Big Data for Better Datacenters



Balaji Parimi

@vimAPIGuru

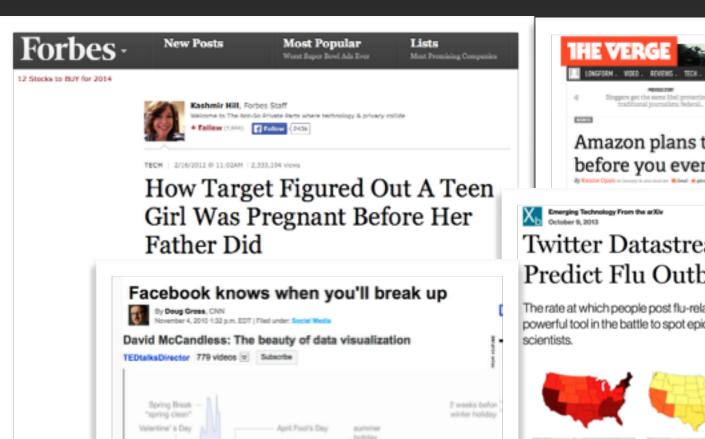
Krishna Raj Raja

@esxtopGuru

Strata 2014, Santa Clara

World Today

"too cruel"



This chart tracks relationship trouble via Facebook status updates, which show a spike of breakups in the spring

Bloggers get the same libel protection as Lightroom for IPed briefly appears on Adsite before being pulled Amazon plans to ship your packages before you even buy them Twitter Datastream Used to Sed on Predict Flu Outbreaks Mile lau The rate at which people post flu-related tweets could become a powerful tool in the battle to spot epidemics earlier, say computer Back in 2008, Google launched its now famous flu trends website. It works on the hypothesis that people Mary or make more flu-related search gueries when they are suffering from the illness than when they are healthy. So counting the number of flu-related search queries in a given country gives a good indication of how the virus is spreading.

The Irony

October 25, 2011, 2:45 PM

Article Tools 🚔 🖂 🚮 🖫









The crash is at least the third outage for the newly redesigned e-commerce site.

New Posts

TECH | 7/02/2012 @ 7:37AM | 8,376 views

Most Popular

Lists

Vic

Thad Rueter Senior Editor Topics: Alerthot, Amazon, AT& 12 Stocks to BUY for 2014 site crash, site outage, site peform

Eastman, Target, Target.com

The gods of online retail continue to punish Target Corp., as the chain's recently redesigned e-commerce site crashed again today.

The outage marks at least the third time the new site has crashed since its August debut. The site also crashed less than two weeks ago, after which Steve Eastman, president of Target.com, stepped down to "pursue other opportunities," according to a statement from his former employer.

A Target spokesman confirmed the site went down today at 11:50 a.m. Central time. "We are working diligently to bring the site back online and to ensure that it is operating efficiently," the spokesman says. "Target strives to deliver an exceptional guest experience in our stores and online, and we regret the inconvenience to





to make the most of our new site: read your password made a new account em all about whet's new



The canine mascot in I



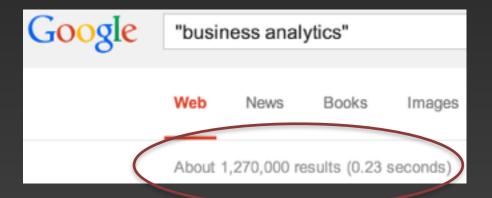
Cloud Computing Forecast: Cloudy With A Chance of Fail

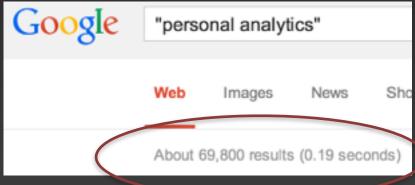
@ @ @ 9 comments, 5 called-out

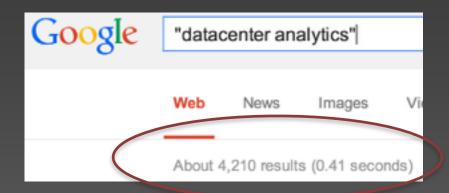
+ Comment Now + Follow Comments

Amazon's Cloud service is having a bad a couple weeks. For the second time in as many weeks Amazon's East Coast cloud crashed during a severe storm that left 1.3 million in the Washington D.C. area without power. The outage brought down numerous high profile web sites hosted on Amazon including Netflix, Instagram, Pinterest, and Heroku. Making things worse was the fact that other cloud services hosted in the area experienced no downtime.

