



# IBM GTS Cirba Case Study

Define Demand. Optimize Supply. Automate.

Southern Computer Measurement Group

Fall 2016

October 20<sup>th</sup>, 2016

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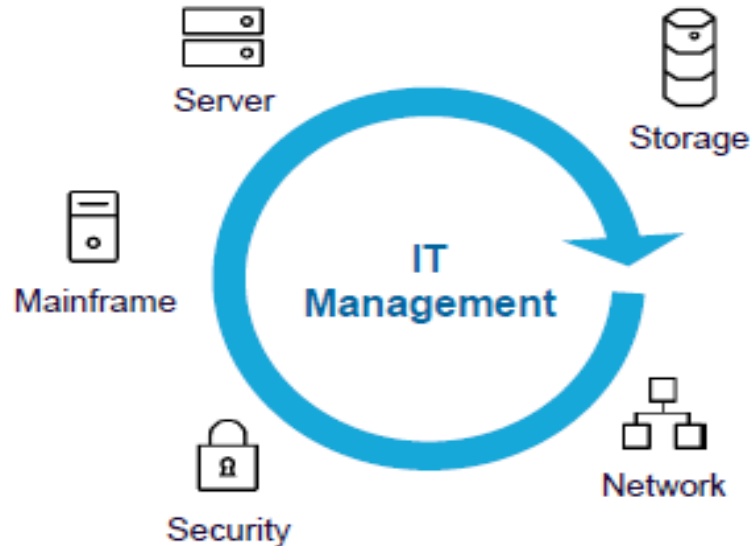
# Agenda

- IBM Global Services Overview
- Cirba Overview
- Better Sizing Program and Client Stories

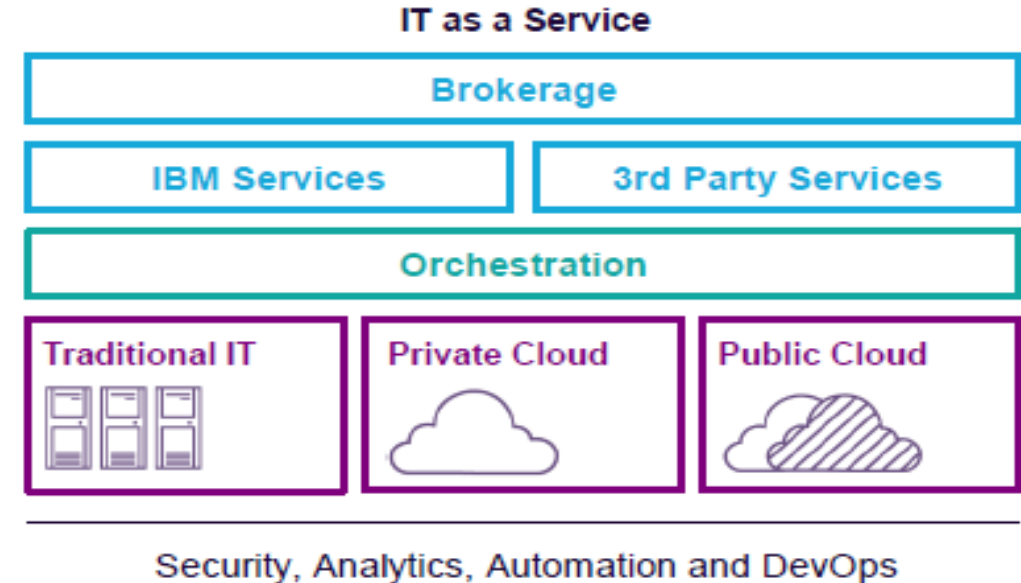
# GTS Strategy

We are transforming the GTS Services model –shifting from a Systems integration to a Services integration approach to Information Technology in the Enterprise

From: Systems Integration...



...To: Services Integration



## From... skills for systems integration

- Workforce required for simple, medium and complex tasks
- Emphasis on discrete technical skills

## To... skills for services integration

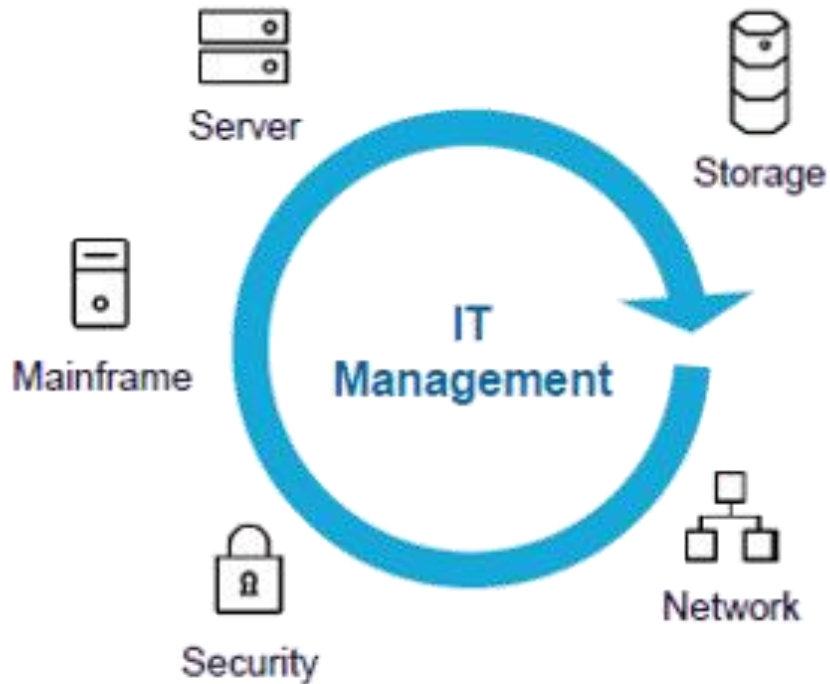
- Automation with a highly skilled workforce
- Services-oriented skills, integrated across enterprise

**Upskill for higher value** aligned with the shift to Services Integration (e.g., cross-services and sales consulting, data scientists, industry expertise, 3<sup>rd</sup> party services expertise, partner alignment and management)

# Why is Cirba Relevant for GTS?

## By the Numbers...

From: Systems Integration...



