Citi Global Technology Conference

Company Participants

- Diane B. Greene, Director and SVP of Google

Other Participants

- Mark Alan May, Director and Senior Analyst, Citigroup Inc, Research Division
- Unidentified Participant, Analyst, Unknown
- Walter H Pritchard, MD and U.S. Software Analyst, Citigroup Inc, Research Division

Presentation

Mark Alan May {BIO 4280734 <GO>}

Welcome, everyone. And thanks for attending Citi's Global Technology Conference. I'm Mark Mahaney (sic) (Mark May), the Internet analyst at Citi. Today, our pleasure to welcome Alphabet to the conference and Diane Greene. Also, joining me on stage today will be my colleague, Walter Pritchard, who heads up our coverage of the software sector. Again, my pleasure to welcome Diane Greene as our keynote today at the conference. Diane doesn't really need any introduction. But as everyone knows, Diane founded VMware in 1999 and company was acquired in 2004. Alphabet, Google was fortunate enough to be able to hire Diane two years ago to help lead their effort in Cloud. And the company has really established itself as one of the leading Cloud providers in the world in a fairly short period of time. We look forward to talking with Diane about some of the key accomplishments over the last couple of years, how key technologies like machine learning and analytics are really helping them to win business with key clients around the world. And how her conversations with customers have evolved in what is still a fairly nascent and high-growth market.

So with that, Diane's going to kick us off with a few introductory slides. Then Walter and I will get into the Q&A session. We will have time at the end to take your questions. So please be prepared. Although, let's stick to the Cloud. Although, sure, they're a lot of questions around search and advertising, we want to keep the conversation to the Cloud.

So with that, Diane, thanks again. Appreciate it.

Diane B. Greene {BIO 6104652 <GO>}

Great. Thank you. Hello, everybody. This mic is on, yes.

So it's great to be here. Cloud is just getting more exciting by the minute. I've been on the Alphabet board for seven years and then 20 months ago joined Google full-time to run the Cloud. And we're still at the beginning of the Cloud. I mean, the Cloud was originally a place for startups, a place for surplus capacity, sort of, a cost savings thing. And now with every business becoming a data business, the Cloud, people are moving to the Cloud to be secure. And they're moving to the Cloud to gain competitive advantage.

And Google, for the last 20 years -- 17 years, has been building out data centers all over the world, developing data analytics. You could argue, we've invented most of the major advances and modern big data processing, machine learning, security and also developer environments for our some-30,000 engineers. We've got over 100,000 miles of fiber optic cable. We're adding a new data center region about once a month, just this -- in the past few months, we opened London and Sydney. And next week, we'll open Frankfurt and that will be followed by SÃ£o Paulo.

We've got -- we run approximately 1/3 of the world's Internet traffic. And in over the last three years, we spent $29 billion in CapEx, continuing to build out, keeping up with the enormous growth we're seeing.

So I want to start with security because I strongly believe that is the most pervasive problem every company has. The data breach is so expensive, I think, our health record is $400 a health record if you get breached. And so Google, with all the information we have and the need to keep our customers' data private, has had to be a pioneer. And we feel pretty good about where we are in security, not that we aren't vigilant with our 800-plus dedicated security engineers every day. But I would say, all of Google's some-30,000-plus engineers are kind of security engineers. And we've built security into every layer of the system. From proprietary purpose-built chips like Titan that say that the hardware hasn't been tampered with and you're running a binary you think you are to every layer of the stack on up to the software that detects a phishing attack and then in your mail and then says if someone tries -- if you gave the password and someone tries to use it, it says, "Are you sure this person should have your password or do you want to change your password?"

And we've also developed perimeter-less security, because if you just have a firewall protecting everything, if someone gets inside, you're kind of in trouble. And so we can look at what you're doing, where you're coming from and what call you're making. So that many, many of our services, Google services are just out there on the open Internet, because we can protect them much better than we could with a firewall.

And you take something like a Chromebook with its -- the Chrome OS tiny attack surface updated in the Cloud constantly. You don't get a Ransomware attack then or something like Heartbleed a few years ago. Google had that patched before it was publicly announced.