Analytics







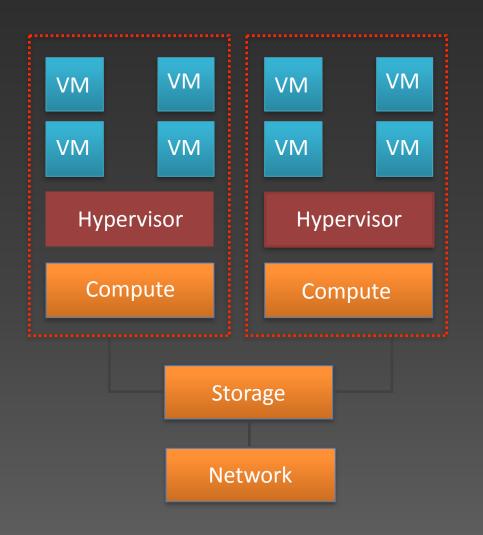
Application Application OS OS Compute Compute Storage Storage Network

Networking becomes mainstream

No effective means to pool storage and compute capacity

100s of silos to manage

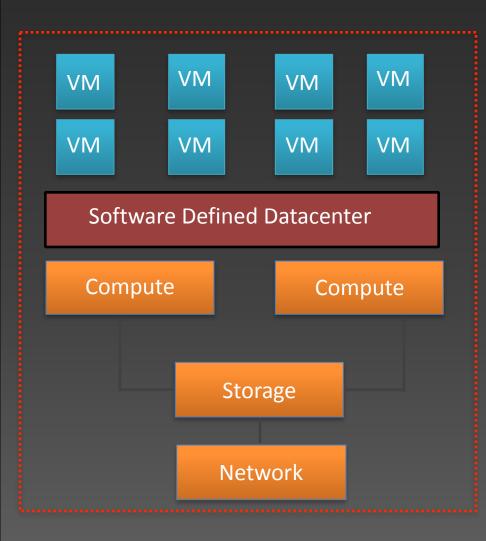
2000s



Virtualization becomes mainstream

Improved resource pooling

Increased utilization



Cloud has become mainstream

Centralized management

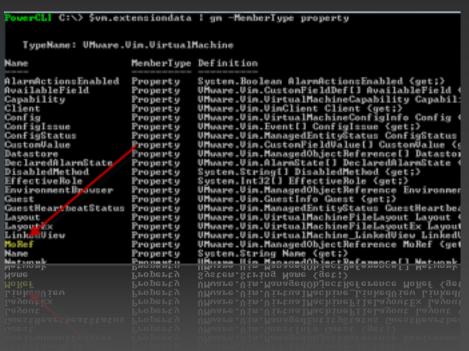
70% of all the x86 OS instances run in virtual machines, 80% by 2016

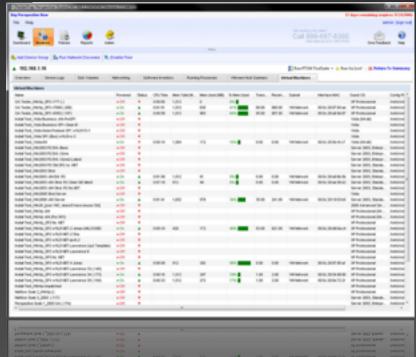
- Gartner (2012)

Data Centers Have Evolved But IT Operations Has Not

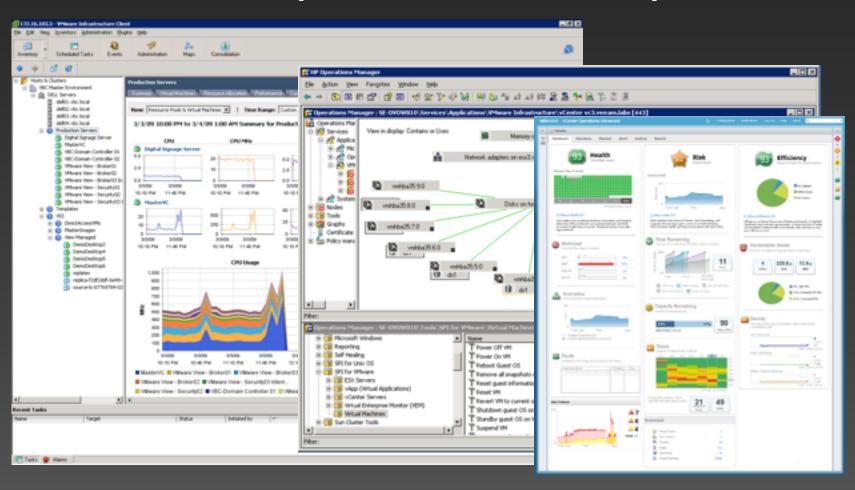


Retrofitted

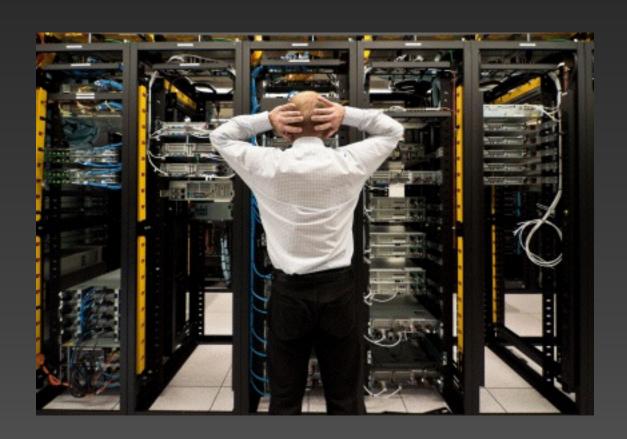




Tedious



Paralyzing



Lot of Guesswork!

