A Brief History of Nutanix

Lessons in Distributed Systems & Distribution

Nutant Forever

Fall 2019
Resetting the Clock

10 Years is the New Zero

Background

Nutanix will be 10 years old this September of 2019. Our first money was raised as a convertible note in December 2009. Our first employee was hired in Jan 2010. Our first VC money was raised in July 2010. The early idea of Nutanix was to bring web-scale engineering — distributed systems running on commodity servers — to the masses. A mass application in 2009-10 was VMware (compute virtualization). VMware in those days was being retrofitted into the old 3-tier architecture of:

- proprietary blade servers: expensive server chassis complexes with non-commodity backplanes being built by 3-4 branded server companies,
- niche Fiber Channel (FC) networking: expensive adapter-switch complexes with a non-commodity — FC, antithesis of Ethernet/IP — protocol to carry storage traffic from the server to the storage array, and
- mainframe-sized storage arrays: bulky refrigerator-sized systems using custom hardware built by branded storage companies

Data sat at the “hub” in a monolithic box, the FC network was the “spoke,” and stateless servers ran at the tip of the spokes.

The consumer cloud world in those days, on the other hand, was using Taiwan-class commodity servers, commodity Ethernet, and commodity Linux to build entire datacenters.
Every datacenter service was pure software running on repurposable servers. Infrastructure had become “code,” as storage or networking or security systems were being “programmed” into servers at deployment time. At the same time, this software-driven approach was running massively homogenous “million-server” scale-out applications, and operated by highly paid internal engineers.

To bring this future-proof commodity-driven approach to the enterprise required: (a) running legacy scale-up applications that ran on only a handful of large servers, and (b) designing it with an Apple-like simplicity so that application administrators could operate infrastructure without any training. The design point for us was to fool the VMware hypervisor and the application above into believing that nothing underneath had changed from the old hub-n-spoke, while everything had. Compute and storage were running as peers next to each other in the same set of servers, and the network was a commodity 10 Gigabit Ethernet (GbE) at the top of a rack. Nutanix would seed a data plane (AOS) and a control plane (Prism), two “apps” that ran next to customers’ apps, sharing the hypervisor, the commodity server, and the commodity network backplane with legacy enterprise applications. This was the birth of “hyperconvergence,” or HyperConverged Infrastructure (HCI).

The quest for an HCI killer app

*Windows is Dead, Long Live Windows*

This hyperconverged web-scale architecture still needed a mass application to prove its merits in the enterprise. The world had struggled, for almost half a decade, to try and virtualize Windows desktops, and run desktop “farms” from inside an enterprise datacenter. The end user experience was pathetic. The business user had
revolted against a disruptive PC architecture that had made every mouse click crawl — traversing the network to a server farm and back, with zero regard to quality of service, latency, and personalization. Virtual desktop Infrastructure (VDI), was “dead-on-arrival,” as one of the VCs would tell us in 2011. Citrix was faking it. VMWare had given up. Offshore contractors hated the experience to the core. And by and large, analysts had written off Windows, now that iOS and Android were the shiny objects that promised to revolutionize mobility within the enterprise. Pundits had surmised that most enterprise apps would be rewritten to a touch interface of Apple and Google, leaving Windows far behind as the new legacy.

At Nutanix, we took a contrarian approach to bet on VDI as the first killer app for our proposed computing architecture within the datacenter. We asserted that enterprise applications do not get rewritten so quickly. As more iOS and Android replaced Windows at the “edge,” Windows itself would be forced to move to the “cloud.” Delivered right, the Windows desktop would flourish in the datacenter (!), especially in verticals such as services, retail, manufacturing, education, and... a post-Snowden Federal. Agencies had begun to mandate that no computer or peripherals would leave their premises, once the federal worker left for the day. Security alone would drive VDI deep within US Federal. And universal access — between home and office, between multiple devices — would become a key driver within the enterprise. Almost 80% of our first $100 million was VDI, and almost 80% of that 80% was from US Federal!

