2,458,05X

MC; Gorilla hands; How to test your backup system; Almost like von Neumann

0.1   MC

Here's how my OS will be better:

memory commands change their behaviour based on how they were called the last few times

context commands change their behaviour based on the directory in which they're called, time of day, currently running commands etc.

Here's what the experience of using MC is like:

You receive a package a bit bigger than a ream of printer paper but lighter. You open it to reveal a card saying, "Your adventure has begun. Grab a drink: the intro will take about an hour."

Below the card is a DVD with beautiful art on it, and a faint smell of perfume. Below the DVD are two 1 TB hard-drives, each differently coloured, say, blue and yellow; 4 USB drives in multicoloured USB adaptors with key tags; a thin roll of light cream labelling tape that can fit on the key tags; and a pen.

You open the DVD case to see a booklet that says, READ ME. As you pick up the READ ME, you notice that there's a small notebook below it.

You flip through the READ ME to see installation instructions and a voucher at the end.

On the left "page" of the DVD case are two DVDs, slightly overlapping. The one on top says Disc 1 and the one below, Disc 2.

The README guides you through backing up your existing system to the blue and yellow drives and booting off of Disc 1. From then on, all other instructions are given by the OS . . .

OK, I'm doing a lot of revising. How about we just describe the package before getting to how it is experienced for the first time (but we gotta get back to that at some point).

The box contains:

1. 2 1TB drives

2. 4 USB drives, and keytags

3. Pen for writing in notebook

4. Sharpie for writing on DVDs

5. Little bit of labelling tape

6. A cloth for wiping dust off of the keyboard/screen

7. 20-DVD sleeve containing

   - Installation DVD
   - Blank DVDs

8. README booklet containing

   - installation instructions
   - Credentials to access an online service that provides
     a) Replicated backup
     b) Simple Web hosting
     c) File hosting
     d) E-mail
     e) Pseudonymous e-mail
     f) VPN
     g) Remote downloading
     h) Physical mail forwarding
     i) Bitcoin purchase/transfer
     j) Newsfeeds
     k) Realtime chat

9. Slim, spiral-bound, dotted-grid notebook

10. Sleeves and elastic straps to hold things in place

11. A 20-sided die for random number generation

The box is made of thick cardboard, or plastic. By construction, even an SD card cannot fall out of the box once it is closed and flipped upside down or shaken.

It is made to be easily opened and closed multiple times a day, so it can be used as a desk organiser. It has a handle for easy carriage.

Every case has a unique pattern drawn on it.

1.1   MC: Welcome Box
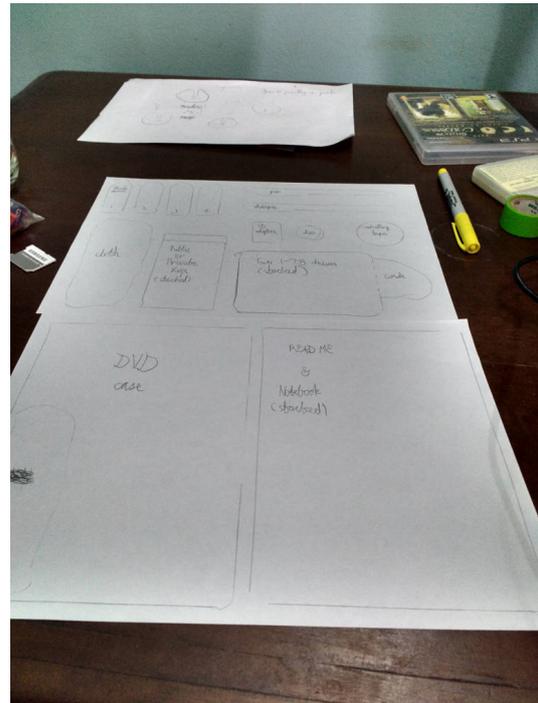
Mock-up of what the Welcome Box looks like when opened flat.

1.2   MC README

Introduction Welcome. My name is MC. In the next few hours, I'll teach you how the tools in this box can help you manage parts of your life.

Insert Disc 1 into your DVD drive, restart your computer, and follow the rest of my instructions.