# 507K

Virtual Machines / LPARS Supported

# 40K

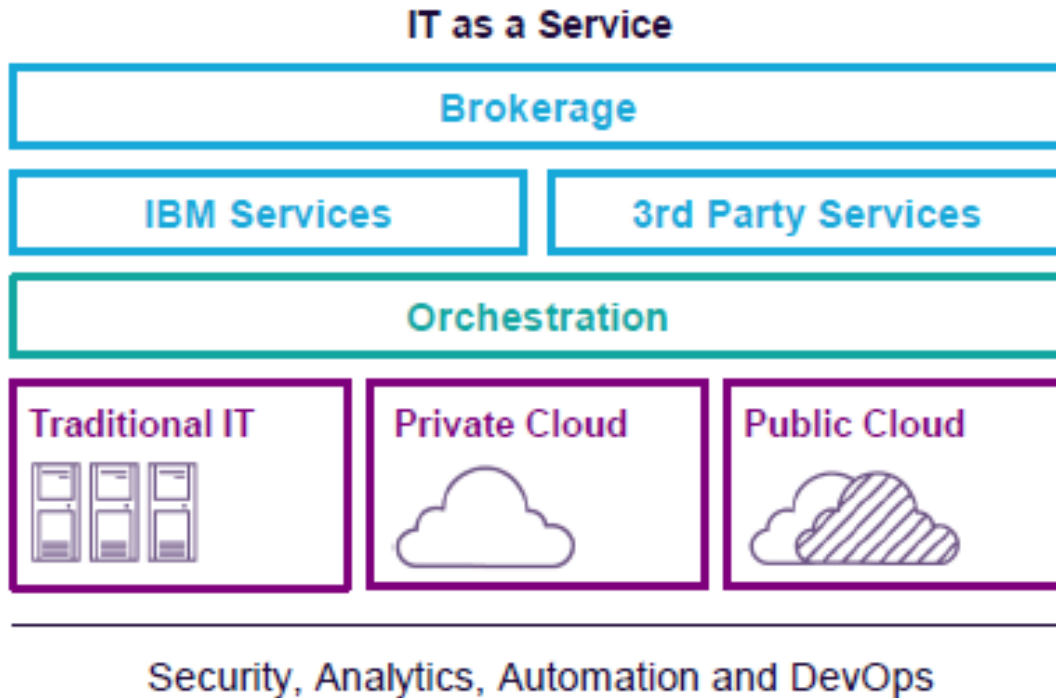
Host / Hypervisors Supported

# 300

FTEs supporting DS Perf Cap

# Transformation to Services Integration....

...To: Services Integration



## ✓ Enabling Cloud / Hybrid IT

- ✓ Embedded in Hybrid IT Services
- ✓ Analytics for Placement and Rightsizing
  - ✓ Traditional IT. Private/Public Cloud (eg Softlayer)
- ✓ Deployed in GTS Private / Public clouds

## ✓ Cloud Brokerage / Governance

- ✓ Optimal placement / best venue selection
- ✓ Gravitant alignment

## ✓ IBM and 3<sup>rd</sup> Party Services Innovation

- ✓ Industry Expertise with Cirba partner alignment
- ✓ Policy-Based Automation
- ✓ Delivered / packaged as a Service
- ✓ Cloud Management Orchestration
  - ✓ VRA, ICO, Openstack

# GTS Program Overview / Stories

Define Demand. Optimize Supply. Automate.



# What is Cirba?

- Workload Control Analytics that balance application demand and infrastructure supply to drive efficiency/automation internally and in the cloud

Bank of America

FedEx

HESS

Cigna

Scotiabank

FIS

DU PONT

Manulife

KAISER PERMANENTE

bp

Westpac

AIG

Williams & Glyn

Disney

citi

nPower

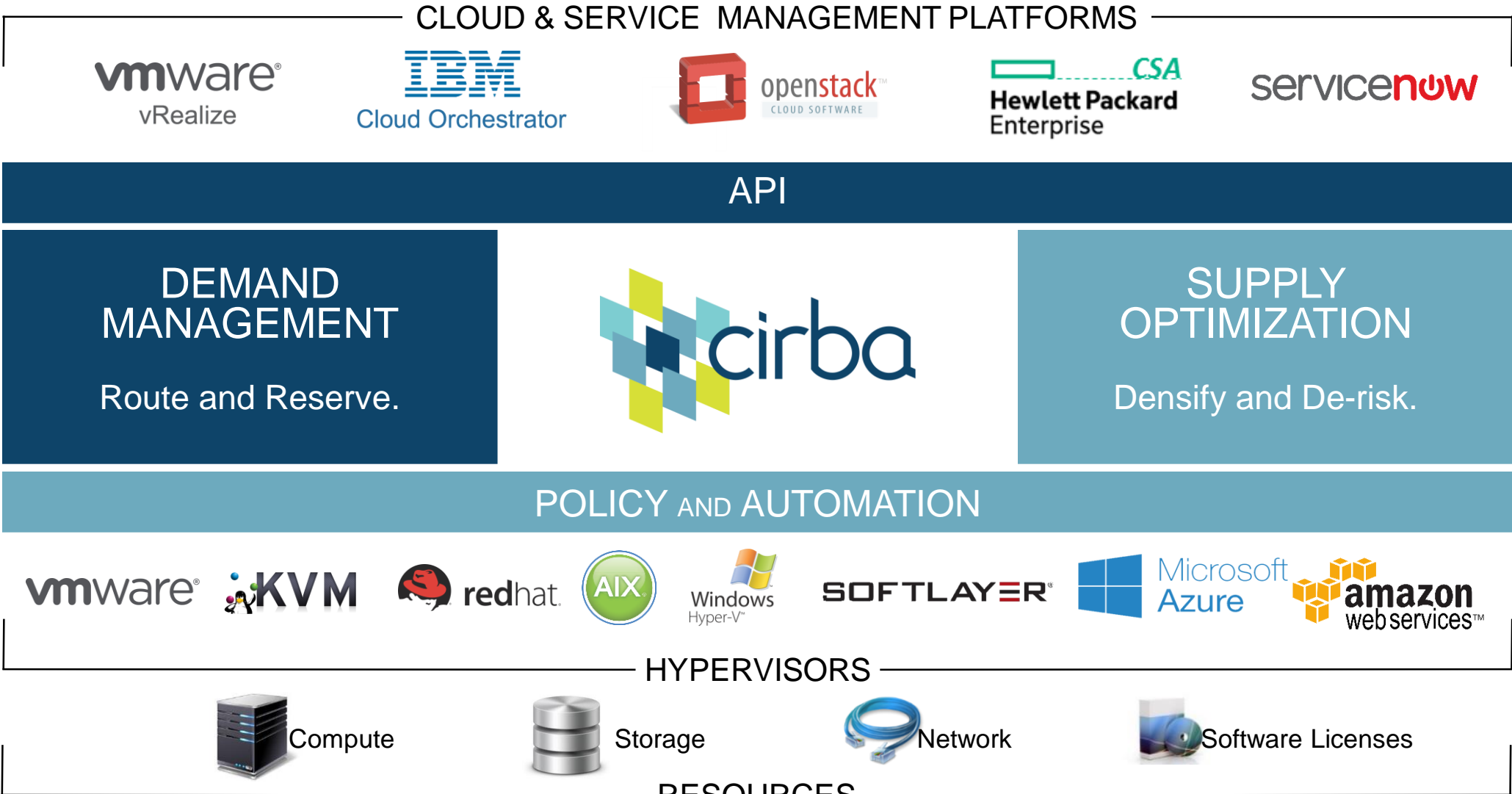
The co-operative bank

Bank of Ireland

AMERICAN EXPRESS

- Partnered with IBM since 2007
  - Standard for Capacity Optimization globally
  - Embedded in DHS (Dynamic Hybrid Services)

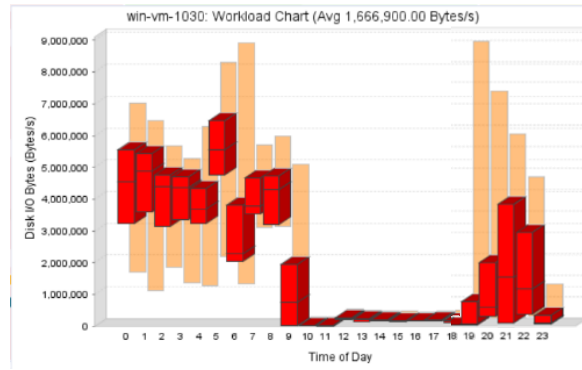
# Where Does it fit in the Ecosystem?



