



规划IT蓝图 提升业务价值

IBM服务管理用户大会



高效灵活的自动化存储架构管理

高伟

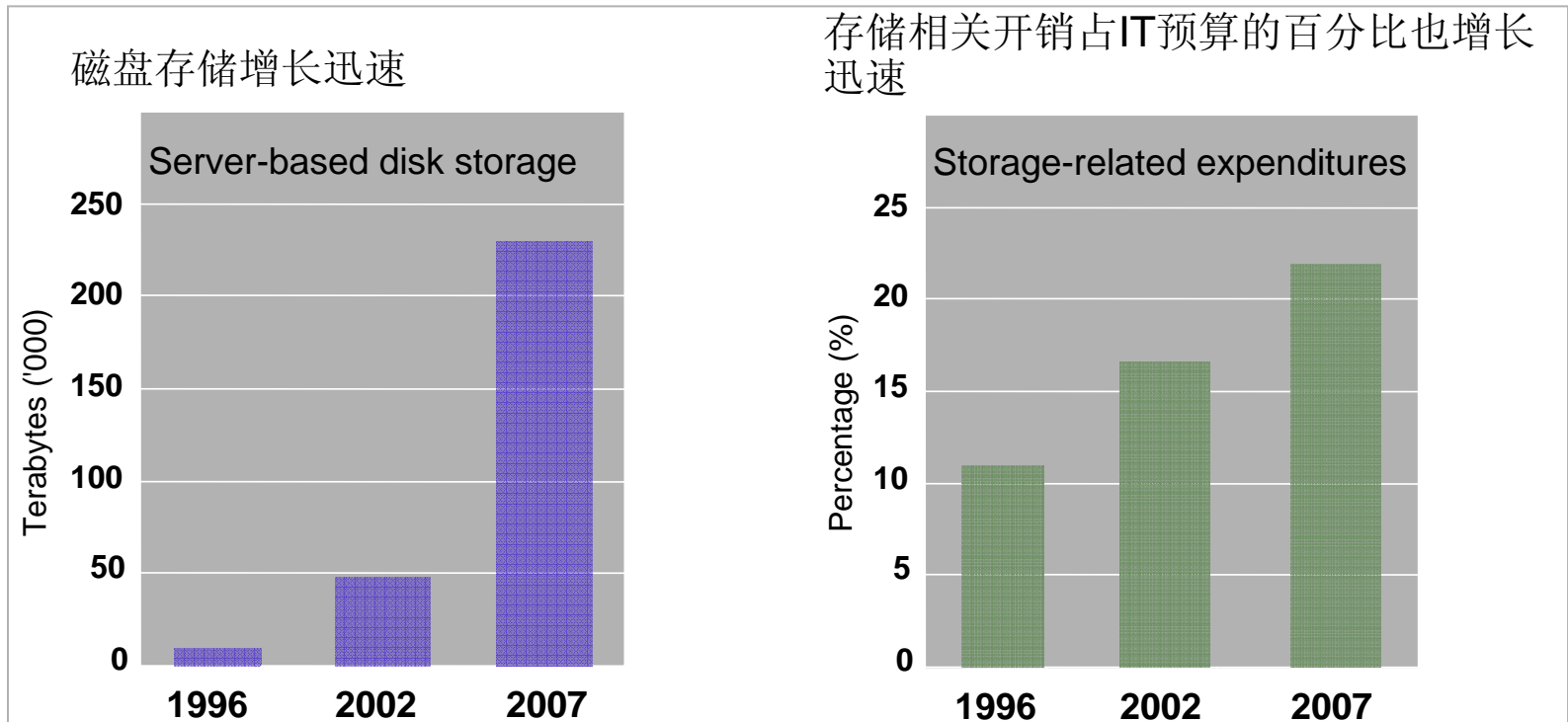
IBM高级技术工程师



我们面临的挑战

数据量 (Volume of data)

典型的财富500强企业

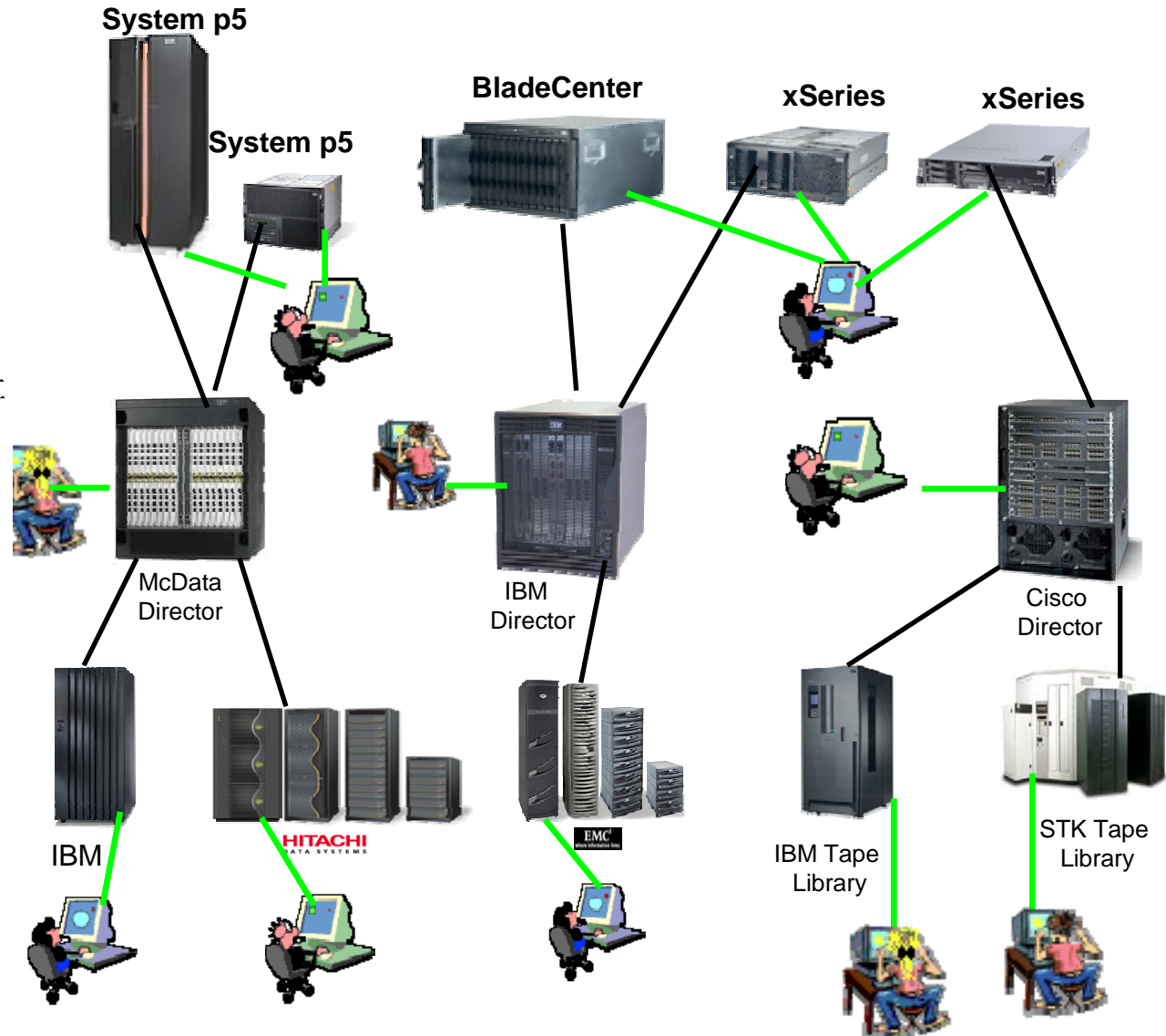


数据来源: International Technology Group

* Hardware, software, storage networking, personnel, backup operations, recovery and security

