Transcript

0:00
hello everyone and welcome to this latest webinar from onia today's topic is recipes to a sustainable AI data

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center our webinar is co-sponsor co-sponsored by omia and our partner L

0:14
Grand my name is Vladimir galabov I'm the director of the cloud and data center search practice at omia and I

0:21
truly thank everyone for joining us so before we get started I wanted to cover

0:27
a few housekeeping items at the bottom of your audience console

0:34
there are multiple application widgets that you can use make sure you check these out during the webinar if you have

0:41
any questions for example you can submit them through the Q&A widget which is

0:46
located to the left side of your screen all questions will be captured so if we

0:51
don't get to answer yours we may follow up via email a on-demand version of this

0:58
webinar will be available in approximately 24 hours and can be accessed using the same audience link

1:05
that was sent to you earlier finally if you have any technical difficulties just click on the

1:11
help widget where you can find answers to some common questions this will be an interactive

1:18
webinar so we will be asking you some questions um and you will of course have an option to answer them one of the ways

1:26
that you can answer them is to actually submit a note to us and now let me introduce our

1:34
speakers I'm very excited to be joined by Rebecca Gilstrap Rebecca is the

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director of strategy for the data power and control division at Legrand we have

1:45
with us Calvin Nicholson Calvin is the senior director of product management for ritan and server

1:52
technology um at the data power and control division at L Grand he's in essence our rack pdu expert um we and

2:00
then we finally last but not least have John Baron Brock who's the director of product management for Starline in the

2:07
data power and control division at leg Grand Starline for those of you who might accidentally not be aware is the

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busway market leader so thank you everyone for joining us welcome um thank

2:19
you for for taking the time to to do this panel with us and um what we'll do

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is we'll jum jump straight into it you have I want to maximize the time that you get to hear from Rebecca Calvin and

2:33
John um so first I just wanted to give you a little bit of context and and also

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explain why we went with this title for the webinar because I understand that

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you know sometimes talking about sustainability and AI in the same context might not make sense um the

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reason why is that today one of the what we are seeing is demand for AI

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infrastructure is strong but one of the big constraints is power availability so

3:04
the pursuit of efficiency of making data center more sustainable actually is a

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key un Locker of AI so let's take a look at a few data points that will kind of

3:14
exemplify that and I'll walk you through a bit of a journey that your average tech company that is trying to invest in

3:21
this is going through before we open up the floor to you so what we've seen when we looked at

3:29
the data center power capacity that is currently in deployment and you know how

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it's evolved over the last couple of years and where it's going what we saw is that as AI deployments accelerated in

3:43
2023 we saw big growth in the demand for power something similar is happening in

3:51
2024 and in fact when we look at the demand profile um what we see is that AI
3:57
deployments will drive a two time growth in data center power capacity in the next five
4:03
years and I think it's important to bear in mind that that some of the growth that we we
4:12
we're seeing currently in 24 and in 25 doesn't take into a fact in doesn't take
4:18
into account the fact that most Enterprises are still in their early um
4:23
uh Jour early stages of their journey of developing their AI strategy especially their generative AI strategy so as the
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long tail of Enterprises that are small and medium ends up coming up with that
4:37
strategy what we end up seeing is AI deployments uh the AI capacity within uh
4:44
the data center becomes 45% now this sounds like a lot how do we
4:50
suddenly double the um power supply to the data center the reality is that that
4:56
is very difficult and this is why this this chart shows you the it load
5:02
capacity in essence for us to be able to unlock the it load capacity there
5:09
are um four enabling factors we could end up figuring out how to consolidate
5:16
some of our other it we could potentially improve some of our utilization we could pursue further
5:23
efficiencies or we could try to get our own power sources but in reality some of these have a longer lead time they're
5:30
more they they take more time than others and as I was um reading the news
5:36
today I saw that the Singapore um uh the Singapore government ended up releasing
5:42
a very interesting white paper where they themselves realize that to be able to unlock the power of AI within
5:49
Singapore one of the things that they will have to do is pursue improvements in data center efficiency they will have
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to find the power savings and probably the area that their um guidance aligned
6:01
the closest to was this third area the further efficiencies in pee and the
6:07
second area of it utilization improvements we will talk about both of these today but first I want to talk to
6:15
also kind of highlight the the fine balance that a data center um operator
6:21
is going through and in in essence this is not just a data center operator it's any ambitious AI tech
6:28
company if Vin and Rebecca and I tomorrow were decided to kind of create
6:34
an AI tech company would end up having the same challenges hopefully you know
6:40
uh John will stay at the grant so that he can help us but um bottom line there ends up being kind of will be exposed to
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exactly the same conditions so the goal for this ambitious aite tech company is
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to be the first to develop a popular commercially successful AI app to do
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that you end up having two constraints on one hand it's the cash constraint an
7:03
AI optimized server is very costly to have there are of course by the way many other constraints I'm not saying these
7:10
are the only two availability of people is one but cash is is kind of
7:15
fundamental it's a fundamental constraint because it's very costly some of the capex that we saw um in terms of
7:23
increases from Google Microsoft meta um this year is you know increasing using
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their data center capets by a third to be able to fund this so so so the the money is a lot but say that you know
7:37
that's one problem all the money in the world today cannot buy you enough power
7:43
and AI optimized servers consume a lot of power so these are the two constraints that you're going to
7:49

inevitably be exposed to amongst many others but these are kind of the hardest to crack and the fundamental
7:55
constraints the first one is a little bit easier to crack because if you have enough money today what you can do is
8:02
instead of building your own AI infrastructure you can rely on a partner who already has that and you can end up
8:09
using it and this is happening a lot Microsoft currently is relying on Oracle because Oracle has already deployed some
8:16
AI clusters and Microsoft is using them as a service so that's one kind of quick
8:23
solution you could however decide to build your own data center because you want to keep your competitive advantage
8:30
in your company rather than end up funding Oracle expansion and profits in
8:35
that case you need to ask the grid for power now if the place where your data
8:43
center is located has enough power they will still be a lead time so there is a
8:48
four to six month lead time for getting more power from the grid since our goal is to be the first to develop a popular
8:55
commercially successful AI application if we have to wait for four to six months that means means that we're exposing ourselves to
9:01
risk so say that we have we cannot wait for the grid there is one thing that we
9:07
can do we can find the power saving in our existing data center to be able to
9:13
start deploying AI today instead of waiting four to six months for the grid
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of course we can still rely on a partner we can also build a new data
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center to run AI somewhere else unfortunately this doesn't necessarily solve the lead time problem because
9:29
building a data center also takes quite a bit of time um or um we can of course
9:36
um choose to get our own power source we can say um you know the grid cannot uh I
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can't wait enough um so so I'll I'll build my own power source this is particularly you know a solution if

