You're standing in a data center. The biggest infrastructure ever created by humans – the cloud – lives here. Building an environment like this is a feat of engineering. It powers AI, IoT, virtualization, crypto, the metaverse to name a few technologies. Some of the solutions to the most urgent problems of our time – like climate change, disease, and feeding the world – are being mapped out here. It powers the apps on your phone, online banking, and businesses large and small globally. It's enormously complex.

This is the Tech Barometer Podcast, I'm Jason Lopez with another in our 3 part series on data centers as seen through eyes of Harmail Chatha, Director of Global Datacenter Operations for Nutanix. In this episode, the challenges of building a data center during the pandemic.

Harmail Chatha (01:18):
We run one of the largest private clouds based off of Nutanix and that's our entire software development platform.

Jason Lopez
Before there was any notion of the threat of a new virus, Harmail's team was planning a couple of data center buildouts. The existing data center environment had to continue. Still, in one of his larger data centers where the company's critical development platform ran, they managed to build out a megawatt of power space cooling each year during the challenges of a pandemic.

Harmail Chatha
You can't travel, you can't be hands-on because anytime you actually do a data center build out, it's very physical. For a guy like me that's been in the industry for quite some time, I like to see it getting built out. I like to be hands-on. I like to course correct if anything doesn't look right, but in this situation, obviously I couldn't do that.

Jason Lopez
In Harmail's words:

Harmail Chatha
Trust the process. I had to trust my team on the ground. I had to trust the relationships I had with the data center provider and with the contractors and the cabling companies and the entire supply chain. Trust them to like order the right parts, deliver the right parts, install it the way I want it installed and get it done in a timely fashion.

Jason Lopez
Let's say you were going to build a data center. What are some things you have to think about.

Harmail Chatha

You'd have to go find the data center to host your gear. That would be step number one in a traditional process, if I was doing this from scratch.

Jason Lopez
It’s often not enough to know the equipment and how to hook up. Building a data center requires coordination with the data center provider. He knew the facility and knew the people who were managing the space. And he had already been there and seen the environment first hand, so he didn‘t have to meet and see it again. So again, he trusted the process.

Harmail Chatha
Trust the data center provider you already have experience with, you already have a relationship with. That kind of takes care of your power, your cooling your space, your physical security. The next is really standing up the environment and by the environment, I mean cabinets. In-Rack PDUs, your containment, your wire cabinets.

Jason Lopez
When the truck backs up and delivers the gear, you now have a floor full of boxes of servers, cables, switches, and racks. You can connect everything out of the box, but Harmail says his environments are custom designed.

Harmail Chatha
We call it a hyperdense data center environment that's little bit custom tailored to our HCI platform. Having already done that, I didn't want to change up the model. There's always 2.0, 3.0. We went with a model here that absolutely worked. So for us to stand up one megawatt... Space was already vetted, locations already vetted. And then it was just a matter of how many racks we can order, how many PDs we can order the containment, how we do hot al containment, how do we take care of that, the wire racks and then cabling itself. Cabling means structure, cabling from your core networking components to each of your top racks and then from top racks connecting into the servers.

Jason Lopez
In the first buildout, in 2020, the pandemic hadn’t been going on long enough to affect the supply chain. All the gear showed up without any problems.

Harmail Chatcha
Then came the issues as far as the buildout goes, because in the data center you have a couple of different teams that come in and do the work for you. One is the team that mounts the racks, does all the physical build out of installing the power busway, installing the racks, installing the hot out containment for you and the basket tray. So that phase was, you know, it took a little bit longer due to resource constraints.

Jason Lopez

They needed to connect the electrical distribution system, known as a busway, to the facility's uninterruptible power supply. But they couldn't find electricians.

Harmail Chatha
They weren't taking work that they didn't want to take. They could pick and choose. I want this job, I don't want that job. That was a challenging factor, working and trying to find electricians. But we were able to, you know, work with our data center provider. And these data center providers are not small. I mean they've got massive campuses essentially with lots and lots of power. Mega multi digit megawatts of power.

Jason Lopez
In addition to the challenge of getting electricians there was the matter of cable management. Anyone who's ever connected a large home theater, multi-room, audio and video setup will know that organizing cable makes the difference between a crisis or an easy upgrade down the road. In a data center, that's fantastically magnified.

Harmail Chatha
This is a art form. Like you don't just plug one cable to one top of rack switch. It's highly designed. Every port, every rack is connected into a specific port and it's all based off automation and we want consistency in that. We want it to look nice and beautiful. So if we ever have to troubleshoot something, it's easy for us to identify which cable to rip and replace.

Jason Lopez
The second data center came a year later in 2021. It was based on the same architecture… one megawatt, 60 racks, four pods of 30 rack pods, and containment. But now, Harmail's team was up against a big supply chain problem. A three month project was stretched to nearly seven months and some gear didn't arrive until 2022.

Harmail Chatha
What it taught me was you had to have the experience in the industry to be able to do this. You couldn't be just a newcomer and say, "Hey, I'm going to go and build out a one megawatt data center." If you didn't know how to do it, if you didn't have the industry contacts, if you didn't have a vetted architecture already, I don't think there is much success for anybody. So for me it was trusting the process. It wasn't time for me to go out and vet out new technologies, new schemes on how to do a power bus way or how I should change my cabling or try out new vendors potentially where I can, you know, save a few bucks.

Jason Lopez
He also points to large providers like Google, Microsoft, Facebook, Amazon which highly architect their spaces for efficiency and sustainability, saving space and power at every turn.

Harmail Chatha
That's the model we are trying to follow. You know, we're, we're a mid-tier data center customer. We didn't want to do everything the traditional route. We kind of challenged

ourselves back in 2018 when we re-architected our data center strategy and how we're going to do our deployments to really do a different scale it out. The work that we put in then to design the data center environments now is what led us to succeed during the pandemic. Because of that hyperdense design, we had some leeway to go more dense versus just continually having to deploy more racks and going horizontal versus us focusing on going vertical.

Jason Lopez
Harmail Chatha Is the global lead of nutanix's data centers. This is one of three reports we've done with Harmail. In our other reports ee profile him and his role as the data center manager, and we also take a look at data center sustainability. you can find those at theforecastbynutanix.com. I'm Jason Lopez thanks for listening.