如今的存储管理

- 每一个存储设备都有自己的管理工具
- 管理员必须精通每一种存储管理工具
- 不同的管理工具几乎做“相同”的事情
- 没有一个端到端(HBA to disk)的存储管理平台
- 没有一个集中的报告管理工具
- 不能自动化定制存储管理任务



TotalStorage Productivity Center 能够帮助回答的问题

问题1：您如何对IT环境中的存储资源能进行详细统计分析？

问题2：您如何决定何时进行存储扩容？何时购置新的存储设备？

问题3：您是否担心由于存储空间不足而造成的应用宕机？

问题3：您是否感觉到对多台异构存储设备的管理力不从心？

问题4：您是否对存储资源具有一个统一的**Topology**图，并且能够对连接状态及数据流量实时更新？

问题5：您是否能够对磁盘阵列的性能进行综合评估，已发现存在或潜在的风险？

Information Assets & Systems

存储基础架构管理



→ IBM TotalStorage Productivity Center

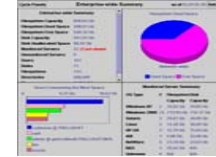
- **Productivity Center for Data**
资产和容量管理
文件系统和数据库
- **Productivity Center for Disk**
存储设备的管理与操作 (Disk, Tape, Virtualization)
- **Productivity Center for Fabric**
Fabric的管理与操作 (Switches, Directors)
- **Productivity Center for Replication**
高级拷贝操作的管理与操作 (ESS, SVC)

单点自动化集中管理

IBM TotalStorage Productivity Center 组件

■ TotalStorage Productivity Center for Data

- 数据收集和分析, 文件系统和数据库
- 报告, 收费 和配额
- 自动化的操作
- 异构磁盘支持(IBM, EMC, HDS, HP, Engenio)
- IBM 3584 磁带库资产报告



■ TotalStorage Productivity Center for Fabric

- SAN 拓扑展示和管理
- 事件报告
- 性能报告
- Zone 控制
- 异构Fabric支持 (Brocade, Cisco, McData, etc.)



■ TotalStorage Productivity Center for Disk

- 磁盘阵列管理
- 性能管理 - IBM 和异构存储
- 卷性能建议 (ESS Only)
- 存储容量供应 - IBM 和异构存储
- 高级性能管理 - IBM DS4000/6000/8000/SVC



■ TotalStorage Productivity Center for Replication

- 对时间点复制和远程卷复制服务的单一控制点
- 自动进行 source-target 匹配
- 跨设备的一致性组
- ESS 和 SVC 的FlashCopy 和 Metro Mirror

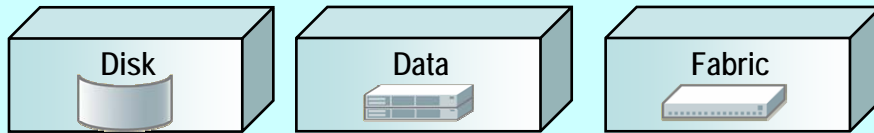
IBM
TotalStorage
Productivity
Center
Std Ed.

TPC Limited Edition

设备发现和基本设备管理

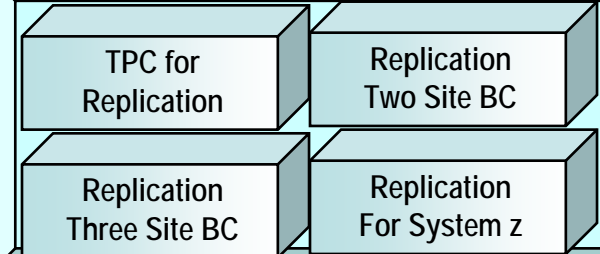
IBM TotalStorage Productivity Center (TPC) v3.3 家族

标准版 (SE)



限制版 (LE)

