

# combox

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0x00B252AF

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# acknowledgments

Dr. Robert C. Green II

introduction

problem

proposed solution

testing

- unit testing

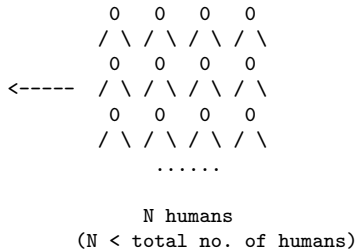
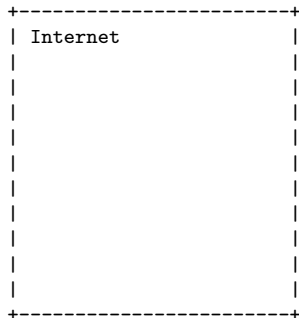
- manual testing

- stress testing

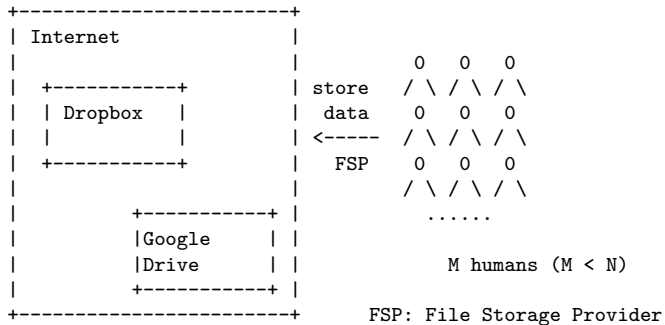
conclusion

pre-recorded demo

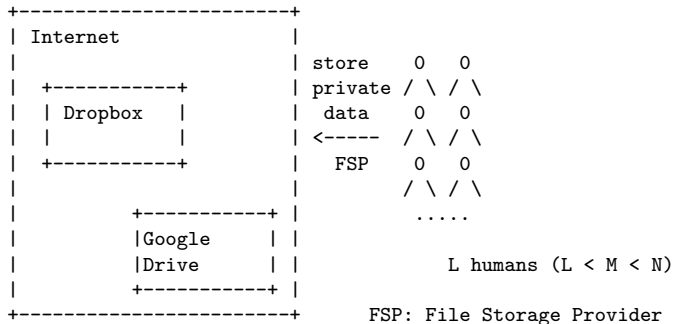
# 2016



# 2016



# 2016



# invariantly

*Law & Order. We may disclose your information to third parties if we determine that such disclosure is reasonably necessary to (a) comply with the law; (b) protect any person from death or serious bodily injury; (c) prevent fraud or abuse of Dropbox or our users; or (d) protect Dropbox's property rights<sup>1</sup>.*

---

<sup>1</sup><https://www.dropbox.com/privacy>

# 2013

- ▶ ECHELON
- ▶ Carnivore
- ▶ XKeyscore
- ▶ Boundless Informant
- ▶ PRISM



problem

“L” folks are in trouble.

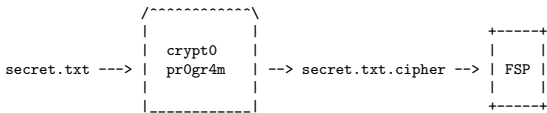
# “L” are in trouble

data stored in FSP's<sup>2</sup> computers  $\neq$  private

the last resort

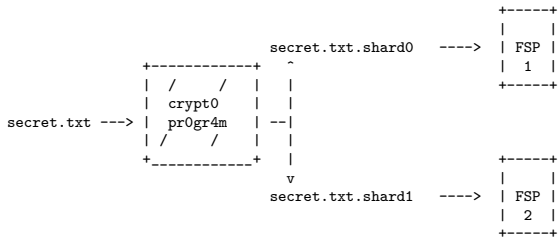
encrypt everything!

# encrypt everthing



FSP: File Storage Provider (Dropbox, Google Drive, etc).

