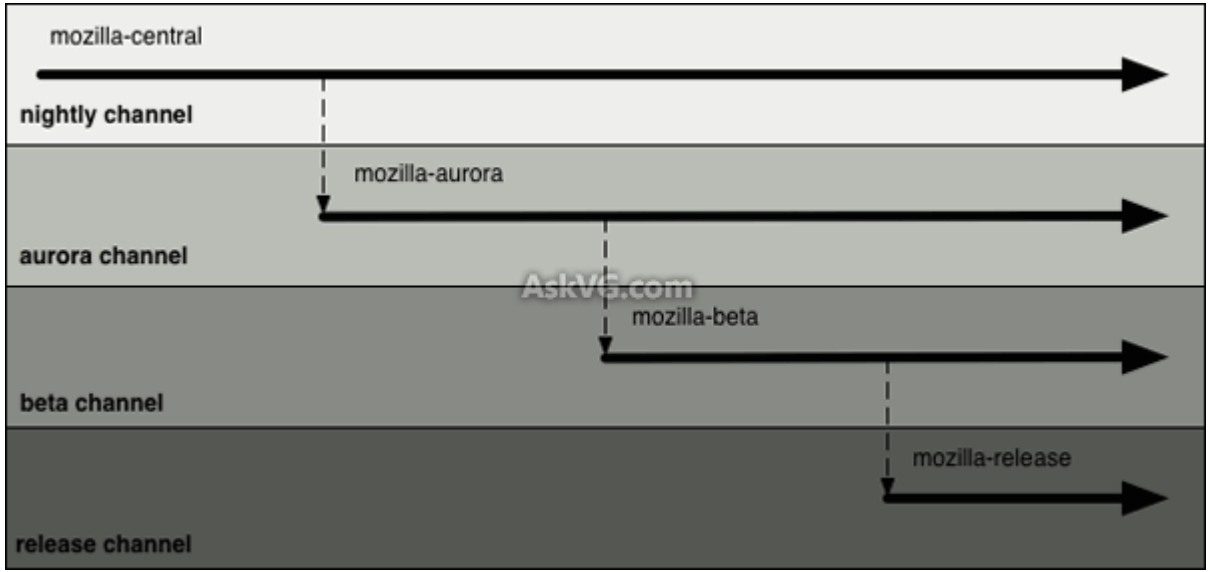
Firefox with TUF

Team Orange

Introduction

- Mozilla uses “four-channel system”



TUF Metadata Scheme

- Nightly and Aurora built daily
  - Delegated role ; automatic signing
  - Online key
- Beta and Stable built less often
  - Offline key ; Mozilla developer signs
  - No need for delegated rule
  - Use Target rule

TUF Metadata Scheme

- Current implementation supports v24=>v25
- Scheme will support
  - 26.0b4 => 26.0b6 (beta)
  - 27.0a1 => 27.0a2 (alpha,aurora)
  - 28.0a1 => 28.0a2 (pre-alpha,nightly)

Security Impact

- Indefinite Freeze Attack
  - TUF metadata would be version-aware
  - Firefox sends request for bad version => TUF disregards and gets correct version

Security Impact

- Endless Data Attack
  - If update.xml compromised, then Firefox update mechanism may be susceptible
  - Tuf maintains integrity of files => update.xml cannot be compromised

Security Impact

- Slow Retrieval Attack
  - Target files will be retrieved from TUF repo
  - Since TUF repo will be previously verified, attack is not possible

