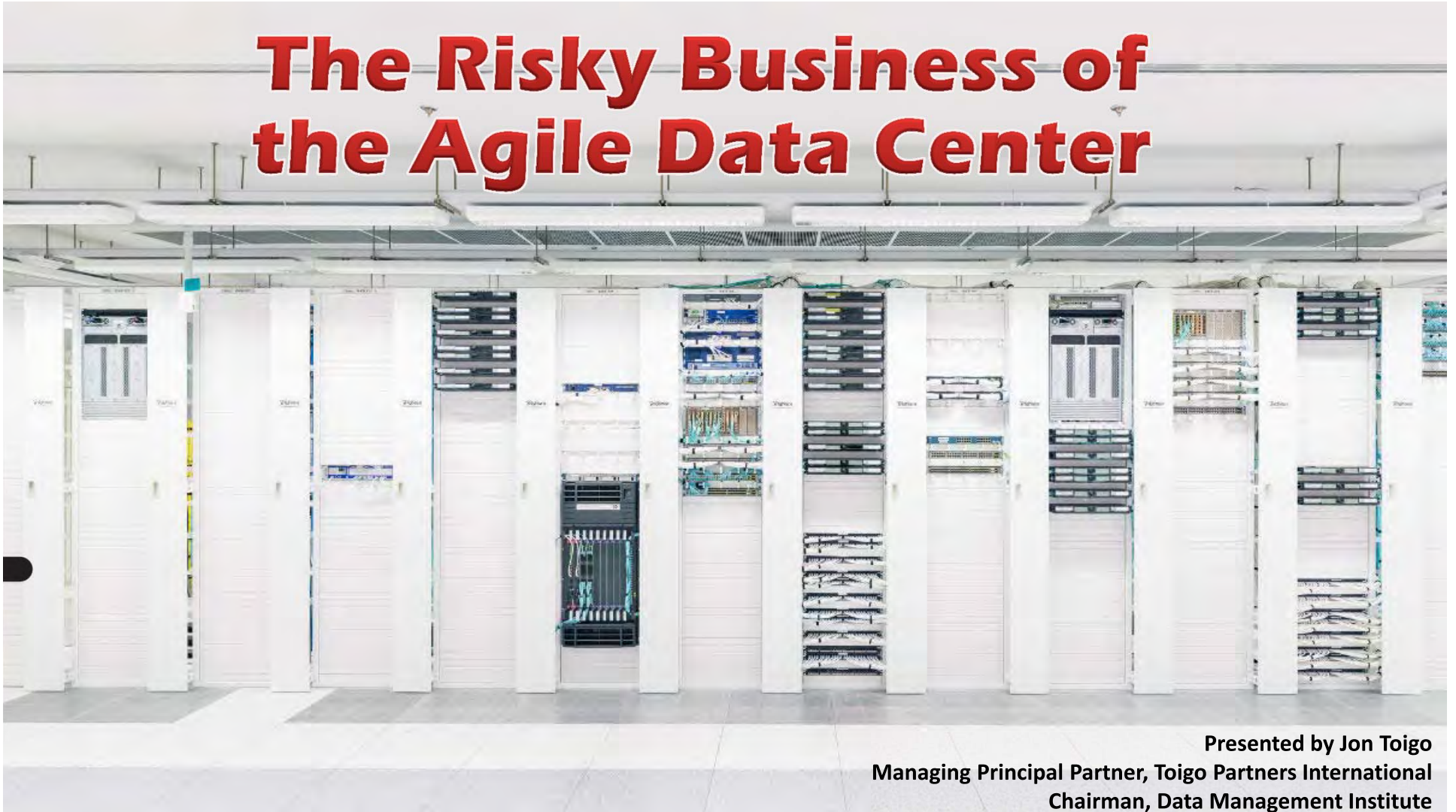


The Risky Business of the Agile Data Center



Presented by Jon Toigo
Managing Principal Partner, Toigo Partners International
Chairman, Data Management Institute

Agile?

- Who doesn't want one of those?
 - Fast allocation of compute, network and storage resources to changing workload requirements
 - Secure data accessibility that supports burgeoning user/client mobility
 - Multi-tenancy with workload insulation for resource utilization efficiency
 - Resiliency and availability that meets zero downtime requirements of “always on” applications



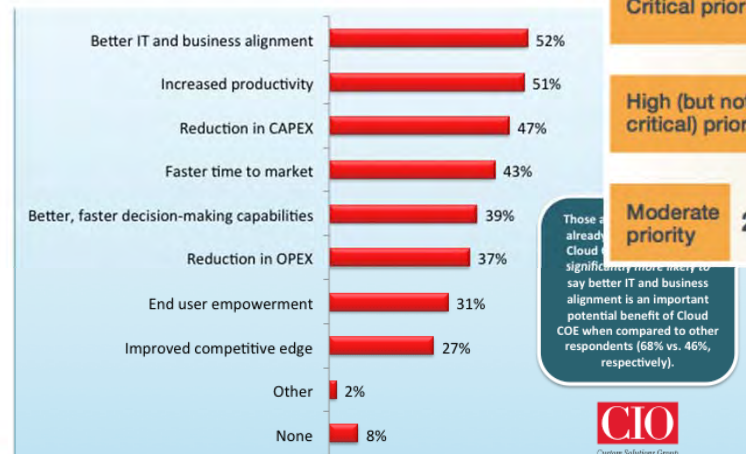
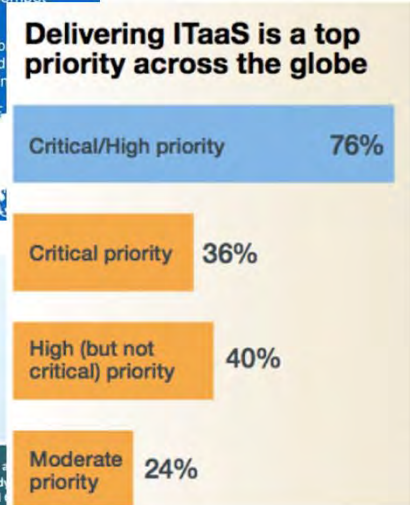
Technology Advantages



Business Impact

The Message Resonates...

- Media and analyst community have jumped right in...



This research comprised of 106 director-level title and above business & IT decision-makers was conducted among the CIO magazine audience by IDG Research Services, a third-party research firm.

Requires a “Sea Change” in IT Architecture



Google

Floating Data Center



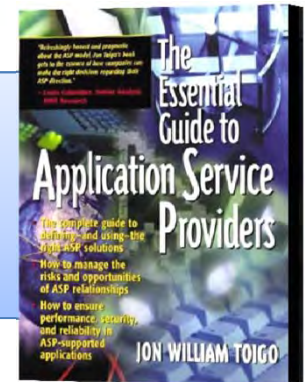
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Like *Déjà Vu* All Over Again

- 1980s Service Bureau Computing
- 1990s Application Service Providers/ Storage Service Providers (ASPs/SSPs)
- 2000s Public Clouds...



