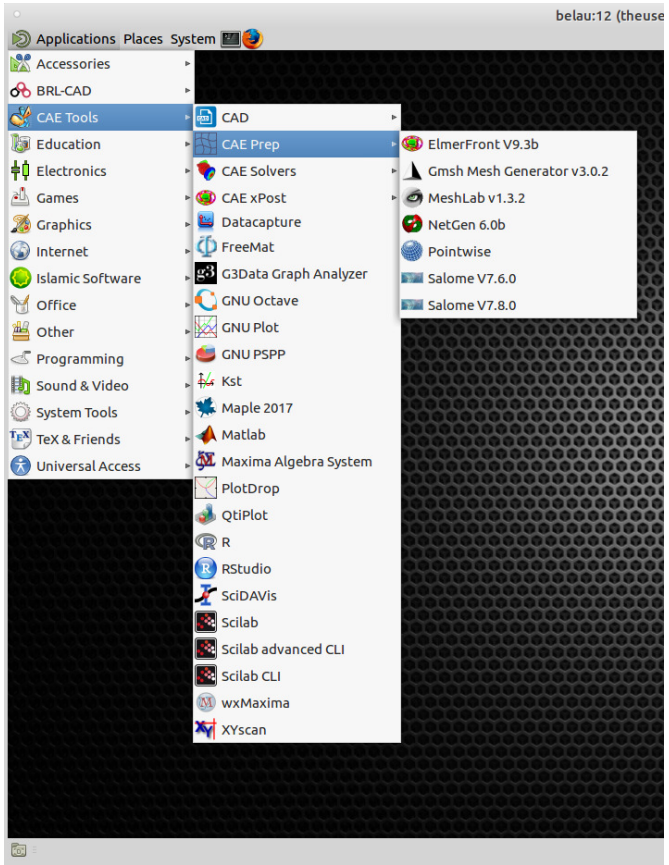

Figure 7: Applications ▷ CAE Tools ▷ CAE Prep.

- Applications ▷ CAE Tools ▷ CAE Solvers
- Open Source CAE solvers
  - EDF Salome-MECA
  - z88 Aurora
  - CalculiX
  - OpenFOAM
  - EDF Code_Saturne
- Commercial CAE solvers
  - Ansys
  - Abaqus
  - CD-Adapco Star-CCM+
  - COMSOL Multiphysics

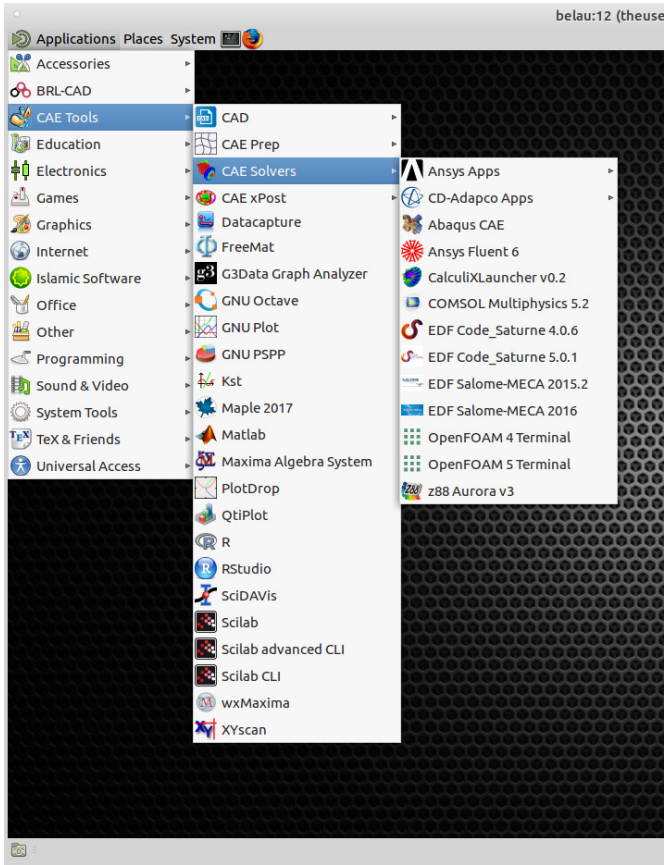

Figure 8: Applications ▷ CAE Tools ▷ CAE Solvers.

- Applications ▷ CAE Tools ▷ CAE xPost
- Open Source CAE postprocessing tools
  - 3D Slicer
  - ElmerPost
  - ParaView
  - Salome
  - VisIt
- Commercial CAE postprocessing tools
  - EnSight
  - Tecplot 360EX
  - Tecplot Chorus
  - Tecplot Focus
  - Tecplot RS

