



vmware®

# vSeminar Series 2010

虚拟化与云计算

吴启新

大中国区高级产品市场经理

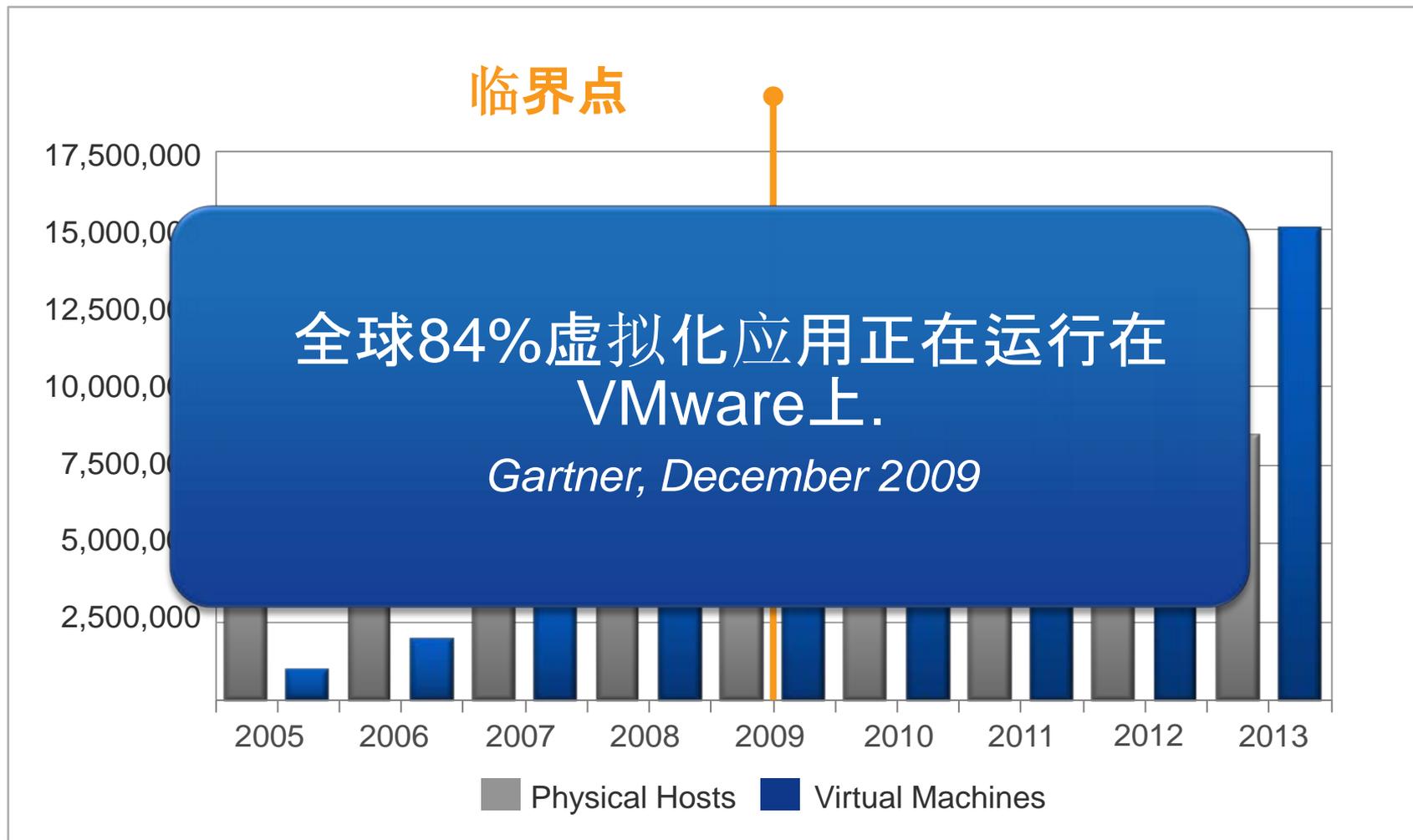
Confidential

**我们从那里来**

**我们现在的位置**

**我们会向何处去**

# 2010 Milestone: 虚拟化已经成为IT规范之一



Source: IDC

# 虚拟化和云计算= CIO 的首要考虑技术

CIO 考虑的技术	2010 年的优先级	2009 年的优先级
虚拟化	1	3
云计算	2	14

资料来源：Gartner 2009 年第 4 季度的 CIO 调查

## Server Sprawl

- 36M physical x86 servers by 2011— a ten-fold increase over 15 years
- \$140 bn in excess server capacity - a 3-year supply

## Power & Cooling

- \$1 for every \$1 spent on servers
- \$29 bn in power and cooling industry wide

## Space Crunch Costs

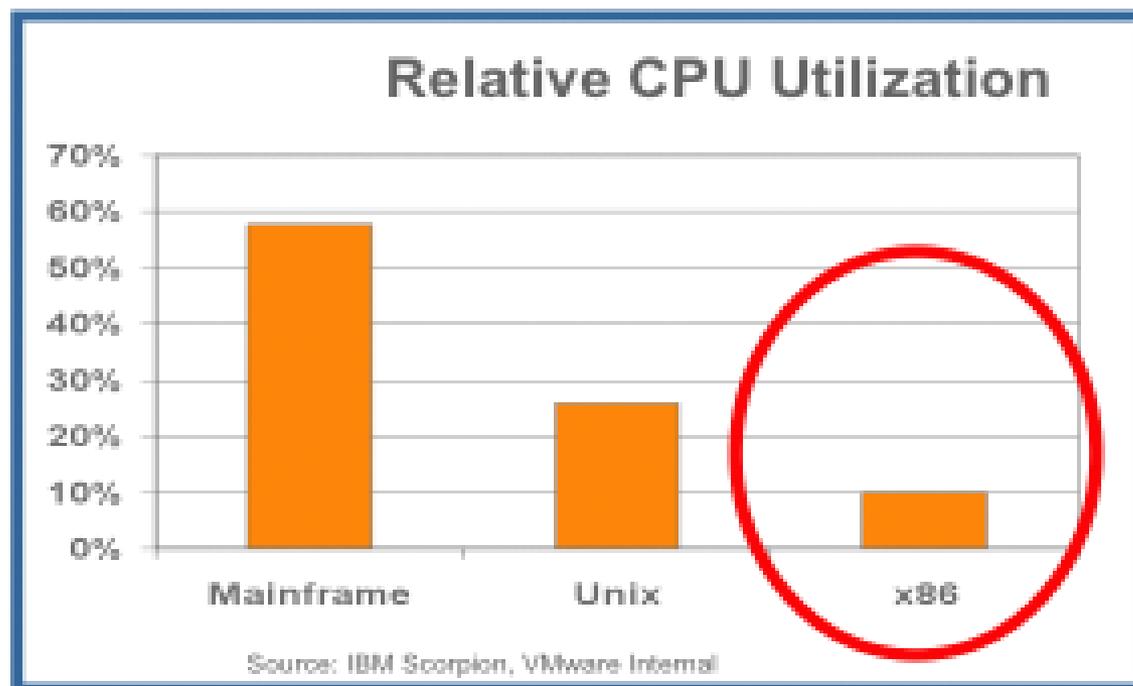
- \$1,000 / sq ft
- \$2,400 / server
- \$40,000 / rack

## Operating Costs

- \$8 in maintenance for every \$1 spent on new infrastructure
- 20-30 : 1 server-to-admin ratio

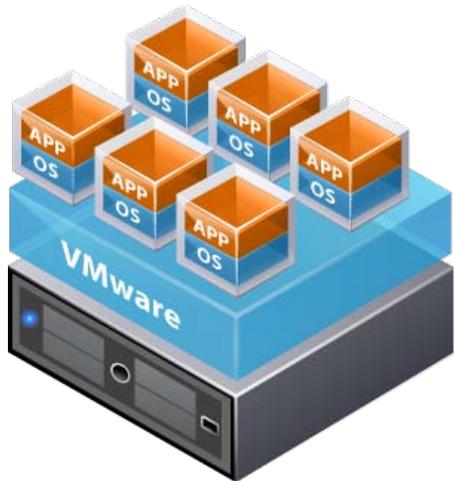
## CPU利用率情况分析

基于x86架构的服务器上，CPU利用率最低



X86服务器上CPU利用率仅为5-15%

## 分区



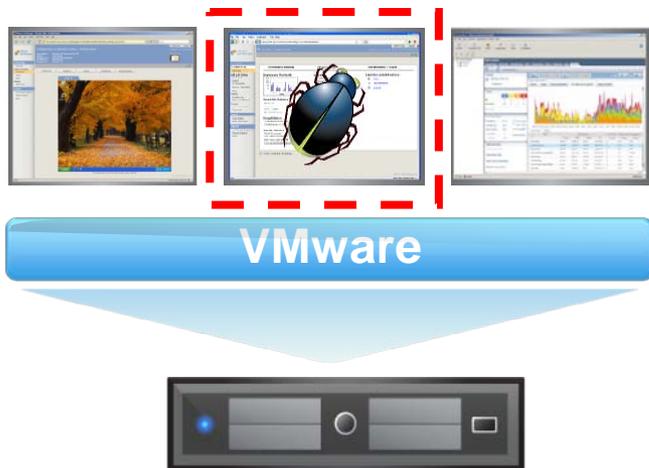
- 在一个物理服务器上同时运行多操作系统
- 在多个虚机之间划分系统资源

# 虚拟化技术的特性和技术价值



## Partitioning

Run multiple operating systems on one physical machine  
Divide system resources between virtual machines



## 隔离

在硬件层实现故障和安全隔离  
高级资源调控保证性能

# 虚拟化技术的特性和技术价值



## Partitioning

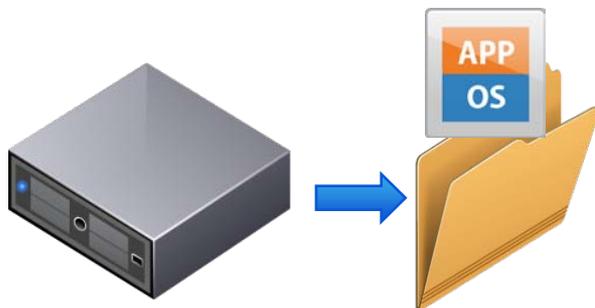
Run multiple operating systems on one physical machine  
Divide system resources between virtual machines