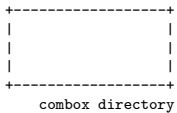
# what if



FSP: File Storage Provider (Dropbox, Google Drive, etc).

enter combox

# combox



computer i

# combox

node directory 0  
(dropbox)



combox directory



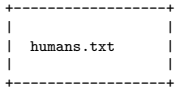
node directory 1  
(google drive)

computer i



# combox

node directory 0  
(dropbox)



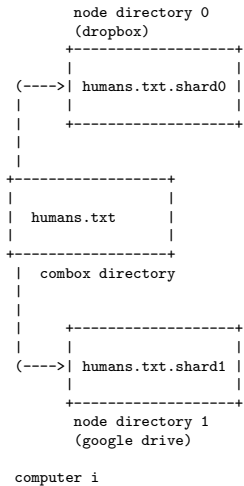
combox directory



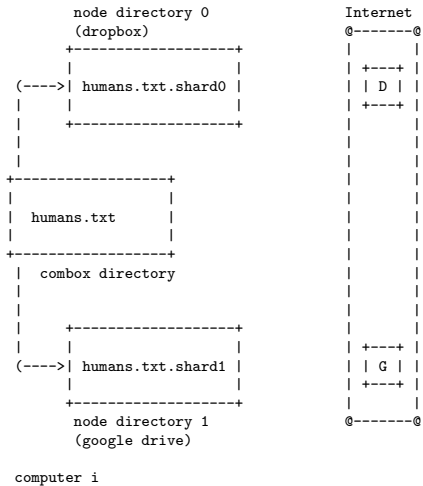
node directory 1  
(google drive)

computer i

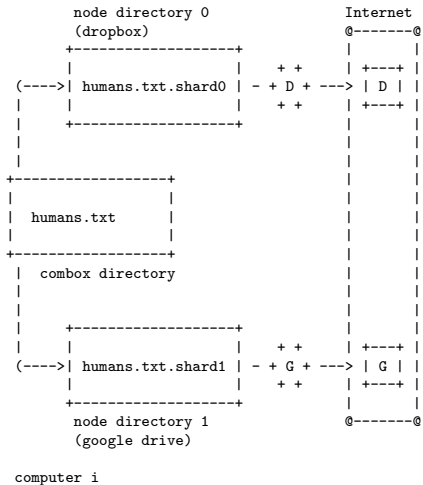
# combox



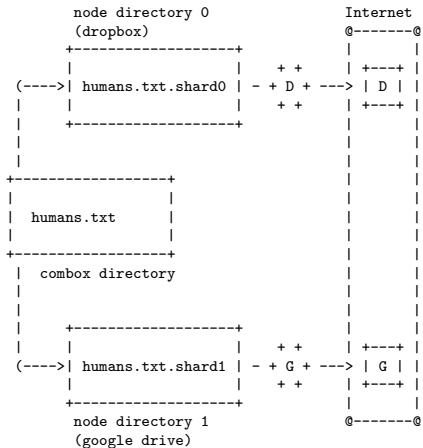
# combox



# combox



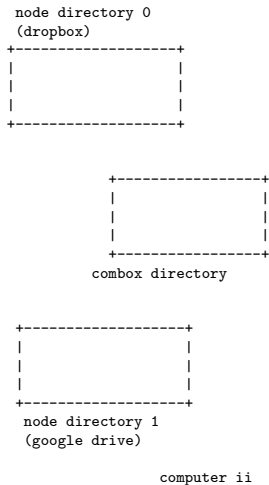
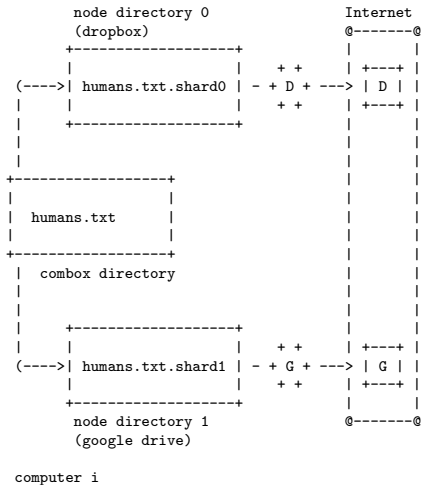
# combox