VDI as a workload was too mission critical for a startup to touch as the first workload. Entire front offices would be rendered useless, were they not to have access to even a browser at the workplace. That's how important reliability and
performance were to Nutanix in the early days. VDI made us an honest company during the formative years, with such an emphasis on uptime, customer experience, and customer service.

Crossing the early chasm would not have been possible without Windows... and Federal.

**The first killer vertical: Federal**

VDI was a contrarian idea for us to survive, but it wasn’t the only one. Being able to survive and thrive with Federal customers in the first 4 years of our go-to-market was equally contrarian. Our first large 8-figure deal was with a Federal agency that nudged us to port our data plane and control plane to run outside of VMware, onto an open-source hypervisor called KVM. Our architecture was hypervisor-agnostic on paper, but that portability would be tested for the first time with this Federal agency. By the end of 2013, we had our first “design win” with open source virtualization, with a customer who refused to spend millions on VMware. The open source experience was clunky and fragile, as Red Hat (RHT) had spent no time thinking about usability, performance, storage, networking, and enterprise-grade reliability. RHT had left a vacuum that we were able to experience first-hand with this federal customer. This customer would also be our first large non-VDI account, where the emphasis was big data and high end performance. They made us work very closely with a company called FusionIO, to bring PCIe-based SSDs to enterprise virtualization workloads.

Flash SSD technology on the server would eschew us from building any proprietary hardware for storage performance. Compute-side flash was a phenomenon popular

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1 More on this later, on how AHV was born
with web-scale companies building low-latency web search applications. Nutanix became the first company to bring server-side flash to the masses running virtualization and legacy enterprise applications. And we ran it inside a unique hyperscale form factor where 4 nodes/servers (4n) resided in a chassis sized 2 rack units (2u). A 2u-4n form factor was built for web farms in consumer clouds, but it also happened to be a perfect form for VDI: 8 sockets of Intel in a 2u, compute-and-memory heavy, and extremely compact for hundreds of Windows desktops even for remote offices.

We sold to hundreds of Federal agencies over time. Federal used to be 30-40% of our business in the early days, and they made us think hard about applications beyond VDI. Federal indeed became the largest vertical for Nutanix between 2012 and 2016.

**Keeping Pace with Moore’s Law**

*The Sandy Bridge Transition (2013): Pivot, Pivot, Micro-Pivot*

PCIe-based flash-on-the-server was a bleeding-edge call that almost killed the company in early 2013, because of the physical limitations of a hyperscale form factor. The move to Sandy Bridge in early 2013 made SuperMicro unviable for us, as they did not have a chassis deep enough to accommodate both a PCIe flash (fast storage) and a 10 GbE NIC (fast network) at the same time. The 2u-4n hyperscale form factor was suddenly the biggest roadblock to our software innovation. We tried moving to Quanta, but within a few months, had to stop-ship because of Quanta’s infant mortality concerns. Luckily, for us, SATA-based SSDs were introduced by Intel just then. The new flash packaging looked just like the old spinning rust (spindles). We were back in business with SuperMicro. The company survived. We resumed shipping a couple of months later. Our first $10M quarter was possible because of these simple micro-pivots.

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2 The burden of responsibility in infrastructure
Moving at the speed of Intel: Not being a Sun Microsystems

We were a server-side company, “owning the compute.” Applications ran “inside” Nutanix. We had to run fast at the speed of Moore’s Law, both in compute (Intel x86) and in storage (silicon-based flash). Back in the day, Sun used to be ultra-slow in its refresh cycles, i.e., could never keep pace with Intel (read: Microsoft and Linux) and commodity peripherals, and that’s what killed Sun. Solaris just moved way slower than the industry when it came to cutting-edge CPU, memory, network, and storage design. Owning compute made it imperative for us to really think hard about platform flexibility, sizing and configurability, and quote-to-cash commerce. We embraced a Dell-like “configure-to-order” business model, and it wasn’t easy, to say the least. We really had to transform the business away from the “any-color-so-long-as-its-black” 2u-4n form factor, which many in the industry found synonymous with HCI. HCI indeed equated to 2u4n back in the day. We had to bust that myth that in this new architecture, you could never scale capacity (storage: spindles and flash) and performance (CPU and RAM) independent of each other.