1.3 MC: Installer

After inserting Disc 1 and restarting the DVD, you see a screen with a three-line terminal at the top, a "say" button (for submitting commands).

The interface for interacting with MC is a first-person shooter. You start in a small low room with a few doors in front of you:

- Backup files from this computer

- Make this computer suitable for MC

MC says, "This is the antechamber to your computer. You must pass through these three doors first in order to proceed to the rest of your computer."

FYI MC speaks by displaying her face at the bottom of the screen, printing the text there, and also saying the words through the speakers.

Backup files from this computer MC: "We shall use the blue and yellow drives to backup your data. After I have setup this computer, we'll restore your data from the backups

"Connect the blue and yellow drives to the computer then say 'OK' (note that backing up may take up to 2 hours)"

Music begins faintly and increases in volume to distract the user from the waiting.

"Your files have been backed up. You *may* disconnect the backup drives. Go back to the antechamber."

Soundtrack dies out.

Installation "We shall set up the computer so I can make use of it. This procedure will erase all data from the computer. May I proceed?"

Music plays.

"The computer has been set-up. Return to the antechamber and proceed to your computer."

Music stops. You hear a rumbling sound like something heavy is moving in the antechamber.

First entry to the computer You return to the antechamber and notice that right in front of you is a large door. You push open the doors to see that you're standing at the top of a flying castle, looking down on an uninhabited city. The time of day depends on your local time of day. You can hear the sound of wind.

MC tells you about the city:

"This city represents your computer. You may return to this castle whenever you want to change how the computer functions.

"Otherwise, you may spend your time using the computer by creating and playing in buildings down there. Let me show you how. First, connect the blue backup drive to the computer then say 'OK' "

"We're going to build a building of music where you can listen to, annotate, and remix your favourite songs. Create a building by telling me, 'MC, create a music building'...

A building appears near the middle of the field of view. Each building has a distinct shape. It has by default one entrance. Overlaid on our view is the randomly generated name of the building.

MC shows you how to use some of the features of Music building then invites you to import the music from your backups so you can play it as well.

4

Next MC shows you how to call on her and how to get back to the castle at any time. You're now free to create new kinds of buildings (from the menu of building types), modify buildings, explore, and destroy buildings.

Each building type has its own set of teachers who can walk you through managing buildings of that type.

Some building types:

1. diaries and diary entries

2. Movies

3. Pictures

4. Contacts

5. E-mails

6. Long-running thoughts

7. . . .

1.4   MC language

Features:

1. Allow one-handed operation by testing each command with only one hand.

2. Amenable to voice input/output

   a) Make shell language case-insensitive and use only tokens from a list of words that are audibly distinct so that source code can be read unambiguously

   b) *All* system application functions can be done through the shell language

1.5   MC: Music building

Features:

1. Import files from the backup (optional)

2. Compose/Remix, Read, Update, Delete songs

3. Browse and organise songs

4. Browse history of songs played

5. End the program by instant silence, or by letting the current song play to the end.

6. Play multiple songs at once e.g. if you wanna cue up another song.

7. Search for music by metadata, lyrics

8. Tag songs and parts of songs

9. Treat parts of songs as first-class e.g. add them to playlists

10. Autogenerated playlists according to mood

11. Export playlists

12. Export sets of music files

13. Re-download the file if the audio is missing

Multiple entrances:

- In play-mode, you appear right inside the auditorium and a random song (according to your preferences) starts playing

- In normal mode, the auditorium starts out silent

The stage shows the currently playing song, the songs lined up to play next, and controls like Play/Pause/Next-track etc.

To select a new song to play, pick up the Programme in the seat pocket in front of you. It brings up a list of files, playlists, artists, and albums.

1.6   MC: I/O

External drives are shown as rockets landing and taking off. Network interfaces are space elevators.

2.01   MC: Music Building

(contd.)

Come to think of it, this music building houses all activities that'd be found in a decent university's music department: finding music to listen to, composing music, listening to performances, learning how to compose and play and appreciate music.

The brochure's table of contents is the menu for using the building (so it might be more of a manual than a brochure).

In the manual, you can ask for a tour of the building which walks you through all possible activities carried out there.