Replication



TPC for Disk

对存储 (磁盘, 磁带, 虚拟化)的管理和操作管理

TPC for Data

资产和容量报告
文件系统和数据基本管理

TPC for Fabric

对光纤 switches 和directors的管理和操作管理

TPC for Replication

对高级拷贝服务的管理和操作管理

TPC for Replication Two Site BC

灾难恢复管理, 包括 Failback 功能

TPC for Replication Three Site BC

灾难恢复管理, 包括MGM的Failback 功能

TPC for Replication for System z

在z/OS上实施的灾难恢复管理 – 等同于上面产品的功能

IBM TotalStorage Productivity Center 产品策略



整合功能

实现一个整合存储网络，存储硬件，存储容量和复制服务的集中管理平台，来满足企业级和中小企业用户的需求



增强开放性

推动存储基础架构管理的工业标准— **Aperi Community Founder and Contributor** 以及 **SMI-S** 实现者

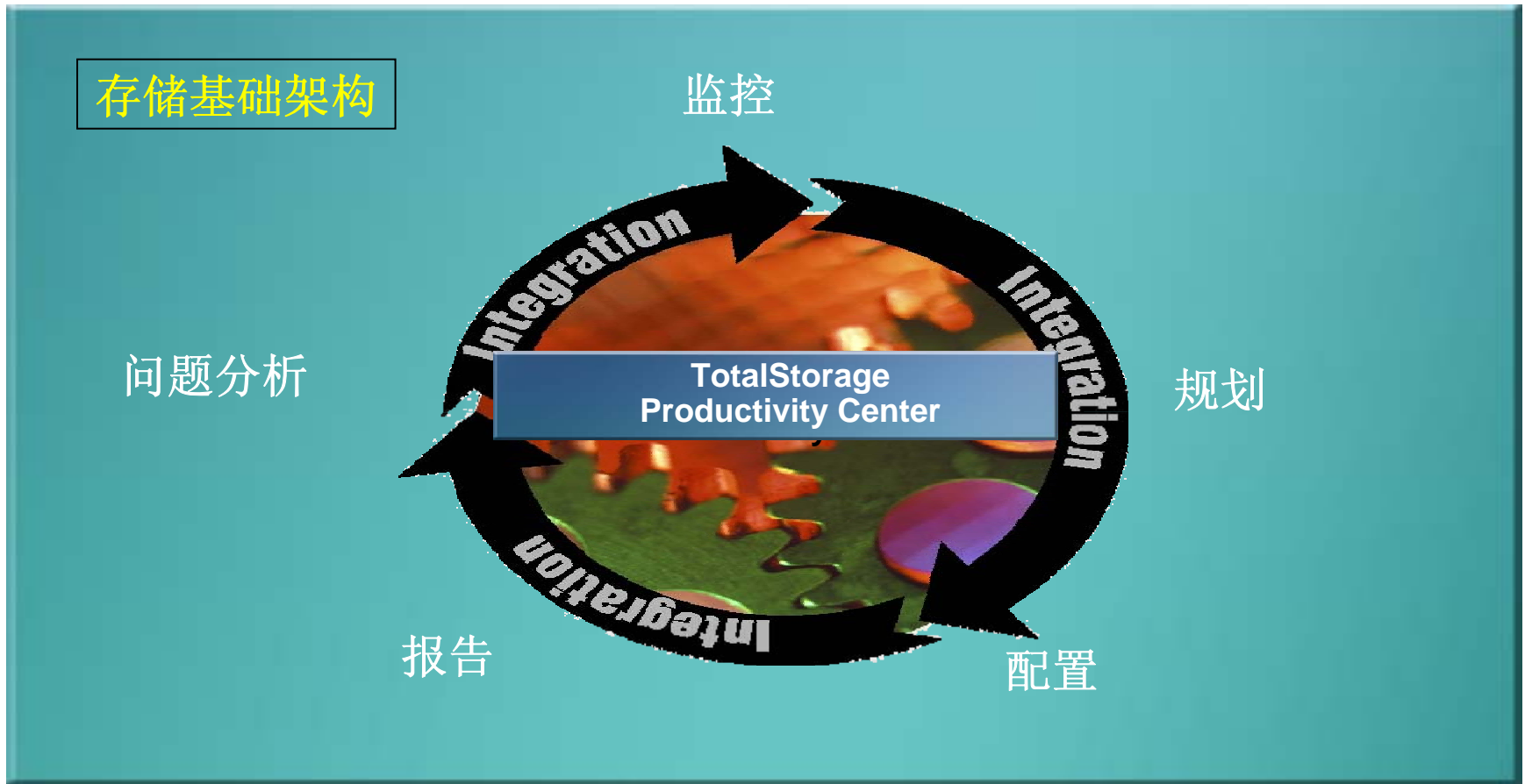


主动管理

提供一组工具，能够通过主动进行存储设施和数据的管理持续的提高存储管理员的生产率，而不仅仅是监控。

TotalStorage Productivity Center 概述

可用性, 性能 和容量



实现IBM 和第三方存储的集中管理

IBM TotalStorage Productivity Center 标准版



扩展的管理支持

扩展的 3rd 方存储管理 (供应与性能管理)

扩展的Fabric 管理
SMI-S 性能管理

DS8000 DS6000 DS4000
Enterprise Storage Server
SAN Volume Controller
IBM 存储

HP
EMC
HITACHI
SMI-S Certified
第三方存储

3584
3494
IBM 磁带库

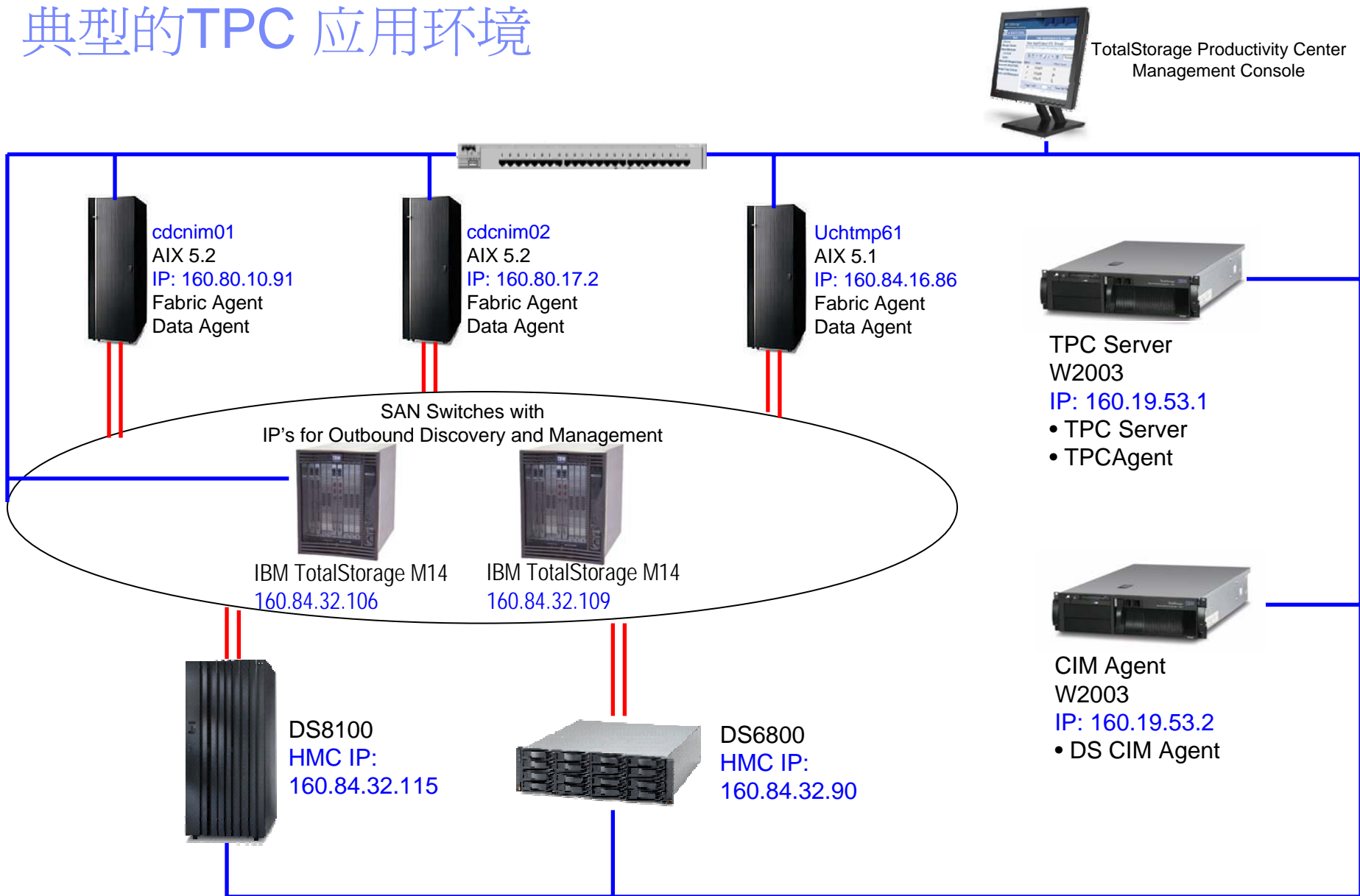
Cisco McData
Brocade QLogic
光线交换机

Productivity Center 支持的设备

Storage Subsystem	Discovery, Monitoring, Asset/Capacity Reporting	Fabric Support (associated zoning)	Disk Provisioning	Performance Management	Replication Mgt	Topology Viewing
ESS	✓	✓	✓	✓	✓	✓
DS6000 / 80000	✓	✓	✓	✓		✓
SVC	✓	✓	✓	✓	✓	✓
SFS	✓	✓	N/A			
DS4000	✓	✓	✓	✓		✓
EMC, HDS, HPQ, Engenio...	✓	✓	✓	✓		✓
Brocade, McData, Cisco, Qlogic..	✓	✓	N/A	✓		✓
Refer to http://www.snia.org/ctp for the latest SMI-S compliant storage						
NetApp	✓					
Tape (3584, 3494)	✓		N/A			✓

 New Support

典型的TPC 应用环境



TPC集中存储管理平台

■ 存储资源统计分析



TPC集中存储管理平台

■ 存储容量分析

IBM TotalStorage Productivity Center for Data Server: TPC1 -- TPCUser, 磁盘容量摘要

文件(F) 查看(V) 连接(C) 首选项(P) 窗口(W) 帮助(H)