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there is no ability to get more power from the Grid in many locations today Singapore Dublin um Amsterdam I can keep

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going um there is just not enough power um so so as a result this idea of

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building your own power source ends up being a solution of course if you're unable to um get more power from the

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grid the same Solutions as the solutions that enable you to not wait end up

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helping the challenge with installing your own power source is that it takes time there's a lead time and the higher

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the power generation of your own power source is the longer delay time so it's

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an extra problem um so you could end up just waiting and or not doing it the

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problem is that then you end up missing the opportunity to develop the killer app and potentially you know kind of

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make loads of money you could if you only rely on Partners what you end up

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doing is you fund other company another company's growth so you end up impacting your own capex to invest your own kind

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of competitive uh advantage buildout and instead you fund someone else um and and

11:02

this actually is the case if you decide to build a new data center just building

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a new data center consumes capex which you could have spent for for AI and then

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of course if you decide to build a new data center that's your only strategy matching where power is

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available might not necessarily match where end users want to have their data stored and and that is or or where they

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prefer to to have their stored or even where regulations are and I'll give you an example one of the crypto uh mining

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um epicenters of the world today is in Kazakhstan but I'm not sure that our potential clients would want Calvin

11:41
Rebecca and I to expose their data to to being stored in a country that has very different regulations from from what the

11:46
us or the EU has so that is a problem and and if you end up then kind of going

11:52
into this back and forth um again you can end up missing the opportunity but there is some lwh hanging fruit that you

11:58
can end up using so so one thing you can do is improve your Poe so that is the um

12:03
the effectiveness in how much power you waste during distribution how much power is consumed by your power distribution

12:10
systems and then of course how much power is consumed by your cooling equipment that is one very effective

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strategy because potentially you can deploy stuff that the deploy strategies that don't have a cost a starting cost

12:24
so so it could be very interesting in essence just changing your operations um can end up helping you with Poe that was

12:31
one of the central um uh debates within the Singapore government paper that was

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released today a very helpful strategy could be to just switch off un new servers every data center has some un

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new servers and switching those unused servers you end up losing nothing but

12:49
actually gaining power typically a server that is 0% utiliz still consumes 50% power so as a result you end up

12:57
wasting power for nothing then you can just stop and then finally you could consolidate your servers if

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you consolidate your servers um you can do it in one simple way where you just change your utilization targets you

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change your practices if you monitor your utilization you can end up making a decision that it's worth changing or you

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can buy new servers unfortunately the problem with buying new servers these servers are costly so then you end up

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impacting your capex um for AI infrastructure so um it's not the

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perfect strategy and and these black squares are in essence the lwh hanging

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fruit the lowest possible investment for the highest possible gain when you

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compare it and stuff that you can even do today within your data center and that's why we decided to focus the

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webinar on this because in reality then you're able to improve your

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sustainability credentials and then for each um each carbon uh ton of carbon

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that you end up init you might be able to do more compute by uh deploying um

14:05

AI so the reason this matters is that power generation capacity is going to

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continue to grow slower this isn't a problem today this is a problem that will remain at the moment the power

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generation growth is about single digit and it's and and the demand for the data

14:22

center is growing in high double digit on top of that we're about to bring up

14:27

another billion people to have access to electricity in the next 10 years actually the next six

14:33

years at this point and we're about to see six times more electric vehicles and in general every aspect of our um

14:41

technology um usage as as end users we're consuming more and more power our

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TVs are getting bigger our phones are consuming more energy we we are you all

14:52

everything in our life is requiring more energy and at the moment the grid is not able to to to generate that so in

15:00

essence we think that we need to make at the moment sustainable

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practices are a AI enabler and but they're also a business enabler so we

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need to recognize that power shortages are becoming the norm already um and that we in that what that's doing is

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it's increasing the importance on finding power savings finding efficiencies being smarter about how we

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use the infrastructure within our data center being smart about how you use your pdu how you use your cooling system

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how you use your uh what system you use to distribute power and in essence what's going to happen is we're also

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going to see regulation I think that the Singapore regulation is looming and that's why we ended up seeing that paper be released

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this morning but in Germany there already is regulation that limits Pue to

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1.2 from 2027 in Shanghai uh there already is regulation that limits pu to

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1.3 so data center operators have to deploy

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a multi-lever strategy and that's really what we're going to talk about today we're going to talk about a strategy

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that ends up kind of utilizing every aspect that you can within your infrastructure to try to be more

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sustainable to save more power and that power that efficiency can then be redeployed for you to gain a competitive

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Advantage by developing AI um within the same envelope so I thought that um in

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preparing for this one of the things that we did is we actually studied um what legrant has done in house and then

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we also try to study what is the different products what is the different Technologies in the data center that are

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used today from an infrastructure perspective that you can use for this multi- Lev strategy so to give you a bit

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of context I'll pass you on to Rebecca and then what we'll do is we'll open up afterwards the floor to uh you because

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we want to hear from you and I just want to remind you before I pass you on to Rebecca that you can send us a Q&A throughout the webinar don't wait just

17:00

until the end because I'm going to be scanning for your questions with that Rebecca the floor is yours thank you

