



Hybrid Computers and Cloud Computing:

**The path that leads
to clouds for payments vendor,
OmniPayments**

Richard Buckle

Founder and CEO

Pyalla Technologies, LLC

About the Author

Richard Buckle is the founder and CEO of Pyalla Technologies, LLC. He has enjoyed a long association with the IT industry as a user, vendor, and more recently, as an industry commentator. Richard has over 25 years of research experience with HP's NonStop platform, including eight years working at Tandem Computers, followed by just as many years at InSession Inc. and ACI Worldwide, as well as four years at Golden Gate, now a part of Oracle.

Well known to the user communities of HP and IBM, Richard served as a Director of ITUG (2000-2006), as its Chairman (2004-2005), and as the Director of Marketing of the IBM user group, SHARE, (2007-2008). Richard provides industry commentary and opinions through his community blog as well as through his industry association and vendor blogs, web publications and eNewsletters. You can follow him at www.itug-connection.blogspot.com and at ATMmarketplace.com as well read his editorial, Musings on NonStop, published monthly in Tandemworld.net

Taking a path into the clouds!

Cloud computing changing perceptions of software delivery

Considering just how much attention cloud computing has attracted of late, it's not a surprise to find most enterprises experiencing difficulties about just what to do with clouds and where to go for help. At a time when so many of these enterprises, particularly in the Financial Services (FS) marketplace, are under strict orders to protect individuals' personal and financial information and to be fully cognizant of just where in the world company business logic resides other forces are at work praising the virtues of cloud computing. For these evangelists, nothing highlights legacy systems more acutely than when they are found to be incapable of running from within a cloud.

“The idea of computation being delivered as a public utility, similar to the service bureaus which date back to the sixties,” a reference to the cloud concept by American computer scientist, John McCarthy, and published in the article *A history of cloud computing* by computer publisher, ComputerWeekly in March 2009. “Since the sixties, cloud computing has developed along a number of lines, with Web 2.0 being the most recent evolution,” ComputerWeekly observed before adding, “since the internet only started to offer significant bandwidth in the nineties, cloud computing for the masses has been something of a late developer.” Of more interest to FIs was the first milestone in cloud computing that came, according to ComputerWeekly, with “the arrival of Salesforce.com in 1999, which pioneered the concept of delivering enterprise applications via a simple website.”

Of course, an even bigger catalyst pushing cloud computing even higher in the minds of Chief Information Officers (CIOs), suggested ComputerWeekly, “was Amazon Web Services in 2002, which provided a suite of cloud-based services including storage, computation and even human intelligence.” For the CIOs of FIs, cloud computing has quickly evolved to where it provides flexible resources at a greatly reduced price even as it allows them to tap software resources that otherwise would be prohibitively expensive for all but the very largest FI. This too was captured by ComputerWeekly as they noted,

Taking a path into the clouds!

“Many IT professionals recognize the benefits cloud computing offers in terms of increased storage, flexibility and cost reduction,’ said Songnian Zhou, chief executive officer of Platform Computing. But he added that IT directors still have concerns about

“Based on their forecast for 2011-2017, Gartner expects adoption to hit \$250 billion by 2017 ... increasingly relying on cloud to develop, market and sell products, manage supply chains and more.”

*Thoughts on Clouds – cloud computing
conversations led by IBMers
May 22, 2014*

the security of their corporate data in the cloud. This means that it will be 2010 at the earliest before cloud adoption sees increased growth.”

The industry has moved well beyond 2010 and whereas expectations were for a rapid adoption, among the Global 1000 enterprises caution prevailed and for the most part, it’s been a process of incremental adoption with little more than “baby steps” being taken. It wasn’t all that long ago when in May 22, 2014, IBM posted *Thoughts on Clouds – cloud computing conversations led by IBMers* that looked at [The future of cloud](#)

[computing: 5 predictions](#). In this post, they reference recent findings by industry analysts at Gartner, noting how, “Based on their forecast for 2011-2017, Gartner expects adoption to hit \$250 billion by 2017. In the fourth quarter of 2013, we saw this prediction supported by enterprises worldwide—enterprises that were increasingly relying on cloud to develop, market and sell products, manage supply chains and more.” More revealing perhaps was the insight into just how enterprises may make the transition to cloud computing, as “Gartner proposes that 50 percent of enterprises will have hybrid clouds by 2017. As we see more and more companies adopt cloud, we see CIOs crafting well-thought-out strategies that include cloud. However, pure cloud implementations are the exception and not the rule. And this is to be expected.”