2.02   MC: Custom building

Sometimes you want to work on new or ill-defined activity which none of the other building types fits. In this case, say "MC create a custom building..."

detour: how can we give MC commands and building-specific commands while allowing all commands to be textual?

2.03   MC: The command line

As mentioned before, the console sits at the top of the screen. It can be made to fill the screen so you can see your history of interaction with the computer i.e. your (textualised) commands and the computer's (textualized) response.

In the command bar there is a thumbnail of the person you're talking to. By default you talk to MC unless you're in a building, in which case you talk to the building's steward. Most graphical operations like moving around a room aren't logged, but moving to different rooms (which may have different command styles) is logged.

Each command (to MC, a building, a part of a building) is designed to have concise (in words, not characters) textual and non-textual forms so that one can participate in all activities using voice alone, or using some more efficient means e.g. a mouse or a piano keyboard.

2.04   MC: Custom Building (2)

In a custom building one can

- Archive i.e. remove from working memory

- view the table of contents of the manual i.e. view all possible activities

- enter and leave buildings and rooms

- copy in/out artefacts from The Attic

- create new artefact

- make a new room or window

- delete room or window

- remove artefact

- rename room or window

FYI activities have a strict subdivision: city > building > room > window.

Archiving is done automatically. The more you access a building the larger it's icon appears on the city map.

2.05   MC: Diary building

Diary buildings have the following activities:

1. Search for similar entries

2. Find only public-friendly thoughts

3. Show entries in certain date range

4. Modifying past entries

5. Commenting on past entries

6. Including sounds, video, images

7. Referencing other core data

8. Text search

Just like auditoriums, diary buildings have a viewing room and a composing room. In the viewing room you can easily cross-reference dates and events from diary stores other than the one being viewed.

The composing room has a window dedicated to previewing the diary, and this window can do everything the viewing room can do.

detour: referencing data from the store

2.06   MC: Data Store

The underlying filesystem is invisible. Instead what you have is a content-addressed data store (even the file open dialogs have been modified to use it). You search for the name of a file or some words inside the file and it pops up lists of candidates tagged with metadata e.g. whether there exist newer versions of this file. The data store learns which files you intend to select when you type certain words e.g. typing "pass" and picking the manual for the pass command 3 times will make it always bring out that file as the top hit in future.

Deleting files is an intentionally difficult operation since you'd have to delete all references to the file, including in backups, then also make a note in the logs so future-you isn't confused by the absence. Plus you'll have to physically delete the permanent logs.

For systems-programming tasks you might need access to the filesystem. This is provided by a special terminal that warns you when making any unrecoverable changes to the filesystem.

What tasks does this abstraction make simpler?

It prevents me from making irreparable changes to files unless, of course, I do wanna make irreparable changes.

Perhaps I can accomplish this by making each building's steward have its own UNIX account which is world-readable but not writable. That way, as an ordinary user you can see what files each building has on you but you can't make irreparable changes, except through the building's interface.

2.07   MC: Diary(2)

Blood pressure, weight, productive deci-days, TODOs, and long-running thoughts can all be tracked using diary-type buildings.

2.08   MC: Museum

The museum hosts picture and video-viewing and editing-related activities.

It has a main gallery for enjoying small/medium-sized collections. The collections are automatically grouped into themes and placed in windows in a large, many-sided room. Certain collections are password-protected.

It also has a "back room" for browsing for pictures/videos quickly, by date, by people pictured, by colour theme, metadata etc. In the backroom, the pictures/videos can be retouched and their metadata edited, all while preserving the originals.

You can export groups of files to a removable drive in the export room. You can select a bunch of files and ensure that their size doesn't exceed a certain amount.

Also, multi-select doesn't require you to hold down a key during the entire process.

◇

Important documents (e.g. birth certificate) can be viewed in special collections at the museum.

2.09   MC: Library

The library has a reading room and the stacks. In the reading room, you have a large desk on which you can place hundreds of books which you're in the process of reading. Each book can be extensively annotated (not only with marginalia) and the librarian will help you merge the notes from multiple copies of the same book. You can also write your own notes and manuscripts here.

In the stacks, you can search for books locally and online. Each book has a permanent window location in the stacks.

