Transcript

July 25, 2023, 9:09AM

Interviewer:
I will anonymize the the transcript and then send it to you for your approval, and if you don't agree for me to publish the transcript, then I'll keep it private.

Storage Provider:
OK, cool.

Interviewer:
OK, so first thing, tell me a little bit about your operations. Do you have your own data center or do you rent out space in like a Co-located DC?

Storage Provider:
We co-locate.

Interviewer:
Does the data center that you use provide info about their power usage effectiveness?

Storage Provider:
No, I mean they provide us granular power consumption.
However, no, they don't specifically referr to PUE. I mean, PUE is more so on our side, right, than the data center?

Interviewer:
Well, the PUE would be pretty much like the the whole energy consumption divided by what's consumed only for IT processes. So the whole consumption is for example also including cooling and lighting on top of what the machines for e.g., data storage and so on consume.

Storage Provider:
Oh, no, they did not.
They don't provide it, but it might be something they would provide if I ask.

However, I suspect not. Because it's *anonymized name of DC* data centers. Do you have any experience with *anonymized name of DC* and whether they've provided that to other people?

Interviewer:
I think they do.
I did a bit of research on large data centers throughout the world and what their power usage effectiveness was, I think they provided some statistics about their average PUE in different locations. But if you can ask them, I think they probably can give you the the exact figures for the data center that you use.

Storage Provider:
OK, I will ask him about that.

Interviewer:
And other than that, do you know if it's a hyperscale data center?

Storage Provider:
It is, yeah.

Interviewer:
Then their PUE is probably quite good. The closer it is to 1, the better.
Average data centers around the world have around like 1.5.
But for example Google have 1.1 umm, but yeah not many can compare to that.

Storage Provider:
Yeah. So do Google own their own data centers?

Interviewer:
Yes, they do.

Storage Provider:
But they would also use many third-party data center providers as well?
I mean, I know of data centers that they're in.
I mean they co-locate at one of our data centers, for example.

Interviewer:

Could be. I just know that for sure they track their PUE quite strictly and aim for very low values.

Anyway, other than that, I suppose you have multiple minerIDs?

Storage Provider:

Yes.

Interviewer:

So what's the the reasoning behind that?

And is your raw byte power somewhat evenly distributed between minerIDs?

Storage Provider:

No. That no varies quite a lot.

Interviewer:

Is it just for efficiency reasons?

For example, if one minerID goes down or what is the reasoning behind dividing your raw byte power.

Storage Provider:

Reasons that have nothing to do with power or anything like that there.

It's nuance, details about you know the way the ecosystem works that's probably not relevant to the research, I would not have thought.

Interviewer:

And are they located in multiple places or are they all in this one data center?

Storage Provider:

We have two data center locations.

But they're they're both *anonymized name of DC* and they're both in *anonymized city*, just different parts of *anonymized city*.

Interviewer:

Hm, I understand.

And since they're *anonymized name of DC* data centers, I suppose they have the additional non-IT processes such as cooling, typical for a traditional data center's operation.

Storage Provider:
Yeah.

Interviewer:
Other than that, are you aware of the the type of hardware that is used in these data centers, I suppose you use different machines for sealing and storage as well?

Storage Provider:
Yeah.
So we have three categories of of hardware: compute or sealing, as you put it.
Then we have head units or miners and then we have storage.
So the three main categories.

Interviewer:
Would it be a problem to provide the exact like hardware specifications?

Storage Provider:
No, that's fine.

Interviewer:
OK, great.
You can just look at the the questions in the email that I sent to you again and for the ones that we were not able to get answers to during in this interview, it would be great if you can answer those via email. Other than that, are you aware of the power consumption and the capacity in e.g., TB/PB of a rack in your system?
So that would be for example 3kW per 4PB of storage, something like this.

Storage Provider:
Yeah, except we have some racks that only have storage in them, and all of our

storage is the same, the storage hardware is the same.

So if we take one rack of 100% storage that way we can get a energy consumption per TB/PB, and if you look at the total raw byte power, you can say that's consumption for our whole business. But we have other racks that have both storage and compute, so it would distort those numbers dramatically because obviously the compute racks consume more power than the storage racks.

Interviewer:
Yeah, definitely. So since you have those racks that are only storage, you can estimate how much power they consume?

Storage Provider:
Yeah, directly.