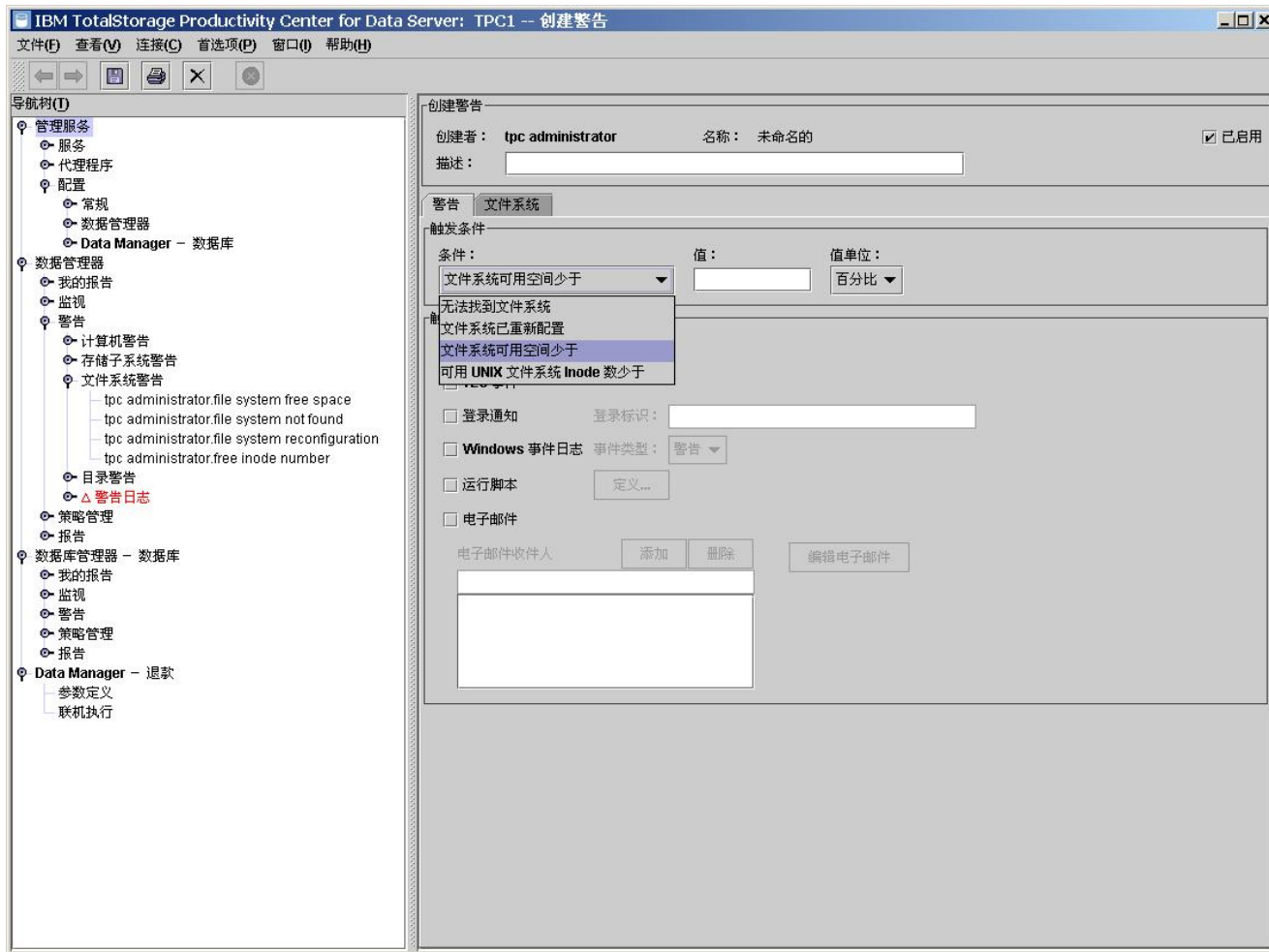
选择 网络范围 图表 network wide

磁盘容量：按计算机
行数：10

计算机	总容量	总的未分配空间	拥有的容量	拥有的未分配空间	OS类型	网络地址	IP地址	时区	CPU体系结构
p650a_test	518.57 GB	110.00 GB	518.57 GB	110.00 GB	AIX	P650A_TEST	10.3.18.1	WST	POWER
p650a_devp	350.94 GB	65.75 GB	350.94 GB	65.75 GB	AIX	172.26.170.18	172.26.170.18	WST	POWER
p650b_tsmb	276.43 GB	185.75 GB	276.43 GB	185.75 GB	AIX	P650B_TSMB	10.3.10.53	WST	POWER
p650a_tsma	276.43 GB	54.88 GB	276.43 GB	54.88 GB	AIX	P650A_TSMA	10.3.10.52	WST	POWER
p650a_jyfk	136.73 GB	48.25 GB	136.73 GB	48.25 GB	AIX	P650A_JYFK	10.3.64.49	WST	POWER
p650b_khjl	136.73 GB	48.25 GB	136.73 GB	48.25 GB	AIX	P650B_KHJL	10.3.64.33	WST	POWER
p650b_yzkh	136.73 GB	48.25 GB	136.73 GB	48.25 GB	AIX	P650B_YZKH	10.3.64.65	WST	POWER
p650b_intranet	136.73 GB	48.25 GB	136.73 GB	48.25 GB	AIX	P650B_INTRA	10.3.64.17	WST	POWER
tpc2	74.47 GB	63.00 KB	74.47 GB	63.00 KB	Windows	TPC2	10.3.10.50	CST	
tpc1	67.83 GB	4.03 MB	67.83 GB	4.03 MB	Windows	tpc1	10.3.10.49	CST	IA32

TPC集中存储管理平台

■ 文件系统空间告警



TPC集中存储管理平台

■ 文件系统空间告警

The screenshot displays the IBM TotalStorage Productivity Center for Data Server interface. The window title is "IBM TotalStorage Productivity Center for Data Server: TPC1 -- 警告历史 -- 所有文件系统". The interface includes a navigation tree on the left, a toolbar with buttons like "清除", "删除", "全部清除", "全部删除", and "刷新", and a main table showing warning history.

计算机	文件系统	警告类型	第一次触发	最后一次触发	次数	警告创建者
p650a_test	/home/aips	数据可用空间量低	2005-10-21 10:30:49	2005-10-21 15:49:25	71	tpc admini:
p650a_test	/home/aips	数据可用空间量低	2005-10-20 17:24:25	2005-10-21 10:29:27	214	tpc admini:

The navigation tree on the left shows a hierarchy starting with "管理服务" (Management Services), including "配置" (Configuration), "数据管理器" (Data Manager), "数据管理报告" (Data Manager Reports), "监视" (Monitoring), "警告" (Warnings), and "警告日志" (Warning Logs). Under "警告日志", there are sub-items for "全部" (All), "计算机" (Computer), "存储子系统" (Storage Subsystem), "磁盘" (Disk), "文件系统" (File System), "目录" (Directory), "用户" (User), and "OS 用户组" (OS User Group). The "文件系统" item is currently selected and highlighted in pink.

TPC集中存储管理平台

■ 文件系统空间告警

The screenshot displays the IBM TotalStorage Productivity Center for Data Server interface. The window title is "IBM TotalStorage Productivity Center for Data Server: TPC1 -- 警告详细信息 -- 数据可用空间量低". The interface is divided into a navigation pane on the left and a main content area on the right.