17:07

Vlad I appreciate that so again you know it's a pleasure to be here and we

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appreciate the work that you have done Vlad to share this data with us and then also you know asking us to do a case

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study on the sustainability efforts that we have in place so the biggest thing for us is that we look at sustainability

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in in kind of Three core spheres of influence and the first one is how we

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are as a company and the culture and what we do uh to set initiatives that can

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represent you know our beliefs uh again as a company and how we can impact uh

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the environment so then what we do is taking those csrs we Implement pieces

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into our product design principles and so looking at Eco design and even

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packaging right how how are our products going out the door how are they getting

18:04

uh produced who who is producing them right right what materials are we using

18:09

and then we take it and look at it as those products are going out into the

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environment and more specifically going out into the data center environment and so there's multiple layers in how our

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products impact data center operators and owners and even the actual operation

18:32

of the data center so it's again it's the products that are chosen it's how

18:37

they are designed and manufactured and then it's how they also um interact with the environment that they are in so that

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we can drive that efficiency and as you said flad that capex savings so that's

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built into a whole host of our different products and just in case anybody isn't

18:56

familiar with L Grand or with you know are our products we do have a whole host
19:02

of different specialized uh whites space products everything from as you can see
19:08

you know our overhead um our Market leading overhead uh busway uh cabinets
19:13

and containment rear heat exchange drawers again Market leading uh intelligent rack
19:19

pdus um and everything from connectivity to uh fiber copper
19:26

transceivers uh and then also we have remote access products so from our kvms
19:31

to um our most Rec recent acquisition of zpe and a lot of the uh the uh devices
19:41

that they have to get out of band management that are being used in core data center white spaces that are
19:48

driving productivity they're driving security um and again we have
19:53

sustainability built you know throughout the product categories as the self but also how these products are uh uh
20:01

interacting with the data center environment this is a great picture to show you all of those pulled together
20:09

um in a data center pod that's great and I think one of the
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reasons why um you know what I think what why this is important is that first
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you can as as you uh listeners you can ask Rebecca Cavin and John topics on
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both power distribution above the rack inside the rack cabinets air flow cooling we can go into any aspect of the
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data center um so you know you can challenge them as we go through this and in general our topics as we kind of now
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kick off the Q&A um will include um all aspects of of these Technologies and
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these technology areas because for a data center operator it's not um a singular decision that they need to make
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yeah and Vlad I'll just add on you know to that sentiment with which is each of
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these products can stand on their own in terms of their impact to the data center
21:06
but as you just said when you actually take all of them in combination there's there is a lot of impact that can be put
21:14
um into those that data center operations um and so again I'm more than
21:19
happy to dive into any individual uh product category or you know to talk
21:24
about it holistically um in terms of design and implement mation excellent and by the way I can
21:32
see questions coming in thank you so much for sending them um U we will absolutely get to them so before we get
21:39
into questions to the panelists I wanted to open the floor to you our listeners
21:45
so I'd like to hear from you what are the biggest roadblocks to improving data
21:50
center efficiency and sustainability that you have faced now here you can choose three please note that you can
21:56
also scroll to the bottom you don't have to stay at the very top of this um chart
22:02
and you know here I've put some common um challenges common roadblocks to
22:08
improving data center sustainability I'm curious to hear what are yours if you can please select up to three and click
22:14
submit I'm going to monitor your response and then um in in a few minutes I'm going to show you the results so one
22:23
um roadblock that we've heard of is data availability Um this can include lack of of standardized criteria and solutions
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for measuring the impact of sustainability programs we've also heard that there is a cost to implementing um
22:38
sustainable practices um and this can include challenges in making a strong
22:43
business case and lack of knowledge about business benefits and we also hear that regulation um can be difficult to
22:51

stay compliant with to stay up toate with so that's one of the reasons why we've listed it we can we know that

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um there's a wide variety of it equipment and that this can sometimes create a challenge for data center

23:05

operators um because you might have different rack densities different clients of your own so um that's why

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we've listed this availability of renewable energy is frequently quoted as a roadblock so that's why we've listed

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it we're curious if that is the case for you lack of standardized best practices

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uh is another one understanding which Technologies can have the biggest impact data center efficiency um being

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determined at the design stage is something that I heard consistently over the last few months saying that once

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you've designed that you cannot improve um efficiency I'm going to ask in a second our panel if that is the case

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supply chain and and partner related carbon emissions I know can be a challenge and then implementing circular

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economy practices it takes a lot of work so so that's why we've listed it and then finally the ability to monitor

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power quality can be hard so um that's why I've listed it but maybe let's start

24:02

while we wait for you to answer and I can see that the answers keep coming in so um I'll wait for for a low in

24:09

answering before I stop the poll um but maybe I can hear quickly from the

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panel do you think that data center efficiency is only determined at the

24:21

design stage and cannot be improved I'm curious to just hear your perspective because I've heard some very strong

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voices in the industry specifically about this as a roadblock and I'm curious maybe we can start with with um

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with Rebecca what do you what do you think about that oh I mean I think it would be
24:39
sad if we were to say it's only it's only at the design phase you know I I look at us as an industry and the
24:46
continuous Improvement that you know we are achieving and going after um and
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then you know just from a Iron perspective you look at many of our products are part of the refresh cycle
24:58
goals uh and where people look to in terms of getting more uh data and
25:04
information on their environment and improving um other products such as like containment are a perfect example of how
25:11
many people are actually they'll they'll build out and containment will not necessarily be a part of the design then
25:18
they quickly realize you know the benefits and and uh the need for
25:23
containment so a lot of times containment is going in as a retrofit um solution to help drive that efficiency
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lower capex costs um and really take care of you know hot spots and get the
25:36
cold air where it it needs to be and and that is part of you know I think you're you'll be talking about it in a little
25:41
bit and we'll touch on it is you know it's it's the heterogeneous um like you said Vlad the
25:48
the stair stepping into different systems um so that you can grow and
25:54
scale and have that flexibility so again I I hope that uh those answers don't
26:01
come in that we're capped at the design because there's so many different ways that we can uh retrofit and you know uh
26:09
go in and and be proactive about the environment past the design stage I agree and so we have a lot of
26:16
answers that have come in now so I think what I'm going to do is I'm going to close the poll and we can take a look at
26:21

what are the biggest roadblocks to improving data center efficiency and sustainability for our audience that is