From capacity planning and sizing to building highly configurable clusters for various workloads to creating a seamless quoting experience, Nutanix went through a lot in 2013 and 2014. We were a new company by mid-2014, because we were paranoid about becoming irrelevant like Sun. We also evolved by thinking like a cloud company, respecting the hardware-software boundary: hardware quality, ops (supply chain), and software quality with commodity off-the-shelf hardware.

The Ivy Bridge transition

Speaking of the hardware-software boundary, we were tested yet again during the Ivy Bridge transition, which were called Generation 4 (G4) servers. The first half of 2015 was one of our hardest product execution challenges for an at-scale business with $75MM quarters, with almost $500MM of an installed base. And by now, we had Fidelity and Wellington as our new institutional investors who had recently put in $150MM of fresh cash into the company. Expectations for a “pre-IPO” company were extremely high.
Our new G4 servers were locking up randomly at many of our customer sites, and we struggled for months to figure out why. Our largest customers were facing real downtime issues during this transition. We were almost kicked out of some of our accounts because we just couldn’t get to the bottom of this intractable platform problem. It took us six months to debug the moving parts of Intel, Intel’s peripherals (LSI in particular), and of course VMware software versions. Finally, before it was too late, we learned that the LSI firmware had a critical bug, and our version of that firmware had to be upgraded to the latest and the greatest. Suddenly, we realized that upgrades of “everything that moved” mattered more to us than anything else for enterprise quality. The burden of responsibility of managing the lifecycle of every software, firmware, and hardware was on Nutanix. We were slowly but surely getting into a (private) cloud business. Packaging, supporting, shipping, and managing the entire hardware-software experience was mundane but a hard requirement from the market. Ops was critical in this business.

1-Click Upgrades

*The killer IT workflow that made Infrastructure Invisible*

Our customers wanted a seamless cloud-like experience from HCI. Uptime was paramount. Infrastructure upgrades had to be invisible. Cluster workflows — growing, shrinking, splitting, and provisioning — had to be as simple as operating an iOS device. The bar had to be raised within what we thought was the early seed of a private cloud. OpenStack as an open source movement to create private clouds was failing miserably because of Red Hat’s inability to think about elegant consumer-grade experience: design, simplicity, and
invisible hardware. HCI was emerging, and Nutanix was defining what it meant to blend web-scale engineering with consumer-grade design. Our 1-click focus for all IT workflows made us stand out, as we emphasized experience over things. There were tons of “things” in a datacenter that IT grappled to keep its arms around — servers, storage, networks, security, hypervisors — and all the software and firmware that needed to be kept up-to-date for operations to be run smoothly and securely. We had discovered our passion for “experience” in 1-click-everything. HCI was in business. VMware was watching from a distance, as it had it hedged its bets between two worlds: the old 3-tier world and the new HCI world.

**VMware: A paradoxical relationship that shaped our character**

Just as Microsoft was building apps in the ‘80s on top of Apple, we were building “apps” — a data plane app called AOS and a control plane app called Prism — on top of VMware (ESXi) hypervisor. In 2013-14, we had also ported these apps to run on Microsoft Windows (Hyper-v) for the commercial mid-market. But by and large, our business was 90% VMware ESXi. We were at the “mercy” of VMware, as they owned the platform. We were happy building apps on top of that platform for the first 4 years of our existence. But then things started to turn downhill in 2014, as VMware was searching for growth beyond its core business of (compute) virtualization.