Key Finding: While we can outsource routine tasks and workload, outsourcing problems rarely works – a lesson we must re-learn after every economic downturn...



Is This Really New?



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Agile Data Centers Sound A Lot Like Mainframe Data Centers...



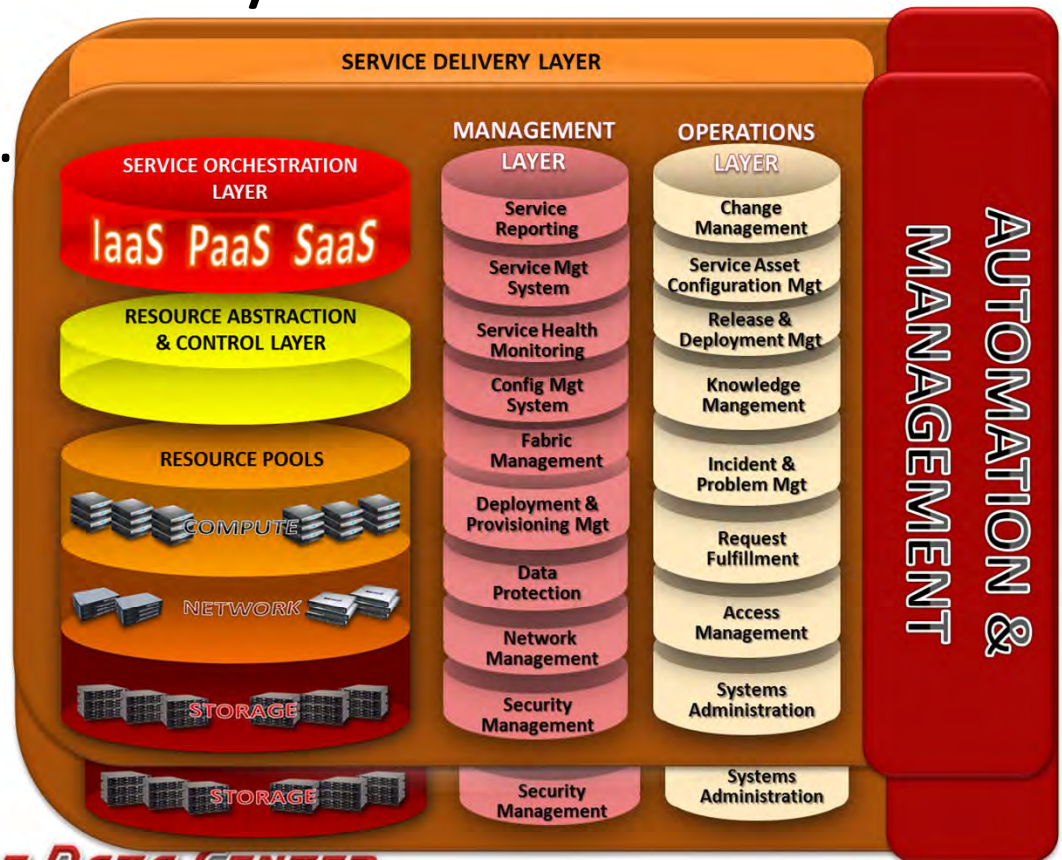
By every popular definition of what a cloud is...

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Does Agile Mean HW/SW or Process?

- The NIST Definition...
 - Provision
 - Control
 - Manage

NIST
National Institute of
Standards and Technology
U.S. Department of Commerce



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The Issues Remain the Same

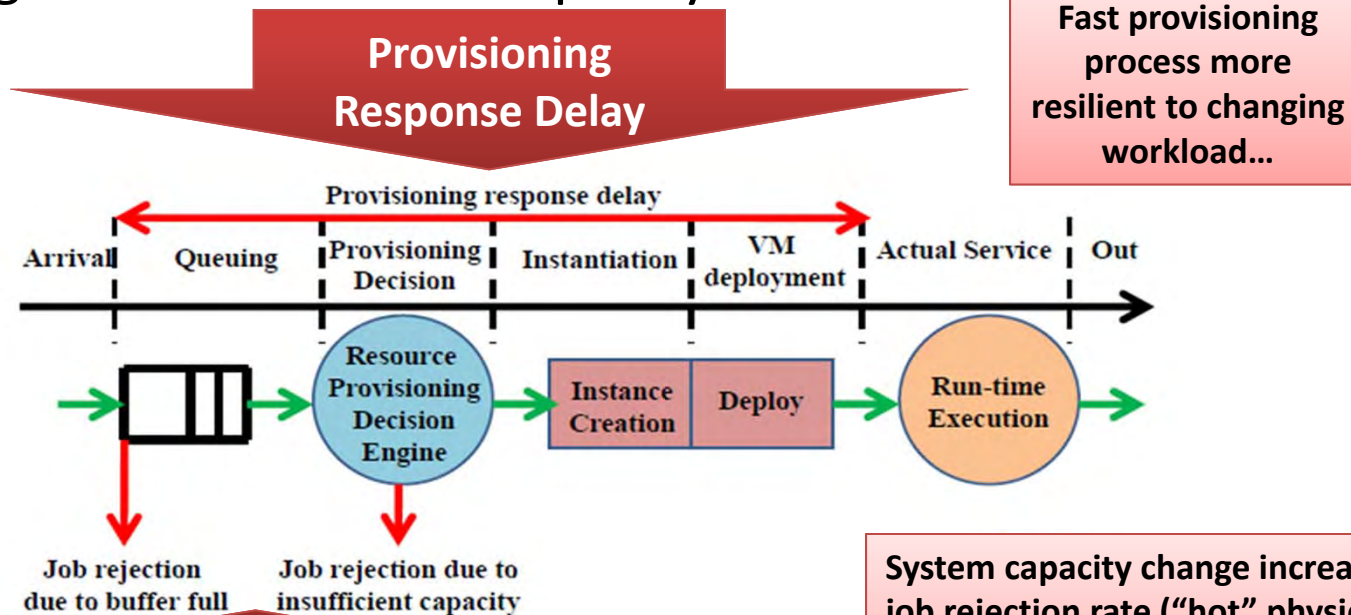
1. Process information accurately and correctly, and cost-efficiently
2. Make services resilient, predictable and flexible
3. Ensure availability: Protect against interruption events/contain impact of interruptions that cannot be avoided



1.2.3

Resiliency Refers to Service Consistency in the Face of ...

- Changes in demand and capacity...




Fast provisioning process more resilient to changing workload...