Navigation Pane (左侧):

- 管理服务
 - 服务
 - 代理程序
 - 配置
 - 常规
 - 数据管理器
 - Data Manager - 数据库
- 数据管理器
 - 我的报告
 - 监视
 - 警告
 - 计算机警告
 - 存储子系统警告
 - 文件系统警告
 - 目录警告
 - 警告日志
 - 全部
 - 计算机
 - 存储子系统
 - 磁盘
 - 文件系统
 - 目录
 - 用户
 - OS 用户组
- 策略管理
- 报告
- 数据库管理器 - 数据库
 - 我的报告
 - 监视
 - 警告
 - 策略管理
 - 报告
- Data Manager - 退款
 - 参数定义
 - 联机执行

Main Content Area (右侧):

警告详细信息

计算机	p650a_test
文件系统	/home/aips
警告类型	数据可用空间量低
状态	已受理
第一次触发	2005-10-20 17:24:25
最后一次触发	2005-10-21 10:29:27
连续触发数	214
可用空间	141.39 MB
触发警告时间	< 10%
警告创建者	tpc administrator
警告名称	file system free space
脚本	beep.bat
运行于	tpc1

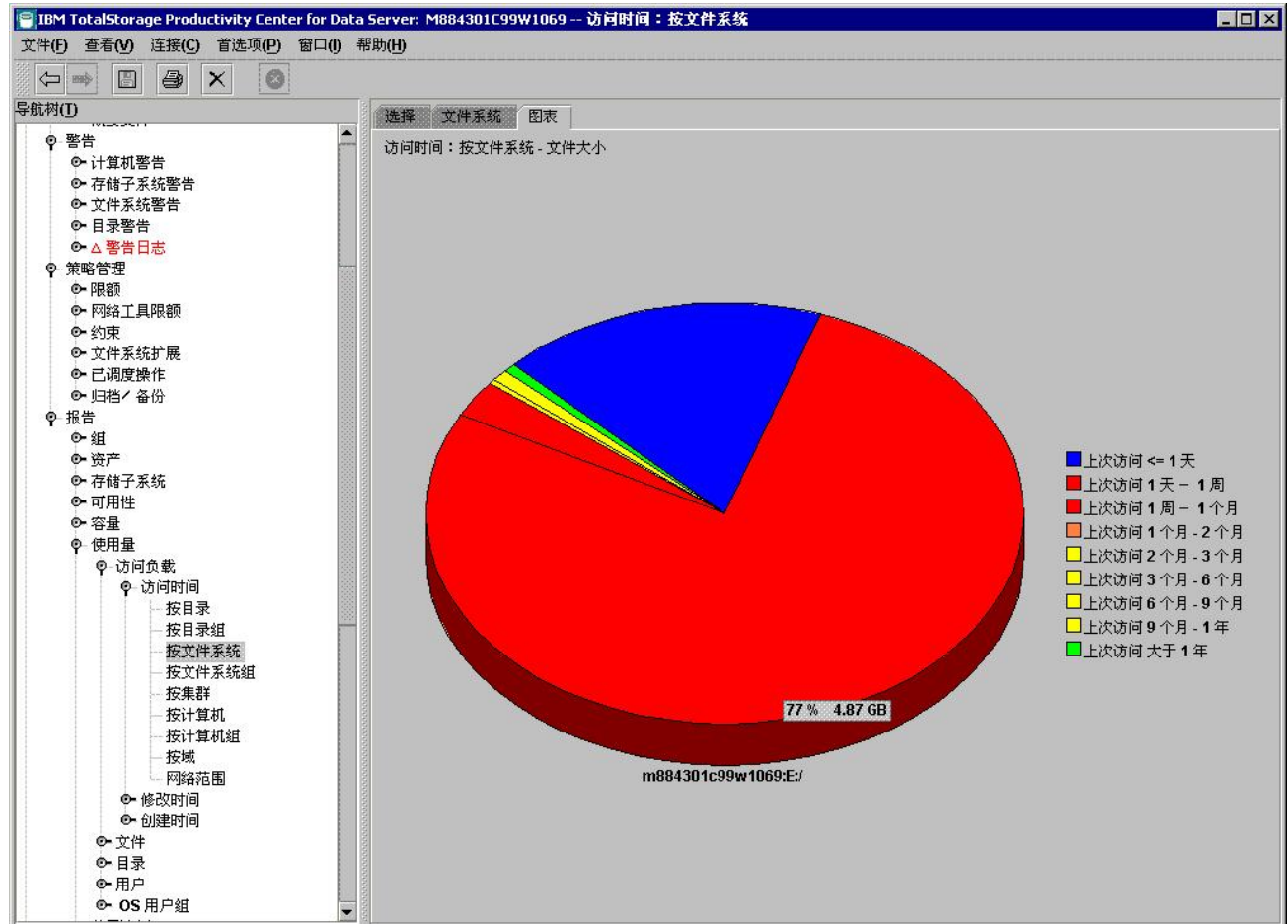
[查看脚本日志](#)

警告文本

ALR0009W: 主机 p650a_test 上的文件系统 /home/aips 上的可用空间已经降到阈值 10% 以下。可用空间是文件系统容量的 141.39MB 或 1.15%。