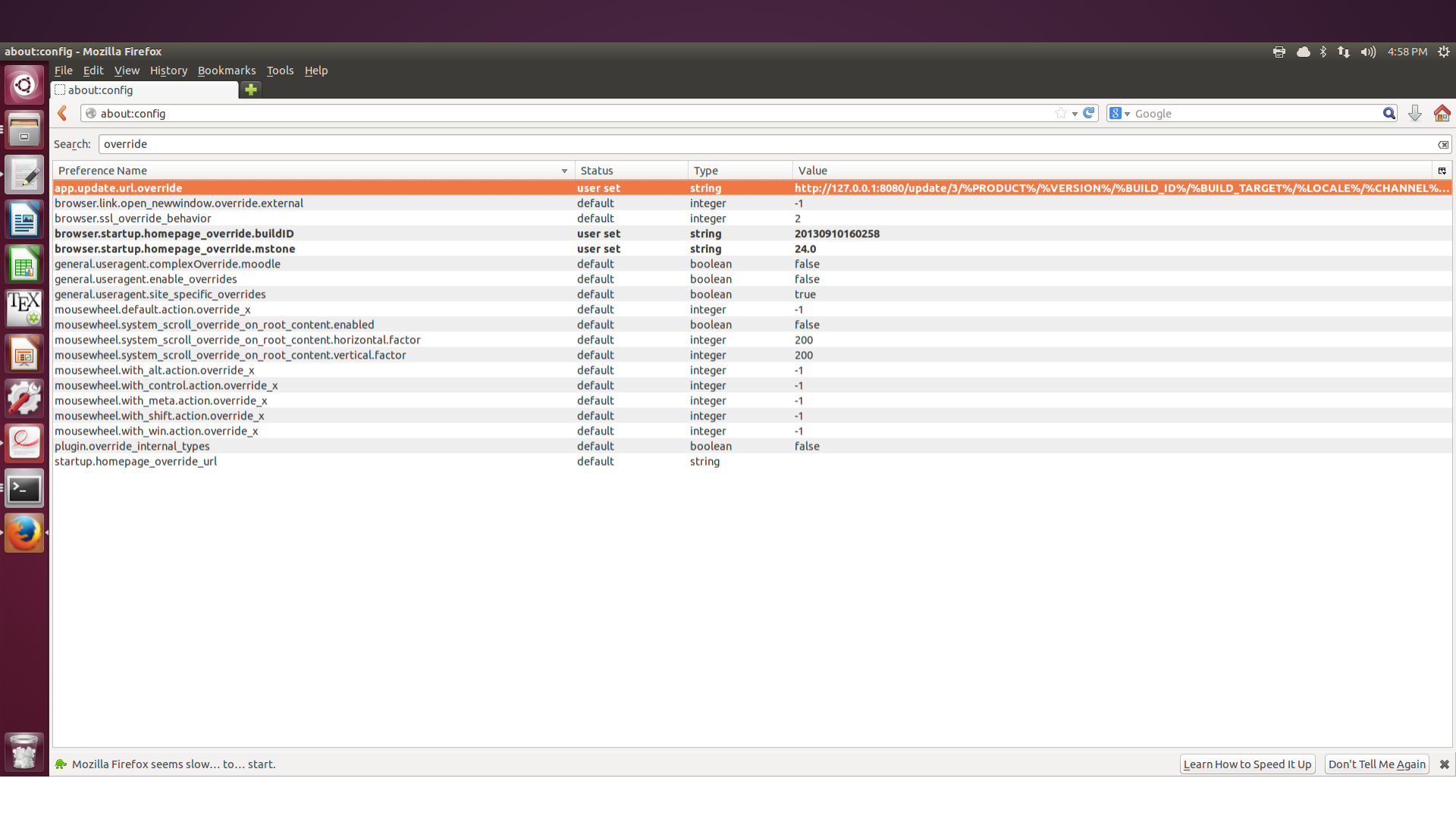
Usability Impact

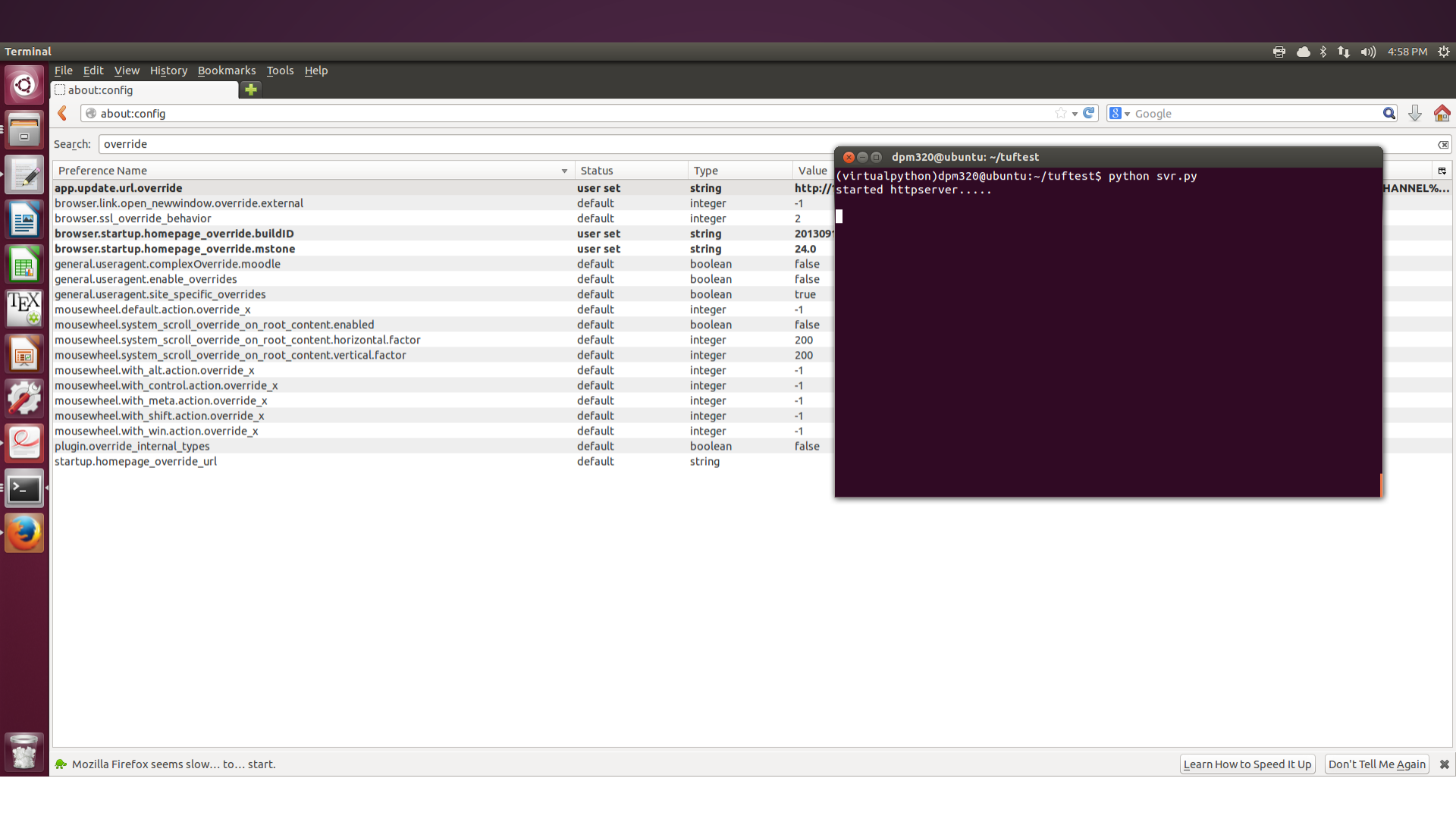
- Aurora/Nightly builds signed automatically
  - No impact
- Beta/Stable builds signed by developer
  - Impact of additional step

Efficiency Impact

- Could possibly improve on speed
  - Put TUF mirror on fast network

Demo


about:config - Mozilla Firefox
4:58 PM
File Edit View History Bookmarks Tools Help
about:config
about:config
Google
Search: override
Preference Name
Status
Type
Value
app.update.url.override
user set
string
http://127.0.0.1:8080/update/3/%PRODUCT%/%VERSION%/%BUILD_ID%/%BUILD_TARGET%/%LOCALE%/%CHANNEL%...
browser.link.open_newwindow.override.external
default
integer
-1
browser.ssl_override_behavior
default
integer
2
browser.startup.homepage_override.buildID
user set
string
20130910160258
browser.startup.homepage_override.mstone
user set
string
24.0
general.useragent.complexOverride.moodle
default
boolean
false
general.useragent.enable_overrides
default
boolean
false
general.useragent.site_specific_overrides
default
boolean
true
mousewheel.default.action.override_x
default
integer
-1
mousewheel.system_scroll_override_on_root_content.enabled
default
boolean
false
mousewheel.system_scroll_override_on_root_content.horizontal.factor
default
integer
200
mousewheel.system_scroll_override_on_root_content.vertical.factor
default
integer
200
mousewheel.with_alt.action.override_x
default
integer
-1
mousewheel.with_control.action.override_x
default
integer
-1
mousewheel.with_meta.action.override_x
default
integer
-1
mousewheel.with_shift.action.override_x
default
integer
-1
mousewheel.with_win.action.override_x
default
integer
-1
plugin.override_internal_types
default
boolean
false
startup.homepage_override_url
default
string
Mozilla Firefox seems slow... to... start.
Learn How to Speed It Up
Don't Tell Me Again