For solutions vendor, OmniPayments, Inc. this doesn’t come as a surprise at all and for its CEO, Yash Kapadia, it’s been a theme in recent quotes he has provided in numerous publications as well as in blog postings. “It really is all about hybrids, when you get right

Taking a path into the clouds!

down to it,” acknowledged Yash. “Hybrid computers let me build a solution around components that offer different price points to perform functions better optimized for their architecture – why would you ever want to run heavily-threaded Java routines better suited to SMP architectures that support your operator dashboards on a shared-nothing, MPP architecture as we have with NonStop. Add a Linux server, hook them together with a high-speed LAN connection (or two), and the resultant hybrid computer is better positioned to meet the needs of financial institutions.”

However, Yash doesn’t end with just this observation. In an interview Yash provided for the post of August 31, 2013, [***The new transformed NonStop; brash, and in your face!***](#) to the NonStop community blog, Real Time View, he said, “don’t rule out OmniPayments combining features that might be on NonStop in part or in whole with OmniPayments features that may be in the Cloud ... offering an alternative solution using Cloud computing instead of on Linux and yet, overseeing it all from an OmniPayments presence on NonStop, is consistent with how we will be working with customers to keep our solutions attractively priced”. Hey!

FIs have relied upon HP NonStop systems for decades with the bulk of credit and debit card processing passing through at least one NonStop system. As the perception of just where and how cloud computing will help even these most critical of applications, adding flexibility, while potentially reducing costs, develops traction among CIOs, choice of solutions providers will become even more important and with the commitments already given in support of both hybrid and cloud computing, the first stumbling baby steps many of these CIOs will make will be in lock-step with the deliverables now coming to market from OmniPayments.

The technology two-step; hybrids and clouds!

There is a clear difference between hybrid computing and hybrid clouds. To some, the difference isn’t all that perceptible but within this paper, hybrid computing is any mix of

Taking a path into the clouds!

platforms including clouds whereas hybrid clouds typically involve a mix of private and public clouds. In a special report by Gartner, [*Hybrid Cloud: Driving the Shift from IT Control to IT Coordination*](#) one of the few free reports from Gartner I have run across of late, they define hybrid clouds as representing, “one of the primary realities of the cloud world: no cloud service stands alone. Cloud computing comes in several forms: public, private and hybrid.” Nevertheless, a hybrid computer can be assembled by any vendor without any reference to or association with cloud computing. Moreover, whereas early renditions of hybrid computers involved the mixing of analogue and digital computers, this too is not a focus of this paper. What is important is the recognition that a hybrid computer created from the union of two or more different computer systems is often the launch pad for hybrid clouds enterprises aspire to – an initial baby step along the journey to cloud computing.

Randy Meyer, HP Vice President & General Manager, Mission Critical Systems, the group within HP where NonStop systems are present (as part of the Integrity server portfolio), talked about the megatrends of *Big Data, Hybrid Computing and Clouds*. In a presentation to the user community late in 2013, Meyer made a clear distinction between hybrid and cloud computing. For the NonStop community, this wasn't done accidentally but rather, reinforces the move to clouds as a journey even as it recognizes that among NonStop users, simply adding just one other platform is a challenge – how will moving functionality off NonStop impact overall application availability? As a company dedicated to smoothing any technology transformation so calling out hybrid computers in this fashion, separating it from cloud computing even as it includes both in its message of megatrends, was a deliberate move on the part of HP.

“One of the primary realities of the cloud world: no cloud service stands alone. Cloud computing comes in several forms: public, private and hybrid.”