In the 5 years before 2014, VMware had a “scorch the earth” policy of selling ELAs with perpetual licenses to all enterprises. Growth meant looking for new
channels, both on the GTM side, and on the datacenter software\(^3\) side. They argued that we resell their software, which was an oxymoron for us, as we were a 60% gross margin business. We just happened to sell whitebox servers, because customers wanted us to make the whole experience invisible. But VMware wouldn’t budge, as they insisted on treating us like a hardware OEM. While this might have been the ostensible reason for the hostility, the deeper reason was perhaps connected to the software ambition that both companies had in storage. We were a storage virtualization company sitting on the server. They were an OS virtualization company sitting on the server, with a newfound ambition to get deeper into storage virtualization. vSAN, their first salvo in this business, was directly at loggerheads with our **Data DNA**.

The platform company was building a new “bundled” app. The app company was at risk of being made irrelevant. Owning the platform was the only way to save the app company. And we aren’t just talking about Microsoft of the late 80s here. History repeated itself in 2014 with Nutanix. AHV was born. We were in the compute virtualization business.

\(^3\) Branching into storage and network virtualization
As I mentioned before, one of our largest customers, a Federal agency, had nudged us back in 2013 to port our core software to open source Linux KVM. KVM was emerging as the hypervisor of choice at Google, both for their internal operations
and for their GCP cloud platform. Linux innovation was at its fastest pace in the
decade before that, because of the consumer cloud companies and Intel throwing
their money and weight behind open source infrastructure.

KVM, though, in its erstwhile 2014 form, was a toy compared to VMware ESXi.
There was little to no focus on usability\textsuperscript{4}, storage, networking, security, and overall
quality of the virtualization software. OpenStack was a disaster, and the enterprise
was quickly realizing that open source for the sake of open source was not a sound
build-vs-buy decision to save costs. That was the AHV opportunity: KVM done
right.

We brought enterprise storage, security, performance, APIs, and availability capabilities via AHV and its
consumer-grade 1-click experience. Linux became the foundation for Nutanix. Fusing open source with our
Design DNA was intoxicating. Crowdsourcing from upstream — sharing innovation from and with cloud
titans and running “at the speed of open source” — and blending it with careful enterprise-grade product
management was a clear competitive advantage for Nutanix. VMware, the legacy platform, wistfully wanted Linux. The Innovator’s
Dilemma wouldn’t let them have it, given their proprietary innovation of 15 years.
They applied the ostrich-in-the-sand strategy to all future innovation: bury all new
products deeper into their legacy platform, tie it all together with a closed-source
approach, and shun openness and accessibility (APIs).

**Openness and Freedom of Choice: The Multi-Everything\textsuperscript{5} Company**

Back in 2015, I had written a blog called Building Things That People Like. It was
about platform companies and app companies. And how when a company builds

\textsuperscript{4} IT infrastructure workflows, “Day-0” and “Day-2” operations

\textsuperscript{5} Multi-hypervisor (2012-2016), multi-server (2014-2019), ... and multi-cloud (2018-now)
both, they’ve to stay vulnerable in the interest of the market forces — how their apps need to run on everyone’s platform, including their own; and conversely, their platform should run everyone’s apps, not just their own. Very early on, when we were still only building “apps,” we made a decision to build our core software — AOS and Prism — to run on all platforms (hypervisors). Prism managed all hypervisors. AOS managed storage underneath every hypervisor. Then, ever since we built AHV in our pursuit to become a platform company, we have strived to run everyone’s apps.

*From Appliance to OEMs: Competing with Ourselves*

In 2014, we were still an HCI company with an appliance business model. Pundits and industry watchers perceived HCI to be a hardware play. They weren’t to blame. While the public cloud ease-of-use was playing out in the first half of this last decade, HCI’s ease-of-use was playing out in the appliance form factor. If anything, we had argued for making infrastructure invisible by subsuming all IT infrastructure, support, logistics, and procurement requirements under one umbrella of HCI. That *was* the thesis of private cloud in the early years. At the same time, we also had to grow the surface area of HCI. Our powerful software wasn’t just built for the appliances we shipped and supported. We had to open up our software to other server vendors. HCI had to become an operating system play. At the same time, ops — monitoring, supportability, serviceability — had to continue to remain the king.

