About the Speakers

Moderator:

K Ananth Krishnan, VP and CTO, TCS

Panelists:

Tim Dombrowski, Partner, Andreessen Horowitz;
Tim Guleri, Partner, Sierra Ventures;
Mark Fernandes, Partner, Sierra Ventures;
Aaron Jacobson, Associate, NEA
Businesses have to keep abreast of new technologies, or die. New and disruptive technologies can come from anywhere. But the universe is a vast space to scan for any single company. To overcome this daunting task, TCS helps its customers to focus on the most promising new technologies with insights from its venture capital partners who make a business of understanding and promoting new technologies.

The TCS Innovation Forum – North America hosted a panel discussion with participants from leading Venture Capitalist (VC) firms such as Andreessen Horowitz, NEA and Sierra Ventures. The session was moderated by TCS CTO K Ananth Krishnan. The discussion centered on emerging trends in the technology landscape.

The latest developments in Cloud technologies, Consumerization of IT, Mobile Strategy, and Software Designed Data Centers were discussed. The panelists also outlined areas of importance in the next couple of years: Enterprise Security, Personalisation, the Empowered Customer and Mobility. The VCs pointed to promising start-up companies in each of these areas.
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1. Introduction

TCS Innovation Forum 2013 – North America, was TCS’ ninth annual Forum in North America. Held on 25th and 26th July 2013 at the Hyatt Regency in Santa Clara, Ca, USA, it had over a 100 invited participants from Venture Capitalist (VC), Emerging Technology companies, Academic Research, and TCS customer communities. The sessions were very interactive allowing participants to understand technologies from their perspective.

The VC panel discussion was moderated by TCS CTO K Ananth Krishnan. We present excerpts here:

Ananth Krishnan: Let me call on stage my panelists, Tim Dombrowski of Andreessen Horowitz. Tim is an old friend of TCS. We have spent lots of interesting hours in their office in San Francisco. Aaron Jacobson of NEA. NEA and TCS have had interactions for many, many years. We have had interesting companies come through as part of our venture networks. We have a dynamic duo from Sierra Ventures – Tim Guleri and Mark Fernandes.

Let me start with you Mark, with your views on the Cloud.

2. Developments in the Cloud

Ananth Krishnan: Enterprises clearly are looking at private clouds and public clouds going beyond infrastructure provisioning into platforms and higher levels of abstraction. Where are you seeing this headed?

Mark Fernandes: We see the following trends:

1. Service providers are going from service provisioning to virtual machines to application provisioning. (We are investing in this trend).
   
   A lot of CIOs are thinking about the public to private cloud spectrum and finding their place in between.

2. On the product side:
   
   ■ It is really easy to get started with the public cloud to do a lot of fast experimentation, try a lot of applications.
   
   ■ If the product company gets to some scale whether it is because of cost reasons or controls reasons, there are issues in moving from public clouds to a hybrid structure.

3. There is tension between CIOs, IT Operations and application developers. Application developers have traditionally been pushed off as they did not have the budget. Now they have the ability to provision their own resources, through Cloud. They want quick access to resources. I think they are becoming an important constituency for the IT group to service.
3. “Consumerization” of IT in Enterprises

_Ananth Krishnan_: Tim, the cloud is typically the back end, the plant. What is happening at the edge? What trends do you see with Consumerization of IT, the mobile, bring your own device and so on…?

_Tim Dombrowski_: User Interface that is demanded, really _demanded_ by the consumer is now into the Enterprise. Ease of use is important. It is a new phenomenon now that enterprise applications are being developed mobile first. Apps are developed for mobile platforms, smart phones, tablets, and then being ported over to the PC. GoodData is a company that creates easy to read visualization for Business Intelligence and Big Data that makes it easy for even the average history graduate to query large data sets and find interesting information. Whereas in the past it may have been quants (Quantitative Analysts) writing Pig and Hive on top of Hadoop to do this. Companies like Tableau, for example have a fantastic user interface, and is becoming the model for any user interface today in the area of Big Data.

As part of consumerization is the adoption and the sale of enterprise applications: the adoption is taking on the what we have learnt from the consumer—the freemium and premium model.