## Isolation

Fault and security isolation at the hardware level  
Advanced resource controls preserve performance

## 封装



每个虚拟机被封装为文件

移动和复制虚拟机如同移动和复制文件一样简单

# 虚拟化技术的特性和技术价值



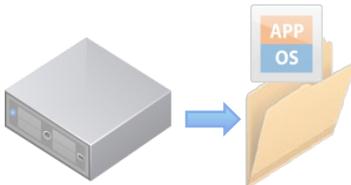
## Partitioning

Run multiple operating systems on one physical machine  
Divide system resources between virtual machines



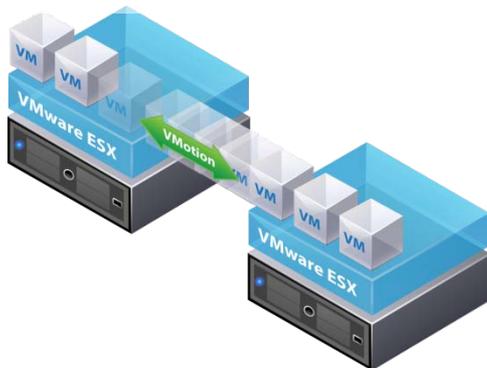
## Isolation

Fault and security isolation at the hardware level  
Advanced resource controls preserve performance



## Encapsulation

Entire state of the virtual machine can be saved to files  
Move and copy virtual machines as easily as moving and copying files