2.10   MC: Post Office building

In the main hall, you can look up details of anyone you've ever contacted (or who has public contact information on the Internet) including their previous contact details.

In different rooms you can send them an e-mail, send and receive packages, make a phone call, a Skype call, a Google Hangout, an SMS, a WhatsApp message, an in-person visit etc.

You can also view logs of all previous contact with these people that you've had.

In the bulk mail room you can import/export your communications to/from a variety of formats. The post-mistress can help you importing all sorts of esoteric formats e.g. Gmail exports, WhatsApp exports, SMS exports etc.

2.11   MC: Treasury

Here you can view and track expenditures, and produce summary reports of your financial accounts.

There's a work room and a viewing room. Entering new expenses and assets to track happens in the work room. Viewing, searching, and dissecting reports happens in the viewing room.

2.12   MC: Clock Tower

There's the clock which shows the time in a hundred ways. The clock is at the top of the building and it is always night up there so you can always see the stars. Moving back and forward in time makes the stars move into their positions at those times.

In the control room below the clock, you can set the clock to chime at intervals (e.g. for meditation practice), and how the time should be displayed.

2.13   MC: Flying Castle

There are multiple rooms here.

From one of them, the time travel room, you can look out at the whole city, and then move time back to a time you want to see. When you then step out, you'll see the city as it was at that point in time.

To retrieve a file from backup you can go to the time travel room, travel to the time you want, pick up the artefact, return to the time travel room, move time back to the present then return to the building where you were.

Alternatively, there's a shortcut so you can time travel any where you are in the city. You also always carry a time-proof sack so you can time travel and collect artefacts to bring to the present.

detour: defining deletion

2.14   MC: Deletion

We never use the word "delete" except in one case, when you explicitly want to remove all traces of a file from your system. In such a case, the file will be removed from all backups and the memory zeroed out. If you ever attach an old backup containing the file, you'll be asked if you wanna delete the file from the backup.

2.15   MC: Vault

Here are stored passwords, log-in credentials, keys, and other secrets.

When you walk in, you can see a large sign showing how many locations your secrets are stored in. There should be at least 4 locations: this computer (always lit), blue backup drive, yellow backup drive, [remote] (the name changes based on what city your remote server is located in).

In the viewing room, you can search and browse through them. You can also create certificates showing that you've seen a secret (e.g. for cryptocurrency work) .

In the work room, you can create and modify secrets.

2.16 MC: Post Office building (2)

You can set a reminder by going to the post office and sending a message to yourself in the future.

2.17 MC: Language Preservation Centre

Here you can record new words you've found, print dictionaries of words found so far, and search the dictionary.

2.18 MC: Memorial Park

There's a headstone for each person/thing you want to remember and an underground room where more memories of the person/thing can be recalled.

All around the park are stands where you can play videogames.

2.19 MC: Travel Office

This is where you go to browse the Web.

The signboard in the atrium announces what city it will look like you're coming from, including the IP address. It also shows lists of common destinations i.e. bookmarks.

Visiting a Website seems like teleporting for fast websites and like boarding a plane for slow websites. The captain remembers previous loading times and will give you soothing messages based on how long the flight is taking and what stage of the flight you're stuck in (in case of a delayed flight).

2.20 MC?

In the end (perhaps because I feel too lazy to build all this) I feel this MC idea is frivolous: UNIX is minimalist compared to MC.

OK, OK. Let's not argue about *words*. Perhaps MC is an ideal OS not a minimalist OS. If it existed today, I'd probably try it out and would probably keep using it as long as with it, I could do everything I can do with UNIX, with less than twice the difficulty.

2.21 World Peace

How can I tell how close we are to World Peace today?

World Peace is 0 cases of torture in the world.

How many people were tortured last year?

. . .

3.01 Exit, supernatural

I'm gonna stop using language like God, Satan, demons etc. unless I have a specific, observable thing I can attach them to.

This is because last night, before falling asleep, I was petrified for an hour or two be-

cause I thought a gorilla hand would touch my leg.

I hope not speaking to myself as if disembodied gorilla hands can appear under my bed will cause me not to lose sleep over being alone and in the dark.

