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The Connection

A Journal for the Hewlett Packard Enterprise Business Technology Community

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How Raymond James Modernized Core NonStop Applications

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NonStop Technical Boot Camp
November 11-14 2018

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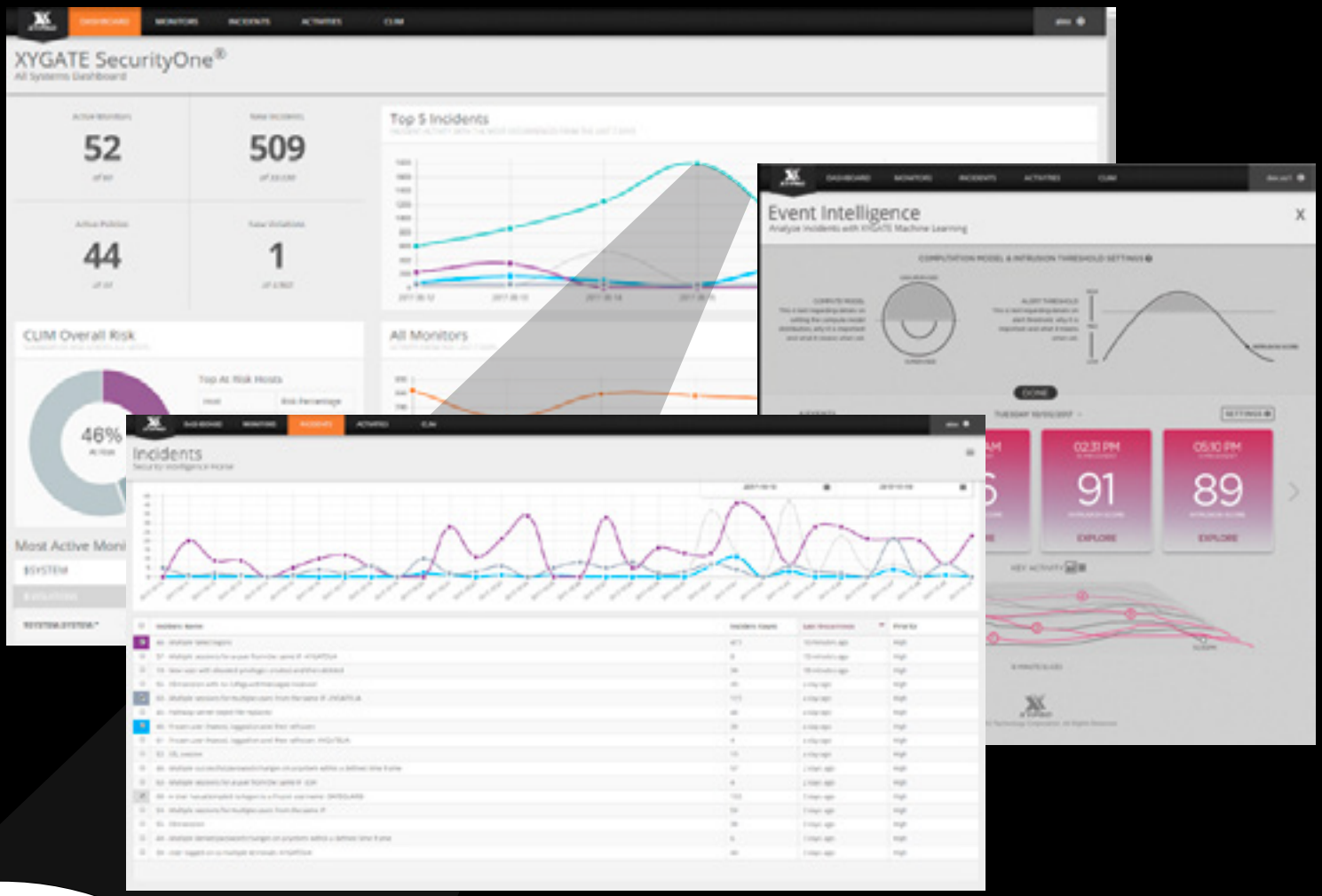

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Technology + Community

Columns

On the Scene at NonStop Technical Boot Camp 2017

A Note from Connect Leadership

This is my final entry as Connect President and I would like to share with all of you one, simple word that can make a huge difference: contribute. The user community is only as strong as the users who build and maintain it.

Contributing means something different to everyone, but I ask everyone to give back to the greater Connect Community. There is no such thing as too little or too much. You can give your time, share advice, contribute source code, or just spread the Connect word. Connect (and the NonStop platform itself) can never get enough exposure. Whether that means speaking at conferences, sharing ideas, mentoring or submitting content for any of the publications that Connect has, every little bit counts.

I remember my earliest exposure to this user community. It had a different name back in the day, but it was composed of most of the same people that make it up now. I had only been on the NonStop for a short while and I was itching to learn how to code for the platform Everyone I worked with was buried in assignments. But one person a took a few minutes to tell me about the ITUGLIB and I was off. A source code repository of cool stuff that I could compile, use and learn from! How awesome was that! He handed me a tape (yes, the old, round 6250 CPI tapes) and set me on my way. Since that first day, I have tried to give back whenever I can.

Do everyone a favor and take a few minutes to do the following:

1. Share your knowledge with someone else. You may be surprised at what seems common knowledge to you that isn't to someone else.
2. Thank someone who contributes! If you need a list, try looking at any of the names on the ITUGLIB, there are quite a few. The Connect staff could always use a "thank you" as well.
3. Contribute something of your own. Again, ITUGLIB has a VERY active group of open source contributors that would be VERY happy to have your help.
4. Write a quick article or blog entry for a Connect publication.
5. Develop a presentation on something you have worked on. My first presentation was REALLY, REALLY bad and I was terrified, but it only gets better! The Connect community LOVES to hear from its members. The more users present, the more users present. Again, if you are uncomfortable or uncertain, ask for help.

I will be around for quite some time. I have dedicated my career to this platform and I still have a long way to go.

Feel free to reach out to me at any time:

Thanks.

Rob Lesan

Rob Lesan
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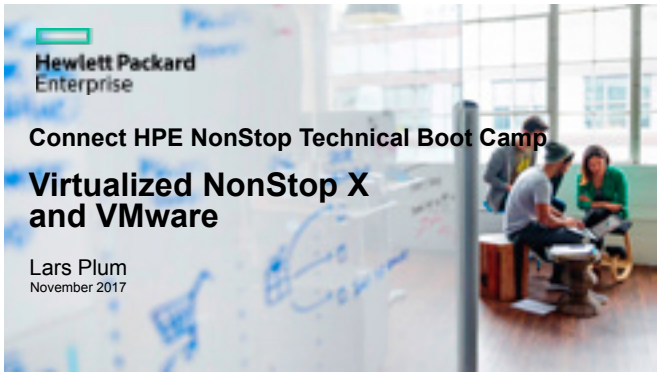
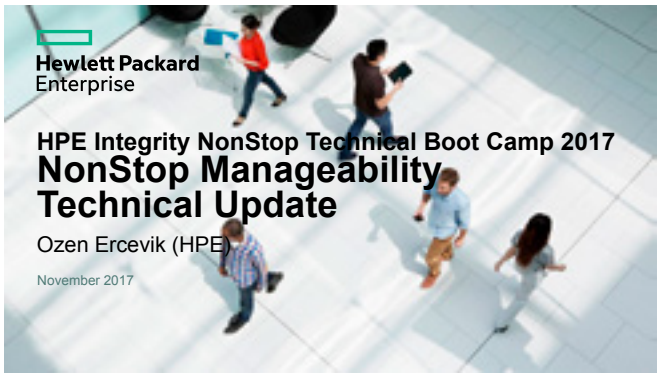
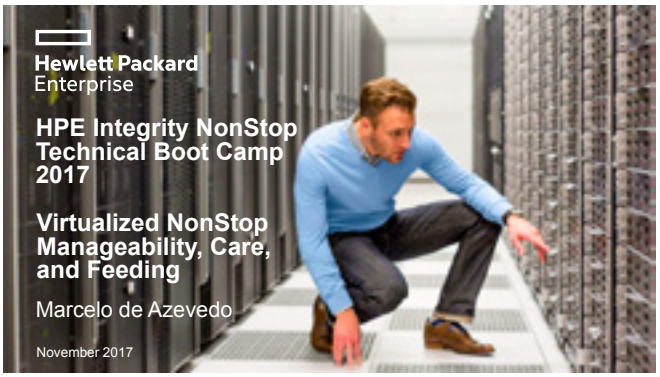
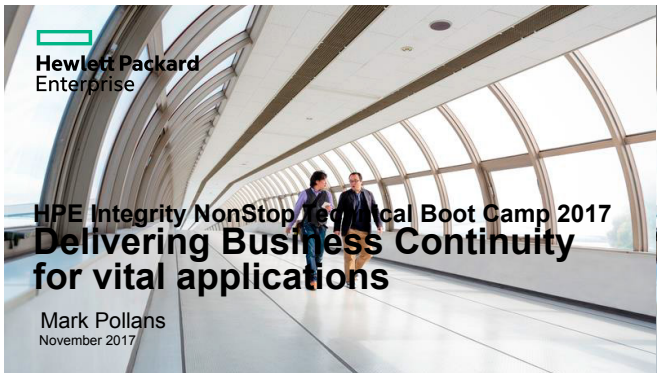
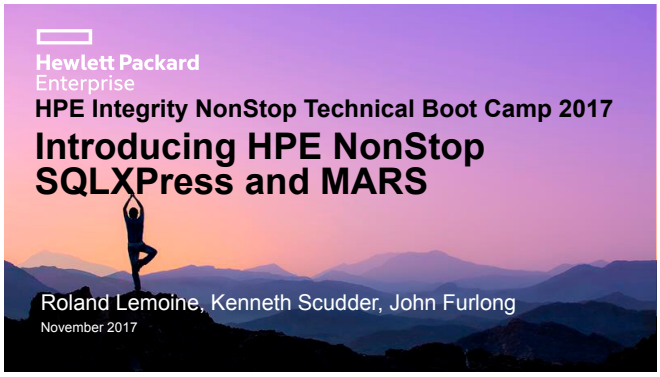