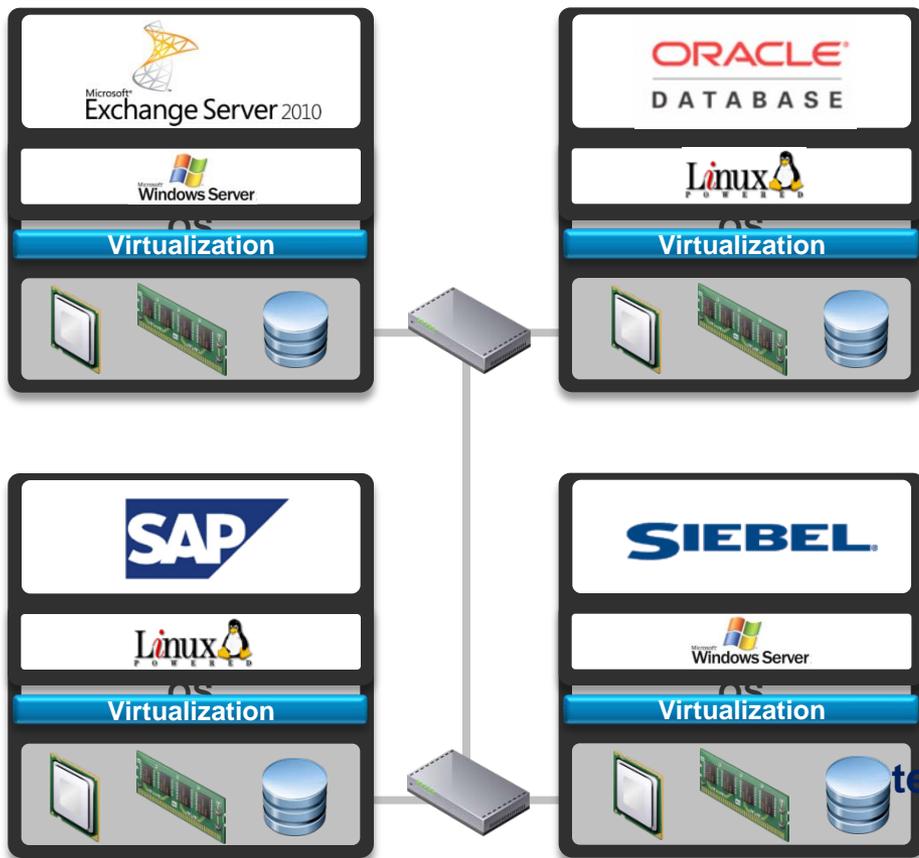


## 硬件独立性

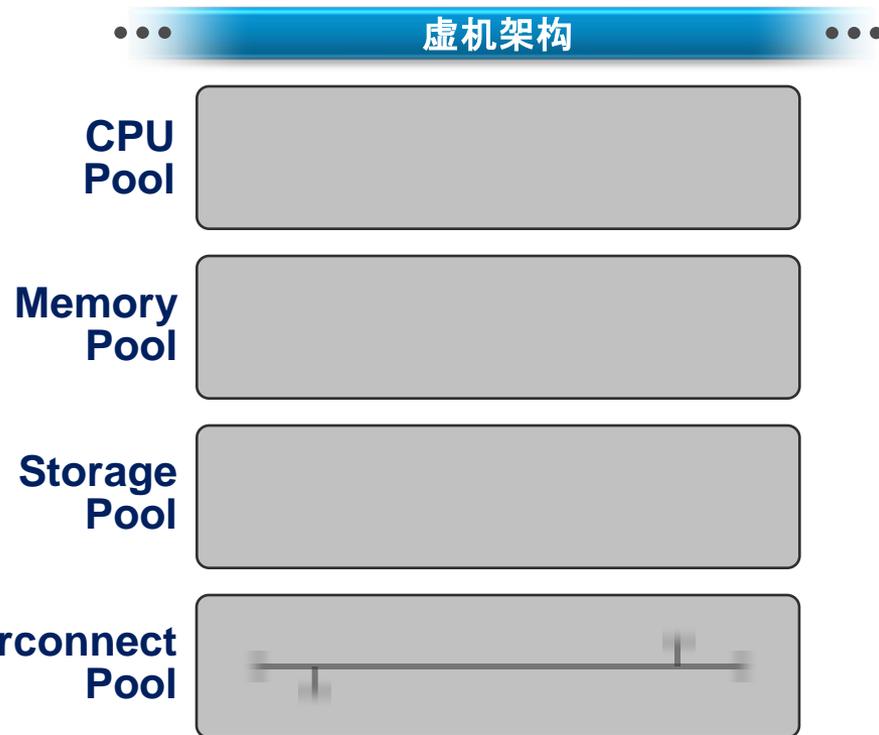
**虚拟机可以在异构硬件安装和移动**

# 抽象+池化 = 降低复杂性

## 传统方式



## 虚机架构

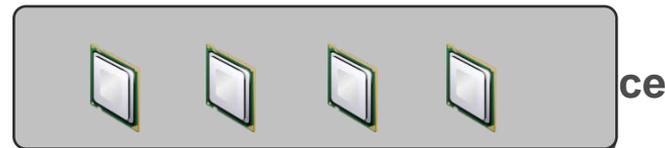


# 抽象+池化 = 降低复杂性

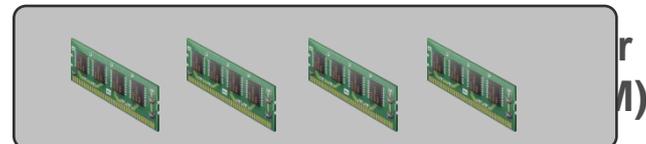


## Virtual Infrastructure

CPU Pool



Memory Pool



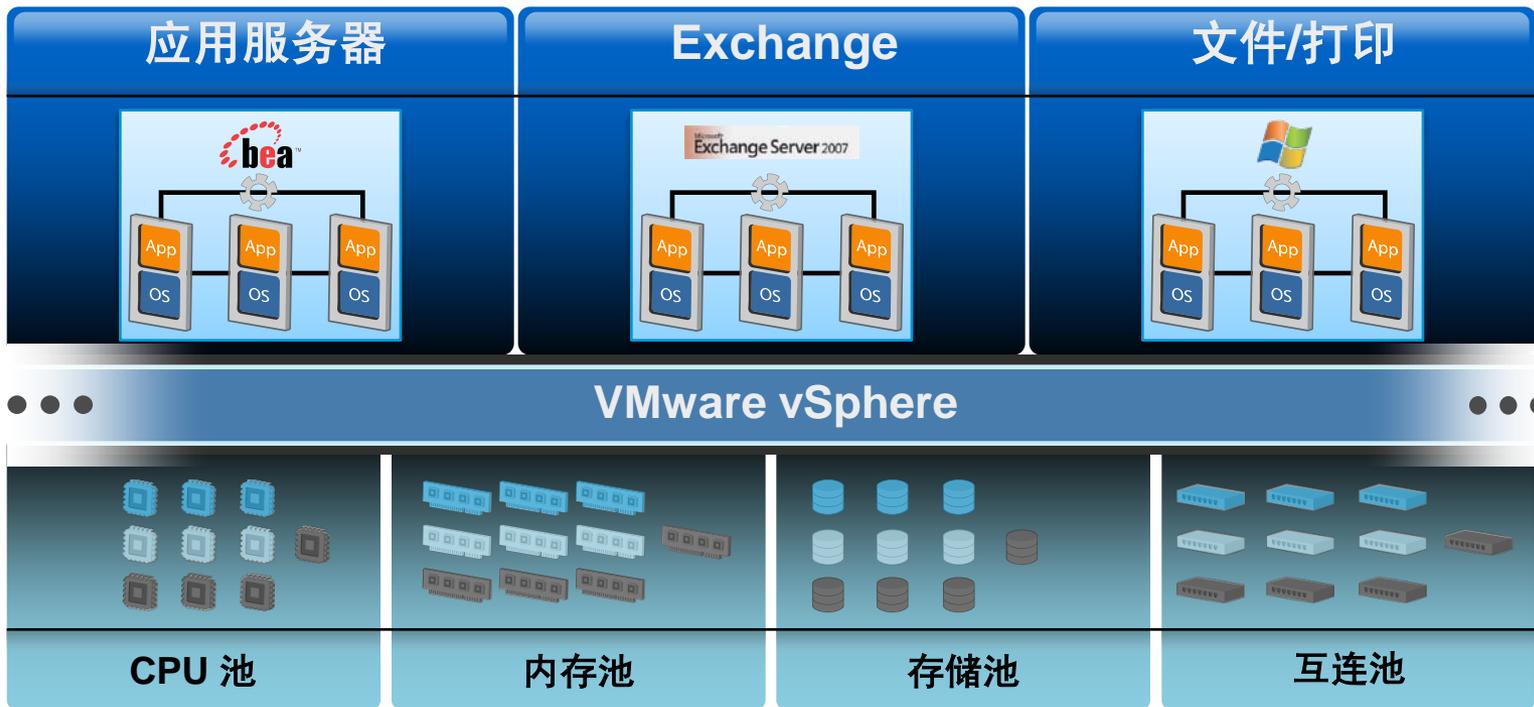
Storage Pool



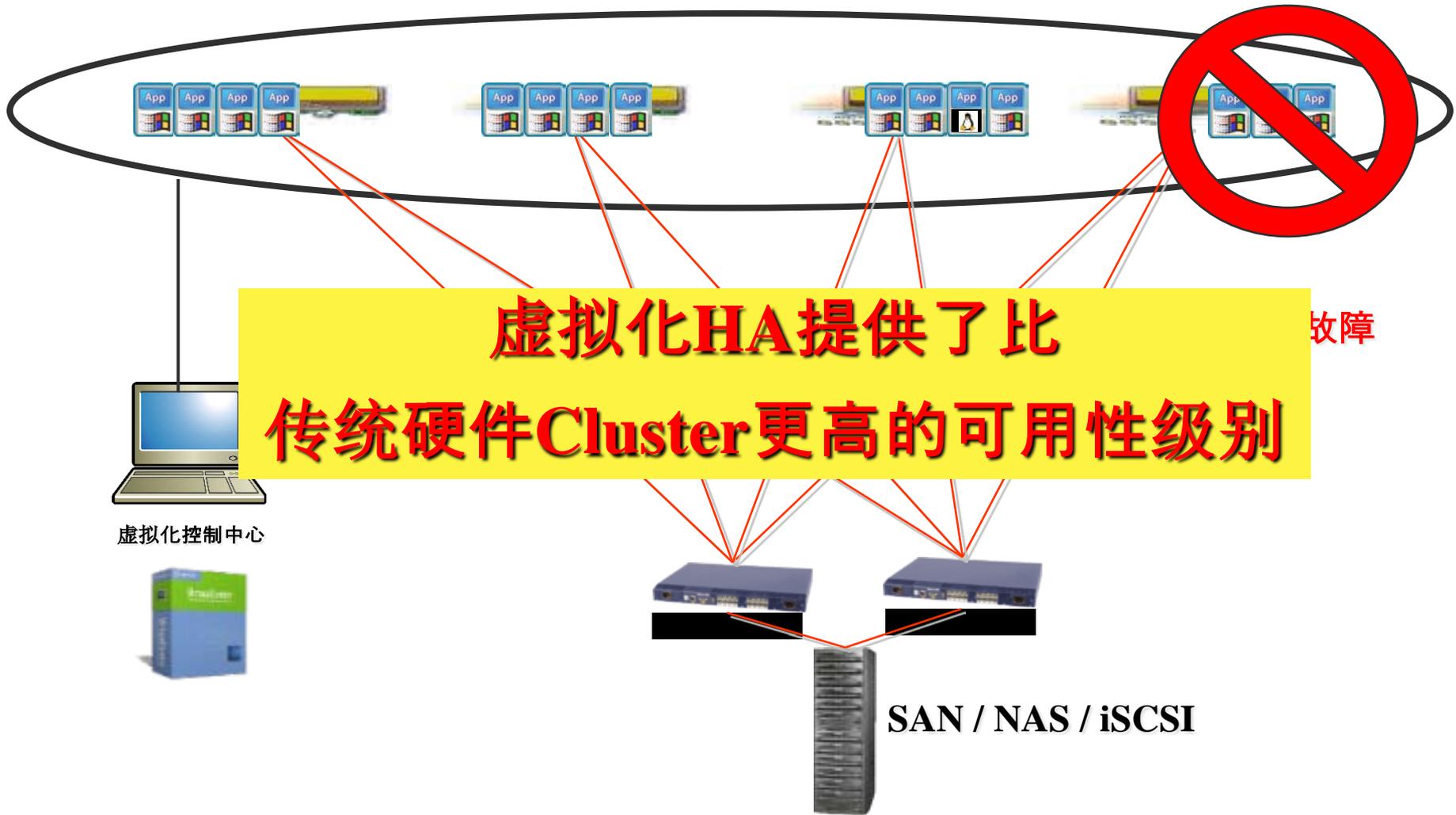
Interconnect Pool



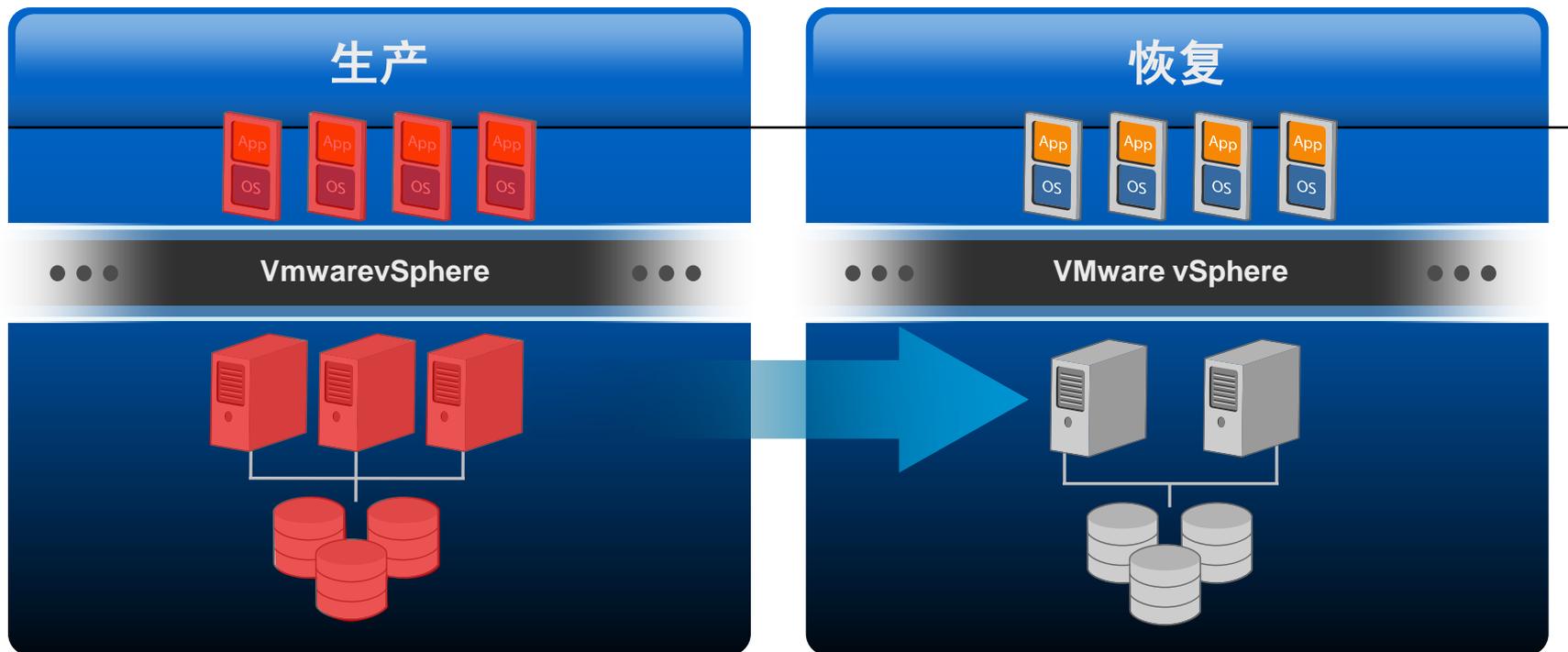
# 资源按需分配、业务应用精确交付



# Vmware High Availability 自动的高可用性保证



# 自动进行整个数据中心的灾难恢复



虚拟化转变灾难恢复方式

## 实例:使用虚拟化技术为数据中心节约能源开销

**VMware 将服务器、存储及网络连接基础架构整合到一起,旨在安全地实现更高的利用率**

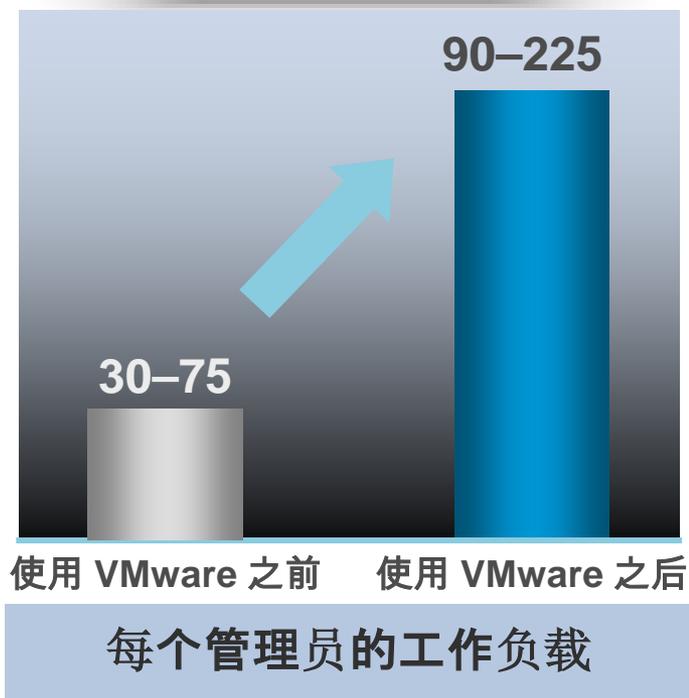
虚拟化前			虚拟化后	
服务器类型	服务器数量	功率 (W)	服务器数量	功率 (W)
单CPU	30	475	0	550
双CPU	60	550	0	672
四CPU	10	950	3	1150

数据中心冷却系统节省的电能为: 31364 (W)

依照上述计算,我们可以估计出该数据中心在一年内节省大约**58.8**万度电力!