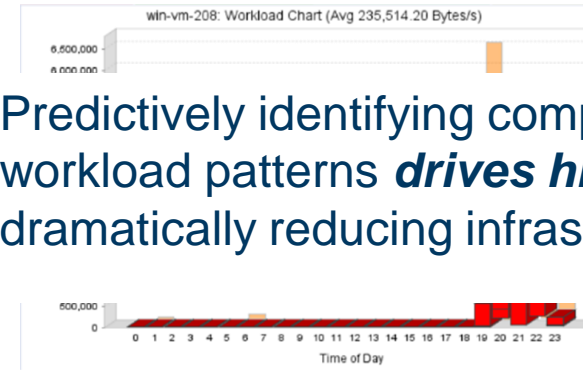


# How Does it Work?

- It predictively analyzes workload patterns to optimize workload density



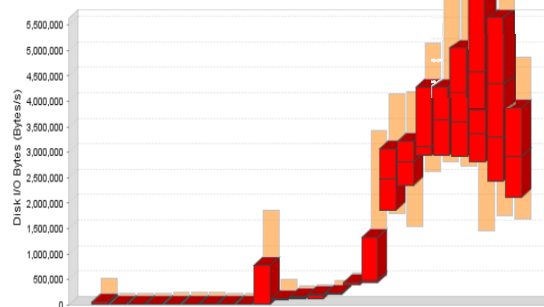
VM1 – Busy in the morning



VM2 – Busy in the evening

Predictively identifying complementary workload patterns **drives higher density**, dramatically reducing infrastructure costs

- While at the same time reducing workload contention and operational risk



Predictively identifying potential conflict **prevents workload contention** before it occurs, making environments run better

# The Importance of Being Predictive

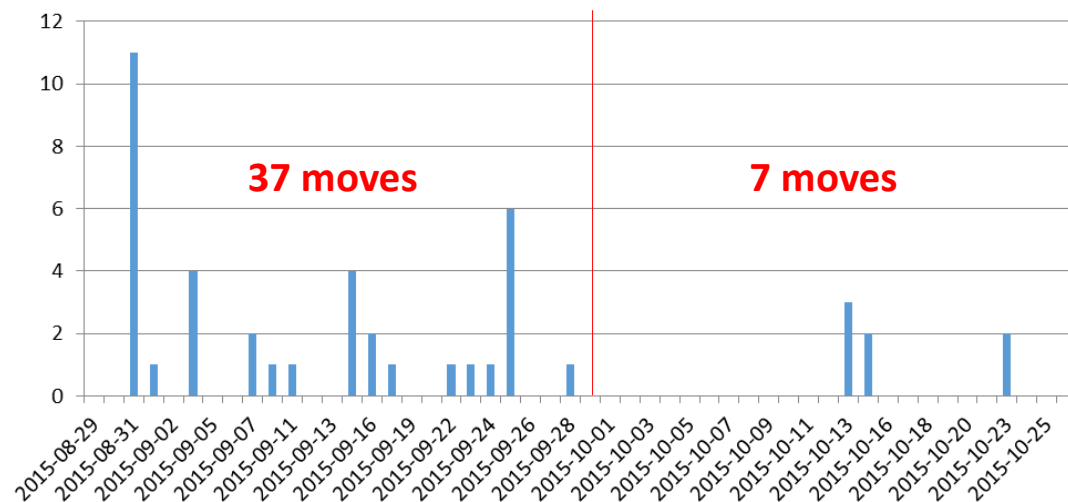
Reactive products only look at recent activity, not predictive models:



Reactive approaches don't move VMs until the damage is already done. Resource contention will have already occurred for at least 5-10 minutes, **significantly impacting end users**

(Note: In this example DRS will never act, as it doesn't look at Disk I/O)

Customer example of the impact of predictive analytics:

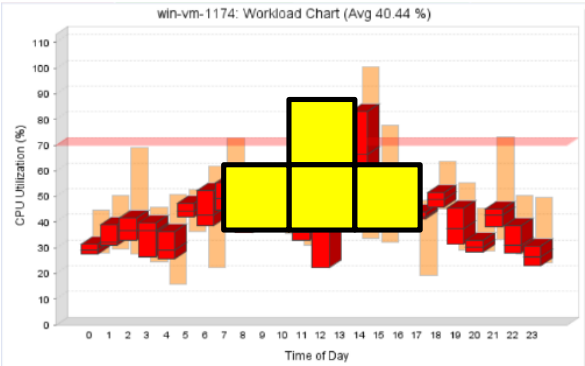


In the month after Cirba was enabled the number of reactive VM moves during business hours **dropped over 80%**

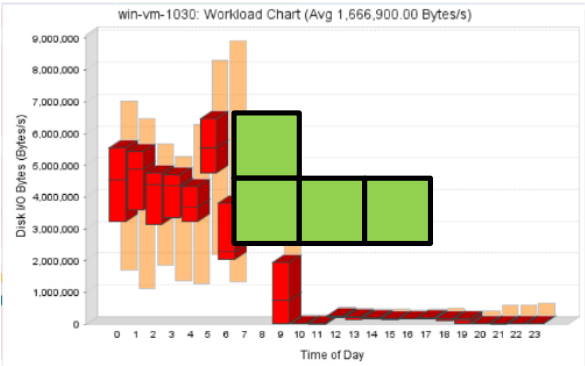
This is a clear indication of **reduced resource contention**