We've also internally developed a very modern programming environment so it can be agile and separate the layers and engineers can move quickly. And so we developed -- we have -- we launched -- everything runs in containers at Google, we launched over 2 billion a day, Gmail, every service we have, Maps and so forth. Our sort of 8 billion-plus active user services. And we brought that to the Cloud. We open sourced it with its Kubernetes. And it's now becoming the de facto way to run your services. And you combine that with the containers, where everything's taken care of for your software. And then API management with Apigee. And your developers can move very quickly, take advantage of the APIs out there, take advantage of the infrastructure, automating everything underneath. And so we're pretty excited about what's going on in the last few months, everybody's announced support for Kubernetes', a very active data analytics and machine learning. You take something like BigQuery, our data warehouse, when Spotify moved from one of our competitors, their 1.5 petabytes, I think, of -- 1.5 billion files over, they got a 35x speed up using BigQuery. Or you take something like Spanner, where we've combined our hardware expertise with atomic clocks in every data center to make it so you can do transactions, distribute it all over the world. So if someone's is withdrawing on either side of the world, we won't let an overdraft happen, for example.

Then machine learning, Google's been doing machine learning, really, Larry got it going right when he founded the company, pretty much. And now we have built all these data models that we give to the -- share with the world through APIs. And so there's all the language APIs, there's even a Jobs API, we just recently announced 30 more languages. For example, for the Translate, we have natural language, video recognition, very popular.

Then, finally, (Alan K) said, if you're serious about software, you're going to build hardware. We have our own processor, we open sourced how we do our machine learning, TPU's, Google's really pushing the world on openness. And the TPU is a processor that is for TensorFlow, Google's open source, which is the most active machine learning project on GitHub.

Then, finally, is how we support people and if -- they'll taught in our Cloud for workplace collaboration and productivity. People are increasingly discovering the huge transformative effects it has on their companies to collaborate. I know a public company whose board of directors collaborates in Google -- a large public company collaborate in Google Docs to ask questions and work with the CEO. And you can do things like search everybody's documents and see who's working on what. And it's proven to be an amazing suite. And we've got 150,000 users of Verizon moving over there, Nielsen with 60,000 using Hangouts all the time, Colgate-Palmolive. And so really getting big enterprise customers moved over to gain that agility in their company, that collaboration. Pretty proud of what we've been, massive effort to infuse it with machine learning, which is you see in things like Smart Reply and in the Calendar.

So that is just a -- I hope, about a 5-minute quick overview of Google Cloud. I'll look forward to your questions. One other little fun thing I'll just mention is, if you took

one of our big data center buildings and overlaid the Stanford Stadium, you'd still see a little bit of the building. These things are massive. It's a very exciting area to be in from the basic data center up to working with all these customers to share Google's technology and see them take advantage of it. Thank you.

Questions And Answers

Q - Mark Alan May {BIO 4280734 <GO>}

Thanks, Diane. Google's Cloud business, kind of, been moving faster than the Cloud market overall in the last couple of years. I wonder if you could think about your time so far at Google in stages and maybe talk about some of the key areas of focus that you'd look to build out maybe in, I don't know, if you want to go up the first year, the second year. Then what are the areas of focus for you going forward? So we can get a sense of how the business is evolving over time?

A - Diane B. Greene {BIO 6104652 <GO>}

Sure, sure. I think when I came in, we were mostly focused on startups. And obviously, the enterprise opportunities, at least, the slide deck -- I mean, the enterprise opportunity is what we're going after and we've made huge strides. So we had to really get all the table stakes functionality and things like identity and access controls and networking configurations and all the compliance and regulatory. So we got that done. That's -- it's all there. Any enterprise customer can be fully deployed on us now. Then we had to buildout the go-to-market, which -- certainly, it's the direct sales force and an immense number of customer engineers, Google quality customer engineers, which our customers really value. We set up professional services. We set up an office of the CTO, Customer Reliability Engineering and advances. We set up a lot. Then it was partnering, because we really -- the most important thing is our ecosystem. So we have big global strategic partnerships where people run on our Cloud and we integrate technically and we go-to-market together. Then just go-to-market partners. So building out our ecosystem has been a huge priority. So we got all that done. Then we started looking at verticals. And now -- and taking our machine learning and applying it to verticals. Then taking Kubernetes and now we can support hybrid and lift and shift. And we bought Apigee to facilitate the API management. Then, I would say, a big milestone, we gotten the top -- Google Drive gotten the top right-hand quadrant of Gartner and Forrester named us as the leader in PaaS, Platform-as-a-Service. So clearly, when I came in, basically, every customer partner discussion was, is Google really serious about the enterprise. And I haven't heard that in months now.