# 实例:降低运营成本, 提高服务水平

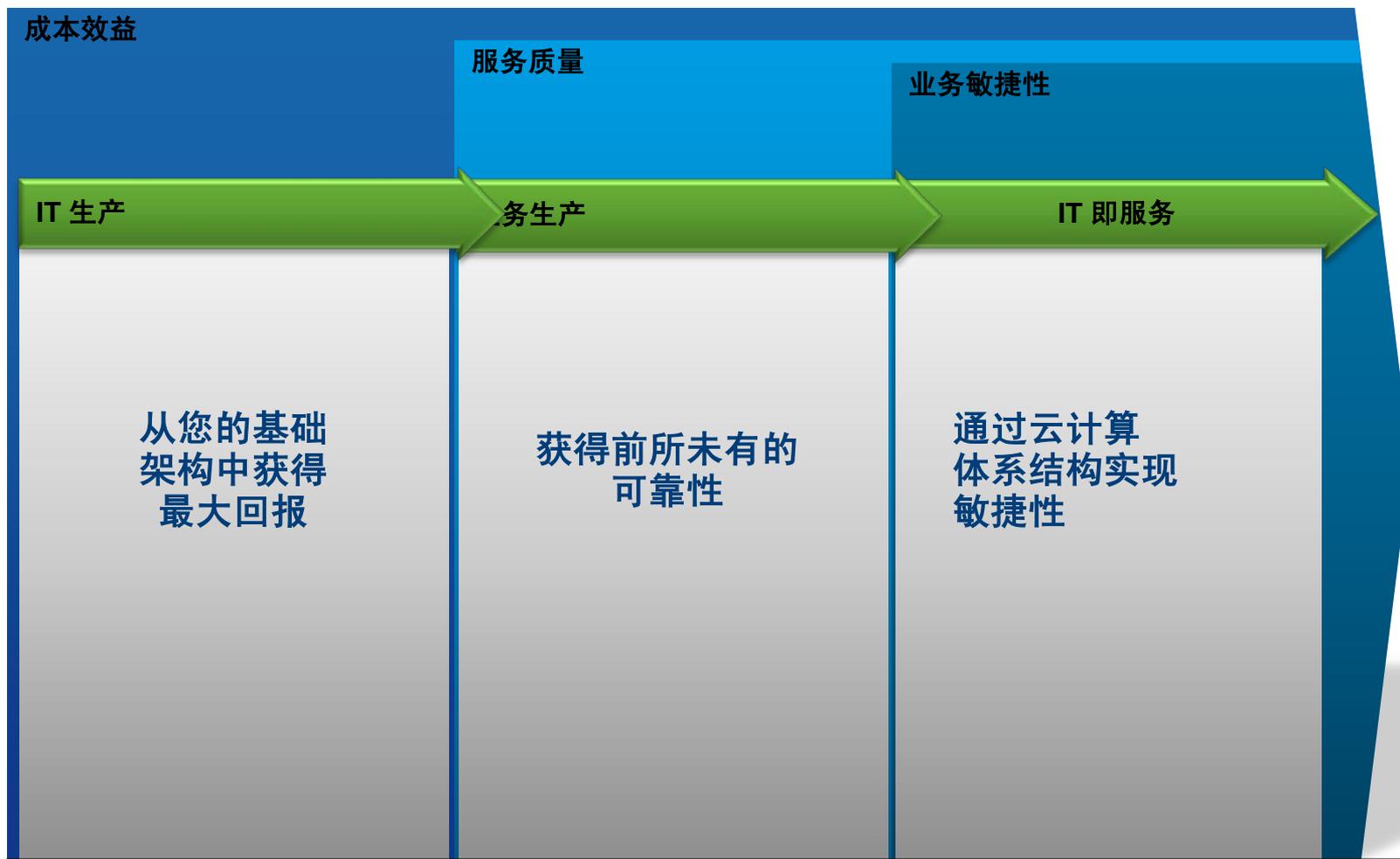
提高生产率、灵活性  
与响应度

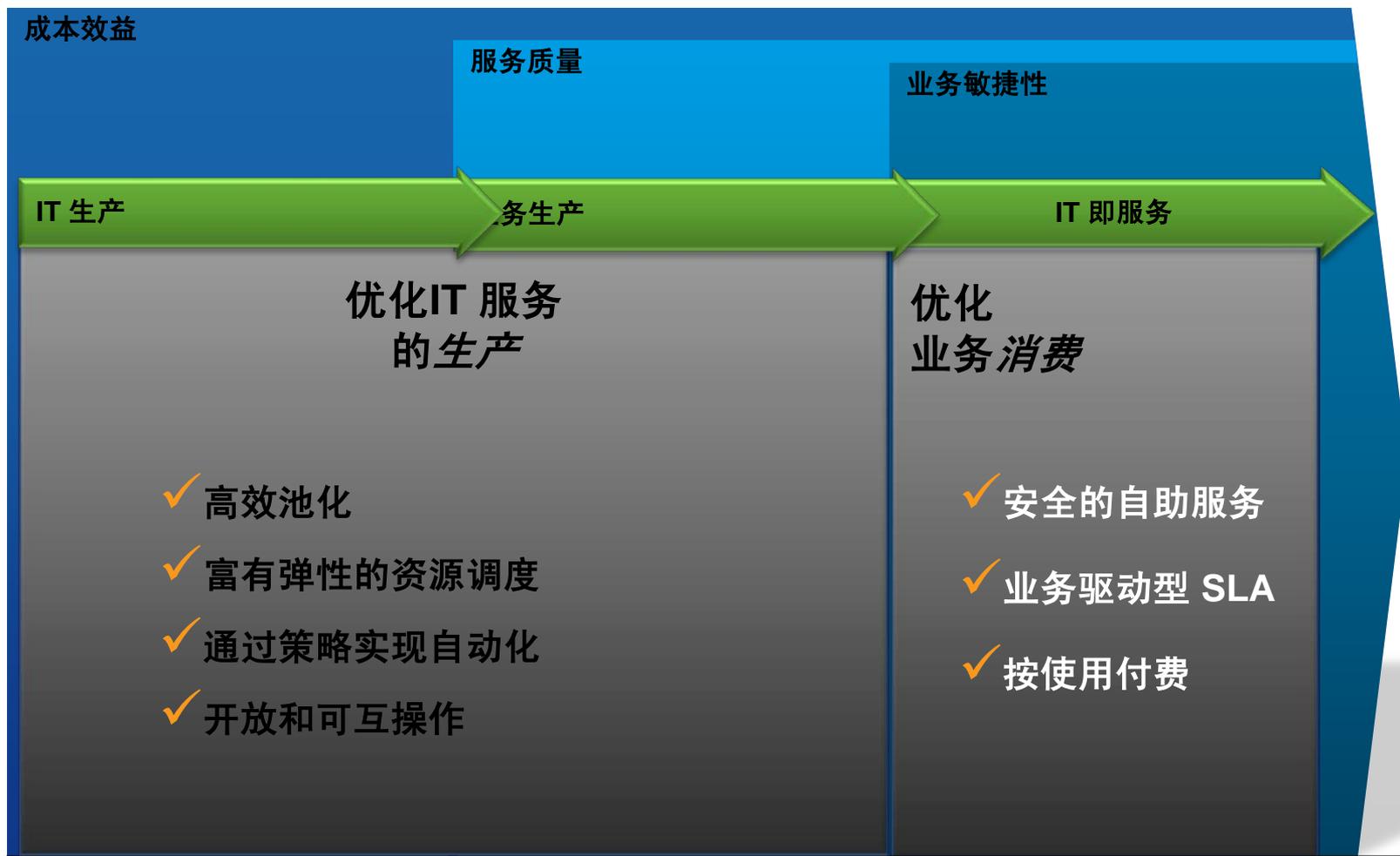


- > 相同的人数完成更多的工作 = 节省运营成本
- > 提高生产率的动力:
  - > 瞬间调配
  - > 动态修补
  - > 零宕机维护
  - > 内置高可用性
  - > 自动进行灾难恢复

