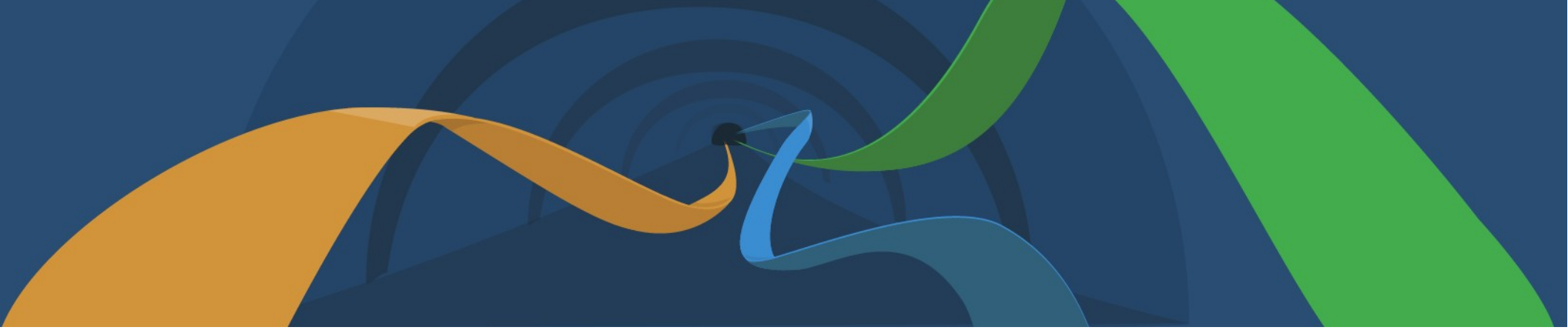
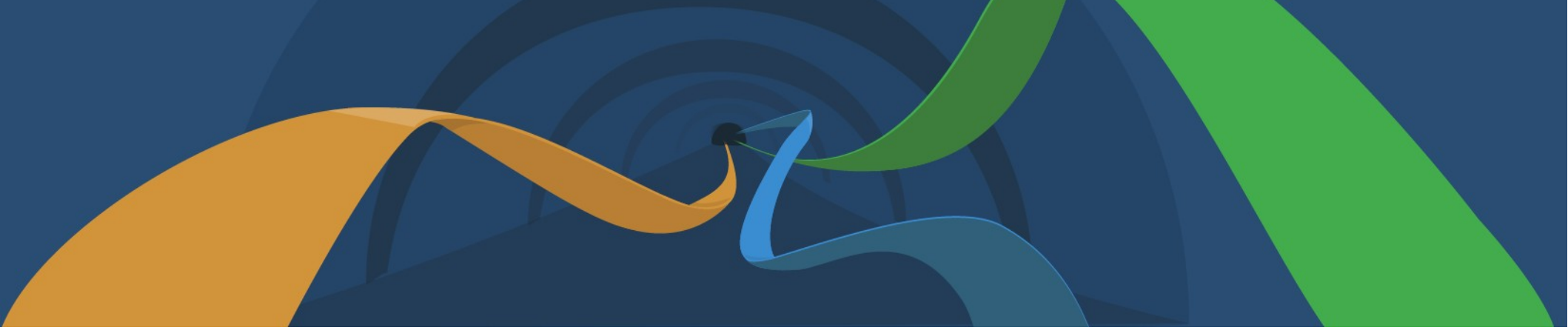
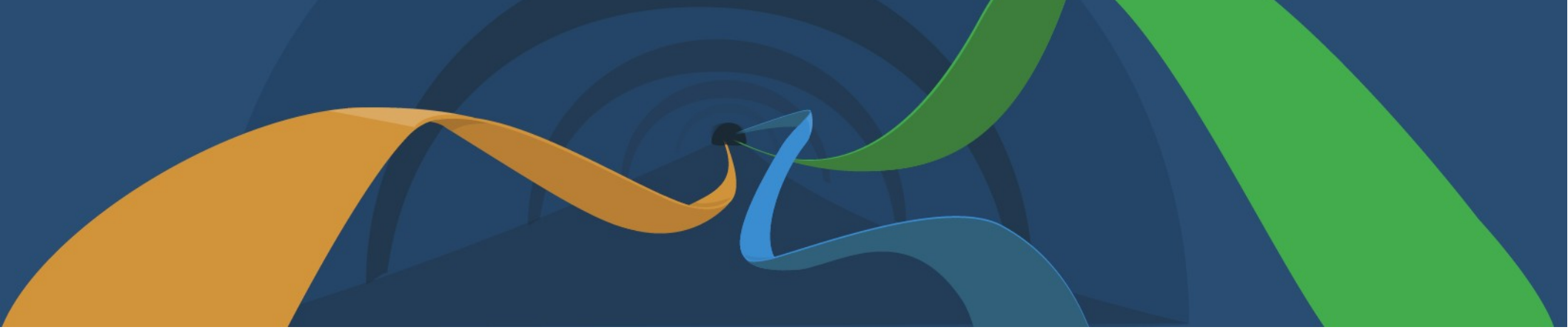




Security by Correctness

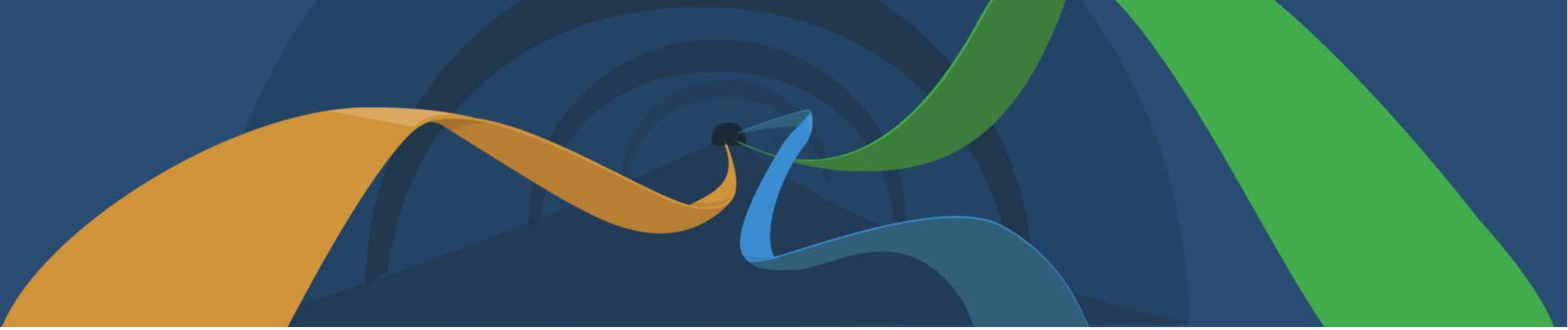
Security by Isolation

Security by Obscurity



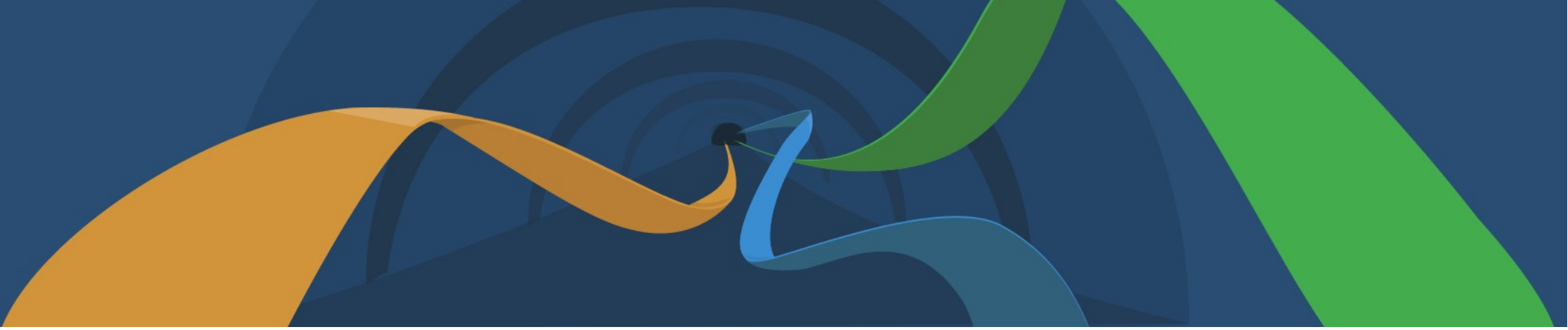
- Development started in 2010

- Made by Joanna Rutkowska et al
  - Low-level security
  - Blue Pill
  - Xen security
  - Intel TXT & Intel SMM