Terminal
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File Edit View History Bookmarks Tools Help
about:config
about:config
Google
Search: override
Preference Name
Status
Type
Value
app.update.url.override user set string http://
HANNEL%...
browser.link.open_newwindow.override.external default integer -1
browser.ssl_override_behavior default integer 2
browser.startup.homepage_override.buildID user set string 201309
browser.startup.homepage_override.mstone user set string 24.0
general.useragent.complexOverride.moodle default boolean false
general.useragent.enable_overrides default boolean false
general.useragent.site_specific_overrides default boolean true
mousewheel.default.action.override_x default integer -1
mousewheel.system_scroll_override_on_root_content.enabled default boolean false
mousewheel.system_scroll_override_on_root_content.horizontal.factor default integer 200
mousewheel.system_scroll_override_on_root_content.vertical.factor default integer 200
mousewheel.with_alt.action.override_x default integer -1
mousewheel.with_control.action.override_x default integer -1
mousewheel.with_meta.action.override_x default integer -1
mousewheel.with_shift.action.override_x default integer -1
mousewheel.with_win.action.override_x default integer -1
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dpm320@ubuntu: ~/tuftest
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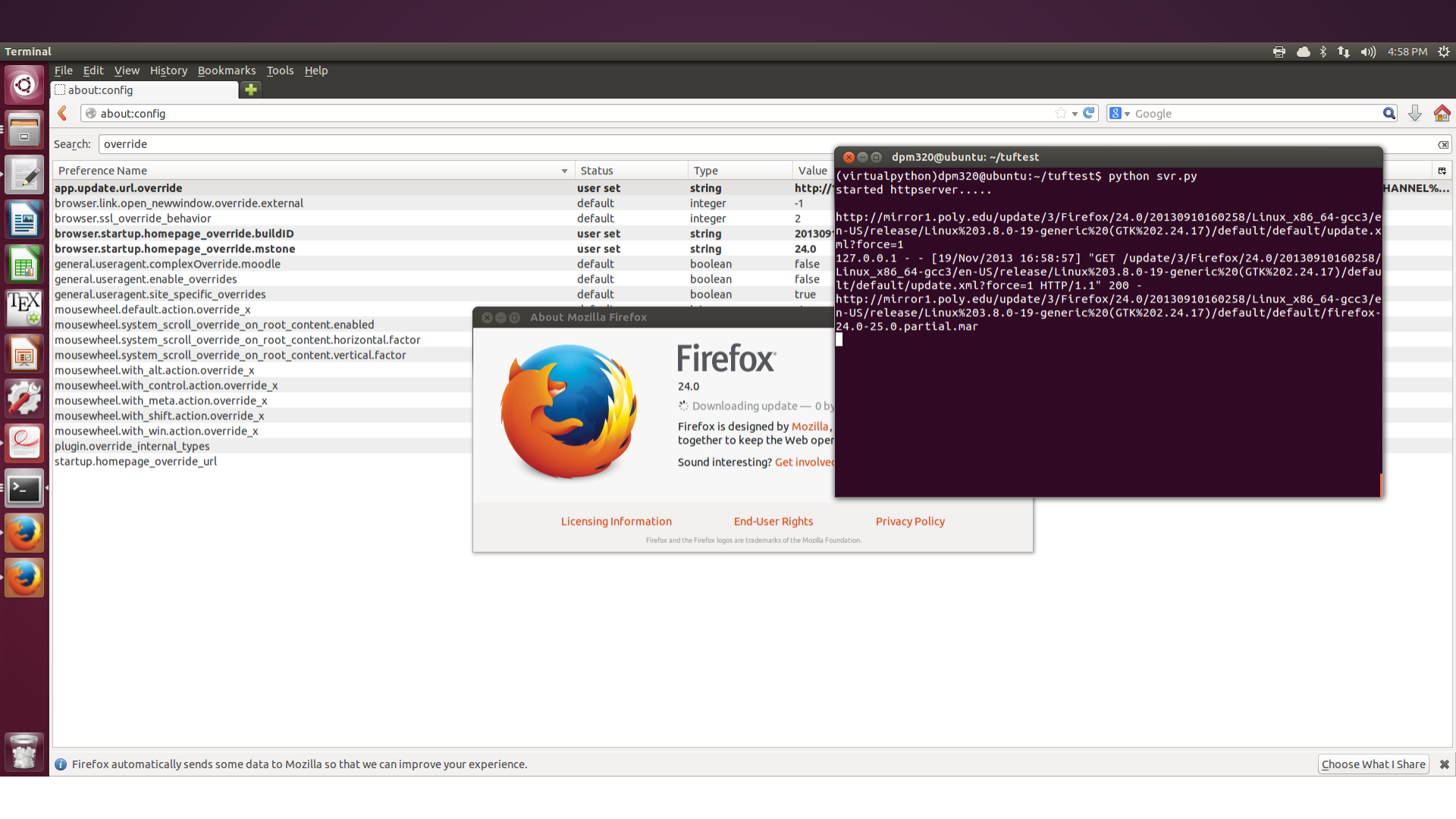
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HANNEL%...
browser.link.open_newwindow.override.external
default
integer
-1
browser.ssl_override_behavior
default
integer
2
browser.startup.homepage_override.buildID
user set
string
201309
browser.startup.homepage_override.mstone
user set
string
24.0
general.useragent.complexOverride.moodle
default
boolean
false
general.useragent.enable_overrides
default
boolean
false
general.useragent.site_specific_overrides
default
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true
mousewheel.default.action.override_x
mousewheel.system_scroll_override_on_root_content.enabled
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About Mozilla Firefox
Firefox
24.0
Downloading update — 0 by
Firefox is designed by Mozilla,
together to keep the Web oper
Sound interesting? Get involve
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Privacy Policy
Firefox and the Firefox logos are trademarks of the Mozilla Foundation.
dpm320@ubuntu: ~/tuftest
(virtualpython)dpm320@ubuntu:~/tuftest$ python svr.py