3.02 Horror

Somehow, I think I like getting scared.

3.03 Gorilla hands redux

Story about person imagining that a gorilla appears under their bed. And that it stretches out its hand and touches their foot. And all the evidence up to the point where the hand drops could be interpreted as other, more benign things.

3.04 MC: Fashion School

Here you can design different patterns e.g. Islamic patterns, cloth patterns, plaid etc.

3.05 Minimalist Computing: Online Services

The computer can be used productively without ever connecting to the Internet. But if you do, there are some activities in the city that open up to you.

When you first enter your local vault, MC tells you that you can store your public and private keys (provided in the welcome box) so that you can access online services later.

Your welcome box comes with free MC tokens. So at this point the treasurer will hand you a wallet with your tokens. Interactions with MC servers cost MC tokens.

3.06 MC: Remote vaults

In your local vault, you can play a game to setup your remote vault. When you enter the game room, you see a map with certain cities flagged. These represent cities where MC has remote servers. You can also enter the server URL of your remote server.

Once you select a server, the treasurer starts copying your encrypted backups there. Since this takes a long time, you can leave now. When the process is done, you'll see a flag over the vault showing whether the process succeeded or failed and then you can come back to replay the game.

In extreme cases, you can restore your backup using only your public/private keys (these instructions are listed in the printed manual).

1. Get a computer with enough disk space, even if it is external

2. Browse to the MC server and download the minimal MC distribution (It should be as small as possible for quick downloading in times of distress e.g. when one's files are lost)

3. At the loading screen, press some keys to enter, Restore From Backup mode.

4. Select "Online restore"

5. At the prompt, enter your public key, then your private key

6. MC will tell you whether your backups were found and will begin restoring. You can stop anytime and when you return the process will resume.

3.07 MC: Publishing House

The publishing house is affiliated with the library. You can also compose manuscripts here, but the main aim is preparing manuscripts to be published to a wide audience.

The publishing house is a set of factory "rooms" where you can publish each kind of artefact (including custom types).

For instance, to publish a document as a Web page on your blog, you'd walk into a Web page room (or create a new room just for your blog). There you'd see a flowchart laid out on the floor, you can add nodes and connectors using standard parts from windows around the room. You can create test artefacts to play with. And if you're publishing to an MC server, you can also locally test how the page will look before deploying the artefact (as part of the pipeline).

3.08 MC e-mail

Once you have an MC subscription, you'll notice a counter at the post office that says,

"Set up your MC e-mail account." There you can set up things like your signature, out-of-office replies, display name etc. From then on, when you go to e-mail someone, your MC account will show up as a possible sender.

3.09 MC: Anonymous Travel

If you're subscribed to MC's VPN, you'll see a passport office where you can create new identities with their own default server of origin, browser id, allowed/disallowed destinations etc.

Selecting the right passport will route your browser traffic for that session through the VPN server.

Note that you can route all non-browser traffic independently of the browsing traffic, but to do this, you need to play a game in one of the back rooms of the travel office.

3.10 MC: Drop Box

The browser has a button letting a remote server download a file which you which you can pick up later.

3.11 MC: Newsstand

At the newsstand you can view RSS and NNTP feeds (and any other open feeds) that you subscribe to.

3.12 MC: The Joint

A place where you can hang out with people from all over the world. It has many (chat) rooms.

Before you enter each room for the first time, a new, random identity is created for you consisting of a name and an avatar. Per Raph Koster's presentation[1], the avatars are all sweater-ugly to prevent discrimination based on body type.

Of course some require you to have accrued social capital in other rooms first before being able to enter. Each room has rules on whether you can change your avatar and name.

3.13 MC: Objective

This MC project has multiple objectives:

1. A capstone project showing off all I've learned about computers

2. A project to show potential employers that I can create stuff

3. A gift to future-me

4. A tool for teaching kids how computers can help their lives

5. The product of my custom OS business

6. A demonstration of what an utopia could look like

7. A home where I can live comfortably day-to-day

---

[1]https://boingboing.net/2017/03/14/grandson-of-rheingold.html

8. A secure communication network for me and my friends

9. An excuse to create my own cryptocurrency

3.14 MC Website

The MC Website is an easy-to-exhaustively-navigate site which

1. tells people what MC can do,

2. lets people download the MC client binary and source code,

3. lets them download the Website's sources as well,

4. lists mirrors of the site,

5. and contains a copy of the printed manual.