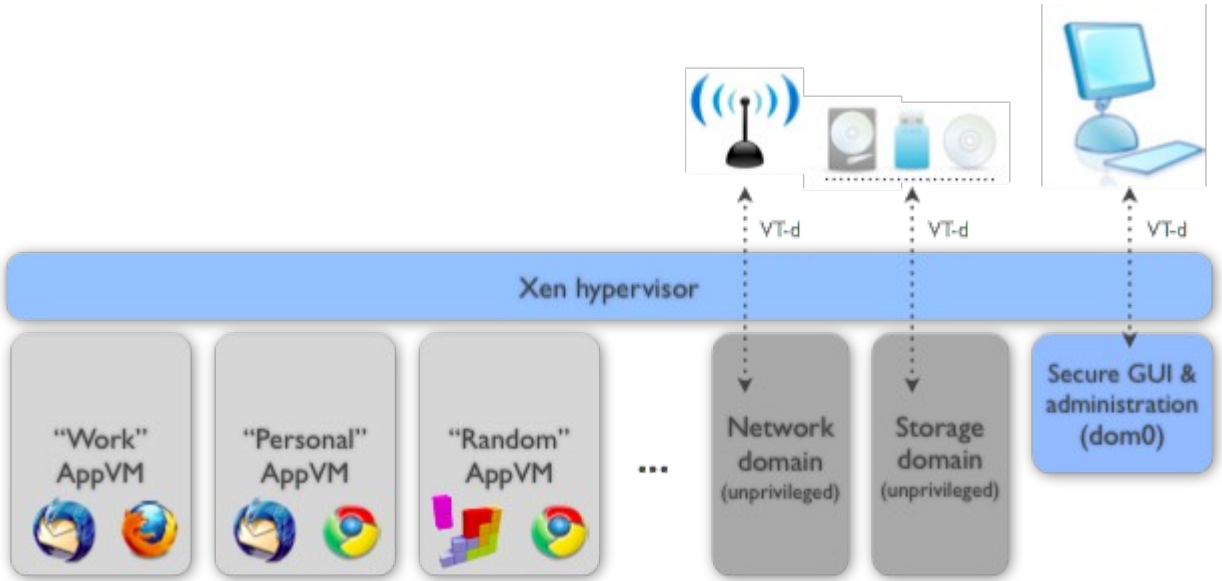


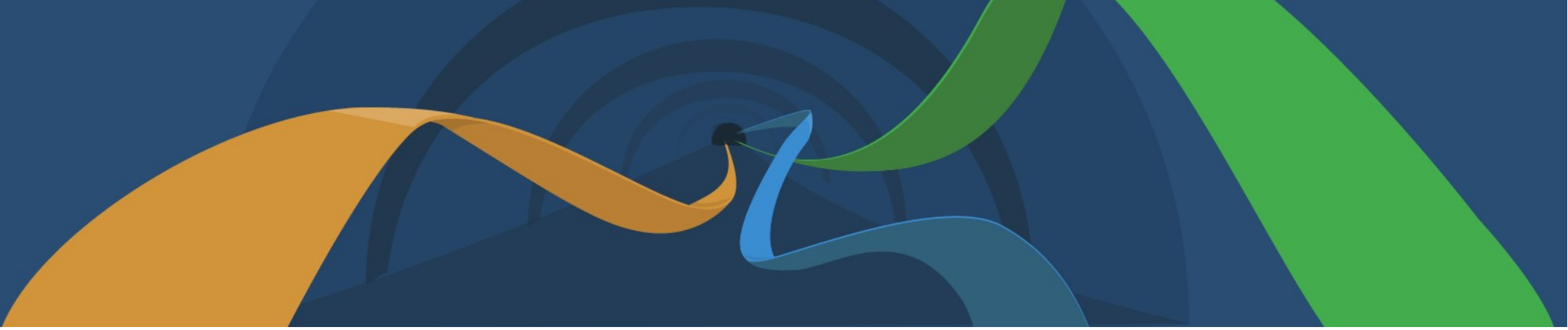
Windows, OSX, Linux

One attack can own everything



# Separate your digital life into security domains

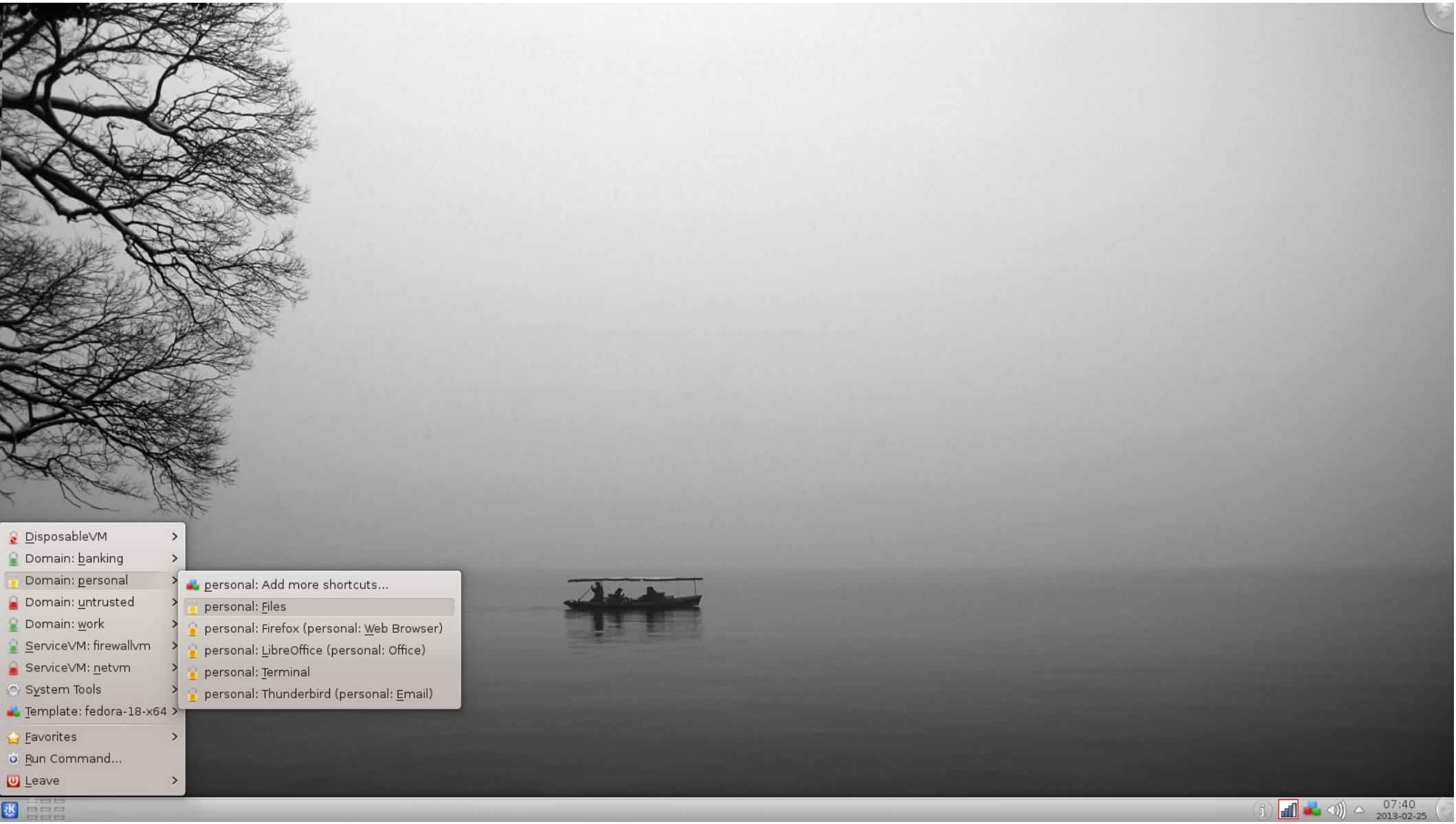

VT-d
VT-d
VT-d
Xen hypervisor
"Work" AppVM