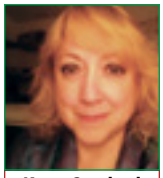






To see all the NonStop TBC Presentations: **http://bit.ly/TBC17Downloads**

News from HPE's NonStop Enterprise Division



Karen Copeland
Manager WW NonStop
Product Management
Mission Critical Solutions

It's a new year!
Happy New Year everyone!

2018 is here and ripe with new possibilities and opportunities.

NonStop continues to do well in a more competitive and constantly evolving market. We continue to bring in deals from our loyal customers and some new ones. The good news is there's a lot of new products and activities underway for 2018. Some projects we talked about at the TBC will deliver in the first half of 2018. Stay tuned for new product announcements which should begin appearing in March.

To start the New Year off right, this edition of The Connection has a new article about how Raymond James successfully completed an application modernization project and how SOAPam Server™ from NuWave helped them to complete two projects in record time. It's the year of transformation and modernization and more stories keep emerging as to how customers are making this happen.

Mark Pollans' article entitled, "Protecting Your Vital Applications" helps customers to think about how important their systems, applications and data really are to their business and how to decide what to protect, how to protect it and build a Business Continuity Plan that they can execute. People buy Mission Critical solutions like NonStop because their business will fail if key applications fail. In the uncertain world we live in now where weather disasters seem to be a regular recurrence, it's wise to have a plan in case you are snowed in, frozen over, flooded, shaken by an earthquake, or over taken by fire, mud or lava. Save yourself and your people, but save your livelihood too by making a good Business Continuity plan.

Randy Becker from NeXTbridge has provided a nice article which talks about DevOps, the value of using methodical ways to do software development, protect and manipulate your code and efficient tools and techniques available in the industry today. If you haven't looked at how you do this lately, you may want to think about re-evaluating your practices to improve efficiency and repeatability.

And in this issue, Marty Edelman's second article on application and data center evolution appears for your education and amusement. This time Marty takes time to explain how modernization can be done using CSL Studio from comForte to web enable applications still depending on old NonStop green screens to display access to applications that need user input.

With a new year, comes a refreshed set of new NonStop events around the world. From SUNTUG on March 2nd in Florida to DUSTUG in Scottsdale, Arizona on March 13th, to this year's big European event, sponsored by GTUG in Liepzig, Germany on May 14th, there are plenty of exciting events to choose from and we hope to see you at one of them this year.

In the meantime enjoy this issue of The Connection!

Karen

Karen Copeland

Manager, WW NonStop Product Management
Mission Critical Solutions
Hewlett Packard Enterprise

HPE NonStop Partner Technical Symposium 2018
Save the Date!

We are pleased to announce our intentions to continue our new tradition and have another Partner Technical Symposium in 2018. This year the event will be held on Monday, July 9th, 2018 at HPE's offices located at 3000 Hanover Street, Building 20A, in Palo Alto, California 94304. This is the same location where the event was held in 2016 and 2017.

More info to follow.

California Fires Destroy HP Archives

Dr. Bill Highleyman >> Managing Editor >> Availability Digest

An archive of historic documents created by Hewlett-Packard founders William Hewlett and David Packard were destroyed by a devastating wildfire in Sonoma County, California in early October 2017. The documents included over 100 boxes of correspondence, speeches, and other documents. They represented the heart of HP historical activities.

The collection was valued at USD $2 million in 2005. It was part of a total archive worth USD $3.3 million at the time.

Hewlett-Packard

Hewlett-Packard was founded in 1939 in a one-car garage in Palo Alto by Bill Hewlett and David Packard. The garage is now an historic landmark, recognized as the birthplace of Silicon Valley. It serves as a private museum.

HP initially produced a line of electronic test equipment. In fact, all the test equipment in my electronics lab when I was a teenager bore the HP label.

In the early 2000s, HP started producing PC systems. From 2007 to 2013, HP was the world's leading PC manufacturer until Lenovo passed them.

HP went on to develop and manufacture computing, data storage, and networking hardware and software. Major product lines included personal computers, enterprise and industry standard servers, storage devices, networking products, and a diverse range of printers and scanners.

HP marketed its products to households, businesses, retailers, vendors, and online. It also provided consulting services around its products.

How Were the Archives Stored?

In 1999, HP shed its test and measurement division into a newly created company, Agilent Technologies. In 2014, Agilent spun off its electronics group as Keysight Technologies. For some reason, Keysight ended up with the archives that were eventually lost to the fire.

HP and Agilent had stored the archives in controlled vaults with foam fire retardant and other protections. When Keysight inherited the archives, it moved them to a modular building in its Santa Rosa campus in Sonoma County, protected only by a water sprinkling system.

Keysight maintains that it met all standards for archival protection and that the documents were stored in the same manner as they had been at HP and Agilent. It noted that many parts of the archives were not damaged. They were situated in other parts of its Santa Rosa facility that sustained only minor damage, or they were stored at other Keysight locations.

What Was in the Archives?

The papers in the archives dated from 1937 to 1995. They revealed the company's strategy and its evolution from the beginning of the electronics industry.

HP had not made the existence of this cache of documents widely known, and it restricted access. As such, many of the documents lost in the fire had never been made available to researchers.

Consequently, the fire consumed a significant piece of the test industry in which HP made its start along with a bit of American history.

The Sonoma Valley Fires

The Sonoma Valley fires were among a series of 250 Northern California blazes that began in early October. Twenty-one of the fires became major blazes, among them the Tubbs Fire, which grew to become the most destructive wildfire in California history.

It was the Tubbs Fire that reached Keysight's Santa Rosa campus and damaged several company buildings. Two buildings were totally destroyed. Unfortunately, one of these buildings contained HP documents that were lost.

Some have said that it was irresponsible for Keysight to put the archives in a building without proper protection. But Keysight maintains that it took appropriate and responsible steps to protect HP's archives. It claims that it met the standards for archival protection as set forth by the United Nations and the U.S. Library of Congress. It packed the material in damage-resistant archival boxes and stored them on steel shelving in modular buildings with sprinkler systems.

It took the most damaging fire in state history to thwart these steps. The fire was so fierce that it even melted some fire-resistant safes. The modular buildings were destroyed by the fire, though Keysight's permanent offices survived. If Keysight had stored the archives in its permanent offices, we would still have the archives. The Good News

However, amidst all of this destruction, there was some good news. A large chunk of HP archives is stored elsewhere. Many archives remained intact or were stored in both physical and digital format. Archives held by HP were not affected. The company uses a facility in Atlanta, Georgia, for its corporate archives.