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on the call so data availability tracking scope one two and three

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emissions is a challenge for nearly a third of the people the biggest challenge is the cost to implement so I

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think that you know one of the things that I will ask you um if if that's all right and I just want to give you a

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heads up is you know is it always really costly to be more s more efficient to

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improve efficiency to be more sustainable and can you give us examples of some lowcost um um strategies

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actually why don't we start with that um and Calvin maybe maybe I'll go to you you know does to to be more efficient um

27:04

to to improve the data Senter sustainability do we always have to have a n new capex is there something that

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can be done without having to buy new equipment well I mean it's interesting

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glad you mentioned a couple of examples obviously if you buy a new server yes

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you could have a more efficient power supply but there's a there's a ton of cost there I see the data availability

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the cost Implement kind of as a chicken or an egg right I often go back to the

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green grids Mantra that you know you really can't improve something that you're not monitoring or managing right

27:39

so if if um there may be a cost initially in the design but the

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monitoring pays off tfold down the road for you know the virtualization and

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consolidation step you've talked about whether it's environmentals uh to Rebecca's comment

27:56

on the cooling and and uh you know the effects that that has maybe you can run your data center a

28:02

little bit hotter right which doesn't involve a lot of change other than you may want to monitor it a little bit
28:08
closely and you know the data has shown that the servers really live just about as long uh because of the refresh rates
28:15
right in most data centers let's say three to five or or three to six years so um you know all the initial things
28:23
that that we need to do to improve efficiency a lot of them do revolving around having that data and in some
28:29
cases there may be a cost Implement in some cases there's not but it's true that the monitoring is key if you tweak
28:36
or make changes to understand how that affects the overall efficiency of your data
28:41
center John what's your perspective about kind of this balance of cost and
28:47
then the challenge of data availability so is it possible to improve data center
28:52
availability kind of quickly are there any solutions to do that and then I'm curious if we should consider those as
28:58
super costly or if there is a comparatively lowcost way to to do to
29:04
improve data availability yeah I think um yeah what
29:09
Calvin said you know adding adding monitoring it can be you know as costly
29:15
or as as inexpensive as you as you kind of want in the level of detail and granularity you know so one of the nice
29:21
things at LR is we we can monitor you know kind of at the row level at the
29:26
rack level at the server level you know between all of our systems and one of the easiest ways that we look at it is
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you know for efficiency is you know our busways need to have balanced loads so
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when when the loads are balanced across all three phases you're you're inherently more efficient but if you don't if you're not monitoring that this
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is just one example uh there's no way to to ensure that you do have balanced loads you know you have to go back to
29:51
your your Upstream equipment and and make sure so you know that's just that's just one example that we can do and
29:57
again down the chain you know as far as you want to take it you know we can we can help you grab that
30:03
data I'm curious if um so a third of the um uh people of the attendees of the
30:10
webinar have an issue with understanding which Technologies can make the biggest impact what advice would you do you have
30:17
for them in terms of kind of understanding that and and is that important should we worry about um you
30:24
know looking at the biggest impact um is is a best strategy to start somewhere
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kind of where how do you see this um as this this process of improving data
30:35
center efficiency and maybe we can start with Rebecca yeah absolutely um so one is I think it's
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just like transparency I mean there there is public data available um not
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just you know to the the largest data centers um out there but just publicly available data from the doe uh which we
30:54
partner with you know on data center uh power usage and where those
31:02
concentrations uh are and so that's that's one place to start is and we can certainly share more information on on
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that flad um after the call but starting there and looking at where are some of
31:13
the averages and where they and then focusing on those largest consumers and
31:19
and the majority of that and and you've covered this before vladin in your u in your research is from that it equipment
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and so it's it's having that interaction with the it equipment supporting the it equipment the physical infrastructure
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that is tied to that it equipment and then the it equipment itself right so how can you get a longer lifespan out of
31:40
it how can as Calvin said how can you run it um hotter right how can you have
31:46
a a hotter environment and then you know again how are you um including in that
31:52
refresh cycle as you extend it how are you including U more efficient Tech
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technology as you pull in that refresh cycle and prioritizing those things and
32:03
then not measuring it just by cost you know in terms of capex but also looking at it from an operational perspective
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and I think that that's something that especially from a a collocation perspective it's been built into who we
32:17
are as an industry you know looking at what is the ROI on the the operations of
32:23
the data center versus just that upfront capex uh cost so you have to balance those two
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your your capex spend versus your Opex uh savings it does feel like this is still
32:37
a reference to what Calvin said earlier that you cannot improve what you're not monitoring so understanding how much
32:45
different aspects of the data center are consuming from a kind of power
32:50
perspective can help you to make the right decision and in the um in the
32:56
question we have in the in the chat we had a question about kind of server consolidation and I'd like to actually
33:04
you know um slightly change one of the first questions that um uh that we we
33:10
were we were asking you know you as the panel um so we already discussed some of
33:15
the biggest challenges but I'm curious you know from a server consolidation perspective you know do you have any
33:20
advice on how you you know kind of what is a strategy to figure out how to to do
33:26
that because I feel like very often there is a perception that server consolidation means you know go in and

33:32
buy new servers I think very rarely do we see a discussion of figuring out server utilization and maybe Calvin you

33:39
can take that one because I know that you have a a a perspective on it yeah

33:46
yeah absolutely V well I I mean first obviously you know you got to follow the

33:51
money and 40 to 60% roughly of the power in your data center used in the cabinet

33:57
right and I saw a recent study um can't remember I think it might have been