# The Importance of Analyzing Workload Patterns

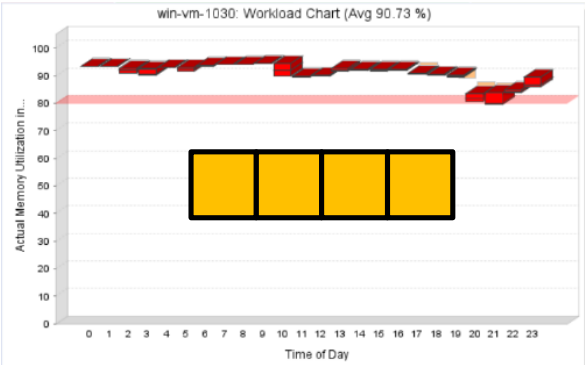
CPU  
Intensive



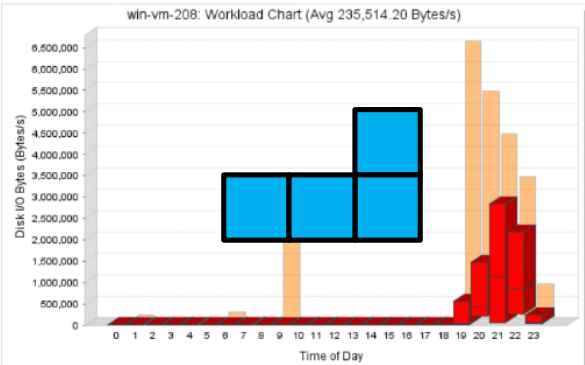
Start of Day



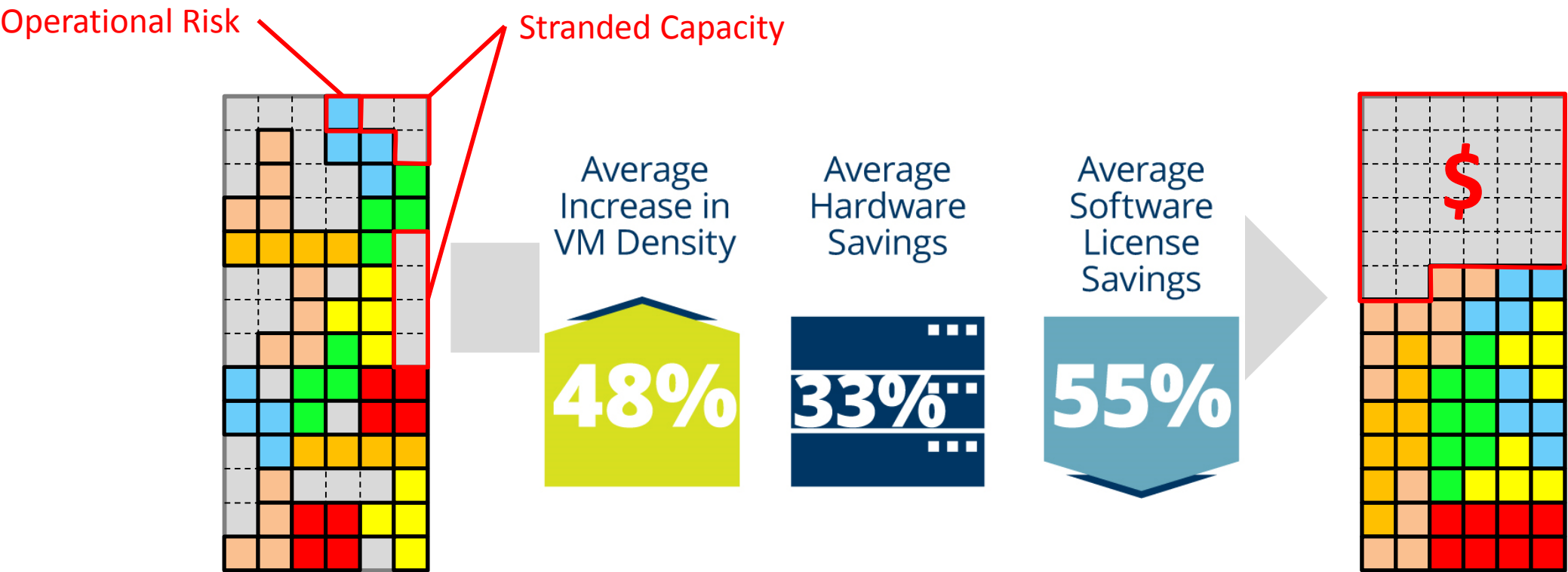
Memory  
Intensive



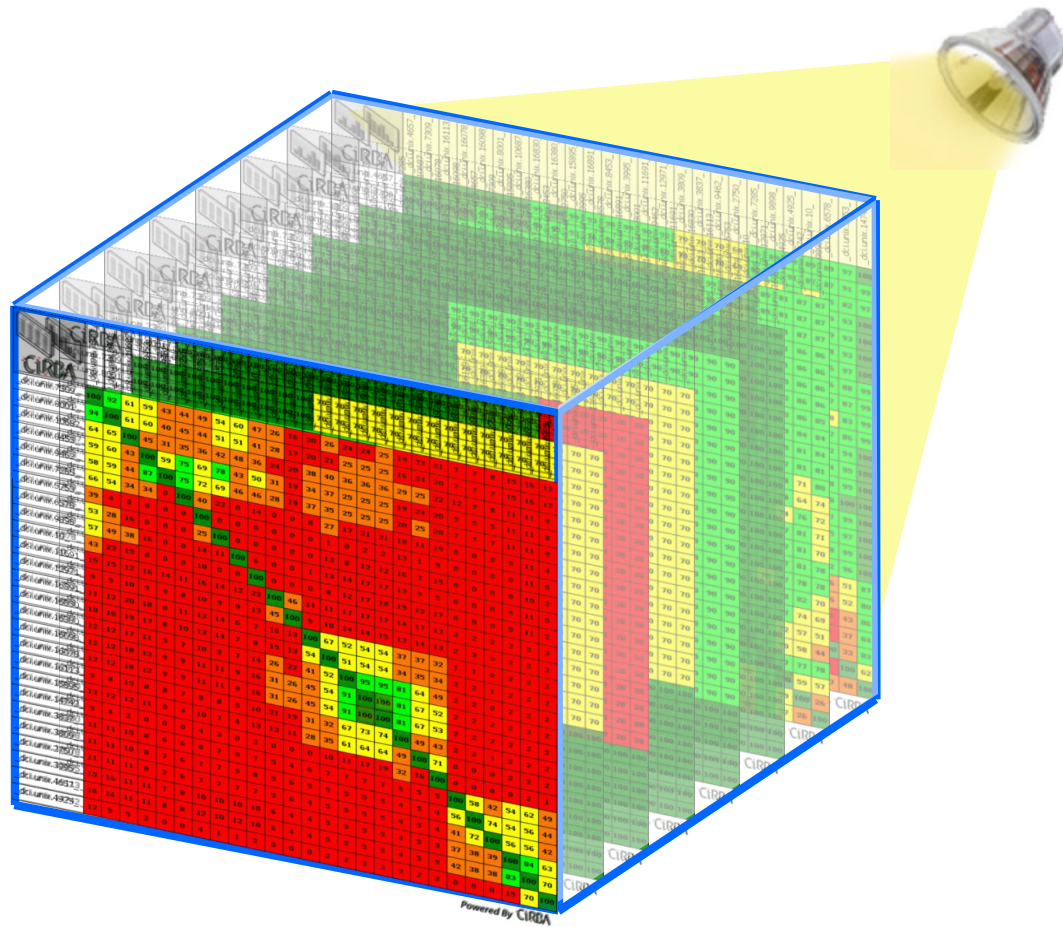
End of Day



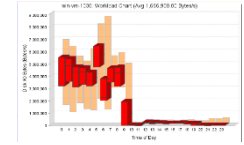
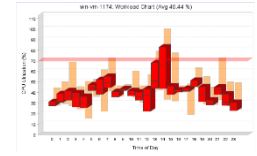
# The Importance of Analyzing Workload Patterns