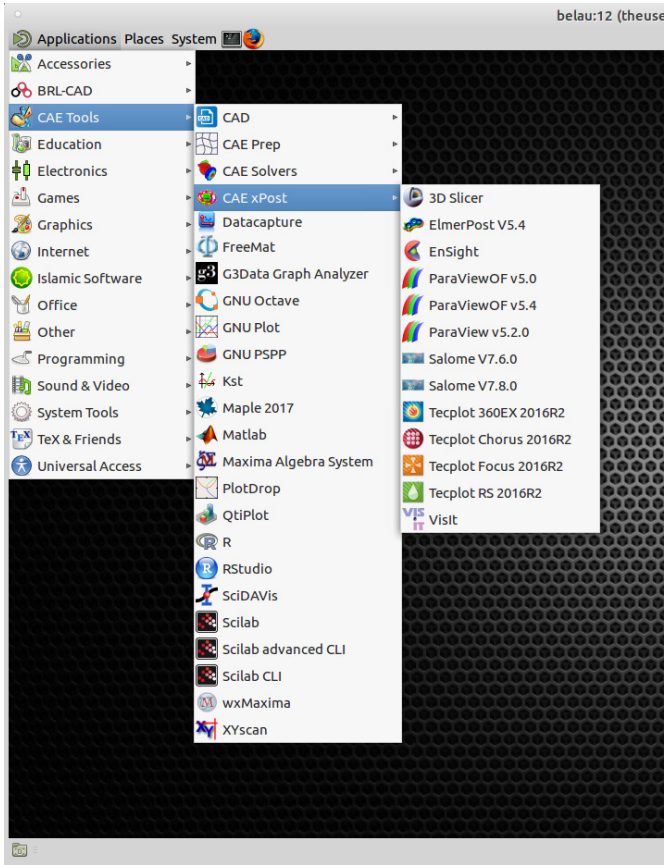

Figure 9: Applications ▷ CAE Tools ▷ CAE xPost.

CAE Demo

- Applications ▷ TeX & Friends is another customized category special to **OSCAE**.Initiative's Linux workstations.
- It collects LaTeX-based tysetting tools and utilities commonly used by many scientists and engineers to prepare technical documents, e.g. Integrated Development Environments (IDE):
  - TeXworks
  - Texmaker
  - TeXstudio
  - Kile and LyX

  tools to manage bibliography and references
  - JabRef
  - KBibTeX

  and editor
  - Winefish LaTeX Editor

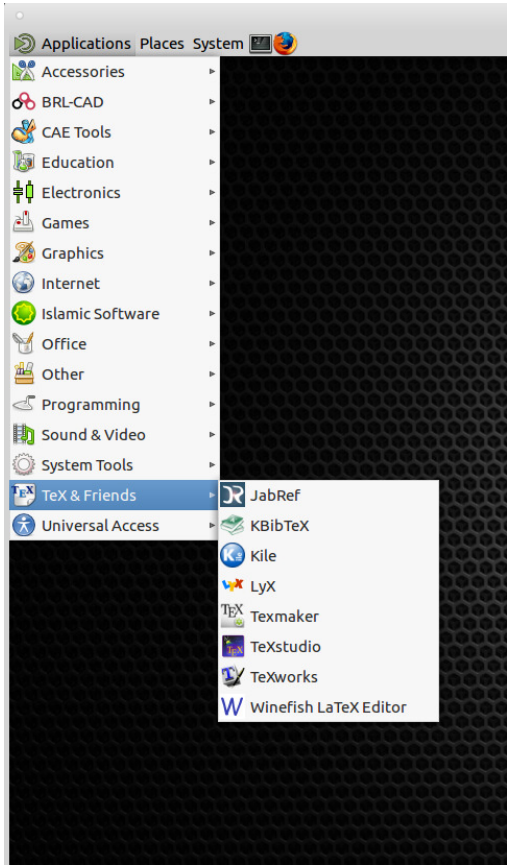

Figure 10: Applications ▷ TeX & Friends.

- Applications ▷ Programming category is of major importance to scientists and engineers.
- On top of the standard offerings many additional tools, e.g. Integrated Development Environments (IDE):
  - Arduino IDE
  - CMake
  - Code::Blocks IDE
  - CodeLite
  - Eclipse

  text editors:
  - Geany and jEdit
  - Bluefish Editor and Winefish LaTeX Editor
  - SciTE Text Editor

  files comparator
  - Meld

  have been added to this category.

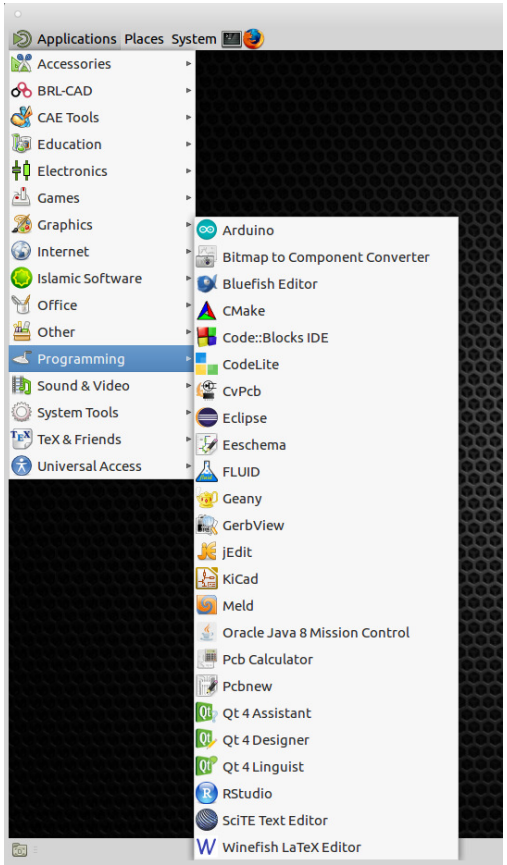

Figure 11: Applications ▷ Programming.