34:03
uptime or somebody anyway um only about half the organizations right now have the ability to to monitor their server

34:10
utilization so it's hard to do um utilization and then consolidation if

34:17
you don't really have the data to understand how you move those workloads and how you can maximize efficiency and

34:23
and you made a very solid Point earlier that a server sitting idle uses about

34:30
half its power doing nothing right um which kind of gets into an old topic

34:35
that that I don't really hear as much anymore but I I still believe is relevant is the the old zombie server

34:43
concept right where there's a bunch of servers that get implemented they have a use they there's you know they're not

34:50
being used anymore and they're sitting in the data center taking up power and if you'll monitor those servers you can

34:57
see that that the loads are not changing right they're not being used you can profile them and understand what the

35:03
load is and then when you see the the load not change then it's very easy to understand that maybe that's a server

35:09
you want to take out of service versus just disconnecting the network connection and then kind of waiting for

35:15
an angry phone call so there are some proactive things you can do um I think

35:20

maybe companies have got a little spoil that there's been plenty of available power um I think some of the server

35:27

consol a and virtualizations efforts have yielded good results and and they've went on to to do other things or

35:33

different battles right so I think the shortage of power that we're seeing in this kind of AI Space Race that you

35:40

mentioned earlier which is an unbelievable investment up front so a

35:45

ton of panic and urgency on the back end to start utilizing these gpus is going

35:51

to drive of a lot of behavior that we've seen in the past maybe it's been overlooked a little bit but again like

35:57

you said you're going to have to do that if you're going to have the overhead of the capacity uh to install some of these

36:03

new systems that that are much more KW intensive we're seeing a lot of standard

36:08

products we're kind of in that 17 KW um now we're seeing a huge uptick in

36:15

400 volt 60 amp products that are 34 35 KW right out of the gate so um that that

36:22

amount of power and the demand for products we're seeing that deliver a lot more power has rad ly increased uh last

36:29

year and the beginning of this year I'm curious um John you know from

36:35

your perspective what do you hear from clients right so are there any

36:40

consistently overlooked areas when you talk to them and you know when you kind of hear about efforts to improve data

36:47

center efficiency yeah I I think one of the one of the biggest things and I maybe I'll

36:53

take it in a slightly different direction Calvin mentioned that we went from 17 to 34kw in in about a year and I

37:02

think that one of the things that we don't know is where we're where we are going so when you think about

37:08

sustainability I I look at it in terms of flexibility like how how are we going to scale next year when it changes from
37:14
34 to 60 you know to to 100 and so when you're choosing technologies that are
37:21
sustainable you want what's more sustainable than a technology that can can be flexible and grow with you and
37:26
scale with you so I think I think you know that's that's an overlooked area and and how we and how we approach
37:33
sustainability you know and and in the way we move about um those conversations
37:39
so I think that is overlooked I agree in fact um so Rebecca and I have been working on a kind of
37:46
summary of potentially all of the areas that people can end up kind of deploying
37:51
it it ended up taking us quite a bit of time but one of the things that we saw is that this idea of reusing of being
37:58
able to have something that you can have for the longest possible time it and it's it's really a key part of the
38:04
circularity and I think very often when we think of circular principles in the data center we think of very simple
38:10
recycling processes we think of you know reusing bits and Bobs of the it but
38:16
actually very rarely do we think of how you can use the technology at the design phase that just has a long use life
38:23
because you can because it's flexible and you can redeploy it and it can grow with you and you can end up just not
38:30
having to replace it so that you don't have something new doesn't need to get produced for you and um and yes you're
38:37
that that's a very good point so I think what I'm going to do
38:42
is reach back to the audience and I just want to focus our discussion a little
38:48
bit more on a specific topic and that is power distribution infrastructure why
38:53

because power distribution infrastructure is one of the as aspects that end up impacting um Pue right it's
39:01
it's one of the things that end up impacting your efficiency so which of the below do you think can have the
39:06
biggest impact on increasing efficiency within the data center power distribution infrastructure do you think
39:13
that gathering and analyzing data at the server or Outlet level can be helpful in
39:19
improving efficiency of the data center do you think that gathering and analyzing data at the r level is is a
39:27
better strategy do you think that gathering and analyzing data at the it room level can help um do you think that
39:34
reducing power loss during distribution is a potential um uh best
39:40
practice is it prolonging the useful life of power distribution infrastructure exactly as um John um in
39:47
indicated recently is it about Distributing power to it devices at um 400 415 volts or is there something else
39:56
that we have missed out and if there is something else please use the Q&A box to submit what you think is what we've
40:02
missed but we would really like to know if there is a power distribution infrastructure
40:09
aspect that can help you significantly improve your efficiency in the data
40:16
center um and I I I already see one response um from from the other that I
40:23
might as well kind of read out and it's minimizing power consumption and I agree minimizing power consumption is very
40:30
important especially the it level that goes back to this idea that um Calvin
40:35
had that you cannot improve what you're not monitoring so Outlet level monitoring of it utilization is very
40:42
often overlooked so to minimize your power consumption you really do need to look at um uh look at at monitoring at

40:50
the outlet level um and and I can see that quite a few have answered there's a few you that

40:58
um haven't answered I'm curious from the panel is there something that you don't see here on the list of options that I'm

41:06
giving the audience that you wish I had asked Vlad I'll um I think that there's

41:13
a piece in here that maybe Calvin can can jump on of just talking about

41:18
harmonics and you know some of the uh monitoring that can happen around that

41:25
just understanding it knowing and being able to do it at the at the pdu

41:30
level that's very important can I just say sorry can I just say there is a

41:36
question on harmonics in the chat as well so um as you do this you'll also be answering one of the questions we have

41:43
which is how harmonics can be a factor that impacts um efficiency it lowers

41:48
efficiency of data center if you could touch up on that that would be great absolutely first I'll make one quick

41:53
comment just on the the outlet or the device monitoring uh um because we track

41:59
obviously our product sales by groups and in type of product and the products

