# Backup strategies for Qubes OS

disp6252 ⋮ 41-52 minutes ⋮ 6/13/2023

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qubist June 13, 2023, 6:48pm 2

@disp6252

If you have ever used Bacula, you would know that Wyng (which is still not ready, IIUC) is no match for it. AFAIK, Wyng is not even planned to have its advanced features. The two are quite different.

ddevz June 13, 2023, 10:08pm 3

just type “qvm-copy-to-vm {filename}”
or open the file browser, right click on the file to transfer and select “copy to VM”

nevermind. Just saw the “isolated” part.

ddevz June 13, 2023, 10:13pm 4

There was some discussion somewhere talking about moving to zfs which, if implemented, would make backups (I.E. copying snapshots) easy. (example sanoid/syncoid). “incremental” would be handled automatically.

qubist June 14, 2023, 7:04pm 5

@ddevz

> There was some discussion somewhere talking about moving to zfs which, if implemented, would make backups (I.E. copying snapshots) easy. (example sanoid/syncoid). “incremental” would be handled automatically.

With that approach:

Can you control which files (not) to backup? (i.e. have complex file sets rules for each qube)
Can you define different backup schedules for different file sets?
Can you backup DBs incrementally?
Can you backup to tape?

If you can find the proper discussion and link to it, we can probably talk there.

SteveC June 18, 2023, 4:45pm 6

I don’t know about “certain files” for a backup…that would require it to look inside the qube.

But a simple option to not back up (again) a qube that hasn’t been accessed at all since the last backup, should be doable. It would require a time-of-last-access property, probably… which as far as I can tell doesn’t exist.

qubist June 18, 2023, 7:41pm 7

- Collaboration with grsecurity to get grsecurity kernels and userspace protection on Qubes.

That would be nice indeed.

@SteveC

> I don't know about "certain files" for a backup…that would require it to look inside the qube.

Not necessarily.

Bacula (which I mentioned on many occasions) can backup a whole network without looking inside each machine in the sense you seem to imply (insecurity). It is a multi-component system:

- Director (which controls all other components, jobs, schedules, file sets etc.)
- Catalog (DB for various backup related data)
- Storage (does the actual reading and writing)
- FileDaemon (a client running on every machine) - only this one has access to whatever you actually backup/restore inside the particular machine
- Monitor

There can be many Storages (e.g. backup to tape, to hdd, to remote location) and FileDaemons (one for each machine).

In the case of Qubes OS replace "machine" with "qube". The Director, the Catalog and Storage(s) can be separate qubes (sys-backup-dir, sys-backup-db, sys-backup-storage), strictly controlled by dom0 (which can look inside anything anyway).

Bacula is a network backup tool but I suppose it would not be a great effort to customize (e.g. a through a module) to transfer data without using network between qubes but through Qubes OS's internal mechanisms. I suppose it is even possible to have disposable FileDaemons, similar to default-mgmt-dvm (which handles updates), running only during backups, thus not requiring a filedaemon service running in the qube.

So, no qube will just look inside any other qube. It may work like (simplified):

- sys-backup-dir tells qubeN: Give me your data for backup based on file set X.
- dom0 starts a disposable management qube which sends (encrypted) data from qubeN to sys-backup-dir. qubeN may receive some instructions (data from catalog), so it will know which files to send (incremental/differential backup).
- sys-backup-dir tells sys-backup-storage: Store this data.
- sys-backup-dir tells sys-backup-db: Write data about this backup job in the Catalog.

*Sorry for the long post, I hope it is not too off-topic.

wahvopae June 19, 2023, 12:23pm 8

Incremental backups, please.

Can someone please describe their system, how it is organized and the case when second backup is needed, meaning what exactly from their system should be included in second backup?

I really don't get it what is there to backup everyday, or a week. Please don't generalize, just your clear use cases.

I want to understand. Thank you in advance.

unman June 19, 2023, 3:47pm 10

I see no need to describe my system. It will be of no help to you.

