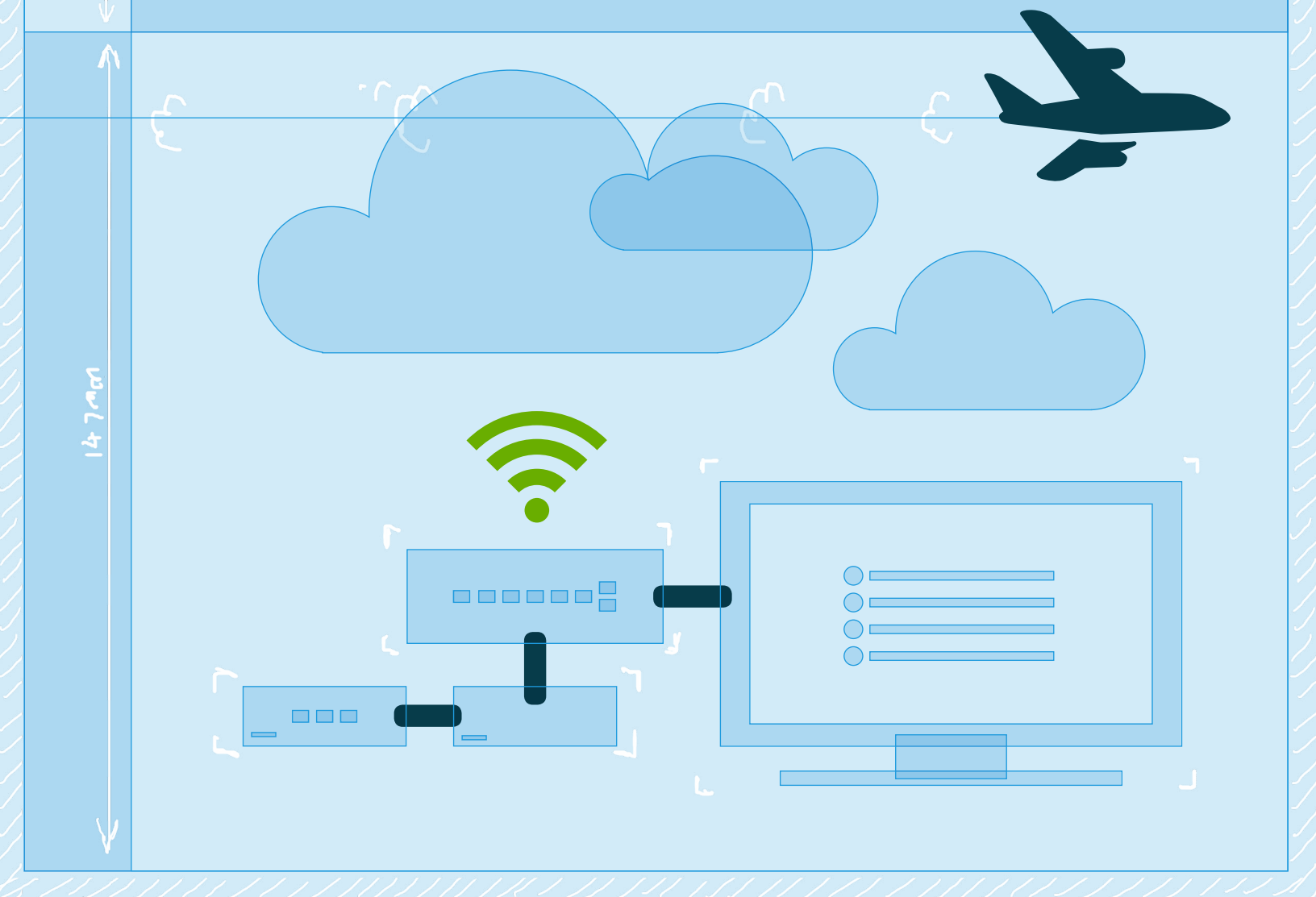
The JUMPCLOUD + MERAKI Blueprint for Cloud-Controlled Networking

With **KEVIN LAM**, Global Network Architect at Grab



HAVE YOU EVER SET UP AN ENTERPRISE-GRADE NETWORK?

How about 50 of them in over 30 cities?

Kevin Lam has. He's the Global Network Architect at Grab®. Founded in 2012, Grab already has over **3000** employees, **63** million downloads, and locations across **7** countries.