Some company archival materials such as historical product catalogs and correspondence were secure because they were housed at other Keysight locations. Nevertheless, a significant amount of irreplaceable personal material was lost.

Where were the backups?

One shortcoming stands out in this story. Where were the backups? A requirement for high availability is the presence of backup copies of all critical data. Who knows when the primary copy of such data will become corrupted for some reason. In that case, it can be replaced with the backup copy (and another backup copy made).

The HP archives certainly qualified as critical data. Backup copies of all documents should have been made. True, there were 100 boxes of documents; and this might have discouraged thoughts of backup. Still, the lost archives were valued at USD $2 million. It would have taken just a fraction of that cost to provide backup copies. The backups could have been paper copies of all documents, they could have been photographs of each page, or they could have been a digitized copy stored on a secure server.

It could have been HP, Agilent, or Keysight that made the backup copies. They all had the documents in their possession at one time or another. As one who specializes in high availability, I fault each of these companies for not doing their jobs. They all depended on 'hope' that the archives would be safe. "Hope' is not a viable backup.

Acknowledgements

Material for this article was taken from the following sources:

HP lost key historical archives in California's wildfires, EE Times; October 29, 2017.

Loss of Hewlett-Packard Archives Wake-Up Call for Computer Historians, IEEE Spectrum; October 30, 2017.

HP lost key historical archives in California's wildfires, Bangladesh 24; October 30, 2017.

Calif. Fires Destroy HP Archive Documents, EE Times; October 31, 2017.

California Fires Destroy HP Archive Documents, One River; undated.

Silicon Valley history lost: Archive of documents that belonged to HP founders destroyed by wildfire, HP; undated.

Wikipedia

Dr. Bill Highleyman brings years of experience to the design and implementation of mission-critical computer systems. As Chairman of Sombers Associates, he has been responsible for implementing dozens of real-time, mission-critical systems - Amtrak, Dow Jones, Federal Express, and others. He also serves as the Managing Editor of The Availability Digest (availabilitydigest.com). Dr. Highleyman is the holder of numerous U.S. patents and has published extensively on a variety of technical topics. He also ghostwrites for others and teaches a variety of onsite and online seminars. Find his books on Amazon. Contact him at **billh@sombers.com**

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Protecting Your Vital Applications

Mark Pollans

HPE Sr. Worldwide Product Manager

This article is based on the presentation, "Delivering Business Continuity for Vital Applications," that was presented at the HPE Integrity NonStop Technical Boot Camp (TBC) 2017.

What is Business Continuity?

When first presenting this topic it became apparent that if you hadn't spent time studying or working on business continuity projects, then the term might be a bit elusive. For those less familiar with the term Business Continuity, here is a way to look at it. Take your mobile phone for example; is it mission-critical? Business-critical? Well, maybe not for most. For some people though, their mobile is essential for them to do their job, pay a bill, or get an urgent message from a family member. We all have different levels of what's critical to us when it comes to our mobiles.

Now imagine a disaster strikes. You lost your mobile or dropped it in a puddle and damaged it beyond use. What would you do? What is your business continuity strategy for your "critical" mobile functions? (Side thought – does anyone even remember a phone number anymore)?

One such business continuity strategy is to run to your local electronics store and buy a new mobile. That's a strategy, and it could work for some. For others it would take too long to recover (see RTO below). And even then, what about your contact data, was it backed up somewhere? How would you do a restore of it? And how far back in time was your last "save," meaning all the changes you made on your mobile since then would be lost (see RPO below). To mitigate these concerns, some people carry two mobiles. Still, with two "active" mobiles, you will need a strategy to keep them synchronized. Depending on how critical your mobile applications and data are to you, there are different methods that you could employ to do so, each with its own characteristics.

Do you have a disaster plan for your mobile? Thinking about this plan before the disaster hits, is the first step of business continuity.

Business Continuity Planning Begins with a Business Impact Analysis

As with your mobile, proper business continuity planning is often overlooked. Continuity planning begins with a business impact analysis to determine the potential effects of an outage of each vital application. A vital application is any mission-critical application that if unavailable, could result in a loss of revenue, a tarnished business reputation, lost productivity, or regulatory violations.

The criticality of applications can change over time as business processes and needs change. An application that was not mission-critical last year may be mission-critical today. (After all, how important was that first mobile phone as compared to today?) Therefore, the business impact analysis should be reassessed at least every one to two years.

The Costs of Outages

Disasters happen more often than you may think; 95% of enterprises have experienced at least one unplanned data center outage in the last two years. During that time, the typical financial services business experienced 1.8 complete data center outages; and those in the healthcare industry experienced three such outages.[1]

The real costs of an outage can be significant. IDC estimates an average downtime cost of about $1.7 million per hour. IDC also notes that some outages can reach up to $10 million per hour! The average outage duration is 90 minutes, with some outages lasting 24 hours or more! Adding to this cost is the reputational damage to the company as news of the outage can spread very rapidly through today's social media.[2]

RTO and RPO

The key elements of a business impact analysis are the Recovery Time Objective (RTO) and the Recovery Point Objective (RPO). These two terms provide a common framework to express requirements and objectives of a business continuity strategy and plan (Figure 1). RTO is the maximum acceptable time for recovery from an outage. It is the time it takes for an application or business process to be restored after a disruption. If the outage goes beyond the RTO, unacceptable consequences associated with a break in business continuity should be expected. On the other hand, as RTO approaches zero, the effects of an outage become less visible to the end users.

RPO is the maximum amount of data loss due to an outage. It is the data that has been generated between the last backup of data and the outage. It is often based on the average value of a transaction. However, in certain cases, no data loss is acceptable. For example, if a loss of data could result in the loss of life or limb, then that data absolutely must be protected.

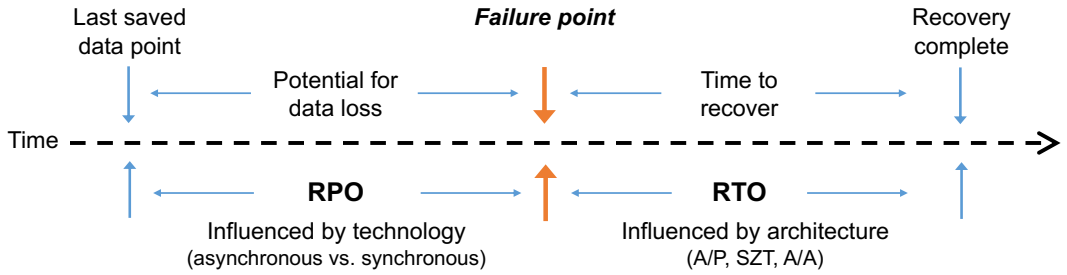

Figure 1: The RTO and RPO relationship

Business Continuity Planning is a Strategic Imperative

"Critical applications" range from business-critical applications to mission-critical applications (Figure 2). Business-critical applications and data are necessary to run the business. Mission-critical applications and data are so valuable that any outage affecting them would be catastrophic. Critical applications can be at either end or in between.

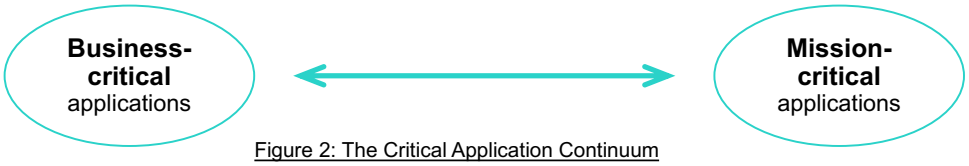

Figure 2: The Critical Application Continuum

Business continuity planning begins with the realization that it is not if, but when, a disaster will happen. Not all applications are critical. However, each critical application must be evaluated to determine what RTO and RPO are required in order to keep the business functioning. Here are some questions to ask when trying to place a particular application on the Critical Application Continuum: What is the potential lost revenue? What is the potential lost productivity? What are the potential lost business functions? What is the impact on customers? What are the legal and compliance issues? Since the needs of businesses change over time and applications evolve, this evaluation must be reassessed periodically.

Once an application's criticality has been assessed, a business continuity strategy then can be tailored to meet the required RTO and RPO objectives.Once an application's criticality has been assessed, a business continuity strategy can then be tailored for it to meet the required RTO and RPO objectives.