Just think of what will happen if your box is stolen, or suffers a catastrophic drive failure.
If you check your emails, and download them to your Qubes box, then you need to backup as often as you do this. (If you leave email on the server, fine, but you may lose detail on what's read/unread/tagged etc.)
If you create or edit files during the day, then you should back them up.
If you do not take a backup then you will lose data. This may not matter to you if you already have data stored online (e.g the email position above), or in a git repository, or a remote server, or you just don't care about what you are doing.
If you only use Qubes for secure browsing, I can imagine having a completely throw away system. But once you start using bookmarks or store cookies, you will probably want to keep them *somewhere*.

So the need for a backup depends entirely on what data you produce/consume and how important it is to you.
How often you backup will depend on how comfortable you are with losing data. That's a judgement only you can make.

I hope that helps.

I never presume to speak for the Qubes team. When I comment in the Forum or in the mailing lists I speak for myself.

solene June 19, 2023, 3:50pm 11

There is the 3-2-1 rule to know for backups: What is the 3-2-1 Backup Strategy? | Definition from TechTarget

- 3 copies
- 2 kind of storage
- 1 off site storage location

In addition, as your backups should be encrypted, especially on remote storage, you must consider having credentials/keys/hardware token required to access the remote backup if your home burns. I've seen too many people being locked out of their backups because their credentials was only on their computer that got destroyed/stolen.

As for the frequency, when you work with your computer, losing data for a day means you waste a day of work. This has a cost on morale, credibility, paycheck.

tempmail June 19, 2023, 5:43pm 12

Or a nuclear attack? Then neither cloud backup will be of a good to me.

I would deserve this if I wouldn't care about my hardware instead and not checking it on a regular basis.

I wouldn't agree. I produce files, I download emails/attachments, I use Telegram desktop, I have my phone data stored out of it and whatnots, yet I have them safe and I don't need to "backup" incrementally or not.

Or, I organized myself not to need backups as often?

Well, obviously to me - it seems, thinking on Qubes when my home burns is not high on my list. It just shows that such a thing, thank God, never happened to you.

Does anyone who choose Qubes? I wouldn't say so, most probably.

Exactly. And it's funny that I especially like that word `copy` used, and not `backup`.

And how any kind of backup will help you with this exactly? This is just missed subject note and it only proves my point that it's not the solution in backup but in you. Because, if I can witness home burning, nuclear attacks, catastrophic drive failures, stealing (beauty my laptop that is) and whatnots, what makes you think Qubes won't screw your backup while creating it at first? Because it does and not that rarely, if you read the forum. Now you think why I emphasized `copy` word in previous paragraph.

Qubes taught me (how) to be more secure and made me feel more secure, thus immensely more relaxed than I was. Backup screaming only shows people don't believe neither in Qubes, nor in hardware, nor in their capabilities to keep their data safe and just tend to transfer responsibility to the outer world.

Since I work in disposables only, you imagine where the data gets at the end of the day… That's what I like is called "thinking with Qubes".

solene June 19, 2023, 6:01pm 13

Backups should be regularly tested. And copies refers to backup copies.

SteveC June 19, 2023, 6:01pm 14

You're assuming a "backup" must entail some sort of utility that you will need in order to restore the backup. Others are using the term in a more generic sense of having other copies of data both nearby (for quick access if you type `rm * ` in the wrong place) and in a safe distant location (in case your computer is stolen or destroyed). That general sense is *also* a valid use of the word backup, contrary to your (apparent) assumption.

That said, certainly the backup *utility* that comes with Qubes is in the class of backup utilities that will leave you in a world of hurt without the utility itself. So I don't rely on it for anything

more than saving my system configuration (yes it captures some data, but I ultimately don't trust it for that, and am working on ensuring the data is backed up [broad sense of the term] in other ways). If I lose Qubes itself somehow, the configuration is useless; if I don't lose it, I will be able to restore the configuration.

I use the backp *utility* to backup VMs, which have some of my data in them (and I need to be better at making sure *all* of that data is duplicated elsewhere). The overwhelming majority of my data, on the other hand is handled…differently, let's just leave it at that.