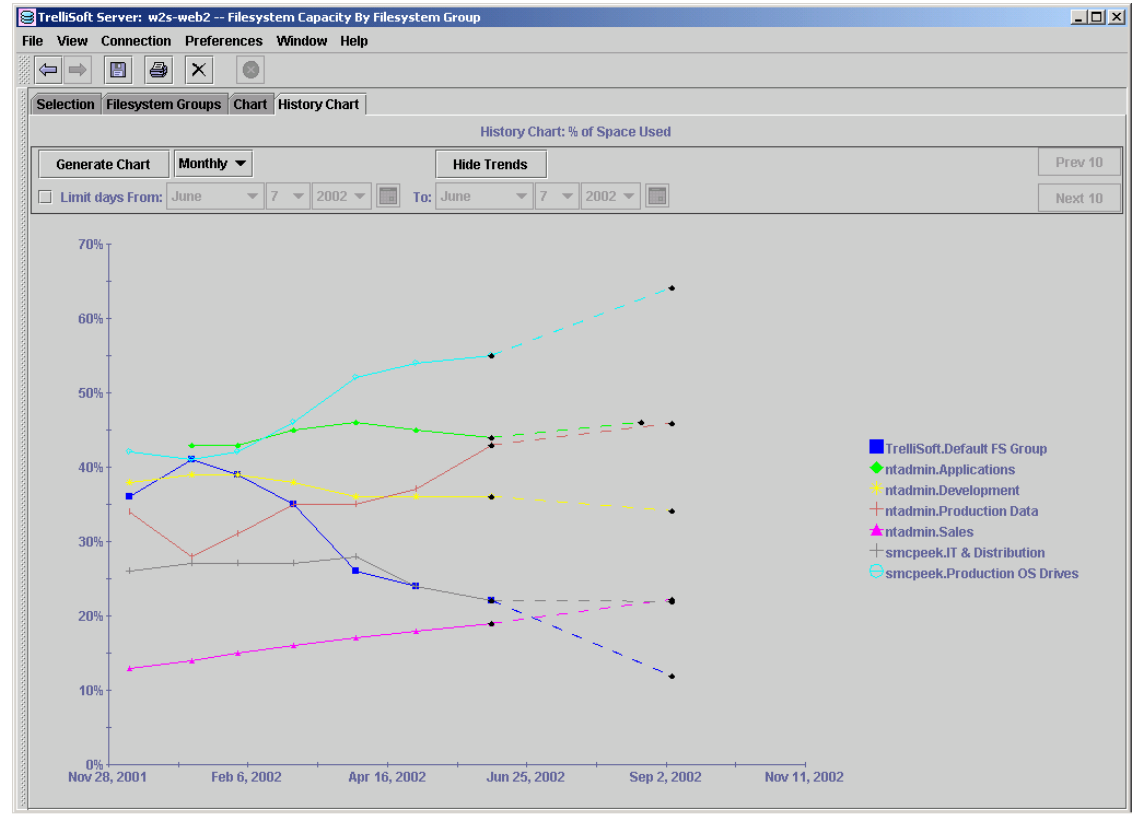
TPC集中存储管理平台

- 文件访问负载分析
- 进行文件和目录级别分析
- 根据文件访问负载进行分类统计



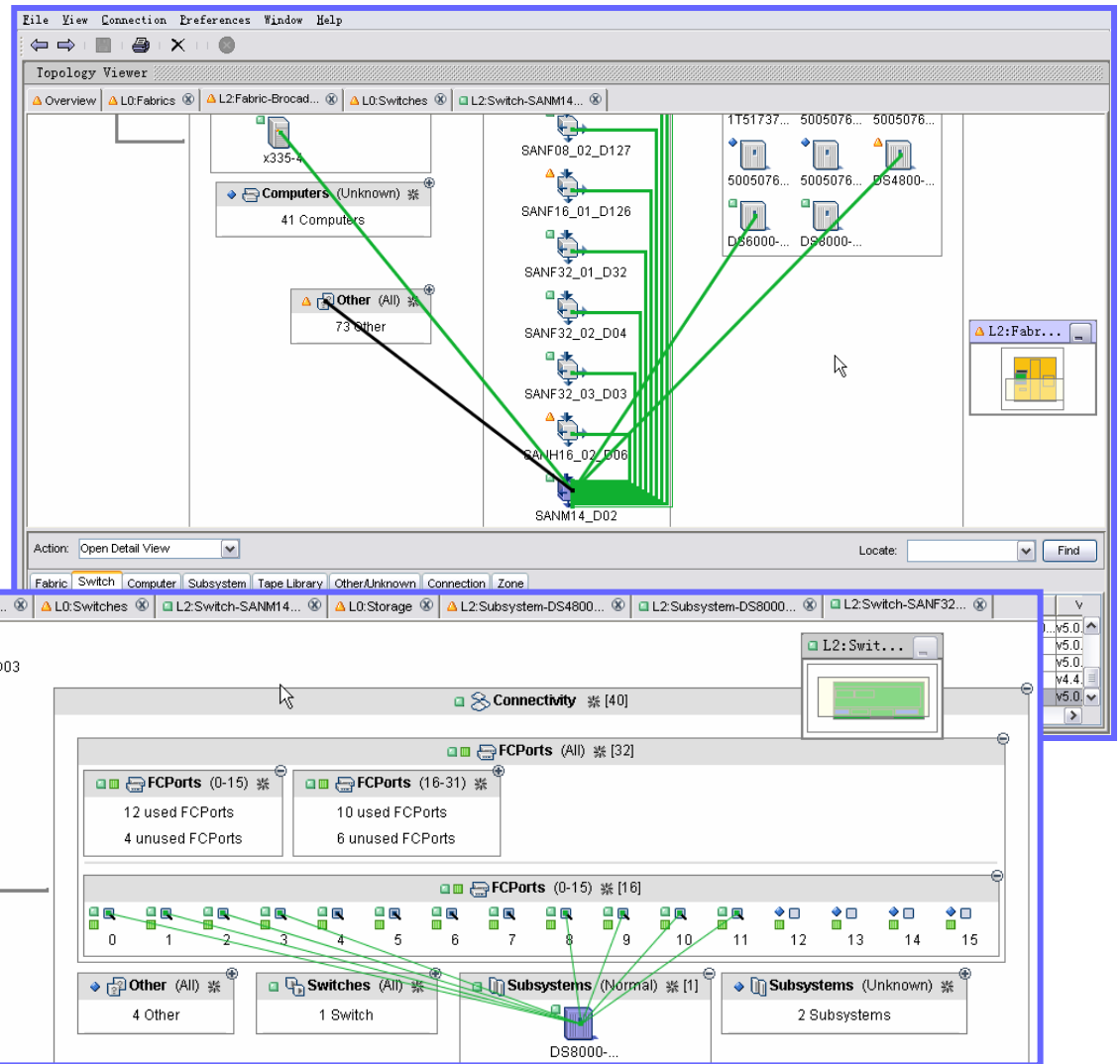
TPC集中存储管理平台——空间分配预测

- 根据历史数据进行未来趋势预测
- 识别容量增长最快的用户、文件系统和数据库表空间
- 预测将来的容量增长
- 进行容量规划



TPC集中存储管理平台——存储网络管理

- 集中控制实现SAN配置
- 自动管理
 - 多厂商的交换机
 - 多厂商 HBA
- 拓扑网络的生成
- 故障设备识别
- 性能监控管理



TPC集中存储管理平台

■ 存储阵列资产管理

IBM TotalStorage Productivity Center: ywcd.test.com -- Storage Subsystems

Navigation Tree

- Usage Violations
- Backup
- Data Manager for Databases
- Data Manager for Chargeback
- Disk Manager
 - Storage Subsystems
 - Volume Performance Advisor
 - Monitoring
 - Groups
 - Jobs
 - Subsystem Performance Monitors
 - administrator.ESS800_03_Perf_Collection
 - administrator.ESS800_10_Perf_Collection
 - administrator.ESS800_11_Perf_Collection
 - Alerting
 - Storage Subsystem Alerts
 - TPCUser.Default.Disk Array Discovery
 - Policy Management
 - Reporting
 - Storage Subsystems
 - Storage Subsystem Performance
 - By Storage Subsystem
 - By Controller
 - By I/O Group
 - By Array
 - By Managed Disk Group
 - By Volume
 - By Managed Disk
 - By Port
 - Constraint Violations
 - Fabric Manager
 - Fabrics
 - Monitoring
 - Alerting
 - Reporting
 - Switch Performance
 - By Port
 - Constraint Violations
 - Tape Manager
 - Tape Libraries
 - Monitoring

Storage subsystems ESS-2105-27549-IBM Details

Storage subsystem: ESS-2105-27549-IBM

Label: ESS800_11

Status: Normal

Vendor: IBM

Type: ESS

Unused capacity (GB): 169.5

Used capacity (GB): 9,762.64

Serial number: 27549

Revision: 2.4.3.56

User-defined property 1 (UDP1):

User-defined property 2 (UDP2):

User-defined property 3 (UDP3):

IP Address: 172.31.1.21;172.31.1.22

Element manager: http://172.31.1.21

Buttons: Launch, Set, Reset

IBM TotalStorage Productivity Center: ywcd.test.com -- LUN: 0001 (CKD) (ESS800_11)

Navigation Tree

- Administrative Services
 - Services
 - Agents
 - Discovery
 - Configuration
 - IBM TotalStorage Productivity Center
 - My Reports
 - Topology
 - Monitoring
 - Alerting
 - Data Manager
 - Monitoring
 - Alerting
 - Policy Management
 - Reporting
 - Groups
 - Asset
 - By Cluster
 - By Computer
 - By OS Type
 - By Storage Subsystem
 - ESS800_10
 - Disk Groups
 - Storage Pools
 - Disks
 - LUNs
 - 0001 (CKD)
 - 0004 (CKD)
 - 0007 (CKD)
 - 000A (CKD)
 - 000D (CKD)
 - 0010 (CKD)
 - 0013 (CKD)
 - 0016 (CKD)
 - 0019 (CKD)
 - 001C (CKD)
 - 001F (CKD)
 - 0022 (CKD)
 - 0025 (CKD)