[1]Fingers Crossed? Or What is Your Business Continuity Plan for the Inevitable, Gravic, Inc., 2015 (original source Ponemon Institute).
[2]High-Value Business Applications on x86: The Need for True Fault-Tolerant Systems, IDC, May, 2015.

Approaches to Business Continuity

Whatever approach is taken with the system architecture to provide the required availability for an application, at the very least, it should be geographically dispersed to survive local and regional disastrous events such as floods, fires, and earthquakes.

Here are three fundamental business continuity architectures described that provide a range of RTOs and RPOs:

- **Active/Passive systems using uni-directional data replication to maintain the passive (backup) system in synchronization with the active system.**
- **Active/almost Active systems, also known as Sizzling-Hot-Takeover systems (SZT), which are active/active systems with the application running on both of the systems, but only processing transactions on one.**
- **Active/Active systems, in which both (or all) systems are actively processing transactions. Their databases are kept synchronized via bi-directional replication.**

Active/Passive Systems

An Active/Passive system is the classic disaster recovery solution. It is the minimally acceptable business continuity architecture for either business-critical or mission-critical applications.[3]

All transactions are executed on the active system, and changes to its database are replicated to the backup (or passive) system (Figure 3). The capacity of the backup system is mostly unused (unless other applications or read-only query/reporting functions are running on it). When a failover occurs, applications must be started on the backup system and the system tested before users can be connected to it. During this time, which could range from minutes to hours, the application is unavailable to the users.

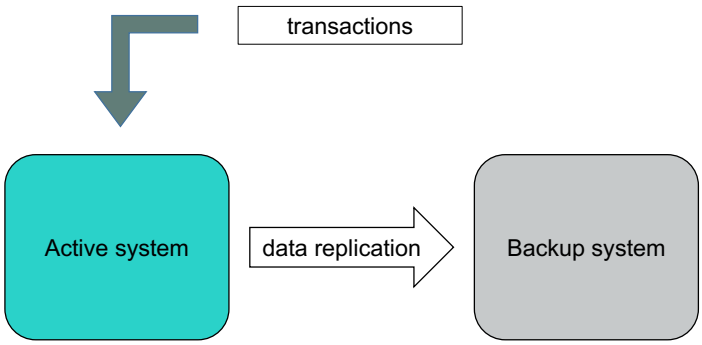

Figure 3: An Active/Passive Architecture

Failover testing generally requires an outage of the application on the active system. Therefore, failover testing is often not performed, or not performed to the fullest extent. Thus, there is a high risk that the backup system cannot be brought online when needed – this is known as a failover fault. Consequently, it is common practice to attempt to revive the original active system first, often resulting in lengthening the overall outage.

Sizzling-Hot Takeover Systems

If an application cannot run in a distributed Active/Active environment, many of the advantages of an Active/Active architecture can still be achieved by running it in an SZT environment. In this architecture, the servers are configured as an Active/Active solution, but the application performs data changes on the active server only. On the standby server, the application is active, but is not performing data changes (Figure 4). The standby server's database is kept synchronized with the active server via data replication. If the active server fails, all that is required is to reroute transactions to the standby server and transaction processing continues uninterrupted.

Because the standby server has all the applications up and running and the database open for read/write access, it is easy to send test transactions at any time to verify that it is fully operational, which is a notable advantage over the Active/Passive architecture. Thus, when the need for a takeover arises, it is a known-working system and will not experience failover faults.

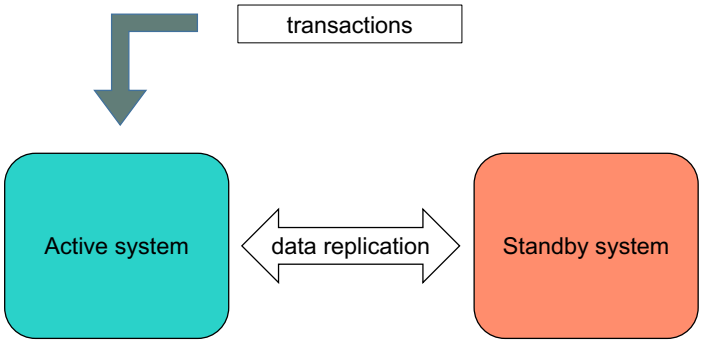

Figure 4: A Sizzling-Hot-Takeover Architecture

Active/Active Systems

In an Active/Active environment, applications are active on all systems, and transactions can be sent to any system in the application network. Changes to the database in one system are replicated to all other systems via bi-directional replication to keep the databases synchronized (Figure 5).

Thus, the application has continuous availability even in the event of a system outage. If a system fails, all succeeding transactions are simply routed to surviving servers. Users connected to the surviving system(s) are not even aware that any outage has occurred.

Active/Active systems are more difficult to implement than Active/Passive systems. Some applications cannot run in a distributed environment (i.e., if the application assigns incremental invoice numbers from a memory-based counter).

[3]Although this is a bold statement to make in light of other recovery technologies such as virtual tape backup and restore, the recovery profiles of such approaches are so long and the data loss potential is so great that the applications being protected do not fit into the typical business-critical or mission-critical RTO and RPO categories.

Furthermore, data collisions are possible. A data collision occurs if the same data object in two different systems are modified at the same time. Both changes will be replicated to the other system. The data object values will be different in the two systems, and both will be wrong. Data collisions must be detected and corrected (i.e., the latest data change is accepted by both systems). Some data replication products offer a technology known as synchronous replication, which can prevent data collisions from occurring.

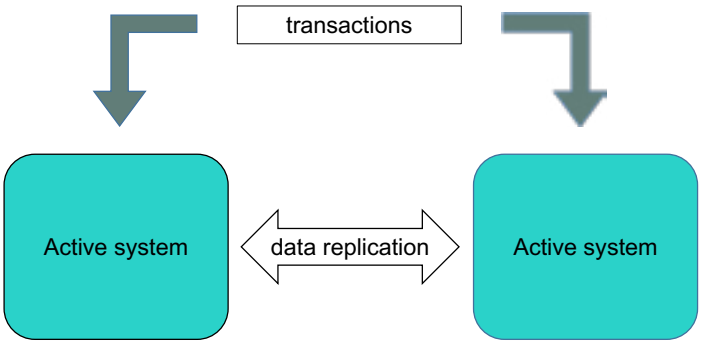

Figure 5: An Active/Active Architecture

The Duration of an Outage

The architecture of the business continuity solution can significantly affect the duration of an outage. Average recovery times for different recovery architectures are:

Magnetic tape backup	24 hours
Virtual tape	12 hours
Active/Passive with failover faults	3 hours (if at all)
Active/Passive without failover faults	10 minutes
Sizzling-hot takeover	30 seconds
Active/Active	30 seconds[4]

Thus, the business continuity solution architecture should be chosen to match the criticality of the application to be protected and its RTO requirements.

Summary

Business continuity is about minimizing or completely mitigating the impact of a catastrophe on your business applications. It is not a question of if a disaster will occur; it is a matter of when. A well thought out, planned, and tested business continuity strategy can provide a business with the assurance that an application can survive a disaster. The business impact analysis is a key part of that strategy. Understanding and creating appropriate RTO and RPO objectives for each application is a good next step towards meeting your business requirements.

Remember to review your impact analysis and RTO/RPO objectives at least every two years as business needs change and applications evolve. What was not mission-critical yesterday could be mission-critical today.

[4]This number is the time to switch affected users and transactions to surviving nodes; users/transactions already routed to surviving nodes see no outage at all.

Mark is Hewlett Packard Enterprise's (HPE) Senior Worldwide Product Manager responsible for the HPE NonStop systems portfolio, including the HPE Integrity NonStop X (Xeon® based) and NonStop i (Itanium® based) systems, drive storage (SSD, HDD and SAN), and Business Continuity. Since 2007, he has orchestrated the release of multiple generations of NonStop systems.

Mark has years of experience at HPE, largely in systems architecture, enterprise computing, and networking. Additionally, during his tenure at Hewlett-Packard Co., he has held various management and engineering positions in R&D and marketing for hardware and software projects. You can reach Mark at mark.pollans@hpe.com


NENUG
New England NonStop User Group
NENUG Chapter Meeting
May 21, 2018 - HPE Headquarters - Andover, MA


NYTUG Chapter Meeting
Thursday, May 23, 2018
NYTUG
New York/New Jersey Area
TANDEM USER GROPUP
Location: HPE Office - Berkeley Heights
Room: 516-517
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Is That a Cloud In Your Data Center Or Are You Just Happy To See Me?