Q - Walter H Pritchard {BIO 4672133 <GO>}

Just a follow-up to that, Diane. You've, obviously, run a large enterprise software company in the past. I think you probably know very well what it takes to have the presence from a go-to-market perspective to be able to compete. You have a couple of competitors in the space, obviously, Microsoft has tens of thousands of sales and marketing professionals just by virtue of their legacy in that market.

A - Diane B. Greene {BIO 6104652 <GO>}

They did when I was running VMware. So...

Q - Walter H Pritchard {BIO 4672133 <GO>}

Right, exactly right. So and then Amazon's been building that out. Do you feel like the go-to-market is kind of the great limiting step in Google's Cloud growth? Or are there other factors as you look going forward? Or -- I guess, I want to focus in particular on the go-to-market and how much of a limiter is that on where you want to be in the next several years?

A - Diane B. Greene {BIO 6104652 <GO>}

Yes. Well it is definitely an opportunity-rich environment. And we are working hard and it's kind of all hands on deck because we don't turn anybody away. We do -- we work with them and it's very exciting for us. But we're building the leverage, we build out training and certification so we can train our partners, we can certify our partners. And we've started -- we announced a very deep strategic partner with SAP, which is going to give us a lot of leverage. And both SAP and Google are pretty excited about that partnership. And also, some of the advanced data trustee things that we'll be doing. Then we're -- you'll see more and more partnering announcements. We recently announced Nutanix for the hybrid support. And so I -- we don't have as many feet on the street, we're growing very rapidly. I recently brought in a very seasoned sales executive, run double-digit billions of revenue somewhere else. And so we'll continue that buildout. But it's really focused on our partners and making them successful.

Q - Mark Alan May {BIO 4280734 <GO>}

And just on -- you mentioned SAP. So your -- you have the G Suite, which is a set of applications. You're market leader in PaaS, you're very competitive on the IS side. Sort of moving up the stack, how partnering with SAP, having some first-party apps, how do you think about that long term in terms of the mix of business that Google wants to have in cloud? And the importance of the Apple-era in SaaS?

A - Diane B. Greene {BIO 6104652 <GO>}

Well so G Suite is very strategic to us because you can do things like between BigQuery and Sheets and it's -- Drive is a great place to put your files, getting greater all the time with all the machine learning and then Gmail with over -- well over 1 billion users, it's a pretty commonplace. So G Suite is the communication mechanism that go with the Cloud. But -- and the storage -- individualized storage, team storages. But the SaaS vendors we're partnering with, we just announced a huge win with Marketo and that was a big deal, that's an example of the kind of partner we're going to -- SaaS vendors that will run on Google Cloud and take advantage of what we have. And so we -- we want to work with every SaaS vendor. And we think it's a huge advantage for them to be on our Cloud. Every time one of them moves, they go, oh, this is fantastic. And they talk about all the things that have been improved for them and all the advantages. So with SAP, it's up and down the stack. I mean all of SAP -- well, HANA runs on Google Cloud. And more and more of SAP is running

on Google Cloud. We are integrating G Suite with them, we're working on with them on machine learning. Then, what people don't know is, we're doing a data trustee relationship. We did announce it. But I'll just reiterate it, where they, over time, it'll be their data center, we're the supplier. So that when they're running in Germany, running our data center, running any workload, it will be a German company who has the data and not a United States company, which is a key milestone for us.

Q - Mark Alan May {BIO 4280734 <GO>}

Interesting. Just on hybrid, you brought up Kubernetes, which I think maybe two years ago there were a lot of these standards out there, that one has definitely gelled as the leading container manager, container orchestrator. What I don't see from Google is, there's products in the market that leverage Kubernetes from other vendors. There's not a sort of hybrid Google offering. What is the hybrid? Because it does seem like also in parallel to hybrid Cloud, you've got enterprises with large data centers, you have large data centers, everybody sees the advantage of what you've built. But getting there and sort of mixing what they have with what you have is difficult. So what is the hybrid strategy with potentially Kubernetes as a big part of that look like?