System capacity change increases job rejection rate ("hot" physical machine removal has biggest impact)

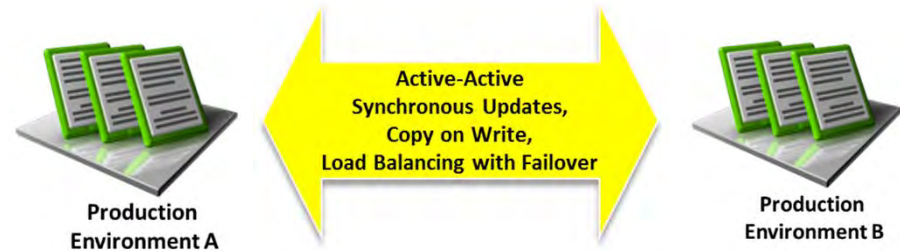
Job Rejection Rate

High Availability Also Has Folks Confused...

- “High availability” thought to mean zero downtime
 - HA refers to the product of all the individual availabilities of a group of components
 - Applied to clouds, HA interpreted to mean “virtualized N+1 actively clustered pairs” providing non-stop availability
- Not true.



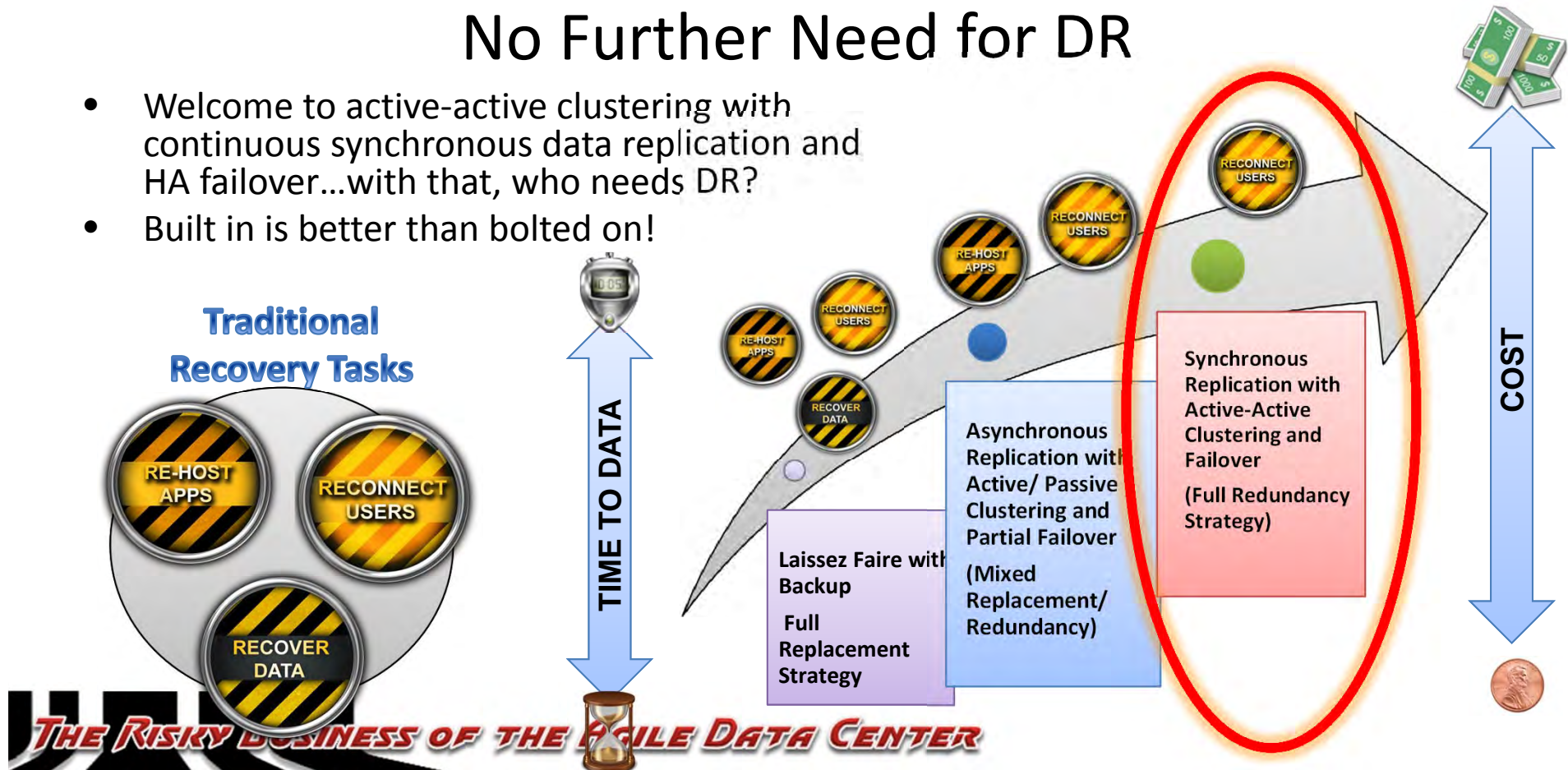
MENU				
	Total downtime (HH:MM:SS)			
Availability	per day	per month	per year	Price
99.999%	00:00:00.9	00:00:26	00:05:16	\$\$\$\$
99.99%	00:00:09	00:04:23	00:52:36	\$\$\$
99.9%	00:01:26	00:43:50	08:45:57	\$\$
99%	00:14:24	07:18:17	87:39:30	\$



Trigger event re-balances load, shifting it to the remaining environment.

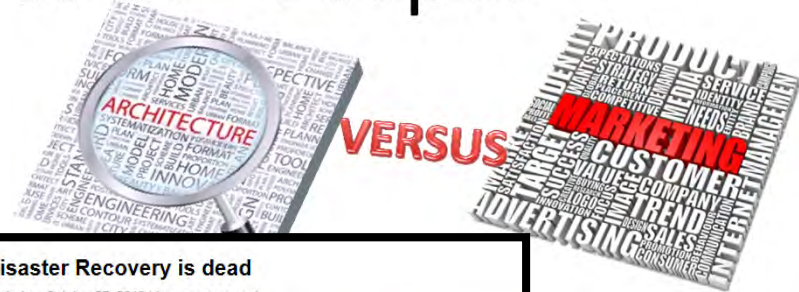
Evangelists Argue the HA is Built In; No Further Need for DR

- Welcome to active-active clustering with continuous synchronous data replication and HA failover...with that, who needs DR?
- Built in is better than bolted on!



Echoed in the Press as “Gospel”

- Logical fallacies are going unchecked
 - Now that “workload runs largely in Flash cache” or
 - “We use our hypervisor and server-side storage for clustered data replication and data protection”
- HA trumps DR



Setting the Record Straight

- Five things to remember when pursuing your agile vision...