Sven June 20, 2023, 4:23am 15

@unman gave you an entirely reasonable answer that matches my own case:

Re: frequency

- emails are only stored locally and not on the server
- using Qubes OS to do your actual work involving local files

Re: reason (things that actually happened to me)

- motherboard dies while working at a customers site[^1]
- I accidentally delete important data because tired / distracted

For me that's the same as with security. I don't need to justify my need with catastrophic scenario like "nuclear attack", "stolen", "government agencies" … it's the mundane stuff I worry about. Mostly me being an "idiot" (tired/distracted) and low-life cyber criminals trying to extract data / money from me.

But I have empathy for your attitude towards backups. Most people (including myself) only get it AFTER loosing valuable data and time. Once that happened, you'll get it too 😉

tempmail June 20, 2023, 7:38pm 16

I tried to respond to you via PM, but kissed the door.

▸ Apologies to the rest of you - read above

qubist June 22, 2023, 7:10pm 17

@tempmail

> I really don't get it what is there to backup everyday, or a week. Please don't generalize, just your clear use cases.
>
> I want to understand.

Consider:

- a hospital processing patient data
- a company issuing invoices every day
- a lawyer working on clients' cases
- an investigating journalist compiling important evidence
- the new chapter of a novel a writer

- a photographer capturing important images
- the daily activity of a digital artist working on important projects
  etc.

As you can see, there are cases beyond your particular way of using computers and backup is very justified. Data (especially personal one) is today's gold.

> I would deserve this if I wouldn't care about my hardware instead and not checking it on a regular basis.

It is not as simple as "It spins and software X shows there are no issues, so it is fine." Computer chips have defects at the time of manufacturing - all of them. Some hardware is deliberately manufactured to fail after certain time (so you can buy new stuff). Hardware is also proprietary (with very few exceptions). The point is: you cannot be sure that what seems to work now won't fail in 1 day. However, if you have backup - you can restore your data on a different hardware.

> Backup screaming only shows people don't believe neither in Qubes, nor in hardware, nor in their capabilities to keep their data safe and just tend to transfer responsibility to the outer world.

So, what is responsible? Not to have backup and "believe"?
Let's rather have secure and efficient backup.

tempmail June 22, 2023, 9:46pm 18

Oh man… Let me try to sum it up: it is obvious to me that the way my simple, explicit question is perceived is completely equivalent to backup perception. Not to speak that I'm not talking about backing up data, but about backup utility feature-adding for which is screamed here.
Not to say, also, that the next feature wanted would be VM indexing, then file indexing, then file content indexing of a backup.
Because, beside the fact it would be insane to create backup after each "new chapter of a novel write", it would be insanely hard to find a previous version of a chapter in dozens, or even hundreds of a backup copies. But the most insane would be incrementing a backup and loosing previous versions. Oh, no. Yes, this can be overcame by file naming, track changes, etc. Oh more things to remember, learn how-to and at the end "couldn't this be more simple than this, I just want to be a writer…"

And all of this can be prevented at the moment of creation by manual copying A FILE to a backup location (both internal and external)

I am not writing this to respond to you. I am writing this to give future inexperienced users a right to a different perspective, out of the box one hopefully.

renehoj June 22, 2023, 11:10pm 19

Why would the backup tool not be able to save each increment, allowing you to restore each previous version and save you a lot of disk space.

I assume that was what was asked for with "incremental backups".

SteveC June 23, 2023, 12:14am 20

I think a huge part of this argument lies in the fact that one side is disputing the value of a “backup utility” (but usually just calls it “backups”) while everyone else is assuming that individual is advocating for never backing up data by any means.

No, Tempmail’s issue is not with making backups, it’s with *backup utility software.*

And to that extent s/he has a point. A lot of such software is set up in such a way that the software is required to restore the backup. If that software was installed on the machine that just died…you could have a problem, depending. If it’s the qubes backup software, you need a working installation of Qubes in order to do a restore.