started httpserver.....
http://mirror1.poly.edu/update/3/Firefox/24.0/20130910160258/Linux_x86_64-gcc3/en-US/release/Linux%203.8.0-19-generic%20(GTK%202.24.17)/default/default/update.xml?force=1
127.0.0.1 - - [19/Nov/2013 16:58:57] "GET /update/3/Firefox/24.0/20130910160258/Linux_x86_64-gcc3/en-US/release/Linux%203.8.0-19-generic%20(GTK%202.24.17)/default/default/update.xml?force=1 HTTP/1.1" 200 -
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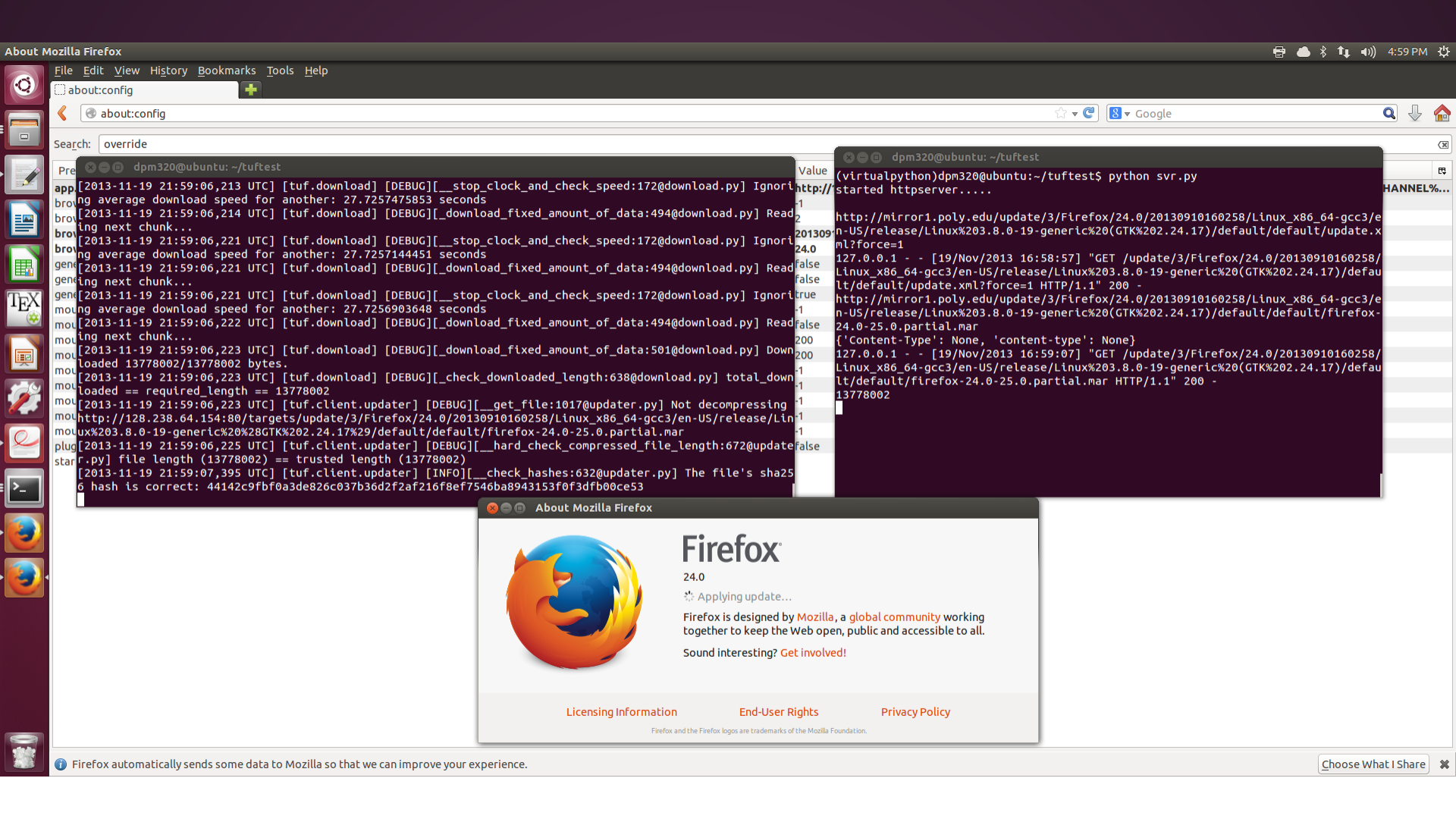
Firefox automatically sends some data to Mozilla so that we can improve your experience.
Choose What I Share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4:59 PM
File Edit View History Bookmarks Tools Help
about:config
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dpm320@ubuntu: ~/tuftest
[2013-11-19 21:59:06,213 UTC] [tuf.download] [DEBUG][__stop_clock_and_check_speed:172@download.py] Ignoring average download speed for another: 27.7257475853 seconds
[2013-11-19 21:59:06,214 UTC] [tuf.download] [DEBUG][_download_fixed_amount_of_data:494@download.py] Reading next chunk...
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[2013-11-19 21:59:06,223 UTC] [tuf.download] [DEBUG][_download_fixed_amount_of_data:501@download.py] Downloaded 13778002/13778002 bytes.