A - Diane B. Greene {BIO 6104652 <GO>}

Well we want Kubernetes to run extremely well on-premise, to run extremely well in every Cloud. We are pretty certain it's going to run the best in our Cloud. I mean, we invented it and developed it. And we did announce a partnership around hybrid with Nutanix. There is a solution there. And we've built solutions with our customers where they're running Kubernetes on-prem and in our Cloud. And I would just say stay tuned, a lot more to come.

Q - Mark Alan May {BIO 4280734 <GO>}

Okay.

A - Diane B. Greene {BIO 6104652 <GO>}

It's -- and then we're taking -- we're also doing some new development that take it to the next level and that will be open source too.

Q - Walter H Pritchard {BIO 4672133 <GO>}

Maybe a question on machine learning. Talk about how important that is to winning business today? And any examples that you can provide about how that's actually being used by enterprise customers today?

A - Diane B. Greene {BIO 6104652 <GO>}

Sure. Yes, machine learning is the -- one of the major disruptions going on in that -- once you get in-site, I always cite Google itself, which has been -- which is the most carbon neutral data center in -- set of data centers in the world, we've always prioritized that. So we optimized our data centers' energy usage as much as humanly possible. Then we applied machine learning and then our cooling got a 40% advantage and humans are getting 2% or 3%, 40% advantage from the machine

learning, it's kind of amazing. So we are working with, basically, every customer on machine learning. And we can even bring them into our advance system labs and work with them. The public customers I can talk about are like Airbus that did use the vision to build a model to take the clouds out of their images, something they've never been able to do in 20 years. Or Ocado, the biggest online retailer in the U.K. -- they're based in the U.K. And they were able to use our machine learning to detect customer sentiments and know how to handle calls in their call center. Or FamilyMart over in Japan use -- it's this huge chain of neighborhood grocers where they stock at 3 times a day and they can -- they're using our analytics and machine learning to figure out how to stock things, to predict what to do. And there's a lot more of that, as you might imagine, I can't talk about.

Q - Mark Alan May {BIO 4280734 <GO>}

Sure. Just on the earlier days of cloud, I think it still gets some airplay, price reductions were a focus and everybody in the market was reducing price a lot. Google actually had some sort of a headline making price reductions a couple of years ago. Can you talk about what impact price reductions are having now on the market? And how does that drive your strategy around pricing in your -- especially, the infrastructure as a service, kind of, the more commodity-type services that you're offering?

A - Diane B. Greene {BIO 6104652 <GO>}

So the question is about pricing and putting words in my mouth saying our services are a commodity.

Q - Mark Alan May {BIO 4280734 <GO>}

Well I'm saying we've seen price reductions at -- I think we'd all agree that maybe the basic compute storage services are -- they've been around for the longest, they're mature. And they're the ones that have seen the greatest price reductions. I'm just wondering your view on maybe price elasticity of demand in the market and how that drives your strategy around pricing versus what some of your competitors may be doing.

A - Diane B. Greene {BIO 6104652 <GO>}

One thing is, we've been a pioneer in the model for pricing. And so when customers look at the total cost, we end up being quite a bit less expensive partly because we charge by the minute, partly because we give automatic price reductions, the more you use, then we don't require reserved instances. And partly because we have such great performance. I forget the name of the group, CloudHarmony or something like that just published a study that showed us the #1 performing Cloud in our services. And so we do have a very low total cost. And it is becoming companies' biggest cost item. So companies care. Then, when you get into the big deals, there's a lot of work because everybody's sort of this -- got some custom -- there's a lot of work that goes into a contract, that's a large team of people for us. And so there's a lot that goes on as you develop a proposal for a customer.

Q - Walter H Pritchard {BIO 4672133 <GO>}

I guess along those lines, given how transparent and how segmented your pricing is, how many of your customers are actually on the sort of rate card, if you will. And -- versus more contractual pricing and how it varies dramatically.

A - Diane B. Greene {BIO 6104652 <GO>}

Well we certainly have a very big self-help online business, right? And maybe, as those people get bigger and bigger, we might come back and discuss what they're doing and how to optimize it. Then -- but the top Fortune 5000, when they're doing a full-on Google Cloud, we get together and talk or a snap, formerly SnapChat, we get together and talk about where they're going to run. And how much are they going to know ahead of time where their loads are going to be. And how spiky is it going to be and we work with our customers.