Logical Disk: Host Paths

LUN Name: 0001

Storage Subsystem: ESS800_11

Capacity: 8.02 GB

Overhead: 1.15 GB

Type: Concatenation

RAID Level: RAID 5

Attributes: Not Surfaced, CKD

0001

- RAID_5
 - Disk - Disk Drive dd1807
 - Disk Allocation @ 20.06 GB Length 1.34 GB
 - Disk - Disk Drive dd1703
 - Disk Allocation @ 20.06 GB Length 1.34 GB
 - Disk - Disk Drive dd1805
 - Disk Allocation @ 20.06 GB Length 1.34 GB
 - Disk - Disk Drive dd1702
 - Disk Allocation @ 20.06 GB Length 1.34 GB
 - Disk - Disk Drive dd1806
 - Disk Allocation @ 20.06 GB Length 1.34 GB
 - Disk - Disk Drive dd1704
 - Disk Allocation @ 20.06 GB Length 1.34 GB
 - Disk - Disk Drive dd1701
 - Disk Allocation @ 20.06 GB Length 1.34 GB

TPC集中存储管理平台

IBM TotalStorage Productivity Center: zhcentre.mcc.com -- Topology

File View Connection Preferences Window Help

Navigation Tree

- Administrative Services
 - Services
 - Agents
 - Discovery
 - CIMOM
 - Out of Band Fabric
 - Network Filer
 - Windows Domain, NAS, ar
 - Configuration
 - IBM TotalStorage Productivity Ce
 - My Reports
 - System Reports
 - administrator's Reports
 - Batch Reports
 - Topology
 - Computers
 - Fabrics
 - Storage
 - Other
 - Monitoring
 - Probes
 - Alerting
 - Data Manager
 - Data Manager for Databases
 - Data Manager for Chargeback
 - Disk Manager
 - Storage Subsystems
 - Volume Performance Adviso
 - Monitoring
 - Groups
 - Jobs
 - Subsystem Performance
 - administrator.DataCollect
 - Alerting
 - Policy Management
 - Reporting
 - Storage Subsystems
 - Storage Subsystem Perfo
 - By Storage Subsystem

Topology Viewer

Overview L0:Storage L2:Subsystem-DS8000...

L2:Subsystem...

Device [777]

Disks (ext_pool0) 8 Disks

Disks (ext_pool1) [8] DiskDriv... DiskDriv... DiskDriv...

Disks (ext_pool10) 8 Disks

Disks (ext_pool11)

Pools (All) [45]

Volumes (ext_pool) 8 Volumes

Volumes (ext_pool1)

Read IO Rate (overall): 0.0
Write IO Rate (overall): 0.0
Read Data Rate: 0.0
Write Data Rate: 0.0
Read Response Time: 0.0
Write Response Time: 0.0
Read Cache Hits Percentage (overall): 0.0
Write Cache Hits Percentage (overall): 0.0

Action: Expand All Groups Locate: Find

| Computer | Switch | Subsystem | Disk | Pool | Volume | LUN | FCPort | Connection | Zone | | |
|----------|--------|-----------|------|-------|------------|-----------------|-----------------|-----------------|------------|------------|----------|
| ... | ... | ... | ... | Group | ▽ Label | Operational ... | Total Capaci... | Available Ca... | Primordial | RAID Level | Number C |
| ... | ... | ... | ... | All | ext_pool0 | ok | 779.0 | 3.0 | false | raid5 | 8 |
| ... | ... | ... | ... | All | ext_pool1 | ok | 779.0 | 3.0 | false | raid5 | 8 |
| ... | ... | ... | ... | All | ext_pool10 | ok | 909.0 | 0.0 | false | raid5 | 9 |
| ... | ... | ... | ... | All | ext_pool11 | ok | 909.0 | 0.0 | false | raid5 | 9 |
| ... | ... | ... | ... | All | ext_pool12 | ok | 909.0 | 0.0 | false | raid5 | 9 |
| ... | ... | ... | ... | All | ext_pool13 | ok | 909.0 | 0.0 | false | raid5 | 9 |
| ... | ... | ... | ... | All | ext_pool14 | ok | 909.0 | 0.0 | false | raid5 | 9 |

TPC集中存储管理平台

The screenshot displays the IBM TotalStorage Productivity Center interface. The window title is "IBM TotalStorage Productivity Center: zhcentre.mcc.com -- Storage Subsystems". The interface includes a menu bar (File, View, Connection, Preferences, Window, Help) and a toolbar with navigation icons. On the left is a "Navigation Tree" with a hierarchical structure. The main area is titled "Storage Subsystems" and contains several buttons: "Volumes", "Create Volume", "Virtual Disks", "Create Virtual Disk", "Remove", "Launch Element Manager", and "Volume Performance Advisor". Below these buttons is a table listing storage subsystems.

Navigation Tree

- Administrative Services
 - Services
 - Agents
 - Discovery
 - CIMOM
 - Out of Band Fabric
 - Network Fileer
 - Windows Domain, NAS, and S
 - Configuration
- IBM TotalStorage Productivity Centre
 - My Reports
 - System Reports
 - administrator's Reports
 - Batch Reports
 - Topology
 - Monitoring
 - Probes
 - Alerting
- Data Manager
 - Data Manager for Databases
 - Data Manager for Chargeback
- Disk Manager
 - Storage Subsystems**
 - Volume Performance Advisor
 - Monitoring
 - Alerting
 - Storage Subsystem Alerts
 - Policy Management
 - Reporting
- Fabric Manager
- Tape Manager

| Subsystem ▲ | Label | Type | Status | Unused Capacity (GB) | Used Capacity (GB) |
|-------------------------|----------------|--------|--------|----------------------|--------------------|
| DS8000-2107-7538671-IBM | DS8000_1860_JS | DS8000 | Normal | 228 | 17,408 |
| DS8000-2107-75BG6M1-IBM | DS8000_BI | DS8000 | Normal | 48 | 37,868 |

TPC集中存储管理平台

IBM TotalStorage Productivity Center: zhcentre.mcc.com -- Storage Subsystem: DS8000_1860_JS

File View Connection Preferences Window Help

Navigation Tree

- Administrative Services
 - IBM TotalStorage Productivity Center
 - My Reports
 - System Reports
 - administrator's Reports
 - Batch Reports
 - Topology
 - Monitoring
 - Alerting
 - Data Manager
 - Monitoring
 - Alerting
 - Policy Management
 - Reporting
 - Groups
 - Asset
 - By Cluster
 - By Computer
 - By OS Type
 - By Storage Subsystem
 - DS8000_1860_JS
 - Array Sites
 - Ranks
 - Storage Pools
 - Disks
 - LUNs
 - DS8000_BI
 - Array Sites
 - Ranks
 - Storage Pools
 - Disks
 - LUNs
 - System-wide
 - Availability
 - Capacity
 - Usage
 - Usage Violations
 - Backup
 - Data Manager for Databases
 - Data Manager for Chargeback

Detail for Storage Subsystem <DS8000_1860_JS>

| | |
|---|---|
| Group | TPCUser.Default Storage Subsystem Group |
| Manufacturer | IBM |
| Model | 921 |
| Serial Number | 2107.7538671 |
| Firmware Revision | 5.1.0.276 |
| Number of Disks | 288 |
| Disk Capacity | 38.24 TB |
| Disk Unallocated Space | 4.24 TB |
| Formatted Capacity | 17.22 TB |
| Formatted Space with No Volumes | 228.00 GB |
| Total Overhead | 21.02 TB |
| Undefined Disk Group or Array Site Capacity | 0 |
| Number of LUNs | 272 |
| LUN Capacity | 17.00 TB |
| Last Probe Time | 2006-3-23 18:53:09 |
| Last Probe Status | Succeeded |
| Probing Agent | zhcentre.mcc.com |

TPC集中存储管理平台

The screenshot displays the IBM TotalStorage Productivity Center interface. The title bar reads "IBM TotalStorage Productivity Center: zhcentre.mcc.com -- Storage Subsystem Performance: By Storage Subsystem". The interface includes a menu bar (File, View, Connection, Preferences, Window, Help) and a toolbar with navigation icons.