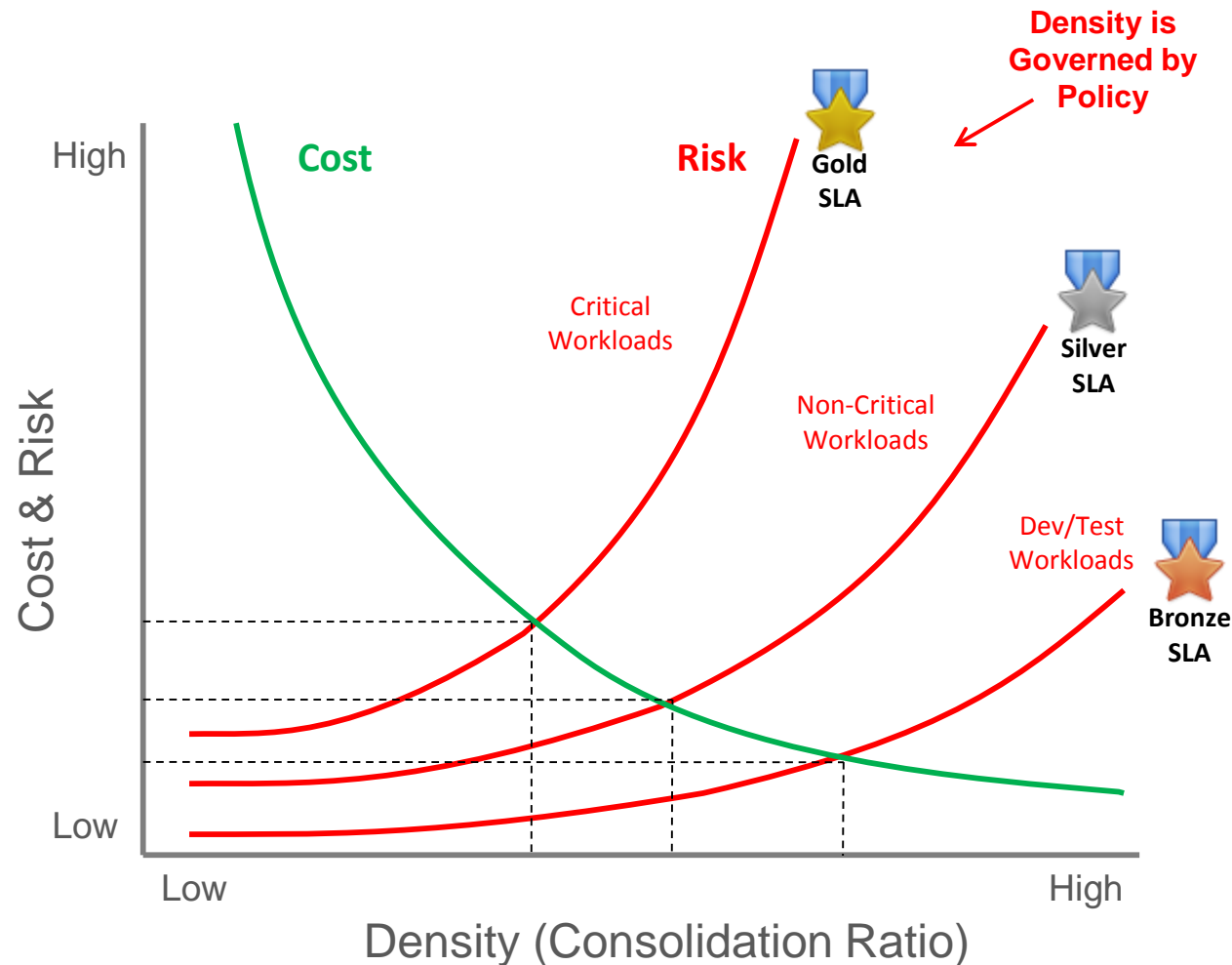
# How Cirba is Different



- CPU
- Memory
- Disk I/O
- Network I/O
- Overcommit
- Business Constraints
- Technical Compatibility
- Compliance
- Software Optimization
- ...