42:05
that they monitor both at the infeed and the outlet or the device level are by far fastest growing and are highest

42:12
selling products and and that's actually been a trend that's been going for a while so I think people are are looking

42:19
at that they're not always utilizing it um but one of the the things that that

42:24
is not often talked about in a data center um is the fact that we've got a ton of

42:30
switch mode power supplies and we know that these switch mode power supplies uh

42:35
generate harmonics and that is uh seen in the data center in a number of

42:41
different ways right it may be higher power supply failures within the servers

42:46

it may be inefficiencies in in looking at the uh power factor harmonic power

42:54

factor you can see how much power is actually being used on theice and how much is being

42:59

wasted um there's just data loss uh heating just a number of things

43:06

that can happen and and right now if you have a problem it's it's very difficult to troubleshoot or diagnose it you've

43:13

got to get a meter you've got to connect it up um you've got to to take those

43:18

samples so and then you got to analyze the data so what would be better than a

43:23

device that automatically monitor ERS the harmonics within the pdu uh and

43:30

that's what we're doing on our on our next Generation products that are out in the market right now and so you can see

43:36

the harmonics for current and voltage and power factor continuously 7 by 24

43:42

and understand um if you have a problem and then look at at what you need to do

43:48

to fix those issues and therefore you know increase your efficiency so um

43:53

we've seen it off and on for many many years we seen very large new data centers where there's been problems

44:01

we've been asked to look at them since some multi-million dollar analyzers a few Engineers that's often the results

44:08

you've got harmonics that need to be resolved and so we've built that into our standard product so it's really a

44:14

kind of a revolution or or a mind shift also based on certain events we can do a

44:19

screen capture and see the current voltage on some of these events if an overcurrent protector on a branch fails

44:25

or some other things and and really get down to the nitty-gritty what's going on

44:31

and actually solve those problems because overall it will greatly affect your your data center

44:38
efficiency thank you that's very helpful and um we're I'm I'm going to close the poll in just 30 seconds so this is your
44:45
last chance to um tell us what you think um and um to also submit if you think
44:51
there is something that we're missing from our options we did get a very interesting question that I just want to
44:57
quickly address myself and and it was you know what should a collocation provider do where you don't have an
45:02
impact on the it right where you can't increase the utilization of it because
45:08
it's not your decision you're only providing the space and I do think that you know if what one thing that you need
45:14
to do is raise awareness right and and even discuss it utilization as a power coping strategy because in reality I'm
45:22
sure that at some point your clients um that use your collocation space will ask you for more power as they're looking to
45:28
deploy AI for example at that point if there is power unavailable I personally
45:34
as a collocation provider will challenge them back and I will tell them let's start monitoring together your it
45:40
utilization we can use you know um Power monitoring for example the outlet level
45:46
and then we can make some decisions together in essence try to become a partner a advisor a consultant to the
45:52
end user so because this is a problem for both of you it might not be your decision how it is utilized but in the
45:58
end of the day it impacts you both so with that let's close the poll we now have quite a lot of responses thank you
46:05
so much for that and the biggest um challenge for so more than half of the
46:11
audience um think that an one of the impact in increasing the efficiency
46:17

within the data center power distribution is gathering and analyzing data at the server or the outlet level

46:23

um and just so that I can move us along at I will just ask um Calvin to confirm

46:29

Calvin if I was to use youra pdu could I gather data and analyze it at outet

46:35

level of course and and in the device level again that's where the bulk of the power is being used what's interesting

46:41

to me is the comment on the Distributing power at 4415 which is really what the rest of

46:48

the world typically does but in North America we bring in 480 and we convert

46:54

it all the way down to 120 volts and so there's a lot of losses in those conversions where if you distribute in

47:01

the cabinet of 4volt you can use an autot Transformer um and and therefore you

47:06

don't have the efficiency losses in the power conversion also servers uh if you

47:13

look at the chart you'll see that typically they run more efficient at higher voltages as well so we have

47:19

started to see a more of a fundamental shift of 400 volt Solutions instead of

47:25

200 volt to a weit Solutions both being three phase but so

47:30

there is there is some gains there and and and based on scale they can be

47:35

significant both in how more efficient your silver run and then secondarily

47:40

like I said in your distribution system of not taking you know 480 and bring it

47:45

all the way down to 120 which is essentially what 208 is right it's two 120 volts uh out of phase um to get you

47:54

your 208 so uh that that was talked about a lot you know kind of

48:00

years ago but but it's still relevant today that there are efficiency gains in distributing power at higher voltages

48:06

within your data center so I'm actually I want to focus on one specific aspect so so many of the

48:12
respondents said that they think that reducing power loss during distribution can be effective and that gathering and
48:19
analyzing data at the rack level can be effective so I'd actually like to focus on that so John you know I'm curious you
48:26
know to hear from you so first you know how can we reduce power loss during distribution can you maybe highlight one
48:32
or two ways and then can you maybe also as a followup kind of tell us a little bit about power monitoring at the level
48:39
and how that can be done yeah yeah thank you um I think that
48:47
the I'll focus on mechanical power loss maybe so when you look at collocation
48:52
providers and and thanks for the user to ask about minimizing power consumption there but you know when you look at uh
48:59
traditional power infrastructure it it might be you know at the branch circuit
49:05
level might be a remote power panel with whips Pulled Under the floor you know
49:10
and traditionally uh that's where the cooling you know Plum space is so when
49:16
you when you look at designing a collocation um you know a new room or or a new data center in general um it's
49:24
it's I think important to look at you know how that cooling is provided and where it's coming from and and what
49:31
topologies you use so if you went to for example a slab on grade type of data
49:36
center design then you can put your power distribution overhead and keep your cooling focused on on where you
49:42
need to be with say like hot owl containment right and and and sort of lon's Technologies when you look at our
49:48
portfolio plays very well with that sort of slabon grade you know very efficient
49:53
cooling using you know hot AI containment for example um so that's probably where I'd look