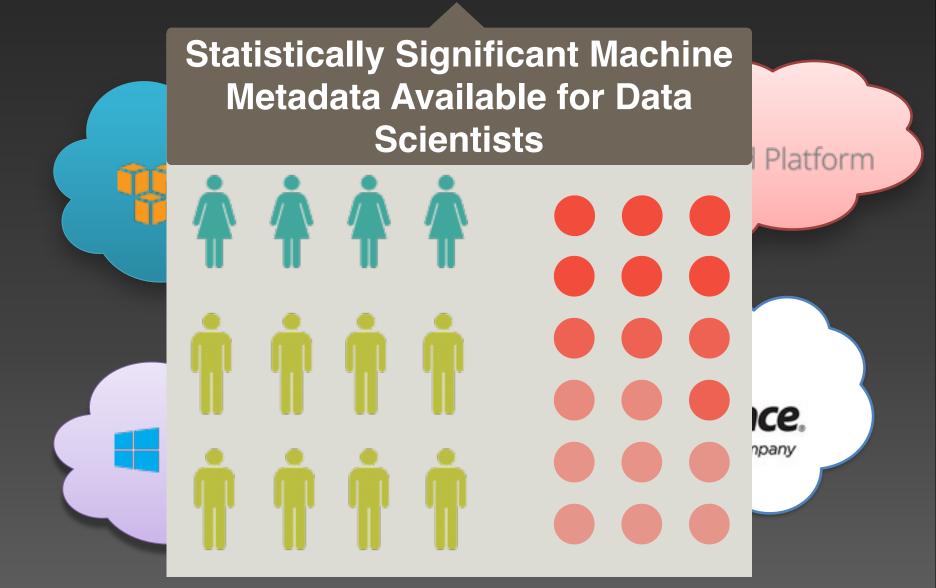
IT Operations Should Be Data-Driven,

"Intuition and Guesswork"

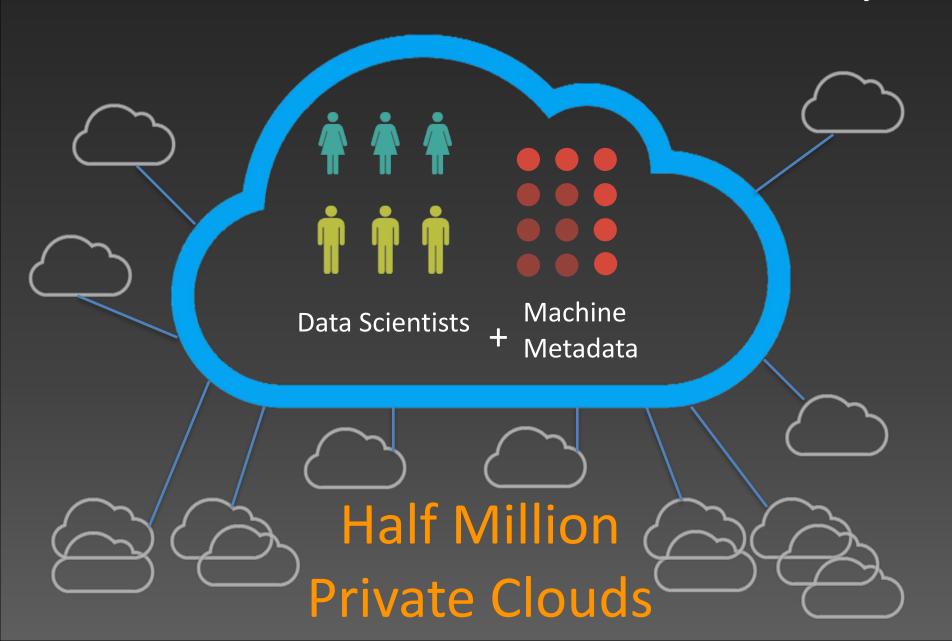
Should be Replaced By

"Analytics and Predictive Intelligence"

Datacenter Efficiency



Can Private Clouds Match The Efficiency?