And what if there’s an encryption key that you didn’t copy off the machine that died?? yes, that does happen. Fortunately the QubesOS software uses a simple password as the basis of the key, rather than randomly generating some keyfile you have to remember to keep a copy of, elsewhere.

There’s nothing wrong with automating backups (even if it’s just a bash script copying things). But it’s necessary to ask yourself if you can restore the backups onto a totally new machine…because your old machine is now a brick, or a puddle of slag, or gracing the shelf of your neighborhood burglar’s ‘fence.’ If your answer is yes, then my counter is “are you SURE”?

As I’ve said before, I don’t trust my data (except for a very minimal amount, which I constantly work on reducing), but rather just my configuration (pretty dang complicated) to Qubes OS’s backups; I have other methods for data. But even so it would still be nice to have a mode where a qube does not get backed up if it hasn’t been started up since the last backup.

[For people who didn’t grow up speaking English: ‘fence’ in this context is slang for the individual to whom a burglar takes stolen goods, in exchange for money.]

tempmail June 23, 2023, 4:18am 21

Because of this. It would be virtually impossible to find desired file/version `inside` the backups. Can we only imagine restoring (and decompressing if so) one backup after another, just to find “the chapter with the better word written that day, which day it was”.

Which is exactly what I wrote, thanks for pointing out that again.

This is how I backup data. Qubes taught me it is better for my security to use disposables. So, should I trust Libre Writer? No. So, I use it in disposable Vm. I’m writing a new chapter there and saved it. Now what? If If I shut down my dispVM, I’ll lose it. So, I copy it immediately to backup locations. Two of them at least. Do I need backup utility? No. So if that’s not “Now you’re thinking with Qubes”, then I didn’t choose proper OS for myself.

renehoj June 23, 2023, 4:59am 22

The Qubes OS backup tool is clearly not designed for you to use to it to make file level backups. It seems like you struggle to understand how to use backup software, which is probably why you are stuck on just manually copying files.

I haven't tried wyng, but it can make incremental backups of qubes as far as I know. There is no reason why the official backup tool shouldn't be able to do something similar.

tempmail June 23, 2023, 2:14pm 23

I want to believe this is joke.

qubist June 23, 2023, 7:54pm 24

@tempmail

Your simple question:

> I really don't get it what is there to backup everyday, or a week. Please don't generalize, just your clear use cases.

got answered. A few of the things I listed are (or have been) actual parts of my own use cases.

I don't hear anyone screaming, so there is no need to scream back. Everyone is free to organize and optimize their workflow.

> But the most insane would be incrementing a backup and loosing previous versions.

Yes, but that's operator's fault. It does not refute the concept of incremental backup, just like driving in the wrong lane and crashing does not mean roads are irrelevant.

tempmail June 24, 2023, 5:03am 25

So, this is actually what I'm trying to understand. You create some of the files listed there today. And then what? Everyday backup? What's included in the backup? How you find it later? Where do you create those files? Where do you keep them out of backup?

Sorry for this metaphor if it insulted anyone. "Screaming" was my perception of many people mentioning incremental backup.

Of course. And some of us just presented that current backup is sufficient, while trying to point out there are probably more urgent things to improve for the daily use that actually don't work (at least not well), like switching keyboard layouts and 3.5GB RAM patch, which are more important at the moment for regular daily driver Qubes deployment.

qubist June 24, 2023, 6:25pm 26

@tempmail

> So, this is actually what I'm trying to understand. You create some of the files listed there today. And then what? Everyday backup? What's included in the backup?

Right now, I am still in the process of transferring my workflow from my Linux and (unfortunately) Windows systems to Qubes OS. I am saying this to clarify that I still don't have any decent backup strategy for Qubes OS due to its lack of what I am used to. So,

what I am used to (and what you ask for) is:

I work on different projects. Suppose today I modify/create some files. At the end of the workday (or before the beginning of the next one) I run an incremental backup which takes very little time and space as it saves only the changes from today. If I had to run a full backup (including files which I don't need to backup), that would require storing a few TB of data every day with all the consequences.