Hybrid Cloud: Driving the Shift from
IT Control to IT Coordination
Gartner

For the FI enterprise, where the balance between costs, flexibility and customer service is

Taking a path into the clouds!

an ongoing battle, any move that helps cut costs while preserving flexibility and enriching the customer experience is welcomed and the concept of deploying just a single homogeneous system is an anachronism and a relic from the earliest of times within IT. The success experienced by the very first Tandem computers as it interfaced a network of ATMs to an IBM mainframe was among the earliest examples of working hybrid computers even if the computer systems involved were both digital computers. However, as legitimate an example of hybrid computers as they were (and existing even to this day), very few CIOs perceived the likely broader acceptance IT would have of future hybrid computers where open systems such as Linux or Windows would happily coexist with more robust platforms such as NonStop. This acceptance can all be traced back to costs and the ease with which NonStop systems can be deployed as part of a hybrid computer bodes well for even broader acceptance among CIOs where mission-critical applications still find the fundamentals of NonStop systems beneficial.

“It is still very much about costs,” said Yash. “There’s no simple way to say this other than with NonStop prices becoming more affordable, there’s less inclination to respond to prospect requests with anything other than NonStop.” In commentary provided for the April 2014 *Musings on NonStop*, published in the eNewsletter Tandemworld, Yash explained too that even as “costs remain a concern for any vendor developing solutions for NonStop there’s other considerations as well, particularly for those vendors looking to embrace modern frameworks and technologies.” Explaining this further, Yash then said, “Perhaps the most important consideration of all is to leverage the best platform for the right function, a circumstance that is often overlooked. When it comes to OmniPayments, we have embraced hybrid computers for some time after we turned to Linux platforms in support of our operational dashboards. Our decision to rely on Java for implementing these dashboards made the choice of Linux easy. When it comes to transaction processing, and even the BI and Analytics that follows, we ensure these are well supported by NonStop systems and our choice of C/C++ as the development language made this choice just as easy for us.”

Taking a path into the clouds!

Very early on with the development of OmniPayments suite of products, the prospect of embracing a hybrid architecture offered considerable pricing advantages for OmniPayments customers and this didn't escape the attention of HP NonStop product managers. In one of my earliest conversations with Ajaya Gummadi, HP NonStop Data and Cloud Product Manager, she made it very clear that she was very pleased to see OmniPayments embracing hybrid architecture particularly as, in doing so, OmniPayments embraced the NS SQL database management system. As the product manager also responsible for clouds in addition to data, Gummadi could see that future transition to clouds – private and public – would be simple to execute for OmniPayments and recent wins by OmniPayments confirmed this acknowledgement on her part.

Hybrid computers and cloud computing are rarely far apart in terms of their contribution in support of payments platforms so crucial to the operations of FIs and those responsible for supporting networks of client devices including ATMs, POSs and the myriad types of mobile devices that are now an integral part of client access to payment services. It's so easy to see how any hybrid computer encompassing multiple digital computers can transition to where one of these participating digital computers could be a cloud. Over the years, these hybrid computers have been made up of tiers as first web servers and then later there was the further separation as application and database servers became better defined, have made the journey to cloud computing easier to accommodate – as simple as pulling out a server and accessing the same functionality sourced from within a cloud. Hybrid and cloud technologies may be advancing in lock step, dancing as it were to the same tune, but it will always be the software that dictates the final configuration and with payments solution providers such as OmniPayments accommodating both configurations, no matter where in the journey an FS may find themselves, there will always be choice!

Real world Hybrid Computer deployments to customers

“If you don't like the road you're walking, start paving another one,” so wrote America's famous country singer, Dolly Parton. This is an observation that resonates well with

Taking a path into the clouds!

many of the NonStop community, particularly the NonStop vendor community. When Sabre, the reservation offshoot of American Airlines, switched from IBM mainframes to HP NonStop systems over a decade ago, they realized that there was more than one way to reduce costs. Reservation systems supported potential passengers browsing for flight information as well as those potential passengers actually purchasing a seat on a plane.

“Perhaps the most important consideration of all is to leverage the best platform for the right function, a circumstance that is often overlooked ...”

Yash Kapadia

The ratio between those looking for seats and those booking seats was heavily skewed in favor of those looking and Sabre took advantage of this to help it cut the operational costs from running their NonStop systems.