Operational Metadata Per Day

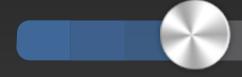


1 Billion Data Points

25GB

Massive Scale





60 million tweets





2.5 billion pieces of content

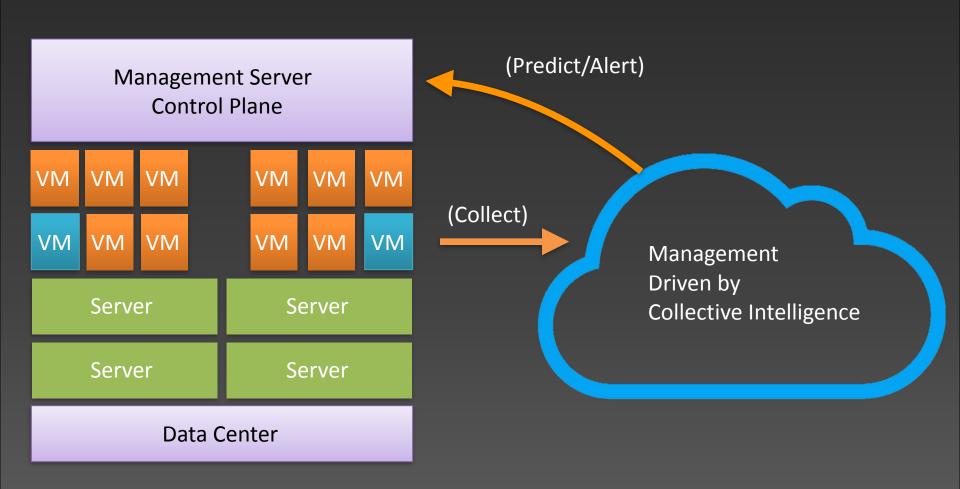
500,000 Datacenters

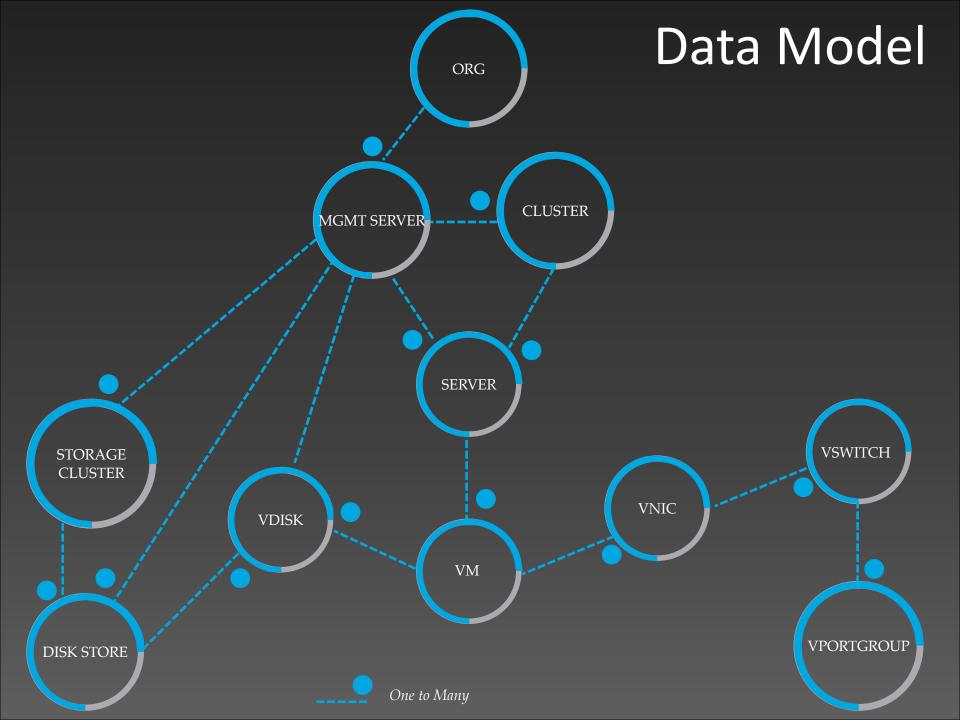


Quadrillion datapoints (10¹⁵)