"Personal" AppVM
"Random" AppVM
...
Network domain (unprivileged)
Storage domain (unprivileged)
Secure GUI & administration (dom0)

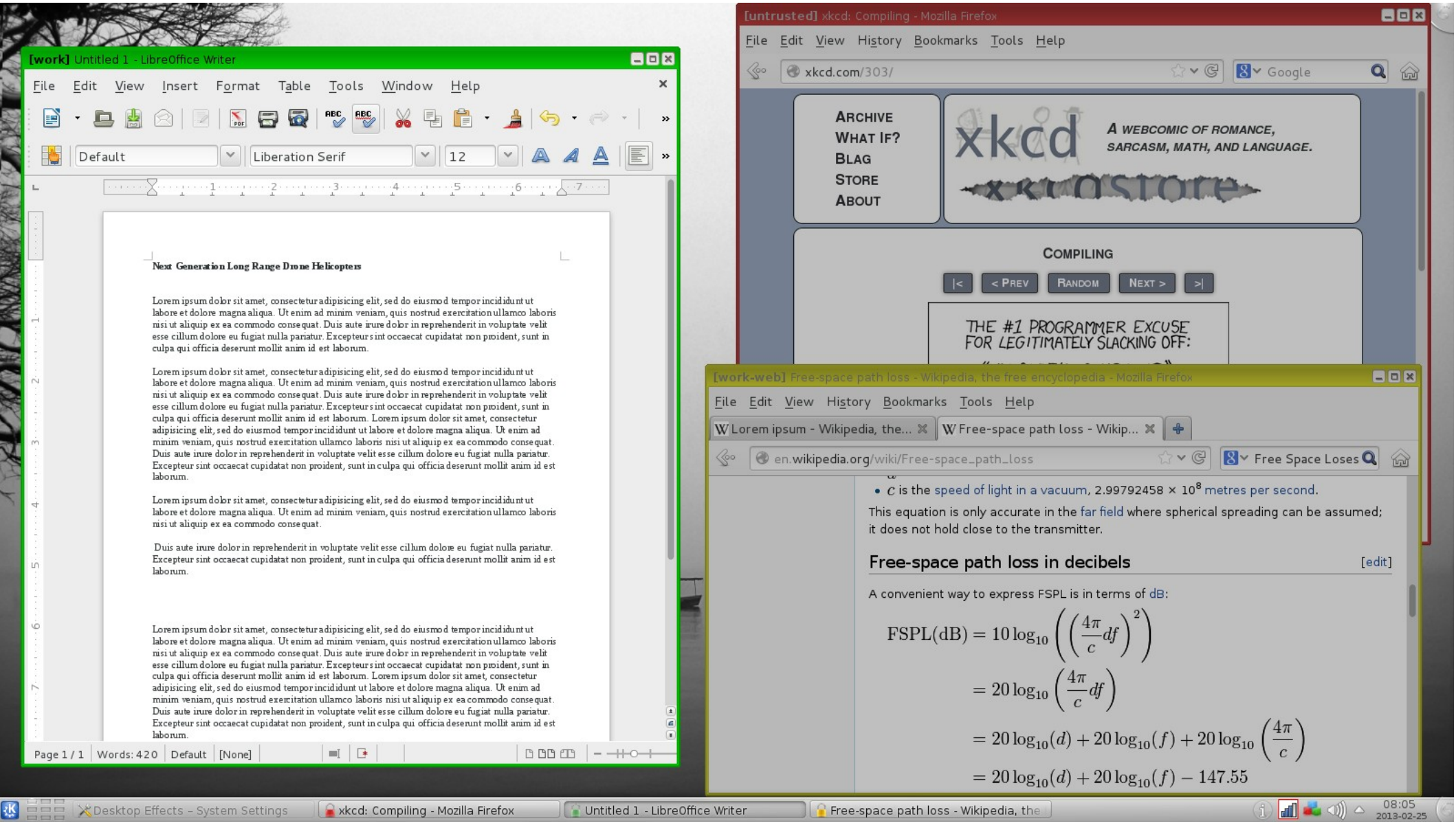


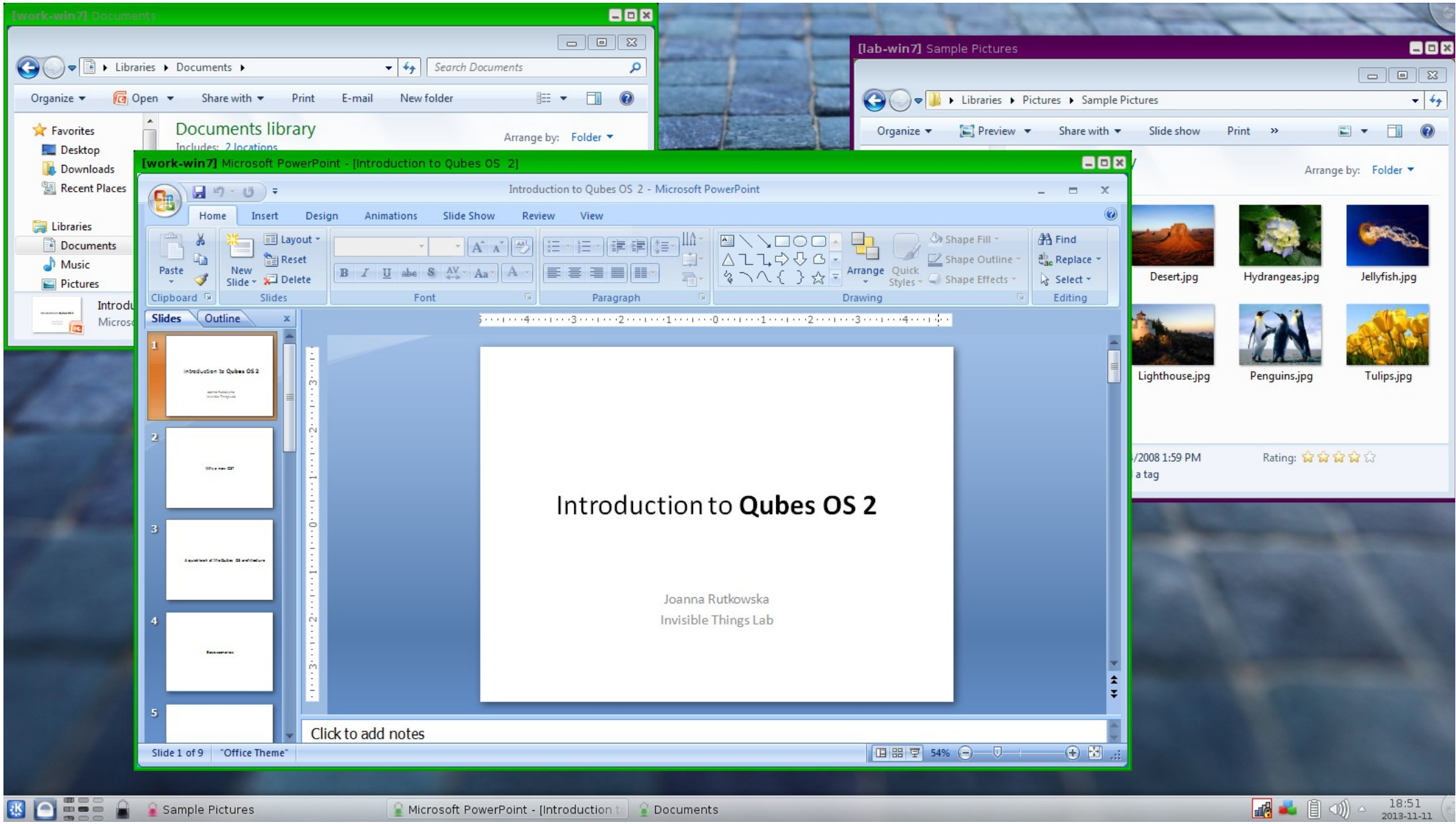
- sys-vpn
- router
- red
- personal
- email
- work-web