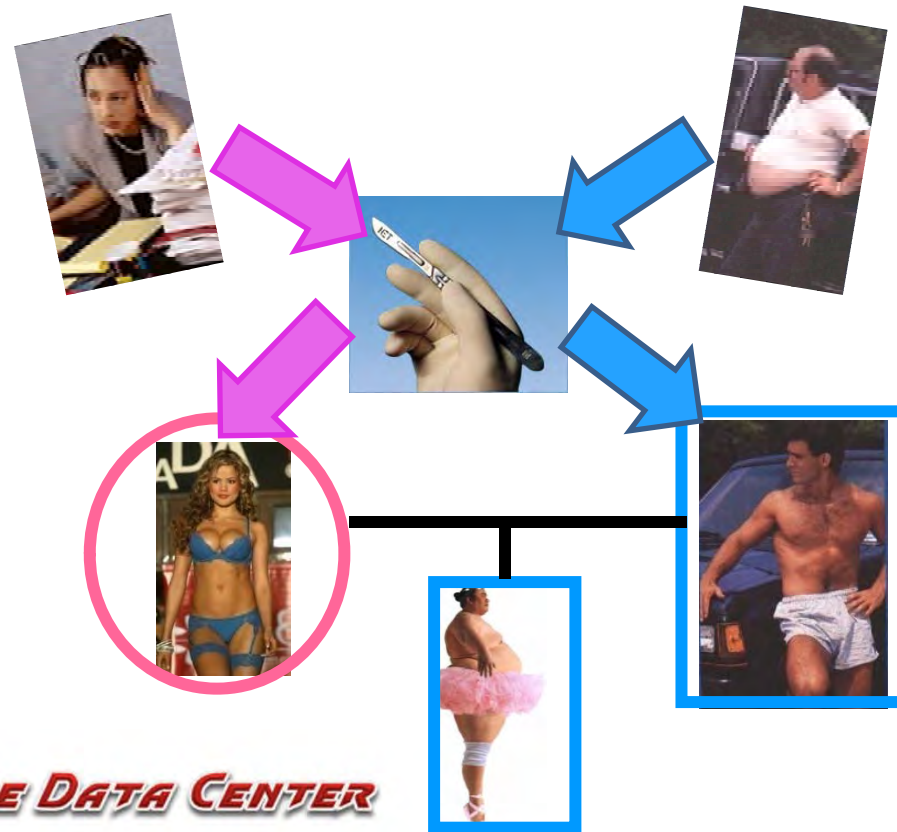
#1: Virtualization Doesn't Solve Hardware Issues, It Just Masks Them From View



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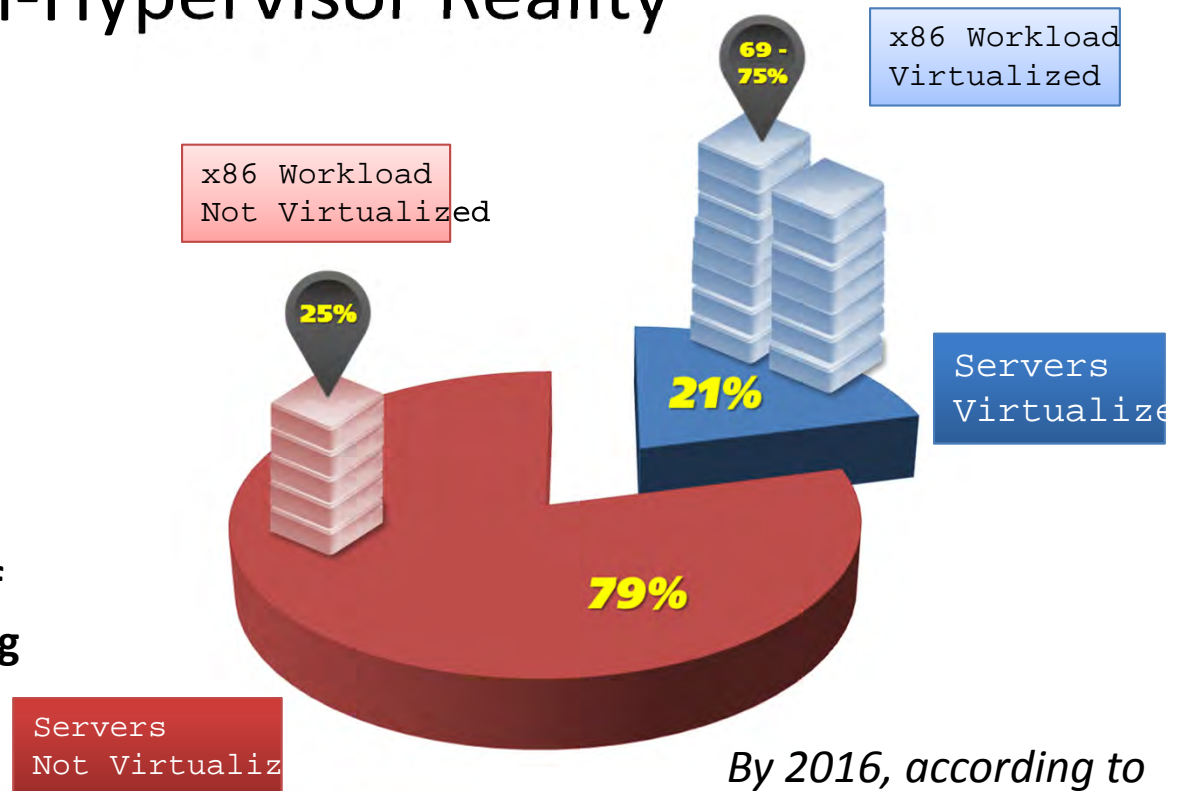
Server Virtualization Hype Doesn't Change Basic Realities...

- Deploying applications under a hypervisor is similar to getting plastic surgery...