49:59
first and so you know for collocations let's start getting the power out from under the floor is where the cooling is
50:04
and and that's going to really make a big impact you know air dams are avoided
50:09
um and in general lots of downtime can be avoided because you're able to quickly adjust with with the uh what the
50:15
end user is looking for um the second part of your question was is is at the rack level how do we
50:22
how do we monitor that so we take our what we call our tap offs
50:28
which is the power distribution or the branch circuit off of the busways and we can monitor at each individual Outlet so
50:34
we can we can say you know a a run B run uh you know maybe there's multiple outlets on the tap off we can take a
50:40
look at each one of those and give you your you know a revenue grade energy so
50:46
again in a collocation perspective where you may not know what the customer's equipment is you may not know what the rack pdu is um we can go ahead and and
50:54
monitor that data at a rack level fairly easily with our technology and John one of the questions
51:01
that we have in the chat is do materials um influence the efficiencies of power
51:07
distribution products and I think this probably is you know kind of works really well for someone who really is
51:13
kind of at the the big power distribution um technology aspect so is
51:19
copper as opposed to aluminium improve operating
51:24
efficiencies No in fact in in fact there's not much difference the size of the conductors changes so copper is
51:30
obviously a much more efficient conductor of electricity uh but what you do is you
51:36
size conductor grade aluminum up and it's about 66% uh so they in the end have the same

51:43
resistance and that's what you're looking for um so that doesn't have a big impact material to material but when
51:48
you look at um say cables to busway then you can start to gain some efficiencies uh in that way so cables
51:56
you know when you're laying multiple cables on top of each other you have unknown impedances unknown short circuit effects um and you have sort of a bigger
52:04
a bigger space and busway can start to provide some efficiency over cables when
52:09
you look at you know different topologies thank you that's that's very helpful so um we're going to move a
52:16
little bit to Thermal management so um if you could please tell us which of the below do you think as the audience can
52:23
have the biggest impact on data center thermal management is it addressing hotpots through a heterogeneous cooling
52:29
strategies is it improving the air flow at the rack level do you think that improving the air flow at the room level
52:35
will have better impact is it reducing heat generation from non-it equipment um
52:41
has the big impact in improving thermal management efficiencies what about reducing eliminating water use is heat
52:47
reuse programs a focus for you operating the data center at higher temperature air containment Solutions like hot a or
52:54
cold out containment and finally if there's something else please um submit your note in the Q&A
53:01
box I'll leave you some times to answer and in the meantime I I actually want to
53:06
address one of the questions that we received in the Q&A and that is what is the best Pue that's been achieved um
53:14
using L Grant's Technologies and I'm actually gonna answer for l Grant because the thing is I do think there is
53:22

very frequently a big competition between data centers operators on PU and that's understandable but one of the
53:30
important things when it comes to understanding how Pue works is that it
53:36
really does depend also on your location some of the best pu in the world can be
53:41
achieved in climates where you can really use free Cooling and in reality
53:47
um that's not possible everywhere so this is kind of brings me back to the same report that I read from the
53:53
Singapore government there is a very clear realization there Singapore Pue
53:59
will never be as good as the Pue in the nordics and that is fine so there it's
54:05
really more about finding an efficiency gain improving the status quo that should be the focus so actually in how
54:12
you think about Pue I would say that it's not just about thinking of what is the world's best Pue but what is the
54:20
optimal pee that you can achieve or how you can take steps to reduce your pee I
54:25
think that's actually what more important um with
54:31
this I'll just add on you know I'll add on to that um specific you know I agree
54:37
with everything that you said and specific to L Grand would be that we
54:42
support some of the largest data center deployments in the world and associated
54:48
with them are some of the best published Pue um but that's not a single like I
54:55
don't want to take that and say oh that's because of lron that that's happening and I and I think that we'll get into this a little bit which is it's
55:02
it is being conscientious of what you were choosing and how you were deploying
55:08
and having strong Partners in that design in that implementation and in
55:13
that ongoing operations of the facility so that you can continue to have the poe
55:19

at the design level but then make sure that you're continuing to meet that and better that you know through the

55:26

operations and the lifespan of the data center totally and by the way um um a

55:33

few I'm going to show you the results now heterogeneous cooling strategies comes out as half of the people and I

55:40

should note that a few of the quite a few of the attendees also noted that uh

55:45

liquid cooling strategy is something that they're looking at and that's very fair I think addressing the hotspots

55:51

through a dedicated cooling strategy is a is a very good idea um

55:56

I'm very glad to see that people understand that improving air flow can have a really big impact because it's

56:02

true that's one of the reasons why most of the um uh industry organizations do

56:08

recommend the use of containment and heat reuse program comes in quite High

56:13

which is which is also quite good I just want to come back to the addressing the hotpots through a heterogeneous cooling

56:19

strategy um you know Rebecca can you maybe give us quickly a example of a

56:24

heterogeneous cooling strategy that you know ground offers absolutely so at a very very

56:32

basic level it's even just the the cabinet selection that you are making and the airflow that goes through that

56:39

cabinet you can use blanks and dampeners and there are all kinds of different

56:45

accessories that you can put into that cabinet to make sure that the air flow is going where it needs so it's one

56:51

optimize your air flow that is also pertinent to containment so which your containment strategy again making sure

56:58

that you're taking um that air right that is there and maximizing it then

57:04

you're going and you're looking at okay how are you producing that cool air that is in it so the more the more efficient

57:11
um Technologies to that and getting that cold air directly where it needs to be because again even if you're even if you

57:17
have a mid to long-term plan to get to um liquid cooling or direct to chip

57:23
specifically direct to chip cooling you're still going to need again a heterogeneous solution to be able to

57:30
tackle the other cooling needs um of the data center right Beyond just that chip

57:36
so rear exchange doors um and get you a nice stairstep function into getting

57:43
that CDU um in place giving you the opportunity to build into that and then