Also, viral adoption across the enterprise is taking lessons from what we do on the consumer side. Adoption might sneak in from a sale to the developer, Business unit or the CIO. These are what I see as examples of consumer influence on the enterprise.

4. Enterprise Transformations

_Ananth Krishnan_: Aaron, we have heard of the cloud (the back end) [Consumerization (the front end)]. Clearly Enterprise IT is in the middle. Are there going to be massive, and hopefully positive, transformations involved in the enterprise?

_Aaron_: Five years from now enterprises are going to use a mix of both on premise applications on private infrastructure as well as multiple public clouds. You are unlikely to rely on one public cloud. There is likely to be some kind of broker or middle-ware that might actually be in your data center which looks at the pricing and performance of different clouds and moves applications around and deliver it on the lowest cost.

The second key trend is consolidation internally within the Enterprise IT department. Given the rise of private clouds and public clouds, it doesn’t make sense to have a bunch of servers lying around in branch offices. That is going to be a rarity, than the norm.

You are also going to get lot more intelligent infrastructure. We at NEA see this as an intelligent enterprise. Infrastructure automatically scales up and down, depending on the needs of the organization. We have a company, Embrane, which more or less allows you automatically spin up virtual balancers depending on the needs of your network and application servers. Intelligent automation will play a key role in the back end, from the infrastructure, all the way down to the application layer.
Towards automation a company of ours, Lattice Engines, will crunch all your internal customer data or correlate with external customer data as well and will give leads to your sales force. They will tell your sales force who to call and when to call them. This is not full automation. I do not think we would want robots calling customers yet, but this atleast points your sales force in the right direction and helps them be more efficient.

5. Software Defined Data Centers

Ananth: Tim, I would like to talk about the other buzzword that the valley has come up with SDDC - Software Defined Data Centers.

Tim Guleri: The Valley is pretty good at coming up with acronyms! At Sierra we look at it through two macro trends:

1. The consumer is breaking away from the shackles of going to a wired desktop to get information. He/she wants information right now on whatever product and services that is interesting. Now the employee too wants the data right on whichever device he/she has. This changing expectation is putting a lot of infrastructure load on IT.

2. Inside the IT shop, nerd programmers are trying to challenge the status quo on saying “Why is that I only have the context of writing an application, why can I not get access to the infrastructure layer and beyond the infrastructure layer into the network and into the storage?” So the pressure equation is pushing down the stack and it is in this context of the customer and the employee that this acronym of SDDC is becoming relevant.

In the first generation of Internet it’s all about under-specified networks, best effort packet delivery; unleashing web and Voiceover IP. But if you looked inside the network, it was a mess. There were routers which had 20 billion lines of code that were responsible for making data decisions and routing decisions so that the control plane and the data plane were inside a single box. So no matter what innovation you did above the network and the storage layer, it would just always get stuck.

The innovation that is happening in the software defined data center space is really the rethinking of the division of labor inside this messy world of networking and storage. What you are going to see is the “death of the control plane”. Currently three planes interact: the data plane, the control plane and the human plane. What you are seeing is this universal thinking about accessibility through an API; an API can give access to the application programmers so that they can actually think through and provision networking resources and storage resources all in single application context. We are seeing the first generation of these applications merging in the datacenter.

Forward thinking CIOs are starting to experiment. They are taking a workload important to the business and thinking through what it would look like in a software defined networking stack where every layer is programmable starting with the application down. This is going to be very exciting with software defined networking because it will include security in the fabric, it will include networking, storage and the rest of the elements.

We are seeing the first boom go off with the VMWare acquiring Nicira. Recently there was a 200 million dollar acquisition by Juniper to get into the software defining networking space. CISCO has a 100 million dollar spin-in project that is also going on.
One of our favorite companies is called Arista Networks. It has a non-blocking networking fabric and separate control plane. So those will be the kind of companies I would advise you to experiment with.

**Ananth:** Would you start /transitioning to this software defined world with the core transactional systems of record kinds of applications or would you go with the newer workloads, the analytic workloads, big data workloads?

**Aaron:** The standards here are not quite settled yet. Perhaps the way to start would be to give this a couple of years. I think internally the organization needs to get really smart about through and through stack to what the future is going to hold.