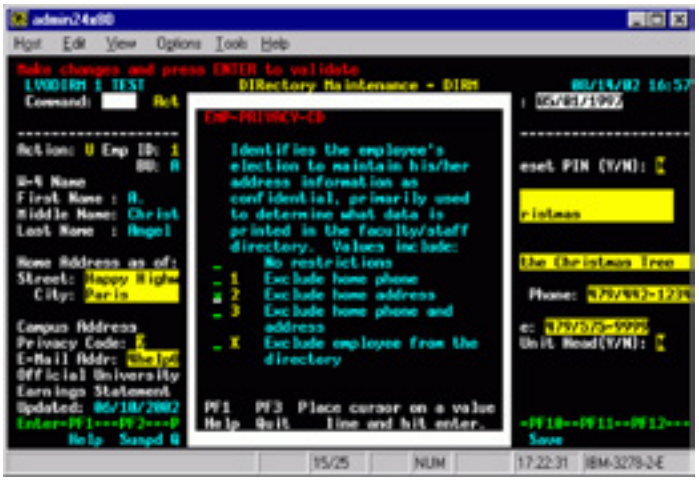
Marty Edelman // Creative System Software, Inc. // CTO

Part 2

As 2017 begins to wind down most companies have a cloud strategy in place. All of the new features they produce are cloud native or at least cloud accessible. They have multiple offerings that their customers can access via the Internet which allows them to compete with their competitors and they are exploring the way to move more of their compute power into the cloud to allow them to focus on providing more features to their business partners. It's a great time to be an IT professional!

As you sit back and ponder the journey you, and your applications, have taken over the last few years you still get a bit uncomfortable when you think about your dreaded legacy application. It still provides lots of value to the company but most of that value is hidden behind legacy interfaces. Go to an airport and watch the gate crew change a seat assignment and you can't help but grasp as you notice them hitting the tab key 10 times in a row to move to the seat you would like using a terminal emulator that 'speaks' 3270. When you rent a car, you notice that the screen the agent is using is just a GUI slapped on an old green screen. Visit your financial advisor and I'll bet you'll notice the same thing.

Some people will tell you that the use of green screens is fine, that they'd rather build new features instead of rewriting them to use modern technologies – that they can't justify the expense of rewriting them. Of course, these people would be wrong, dead wrong!



Green screens aren't intuitive meaning that companies spend a lot of money each year training folks how to use them. In industries such as retail where the average turnover is 50% per year, training adds up quickly. If it takes a week to train a cashier and you have 100,000 cashiers that means you need to train 50,000 cashiers per year – without factoring in seasonal labor, which could double that number. That is 2,000,000 hours of time these new employees aren't being productive and it doesn't even factor in the time of the folks that are working with them. At $12 per hour that is $24,000,000 a year that is wasted. Put that same person onto a modern interface and the training time drops to a single day since they will know how to use it. That is a savings of more than $19,000,000 per year. The travel industry has the same economics. Now let's talk about how a CIO can't justify the money to rewrite them...

As in all discussions of modernization there are always numerous ways to do things. I'm a huge fan of finding a tool that can leverage the existing data model so a company doesn't have to change the backend immediately. This is probably the quickest path to getting something into production. During this phase, the software engineers should be working hand-in-hand with the user experience (UX) team to ensure that the new system meets the needs of the users. Using a tool such as comForte's CSL an existing Pathway server can easily be exposed as a REST or (gasp) SOAP service. This allows the company to leverage the unparalleled reliability and scalability of their NonStop while exposing these services to new consumers without having to rewrite the application. Clients can be written in any language and run on any platform. CSL also provides the application with TLS security to ensure that your data stays private (if only Equifax used it!).

To create a RESTful or SOAP service using CSL Studio requires only four steps:

1. Import the applications DDLs
2. Import the Pathway definitions
3. Generate the REST wrappers and Doco or the SOAP WSDL
4. Deploy the service to the NonStop

All told in about 15 minutes a legacy Pathway server can be exposed as a running webservice!

Web-enabling an enterprises' legacy applications isn't just for the replacement of green screens, any running Pathway service can be exposed in this manner. Once an enterprise's legacy services have been exposed one can argue that they are no longer legacy. The ROI for a tool such as CSL is amazing, no longer are company assets hidden behind a proprietary set of solutions, now third-party applications can be purchased that can access these services and create new, more powerful, services. Creating a new feature can be as simple as writing a small workflow to call a few services in a totally new way. Testing can be automated using 3rd party tools. Stress testing is as simple as pressing a button on a tool.

Once a company has exposed their back-end services they should start thinking about using the new Virtual NonStop capabilities. Imagine a world where a complete service can be deployed to an end-point location to ensure that it is always available. In this model, a data capture service can be deployed to the location where the data is generated and then a data replication product such as Gravic's Shadowbase can be used to move that data back to the central location. If the remote location goes offline it can still continue to operate without any impact to the users! Once a company moves into the virtual world the possibilities are virtually (pun intended) limitless. As a company's transaction rate increases the system would automatically expand to handle it without any user intervention. Gone forever are the days of buying enough hardware to handle the peak season and watching as it sits unused for 11 months out of the year.

With a little help from the Escort product we discussed last issue an enterprises data can be available via one of the best SQL engines, NonStop SQL and their applications being exposed using CSL a company now has all of the building blocks to provide immense value for years to come. In the next issue we will discuss how to easily secure the enterprises data both at rest and in motion.

Since leaving The Home Depot Marty Edelman has provided strategic guidance to organizations wishing to modernize their IT infrastructures. While at Home Depot he was responsible for the interconnected payments team which has responsible for all payment processing.

Edelman has been involved in the IT field for more than 30 years. As an independent consultant, he founded a small consultancy firm that specialized in developing high-volume mission-critical solutions for Fortune 500 companies. He and his team helped to build the UPS Tracking System, the NYSE Consolidated Trade and Quote systems, and the S.W.I.F.T. next-generation computing platform.

Integrating NonStop Applications with Third-Party Web Services

A Raymond James Case Study

By: Jes Thamdrup

Within the NonStop user base, modernization is rightly viewed as an effective method to meet changing business requirements more quickly. However, when it comes to actually modernizing NonStop applications there are a number of different approaches to choose from. This case study will detail how Raymond James recently modernized their core NonStop applications to allow them to quickly address new business requirements.

Raymond James is a large financial services and wealth management firm that serves over 3 million client accounts through 7,300 financial advisors. At Raymond James, our clients are the most important aspect of our business. We believe if we do what is right for our clients they will achieve success, and through them we realize our own success. With this said, it is important we offer the best and most reliable technology to our clients.

We recently had two business requirements to improve the services offered by Raymond James to our customers. The first was to integrate our Windows-based quote system with the NonStop so that we could integrate our internal trade service with the real-time ticker from the Windows application. As a full-service wealth management company, the other requirement was to offer our clients the ability to short sell stocks.

We started with the first requirement - to integrate our internal trade server with our QuoteServer running on Windows. The QuoteServer service is the real-time ticker with details about equity research, financial news, historical performance, investment strategies, and regulatory filings.

Microsoft has released the SOAP toolkit for exchanging structured information over HTTP as a way to integration with other, non-Windows environments. We decided to run a POC using SOAPam Server™ from NuWave.

We found that SOAPam Server™ was very intuitive and required no special training. SOAPam runs on the NonStop and sits in front of the Quote System. SOAPam is simply configured by importing the application Inter Process Message formats. It is then able to map the messages between the SOAP requests and the IPM (InterProcess Message) that the Quote System expects. This was all done easily and quickly using the development tools that came with SOAPam. We went from the POC to live in less than 4 months!

Working with NuWave was great - if we had any questions we would get replies very quickly and if we needed any help they were there to support us. We could have developed our own SOAP implementation, but it would have taken much more time and we would have had a very steep learning curve, with whatever support we could find on the web.