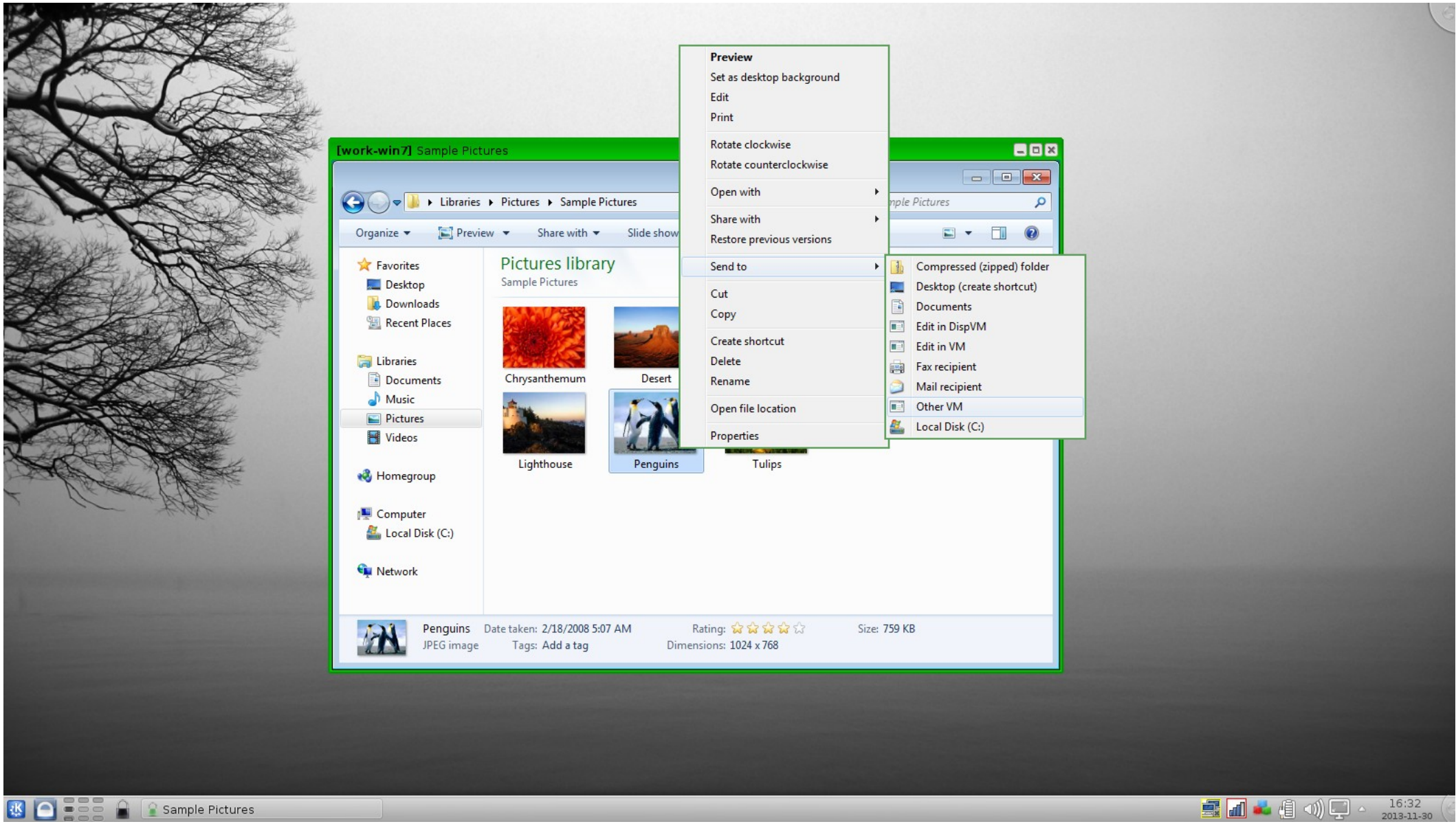
- chat
- mullvad-dev
- printer
- server-admin
- sys-backup
- vault
- proj-*