All other online services (e.g. e-mail) are accessible only through dedicated clients so I can avoid Web programming.

3.15 MC: Systems Programming

Would I write MC using MC?

That is, would I write MC using Racket and MC as the IDE?

Yes...?

3.16 MC: The Caves

In the caves you can manipulate MC directly at the operating system level e.g. use the OpenBSD console directly, modify the kernel etc.

3.17 MC: The Workshop

In the workshop you can create new programs, even those as complex as MC itself. Each program is developed, tested, and run in a virtual machine. Each VM is represented as a parallelepiped (with distinct shape, colour, and pattern for ease of identification).

The doodads attached to the box change depending on what peripherals are connected to the VM e.g. a cord snakes to "Real filesystem" if the VM uses that, but goes instead to a box labelled "VM FS" otherwise.

$$\Diamond$$

The workshop has to be the first thing to be built. Once that's done, I can store the templates I used to build everything else, and use those templates as teaching aids for other MC users.

3.18 Building MC

How do I build MC? By creating

1. an IDE for designing virtual machines (since each MC instance—including the cloud services—can be modelled as a VM).

2. a VM that can run the user-interface and all other online services at the same time. If necessary, programs can be broken out to separate VMs during deployment.

3. a user-interface program that supports traversing a 3D city.

4. a level editor

5. a backup server/client

6. a torrent server/client

7. an e-mail server/client

8. VPN server/client

9. RSS/newsfeed aggregator/client

10. Chat server/client

11. a console for speaking to MC

12. an MC installer

13. A speech synthesizer

14. A digital audio workspace

15. Music browser

16. Media player

17. A DJ mixer

18. File metadata editor

19. Audio fingerprinter

20. Score writing program

21. PDF viewer

22. Text editor

23. Full text indexer and searcher

24. Rich text e.g. LaTeX composer

25. WYSIWYG document composer

26. DBMS for storing/querying data

27. Deduplicating filesystem (to save space)

28. Snapshotting filesystem (for time travel)

29. Secure file deleter

30. Program that displays groups of pictures/videos nicely

31. Photo editor

32. Drawing program

33. Book browser

34. WYSIWYG spreadsheet

35. Accounting software

36. Star viewer

37. Calendar

38. Password manager

39. Software for CRUD-ing software i.e. package manager

40. Compilers for major languages

41. Dictionary creator

42. Videogames

43. Web browser

44. Document processing pipeline software

45. HTML editor

46. Virtual machine runner

47. Anti-RSI program

48. Virtual keyboard for multiple IMEs

49. Peripheral drivers e.g. printer, mouse, keyboard, Wi-Fi, scanner, webcam, microphone, HDMI, speakers etc.

3.19 Virtual Machine Integrated Development Editor

Features:

- Every time you run a VM, its input/output (be it video, sound etc.) is recorded in a rolling buffer so if it crashes, you can go back and see what went wrong.

- For certain, well-behaved VM types, we can replay the VM state but make a few changes e.g. "recreate that crashed VM but use Python 2 instead of Python 3" (sounds like something Guix/Nix could help with)

- The well-behaved VMs have filesystem watchers so they can apply any source file changes without needing an explicit action (unless, of course, you want to explicitly signal recompilation).

- Has a Read-Eval-Print Loop so I can automate VM creation/testing tasks

◇

So, to start I can just manually create the VM that'll run the desktop and server programs, carefully note the troubles I face while doing that, then create an IDE that makes it a 15-minute job to recreate such a VM.

3.20 MC VM

Features:

1. Deduplicating filesystem

2. Snapshotting filesystem

3. Functional package manager

4. OpenBSD

5. . . .

4.1 How to test your backup system

What would a backup guide contain?

- Threat model

- Who this guide is meant for

- What you'll need to backup

- How to backup for Windows, Linux, and OSX

- How to test your backups

Language Note Backup should be used only as a noun, never as a verb.