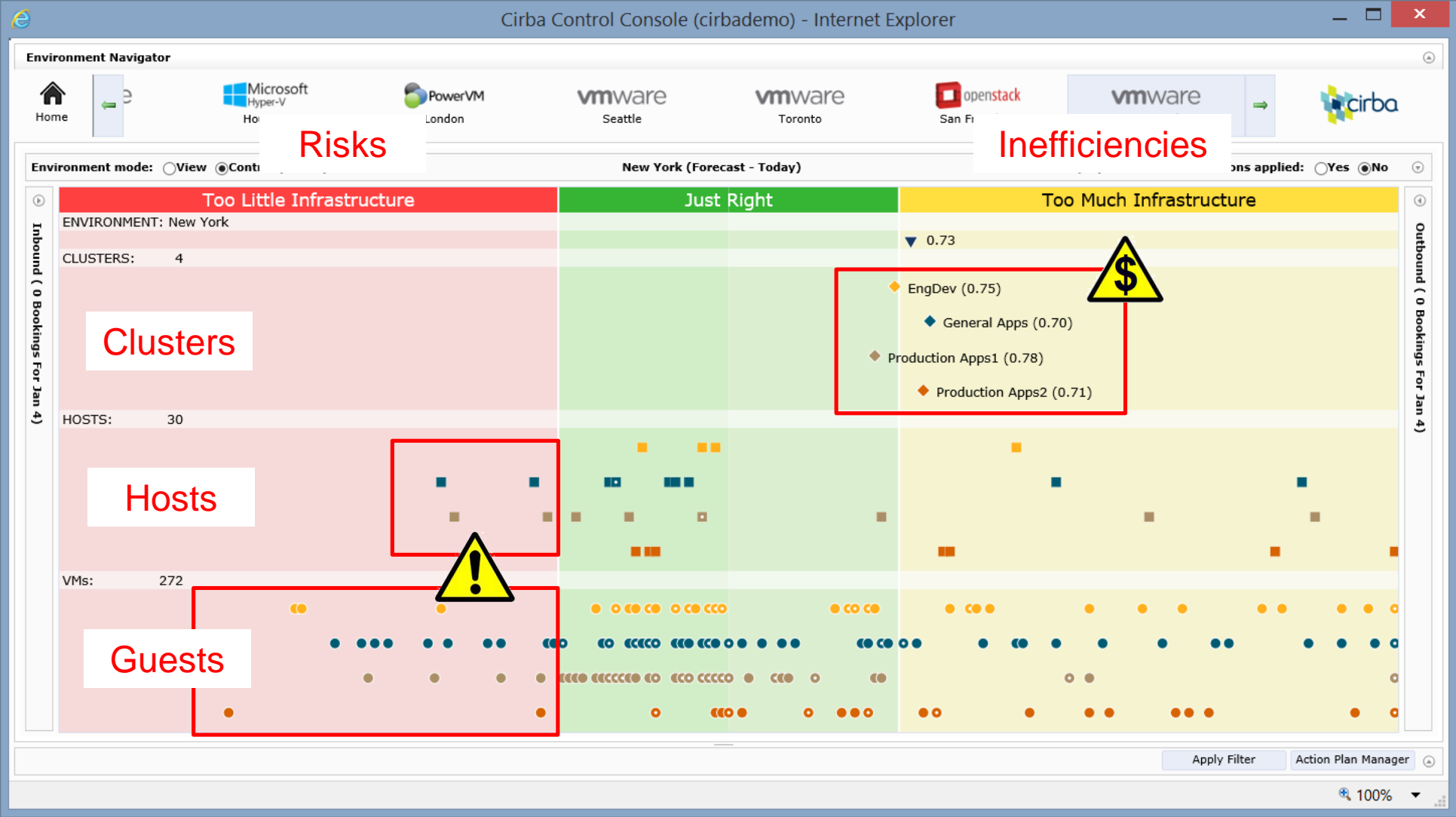


# How does it know what “good” is?



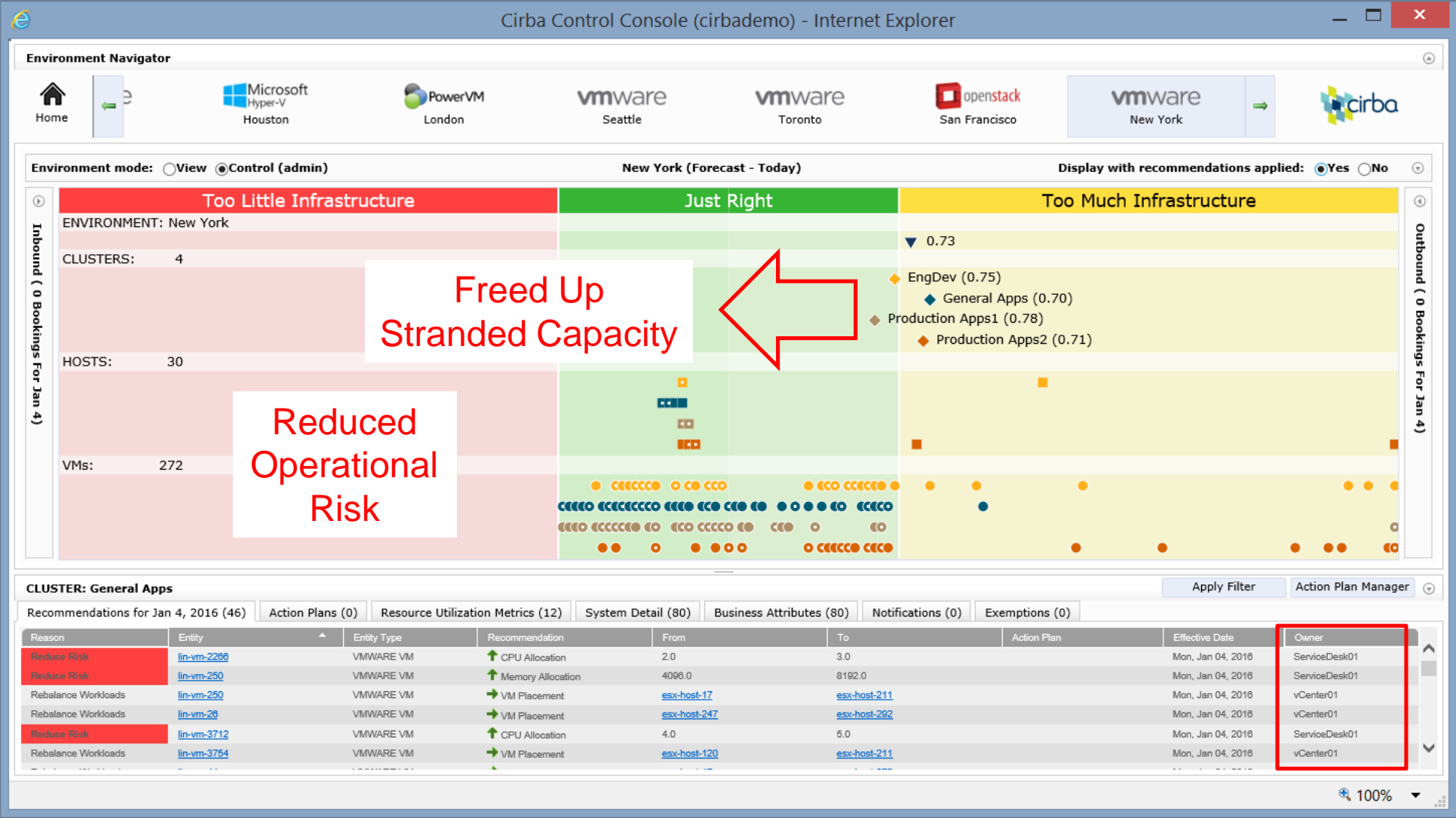
- Out of the box policies define “fit for purpose” behavior and hosting
- IBM standard policy settings for Production Critical through Dev / Test

# Visualizing Efficiency and Risk





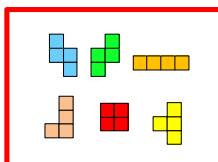
# Automated Optimization



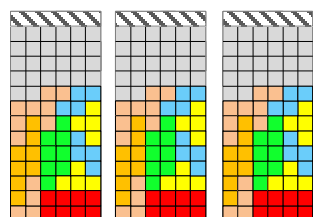
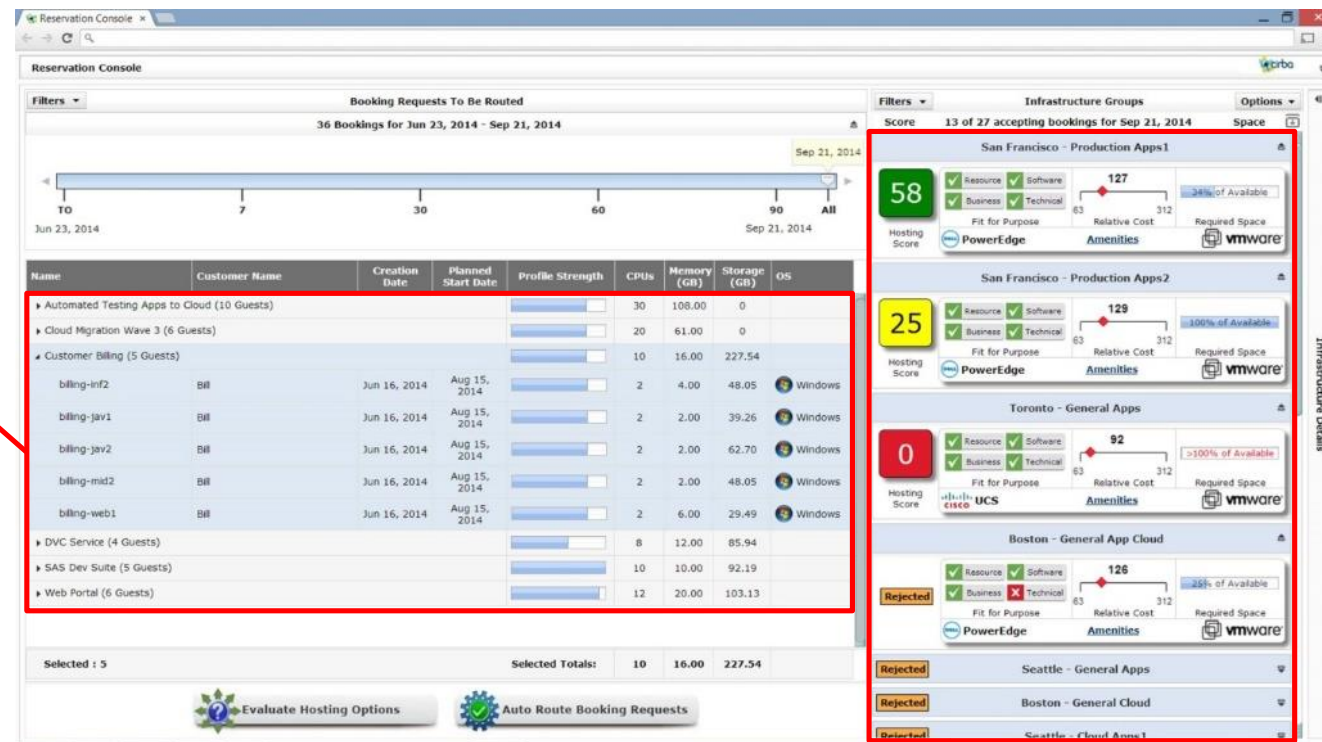