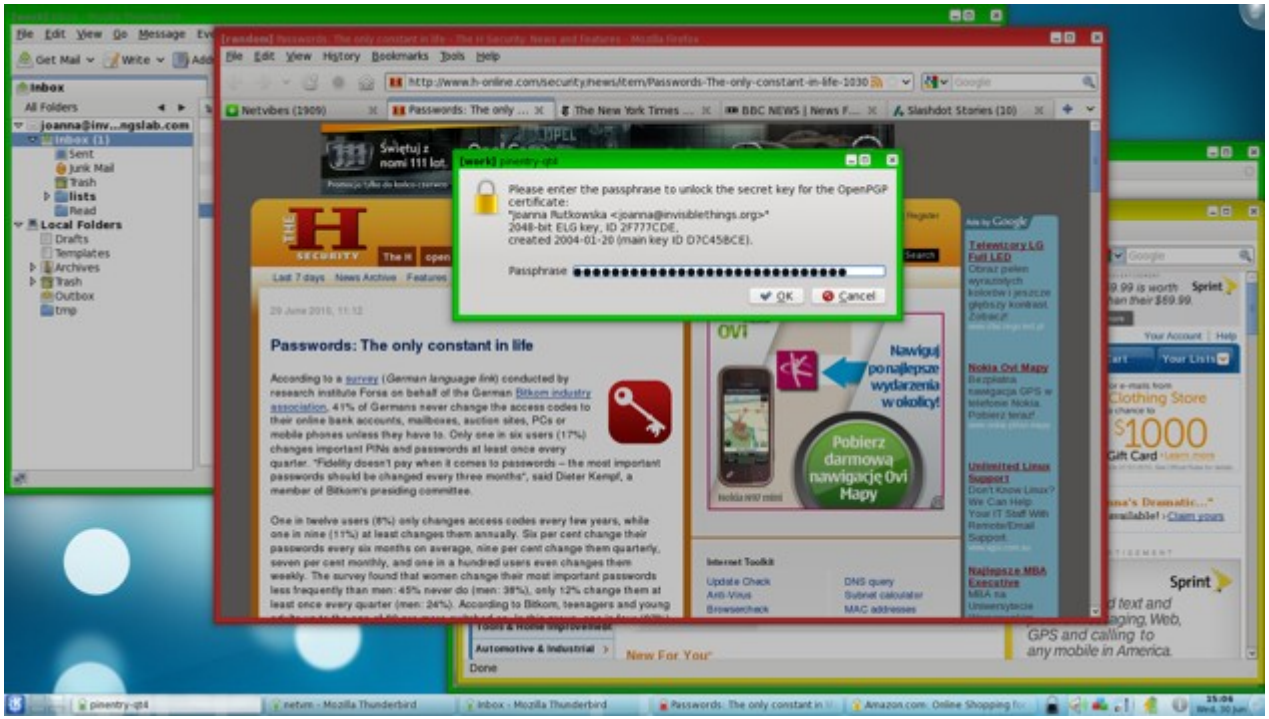
- Disposables

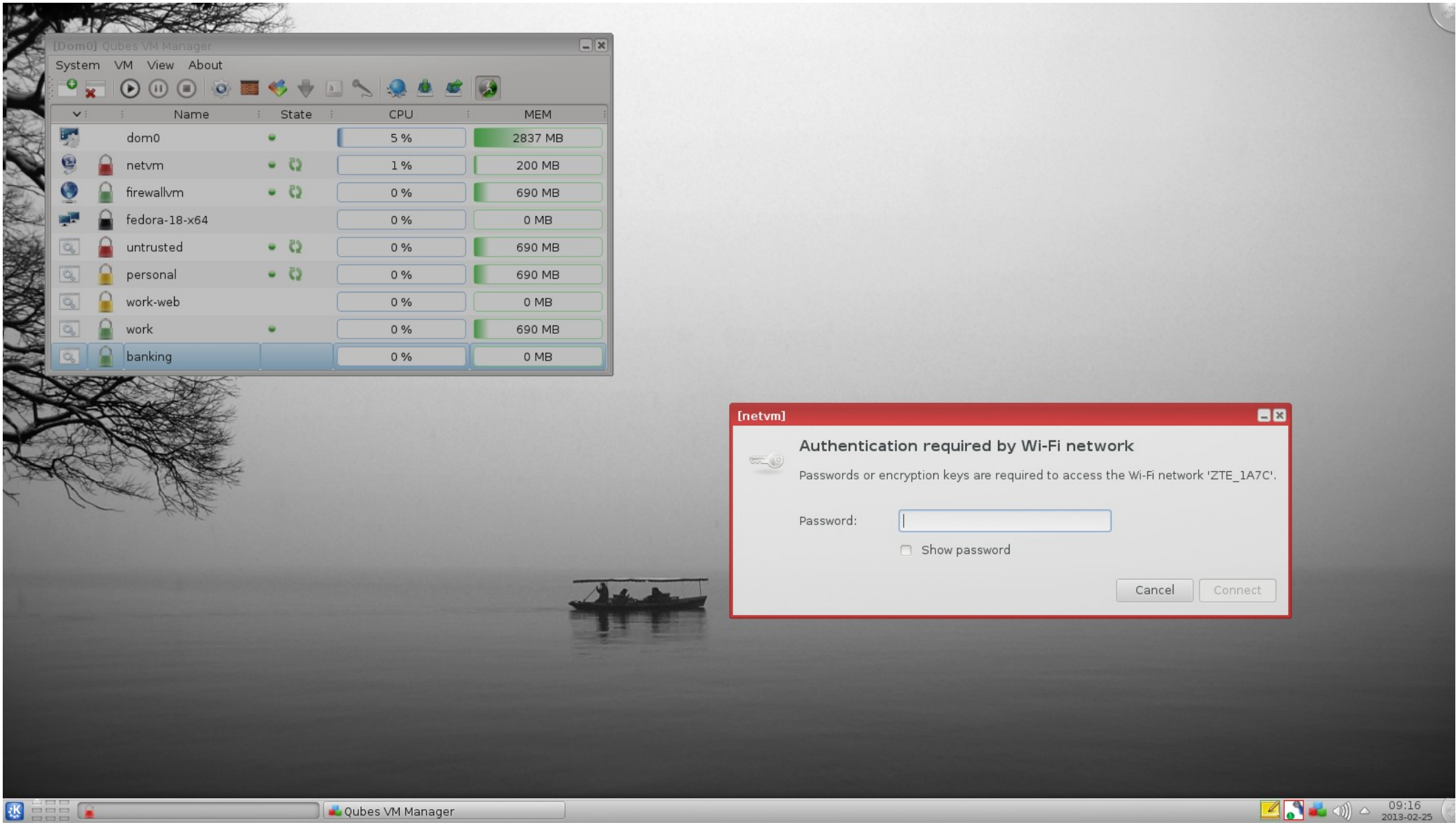

DisposableVM
Domain: banking
Domain: personal
Domain: untrusted
Domain: work
ServiceVM: firewallvm
ServiceVM: netvm
System Tools
Template: fedora-18-x64
Favorites
Run Command...
Leave
personal: Add more shortcuts...
personal: Files
personal: Firefox (personal: Web Browser)
personal: LibreOffice (personal: Office)
personal: Terminal
personal: Thunderbird (personal: Email)
07:40
2013-02-25