The paradox of simplicity and choice defined the next 5 years of HCI. While we continued to ship appliances and stay a 60% gross margin business, we also started to give our software to other server OEMs — starting with Dell, then with Lenovo, and over time with others. Along the way, we learned to compete with ourselves, comfortable cannibalizing our own top line for a better tomorrow. Nutanix, a multi-hypervisor product, was gradually becoming a multi-server software business. HCI was becoming a cloud “operating system.” Our **Delivery DNA** was going to be tested to the hilt.
Customer Support: Empathy is the Only Constant

Speaking of delivery, we were deeply committed to customer support from day one. SREs — System Reliability Engineers — were the heroes that quietly innovated with customer empathy, digital assets (support portal, telemetry), and global delivery. Support was never a cost center for us, always a “profit center.” As we delivered our software through various platforms, embracing choice, we had to compensate for that with knowledgeable and gritty people and robust processes. Our NPS became one of our biggest differentiators in the industry, as we hustled hard to complement our tech with our services. Professional Services became an important piece of the delivery puzzle over time, especially as we started to deliver software-only form factors to the enterprise.

Software Only Delivery: Change is the Only Constant

In September of 2017, we announced to the world that we will shed all our hardware revenue and associated top line bookings and billings in the future. This was a clean way to provide clarity to our sellers, so they could become neutral to our appliance route-to-market and routes through other server OEMs. This didn’t necessarily mean that we abandoned the beloved appliance form factor that enough customers doted on because of its elegant (unified) support model. All it meant that our channel would split the economics between software and hardware through an indirect transaction between us and the customer. Of course, there were real advantages to going all software, bereft of the appliance packaging:
Hardware depreciates over time. Software appreciates over time. Our customers should buy less of the former upfront, and more of the latter upfront with volume discounting (ELAs, EPAs).

Pure software entitlements would be portable for customers, so they can commoditize their server hardware even further.

Software readies the company for subscription transition in the future. The company needed to think ahead, as clouds appeared on the horizon.

This transition to a multi-server software-only pricing and packaging was not an easy feat for the company. From sizing to quoting and configuring to cash to revenue, everything had to change — akin to changing the wings of a plane flying at 35,000 ft. Most importantly, sales and marketing culture, channel behavior, and alliance partners’ attitudes had to be changed with zero downtime to Main Street and Wall Street. Nutanix had to be reinvented one more time.

Core, Essentials, Enterprise: Maslow’s Hierarchy of Platform and Apps

Going from AOS and Prism to AOS, Prism, and AHV was reinventing ourselves as a platform company for the first time. The next step was to “tinker” with some apps that could then “drag the platform” invisibly — both in customer experience and in monetization. We seeded Nutanix Files and Flow to wrap the Core platform into higher-level consumption of user files and network micro-segmentation apps. And Prism Pro to wrap Prism for enterprise operations management. And now in the last year, the Frame app to drag Core platform for hybrid Desktop-aaS, Era to drag Core for Database-aaS, IoT to drag Core and blur IT and OT at the edge/ROBO, and so on.
Each of these products is a 5-10 year journey, so they needed to be seeded at just the right time. Not sure whether we timed them all perfectly, but the stream of consciousness has emerged to ensure they are seamless for our customers, our sellers, and our partners. Start with Core (Modernize Your Infrastructure). Graduate to Essentials (Build Your Private Cloud). Self-Actualize with Enterprise (Delight Your Developers and IT Ops with Multi-Cloud).