Because when we deploy storage, you can't use 100% of the capacity that's in that storage because of the redundancy that's built into that, and our raw byte power on-chain is different than the actual raw storage capacity of the storage hardware.

So do you know which of those two numbers you want to compare?

Interviewer:
I would hopefully want to work with the on-chain raw byte power because that's the data that we have available. The idea is to pretty much create a formula which includes how many sectors you've sealed in a certain amount of time, for example, and how much data you were storing during the same amount of time according to the official Filecoin data, because they do not have access to the information about for example, if you create back-ups. Other than that, do you seal 34 or 64GiB sectors?

Storage Provider:
Yeah, OK.
32.

Interviewer:
And how much time does it take on average to seal a sector?

Storage Provider:

The average time is about 6 hours, but rather than try and shorten the length of time we go for higher concurrency.

So, it takes us longer to seal the average sector, but we seal at 10 times greater concurrency than most people do.

So, do you look at concurrency as well as a metric?

Interviewer:

It's more like a looking at your specific hardware and what the power consumption would be at peak load and how much time it takes to seal a sector and calculate how much the sealing machine would consume.

That's pretty much a backup question, in case you don't know the answer to my next question, which is do you know how much energy sealing a sector consumes on average in kWh? Because most storage providers, if you ask them how much energy does your sealing hardware consume, they wouldn't know.

Storage Provider:

We can work it out. I'm just trying to figure it out because there are various things that affect sealing time. I'm just trying to find the best way to prepare that for you. Let me think about that.

Interviewer:

I guess it also depends on, like you said, you have those racks that are compute and storage, do you also have those that are just compute? Maybe a way to calculate it if you're able to, would be to see at what power your machines are operating during sealing on average and then just multiply it by the time that you use for a sealing.

Storage Provider:

Yeah, it's the on average basis that is hard because there is different run rates as well. So yeah, they could be sealing, they could be working but not pushing a high concurrency because we're just don't have that much data that we are ingesting at that time. OK, let me have a think about that.

I will come up with a way to measure that for you.

Interviewer:

Alright, thank you. If it's not possible then no worries.

Storage Provider:

I have a sort of analysis of all of this that I've shared with Marc in the past.

I'll open up what I already have and I'll share it with you and, you know, what information you can't pull out of that already or what I can't prepare for you prior, then you let me know what we're missing and I'll come up with answers for you. Are all these questions we're talking about there in what you sent me previously?

Interviewer:

Yeah, they're the same exact questions. Other than that, since you rent out space in a co-located data center, are you aware of the energy mix of *anonymized name of DC*?

Or do you yourself offset your energy consumption by buying renewable energy certificates or something like this?

Storage Provider:

Yeah. We're buying renewable energy certificates as our form of reconciling our energy consumption because the data center themselves don't provide any offset or otherwise.

And unfortunately, *anonymized city* doesn't have sufficient green power.

I don't think they're buying any green power, otherwise they would be telling us.

Interviewer:

So their energy mix would probably be what's the average for *anonymized city*, I guess?

There's definitely information about that online. Do you offset 100% of your energy?

Storage Provider:

Yeah, yeah.

Interviewer:

OK, well, it's probably quite a lot. I assume not, but do you reuse the same hardware for mining other cryptocurrencies or running an Ethereum node?

Storage Provider:
No.

Interviewer:
OK. That's great.
That's just a question because I'm also trying to estimate the new energy consumption of the Ethereum 2.0 now that there is no actual mining but these validators, because it still consumes energy, the question is, is it really that much less than before?

Storage Provider:
Oh, interesting. Maybe we should try it, validating some Ethereum transactions.

Interviewer:
The problem is the high up-front investment because to run a validator you have to pretty much lock off 32ETH and that's probably more than $50,000.

Storage Provider:
You need to stake that, did you say?

Interviewer:
Yeah, 32ETH. The problem is that you can't just stake more if you want and to have a greater chance of validating transactions, then you just create multiple validators.

Storage Provider:
Yeah, sure. I mean then it becomes whoever holds the most Ethereum wins the most Ethereum, so I don't see the point in that, yeah.

Interviewer:
Yeah. OK, so I guess those are all my questions.
And then you can just look at them again in the email.

Storage Provider:
Yeah.

OK, great.

I will look at that and I'll come back to you on on those questions in more detail.

Interviewer:

Again, thank you for participating in this research, at least I was able to tell you a little bit more details about the questions, what exactly I need so that's good.

Storage Provider:

Yeah, sure.