Q - Walter H Pritchard {BIO 4672133 <GO>}

So as an outsider, how do we translate when we see these kind of public rate card-type price changes. How immediate does that flow through to customers that are on contractual terms? Do they see the immediate benefit most all of your customers from these reported...

A - Diane B. Greene {BIO 6104652 <GO>}

Yes. Well I mean, we will certainly -- yes, we honor our prices, no matter what.

Q - Mark Alan May {BIO 4280734 <GO>}

Yes, sure.

Could we -- we have some microphones I think on the audience, we wanted to definitely give (inaudible)

A - Diane B. Greene {BIO 6104652 <GO>}

Yes, I would love your questions.

Q - Mark Alan May {BIO 4280734 <GO>}

To have an opportunity. I saw a hand. Yes. You got it right there.

Q - Unidentified Participant

So I guess Walter asked you about enterprise sales force and you said you're partnering with Nutanix and someone else so I guess.

A - Diane B. Greene {BIO 6104652 <GO>}

SAP.

Q - Unidentified Participant

Yes, SAP. So I guess...

A - Diane B. Greene {BIO 6104652 <GO>}

We have more partners, we have Salesforce, Box, we have more partners and more coming.

Q - Unidentified Participant

And I think everyone recognizes your -- the amount of money you guys have spent and you guys are leaders in technology. But to Walter's point, his point is, do need an upgrade in your enterprise sales force? Let's say, two years down the road, if Google Cloud is kind of still maintaining its current trajectory, Walter will probably -- Walter and Mark will ask the same question, do you need more traditional enterprise sales force? So...

A - Diane B. Greene {BIO 6104652 <GO>}

Well I think the Cloud -- so we are hiring incredibly aggressively. Alphabet is investing in Cloud. So it's -- we're not, sort of, saying, "Oh, we're done with our sales force and they're very Googley." We are building out a serious enterprise sales force. But I would argue that Cloud demands are different approach. It's a very -- if you think about what's going on, when a company moves to the Cloud, this is something they had in-house where they run it all and now they're just building these -- assembling almost these applications and putting them in containers and we're kind of doing everything else. That's where it's going. And so we need to partner with them. And so you do need the salespeople to drive a contract and sort of project manage, if you will. But it's -- you also want a lot of technical people involved. That's what the customers need. How do they take advantage of our data analytics and machine learning? How do they transform to be a more of an agile container-based development? How do they migrate things? So -- but we are building out serious enterprise people. I think it's really -- the way I translate that is, we've become extraordinarily customer-centric. Everybody in Google Cloud is so focused on our customers. And it's what we talk about every -- and our partners, every single day and share a lot of information about what's going on with our customers and partners and that's how we're driving the business. We have our SLAs. And we track how we are doing very carefully. And I would say, we're getting some pretty high-quality people. And one advantage of the many advantages to Google Cloud, one advantage that I see is, we really don't have any trouble hiring. People really like to come to Google. So that's been very helpful.

Q - Mark Alan May {BIO 4280734 <GO>}

I think there's a question there towards the middle.

Q - Unidentified Participant

Diane, you did a good job in describing a lot of the IP that has been developed inside of Google over the last 5 or 10 years. And Kubernetes, for example, I think if that were commercial software that would probably worth the entire enterprise value of VMware at its peak.

A - Diane B. Greene {BIO 6104652 <GO>}

Yes, I sometimes say we have 80 company-sized products.

Q - Unidentified Participant

Yes. So can you just describe the decision to open source all that software and IP rather than monetize it internally? And what goes into that decision and what's the kind of the longer-term monetization opportunity for all that open source IP that's created?

A - Diane B. Greene {BIO 6104652 <GO>}

It's somewhat of a principled approach where we feel if this is -- if the benefit of this will be far greater if it runs everywhere, then it should be open sourced. And so you take a Kubernetes, it -- it's -- we're driven by creating customer value, we really are. And if Kubernetes is available to everybody to run anywhere, it really amplifies its value. And that's why Kubernetes has won. And we feel that we know how to do it better than anybody else and that's our advantage. And so -- and TensorFlow was the same way, we want to build the ecosystem, we wanted to get a huge community. But we can -- we'll continue accentuating the advantage to running it on our Cloud. But we want to make it available everywhere. So wherever there is something that is open source-able and its advantage gets hugely amplified by being available everywhere, we'll open source it.