“An innovative technology company that leads the travel industry by helping our customers succeed,” is the byline of Sabre. To better help their customers succeed, Sabre came up with the novel idea of offloading the looking for seats processing to less expensive commodity processors running Linux with

My SQL while the booking of seats stayed on NonStop. With this split based on what became known as the “look to book” model, Sabre built a hybrid computer system on the floor of their data center where data was replicated between NonStop and Linux in a manner that ensured seats viewed by someone looking at a flight would very likely be available when the customer subsequently transitioned to booking the seat.

However, not every user within the NonStop community had either the technical skills or the management support that Sabre were blessed with and yet, as the look to book model took hold, there were vendors who saw value with this model. When it comes to FIs and their payments processing applications, operational costs are a concern as well. However, retaining the flexibility to support as many financial channels (popular with their customers) as they can, leads to trade-offs and nowhere is this better addressed than when hybrid configurations are deployed – looking up a statement or printing a receipt after all

Taking a path into the clouds!

is similar to the look functionality identified by Sabre just as deposits and withdrawals can be viewed as similar to the book functionality – the latter as with airline bookings, results in changes being made to the database and hence represents transactions that cannot be missed for any reason. None of this was lost on OmniPayments and when competitive situations arose in emerging markets, according to Yash, OmniPayments built their own hybrid systems to remain competitive.

“While costs remain a concern for any vendor developing solutions for NonStop there’s other considerations as well, particularly for those vendors looking to embrace modern frameworks and technologies,” said Yash in the April 2014 *Musings on NonStop* published in the eNewsletter Tandemworld. “Perhaps the most important consideration of all is to leverage the best platform for the right function, a circumstance that is often overlooked,” acknowledged Yash. “When it comes to OmniPayments, we have embraced hybrid computers for some time after we turned to Linux platforms in support of our operational dashboards. Our decision to rely on Java for implementing these dashboards made the choice of Linux easy. When it comes to transaction processing, and even the BI and Analytics that follows, we ensure these are well supported by NonStop systems and our choice of C/C++ as the development language made this choice just as easy for us.”

“When it comes to transaction processing, and even the BI and Analytics that follows, we ensure these are well supported by NonStop systems.”

Yash Kapadia
OmniPayments, Inc.

More recently, Yash told the ATMmarketplace community, in a July 8, 2014, post Dressing up for the occasion ... that “if HP built such a system themselves – yes, it’s all HP components – then great.” Looking further ahead, Yash then told the ATM community that, “shortly HP will engineer NonStop to support the Intel x86 architecture allowing OmniPayments to run an optional all-blades chassis but the real benefits here are twofold; removing the complexity while increasing the flexibility.” Working with HP

Taking a path into the clouds!

standard chassis supporting rack-mounted processors, OmniPayments anchored their hybrids with enough processors to support the key components of their payments solution, running on HP NonStop. OmniPayments then threw into the racks a couple of Atalla security modules before topping up with ProLiant servers running Linux and Windows. Serving up web pages – potentially video – retaining flexibility to run whatever security options customers mandated, and servicing the needs of operational and business managers were all supported out of a single Yash-tested hybrid system.

Most important of all, Yash informed the ATM community in the post, OmniPayments made sure the operations were seamless across the hybrid computer so assembled, but a significant byproduct from going down this path was that potential customers really didn't need to know what was inside the cabinet. "We could have called it the Y-box or the OmniPower Mark I," said Yash, "and no one would be the wiser. Even after four decades of being in the marketplace, there's still some residual hesitancy over the presence of NonStop in any proposed solution, and this just takes any conversations about NonStop out of the equation entirely!" Reduced costs, greater use of open and standard software, and all the flexibility FIs required made this hybrid system centered on NonStop a success and in a country like Columbia, where the first system has been installed and is in production.

Late last year, in the November / December issue of the NonStop community magazine, The Connection, Yash provided additional insight into the development of hybrid systems in the article, Virtualization a shoe-in! Big Data, Hybrid Computers and Cloud Computing become Megatrends! "We aren't expecting a rush to these hybrid configurations," Yash said, "but rather a careful weighing of the value proposition from moving transactions off NonStop". Yes, there's a future for these hybrid systems but just as importantly, with our commitment to open and standards-based software, we have options as to where processes run including HP systems apart from NonStop and this is definitely broadening the reach of their products. It wasn't so much a case of us not wanting to take the path, in lock step with HP, which led us to pave a new path so much

Taking a path into the clouds!

as it was an opportunity to differentiate our products in a positive manner. Hybrid is not just a step in a journey to cloud computing but an opportunity to tailor our solutions to meet the needs of any FI involved in payments processing.