来源: IDC 和 VMware TAM 计划

# ITaaS 之旅





# 云计算的特征

云计算是一种 *计算方法*，它将按需提供的自助管理虚拟基础架构汇集成高效池，以服务的形式提供计算资源。

通过提高利用率和  
实现自动化获得高效性

优化 IT 服务的生产

兼具敏捷性和可控性

优化 IT 服务的  
业务消耗

可自由选择

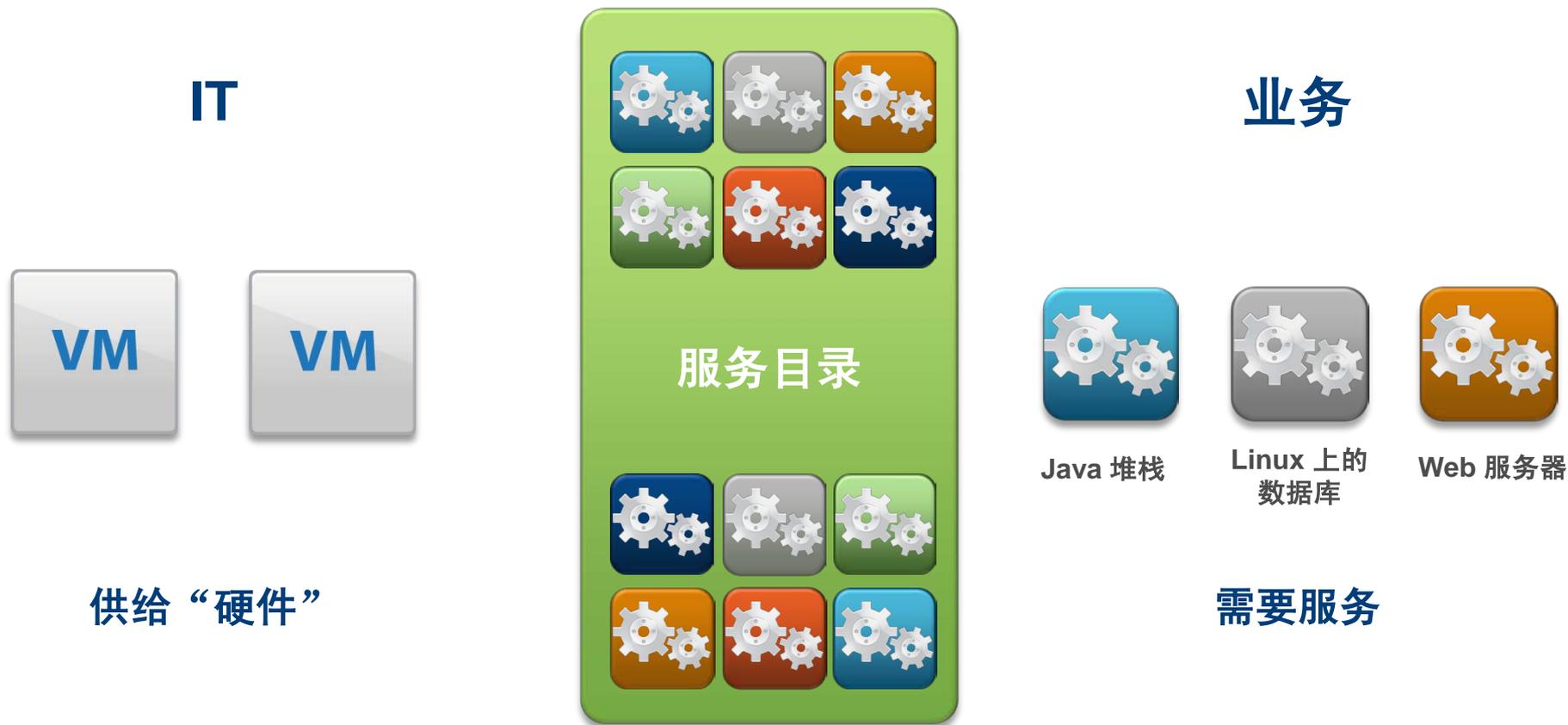
开放和互操作

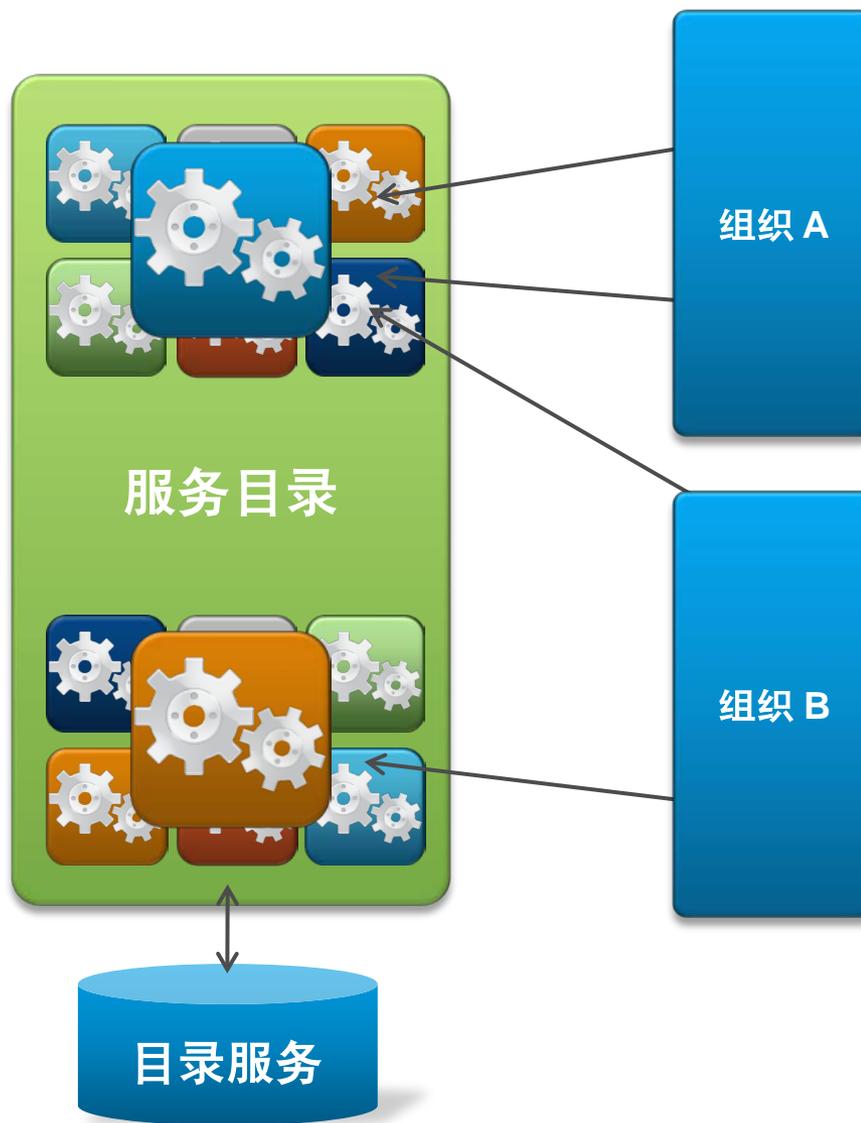
应用程序可基于开放标准在云之间实现移动

利用现有投资

云计算为现有应用程序和数据中心带来诸多好处

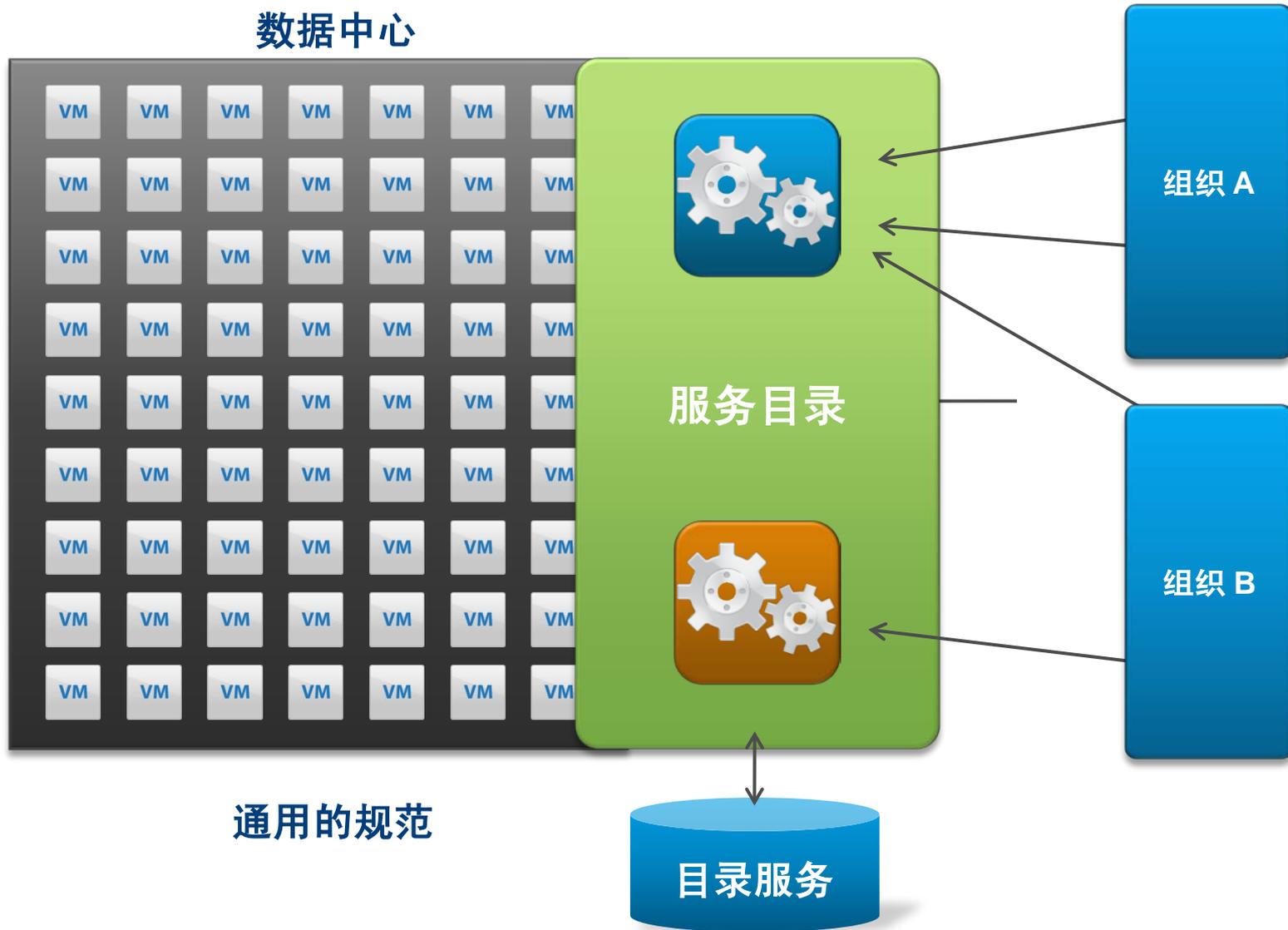