# Using Analytics to Automatically Route New Applications

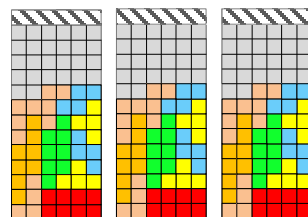
## New Application or Cloud Request



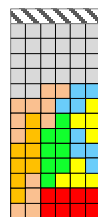
Windows OS  
Requires SQL server  
Has customer data  
Needs Gold tier storage  
Must run on west coast



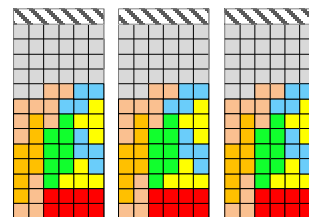
New York



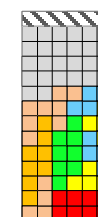
San Francisco



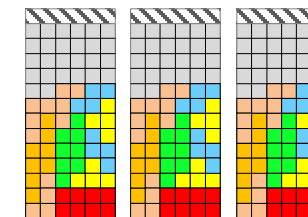
Toronto



London



Singapore

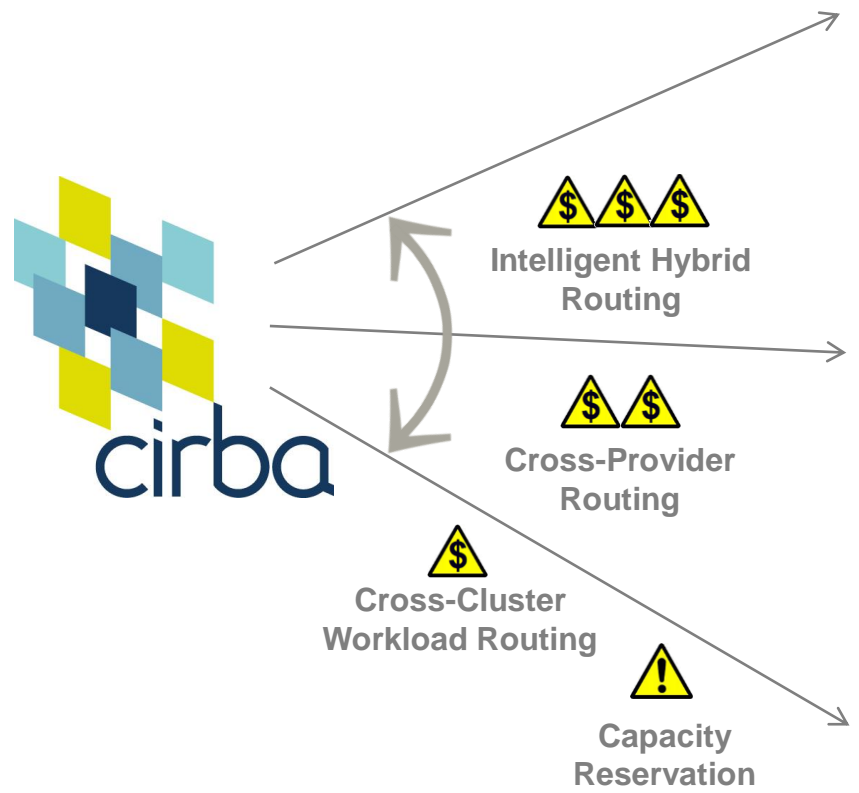


SOFTLAYER  
Bare Metal

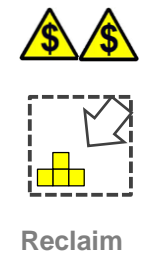
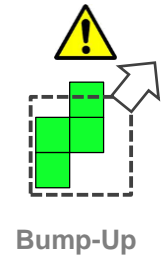
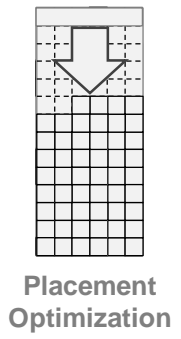


Public Cloud

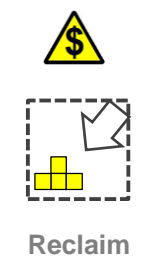
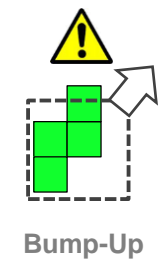
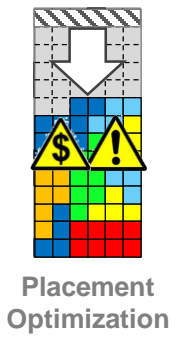
# Cirba and Hybrid Cloud Optimization



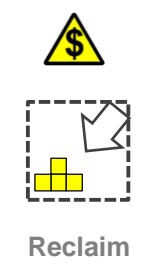
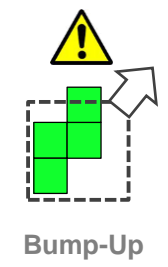
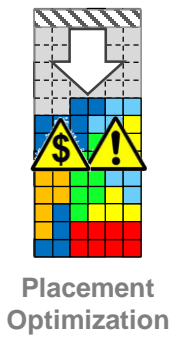
## Off-Prem IaaS