- Applications ▷ Office
- LibreOffice is the backbone to an integrated office suite providing wordprocessing, spreadsheet, presentation and drawing tools through
  - LibreOffice Writer,
  - LibreOffice Calc,
  - LibreOffice Impress,
  - LibreOffice Draw,
- PDF tools
  - Atril and Evince PDF Document Viewers
  - Master PDF Editor
- Project management tool
  - GanttProject

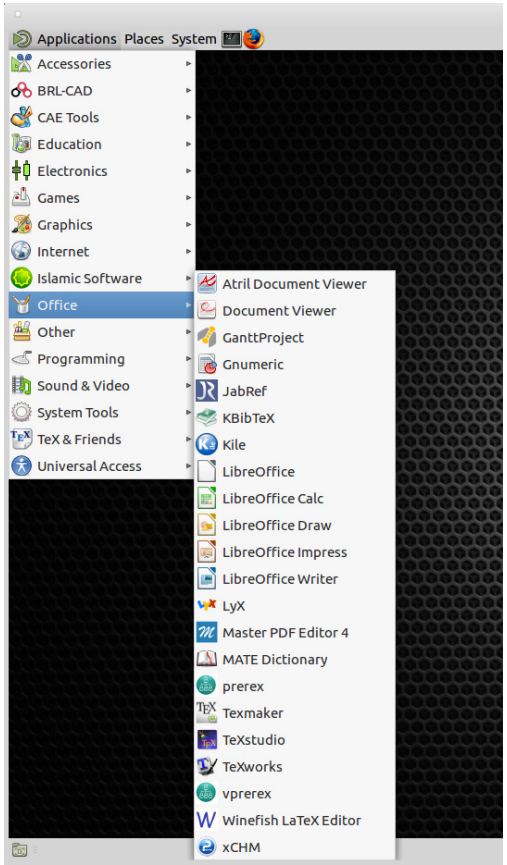

Figure 12: Applications ▷ Office.

- Applications ▷ Sound & Video
- Video tools
  - Kodi
  - mpv, MPlayer, SMPlayer, GNOME MPlayer,
  - VLC media player
  - xine
- HandBrake and MKVToolNix are tools for processing digital video files
- Audio tools
  - Alsaplayer
  - Amarok
  - Audacity
  - GNOME Alsa Mixer
  - Rhythmbox
- CD and DVD tools include K3B, AcetoneISO, Brasero, ISO Master

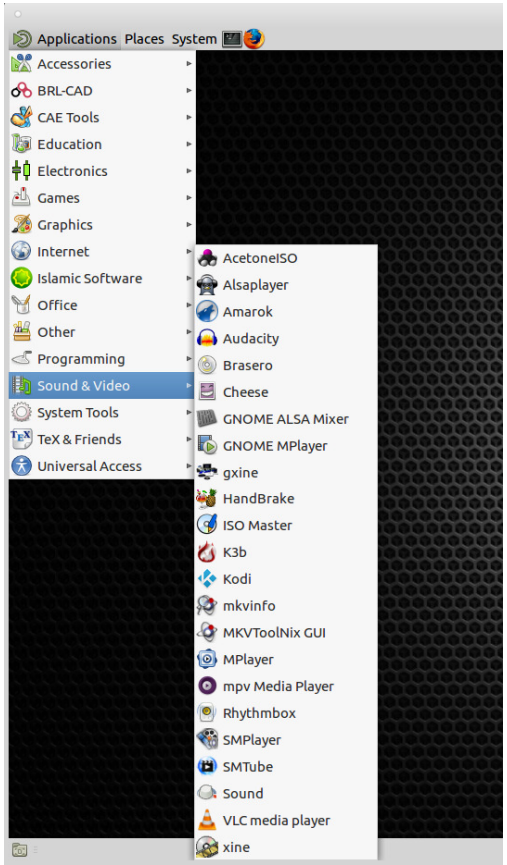

Figure 13: Applications ▷ Sound & Video.

- Places menu is also at the top left of the Menu panel.
- This menu lets you browse files in Home Folder, Figure 15, on the local Computer, Figure 16, and on the Network, Figure 17.

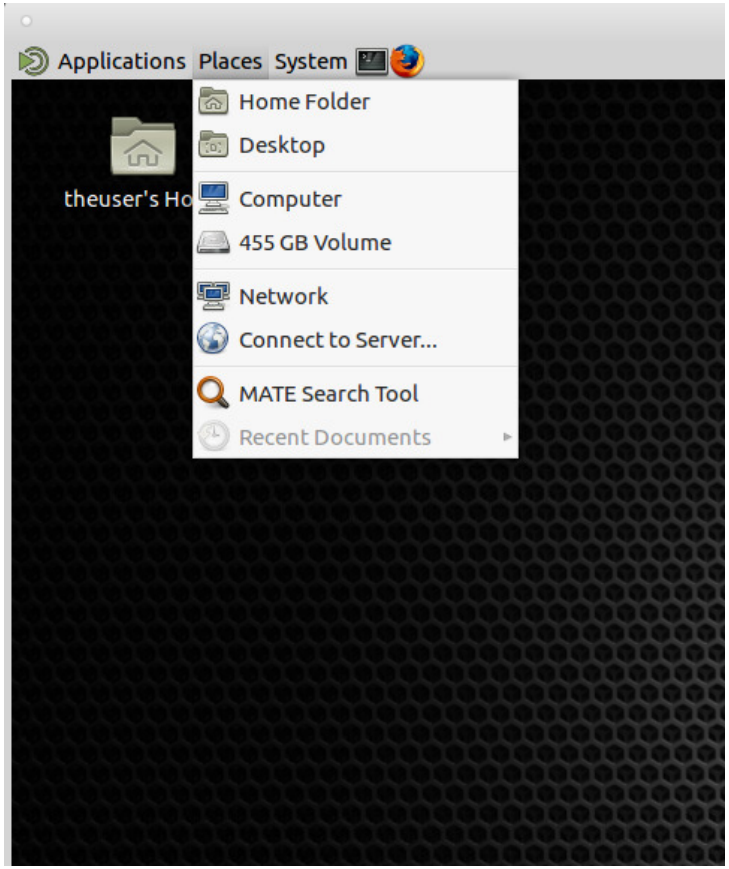

Figure 14: Places menu.