Real World Cloud Computing deployments to customers

“While Software as a Service (SaaS) applications promise greater flexibility and lower costs, they also present new challenges to the enterprise. With the procurement of each new SaaS application, enterprise data becomes segregated into cloud silos, a problem exacerbated by the increasing number of vendors in the SaaS market and the ease of obtaining such services,” wrote MuleSoft, a vendor highly praised by Gartner. “The adoption of other cloud computing models such as Platform as a Service (PaaS) and Infrastructure as a Service (IaaS) and the growing popularity of mobile applications and social media platforms means that additional data and processes are also moving outside of the firewall and into the cloud.” Universal in the explanation of the benefits, as well as some of the concerns, embracing cloud computing provides enterprises today, it shouldn’t come as a surprise to find that OmniPayments is adopting a conservative approach that leverages the work they have done in moving to open and standard software including programming languages as well as the initial success they have experienced since adopting hybrid computing.

The move to cloud computing is a journey with many steps along the path but for FIs it is again all about retaining flexibility, keeping costs under control and ensuring they are providing their customers with the services needed. Mobile applications are indeed popular as is the use of social media but so is a growing concern over security. Infrastructure in place may make it easy to offload every processing step to a cloud provider but do they have the experience to support FIs and do they have the credentials to satisfy regulatory authorities? So much personal information is on file at FIs that a simple security breach can expose entire user communities to potential financial loss. It is not unexpected therefore to see current solutions vendors in the payments processing

Taking a path into the clouds!

marketplace begin to break down the many processing steps involved in payments and to support from out of clouds these vendors manage on the behalf of their customers.

In an April 17, 2013, post to the NonStop community blog Real Time View, *It's time ... and the idea is not as wild and crazy as we might imagine!* Yash suggested that following some of the most recent wins that have been made, “don’t rule out OmniPayments combining features that might be on NonStop in part or in whole with

“Don’t rule out combining features that might be on NonStop in part or in whole with OmniPayments features that may be in the Cloud just as you shouldn’t rule out greater support for additional channels such as mobile and online banking.”

Yash Kapadia
OmniPayments, Inc.

OmniPayments features that may be in the Cloud just as you shouldn’t rule out greater support for additional channels such as mobile and online banking.” Furthermore, in an April 8, 2014, post to the same blog, *Hey! You! Get off of my cloud*, Yash went further observing that, “Can clouds only run on Linux or Windows? I don’t think so and we are getting no push back in the markets we serve.”

To the many supporters of NonStop systems, deploying NonStop systems on the edge of clouds thereby “hardening” them and masking any deficiencies behind the bullet-proof

attributes of NonStop seems is a natural extension to what NonStop has always demonstrated as a core competency. From the very first time a FI inserted a NonStop system between a mainframe and a network of ATMs, downtime of the mainframes were masked by the NonStop that kept open service to all the ATMs. Viewing resources in the cloud no differently simply allows NonStop systems to keep doing what they have always been doing – providing uninterrupted services, 24 X 7.

However, cloud computing is also about services as much as it is about products. Building out a cloud allows vendors traditionally associated solely with products to move

Taking a path into the clouds!

into a new way of doing business and when it comes to some markets, allows FIs in those markets access to sophisticated products they may have been unable to afford previously. “For companies like OmniPayments to succeed over the long term, we are looking to balance the creation of products with the development of services,” said Yash in the December 16, 2013, post to the NonStop community blog, *NonStop offers balance, and why not?* “This is needed for two reasons; for some clients we can augment their staff with skilled and knowledgeable experts who can help them bring new business products to market faster but it’s also a growing need of some clients to have better fallback capabilities and nothing can match the expertise in OmniPayments as OmniPayments can!”