[2013-11-19 21:59:06,223 UTC] [tuf.download] [DEBUG][_check_downloaded_length:638@download.py] total_downloaded == required_length == 13778002
[2013-11-19 21:59:06,223 UTC] [tuf.client.updater] [DEBUG][__get_file:1017@updater.py] Not decompressing http://128.238.64.154:80/targets/update/3/Firefox/24.0/20130910160258/Linux_x86_64-gcc3/en-US/release/Linux%203.8.0-19-generic%20%28GTK%202.24.17%29/default/default/firefox-24.0-25.0.partial.mar
[2013-11-19 21:59:06,225 UTC] [tuf.client.updater] [DEBUG][__hard_check_compressed_file_length:672@updater.py] file length (13778002) == trusted length (13778002)
[2013-11-19 21:59:07,395 UTC] [tuf.client.updater] [INFO][__check_hashes:632@updater.py] The file's sha256 hash is correct: 44142c9fbf0a3de826c037b36d2f2af216f8ef7546ba8943153f0f3dfb00ce53
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{'Content-Type': None, 'content-type': None}
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13778002
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Applying update…
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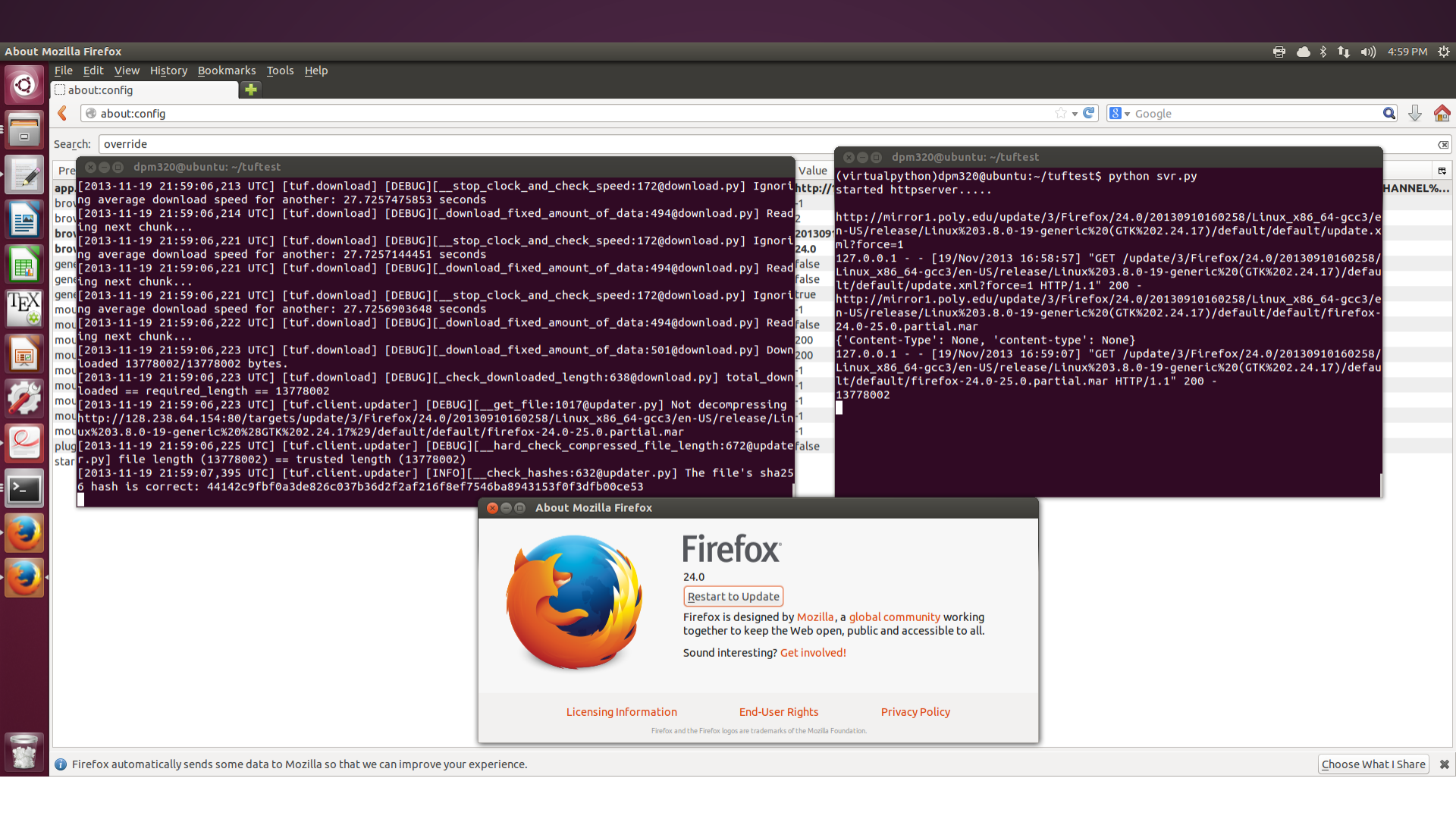
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13778002
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