57:49
off of the rear heat exchange doors you can then again add in direct to chip liquid cooling at part of again a a

57:58
scalable flexible heterogeneous you know mid to to longterm cooling strategy

58:04
without doing a a full-blown plunge and of going straight to direct to Chip and

58:10
and again going back to your CeX discussion um Vlad you know how can how

58:16
can you build up a program build up a plan to get yourself into that um while

58:23
again not not biting off too much I would encourage I would encourage people to actually um kind of spend some

58:30
time just taking a look at what is possible with a rearo heat exchanger because there is a bit of a

58:36
misconception that I've seen in the industry that you know you can cool a few tens of kilowatts actually some of

58:42
the at the top end that technology is used for high performance Computing where you see 100 kilowatt racks I think

58:49
immersion cooling is a very interesting technology but it's there's something very important what I've seen with

58:54
imersion Cooling and I and I comment because I see it in the chat uh in the questions uh that that are quickly

59:00

coming in some of the things with immersion cooling that people forget is immersion cooling is tends to be focused
59:07
on cooling the entire system every aspect of it if you have a hot spot for example one chip is 1500 watts actually
59:14
the best strategy is to take um liquid first to the Hotpot within the tank so
59:20
it's in essence it's kind of like direct the chip within the immersion tank to cool it that that's what some of the
59:26
vendors are suggesting now so immersion cooling works but in terms of uh being
59:32
able to eliminate the power at the highest end you need to even get creative with immersion so one of the
59:38
things that I encourage you to think as you think about immersion because I can see multiple people are indicating we're
59:45
going to go to immersion air assisted direct to chip liquid cooling is being advised by ovh for example a cloud
59:52
service provider and user of air assisted um liquid cooling a director chip liquid
59:58
cooling as being better they're basically able to kind of rightsize the number of fans they have in the servers
1:00:05
the number of fans in the rearo heit exchange or in the director chip to be able to get to an optim optimal
1:00:11
environment so I would say don't go straight into a singular technology explore different aspects because
1:00:17
otherwise you might end up um just perhaps rushing into it um is is what I
1:00:22
would say when it comes to Thermal management so I'm going to put I want to and we're at the top of the hour and now
1:00:29
let's give a homework to Rebecca Calvin and John so I would ask you if you can
1:00:34
tell them what expertise do you find most valuable in your data center
1:00:39
infrastructure partner tell them what they need to work on because in the end of the day that's very important um so

1:00:47
as you um kind of tell us what do you find most valuable in your data center infrastructure partner I'm just going to

1:00:54
answer one of the questions that is really easy to answer and it's about the Singapore report it's I've posted it on

1:01:00
LinkedIn so if you just V find Vlad galabov on LinkedIn the last post that you see is the Singapore report I've

1:01:07
uploaded the entire report there so so you you'll be able to see that and then

1:01:14
with this I just want to give you guys as the audience answers the last question to give you some homework maybe

1:01:20
a couple of closing remarks and I'll start with Calvin Calvin what do you want people to have as an action item

1:01:26
like a singular action item as they leave this webinar you know I guess it really

1:01:33
depends on on what your challenges are you know if if if you're in AI

1:01:39
now and and you're going into it heavily then you can avoid the cooling conversation but of course also you have

1:01:47
to have the right amount of power right and I agree that that certainly um

1:01:53
reference designs consultancy with whatever you want to call it you know reach out to your vendors um at a high

1:02:00
level we can share what other people are doing and we've got experience in how um

1:02:07
some of these systems are being powered in many cases it's a it's a three-pronged power solution and and two

1:02:14
of those uh supplies have to have 100% power 100% of the time um where you can

1:02:21
lose efficiency in your AI so there there we can help and and and and

1:02:27
understand help you understand what other people have done to do that so I I think just reaching out to uh vendors

1:02:35
and talking to them about what they're seeing and what they're doing to solve

1:02:40

some of these problems is is just a huge huge resource uh for the people out
1:02:46
there and by the way we received we I I still have received one extra question that we haven't answered we will send
1:02:53
you a note on it I'll I'll personally send it to the the cabinet experts Grant
1:02:59
to follow up with you John what would be the singular act call to action that you leave our audience
1:03:05
with yeah I I would um I would encourage everybody to take a look at their Monitoring Solutions you know what do
1:03:12
they have in place and where their gaps are you know one of the things and of course I agree with Calvin you know what
1:03:17
have we done to help other customers as they race to implement their AI challenges but but you know let's take
1:03:23
it back to basics and let's look at your infrastructure let's look at your Monitoring Solutions and I think you
1:03:28
know we started the presentation say you can't you can't improve what you aren't monitoring and I think that's what I
1:03:34
would want everybody to take away and Rebecca same question yeah I would just
1:03:39
try you know I'm gonna I'm gonna turn it back around and challenge the audience
1:03:44
and also the industry to really dig deep into you know challenging ourselves and
1:03:51
looking for um these little Treasures right these little these this these pee
1:03:56
treasure that we are are chasing and challenge yourself internally so one of the things that Iron did um in our
1:04:04
sustainability efforts as we actually partner with the doe and we we did we did we did uh sustainability treasure
1:04:10
hunts within our facilities to see where we um could approve on Energy
1:04:16
Efficiency and it came up with just really awesome internal finds and so if
1:04:23

you create that culture it gives you the the opportunity to solve these problems and then it also in having a culture
1:04:30
where you have you know supportive Partners um we can help Inspire some of
1:04:35
those things and we can also show you how you can maximize your functionality of what you may already have and also
1:04:41
plan for the future you know again as you're doing those refreshes making sure that you're getting you know the
1:04:47
infrastructure in there that you need to to scale to be flexible and that's going to that's going to grow with you um into
1:04:55
those next stages thank you Rebecca so with that
1:05:00
we're going to close off today's session we will follow up with any unanswered questions thank you so much for joining
1:05:05
us um and um good luck on your mission to creating a sustainable AI Data Center
1:05:12
thank
1:05:24
you e