Periodically I run a full backup (e.g. every month) and the next incremental ones are based on that one.

Re. the rest of your questions:

> How you find it later?

Bacula (which I like so much and which I hope to see integrated in Qubes OS some day) has a database (Catalog) which stores information about all backup jobs, schedules, storage media. The data is browseable in a console app, so one can see the structure of the actual data and restore a file from a particular date.

Another incremental backup software which I use sometimes is `rsnapsnot`. It rsyncs new/modified files to an ext4 file system, so the result is a browseable FS tree.

FWIW, recently I learned that another software exists: rdiff-backup. IIUC, it is even more efficient as it copies only the differences between previous and current data, not the whole modified files. Bacula has a delta plugin which does that too but it is only in the enterprise version and I have no access to it.

> Where do you create those files?

In the software which creates the content (text documents, images, code, etc). In the case of Qubes OS that would be also in different qubes.

> Where do you keep them out of backup?

I don't understand what you are asking. If you clarify, I will answer.

> […] And some of us just presented that current backup is sufficient, while trying to point out there are probably more urgent things to improve […]

The other thread did not ask "what do you want to prioritize" but "what would you like to see improved", so I answered that.

tempmail June 24, 2023, 8:22pm 27

I suspected this, honestly, that's why I was active on this matter, among other reasons.

And i pointed this above. The very next thing after incrementing feature of Qubes backup would be indexing, if you noticed that. So I was right., I guess.
Which I said next wanted feature would be content/preview feature of the files in backup, because at some point you could realize that several versions ago, the idea was better. But, in which version it was, regardless you can browse backup?

I meant in what kind of VM? DispVm or some other?

Do you have any version (probably most recent one) out of backup? Where it is stored?

My point is that instead of putting files in backup, I put files on several internal and external locations intermediately after creation and closing app. That way I can browse all copies of my files efficiently without any additional software, and I have them backed up, since same copies exists at several locations.
And this was imposed to me because I use dispVMs exclusively. So when creating file in dispVM I have to store/copy it somewhere out of dispVM if I want to preserve it, right? So, why don't copy it then to several locations immediately then, instead of one out-of-dispVM location, thus getting backup copies without backup utility? And it's a matter of seconds to do that.

I have a single backup created with backup utility though… It's the one of the full finally set Qubes configuration. It's tested on the second internal disk, so it works. And before it, there were seeral iterations to reach it, while carefully and meticulously setting Qubes step by step to the point where I don't have anything else to set/install.

I hope I made my backup strategy more clear now. which saves me immensely more time than if I'd use backup utility, less stress to find a version back in time, and above all, I do not depend on a utility that proves that messes peoples life not so rarely, as it can be read here on the forum and elsewhere (just search how they tried to restore the backup to no avail)/.

qubist June 25, 2023, 6:11pm 28

@tempmail

> And i pointed this above. The very next thing after incrementing feature of Qubes backup would be indexing, if you noticed that. So I was right., I guess.

I did notice but that if Bacula is used and modified to integrate with Qubes OS, then there will be no such "next thing" because it already has it.

> Which I said next wanted feature would be content/preview feature of the files in backup

Someone may want that. Not me.

> But, in which version it was, regardless you can browse backup?

One could simply restore some version and check. When it comes to my own work, I don't get easily lost in it.

> I meant in what kind of VM? DispVm or some other?

Check the first sentence of my previous reply. That said, for extra security creation/editing and storing could be on separate VMs. The editing VM would be a minimal one and have only the software needed for editing the particular document type (e.g. spreadsheets). After editing the file, move it to a storage-only VM. Then backup that storage-VM.

> Do you have any version (probably most recent one) out of backup? Where it is

> stored?

Normally - no. If I need to exclude a file/dir from backup, I put it in a (sub)folder which has proper name pattern which is defined for exclusion in the backup fileset (Bacula supports regex matching for include/exclude options).