When it comes to finding a balance in mixing technologies, Yash then noted how “We are fully supportive of Cloud computing and see it’s exploitation as a resource-on-demand. We will see the Cloud increasingly become a repository for data as our clients turn to Clouds for disaster recovery (DR), and we anticipate the next phase to be Cloud bursting in support of low value transactions – if the data is already in the Cloud, supporting transactions that simply look-up data, will be an easy next-step to accomplish.” The acceptance of cloud computing by FIs in every market is not a given and will depend upon the quality and experience of the vendors involved, but today, with the customers already supported, OmniPayments has demonstrated that it is among the more reliable of vendors in these markets. It may just be revisiting the service bureau model of the 1960s / 1970s even as it looks to be just another way to implement client / server computing based on the services models that appeared in the late 1990s but no matter how it is viewed, cloud computing is being viewed positively as the way to keep costs in check while retaining the flexibility to pursue innovation all FIs desire and OmniPayments will be a vendor many FIs turn to for their cloud computing solutions.

Conclusion

Taking a path into the clouds!

“As a metaphor for the Internet, ‘the cloud’ is a familiar cliché, but when combined with ‘computing,’ the meaning gets bigger and fuzzier,” wrote InfoWorld columnists Eric Knorr and Galen Gruman. In the feature, [*What cloud computing really means*](#) they note how, “Some analysts and vendors define cloud computing narrowly as an updated version of utility computing: basically virtual servers available over the Internet. Others go very broad, arguing anything you consume outside the firewall is ‘in the cloud,’ including conventional outsourcing.” More importantly, perhaps, “Cloud computing comes into focus only when you think about what IT always needs: a way to increase capacity or add capabilities on the fly without investing in new infrastructure, training new personnel, or licensing new software.”

For FIs running payments processing on NonStop systems the opportunity to tap increased capacity or even adding new capabilities “on the fly” has been on the top of many of the CIOs wish lists. However, the arrival of cloud computing also calls for caution and for careful evaluation of implementations on offer. In a world where personal information needs to be protected and where financial information cannot be exposed to fraudulent activities, there’s a need to take just baby steps along the journey to clouds and the move to hybrid computing with combinations of NonStop and Linux systems, for instance, offers a good first step. Providing additional flexibility even as it brings with it reduced capital costs, is an easy sell to company executives with the next step, the addition of a private cloud also can be easily explained. The key however is in the choice of vendors that have the depth of experience in payments together with the exposure to multiple differing systems and infrastructure.

“Cloud computing comes into focus only when you think about what IT always needs: a way to increase capacity or add capabilities on the fly without investing in new infrastructure, training new personnel, or licensing new software.”

What cloud computing really means
Eric Knorr and Galen Gruman
InfoWorld

Taking a path into the clouds!

One such company is OmniPayments who over the course of just a few years, have rearchitected the OmniPayments suite to better leverage hybrid computing – a mix of C/C++ and Java code and where the transaction path is executed on NonStop systems while the supporting management, monitoring and dashboards are all executed from a Linux platform. However, it is the next step that OmniPayments has taken, building out its own cloud in box with a mix of Itanium and Xeon servers – NonStop and ProLiant processors together with Atalla security modules, that differs from approaches of other vendors. As a single system, integrated at the console and fully tested at OmniPayments offices, this is a sizable step along the path to cloud computing. Offering this system on premises or as the engine driving services offerings - a service consumed outside the firewall that's now inside OmniPayments functioning 'in the cloud' – will certainly find acceptance among many FIs.

Today few vendors in the payments platform marketplace offer products as advanced as this and OmniPayments is certainly going to tap into markets where such a product and service mix provides the flexibility at price points FIs can leverage for competitive advantage. “The gradual progression from server to server farm to cloud seems quite natural for us. When it comes to identifying where OmniPayments processes are running inside the cloud of NonStop we have set up, customers really can't tell,” said Yash. “It's just somewhere in our data center and for us, 'provisioning' additional resources is relatively easy and more a function of the multi-tier architecture we have embraced.”

Clouds and cloud computing may be a cliché but OmniPayments has set about leveraging it to the benefit of all their customers and keeping NonStop in the picture is certainly a reassuring aspect of the progression OmniPayments has made. Clouds, used wisely, hold tremendous promise but ultimately their true value will only be realized as vendors bring to market competitive products of value to their communities. OmniPayments may have begun paving another road but it's a road I am sure will attract numerous FIs willing to take the journey with them.