**Coopetition: Competing with Ourselves, Frenemies, and Enemies**

Our server OEM partners have always been conflicted partnering with us. After all, they all have legacy 3-tier businesses to protect. Internally, we ourselves have grappled with channel conflicts and seller compensation, trying to fulfill both the appliance and the OEM form factors. Our business used to be a blend of the appliance gross margin and pure software margins. And by 2017-18, VMware and we were on a direct collision path after Dell acquired EMC (and by corollary, VMware). It has been a pretty complex labyrinth of relationships. Our largest OEM partner, Dell, although never more than 10% of our business, owns both EMC and VMware. We, on the other hand, have been attacking both the SAN and the vTax with our messaging. This creative conflict, though, is the tip of the iceberg.

Nutanix and VMware have emerged as the only two full-stack software companies in the enterprise cloud. The IT landscape is now a complex (quantum!) entanglement that has put both these companies at a crosshair with legacy hardware companies and at crossroads with emerging cloud players. Here is an illustration:

- VMware cannibalizing Dell EMC’s 3-tier storage products
- VMware competing with Cisco on networking,
which in turn has increased its rhetoric against VMware with its own hardware-based networking and security products

* Cisco hurting because of VMware, but refusing to touch Nutanix because of its awful memories of propping VMware, a veritable Frankenstein created a decade ago. Back in the day, Cisco had invested hundreds of engineers and hundreds of millions of dollars to help VMware build its software-based networking stack, only to realize a few years later that software companies bite the (hardware) hand that fed them

* HPE and other server OEMs hurting because of Dell and VMware coming together, as Dell pursues its $2 billion “synergies.” Synergies are a euphemism for replacing every non-Dell hardware under VMware’s global installed base

* HPE now partnering with us, despite having assets that directly compete with us. It’s the realization that enterprise cloud is now a full-stack operating systems play, one in which only two software companies operate

* VMware now gradually becoming a single-server OS company, like Solaris, as Dell sneaks more of its servers underneath VMware

* And finally, the public cloud players now realizing that the enterprise computing landscape would be more hybrid than they imagined

This last observation on the intersection between public cloud and private cloud is what makes for a very interesting multi-cloud delivery journey for Nutanix.

Multi-Cloud and Hybrid Cloud: More than just Cloud-Washing

As software-defined infrastructure (SDI) — the older name for HCI — becomes more prevalent, infrastructure essentially becomes “code.” This means that entire datacenters, not just software applications, become “teleportable” from one location to another. This includes compute, storage, networking, security, identity, and everything else that defines an application. Computing is moving to an era in which an entire cloud can be “virtualized” by moving a running app from one
destination to another. That is basically what the coming decade will define: cloud virtualization.

*Virtualization enables “Firing Your Supplier”*

The first wave of server virtualization, more than a decade ago, made it possible to move a running application from one x86 server to another. Before that time, x86 servers were a “pet” that commanded a Gartner Magic Quadrant and CIO strategy sessions. Virtualization turned enterprise servers into “cattle,” just as the cloud titans were treating servers as cattle in their datacenters. Virtualization helped decouple the hardware from software, and enabled customers to “fire” their server supplier with zero downtime or disruption.

Over time, consumer cloud companies virtualized storage, networks, and security devices into pure software, running all elements of the datacenter infrastructure on this cattle-class server. Virtualization also introduced “Storage vMotion,” a powerful IT workflow that made it possible to move all data from one legacy storage array into another, with zero downtime. Mobility of data and compute made it possible to fire a storage and a server supplier on-the-fly, without any downtime.

*Mobility will be the killer app of the multi-cloud world.*

**Keep Calm and Think Apps vs. Platform**

The last decade has proven time and time again on how we’ve been comfortable competing with ourselves, if that meant growing our total addressable market in the long term. We’ve been comfortable waging a war on behalf of the underserved customer, making the insurgent in us fight the smug incumbent within. It’s an extremely schizophrenic state of being, but one that keeps us subservient to the customer and the market forces at large.