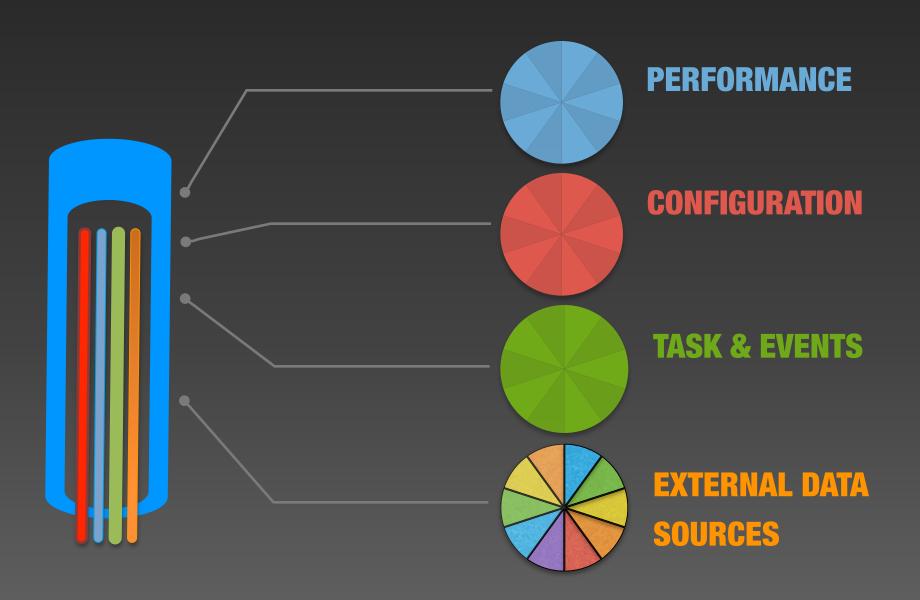
50 Million VMs

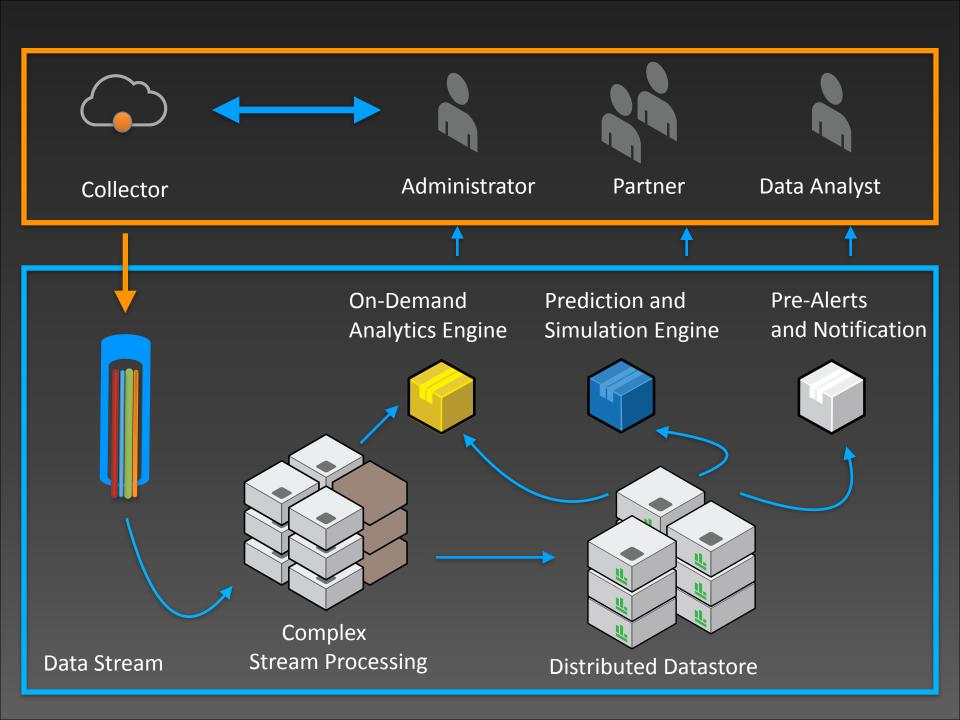
Challenges



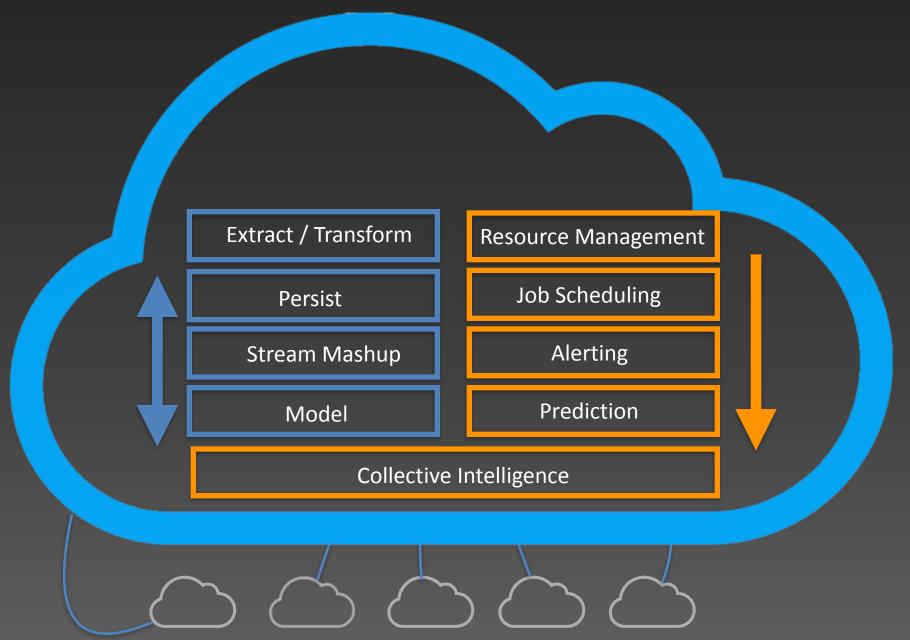


Types of Data Streams



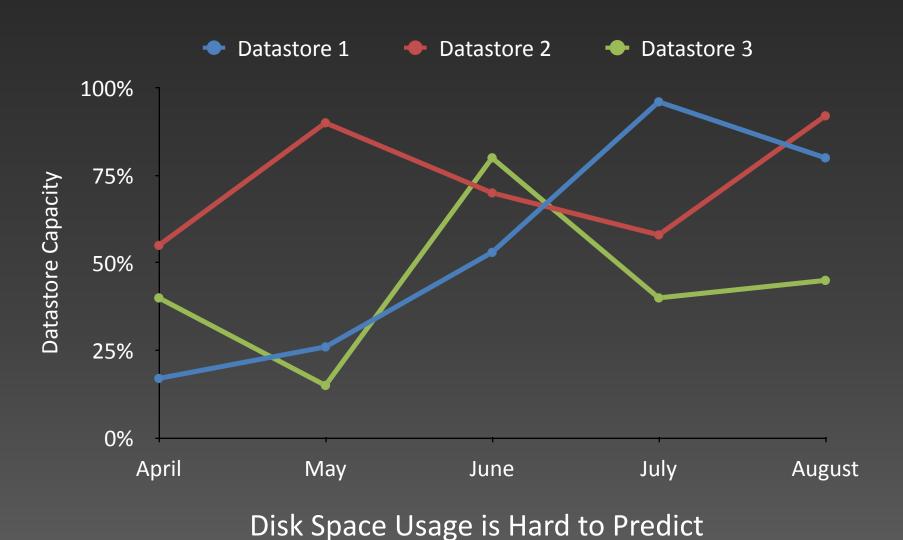


Enabling Private Clouds

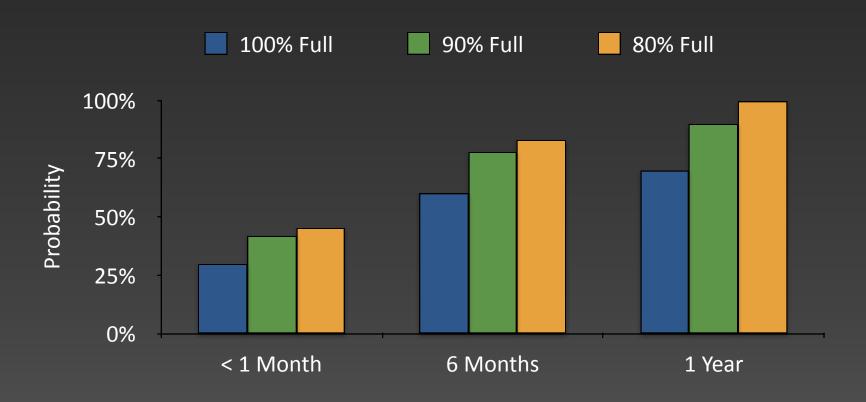


Use Cases

Predicting Out of Disk Space Event



Predicting Out of Disk Space