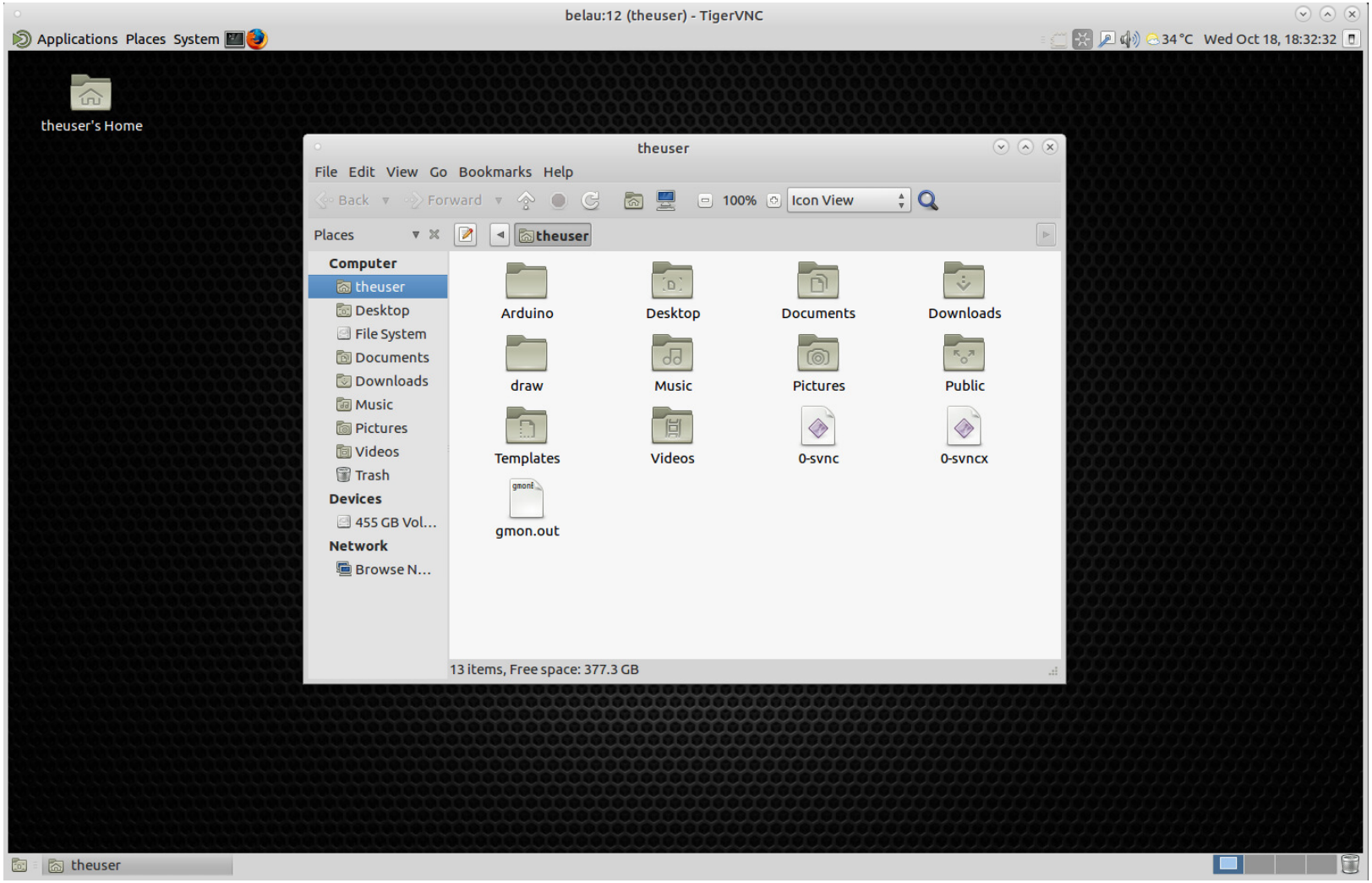

Figure 15: Places ▷ Home Folder.