In mid 2018, we seeded Nutanix Calm, our orchestration and automation product, to make Day-0 provisioning in multiple clouds extremely simple. In 2019 and 2020,
we will be working hard to make Day-2 migrations and lifecycle management (upgrades, scale-out) autonomous in multiple clouds. There is a ton of work here, in how Calm morphs into a Nutanix Central console from where one can launch any service on to any cloud, private or public, Nutanix or non-Nutanix. This would be one big step towards virtualizing the “VPC” experience of monotheistic cloud providers. Nutanix Central would be the VPC-of-VPCs, a Virtual Hybrid Cloud (VHC) that provides a “Virtual Reality” to operate in all clouds simultaneously. And by all clouds, I mean private as well... and Xi.

**Xi: X-to-the-power-of-invisible**

Once we converted to a software company, it was imperative we started thinking about “streaming ourselves” over the Internet — not just Nutanix Core, but all of Essentials and Enterprise. All services that are streamed over
the web as a public cloud service are called Xi services. Some of them are pure SaaS apps such as Xi Frame, while others are IaaS services such as Xi Leap and Xi Clusters.

**Xi Clusters: Pivot, Pivot, Micro-Pivot**

At Anaheim .NEXT 2019, we introduced the concept of running our Core software on AWS Bare Metal Instances, an organic and immersive cloud experience: on Amazon's native server fleet, in their native networks, and with their native identity and billing. This work over the last several quarters has been a serendipity of sorts. We are now thinking of bare metal as the new “hypervisor,” so all our Xi code can be location-agnostic, i.e., the same abstractions work in AWS, Azure and GCP in the future, and also in Xi DCs operated by us or by our Service Provider partners. The SP partner program, the Xi Partner Network, is about copying the Uber business model in the world of computing: how we create a network of suppliers and consumers, where the consumer has a single identity, billing, payments, and the right to choose a supplier in real time with a unified experience globally.

*Cloud will become about software this decade. The next cloud company better be asset-lite.*

**Software Journey Contd.: Subscription On-Prem**

No cloud OS can be hybrid without providing some form of subscription on both sides of the hybrid divide. Then entitlements can be portable, pricing can be unified in a single rate card, and credits can be fungible. Subscription also makes it possible to separate new sales (and upsell-cross-sell) from renewals, thus paving the way for the final frontier in sales segmentation — hunting for new accounts or new products in existing accounts vs. farming renewals.

In the first phase of this transformation, we are aiming for 1-year or multi-year term-based subscription for Core and Essentials, or monthly/quarterly terms for Enterprise Xi services. To make this transition possible, we had to move away from...
model-based appliance-driven pricing of our software to a simplified compute-and-flash aggregated pricing model for Core. In the near future, we will do the same for other products in Essentials and Enterprise as well. Much work remains.
Scribbles on The Future: year xi & beyond

“The More Things Change, The More They Remain The Same”

On-Prem is Dead. Long Live On-Prem

A ton of work in the private cloud, although with an eye on hybrid (where the puck is headed). So here are the things we need to get right at the high level:
* Master the Core transformation at the customer first (Why-How-What). Then take them through the Essentials-Enterprise journey.
* Complete term-based subscription transition in a year. Then plan for sales segmentation
* Publish new business results by ACV/ARR/QRR/churn
* Improve Core product in first half of FY20: for very large enterprises. See details in Appendix
* Define and execute on US Commercial mid-market GTM 2.0, including with HPE
* Define Global SIs and SPs GTM 2.0, including with XPN
* Break the “Series C” (growth stage) barrier for some Essentials and Enterprise products

**The New “Hypervisor” in Multi-Cloud**

Bare Metal is the least common denominator, the consensus for AHV, across all multi-cloud locations of the enterprise. Cloud Bare Metal is the new hypervisor for us. AWS is the new “VMware” for us. Azure is the new “Hyper-v”. And Xi with SPs and our DCs is the new “AHV.”