**Mark:** Let me answer your question with an example. A company called Elastic Box made some interesting delveopments for a media company, Netflix. They have taken a lot of the core applications from Netflix's significant business, their DVD business. They are beginning to use SDDC architecture which Tim described. The more bleeding edge customers, the more sophisticated customers, are definitely willing to take more risk and adopt some of these technologies. But the mainstream customers are not doing that.

**Tim Guleri:** I definitely agree. It is tough for me to see the mainstream putting production applications into the Software Defined Data Center. The early adopters among service providers are still figuring out their space. It is going to take cloud service providers to figure out software to find the data server first. Once they have it, you will start to see more traction within the enterprise. Production applications can be done as public applications. I would actually encourage CIOs to look at some of the vendors which are more foreign facing on how they deliver these critical transactional applications. One of our companies WorkDay has proven that you can take something that is core as financial applications, put that in the cloud and deliver it with the same quality service as if you are running SAP on premise. You can learn a lot from their model.

### 6. Focus Areas beyond the Next Two Years

**Ananth:** What is the one big technology or trend you expect to gain importance in the next two years and beyond?

**Security**

**Tim Dombrowski:** Security. In the area of security there needs to be a new company invented for every threat that arises and there is an infinite amount of threat that in coming our way on a daily basis. We need to find a different way to protect ourselves.

There are probably two elements of it:

You can protect the individual with single sign-on identity access management. You have to protect your people accessing your systems. The company called Octa is here today looking after the identity in access management into all of your systems whether they be in the cloud or on premise.

Secondly, you trust nothing! An interesting company called Bromium takes the stand that you should be trusting nothing.
Personalization

Aaron: One trend that I am really excited about is personalization (and automation) within the enterprise. Products like Google Now tell you when you should be going for a meeting, what are the restaurants in the area that you might want to eat at and so on. Now personalization enters the enterprise. A lot of this is on the sales side. Imagine if you could have a CRM application that knows that you are at this meeting and it calls you two days later or sends you an email saying you should followup with the person you met. There are lot more exciting opportunities for personalization of applications for individual business users within the enterprise.

Empowered Customer

Tim Guleri: For me, we are just in the first inning of the empowered customer. Consumers check prices while they are in checkout lines or when looking at products. Employees at work, whether it is application developers, they want immediate resources. The empowered customer is really going to change things across all the different areas that we have looked at and I feel like we are barely scratching the surface here.

Mobility

Mark: The biggest opportunity I see is around mobile as a general theme. With the emergence of mobile, there is this whole set of workflow and engagement methodologies and new applications that are yet to be invented. I can guarantee you whether you are in C2B business or B2B business, there is opportunity for you to do it. You can be sure that your competition is doing it. I was talking to one CIO who said that they had 100 million dollar spend with SAP. They moved that SAP spend to 50, freed up 50 million dollars and that is all gone into a mobile innovation fund. That is the scale people are doing things at.

7. Conclusion

Thank you so much all panelists, Tim, Aaron, Mark and Tim. I think we have had lot of food for thought. I would like you (readers) to engage with the panelists and us at TCS, through emails on any of the technologies you may be interested in.

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1Bromium defines its services as “Bromium provides protection at the endpoint with vSentry, an innovative product that protects against all advanced malware. vSentry automatically creates hardware-isolated micro-VMs that secure every user task - such as visiting a web page, downloading a document, or opening an email attachment.” http://www.bromium.com/company.html
About TCS Innovation Forum

TCS holds this premier, by-invite-only event annually in UK, USA and Asia. It is held in the hub of innovation in each of these geographies and attracts thought leaders who are working along key innovation themes that challenge industry and society. TCS Innovation Forum 2013 had keynotes on how businesses can Optimize, Analyze and Digitize.

It had several industry based tracks on technology trends. A day was dedicated to Co-Innovation with several of TCS emerging technology partners speaking as well as exhibiting innovative solutions.

CIOs from various domains and COIN partners and senior technologists presented their hands-on experiences around these areas in their organizations.

TCS Innovation is focused on keeping customers ahead of the curve. In doing this, it believes that no one organization can do it alone. TCS’ Co-innovation Network (COIN)™ is a collaborative network, connecting several entities in the innovation ecosystem. COIN comes alive in TCS’ annual innovation forums. The format is interactive and the brainstorming sessions offer true take-aways around new technologies.

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