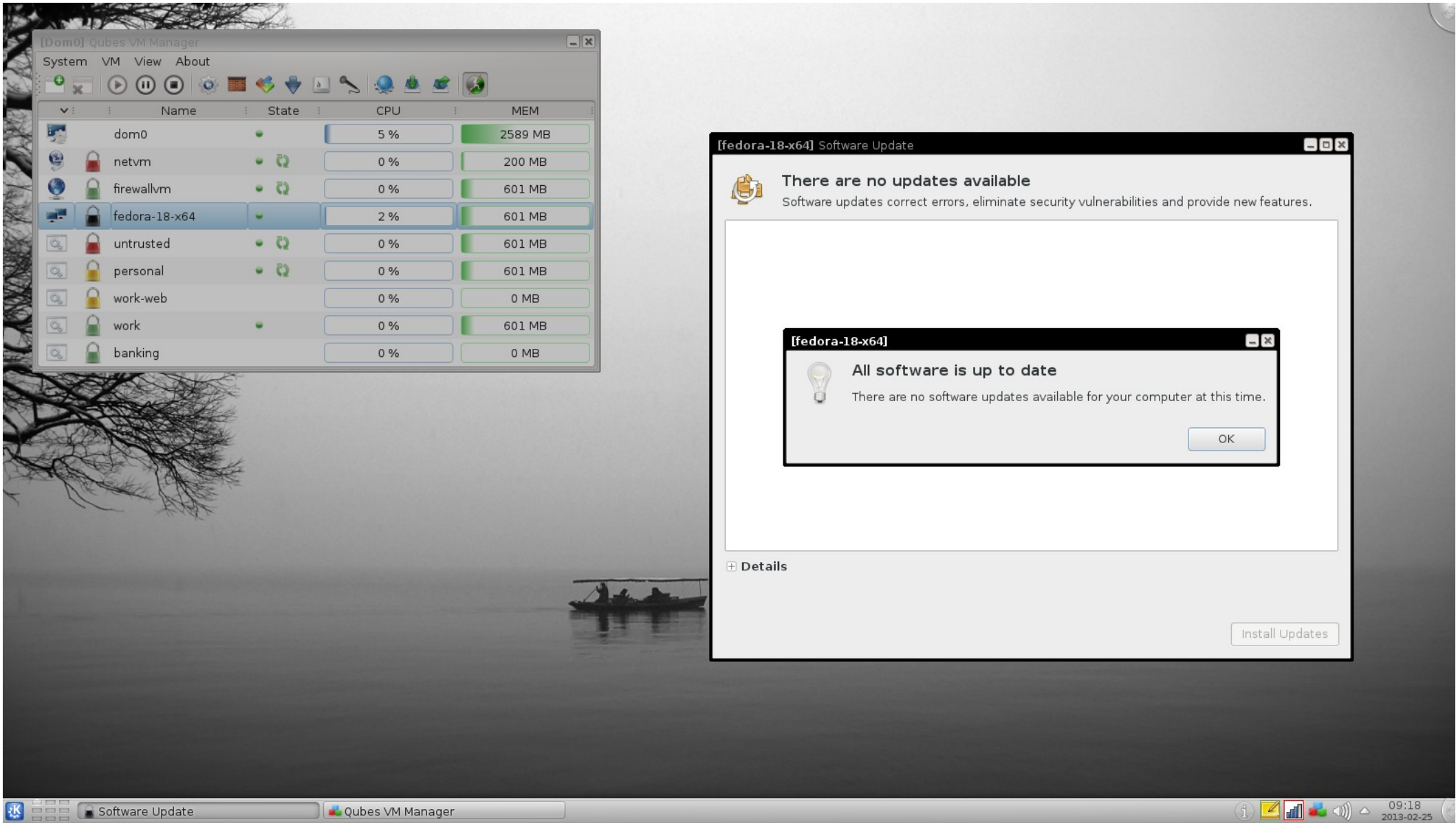

[work] Untitled 1 - LibreOffice Writer
File Edit View Insert Format Table Tools Window Help
Default
Liberation Serif
12
Next Generation Long Range Drone Helicopters
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum. Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.
Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum. Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.
Page 1 / 1 Words: 420 Default [None]
[untrusted] xkcd: Compiling - Mozilla Firefox
File Edit View History Bookmarks Tools Help
xkcd.com/303/
Google
ARCHIVE
WHAT IF?
BLAG
STORE
ABOUT
xkcd
A WEBCOMIC OF ROMANCE, SARCASM, MATH, AND LANGUAGE.
COMPILING
|< < PREV RANDOM NEXT > >|
THE #1 PROGRAMMER EXCUSE FOR LEGITIMATELY SLACKING OFF:
[work-web] Free-space path loss - Wikipedia, the free encyclopedia - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Lorem ipsum - Wikipedia, the...
Free-space path loss - Wikip...
en.wikipedia.org/wiki/Free-space_path_loss
Free Space Loses
• c is the speed of light in a vacuum, 2.99792458 × 10^8 metres per second.
This equation is only accurate in the far field where spherical spreading can be assumed; it does not hold close to the transmitter.
Free-space path loss in decibels [edit]
A convenient way to express FSPL is in terms of dB:
$$\begin{aligned}\mathrm{FSPL(dB)} &= 10\log_{10}\left(\left(\frac{4\pi}{c}df\right)^2\right)\\ &= 20\log_{10}\left(\frac{4\pi}{c}df\right)\\ &= 20\log_{10}(d)+20\log_{10}(f)+20\log_{10}\left(\frac{4\pi}{c}\right)\\ &= 20\log_{10}(d)+20\log_{10}(f)-147.55\end{aligned}$$
Desktop Effects – System Settings
xkcd: Compiling - Mozilla Firefox
Untitled 1 - LibreOffice Writer
Free-space path loss - Wikipedia, the
08:05
2013-02-25

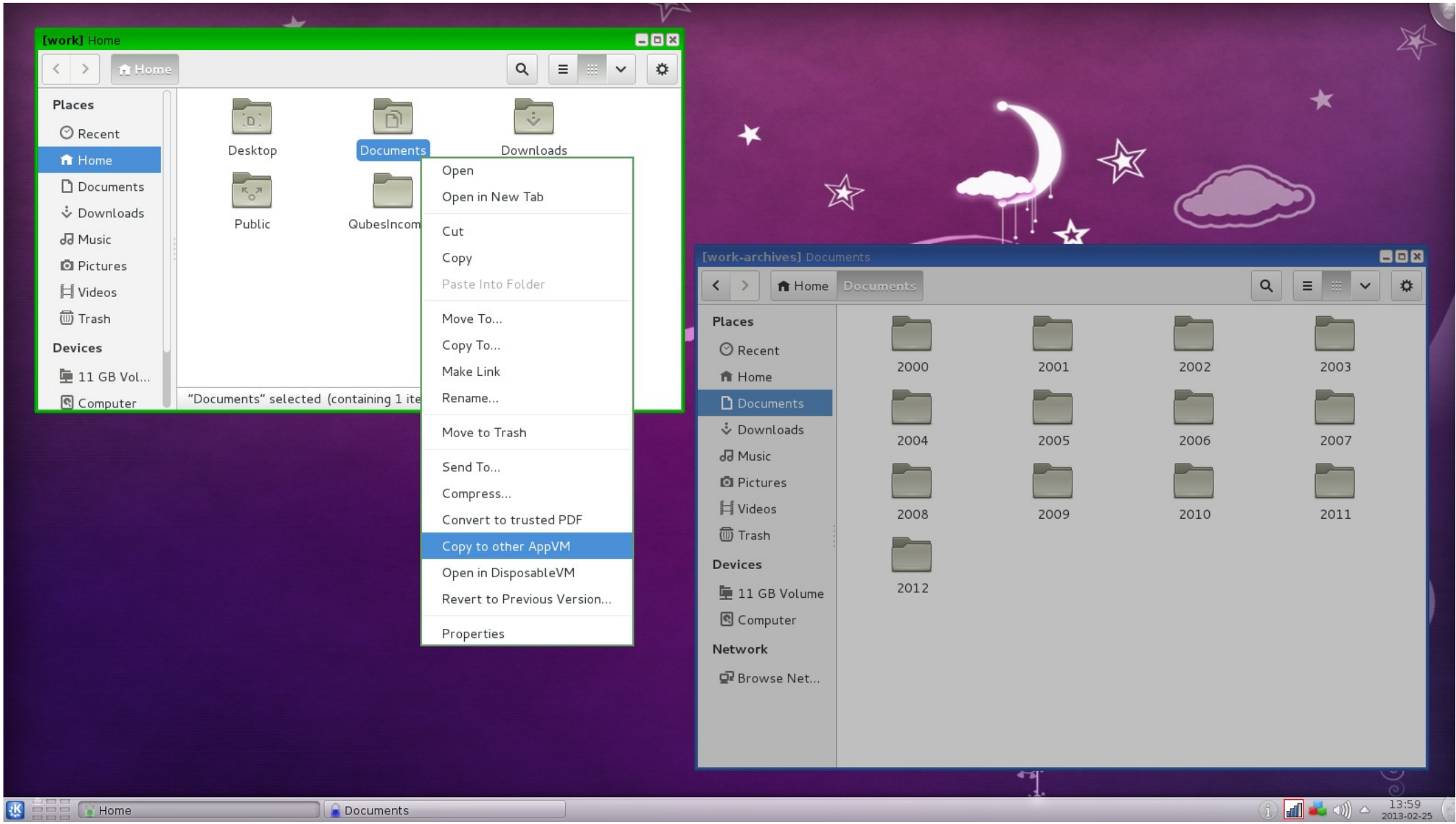

[work-win7] Documents
Libraries ▸ Documents ▸
Search Documents
Organize
Open
Share with
Print
E-mail
New folder
Documents library
Includes: 2 locations
Arrange by: Folder
Favorites
Desktop
Downloads
Recent Places
Libraries
Documents
Music
Pictures
[lab-win7] Sample Pictures
Libraries ▸ Pictures ▸ Sample Pictures
Organize
Preview
Share with
Slide show
Print
Arrange by: Folder
Desert.jpg
Hydrangeas.jpg
Jellyfish.jpg
Lighthouse.jpg
Penguins.jpg
Tulips.jpg
Rating:
[work-win7] Microsoft PowerPoint - [Introduction to Qubes OS 2]
Introduction to Qubes OS 2 - Microsoft PowerPoint
Home
Insert
Design
Animations
Slide Show
Review
View
Paste
New Slide
Layout
Reset
Delete
Clipboard
Slides
Font
Paragraph
Arrange
Quick Styles
Shape Fill
Shape Outline
Shape Effects
Drawing
Find
Replace
Select
Editing
Slides
Outline
Introduction to Qubes OS 2
Joanna Rutkowska
Invisible Things Lab
Click to add notes
Slide 1 of 9
"Office Theme"
54%
Sample Pictures
Microsoft PowerPoint - [Introduction t
Documents
18:51
2013-11-11