The second requirement we received from our business stakeholders was to allow our clients to short sell stocks. Selling a stock 'short' means selling stock you do not own in expectation of a decline in the stock price. Once the decline happens you buy shares to cover your initial sale. By way of example Stock X sells for $100 a share but you believe the stock is about to fall in price. You sell 10 shares (that you do not yet own) and receive $1,000. The stock falls as expected and is selling for $80 a share. You buy 10 shares for $800 and transfer those shares to your original buyer while pocketing $200. At Raymond James we named this

system the SmartLoan Service. This request was challenging to accomplish, partly because when the short sell is executed the trading server needs to validate that the security is available in inventory and then if the inventory is available it needs to reserve that inventory. MQ is our internal Raymond James standard for communicating with 3rd party processes. MQ was fast, but we ran into problems with creating a synchronous process when messages did not get transmitted. When there were issues with transmission all the messages would timeout and hold up other trades. The MQ solution was also missing error handling and a resubmit would create a duplicate inventory request.

After we ruled out MQ, we looked at an in-house option using HTTP, but it did not allow for encryption of user IDs and passwords to validate a user. We had to figure out another way to make the system work successfully. We knew we needed a synchronous solution to simplify error conditions. Our NonStop was not connected to the internet, and to complicate things further, our NonStop engineers had no web knowledge and our web administrators had no NonStop knowledge.

NuWave came to the rescue again with SOAPam Server™. We were able to make the connection for the SmartLoan Service without having to train our NonStop engineers on the web or our web developers on the NonStop. We built the SmartLoan application as a C# Web service that sits on our internet domain and calls out to the 3rd party. An added benefit was that SOAPam Server™ also included security and HTTP authentication and authorization which we needed since we are dealing with financial transactions. This security ensures that only authorized users are able to use the service, and this is a built-in feature that comes standard with SOAPam Server™. Having already become familiar with SOAPam Server™ with the first project, we found it very easy to get up and running for this project - once you have done one implementation, the next one is a breeze.

Raymond James is always looking to the future and we are now planning to implement services using REST. We are currently setting up our NonStop X Server and will soon be doing a POC for REST migration using LightWave products from NuWave. Based on our experience with SOAPam™ we are sure we will once again have a great experience with the products - from the way their solution is constructed, and how no application changes are required. In our experience, NuWave's middleware is very intuitive and imports the DDLs of the NonStop programs you want to expose. It then creates the code you need to connect the NonStop to the Web service that you desire. NuWave's middleware runs on Guardian, so OSS is not required. Raymond James has had a great experience with NuWave's middleware solutions. They really are experts when it comes to Web services and the NonStop. They saved us hours of coding and time learning new technology. We look forward to working with LightWave in the near future.

Jes Thamdrup currently works at Raymond James as Data Engineer responsible for enterprise-wide replication systems. Prior to his current role, he supported Raymond James' data warehouse as DBA and Data Engineer. Jes holds a degree in computer science from the Danish Department of Computer Science.

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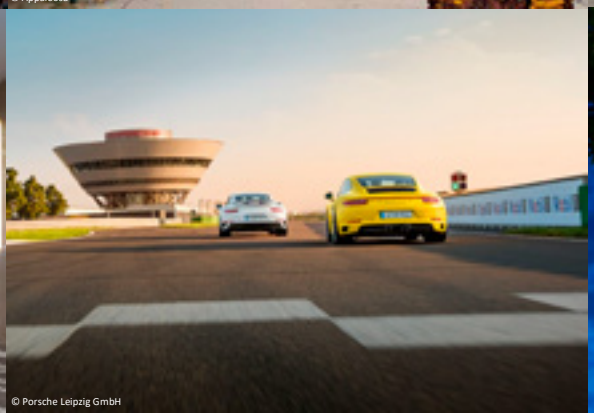
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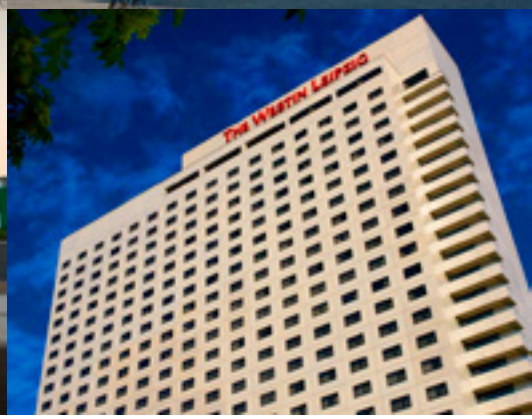

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HPE NonStop Boot Camp 2017 - A Bright Future Ahead

As 2017 wraps up, there were only a few more trade shows left on the schedule and this one is the biggie. This year's NonStop Technical Boot Camp moved from our familiar home at the Fairmont in San Jose up the Peninsula to a new location at the Hyatt Regency in Burlingame. This multi-day event is the NonStop community's largest trade show, with nearly 500 attendees and 40 vendors. According to sources, this year's customer attendance was up by nearly 40%.

XYPRO had a lot to be proud of this past year. Our booth featured XYPRO's award from **INC Magazine's 100 Best Workplaces**. It was also the first time Merlon Software exhibited under the XYPRO corporate brand. **XYPRO acquired Merlon Software** in early 2017.

The value started even before the conference officially opened - XYPRO's investment in the future of NonStop talent benefitted from the HPE NonStop education sessions offered on Saturday and Sunday as we sent our Junior NonStop Development & Support Teams to take advantage of this education opportunity.

Pre-Con Seminars

XYPRO participated in the Sunday Seminars again this year and we were proud to offer extremely useful and practical education sessions on the topics of Tuning NonStop SQL Queries and meeting the newest PCI-DSS 3.2 requirement for Multi-Factor Authentication on the NonStop server using XYGATE User Authentication™ (XUA), which is shipped with every HPE NonStop server.

Here's a recap of some of the interesting sessions and key takeaways from this year's show.

The Best Investment we ever made in NonStop Security

BankServAfrica is Africa's largest automated clearing house, processing close to three billion interbank payment transactions valued at ZAR 8 trillion annually (USD$ 570 Billion). It is critical for them to ensure secure and reliable payment mechanisms. BankservAfrica is required to comply with International Banking Best Practice and Standards as set by the Bank of International Settlements; ISO, PCI-DSS Central Banks and Payment Associations.

Hamman Ferreira, CIO of BankservAfrica presented to a standing room only audience. In this session, he discussed their need for risk reduction and compliance and how the XYGATE suite of products from XYPRO addressed their needs. The key objective for BankservAfrica's implementation was to ensure the safety and functionality of a security measure system through which Administrators, Developers and Testers can connect to any server in BankservAfrica. They also had requirements to track, alert and review all activity on the HPE NonStop server. The XYGATE suite was the solution chosen for this project.

Mr. Ferreira described the installation process this way: "the setup was quick and could all be done in one day". XYGATE Access Control (XAC) provided individual accountability and eliminated the need for shared user IDs. XYGATE Merged Audit (XMA) provided a single repository for all security event data on their systems. XYGATE Report Manager™ (XRM) and XYGATE Compliance PRO™ (XSW) allowed them to generate activity and compliance reports on the fly with a single click. This powerful combination of functionality, simple setup and ease of use of the applications, as Hamman put it, is "The Best Investment we ever made in NonStop Security".

Real Time Security Monitoring

Navy Federal Credit Union

Security intelligence and analytics are no longer buzz words. These are solutions that can minimize the impacts of a breach by identifying it in its early stages. Kelvin Anderson of Navy Federal Credit Union discussed NFCU's experience working with XYPRO's newest security offering, XYGATE SecurityOne® (XS1). XS1 is a security intelligence and analytics platform for the HPE NonStop server. At Navy Federal, the need for proactive, real time monitoring using a single console and getting visibility into activity trends was a long standing requirement. Kelvin described how, working closely with XYPRO, Navy Federal Credit Union was able to quickly

deploy XS1 in their environment and immediately get visibility to anomalous activity. He described multiple use cases that without XS1, would have nearly been impossible to identify and stop. SecurityOne uses NonStop specific indicators of compromise to detect incident patterns before they result in a breach.

Case Study:

How a Credit Card Company Strengthened NonStop Security

Delivered by Chinami Higashibata of DXC Technology, this case study described how credit card companies in Japan have strengthened their security and improved their overall compliance, mainly for the VENUS card system. The VENUS system provides operations and management of billing for cardholders and franchise information for the "VIEW Card". Credit card usage in Japan has been increasing year over year at a healthy pace. In 2016 alone, transaction volume country-wide increased by nearly 10%. With the 2020 Olympics being held in Tokyo, this volume is anticipated to skyrocket, along with the concomitant risks of data breaches and credit card fraud, and requirements for increased processing power and system performance. Compliance with security standards, such as PCI-DSS are critical.