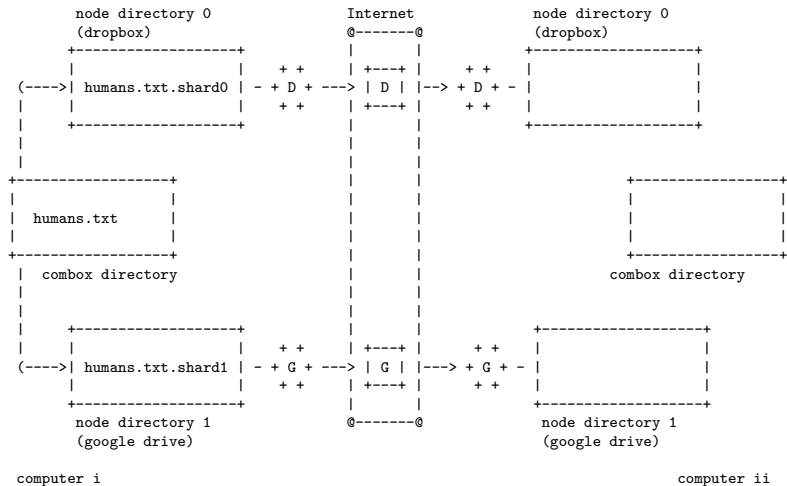
computer i

computer ii

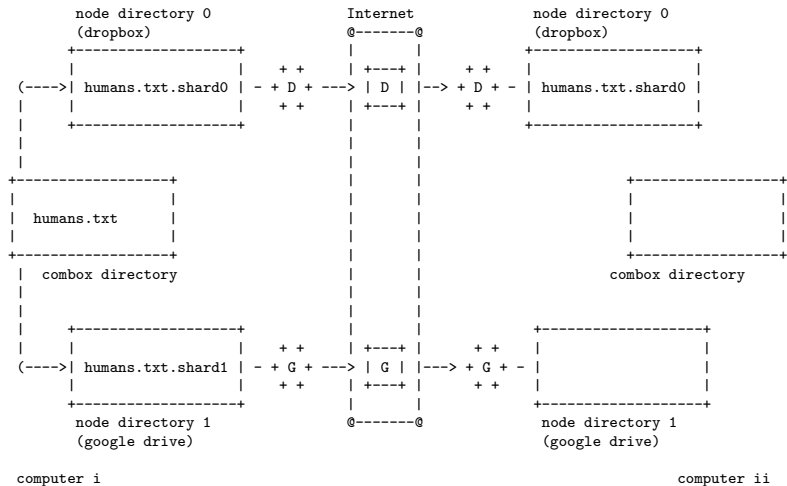
# combox



# combox

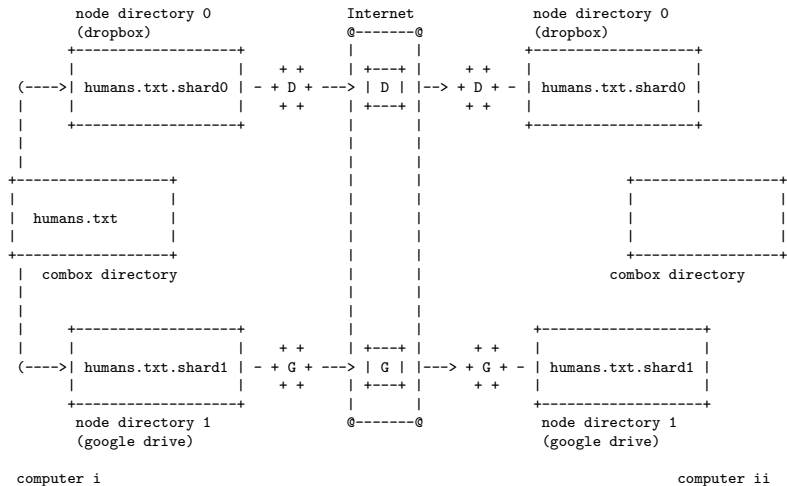


# combox

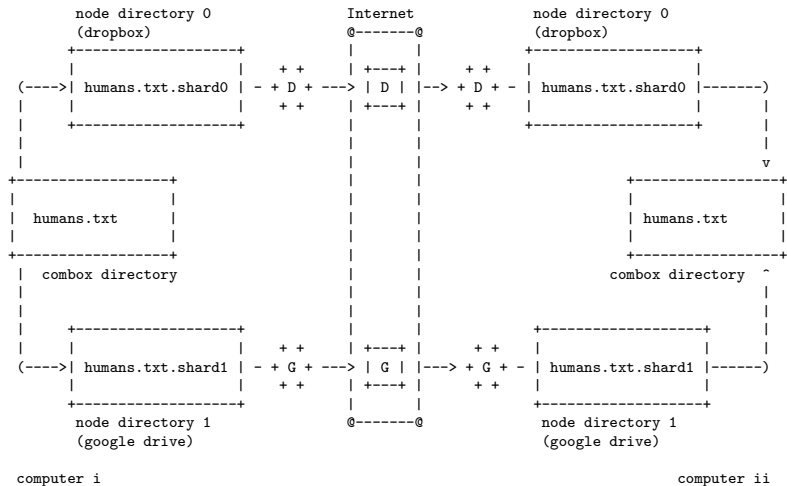




# combox



# combox



# Vollmar's Combo-Box

- ▶ C#

# Vollmar's Combo-Box

- ▶ C#
- ▶ SQL for tracking files

# Vollmar's Combo-Box

- ▶ C#
- ▶ SQL for tracking files
- ▶ Microsoft Windows program

# combox

- ▶ python

# combox

- ▶ python
- ▶ key-value data store for tracking files

# combox

- ▶ python
- ▶ key-value data store for tracking files
- ▶ python package, runs on GNU/Linux and OS X



testing

# testing

- ▶ unit testing
- ▶ manual testing
- ▶ stress testing

# unit testing

# unit testing

- ▶ nose testing frame work

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- ▶ nose testing frame work
- ▶ not pure TDD

# unit testing

- ▶ nose testing frame work
- ▶ not pure TDD
- ▶ benefits?