"Grab has been growing very quickly," confirms Lam. "For a while there, I was setting up a new network for a new office in a new location every two weeks."

AS SOUTHEAST ASIA'S LEADING RIDE-HAILING APP, GRAB NEEDED A NETWORK THAT COULD KEEP UP: ONE THAT WAS AS SCALABLE, RELIABLE, AND SECURE AS THEIR FAST-GROWING STARTUP.

KEVIN NEEDED A BLUEPRINT THAT WOULD REVOLUTIONIZE CLOUD-CONTROLLED NETWORKING

"Today, I have a sprawling Cisco Meraki® cloud-controlled network from Singapore to Seattle, 55 locations and more on the way every day, handcrafted from our very first location to our very latest location in Myanmar. Underpinning that entire infrastructure is our identity management platform, JumpCloud. After all, what good is a network if people can't access it?"

"We have learned so many lessons from all of these international adventures. Based on the sum total of these lived experiences, I've created a blueprint for how to set up an office quickly – what we need to have and what we need to do. The reason I'm telling these stories is that I think you can relate, because our challenges are not unique – in fact, we have more in common than we do apart. You guys have dealt with inaccessible locations, whether in rural areas of the US, the Australian outback, just as I have in developing parts of Asia. But that's the idea behind this setup, it's designed to work, wherever you go, as long as you get the right kind of cellular connectivity. The rise of the mobile workforce and the mobile phone in the cultural era of "I want it now" has both caused a problem, but also, created an opportunity."

"Let's look at how we can turn this challenge into an opportunity."

IN THE FOLLOWING PAGES, KEVIN WILL SHARE HIS BLUEPRINT FOR CLOUD-CONTROLLED NETWORKING.

(Disclaimer: Please note that this does not reflect an actual Grab network, and is an illustration of what is possible, not what is. The opinions and designs expressed here are solely that of the author and no proprietary information has been used in the creation of this document.)

The blueprint

PHYSICAL HARDWARE WITH MERAKI

Cradlepoint IBR650

Cradlepoint Ethernet LAN
to Meraki MX65 Internet 1

Meraki MX65
Security, Appliance, firewall,
UTM, VPN

MS LAN port
to MS port 1

Meraki MS220-8P

8 port PoE switch with
2SFP fiber ports

MS LAN port
to MR33
uplink port

Meraki MR33

Meraki MR33
802.11ac, Wave 2
Cloud-Controlled
WiFi Access Point

MS LAN port
to wired endpoint

The blueprint

CLOUD-CONTROLLED NETWORKING WITH JUMPCLOUD

Cradlepoint IBR650

4G LTE Modem
for Internet access

Meraki MX65

Utilizes JumpCloud RADIUS to securely authenticate incoming VPN connections.

JumpCloud.
RADIUS-as-a-Service
with
Meraki MS220-8P

Meraki MR33

Utilizes JumpCloud RADIUS to provide 802.1X PEAP wireless authentication to mobile devices.

802.1X wired authentication to wired endpoints.

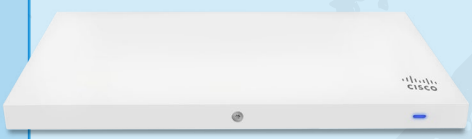
The blueprint

AIR TRANSPORT

All of the above, including accessories such as power supplies, power strips, antennas, and LAN cables, will fit into a single Pelican 1510 equipment case designed for air transport of sensitive electronics.

The Pelican is watertight, floats (within limits), is practically crushproof, and also within FAA airline carry-on limits. It also has wheels, to take the strain off your back and arms.

Pop open the Pelican, find a power source, and be online and in the cloud in minutes!



BEHIND THE BLUEPRINT: HOW IT WORKS

When I'm tasked with setting up a new office, I know that I have a few key components. JumpCloud is the glue that pulls together the access to the network and Cisco is the actual network. First, we spec up all the networking hardware using our sizing guide.

You can determine a lot just by knowing the the size of the office. We know roughly how many people plan to work there, and we have a floor plan. With that, we can spec out the network hardware really, really quickly.

It's very templated.

Sometimes I feel like I'm writing a prescription for medicine. "Take one MX65 before breakfast. Text me if it doesn't work."