Using a combination of XYGATE Access Control (XAC), XYGATE User Authentication (XUA) and XYGATE Object Security™ (XOS), Higashibata-san detailed how the XYGATE suite was used to achieve PCI-DSS compliance.

From a database performance perspective, Merlon Auto Reload Software (MARS) from Merlon Software was used to ensure database operations continued to work in a high availability, high performance model. The automation of database reloads using MARS reduced manual overhead and error prone user activity, which also reduced costs and business risk.

SQLXpress and MARS News

HPE announced the addition of Merlon SQLXPress and MARS to the HPE pricebook. This allows NonStop customers to purchase and get support for these two products directly from HPE, the same as they would any other HPE product. SQLXPress is a Windows based browser-like interface to NonStop SQL with support for both SQL/MX and SQL/MP. MARS is an impressively easy to use utility for maintaining database performance and health.

A Successful Show

The 2017 version of NonStop Technical Boot Camp had lots of great seminars and workshops for those new to the business as well as industry veterans. It was a great way to end 2017. The feeling all around was that the show was a success. The new venue was a change and it worked out. It was centrally located, the food was fantastic and the views of the San Francisco Bay were breathtaking. There were a lot of creative ideas for the industry and the future looks bright.

Finally, a couple of short notes of appreciation from the XYPRO team. First, a huge thank you to the Connect team for organizing another extremely valuable event; we recognize how hard you work to make these events a success. And, of course, thank you to all the customers and vendors involved, as well as to the HPE staff who dedicated so much of their time to pull the schedule and content together. It was a blast.

NonStop TBC XYPRO presentations are **ready for viewing here**. We're all looking forward to seeing everyone again next year!

Steve Tcherchian
CISO, Director of Product Management
XYPRO Technology

DevOps: The Critical Components

By Randall S. Becker

Background

Jane sat at her desk, glancing at a book involving cheese relocation, glaring at her laptop, and playing email slot-machine. You know, that game where you hit refresh in frustration every few seconds hoping for a good response from someone who hasn't answered you yet. The back-story: A Common Vulnerabilities and Exposures report (CVE) hit a critical infrastructure component in the company's production application across four platforms. Jane was monitoring her email, waiting for the report that the code was fixed and ready for installation. What was keeping her up at 3am? While there was a good process defined for getting the fix to production, the knowledge of where things stood was sitting in the heads of a dozen or so people across multiple departments. Sure, there was a SWAT team distribution list for the issue, but that was not helping calm Jane's nerves, after too much caffeine, not knowing whether her approval was going to be needed in 5 minutes or 5 hours. In her angst, she happened upon an article in the Connection Magazine on DevOps...

DevOps:
What's It All About

DevOps is the combining of development and operations processes and tools into a common framework; or more simply, sharing techniques and tools across departments that do similar things. The idea is that Development – being customers, product managers, developers, QA staff, sponsors, and auditors – coach, mentor, and help provide skills to Operations. Operations – being system administrators, systems engineers, operations staff, release engineers, DBAs, network engineers, and security staff, in turn, guide, and provide process discipline to Development. So, in other words, what we on NonStop already do well, but have not actually formalized it much, yet.

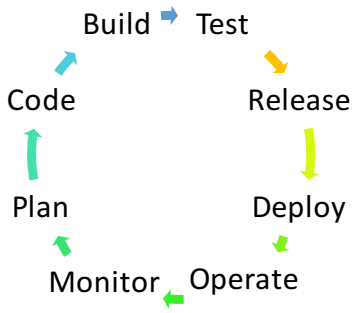
DevOps comes from a few diverse areas to solve the need to reliably and quickly deploy solutions. These include: Lean; Agile; Continuous Integration; Continuous Testing; and Symmetrical Installs. Ultimately, this is about delivery speed, and involves developers, operators, systems staff, processes and even customers and vendors, as primary touch-points in the DevOps world, or everyone who delivers information services.

Ultimately, the cost of manual efforts exceeds the cost of automation.

Continuous at the Core

The common attribute across all DevOps components is continuity; in its many forms: continuity of the flow of information from one process to another; continuous development and integration; continuous testing; continuous releases. Your organization needs to be able to deliver changes from start to end in a fast, repeatable way, so that Jane can know when and how long to sleep.

The alternative is setting up a team for every new project, or formally assigning resources and scheduling them, which involves budgets, approvals, and by the time you're done, a lot more costs to your organization than continuous flows. Ultimately, the cost of manual efforts exceeds the cost of automation.



Tooling up

Just as it is hard to take a shower without plumbing in your home – sure you can use a bucket hanging from the ceiling with holes in the bottom – rapid delivery is highly improbable without having solid infrastructure to execute on your projects. A core principle of DevOps tooling is to share tools between development and operations. Why? So that both groups can speak the same language (and I don't mean Java or C). It is the language of your processes that is essential. Both groups are delivering solutions to your customers, so it is imperative that they understand each other clearly. How many of you out there create run-books for each project that describe how to install and how to start your application, each time you create a release or fix? How much time would you save if this didn't have to happen?

A core principle of DevOps tooling is to share tools between development and operations.

One of the core tools in DevOps is the Distributed Version Control System (DVCS), with the leading one being git. This product has had a massive impact on the Open Source world, allowing Linux and thousands of Open Source components to be built by collaborations of hundreds of thousands of developers world-wide. You can catch up on the Connection Magazine series articles about git in past issues. But a simple recap is this: git provides capabilities that many parts of your organization can leverage, from development, finances, operations, and even aspects of factory floor management:

- **Obviously, version control. This is the VCS part.**
- **Asset transportation. Moving soft assets, including software, documents, scripts, plans, and configurations, from point to point (a.k.a. deployment) with 100% fidelity, without losing needed bits, is a crucial benefit provided by git. Git also plugs into SSH, so the movement of components is done with 100% security as well.**
- **Change monitoring. Another key benefit git brings is the fast awareness of what you have and what you have changed in a specific environment, without regard to location or platform differences.**

Git's capabilities have spawned a large eco-system that streamlines communications between Development and Operations. The GitHub and BitBucket, among others, have packaged increasingly capable servers that started with git, then added issue tracking like Jira, code review systems, and recently automated build and test pipelines including Travis. While the pipelines they support are geared to Open Source applications, they provide exemplary templates for us to use to put together our own plumbing on NonStop with existing solutions from partners.

One recent addition to the git eco-system is the NSGit product, that opens up the NonStop GUARDIAN to DevOps. NSGit adds GUARDIAN-awareness to git, so that code that needs to run in GUARDIAN can be put there easily in the right format, without worrying about conversions or file format issues. NSGit offers methods if adding EDIT and ENSCRIBE files to git in development, and bringing them back into QA and production through its checkout and install methods. This ability significantly reduces the cost and effort, on an ongoing basis that your team has to do manually or tools they have to build and maintain.

One area requiring serious investment is that of automating testing.

What makes git so capable for building out infrastructure like this is the definition of a change and how activities get triggered. Jenkins, for example, uses the commit identifier on the branch it monitors to determine whether there are changes. Because the value of the commit identifier is unique on a world-wide basis, activities do not depend on monitoring something artificial like a version number on a file or a timestamp. This mechanism is built into Jenkins. Complex pipelines can then be built based on job completion or failure, and can include human approval of the results of the job where appropriate. More importantly, systems like Jenkins represent effective documentation of the activities needed to move code from development into production that anyone with access can consult if there are questions about what must happen next, what has been automated, and what requires manual intervention.

One area requiring serious investment is that of automating testing. Of all the parts of DevOps, this area is likely the most expensive and the most beneficial. While the subject has been written about extensively, it remains a mostly unexplored area on NonStop. In the Open Source world, automated testing, particularly regression testing, is another pillar allowing contributions. While git permits contributions to be delivered and integrated, testing tools facilitate their evaluation. As enhancements and fixes are made, the test suites grow. And as many of us have experienced, they sometimes take days or even weeks to run. Despite that, having computers run lengthy exhaustive tests hundreds of times as often as required is far more cost effective than having people follow scripts – although elbow tests can still be enjoyable if you are looking to replace a hated keyboard. There are many partners who have products in the NonStop space for handling automated testing. You can be pretty sure they would love to help you with your needs.