# benefits

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```
$ nosetests
```

```
.....
```

```
-----  
Ran 35 tests in 62.159s
```

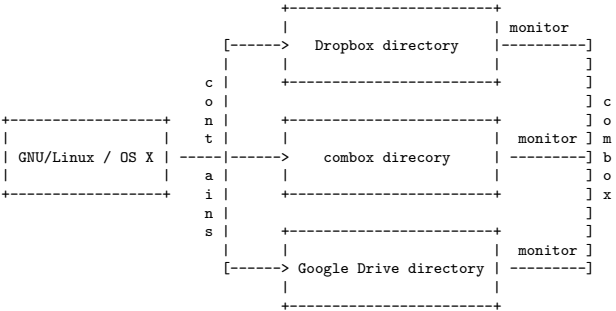
```
OK
```

# manual testing

# manual testing

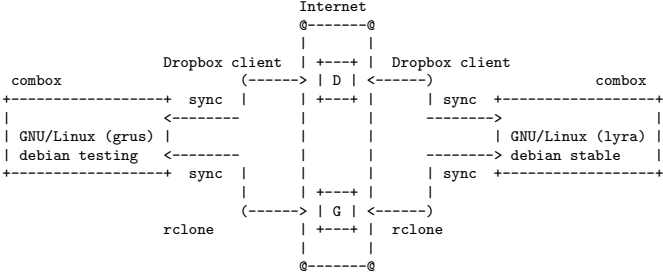
- ▶ combox on two GNU/Linux machines.
- ▶ combox on GNU/Linux and OS X
- ▶ combox on GNU/Linux and OS X with USB stick as the third node.

# manual testing



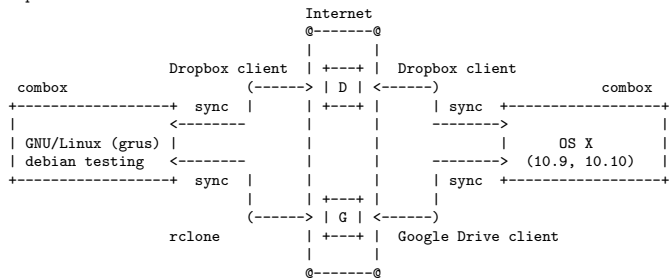
# manual testing

setup i



# manual testing

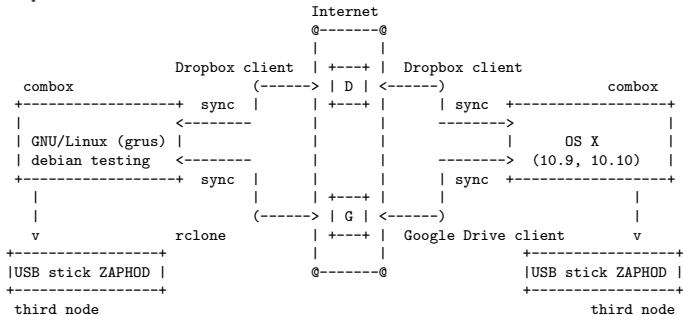
```
setup ii
```



```
found bugs #5, #6, #7, #10, #11
(git.ricketyspace.net/combox/plain/TODO.org)
```

# manual testing

setup iii



- modified shard on usb stick must be "touch".
- file rename/move does not work.

# stress testing



# stress testing

```
1 second delay
  +----+
  |    |
  v    v
- F - -1s- - F - -1s- - F - -1s- - F -
  -     -     -     -     -     -     -1s-
----->----->----->----->
dump script

-
- F - 20MiB - 90MiB file
-
avg. file size 60MiB

-
- F -
-
|
| - - - - |
| - F - - F - |
| - - - - |
+-----+
  combox directory
```

[git.ricketyspace.net/combox-paper/tree/dumper/dump](https://git.ricketyspace.net/combox-paper/tree/dumper/dump)

1620MiB dump - 27 files

# 1620MiB dump - 27 files

avg. time to split and encrypt → 2670.59ms

# 1620MiB dump - 27 files

avg. time to split and encrypt → 2670.59ms

total time to process all files → 02m:22s

5940MiB dump - 99 files

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avg. time to split and encrypt → 2979.64ms (↑ 309.049ms)

# 5940MiB dump - 99 files

avg. time to split and encrypt → 2979.64ms (↑ 309.049ms)

total time to process all files → 09m:10s (↑ 6m:48s)

# 10800MiB dump - 180 files



# 10800MiB dump - 180 files

avg. time to split and encrypt → 3423.08ms (↑ 443.440ms)

# 10800MiB dump - 180 files

avg. time to split and encrypt → 3423.08ms (↑ 443.440ms)

total time to process all files → 18m:04s (↑ 8m:54s)

# conclusion

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- ▶ combox v0.2.3

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# conclusion

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# conclusion

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- ▶ in “alpha” stage
- ▶ [rickety.space.net/combox](http://rickety.space.net/combox)

# conclusion

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- ▶ [ricketyspace.net/combox](http://ricketyspace.net/combox)
- ▶ [git.ricketyspace.net/combox](https://git.ricketyspace.net/combox)

# pre-recorded demo

[rickety.space.net/combox/demo.webm](http://rickety.space.net/combox/demo.webm)

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<https://creativecommons.org/publicdomain/zero/1.0/> for full  
legal verbiage.

Source at <https://git.ricketyspace.net/combox-paper/tree/presentation>