Q - Mark Alan May {BIO 4280734 <GO>}

There's a...

A - Diane B. Greene {BIO 6104652 <GO>}

And I think this game of trying to lock people into your Cloud, we'll see. But it's not a great customer decision to do that. And as the advantages, I think, of Google Cloud become more and more apparent. And we are so open, I am seeing customers find that pretty appealing. Go ahead -- I'm sorry.

Q - Unidentified Participant

Can you talk a little bit about the decision to build hardware for machine learning? Then kind of how do you see in the future use cases that will be better run on your TPUs versus GPUs?

A - Diane B. Greene {BIO 6104652 <GO>}

Well we -- first let me just be really clear, we have a lot of GPUs in Google Cloud. And we work very well with NVIDIA. And the TPU -- so Google does an immense amount of machine learning internally as well as externally. And so for the big data machine learning, training and using the models, we saw an opportunity to build a custom chip that would give an order of magnitude performance advantage, which actually saves us a lot of money and also lets us do a better job on the machine learning because you could turn things around so quickly. Then it's natural to put it in our cloud for our users. So the really exciting thing about Google Cloud is, we now have a vehicle to take Google's, really, ongoing technical innovations and share them with the world, with every company and every geography of every size. That's

pretty exciting. And so it's a natural thing to share the TPUs and we'll also take advantage of all the innovations coming out of NVIDIA as well.

Q - Mark Alan May {BIO 4280734 <GO>}

Maybe time for one more. Go ahead, (inaudible).

Q - Unidentified Participant

Yes. Two quick questions. One, how would you compare you experience at VMware versus Google Cloud where VMware you're leading from the front and here it looks like you're coming from behind? Then second, do you think you need to make any acquisitions to accelerate your enterprise adoption?

A - Diane B. Greene {BIO 6104652 <GO>}

Yes. How do I compare being ahead at VMware to being behind in number of customers, I wouldn't say we're behind in every category. And so -- I mean, there is actually a similarity, if you think about it, because when we came out with virtualization at VMware, nobody ran it. And it was the best way to run your system. But people didn't see the value in it. And there were a lot of operating systems running native on every machine out there. So we were behind in a certain way. But we -- once we got it out there and people realized the value, we were definitely ahead. And I think in a -- you could say there's the same thing going on at Google where we have the technology that's going to really automate things for people and give them a competitive advantage and on an ongoing basis. But we're behind in terms of people saying, "okay, I'm going to be here," although it's -- I've never seen -- one thing that is different from VMware is the pace. I've never seen such a pace. And VMware was pretty rapid growth. I was there 11 years to $2 billion in revenue. And -- but -- there's a similar kind of startup feel in Google Cloud although we have immense resources and immense technology and very high-quality people. And now we've got very replicable customer deployments that go across the board in every single vertical. So I'm pretty optimistic. But it's -- I guess, I sort of -- I think competition isn't a bad thing. And in a certain way, we had competition. It was against running in the old way. So well...

Q - Mark Alan May {BIO 4280734 <GO>}

I think the second question he had on acquisitions (inaudible)

A - Diane B. Greene {BIO 6104652 <GO>}

Acquisition. Yes. We are definitely acquiring, a lot of them have been fairly small. The biggest acquisition we did was Apigee, which has worked out really well because API management is a big, big deal in the modern enterprise and how companies work across with their customers and partners. And we are constantly on the lookout for any size acquisition. We have -- we're constantly revisiting our strategy. And we will acquire if we can find a way to make them help us accelerate things. Yes.

Q - Walter H Pritchard {BIO 4672133 <GO>}

I think we've come to the end of our allotted time. But I'd like to thank Diane and the team at Alphabet.

A - Diane B. Greene {BIO 6104652 <GO>}

Okay. Well thank you very much. Okay.

Q - Mark Alan May {BIO 4280734 <GO>}

That's a real treat. Thank you, Diane.