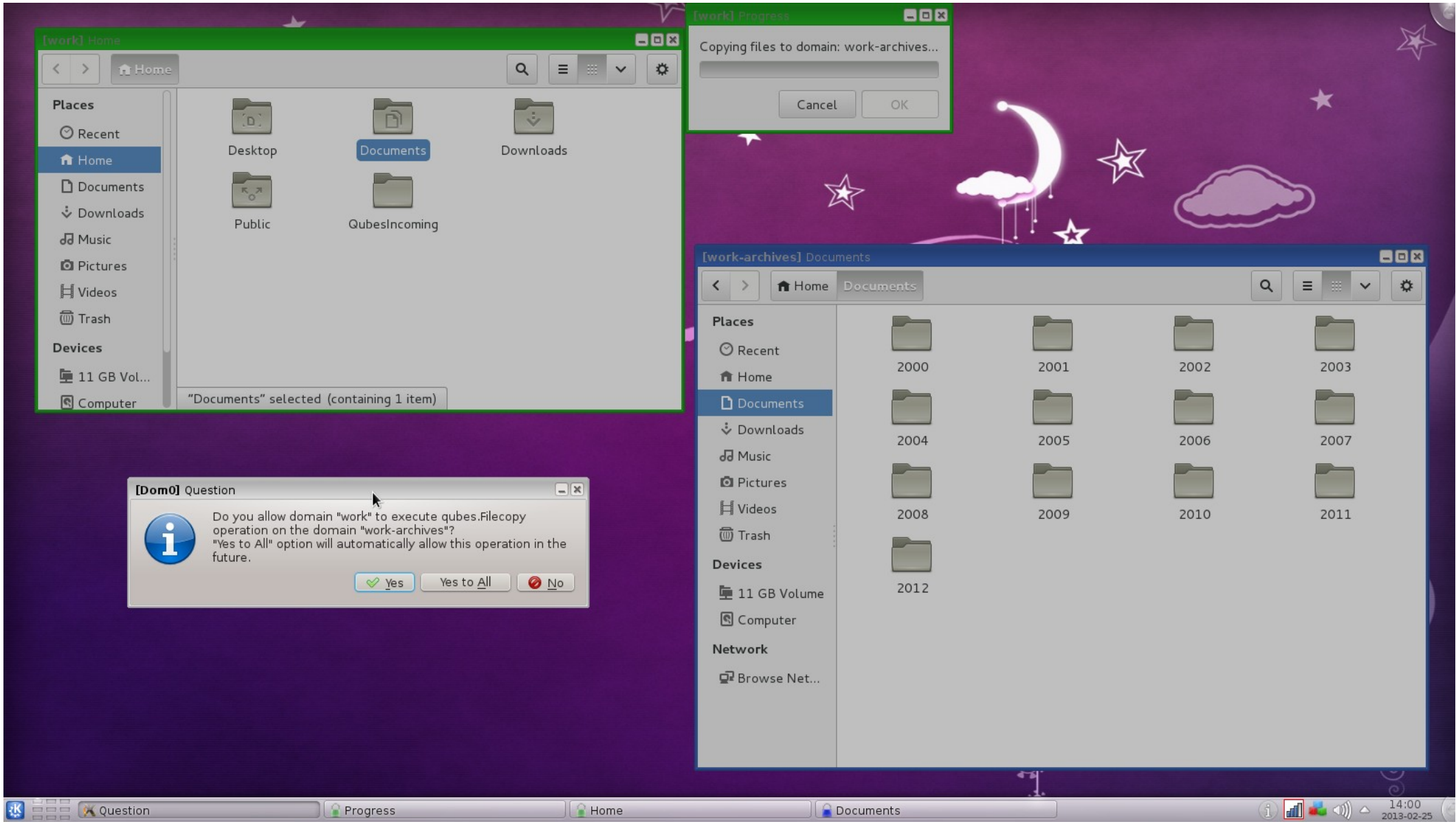

[work-win7] Sample Pictures
Libraries ▸ Pictures ▸ Sample Pictures
Organize
Preview
Share with
Slide show
Favorites
Desktop
Downloads
Recent Places
Libraries
Documents
Music
Pictures
Videos
Homegroup
Computer
Local Disk (C:)
Network
Pictures library
Sample Pictures
Chrysanthemum
Desert
Lighthouse
Penguins
Tulips
Penguins
JPEG image
Date taken: 2/18/2008 5:07 AM
Tags: Add a tag
Rating:
Dimensions: 1024 x 768
Size: 759 KB
Preview
Set as desktop background
Edit
Print
Rotate clockwise
Rotate counterclockwise
Open with
Share with
Restore previous versions
Send to
Cut
Copy
Create shortcut
Delete
Rename
Open file location
Properties
Compressed (zipped) folder
Desktop (create shortcut)
Documents
Edit in DispVM
Edit in VM
Fax recipient
Mail recipient
Other VM
Local Disk (C:)
Sample Pictures
16:32
2013-11-30