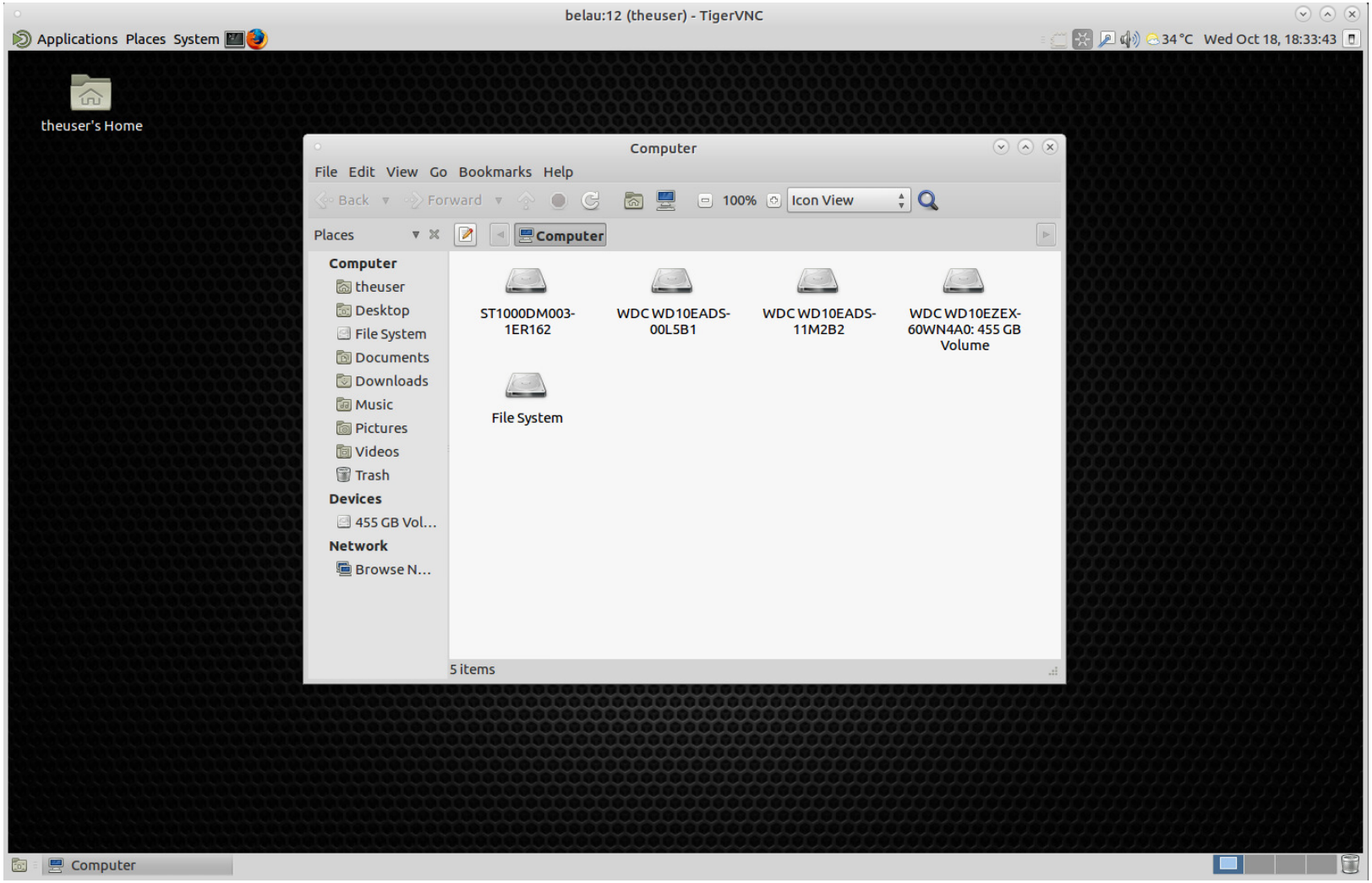

Figure 16: Places ▷ Computer.