> My point is that instead of putting files in backup, I put files on several internal and external locations intermediately after creation and closing app. That way I can browse all copies of my files efficiently without any additional software, and I have them backed up, since same copies exists at several locations.

That wouldn't be so trivial if you used tape backup.

> And this was imposed to me because I use dispVMs exclusively. So when creating file in dispVM I have to store/copy it somewhere out of dispVM if I want to preserve it, right? So, why don't copy it then to several locations immediately then, instead of one out-of-dispVM location, thus getting backup copies without backup utility? And it's a matter of seconds to do that.

Being quick in a deliberately over-complicated workflow is the way to messing things up. Computers are made to make our work easier. Personally, I would rather spend my N*(few seconds) on actual work, rather than performing manually repeated operations which can be automated. It is much more efficient and non-error-prone to backup the whole work for the day, rather than take care to multi-copy each file after each editing.

In my experience with the older large scale computers. Incremental Backups can find Unique and Creative ways to fail, just when you try to do a restore.

Consider what happens if there is a problem with a small bit of data, or data structure that occurred several backups ago.

I would hope someone would write about the issue of restoring malware while doing a restore… And the value of doing a re-install with a data reload. And once again, how to prevent any malware from sneaking back in.

Yeah, I know , I also have a lot of settings and specialized qubes this strategy would lose. I would have to have a list of those on paper.

For several reasons, I would like to have a technical person write about powering down the computer versus: Closing the Lid. Putting the computer into sleep or hibernate. How much how often.

Linus Torvalds gave a strong statement about laptops should be built with ECC Memory. Error Correcting Memory also requires a MOBO to use it. Someone said that it would cost twenty percent more.

Memory Errors are more likely to occur with the number of hours since power up. Infiltrating file structure, and data accuracy. (From what I have been told)

So, when to power down and power up; Any technical person want to inform me? Us?

adw

July 2, 2023, 2:07pm 30

This is a common misconception. It's not true. In fact, one of the **explicit design goals** of the Qubes backup system is that you can **always** access your data in an emergency **without** a Qubes installation or any Qubes-specific tools:

SteveC July 2, 2023, 3:44pm 31

I stand corrected, and furthermore, I say, **GOOD!!!**

Eric July 2, 2023, 10:09pm 32

Just a comment on the existing backup system: The current format is a real PITA to use without Qubes - the scripts in the doco don't work, writing lots of 100MB files has not been necessary since FAT! I found that these file are written ignoring errors. I have found empty and truncated 100MB files in a backup that was written to a flakey drive with no error reported at write time.

Sorry not to have time to diagnose in detail a log an issue.

The backup utility offers you to **verify** the backups you create. If you're using faulty hardware there isn't much more that can be done than giving you the tools to verify that the backups you create are effective, is it? What would have you expected exactly, an automatic verification step?

adw July 3, 2023, 12:43am 34

They do work. I have successfully tested them myself.

I would actually like this and have requested it here:

Eric July 3, 2023, 9:34pm 35

These were issues from R4.0. Another problem with the backup verification facility is that it says it is just checking and not updating but it applies the meta data without telling you. I had a running qube flipped from a VPN to firewall without my noticing by doing a backup verification.

@gonzalo-bulnes my point was that when a file is written and it ends up with a known size different from what was written then the OS knows there was a problem and would have reported an error, that was ignored. I guess the 100MB files are to limit the disk space requirements of the backup, presuming it cannot all be done in a pipeline.

All I can say is your shell works differently from mine…

That's been fixed in R4.2; the same fix for R4.1 is in the dom0 current-testing repository as part of the `python3-qubesadmin-4.1.31` package

de_dust2 July 4, 2023, 12:18pm 37

I have been using ZFS snapshots and `zfs send -LR $zpool@$snapshot | zfs receive $external_zpool/backups` to back up all the ZFS volumes (the `zvols`) used by other qubes. In one of the ZFS datasets I have salt for how I want Qubes OS and all the

qubes configured. If something happened to my machine I should have almost everything I need to recover very quickly.