Closing the loop about tooling, we come back to sharing tool sets between development and production. Here is where git (or whatever DVCS you have) becomes crucial. One area that is commonly overlooked in production management is making sure that execution and configuration scripts are managed. DevOps has good advice here – don't just take it from me – when suggesting using the same tools in development and production. Managing your scripts in a repository allows a few great benefits:

- **Version control, so you can go back if there's a problem.**
- **Detecting if a script got changed without a good reason.**
- **Comparing environment configurations.**

This last point has serious relevance when looking at large systems with multiple partitions, environments, and coming soon to a NonStop near you, virtualization. Knowing which environment has what configuration settings is, without doubt, critical to your success.

Conclusion

So, returning to Jane's situation, we need to understand what her need actually is. Well, it's not really about 3am, but knowing whether to be up at 3am in the first place. DevOps sets up the methods of communication that lets people know what is going on throughout the organization. In Jenkins, you get graphical indicators of roughly how far a job has progressed, based on prior executions – so Jane can estimate, roughly, how much longer she might have to wait for the regression cycle to run. She can get email status reports as activities flow through the process. Staying up all night is no longer required – just set an alarm for the approximate time approvals will be needed and try to sleep.

But there a snag, and this is an area where DevOps researchers are active. While git repositories and installation records can tell managers where things stand on a moment to moment basis, dashboards are currently limited in their capability and typically present granular views that are geared to managers of individual teams, rather than across the whole environment. That leaves space for the frustrating games of email slot machine when urgent fixes need to be monitored. It also keeps people who like status meetings happy. Where we're going in DevOps is an area called Command and Control, where high-level views of the organization are integrated into DevOps dashboards that directors and executives can use for corporate situational awareness. Stay tuned for more evolutions in DevOps.

For more information on how DevOps can streamline your time-to-market, contact the author at rsbecker@nexbridge.com. For NSGit, please contact sales@comforte.com or the author.

Mr. Becker has been a frequent contributor to Connection Magazine including articles on git, DevOps, ITUGLIB updates, and the general topic of Modernization. A long-time NonStop OSS and GUARDIAN, Randall is responsible for maintaining many Open Source ports on NonStop and designed the ITUGLIB DevOps processes. Randall is also the creator of the NSGit product. You can-contact him at rsbecker@nexbridge.com or +1.416.984.9826.

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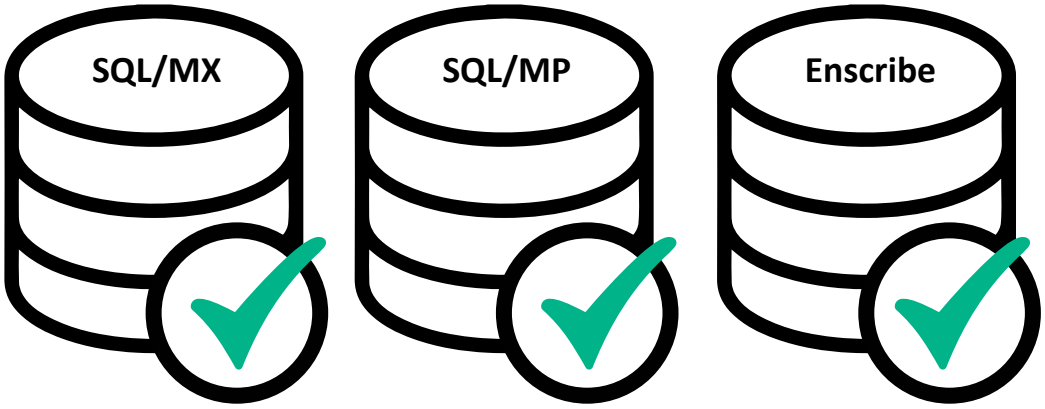

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Back*for*More

Richard Buckle // CEO // Pyalla Technologies, LLC.

I am often asked about how well NonStop is doing as a business just as I am asked, with an almost casual aloofness, are there still enterprises running NonStop systems? And my response to both has followed similar lines – new logos being added, with a product line that has expanded from just a single product to three and yes, a vendor community that continues to invest and to find new ways to bring even more value to NonStop. For the NonStop community, this response isn't surprising but to the broader IT market, after years of NonStop being "the best kept secret" and dominating the "systems of engagement" niche, NonStop remains among the most robust and reliable systems available today.

Decades ago, those working in networking often remarked that the then industry-standard mainframe SNA protocols were robust enough that customers could deploy them over barbed wire. Not to be outdone, it was left to the BBC to report on December 13, 2017, that a company succeeded with "a broadband connection work over 2m of wet string." This small British internet service provider then explained how, "To be honest it was a bit of fun, which one of our techies decided to try out - we have equipment we could test in the office, and why not?" Adrian Kennard, the internet provider's director, told the BBC during that interview. "There is no commercial potential that we are aware of." And yet, here we are – prepared to see if today's modern protocols could match what was somewhat light-heartedly predicted for network protocols all those decades ago. Robustness still counts and nothing is more robust than a server that doesn't fail, barbed wire and salt water not included.

However, as we begin to look forward at what may transpire for NonStop in the coming year, there is little need for deliberation over what NonStop has done in the past given its tremendous track record as a fault tolerant server. However, what is being discussed is whether NonStop will be able to grow even more pervasive given how wide the niche it has called home for so long is becoming to include much of what any modern enterprise needs to address – true 24 x 7 x 365 operation. "If you're an enterprise CIO, you have lots on your to-do list – including AI (analytics and machine learning), cybersecurity and continuous delivery," the President and CEO at Compuware wrote in a post to LinkedIn. "So to keep pace with market innovation you must aggressively evolve both your systems of record and your systems of engagement in tandem."

Few within the NonStop community would argue with the three items O'Malley listed on the CIO's to-do list, as they just as readily apply to NonStop. However, given that the theme of this issue of The Connection is Transform your NonStop perhaps the single biggest consideration for any enterprise CIO will be whether they have any appetite to run NonStop across shared-nothing virtual machines. When it comes to aggressively evolving your systems of engagement, virtualized NonStop may be the upgrade you need to consider as a priority. The very idea that NonStop could provide the same level of fault tolerance whether it runs on virtual machines or on traditional NonStop servers surprised many – the only remaining surprise for 2018 may be who will be the first to deploy it in production. Transformation from traditional to virtual is indeed going to be watched very carefully and as much as NonStop development champions the L-Series leveler in terms of compatibility across both traditional and virtual, the NonStop community will be watching early outcomes very intently. As important as virtualization will be for the NonStop community no discussion on transformation would be complete without referencing hybrid IT – the primary path from traditional to clouds and software-defined everything. Hybrid may have its roots in clouds, but today hybrid is part of the equation when looking to embrace clouds as part of enterprise IT.

In talking with my clients it is clear that most of them are complementing their investments in NonStop with investments in open systems. You want to run on NonStop and Linux, for instance; it's not a problem as these clients have offerings for both. Indeed, since the Partner Symposium in May, more than one client has begun considering how to break apart their product offerings to have components running on NonStop even as other components are running on open systems. Sometimes it's because of the flexibility inherent within the product offerings whereas in other instances, it comes down to the languages being used with those vendors developing in Java seeing a lot of advantages to evolving their product offerings this way.

"When it comes to transformation it isn't solely for NonStop users looking to bring in clouds," noted DataExpress CEO, Billy Whittington. "For vendors like us with significant investment in Java, we are now giving serious consideration to running our DataExpress Open Platform on the NonStop Linux partition which supports Java and have it become a front-end to DataExpress NonStop. We see this configuration as being beneficial not only for traditional systems but where there is a need to move files into virtual machines. We continue to be impressed with the robustness and flexibility of NonStop and it never ceases to amaze us whenever we see new life being given to NonStop. And we are not alone in being amazed as our vendor partners all express equal surprise tinged with a degree of relief – the investments that continue to be made in NonStop by the vendor community look to be safe for 2018"

As we continue to talk about transforming our NonStop there is little need to further debate the value proposition of NonStop particularly when it comes to attracting additional solutions to NonStop. If the widening of the niche happens as expected, there will be even more NonStop systems deployed and we will not be discussing the addition of twelve or fifteen new logos but as many as fifty and solutions vendors will find that hard to ignore. What we do have to talk about is the role we all want to play in communicating this message to the wider enterprise market and for that to happen, it is up to us to transform right alongside of HPE and NonStop and that is perhaps the single most important aspect of how best we can help transform NonStop in 2018.

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