## Off-Prem Bare Metal

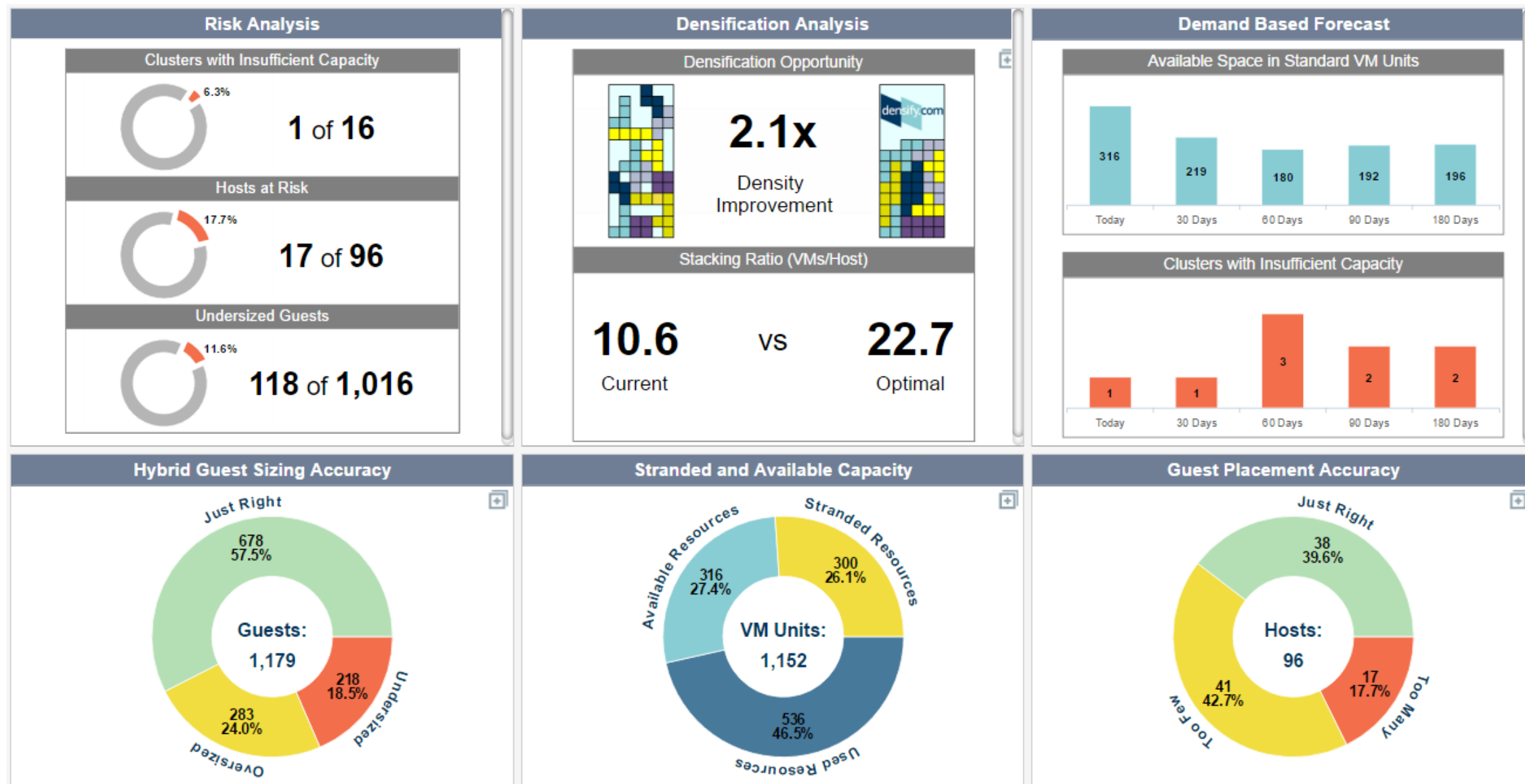


## On-Prem Virtual & Cloud



# Next Generation Dashboards

By the Numbers   Analysis Insight   Expert Insight



# Better Sizing for Workload Demand (BSWD) Summary

## ■ Project Objectives

1. Improve issue with underutilized server hardware
2. Utilize advanced analytics to identify, recommend & automate capacity changes
3. Provide actionable list to Account Teams for Automated/Manual Execution

## ■ Use Cases / Benefits

### – Capacity Management – Optimize Supply

- Multi-platform (x86 and System p) hardware
  - Setting more appropriate CPU and memory values based on historical data
- Image placement
  - Optimizing the workload onto fewer physical resources
  - Right sizing to balance vm density and defrag environment based on Policy
- Software licencing – Cost reduction based on physical location
  - Image placement based on software license models (e.g., Windows, Linux, Oracle)
  - Reduce VMware licensing via hypervisor reclamation

### – Demand Management & Forecasting

- Reservation & Routing on Supply; Bursting to Softlayer
- Potential to replace SRM in the HRM process



# Healthcare: Cost Avoidance

## Customer

Large healthcare provider in the USA and IBM's largest Cirba deployment

- **Hypervisors:** Vmware & PowerVM
- **Servers:** 31,000 VMs/LPARS & Servers
- **Cirba Customer Since:** 2015

## Challenge

Requires a solution that provides;

- Ability to optimize server environment to reduce Capital and SW expense;
- Increase system density and reduce / eliminate unused capacity within environment via reclamation;
- Address systems Performance Risk due to Capacity Constraints
- Improve planning and governance model for new Hybrid Workloads

IBM®

BETTER SIZING  
FOR WORKLOAD  
DEMAND IN 2015

SOFTWARE-DEFINED  
INFRASTRUCTURE  
IN 2016

## Solution: **Densification, De-Risk, Automation & Hybrid IT**

- ✓ Cirba's workload optimization analytics was used to identify 20% infrastructure recovery with VMWare
- ✓ 4700+ automated rebalance actions applied
- ✓ Establish reclamation governance process for right sizing virtual workloads and remove operational risk
- ✓ Expansion of Cirba capabilities for ICO routing and reservation of Cloud workloads

## Measurable Success

Reduction in costs to tenants relative to legacy environment

> 20% (VM)  
> 20% (AIX) \*

Automated rebalance activities that reduce operational risk for hypervisors

> 4700 (VM)

Reclamation benefits identified to date (conservative policies)

> \$2M \*



# Government: Efficiency Increases



## Customer

Government provider of IaaS cloud services that address data sovereignty requirements in a “pay as you go” model

- **Hypervisors: VMware**
- **Servers: 2,000 VMs & servers**

## Challenge

Cloud needed a solution that:

- optimizes cluster capacity to predict and defer infrastructure spend;
- provides tenants visibility to workload performance and VM right-size recommendations;
- and streamlines capacity management overhead to efficiently oversee the environment, which is expected to grow dramatically

## Measurable Success

**> 40%** Reduction in costs to tenants relative to legacy environment

**> 10%** Increase in revenue due to upsize recommendations from Cirba

**> 50%** Effort savings for capacity planners to manage the cloud environment

## Solution: Densification

Cirba’s analytics were used to densify the virtual environment and identify true infrastructure requirements. Reporting on tenant VMs showed customers which VMs were running “at risk” (especially for memory usage) and needed to be upsize.

# Energy: Data Confidence



## Customer

IBM Managed Infrastructure for energy company engaged in global production of crude oil and natural gas.

- **Hypervisors: VMware**
- **Servers: 1750 servers**

***“For me, it’s all about what Cirba gives us now...The ability to make informed decisions about workload placement and CPU/RAM allocation and de-allocation”***

## Challenge

The IBM team managing the client’s infrastructure wanted to:

- Improve visibility into operational risks
- Accurately forecast and model capacity requirements
- Leverage existing infrastructure more comprehensively

## Solution

- ✓ Cirba’s analytics reduced operational risks through VM rebalancing to eliminate over-stacking and load imbalances. In addition, CPU and memory allocation changes reduced the risk of VMs being starved for resources.
- ✓ The team also identified 54 nodes they wanted to migrate to 3 specific clusters, using Cirba to identify the appropriate placements for workloads. The team saved a minimum of 2 to 3 days that would have previously been spent gathering CPU, memory and storage details to factor into the plans.
- ***“[Without Cirba] We would have absolutely no way of knowing whether we could successfully move those workloads to other clusters without introducing risk into clusters that were risk free before we added the additional workload.”***

# Chemical: Reducing risk

## Customer

Large chemical company.

**Servers:** 500 AIX on PowerVM, 2500 VMware

## Challenge

The IBM team turned to Cirba for cost savings through improved density and right-sizing as well as enabling more accurate demand management and forecasting.

## Solution

- ✓ Cirba automates infrastructure optimization for the IBM team to ensure ongoing efficiency. The analytics dashboard also enables central demand management and forecasting to streamline and improve resource planning.
- ✓ While Cirba has not been released into production, early analysis has identified a number of opportunities to reduce risk and increase efficiency while preparing for cloud within the mix.



*“Using out of the box settings, the DPE and I were presented with a realistic action plan for right sizing clusters, host, and virtual machines in our environment..” Chief Architect for the Account, IBM Certified Executive Architect*

44%

Of environment has densification opportunity

17%

VMs over-sized, opportunity for right sizing

11%

Hosts overloaded

14%

VMs starved for resources







thank you!