All it takes from there is to size the Internet connection and order an ISP connection. We'll usually use two carriers for backup, so they're active / active, both running at the same time. While naturally, fiber optics are more reliable and stable, one of the carriers can be cellular, 4G/LTE based, via a Cradlepoint IBR enterprise-grade modem.

Then we just parachute the hardware in. We clone the configuration off of our existing template, so as soon as the hardware lands, I put the config in the cloud controller. When the hardware gets there, I plug it in, it sets itself up from the cloud, and everything is up and running.

IT'S ENTIRELY POSSIBLE TO DO IT IN ONE DAY. I WILL JET IN THE DAY BEFORE, SPEND THE NEXT DAY SETTING IT UP, AND THEN FLY OUT ON THE THIRD DAY.

BEHIND THE BLUEPRINT: HOW IT WORKS cont.

We've refined the playbook a little bit over time, but it hasn't changed that much from the early days. The core concept is really quite simple and elegant.

We brought in Cisco Meraki gear, based on the recommendation of one of the team members. It was actually really, really good. The speed of deployment is amazing. The other critical component is JumpCloud's Directory-as-a-Service®, which we use to gain centralized management over access to all of the networks, apps, and endpoints within our IT infrastructure. This way, I can skip the hardware for my directory server, because JumpCloud handles that in the cloud. No Active Directory® servers for me.

Here's how it works:

1. **As soon as Cisco puts the hardware on the jet out of San Francisco, you enter in the license key, claim the hardware, and set up everything using a web based UI. Since everything is uploaded into the cloud, the entire config can be done via the browser. It's easy, intuitive, and graphical. Then, when the plane lands at the site, all you do is plug it in.**

2. **If necessary, give the network a static IP address to work with your ISP for the perimeter firewalls. The access points (APs) work straight up – no configuration. Just plug everything in, it retrieves all of its configuration from the cloud, and away you go! You're ready to deploy.**

Honestly, this thing is simpler than most home routers. It's the power of enterprise hardware with the simplicity of home based networking. That's the Meraki story in a nutshell. Then, JumpCloud does the rest.

THAT'S BASICALLY IT. IT'S ABOUT SIMPLICITY, BECAUSE IT SHOULD BE SIMPLE.

GAINING CLOUD-CONTROL – THE SOFTWARE

But the central management software isn't just for network access and communications systems. It's for everything: all of your endpoints, web apps, identities, and infrastructure are there at your fingertips in one browser window.

IT management tools being delivered from the cloud are life changing for IT admins. The concept of a cloud directory service didn't exist until JumpCloud created it. We'd be stuck using Active Directory or LDAP if it wasn't for the idea of a cloud directory.

JUMPCLOUD INTEGRATES EVERYTHING ACROSS THE ENTIRE ORGANIZATION WITH A SINGLE SOURCE OF TRUTH.

Where cloud controlled networking is completely changing the game is that everything can be done through the web GUI. The new Meraki equipment is based on the assumption that you have an Internet connection. Everything is on the cloud with JumpCloud's Directory-as-a-Service®, so you have a full network management system and configuration management system right in your browser.

You've got identity management, you have a single sign on, and then you have the network side, all tied into one single provider. JumpCloud is clean, elegant, and doesn't need middleware, or translation other weird "glue." You gain simple, centralized control, seamlessly.

NETWORK EFFICIENCY WITH SINGLE SIGN ON

Originally, I was looking at JumpCloud from a more narrow angle. I was mostly just interested in the RADIUS capability in the cloud.

My boss at Grab had a much bigger vision for what JumpCloud could do. He said to me, "No, there is so much more potential in this. You can use this as a Single Sign-On system across the entire organization, across all of our IT resources - a person's system, apps, servers, and WiFi authentication. So, the user only needs to remember one password."

That's what we did. Today, we just sign in to the JumpCloud user portal, we click on whatever app we want, and then we're granted access."

WE DIDN'T WANT TO GO THE CONVENTIONAL ROUTE. IT TAKES SO MUCH WORK AND WE COULDN'T MOVE AS FAST, WHICH IS CRITICAL FOR A QUICKLY MOVING STARTUP LIKE GRAB.

INSTEAD, I OPTED FOR CLOUD-CONTROLLED NETWORKING.