Chances Are You Will Soon Be Coping With a Multi-Hypervisor Reality

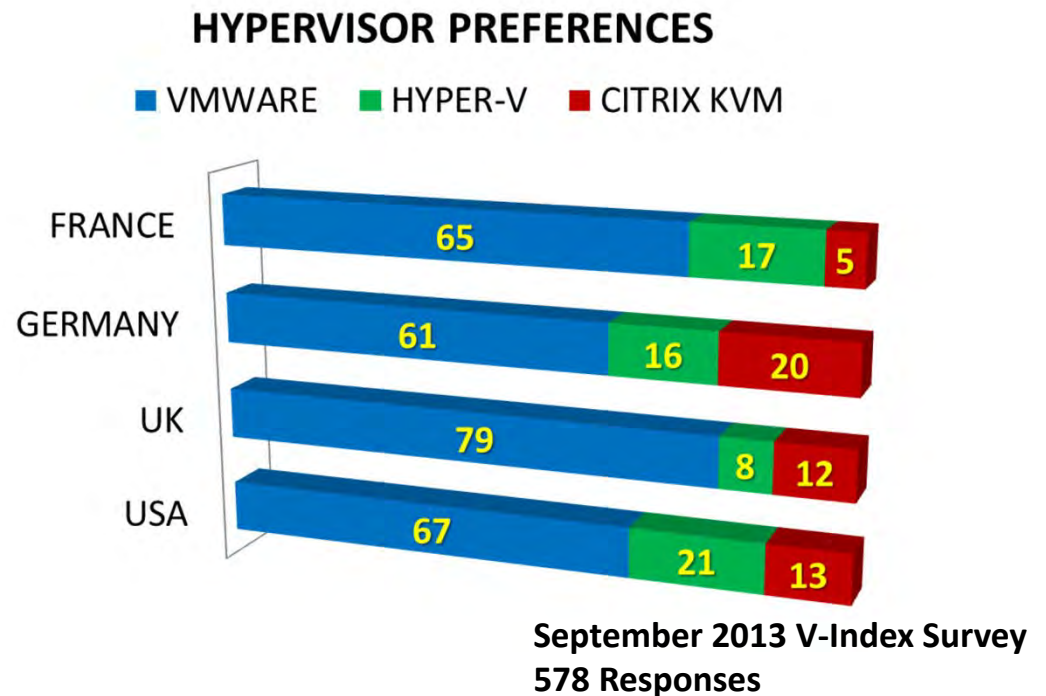
- According to leading analysts, by 2016, 68 to 75% of x86 workloads will be virtualized...
- They will run on the 21% of physical servers that are running hypervisors
- The remaining 27 to 29% of workload will run on 79% of physical servers NOT running hypervisors...



By 2016, according to IDC and Gartner...

Confirmed by Surveys...

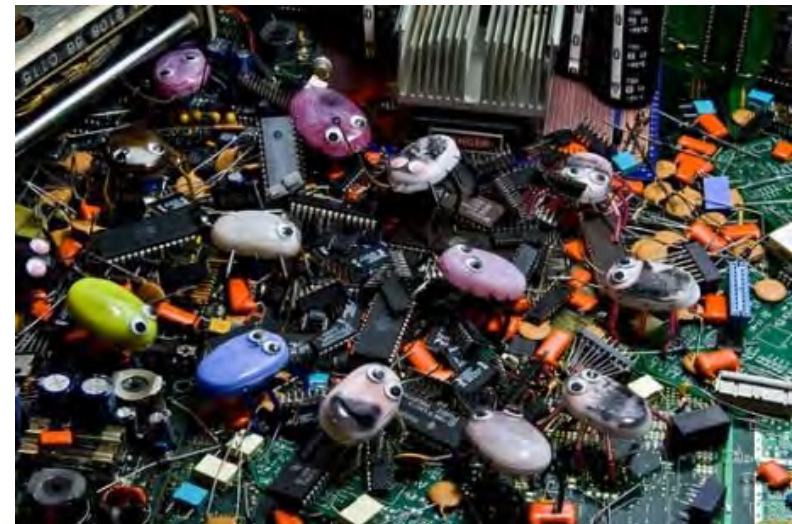
- VMware reportedly leading server hypervisor, but...
- According to recent survey data, **38% of firms virtualizing their servers plan to change hypervisors this year, citing cost as the key issue...**



<http://meship.com/Blog/2011/11/07/primary-server-virtualisation-hypervisors/>

So, Hypervisor Computing is No Panacea...

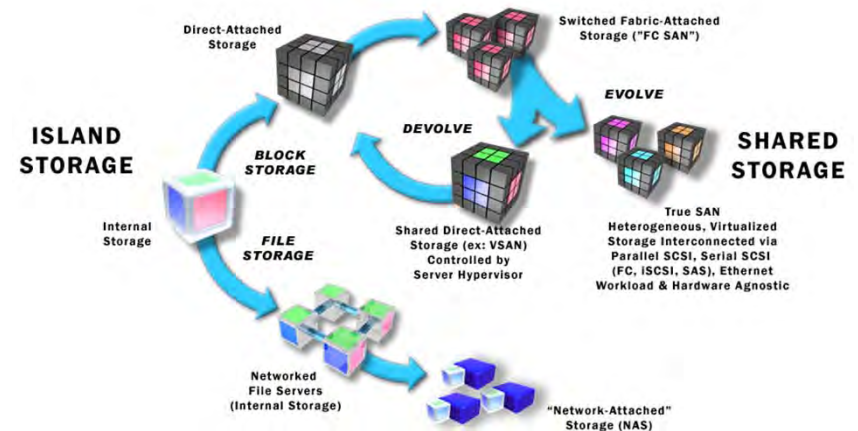
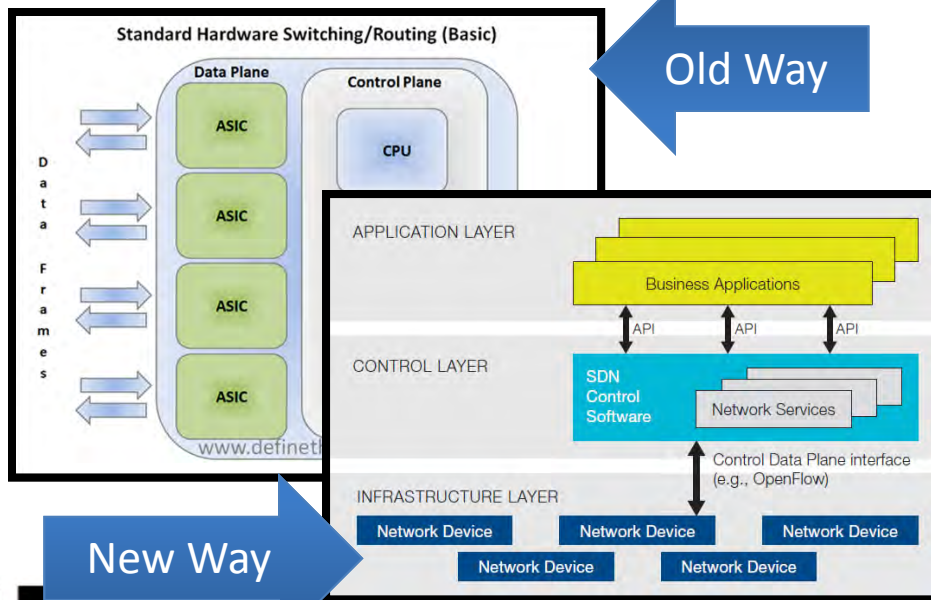
- It may, in fact, complicate recovery planning rather than simplifying it...



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So, too, Software-Defined Networks and Storage...

- Software-Defined Networks are still a work in progress...
- Lack of agreement on what constitutes Software-Defined Storage....