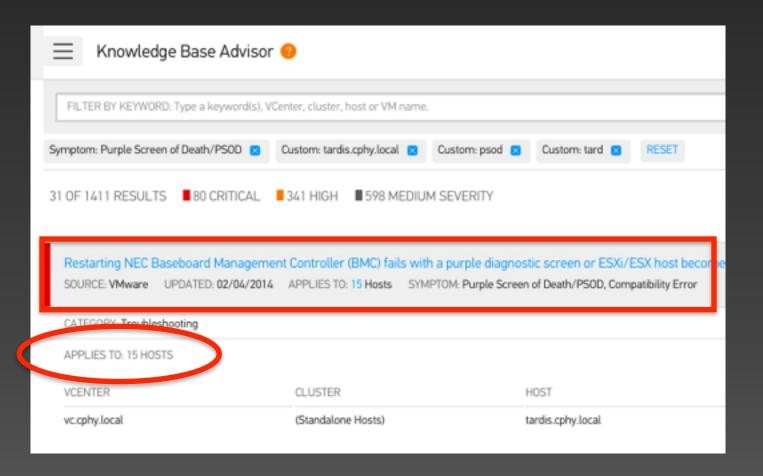


Probability Distribution Using Monte Carlo Simulation

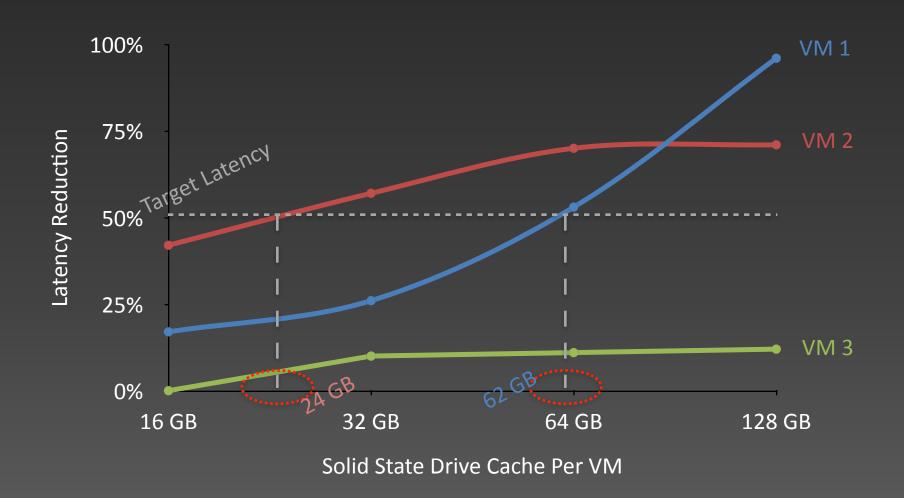
Discovering Causality



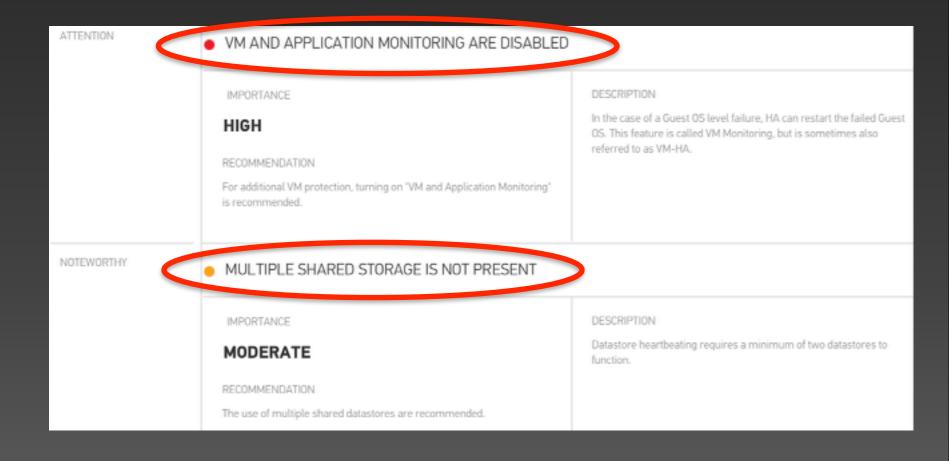
Predicting Potential Outage



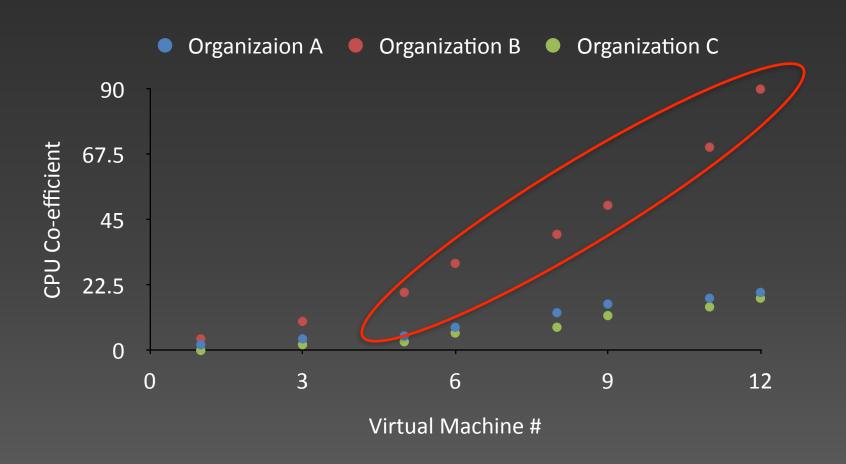
Predicting SSD Performance Impact



Predicting Configuration Outliers



Predicting Performance Outliers



Some Closing Thoughts





Towards a New World



DATACENTER NEWS

Performing 6/5x, 17579 Countail Drive in RHE, on Saturday, Month Jib et 2 and 6 g.m. Tribute pro \$18 for equits and \$18 for situations for the assuming performance and STO for adults and STS for stodame at the material per-Surrageous For reservations, call Salebooks.