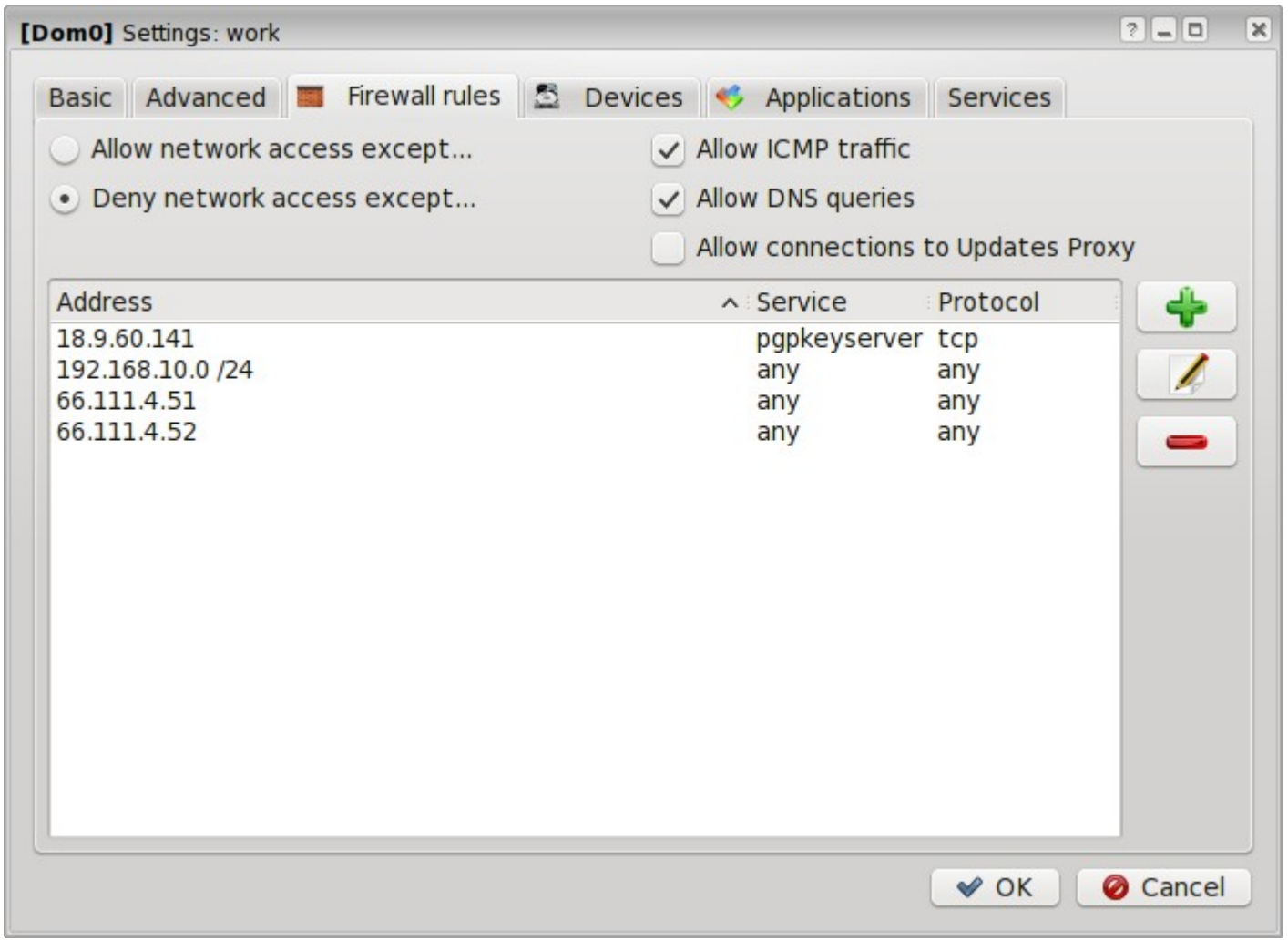

Please enter the passphrase to unlock the secret key for the OpenPGP certificate:
"Joanna Rutkowska <joanna@invisiblethings.org>"
2048-bit ELG key, ID 2F777CDE,
created 2004-01-20 (main key ID D7C45BCE).
Passphrase
OK
Cancel
Passwords: The only constant in life
Pobierz darmową nawigację Ovi Mapy
Nawiguj po najlepsze wydarzenia w okolicy!
Done

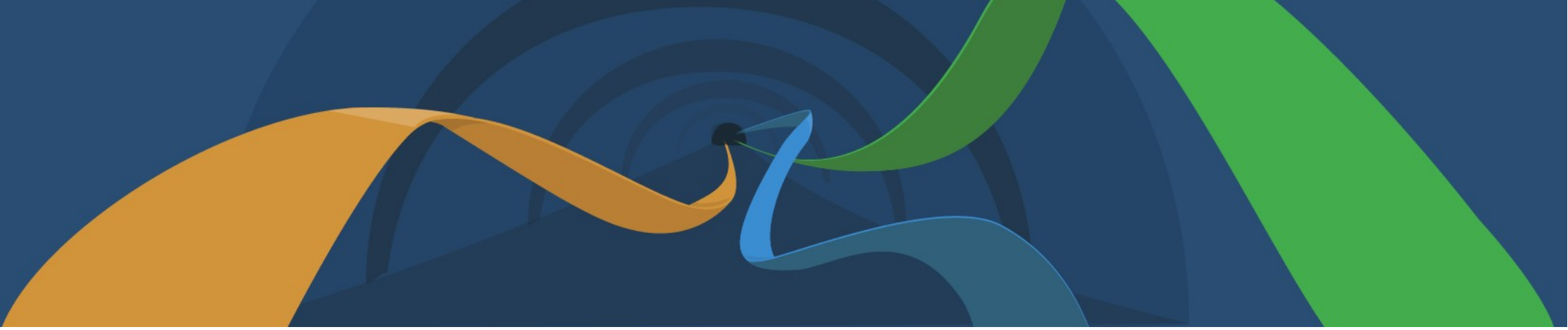

[Dom0] Qubes VM Manager
System VM View About
Name State CPU MEM
dom0 5 % 2837 MB
netvm 1 % 200 MB
firewallvm 0 % 690 MB
fedora-18-x64 0 % 0 MB
untrusted 0 % 690 MB
personal 0 % 690 MB
work-web 0 % 0 MB
work 0 % 690 MB
banking 0 % 0 MB
[netvm]
Authentication required by Wi-Fi network
Passwords or encryption keys are required to access the Wi-Fi network 'ZTE_1A7C'.
Password:
Show password
Cancel
Connect
Qubes VM Manager
09:16
2013-02-25


[Dom0] Qubes VM Manager
System VM View About
Name State CPU MEM
dom0 5 % 2589 MB
netvm 0 % 200 MB
firewallvm 0 % 601 MB
fedora-18-x64 2 % 601 MB
untrusted 0 % 601 MB
personal 0 % 601 MB
work-web 0 % 0 MB
work 0 % 601 MB
banking 0 % 0 MB
[fedora-18-x64] Software Update
There are no updates available
Software updates correct errors, eliminate security vulnerabilities and provide new features.
[fedora-18-x64]
All software is up to date
There are no software updates available for your computer at this time.
OK
Details
Install Updates
Software Update
Qubes VM Manager
09:18
2013-02-25


[work] Home
Home
Places
Recent
Home
Documents
Downloads
Music
Pictures
Videos
Trash
Devices
11 GB Vol...
Computer
Desktop
Documents
Downloads
Public
QubesIncom
"Documents" selected (containing 1 ite
Open
Open in New Tab
Cut
Copy
Paste Into Folder
Move To...
Copy To...
Make Link
Rename...
Move to Trash
Send To...
Compress...
Convert to trusted PDF
Copy to other AppVM
Open in DisposableVM
Revert to Previous Version...
Properties
[work-archives] Documents
Home
Documents
Places
Recent
Home
Documents
Downloads
Music
Pictures
Videos
Trash
Devices
11 GB Volume
Computer
Network
Browse Net...
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Home
Documents
13:59
2013-02-25


[work] Home
Home
Places
Recent
Home
Documents
Downloads
Music
Pictures
Videos
Trash
Devices
11 GB Vol...
Computer
Desktop
Documents
Downloads
Public
QubesIncoming
"Documents" selected (containing 1 item)
[work] Progress
Copying files to domain: work-archives...
Cancel
OK
[work-archives] Documents
Home
Documents
Places
Recent
Home
Documents
Downloads
Music
Pictures
Videos
Trash
Devices
11 GB Volume
Computer
Network
Browse Net...
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
[Dom0] Question
Do you allow domain "work" to execute qubes.Filecopy operation on the domain "work-archives"?
"Yes to All" option will automatically allow this operation in the future.
Yes
Yes to All
No
Question
Progress
Home
Documents
14:00
2013-02-25


[Dom0] Settings: work
Basic
Advanced
Firewall rules
Devices
Applications
Services
Allow network access except...
Deny network access except...
Allow ICMP traffic
Allow DNS queries
Allow connections to Updates Proxy
Address
Service
Protocol
18.9.60.141 pgpkeyserver tcp
192.168.10.0 /24 any any
66.111.4.51 any any
66.111.4.52 any any
OK
Cancel



Thank you!