We need to harmonize Xi Clusters with the rest of Xi (SPs and DCs) for better leverage and code reuse. We need to apply all the lessons learned from the multi-hypervisor abstractions of the last 10 years. No good company should repeat the same mistake twice. We’ve had our fair share of multi-hypervisor design flaws last decade. We’ve to think hard about common Bare Metal, SDN (VPCs), billing, and identity abstractions for multi-cloud to be beyond just a buzzword.

**The Quest for the Killer App(s) in Hybrid Cloud Infrastructure (HCI 2.0)**

We’ve powerful products in Core-Essentials-Enterprise to get hybrid right. With Core bolstered, here are some things to get our hybrid strategy illustrated in 2020:

* Bursting into AWS via Xi Clusters during a peak business load
- Xi Leap, both in our DCs and via SPs, but via a smaller Xi (BonXi) form factor
- Desktops, SQL Databases, and Unstructured Data (Files, Objects) done right in private cloud. Windows, SQL, and NFS were supposed to be dead this last decade. They’re alive and kicking like never before.

The key questions we’d need to answer in this decade — for which we’ll need to think deep with design and product management — would be:

1. How does the private cloud truly compete for predictable workloads with a consumer-grade IaaS and open-source-driven PaaS?
2. How do we build a true PaaS offering with Calm app store partners?
3. How do we monetize our Core products on things other than per-node pricing, in case the Bare Metal offerings of the public cloud are expensive on a 3-year basis? Probably charge for per-Gb replication over hybrid, or other such cross-cloud capabilities?
4. How does one think of services on a 3rd party public cloud platform? What capabilities of the service would customers pay for, more than taking pure software portably from on-prem to off-prem?

5. If we lose some of the AOS and AHV platform sheen — because of EBS or EC2 — how do we make up for it by making money on hybrid capabilities?

6. How do we build the world’s best hybrid capabilities, which are truly delightful and worth paying for?

7. What are the vMotion and Storage vMotion capabilities of the coming decade, distributed systems mechanisms that would truly virtualize the cloud?

8. While the hardware markets were large — servers ($55BB), storage ($30BB), networking ($25BB) — customers paid for virtualization software because the notion of “drag-n-drop” of a running application was powerful. How does one virtualize with software yet again, while thinking of the public cloud as the new “hardware”?

To sum it up, I’d say we’re in very early stages of this multi-cloud journey. Today feels like 2010, with the only difference being that we don’t have to raise money anymore. Our customers are our new “investors.” We need to dream on behalf of them, and with them.

We need to learn distributed systems and distribution one more time with them!

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6 After all, software didn’t have to compete with hardware, if anything it commoditized hardware.
Appendix

The burden of 1-click proof in 2019: how upgrades to the full-stack is now a much different bar than in 2012, when we had simple apps, AOS and Prism, to upgrade.

Product roadmap in FY2020:
- Make Upgrades 10x faster. Make Prism Central 10x more scalable. Bring parity to AHV vis-à-vis vSphere and more. All improvements get reused in Xi
- Decouple engineering and releases of all products, focusing intently on developer and QA productivity
- Make Google Test Drive pervasive across all functions of the company: test-n-dev, presales, education, alliance engineering, etc.
- Integrate Flow-Epoch-Beam for network security compliance
- Integrate Prism-Files-Objects-Era-Beam for data security compliance
- Launch Nutanix Central, i.e., Calm and My Nutanix 2.0, for a unified Nutanix experience
- Abstract BMaaS and Xi Networking from Xi so that all forms of Nutanix digital — Xi DCs, Xi Partner (SPs) DCs, AWS, et al. — share common code
- Internalize Xi Clusters pricing, packaging, and a potential SaaS model, a la Frame (for desktops)
- Bring Essentials and Enterprise products to a combined $150-200MM TCV