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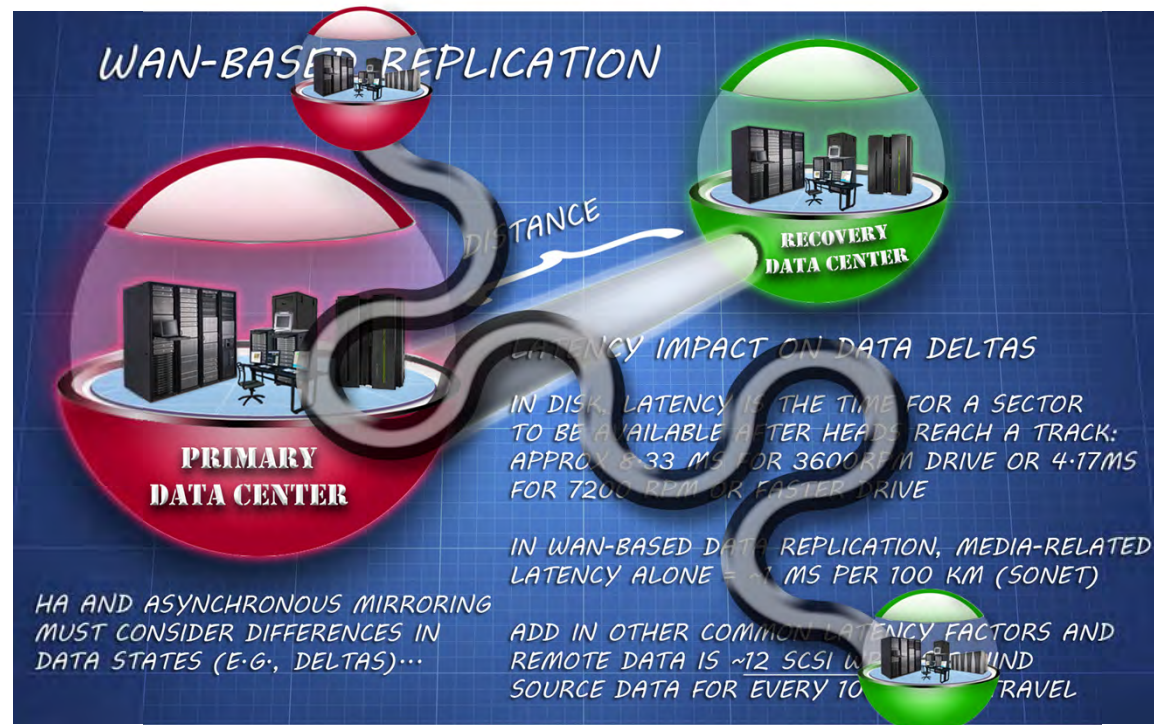
Bottom Line

- We are still struggling with different ideas about resource virtualization, technology in flux...
- Calls in to question the stability of the underlying infrastructure
- And increases the need for protection...



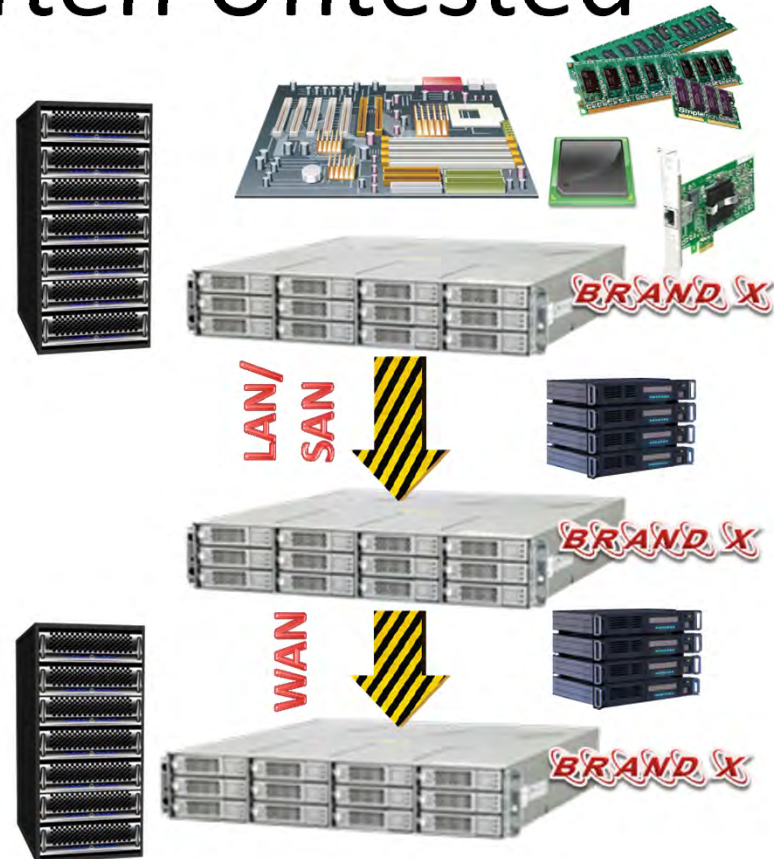
#2: “Replicate Everything Across a WAN” is Not a Recovery Strategy

- Prerequisite for HA failover via Active-Active or Active-Active clustering
- But subject to problems of physics...and cost!



Mirrors Too Often Untested

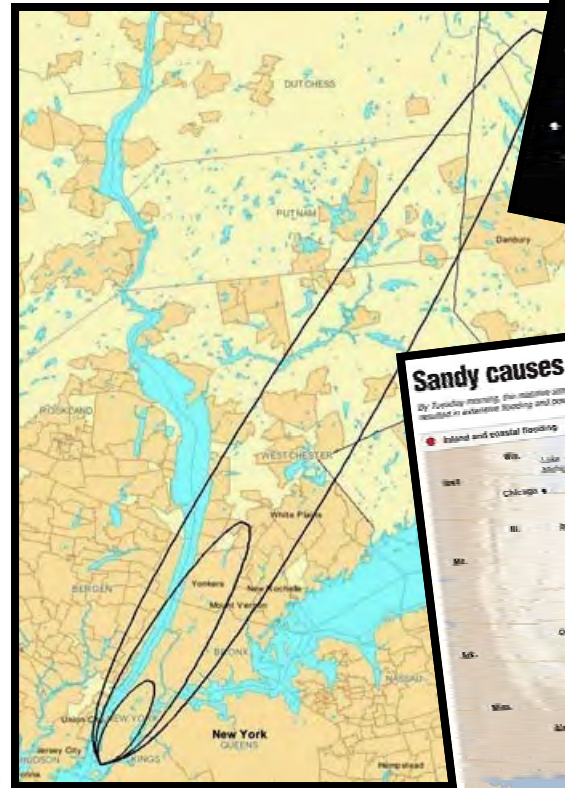
- Expensive to set up...
- Challenging to quiesce and test...
- Difficult to manage and maintain...



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What is a Safe Distance?

- Just making a data copy is not data protection
- Data copies need to be placed at sufficient distance from originals so as not to be consumed by the same disaster event...



DIRTY BOMB

- A conventional explosive that scatters radioactive materials
- Radioactive potency varies depending on material used
- Designed to induce terror as much as personal injury

Sandy causes widespread havoc

By Tuesday morning, the massive storm known as Sandy whipped most of the eastern part of the country, where coastal flooding resulted in extensive flooding and power outages.