# 从提供“机器”发展为提供服务





与目录服务集成

# 逻辑数据中心可提供多种服务水平 (SLA)



# 逻辑数据中心可提供多种服务水平 (SLA)

## 虚拟数据中心

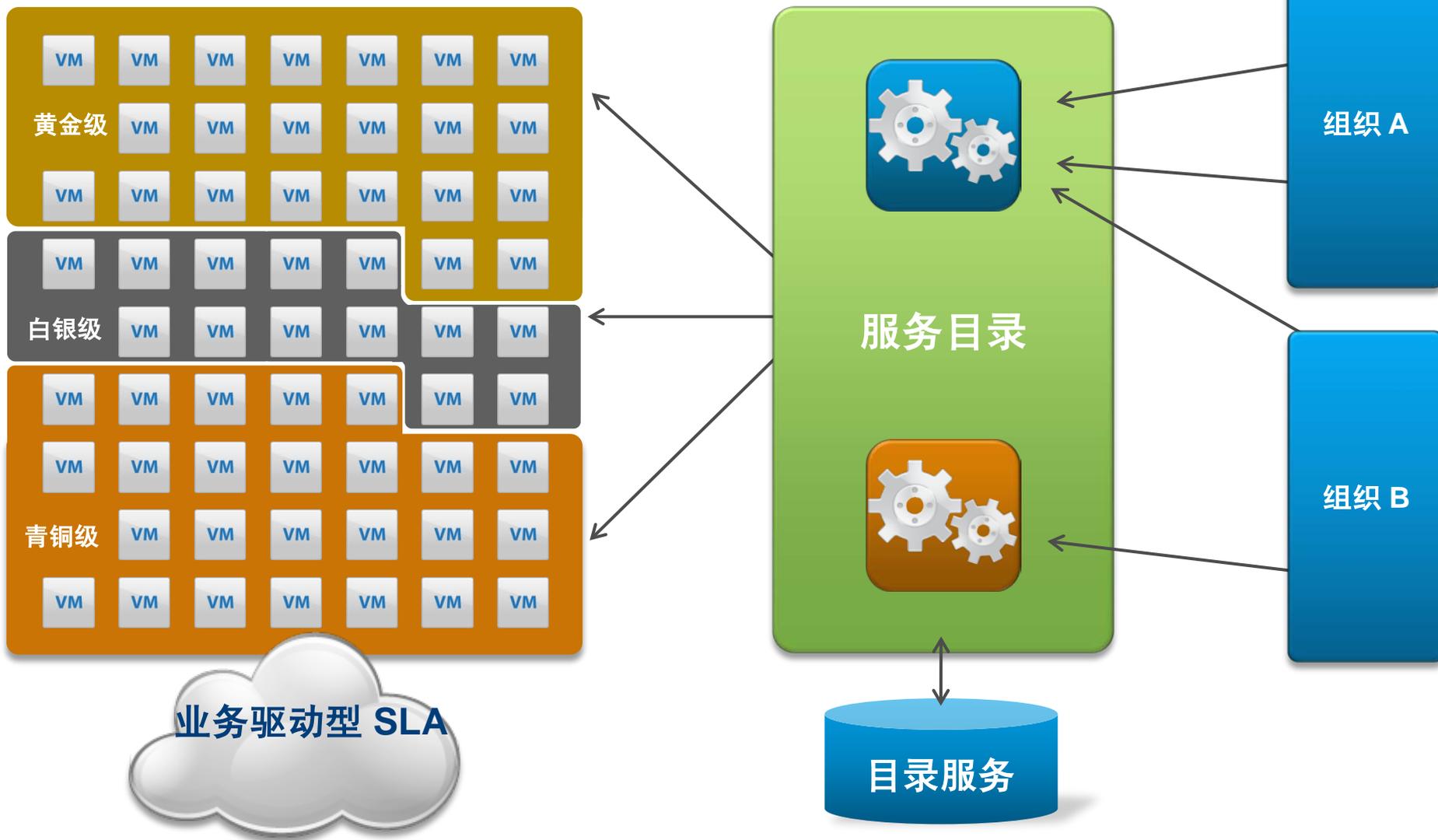


## 业务驱动型 SLA

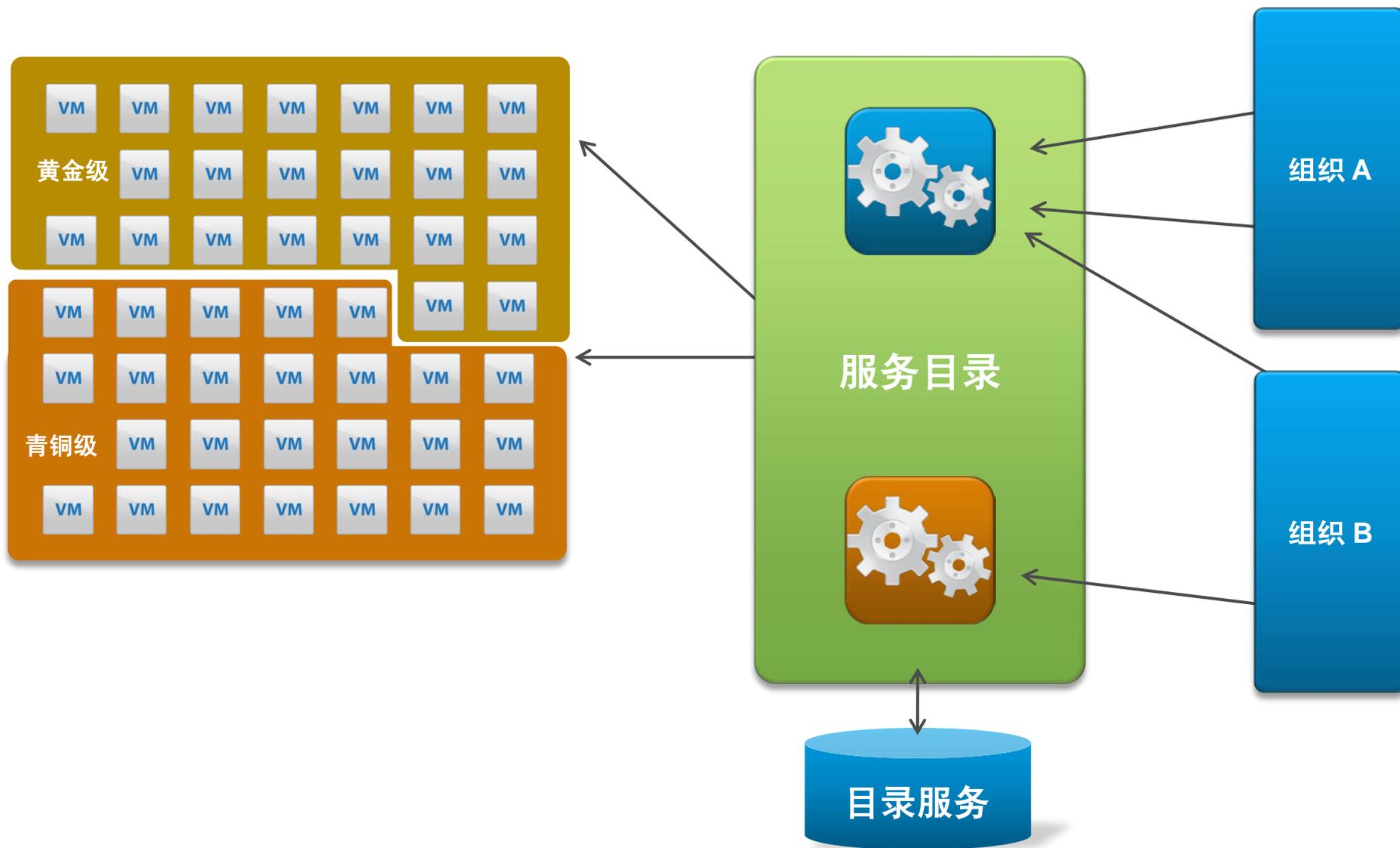


# 逻辑数据中心可提供多种服务水平（SLA） – 跨云提供

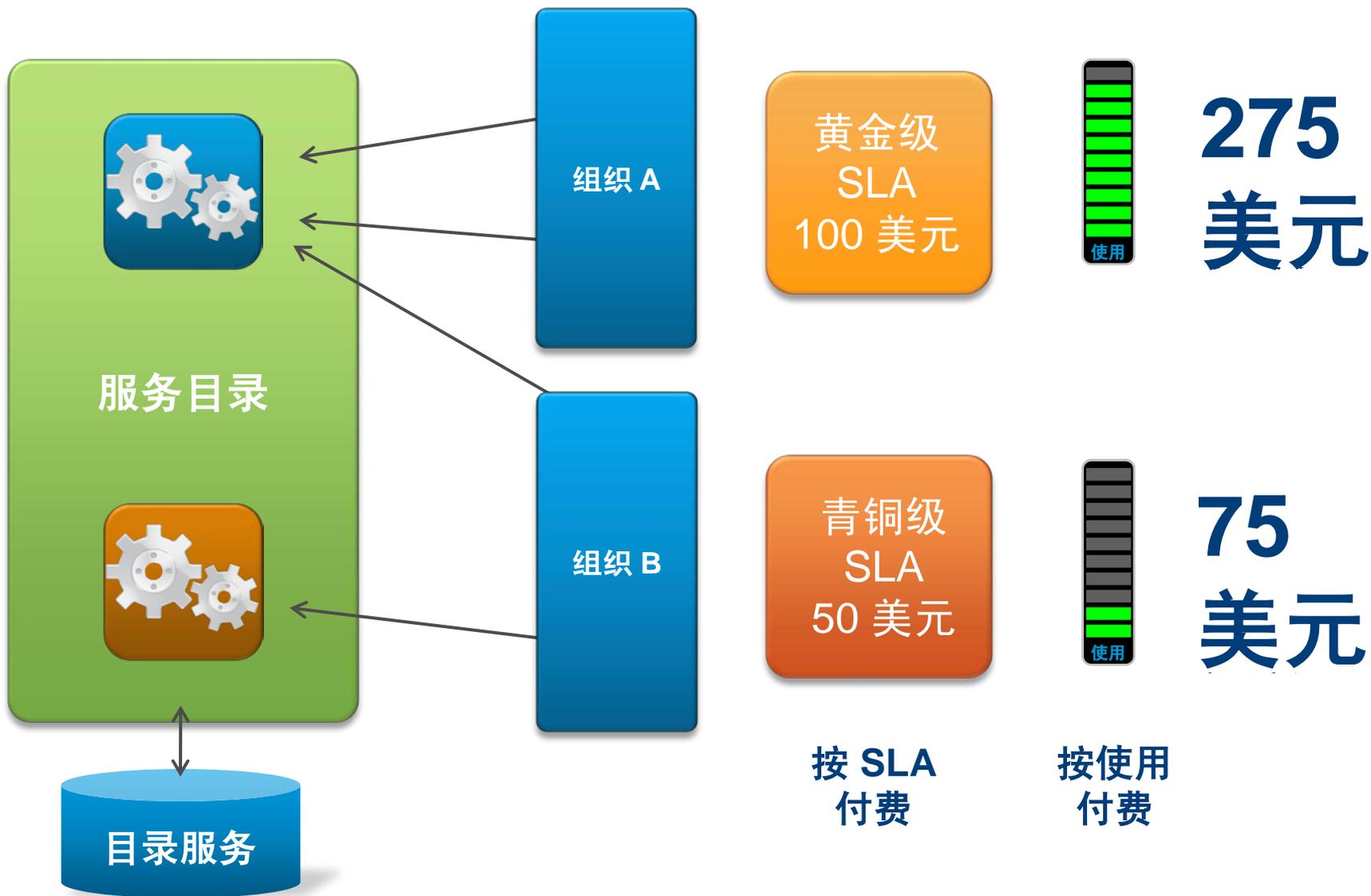
## 虚拟数据中心



# 按使用付费的模式



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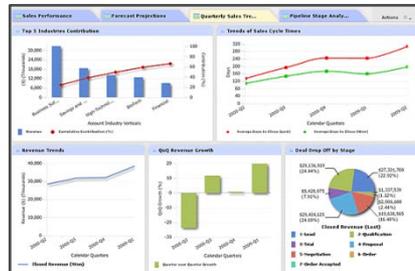