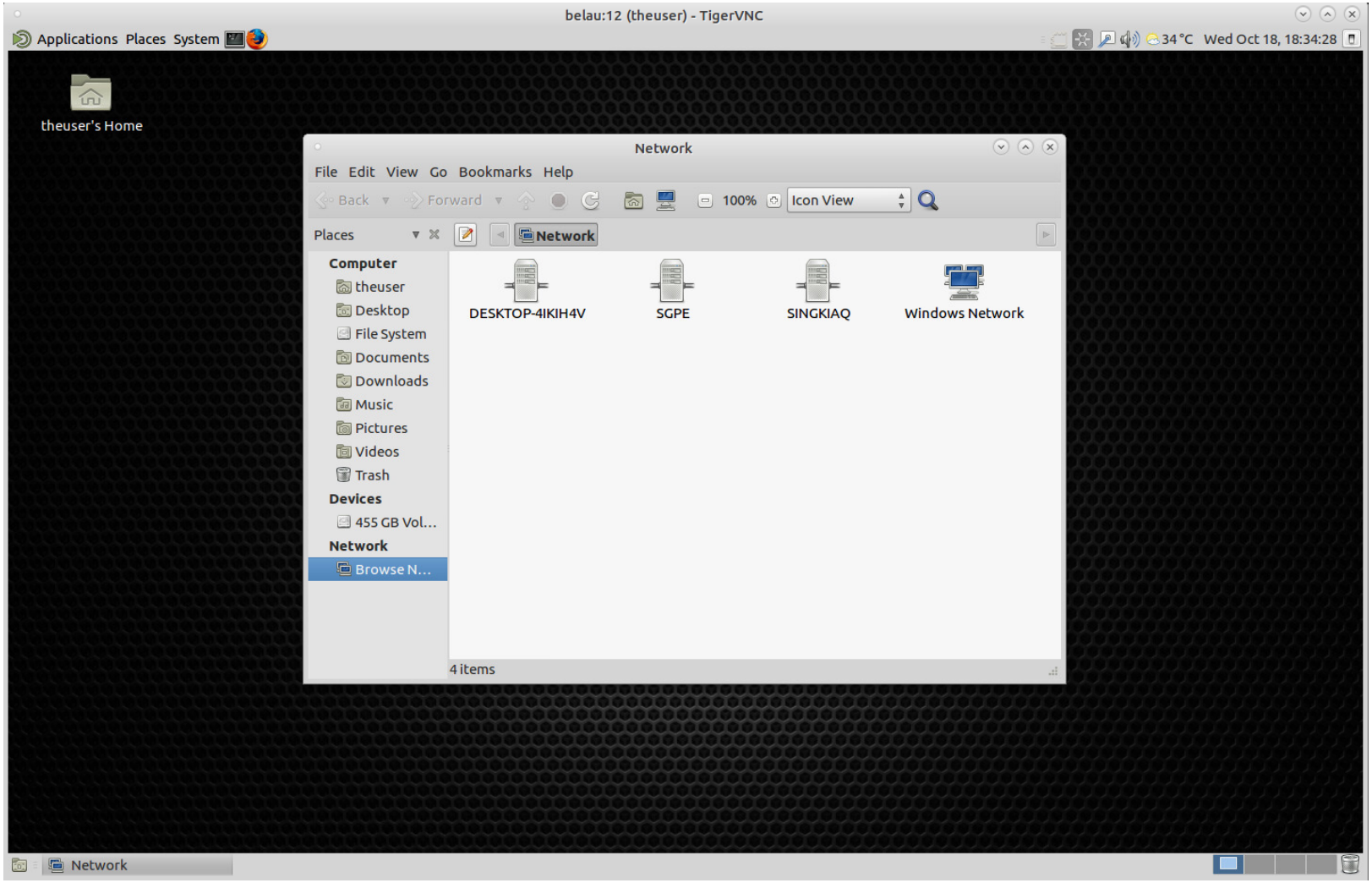

Figure 17: Places ▷ Network.

- System menu
- From the System Menu you can start various Administration jobs e.g. update and install new software–see Figure 19.
- . . . set Preferences to customise desktop, Figure 20.
- There are also options to
  - start the Control Center, Figure 21,
  - lock the screen,
  - log out or
  - shut down the workstation.

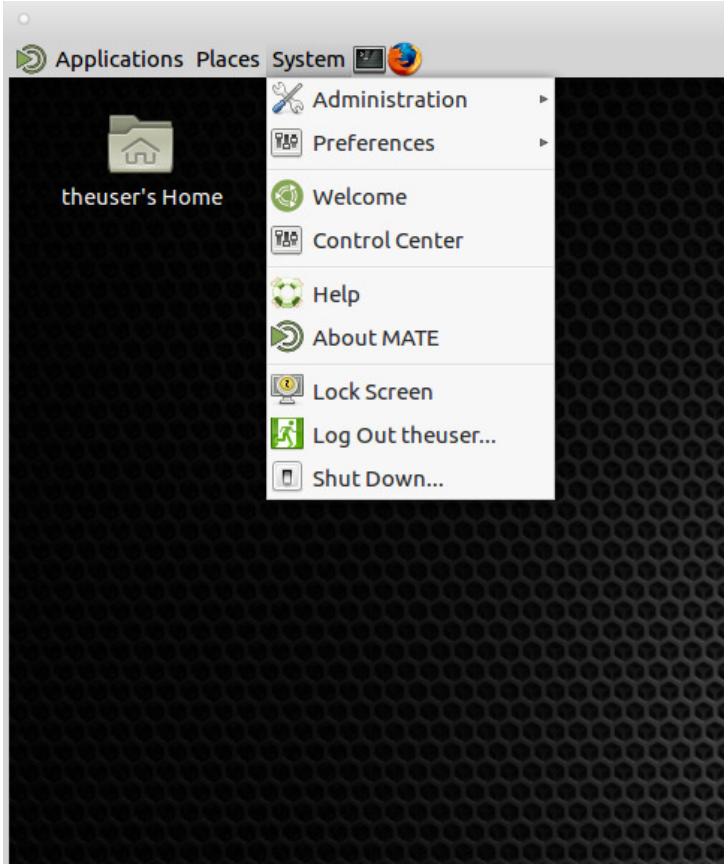

Figure 18: System menu.