. UPCOMING -- The Pales Yarden Pacinous's Unified School Disease and Inforest of School Monte hint the 15th. Changi Festion to March 25. Center for the Performing Well, Hit shows begin at 7.80

Collective Intelligence used to predict datacenter outage

and their families assigned to the samp. New bose, beater of the U.S.S. and their bridges angined to the Cathagh Country proposates materials. Such terror, where their proposates and their bridges country of their bridges and the materials of places. Such parties are their brings and the materials and their bridges in the large Missouri teas. Their Floridage was depressing when Evol Floridage and and brings of California for the parties. his bond bridithmerican hand. backles, topoled to the base to of Danialter were delighted and bern and to be also re-gare-layer and life the spicits, if only the a liver boom, of the Navy personnel and their furnities, For the filtral year in a now, Plenning

a food townsor broke in Bulling.

water, wellings, birbolen and on emerate due on it. Particl's Dos naturations where there was little their participant protecting on Ferning and the other the numbers access for throwing aparts.

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make to go in their place. With some topolotics: they made - for exciting tips of the base, stalling

SKELEDIE SOKBEH 13, 2004

A cought of the families even make

had Tery and the band manders. That maked them to a gooded toor of

they woned talk pult force. the resolution with medical mic right, se

SATURDAY NOW/WHAT AND

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la director and bouch of California for the part. "one was sensit by the contribution." A special board developed between 22 mars. They have placed at pairs, and disclarates of one year and the hand marriers and these breight senson in scriben at they played and aboutly exchange visits have

was but not of many satisficialments

thebridge

Performing Arts, 27570 Groupfield Brow in Brill, on: Saturday, Warth 30 at 7 and 6 s. Tickets are \$18 for adults and \$19 for students her the eleganing performance and \$10 for advice and Eril for modeets at the matteres performance for reservations.

. URCDARNIG ... The Palms Ventice Particular Unified School District and Irrando of Patini Viertes Elementary Charall Festival on March 29. 24 and 25 at the North Center for the Participancy Artic 27579 Grootfield Draw in Well: All phones begin at 7-95 pure. For todarts, call the Morris box office at 584 0400.

* GASSONS -- The Distinctive Edge, 29050 S. Windson Ave., Suite 113 in APV, continues "Third Fenery a Charm," an exhibit of 8-0. unilages by serior Steam ottom, through March Mr. for gathery hours, call 803-3613.

a DNOOMS -- Yestural freetires" solidation contin

Analytics Predicts Datacenter Capacity Needs Before the Admins Did

Amog: Novy base, boose of the U.S.S. Heming and the other five members - evous for threwing a party. of Seniative were delighted and Son-

a local insurance broker in Bolling — sently to go in their place. Hills by day and an exceptioner by

tax, a sover disector with CBS server. with much encouragement from the Dania Disele. Celtic barrain, a profess. Transf. sor at Glendale College, Kevin Ward,

and their families assigned to the Oscopy-County Innephony and Mills Titles, have, a conspany explorer Eiroband, were toughed to a rare. The band has been ploying the length experience when Terry Floring and and breath of Coldinesia for the post focal disdistancions band. 25 years They have played at pubs. lumides, traveled to the how to wakes, weldings, buildings and on emerals then on it. Famil's Disc. occupions where these was little

Plenting says it was by coincidence cool to be able to go to Japan and SB. Ger band got the reportmenty to tranthe spirits, if only for a few hours, of - el to hipsis. Another band was unable the Nort personnel and their families. Its travel at the fur minute and so be For the third year in a row, Floring and his hand were offered the oppos-

With some trapidation they made might -- and the band troub to enter. Their first trip and with the overtain the Navy man, women and fami- whelming empouse they received at let at various hours throughout. Amon, are from they led were quidalleyel. On a dang St. Persit's Ressing, the leader of the band on Day, bursteels of funders, slad in was a very rare right, a place salled scoordion and harmonics, artually is many shades of green, whomped it up. the only member of the band from savig their brown out and describing a ed in the brant of a bristing down-Induced. Other avanders include lead - stores, he the evening were so, must singer Julie Delawer, a civil engineer: in the nuclemer were orefultioned to in Newport Beach. Terry Drole, gai-try their hand or four at the Irish gig.

Even though for from lume, the keyboards and loggipes, music Amagi lase - steamed a few hours

from horse, with its hall-great rolling. How filed house, It named out that it landscape and its makingle of chorn Mounts tree, "Bo," Floring sep-"one was wrack by the constructor their part is persecting and serving is an over challenging and horsie

A cough of the function over took time out from their boar wheelele to there! hos Sery and the band members. They treated them to a guided tour of the base and accompanied them on a few exciting trips off the base, visiting broatful sectors secrets, menuments and reversed pions fluidiles.

On a visit to deventown Tokyo, the hard came across what they assumed "horselfo bidorolos," an lovals mult focus town. Upon shedding the establish ment out, they discovered a rest authoriz Irol. Pub with mudirer Culanum and good pub grols it also hangered to be open our right, on On head greenbers took over the stage

south of Token -- talk like botte near - and externalmed the locals the a life was just one of many neighborsoms

A special bond developed between and dedication of our most and, the band members and those feeding senson to uniform as they placed and already exchange visits have occurred when the same familie were on lower in the United States.

Any:

thebridge

Thank You



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