# 新 IT 前景



Segment	Segment Class 2	Type	Beginning Balance (Credit)	Beginning Balance (Debit)	Debits	Credits	Ending Balance (Debit)	Ending Balance (Credit)
1400	Operating Equipment	E	0.00	0.00	1,100,000.00	0.00	1,100,000.00	0.00
1405	Transportation Equipment	E	0.00	0.00	1,000,000.00	0.00	1,000,000.00	0.00
1500	Prepaid	E	0.00	0.00	400,000.00	0.00	400,000.00	0.00
1600	Equipment Expense	E	0.00	0.00	1,400,000.00	0.00	1,400,000.00	0.00
1700	Lease Liabilities	E	0.00	0.00	600,000.00	0.00	600,000.00	0.00
1800	Leases	E	0.00	0.00	2,500.00	0.00	2,500.00	0.00
1900	Car Rental	E	0.00	0.00	700.00	0.00	700.00	0.00
2000	Accumulated Depreciation	E	0.00	0.00	1,000.00	0.00	1,000.00	0.00
2100	Accumulated Depreciation	E	0.00	0.00	0.00	0.00	0.00	0.00
2200	Manufacturing	E	0.00	0.00	22,000.00	0.00	22,000.00	0.00
2300	Manufacturing	E	0.00	0.00	0.00	44,000.00	44,000.00	0.00
2400	Manufacturing	E	0.00	0.00	2,000,000.00	0.00	2,000,000.00	0.00
2500	Manufacturing	E	0.00	0.00	1,000.00	0.00	1,000.00	0.00
2600	Manufacturing	E	0.00	0.00	8,000.00	0.00	8,000.00	0.00
2700	Manufacturing	E	0.00	0.00	1,000.00	0.00	1,000.00	0.00
2800	Manufacturing	E	0.00	0.00	24,471.90	0.00	24,471.90	0.00
2900	Manufacturing	E	0.00	0.00	912,000.00	0.00	912,000.00	0.00
3000	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
3100	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
3200	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
3300	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
3400	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
3500	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
3600	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
3700	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
3800	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
3900	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
4000	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
4100	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
4200	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
4300	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
4400	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
4500	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
4600	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
4700	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
4800	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
4900	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
5000	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
5100	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
5200	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
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5900	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
6000	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
6100	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
6200	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
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6600	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
6700	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
6800	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
6900	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
7000	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
7100	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
7200	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
7300	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
7400	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
7500	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
7600	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
7700	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
7800	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
7900	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
8000	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
8100	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
8200	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
8300	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
8400	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
8500	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
8600	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
8700	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
8800	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
8900	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
9000	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
9100	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
9200	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
9300	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
9400	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
9500	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
9600	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
9700	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
9800	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
9900	Manufacturing	E	0.00	0.00	0.00	0.00	0.00	0.00
9999	N/A	E	2,790,000.00	0.00	2,790,000.00	0.00	0.00	2,790,000.00

现有应用



新的企业级应用



SaaS应用



现有数据中心



公共云服务

# 三个核心关注领域

终端用户计算

云计算应用平台

云计算基础架构和管理

现有数据中心

公共云服务

# 可跨云移植

spring  
框架和工具



丰富的 Web



集成



批处理



数据访问



社交媒介



云计算 API

## VMware vFabric

通用平台服务



应用管理



数据管理



信息传递



动态负载均衡



应用服务器



私有云



vmforce



Google  
app engine



# 终端用户所看到的



SaaS应用

The screenshot shows a financial ledger application. The table lists various transactions with columns for Segment, Type, Beginning Balance, Balance, Debits, Credits, Ending Balance, and Ending Balance Credits. The data includes entries for 'Cleaning and Maintenance', 'Equipment Expenses', 'Fuelage', 'Legal Services', 'Medical', 'Car Rental', 'Accommodation', 'Meals', 'Microfinance', 'Interest Income', 'Interest Expense', 'Discount Sales', 'Currency Loans', 'Unearned Foreign Ex.', 'Manufacturing In', 'Offset Account 10', 'Offset Account 20', and 'N/A'.

Segment	Type	Beginning Balance	Balance	Debits	Credits	Ending Balance	Ending Balance Credits
1400	Cleaning and Maintenance	0.00	0.00	1,100,000.00	0.00	1,100,000.00	0.00
1400	Equipment Expenses	0.00	0.00	1,000,000.00	0.00	1,000,000.00	0.00
7000	Fuelage	0.00	0.00	400,000.00	0.00	400,000.00	0.00
7000	Equipment Expenses	0.00	0.00	1,400,000.00	0.00	1,400,000.00	0.00
7000	Legal Services	0.00	0.00	600,000.00	0.00	600,000.00	0.00
1400	Medical	0.00	0.00	2,500,000.00	0.00	2,500,000.00	0.00
7000	Car Rental	0.00	0.00	700.00	0.00	700.00	0.00
7000	Accommodation	0.00	0.00	1,000.00	0.00	1,000.00	0.00
7000	Meals	0.00	0.00	670.00	0.00	670.00	0.00
7700	Microfinance	0.00	0.00	22,222.22	0.00	22,222.22	0.00
9000	Interest Income	0.00	0.00	0.00	44,141.94	0.00	44,141.94
7000	Interest Expense	0.00	0.00	2,000,500.00	0.00	2,000,500.00	0.00
7000	Discount Sales	0.00	0.00	0.00	5,542.00	0.00	5,542.00
7000	Currency Loans	0.00	0.00	8,814.90	0.00	8,814.90	0.00
7000	Currency Loans	0.00	0.00	13,627.80	0.00	13,627.80	0.00
2000	Unearned Foreign Ex.	0.00	0.00	24,475.56	0.00	24,475.56	0.00
8100	Manufacturing In	512,366.68	0.00	0.00	0.00	512,366.68	0.00
8000	Manufacturing Out	0.00	973,300.00	0.00	0.00	0.00	973,300.00
8100	Offset Account 10	0.00	0.00	15,375,000.00	0.00	15,375,000.00	0.00
8000	Offset Account 20	0.00	142,000,000.00	0.00	0.00	0.00	142,000,000.00
9999	N/A	0.00	0.00	22,222.22	0.00	0.00	22,222.22

企业级应用



Windows 应用



# 终端用户所看到的



SaaS应用

The screenshot shows a financial ledger application. The table lists various transactions with columns for Segment, Type, Beginning Balance, Ending Balance, Debits, Credits, and Ending Balance. The data is organized into segments like 'Cleaning and Maintenance' and 'Equipment Expenses'.

Segment	Type	Beginning Balance	Ending Balance	Debits	Credits	Ending Balance
1400	Cleaning and Maintenance	0.00	1,100,000.00	0.00	1,100,000.00	0.00
1400	Equipment Expenses	0.00	1,000,000.00	0.00	1,000,000.00	0.00
7000	Phrasing	0.00	400,000.00	0.00	400,000.00	0.00
7000	Equipment Expenses	0.00	1,400,000.00	0.00	1,400,000.00	0.00
7000	Legal Services	0.00	600,000.00	0.00	600,000.00	0.00
7000	Medical	0.00	2,500,000.00	0.00	2,500,000.00	0.00
7000	Car Rental	0.00	700,000.00	0.00	700,000.00	0.00
7000	Accommodation	0.00	1,000,000.00	0.00	1,000,000.00	0.00
7000	Meals	0.00	670,000.00	0.00	670,000.00	0.00
7700	Microfinance	0.00	22,222.22	0.00	22,222.22	0.00
7000	Interest Income	0.00	44,444.44	0.00	44,444.44	0.00
7000	Interest Expense	0.00	2,000,000.00	0.00	2,000,000.00	0.00
7000	Discount Taken	0.00	5,555.56	0.00	5,555.56	0.00
7000	Currency Gains	0.00	8,888.89	0.00	8,888.89	0.00
7000	Currency Losses	0.00	13,333.33	0.00	13,333.33	0.00
2000	Unrealized Foreign Ex.	0.00	24,444.44	0.00	24,444.44	0.00
8100	Manufacturing In	512,366.68	0.00	0.00	0.00	512,366.68
8200	Manufacturing Out	0.00	973,300.00	0.00	0.00	973,300.00
8510	Other Account 10	0.00	15,375,000.00	0.00	15,375,000.00	0.00
8520	Other Account 20	0.00	142,000,000.00	0.00	0.00	142,000,000.00
9999	N/A	0.00	0.00	22,222.22	0.00	22,222.22