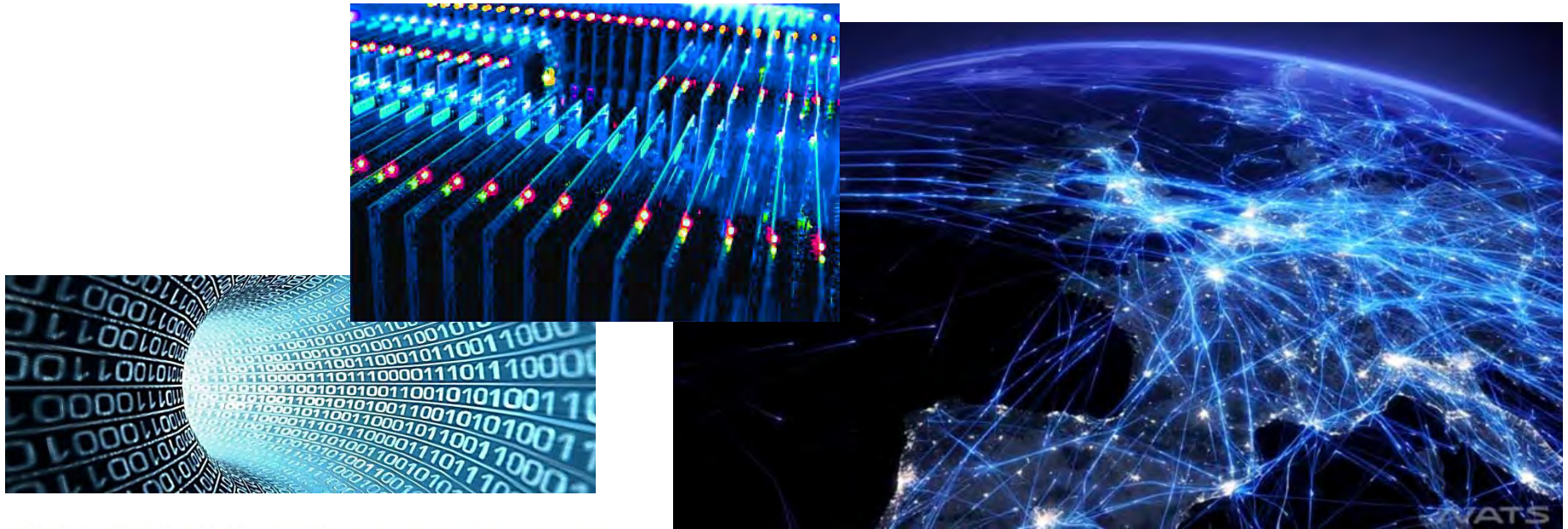
Island and coastal flooding

A map of the United States showing the path of Hurricane Sandy. The storm's path is indicated by a red line starting from the Caribbean and moving north along the East Coast. Red dots along the coast indicate areas of island and coastal flooding. Major cities like New York, Washington D.C., and Boston are marked. The map also shows state boundaries and names.

Source: USA, NASA, National Weather Service, Environmental National Hurricane Center, US Coast Guard, NOAA, Google Earth
© 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100

And What Happens to “Data in Flight?”

- Or in buffers waiting to be sent...



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Is Your Cloud Really Safe?



Hope the Bed Bugs Don't Bite...



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#3 All Data is Not The Same

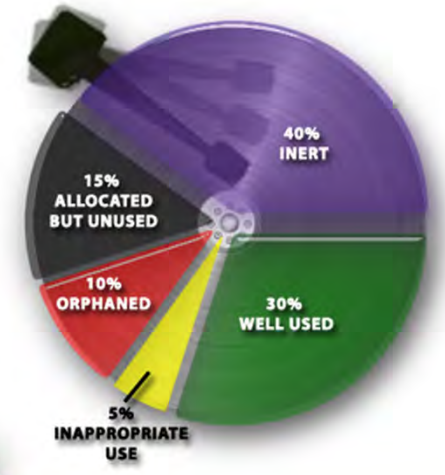
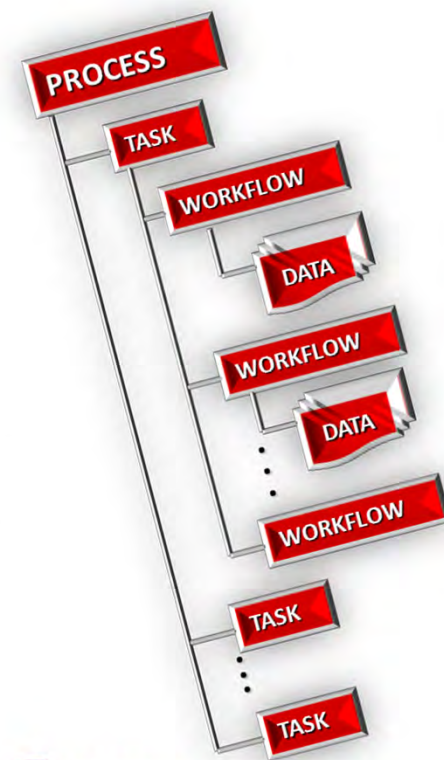
- Data inherits its criticality like DNA from the business process and application that it serves
 - Whether the app is virtualized or not...
- So, one method of data protection and disaster recovery planning does not fit all data...



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Doing DR Right Requires Data Management...

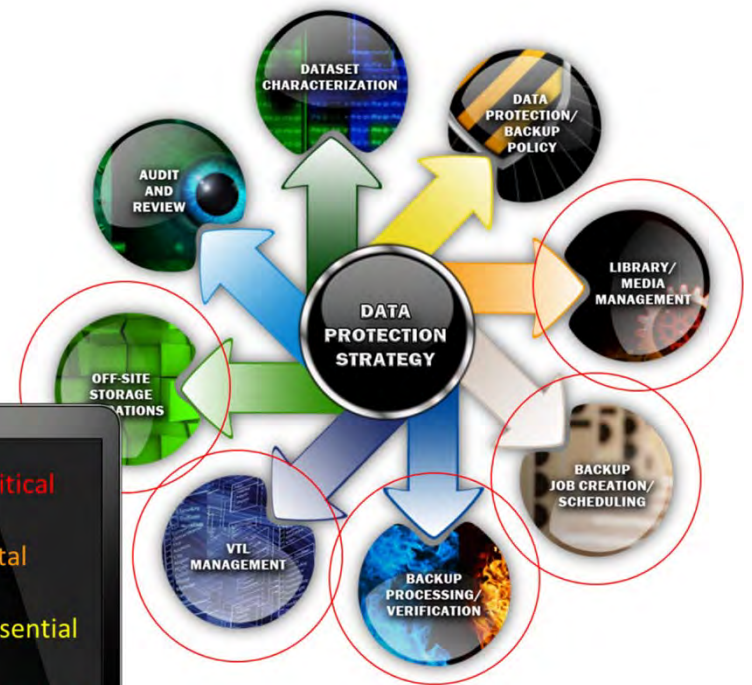
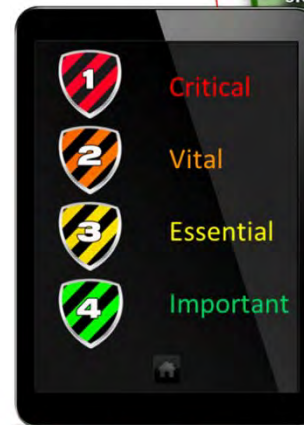
- You are going to have to sort the junk drawer of storage...
- Apply some data hygiene and archive technology and you will reduce your backup and/or mirroring workload to just the data that requires it...