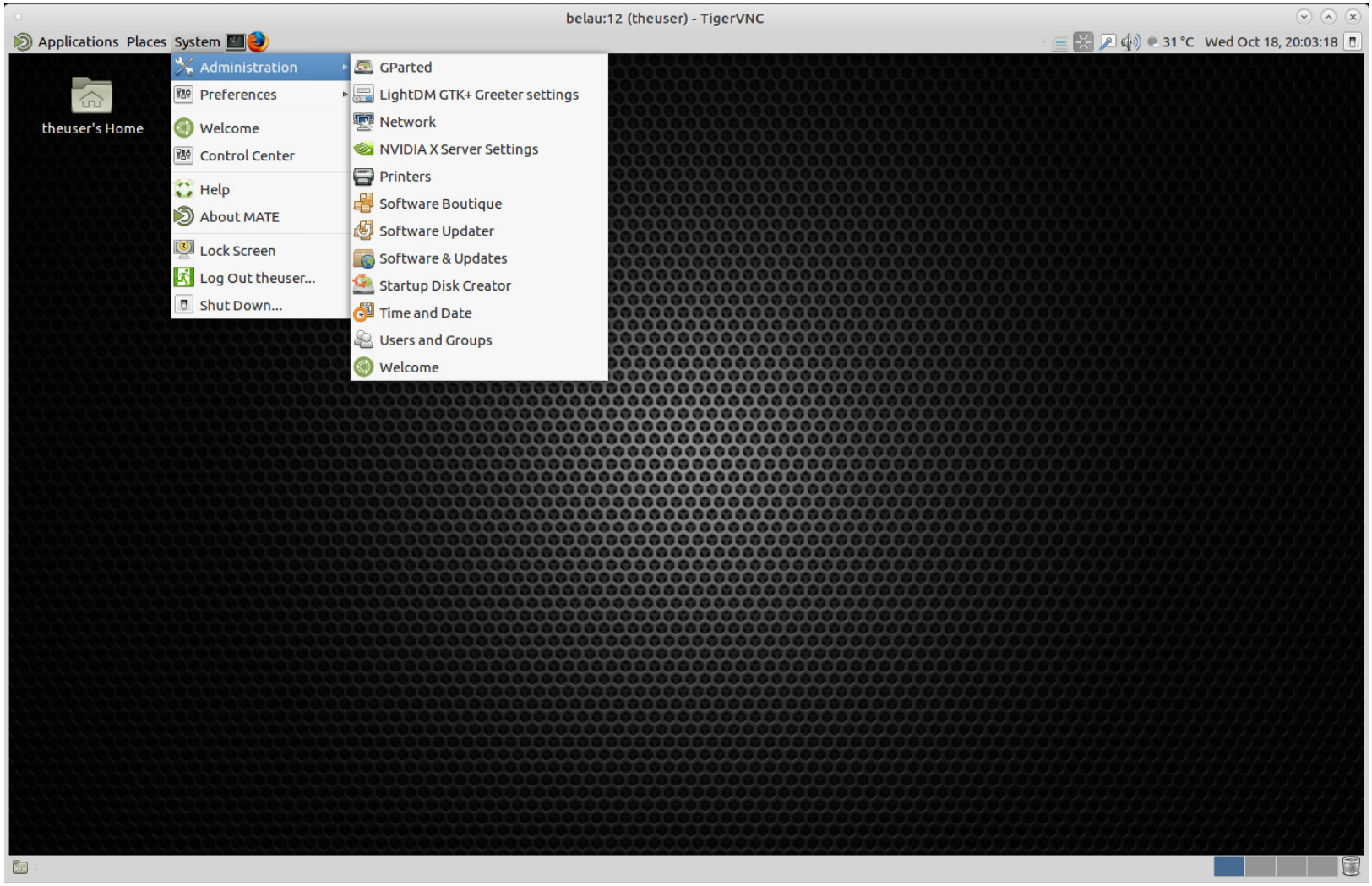

Figure 19: System ▷ Administration.