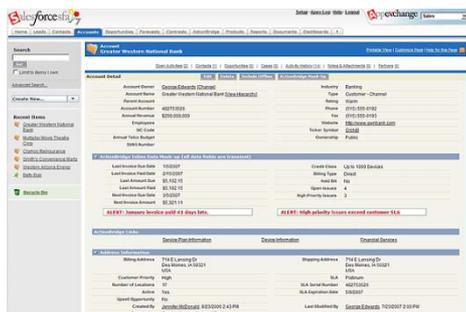
企业级应用



Windows 应用



# 终端用户计算 = 以用户为中心



SaaS应用

Log: Fusion Operations (SaaS)

Period: Jan 07

Segment	Segment Desc	Type	Beginning Balance Debit	Beginning Balance Credit	Debit	Credit	Ending Balance Debit	Ending Balance Credit
1400	Clearing and Materials	E	0.00	0.00	1,100,015.17	0.00	1,100,015.17	0.00
1400	Equipment Expenses	E	0.00	0.00	1,009,645.45	0.00	1,009,645.45	0.00
7010	Freight	E	0.00	0.00	490,473.97	0.00	490,473.97	0.00
7020	Equipment Expenses	E	0.00	0.00	1,445,194.72	0.00	1,445,194.72	0.00
7020	Legal Services	E	0.00	0.00	605,406.10	0.00	605,406.10	0.00
1400	Adhes	E	0.00	0.00	2,545,000.00	0.00	2,545,000.00	0.00
7020	Car Rental	E	0.00	0.00	760.00	0.00	760.00	0.00
7020	Accommodation	E	0.00	0.00	1,000.00	0.00	1,000.00	0.00
7740	Microfinance	E	0.00	0.00	675.00	0.00	675.00	0.00
7740	Health	E	0.00	0.00	22,222.22	0.00	22,222.22	0.00
9910	Interest Income	R	0.00	0.00	44,147.94	0.00	44,147.94	0.00
7020	Interest Expense	E	0.00	0.00	2,009,533.27	0.00	2,009,533.27	0.00
7020	Discount Sales	E	0.00	0.00	5,542.30	0.00	5,542.30	0.00
7020	Currency Gains	E	0.00	0.00	6,814.90	0.00	6,814.90	0.00
7040	Currency Losses	E	0.00	0.00	13,627.80	0.00	13,627.80	0.00
2040	Unrealized Foreign Ex.	E	0.00	0.00	24,471.56	0.00	24,471.56	0.00
8100	Manufacturing In	A	512,366.68	0.00	0.00	0.00	512,366.68	0.00
8200	Manufacturing Out	A	0.00	973,300.00	0.00	0.00	973,300.00	0.00
8510	Offset Account 10	E	0.00	0.00	15,375,000.00	0.00	15,375,000.00	0.00
8520	Offset Account 20	A	0.00	143,900,000.00	0.00	0.00	143,900,000.00	0.00
9999	Null	E	0.00	0.00	22,222.22	0.00	22,222.22	0.00

Call Report: 0.00 To: 1/31/2007 3,790,043,304.07 700,487,019.00 700,487,019.00 1,832,213,176.95 2,832,213,176.95

企业级应用



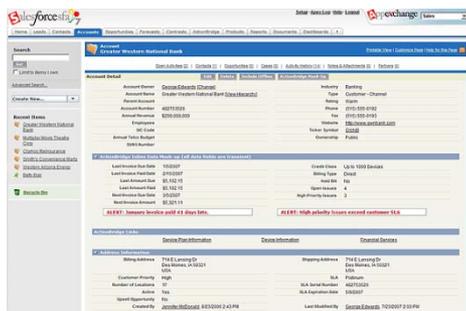
Windows 应用

对所有设备提供本机支持

安全访问所有应用



# 源自云的终端用户计算



SaaS应用

The screenshot shows a financial ledger application with a table of transactions. The table has columns for Segment, Description, Type, Beginning Balance, Balance Credits, Debits, Credits, Ending Balance, and Ending Credits. The data includes various expense and income items like 'Cleaning and Maintenance', 'Equipment Expenses', and 'Interest Income'.

Segment	Description	Type	Beginning Balance	Balance Credits	Debits	Credits	Ending Balance	Ending Credits
1400	Cleaning and Maintenance	E	0.00	0.00	1,100,011.17	0.00	1,100,011.17	0.00
1400	Equipment Expenses	E	0.00	0.00	1,009,645.45	0.00	1,009,645.45	0.00
7010	Portage	E	0.00	0.00	490,473.97	0.00	490,473.97	0.00
7020	Equipment Expenses	E	0.00	0.00	1,441,994.72	0.00	1,441,994.72	0.00
7020	Legal Services	E	0.00	0.00	606,406.10	0.00	606,406.10	0.00
7040	Adverse	E	0.00	0.00	2,540,000.00	0.00	2,540,000.00	0.00
7050	Car Rental	E	0.00	0.00	768.00	0.00	768.00	0.00
7070	Accommodation	E	0.00	0.00	1,000.00	0.00	1,000.00	0.00
7070	Meals	E	0.00	0.00	675.00	0.00	675.00	0.00
7740	Microfinance	E	0.00	0.00	22,222.22	0.00	22,222.22	0.00
9010	Interest Income	R	0.00	0.00	44,147.94	0.00	44,147.94	0.00
7020	Interest Expense	E	0.00	0.00	2,028,533.27	0.00	2,028,533.27	0.00
7020	Discount Sales/E	E	0.00	0.00	5,542.30	0.00	5,542.30	0.00
7020	Currency Gains	E	0.00	0.00	6,814.90	0.00	6,814.90	0.00
7040	Currency Losses	E	0.00	0.00	13,627.80	0.00	13,627.80	0.00
2040	Unearned Foreign Ex.	E	0.00	0.00	24,471.56	0.00	24,471.56	0.00
8100	Manufacturing In	A	512,366.68	0.00	0.00	0.00	512,366.68	0.00
8100	Manufacturing Out	A	0.00	973,300.01	0.00	0.00	973,300.01	0.00
8510	Other Account 10	E	0.00	0.00	15,375,000.00	0.00	15,375,000.00	0.00
8520	Other Account 20	A	0.00	142,900,000.00	0.00	0.00	142,900,000.00	0.00
9999	N/A	E	0.00	0.00	22,222.22	0.00	22,222.22	0.00

企业级应用



Windows 应用





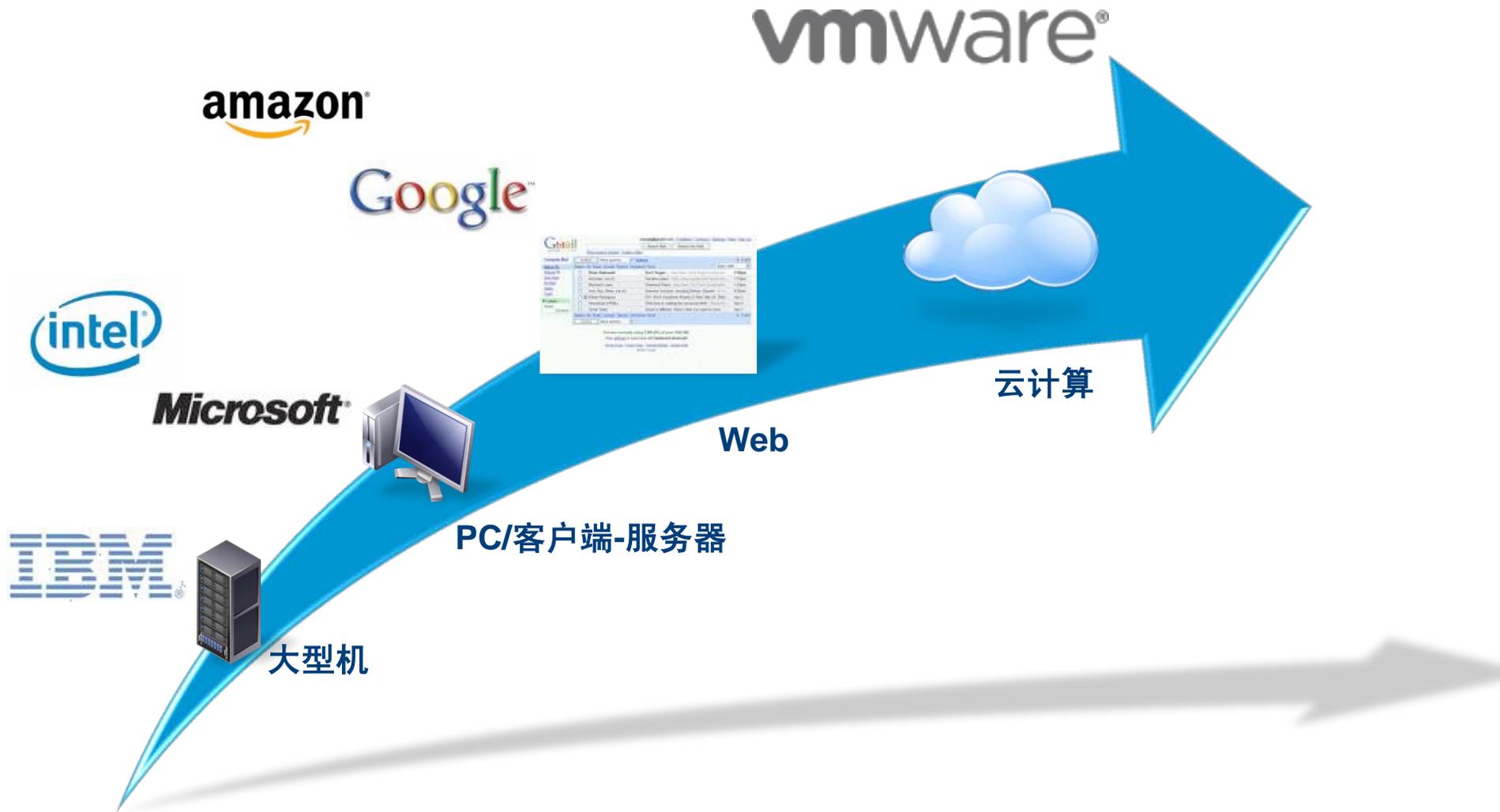
Windows 应用

# 面向 ITaaS 的 VMware 解决方案

安全、可管理、内聚



# IT 周期由业内革新技术驱动



# 谢谢