You are eliminating all the need for power, cooling, battery backup, lights in the data center, traditional big iron boxes that you have to get people to manhandle into the rack, and you're speeding up all of this process. If you get a traditional server, just to install Windows takes three hours. Then you have to configure all your bits and pieces.

With JumpCloud it's just like "I want it in 5 minutes? I can have it in 5 minutes." The value is in the time to market and all the cost savings that go along with it. What more can a network admin ask for?

WHAT'S NEXT?

Someone asked me, "How do you manage so many locations?"

I told him, "I spend a lot of time staring at aircraft interiors." But I don't need to say that anymore.

WE'RE ACTUALLY GETTING TOWARDS THAT POINT WHERE I WON'T HAVE TO TRAVEL TO THE SITES ANY MORE. THE ONLY THING THAT FLIES IS THE HARDWARE.

There used to be a time when I was on the jet every two weeks. In fact, sometimes I fly the same plane in two countries. I'm starting to recognize the planes themselves!

The key difference now is that using the blueprint, all the work on the ground can be done by level 1 support staff. You don't need a dedicated network specialist in each country or at each location.

Like I said, I spec out all the equipment for them, then I set everything in the cloud controller quickly using the templates, and then I just tell them, "Guys, hardware is on the way." Once the hardware arrives, I have the physical wiring diagram that I share with them. You guys just plug it in according to the diagram and get your building contractor to hang the APs in the spots that we have marked on the floor plan.

IT'S PRETTY MUCH PLUG-AND-PLAY.

Once they get things online, everything just starts to fall into place. They can tell me if they can see the green light and then they can go home. So, you don't need a very high-level of expertise. That's a huge cost saving right there because you're automating a lot of the day to day tasks with a better platform.

ANY PARTING ADVICE?

One word: simplify.

Simplify, simplify, simplify. The secret that I found is not more complexity, because we live in a world with overwhelming complexity, the idea is to simplify what your core mission is. What is the most important thing you're doing? The most important thing that we're doing is actually not turning out servers or putting things in equipment racks. It is about delivering a ground-breaking service to the users.

IF WE CAN DO THAT IN A FAST, RELIABLE, AND SIMPLE WAY... THAT ENABLES US TO IMPROVE THE LIVES OF OUR USERS.

Of course, it improves our lives on the IT side as well, so everyone wins in this situation. Let me give you a new KPI (Key Performance Indicator). What's your stress level? Are you plagued by callouts, servers failing, networks flaking out, and do you want to simplify your own life? You're here to enable your users' hopes and dreams - and if you take a step back and look at the larger picture, you're not here to babysit servers or crimp cables. You're here as an enabler, to deliver the solutions that help your organization execute. Let the cloud help you do this. Let the cloud help reduce your stress level and accelerate your service velocity - your time to deliver a service to your end users.

That's the simplicity of Meraki and JumpCloud. It just works. You don't have to worry about scaling. You don't have to worry about running after the hardware. You don't have to worry about a hard disk failing in some random server at 2 am, which leads to you getting a call stating that no one can login, and then you find that it's because a hard disk has died in some box in the middle of nowhere, and you have to go out and replace it.

It just works.

That's the beauty of the next generation of networks and cloud infrastructure. You don't have to watch over the cloud because JumpCloud and Meraki watch over it for you. You don't have to be on call 24 hours a day because they do it for you. Grab aligns with JumpCloud and Meraki because all three are about simplifying a very complicated problem.

DIVE DEEPER INTO THE OFFICE IN A BOX

More Info

If you would like to learn more about how Directory-as-a-Service can help your organization expand, drop us a note at sales@jumpcloud.com.

About JumpCloud:

JumpCloud®, the first Directory-as-a-Service® (DaaS), is Active Directory® and LDAP reimagined. JumpCloud securely manages and connects employee identities to IT resources including devices, applications, data, and networks. Try JumpCloud's cloud-based directory free at JumpCloud.com or contact us at 855.212.3122.

Contact Us

For additional reading, blog updates, and the latest news please visit our blog.

Kevin is a passionate network architect (CCNP, CCDP), expert Cisco Meraki operator and cloud networking fan who greatly enjoys working with forward-thinking people who bring joy to what they do and who are helping to make the world a better place. If you'd like to work with Kevin, you can connect with him on Linkedin!