Ubuntu MATE Desktop

System ▷ Preferences

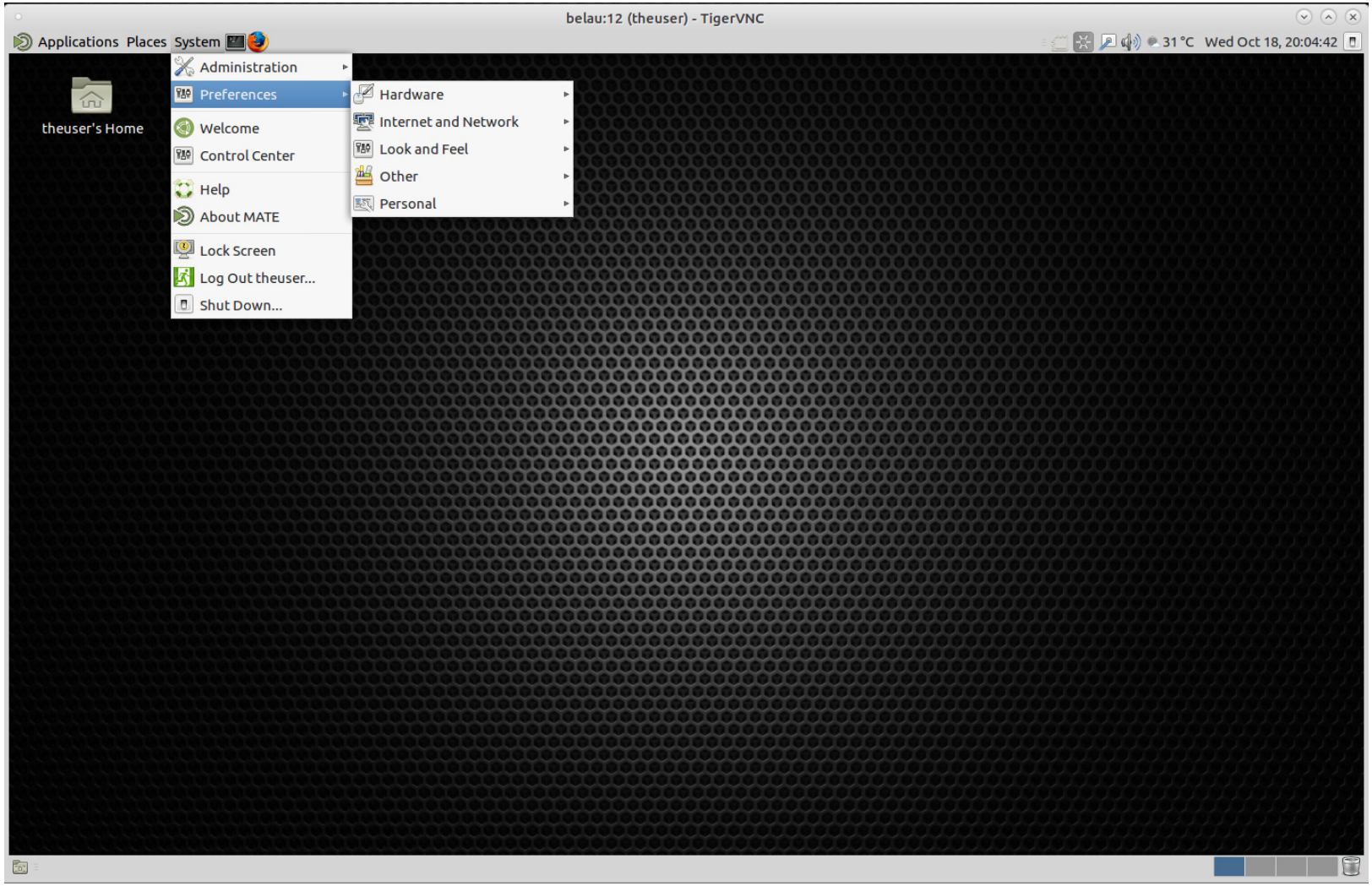

Figure 20: System ▷ Preferences.

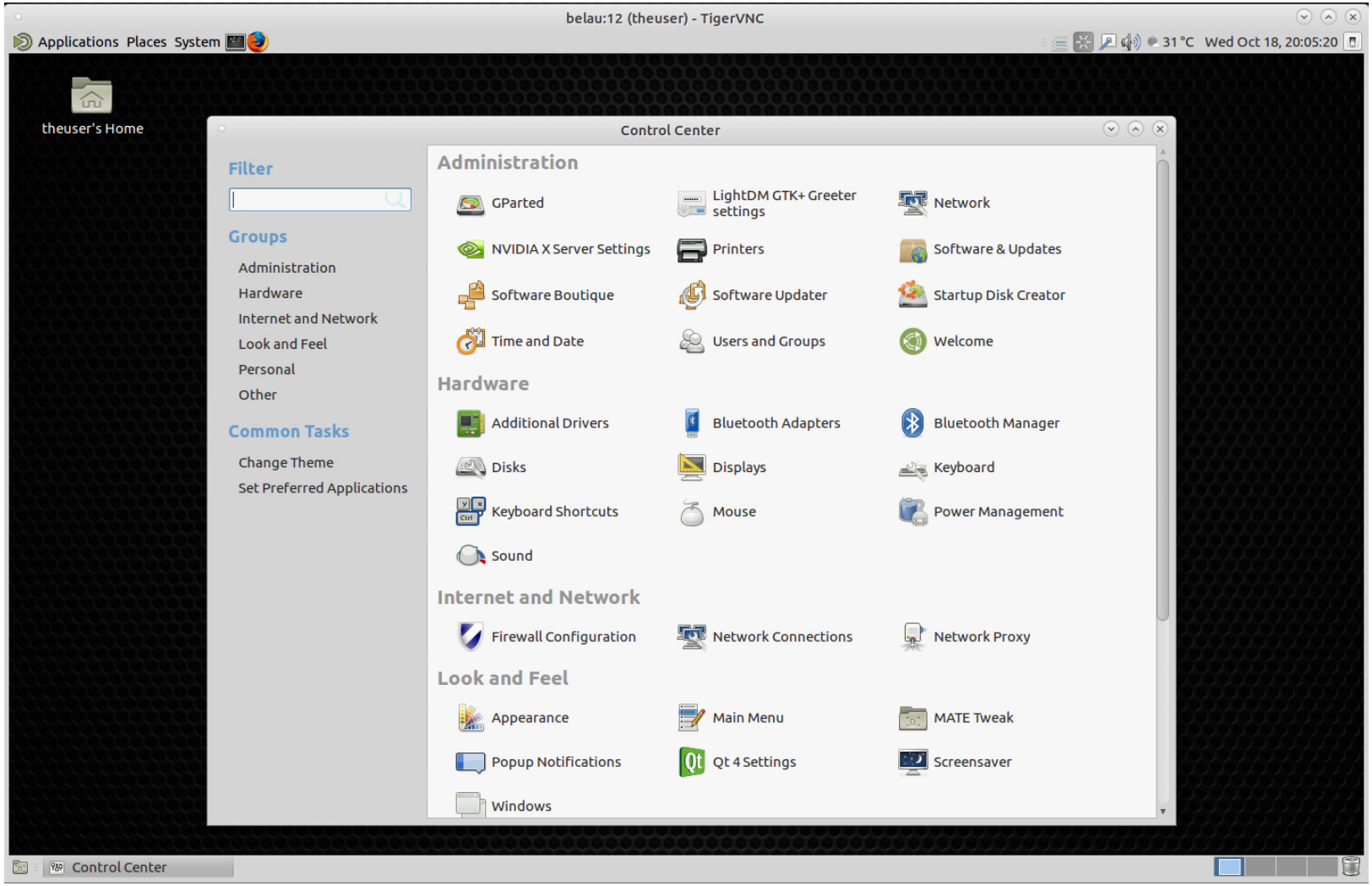

Figure 21: System ▷ Control Center.

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. . . must end

- . . . and I end my presentation with two supplications

رَّبِّ زِدْنِي عِلْمًا

my Lord! increase me in knowledge

(TAA-HAA (20):114)

اَللّٰهُمَّ اِنَّا نَسْئَلُكَ عِلْمًا نَافِعًا

O Allah! We ask You for knowledge that is of benefit

(IBN MAJAH)