The statement "I'm going to backup my computer," should irritate your ears; what if you "backup" your data and lose the backup? what if you "backup" wrongly and no data gets saved? Serves that person right for "backing up."

Instead, of "backing up" you should "test" your "backups." Testing implies that backups have already been created and now you're checking to make sure the backups work as you expect. Believe me: when you do lose your data, you're gonna want only the tested backups.

4.2 Backup Threat Model

I'm protecting against ransomware, hard drive failures, and fire. I am not protecting against theft.

4.3 Backup: Who is this guide meant for

Imagine that your computer suddenly and inexplicably stopped working today.

Let that sink in.

Now a genie appears and says, "I shall restore all the information that was on that computer if 1) you can give me two brand new portable hard drives (each able to hold all your data)and 2) you agree to work for me for one hour a month for the rest of your life."

If you would agree to such a deal, then this guide is for you.

If perchance you store any information that people would like to steal from you, this guide is definitely not for you.

4.4 What you'll need to backup

You will need two portable hard drives, each big enough to store the contents of your computer.

4.5 How to create the first backup (Linux)

1. Set a monthly reminder to test your backups

2. Install Backintime

3. Set Backintime to create a backup once every hour

4. Create your first backup

4.6 Strange Fruit

Strange fruit by Nina Simone

shudder

4.7 Melting snowflake

It was a hard notion to accept: that the world would keep turning even if I stopped cranking the wheel.

4.8 Friend 4 165

Friend 4 165 is a *slightly* (but consistently) more moral me than me.

Today he forgave me for missing our phone date with barely a shrug.

4.9 Free Writing

Read Drexler's book and determine what makes nanotech dangerous

◇

We should test programmers with ICFP problems (esp. the PLT one) instead of whiteboard puzzles

◇

If I can't compete and place in the top 10% of the ICFP 2018 (September) contest then I'm probably a mediocre programmer [probably not true]

◇

My daily rate should be USD 821 (as at 2016).

6.1 Mental Math

FYI the past few days I've been reading a mental magic book instead of doing addition tables in the morning. I've realised that I was practising the wrong thing anyway: instead of filling out a multiplication table by repeated addition (and thus practising addition), I should fill out a 10×100 table and recite it the way the school children do, "12 times 90, ten hundred and eighty; 12 times 91, eleven hundred and seventy-one."

6.2 How to test a backup (Linux)

Immediately after your first backup is created. You should test it by going to the text file you created earlier, changing its contents to "I love Bayliss" and saving the file.

Now use your filesystem explorer to search for the test file and open it. If it

says, "I love Amanda" then this backup is usable. If it says, "I love Bayliss" then, for some reason, the backup failed.

Try repeating the steps again, and if you still fail, ask a computer-savvy friend for help.

6.3 How to make subsequent backups (Linux)

According to your settings, Backintime will make subsequent backups periodically, whenever the backup drive is plugged in.

If you want to make a backup now, open Backintime (root) and click "Backup" on the toolbar.

6.4 How to make the first backup (Windows)

1. Attach a backup drive

2. Create `friend.txt`

3. Turn on *File History*. It will take a while to create the first backup.

6.5 How to test a backup (Windows)

(Same as for Linux.)

For more details on File History see the Microsoft Support article, "File History in Windows."[2]

6.6 How to make subsequent backups (Windows)

File History occasionally makes more backups as you use the system. If you want to make a backup right now, browse to the File History control panel and click "Run now."

6.7 How to test backups on OS X

See the Apple Support article, "How to use Time Machine to back up or restore your Mac."[3]

6.8 More MC features

BTW every building, room, and window will have a tutorial that walks you through expert level performance with it.

◇

Autocomplete for every command.

◇

The shortcuts (e.g. Alt-Tab) for a host VM and guest VM never clash.

---

[2]https://support.microsoft.com/en-us/help/17128/windows-8-file-history
[3]https://support.apple.com/en-us/HT201250

6.9 "It" by Stephen King

What the fuck, Stephen King? There's no rhyme or reason to the way It strikes; there's no way you can dodge it. One day, it's just your turn to die and It shows up. Why would anyone write such scary stuff, for fuck's sake???