Source: *Making IT Matter* (Toigo, 2011 at MakingITMatter.com)

Enabling a Business-Savvy Data Protection Strategy

- That applies the right protection services at the right cost to the right data assets supporting the most critical business processes...



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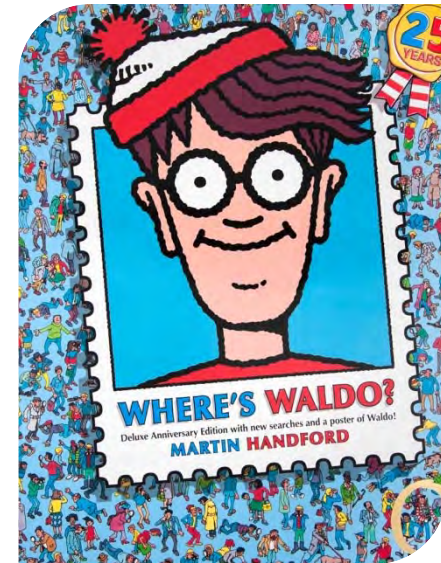
#4 Make Sure You Have All of the Data Required For Recovery...Duh!

- Some folks think data protection/recovery are different in a virtual world...
 - The VM container has everything you need to recover the application and workload on a different machine...
 - Golden dream: copy VM disk files somewhere safe for “instant restore”
 - So, all of the hard work of data protection goes away



Does the VM “Disk” Contain Everything You Need?

- Depends on how the VM is hosted
 - Internal or DAS storage connected to server
 - Volume from shared storage infrastructure such as NAS or SAN
 - Virtual volume presented by storage virtualization engine
- What about VM metadata, hypervisor configurations, application interrelationships, support software/utilities, backup software? Are we capturing everything required?



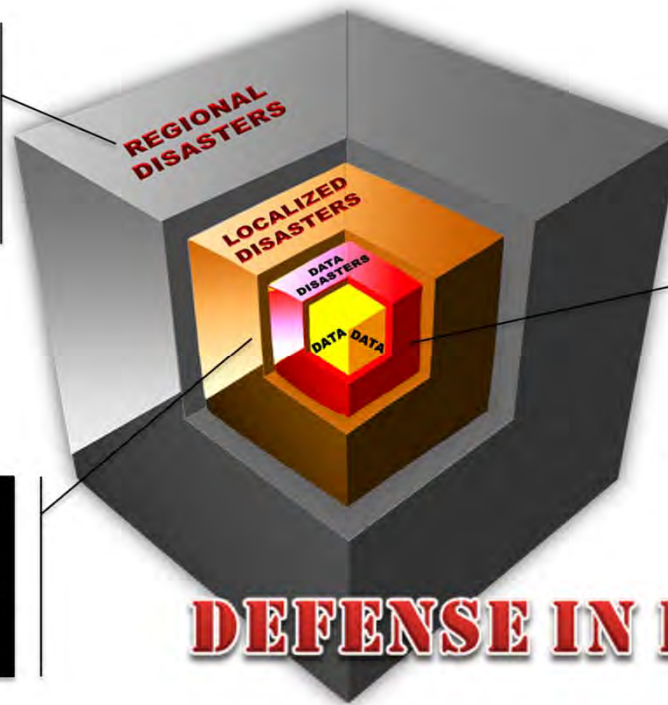
And #5...

- Getting to a highly available “agile” infrastructure requires...

Regional Interruptions caused by natural and man-made disasters

Localized Interruptions involving equipment and facilities

Data corruption or deletion due to viruses or malware, application and user errors



DEFENSE IN DEPTH

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Reflecting the Diversity of Threats...



5%

VS



55%

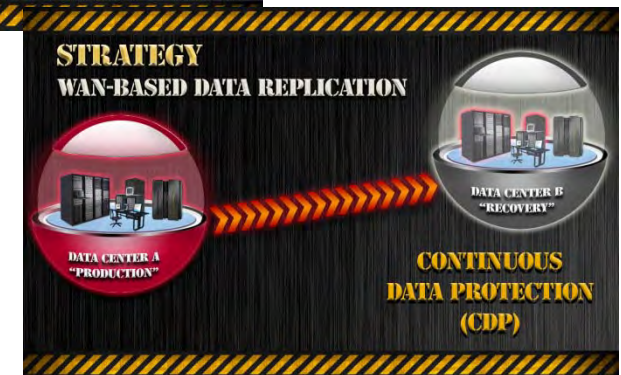
(40% of Downtime is Scheduled)

The Diversity of Assets...



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And the Diversity of Protective Techniques and Services Available...



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And, Yes, There May Even Be Cloud Services in the Data Protection Mix...



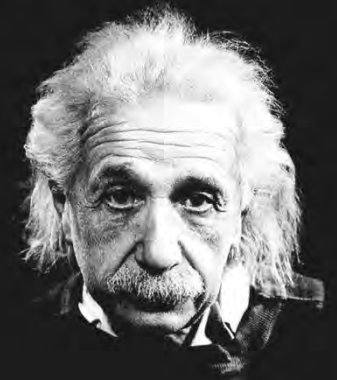
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Conclusion

- It would be silly to argue that agile software-defined data centers eliminate the need for conventional business continuity/disaster recovery planning
- Agile, by definition, introduces new technology and new processes that place data center services at risk
- And you can't argue with Einstein...

**“Everything should be made
as simple as possible,
but not simpler.”**

- Albert Einstein



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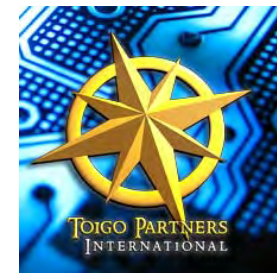
Thanks.

- We all hope that agile technology will deliver, but hope is not a strategy. Preparedness is.
- Questions?

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Twitter: [@jontoigo](https://twitter.com/jontoigo)

Blog: DrunkenData.com



More Interviews and Webinars
With Industry Big Brains
Planned for September
At IT-SENSE.org

STAY TUNED

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