This approach to backups covers “datasets” and not individual files, but if I needed to recover an individual file I could clone an old enough snapshot of the dataset the file is still in.

The ZVOLs contain LUKS volumes so the encryption is “above” the zpool that is backed up. Some ZFS experts have pointed out to me with ZFS’ log-structured copy-on-write design that backing up incremental snapshots “under” the encryption layer isn’t the *most* efficient thing, and there does seem to be more data copied than necessary, but backups have still been pretty quick.

de_dust2 July 4, 2023, 12:20pm 38

This is why I use ZFS on two disks mirrored with checksumming enabled (which is the default). One of my colleagues uses three disks mirrored. For more peace of mind I can run `zpool scrub $pool` and I do sometimes.

Eric July 4, 2023, 5:23pm 39

I am not sure if this should be mentioned here or in a separate topic (is related): back when I was starting using Qubes, I read the doco that said you can migrate a running system by taking a full backup, installing Qubes on a new machine, then restoring. I tried that and got to the screen where it asked what to install, thought do the minimal, but it said for experts only, so went ahead and did a normal install. The restore than created a duplicate set of qubes with 1 added the the name of each. Took ages to delete all the new qubes and unlink, rename and relink everything. Made mental note never to do that again…
So while testing R4.2 I thought I would try that again, this time selected expert mode, install no qubes and all was looking good, with system coming up with just dom0. Selected backup restore, no problem opening the file on a USB device, select all qubes to restore OK. Then every qube has a message like “-> Restoring fedora-38…” followed by a red error message “Error restoring VM fedora-38, skipping: Got empty response from qubesd. See journalctl in dom0 for details” Go to journal and there are 3500 lines from qubesd - python double faults with tracebacks, all Attribute errors, missing attribute or missing default. Finally a bunch of errors restoring dom0, unable access properties… Then “Extracting data: 7.0 MiB to restore” then a couple of minutes later in nice friendly green letters: “Finished successfully!”. Did I mention elsewhere that qubes ignores errors?

So what is the recommended procedure to actually do a simple full backup restore on a new system?

adw July 5, 2023, 1:22am 40

Personally, I would just:

1. Install normally. (Don’t choose the “expert” option.)
2. Delete the few default qubes I don’t want.
3. Restore.

ddevz August 17, 2023, 10:57pm 41

You already have qubes running on zfs? That's great. I imagine that you had to modify the qvm-create command to use zfs instead of lvm?

Quick note that the qubes "verify backup" feature does not verify the backup as one would expect. (if i'm verifying the backup, i expect that means that the checksums of the backup match the checksums of the original)

As far as I understand, the tool verifies that the backups can indeed be used to restore the data.

Are you saying that you've seen cases when the backup verification succeeds, despite the backup file having been modified (as implied by a different checksum value)? Am I understanding correctly what you wrote @ddevz?

If that was the case, I wonder if the parts of the backup file that can be modified *without causing the verification to fail* are any significant. (If some of them are, that is something to be aware of.)

*To clarify my thoughy process: the backup file is an archive. One can certainly create two* distinct *archives from the same (identical) group of files. That doesn't make any of the two archives any less good as a backup of those files.*

adw August 18, 2023, 12:10pm 43

de_dust2 August 24, 2023, 11:42pm 44

The QubesOS itself still lives on its own disk. A designated qube has access to the slices (partitions) of the physical disks containing a zpool. The ZVOLs found in `/dev/zvol/` can be attached to other qubes.

From how I see things:

- QubesOS itself is a relatively stateless OS defined by Salt states.
- Pretty much all "user data" lives in a ZVOL served by a designated qube of type `DisposableVM`.

As far as getting QubesOS itself onto ZFS I have not done anything but others have. See the work by @Rudd-O

SteveC August 25, 2023, 12:35am 45

Not so different from me. In my case almost everything substantive lives in encrypted containers on a ZFS NAS. Almost every VM is a disposable; essentially stateless outside of the creation via salt. (The containers internally are mostly ext4, IIRC. I don't believe veracrypt offers zfs as an option though I could be mistaken.)