7.1 How to test your backup system

Let's have a metric for comparing backup systems. Possible measures of quality:

- Time since last backup was taken

- Time to restore from a backup

- Size of data

With such a measure, I can determine the relationship of effort expended to quality of backup system produced.

How do we measure effort expended?

- Cost of equipment

- Time spent maintaining system

Theory the value of the time lost (TL) due to data loss every year should equal the yearly cost of maintaining the backup system (M).

Proof If you will lose data at some point you'll cost yourself TL. Assuming that this will happen at a random time, but it *will* happen at some point, you can pay upfront so you get to choose the date of data loss.

$\diamondsuit$

This suggests that, all things being equal, the more valuable your data, the more frequently you should "lose" your data on purpose.

$\diamondsuit$

But this article's scope seems to be ballooning out of hand. Perhaps I should find out what kinds of data losses people actually suffer, and make a system suited for that.

FYI Friend 9 960 hasn't suffered data loss since 2010. I should start recording every time I, or the people I love, lose a file.

$\diamondsuit$

Given ~~an amount of data,~~ the amount of time you want to spend restoring data after a loss event, and how frequently you lose data, I can tell you...

$\diamondsuit$

FYI I get about 80MiB/s data transfer for transferring small files from my external drive to the computer. That limits me to filling the hard drive soonest in $\frac{240GiB \times 1024}{80MiB/s} = 3072s = 51.2m$.

7.2 Backup: Data Loss Events

Friend 342's drive of movies died in 2014. Before that, his last data loss event was in 2007.

7.3 Idea

Home-brew service where one can get movies, series, music, and books delivered to phone, kindle, or laptop.

7.4 MC: Next steps

1. learn Emacs so I can submit NixOS documentation patches.

2. Then, install a snapshotting filesystem onto NixOS, or Nix/OpenBSD.

3. Read the documentation for the filesystem.

4. Create a VM with all my daily use software

5. Use the VM's configuration as my work computer's configuration for more than 10 days.

6. Publish a report on what I learnt from building such a system, and future work.

7. (Bonus points) build Hugh Howey's dream writing system using my computer.

8.1 MC: Emacs tutorial

My goodness! Emacs really is self-documenting.

(I just finished the Tutorial and was about to begin reading the Emacs manual from within Emacs, but first it is giving me a walkthrough of how to use the Info system to read the manual)

8.2 TeX

The main lesson I learned from reading the TeXbook was not written down anywhere. I just got the sense that there wasn't a "wrong" way to do anything so long as the text appeared on the page in the way you wanted.

9.1 Almost like von Neumann

Chest beating because I'm getting noticeably better at 2x2 digit multiplication after about a week of reading the mental math book.

It felt good to reach out for a 1x2 digit product while working on a larger problem and have the answer *magically* come to me.

9.2 Flow

I just spent the past two hours finishing off letters to Friend 7 956 and Friend 412. I don't remember the time passing.

9.3 Emacs

I use Emacs, which might be thought of as a thermonuclear word processor. It was created by Richard Stallman; enough said. It is written in Lisp, which is the only computer language that is beautiful. It is colossal, and yet it only edits straight ASCII text files, which is to say, no fonts, no boldface, no underlining.... If you are a profes-

sional writer—i.e., if someone else is getting paid to worry about how your words are formatted and printed—Emacs outshines all other editing software in approximately the same way that the noonday sun does the stars. It is not just bigger and brighter; it simply makes everything else vanish.

> —Neal Stephenson

Just today I'd been thinking that Emacs was so good at making me proficient that you could think of it as that girl's primer in that Neal Stephenson book (was it Diamond Age?). And then I came upon this quote in the book, "Beautiful Architecture" (edited by Spinellis and Gousios) and then it all made sense.

9.4   Baggage Land (2)

No one may place another person in their baggage closet.

9.5   My Village

Currency is used to track citizenship. You vote with your wallet.

9.6   National ID card

I keep thinking on that part of revelations where everyone gets a number on the forehead, and feel like I shouldn't have a way of numbering i.e. exactly accounting for everyone in my village. Perhaps it is because this will legitimise cruelty towards non-citizens (i.e. non-number holders). Perhaps because it will enable mass surveillance.