Navigation Tree:

- Administrative Services
 - IBM TotalStorage Productivity Center
 - My Reports
 - System Reports
 - administrator's Reports
 - Batch Reports
 - Topology
 - Computers
 - Fabrics
 - Storage
 - Other
 - Monitoring
 - Probes
 - Alerting
 - Data Manager
 - Data Manager for Databases
 - Data Manager for Chargeback
 - Disk Manager
 - Storage Subsystems
 - Volume Performance Advisor
 - Monitoring
 - Groups
 - Jobs
 - Subsystem Performance Monitors
 - administrator.DataCollection_B1
 - Alerting
 - Policy Management
 - Reporting
 - Storage Subsystems
 - Storage Subsystem Performance
 - By Storage Subsystem
 - By Controller
 - By I/O Group
 - By Array
 - By Managed Disk Group
 - By Volume
 - By Managed Disk
 - By Port
 - Constraint Violations
 - Fabric Manager

Selection

Report Filter Specifications

Generate Report [Selection...] [Filter...]

Return maximum of rows

Available Columns

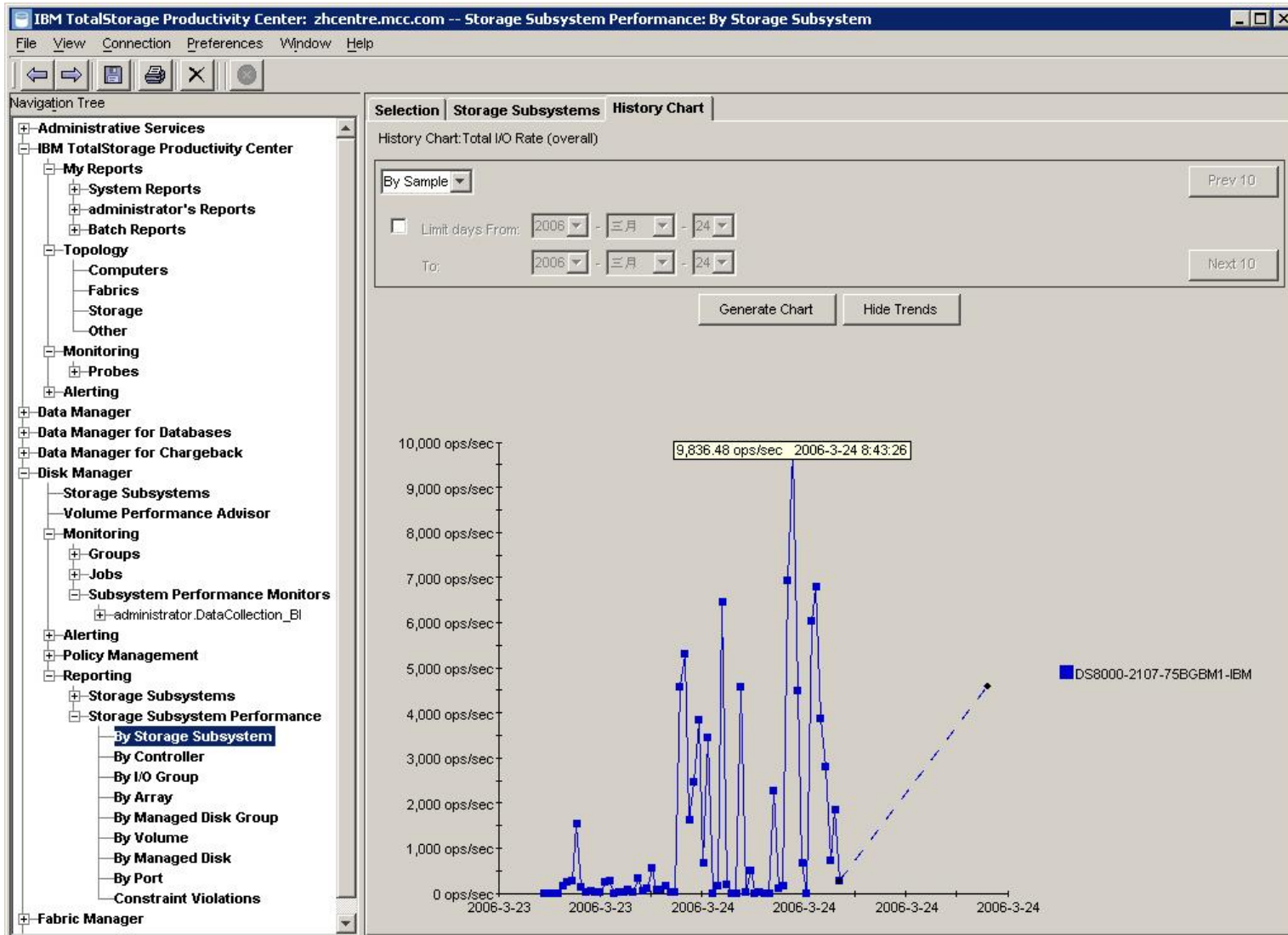
- Read Cache Hit Percentage (normal)
- Read Cache Hits Percentage (sequential)
- Read Cache Hits Percentage (overall)
- Write Cache Hits Percentage (normal)
- Write Cache Hits Percentage (sequential)
- Write Cache Hits Percentage (overall)
- Total Cache Hits Percentage (normal)
- Total Cache Hits Percentage (sequential)
- Total Cache Hits Percentage (overall)
- Read Response Time
- Write Response Time
- Overall Response Time
- Record Mode Read I/O Rate
- Record Mode Read Cache Hit Percentage
- Disk to Cache Transfer Rate
- Cache to Disk Transfer Rate
- NVS Full Percentage
- NVS Delayed I/O Rate
- Cache Holding Time

Included Columns

- Subsystem
- Time
- Interval
- Read I/O Rate (normal)
- Read I/O Rate (sequential)
- Read I/O Rate (overall)
- Write I/O Rate (normal)
- Write I/O Rate (sequential)
- Write I/O Rate (overall)
- Total I/O Rate (normal)
- Total I/O Rate (sequential)
- Total I/O Rate (overall)
- Read Data Rate
- Write Data Rate
- Total Data Rate
- Read Transfer Size
- Write Transfer Size
- Overall Transfer Size
- Backend Read I/O Rate
- Backend Write I/O Rate
- Total Backend I/O Rate
- Backend Read Data Rate
- Backend Write Data Rate
- Total Backend Data Rate
- Backend Read Response Time
- Backend Write Response Time
- Overall Backend Response Time
- Backend Read Transfer Size

[>>] [Reset]

TPC集中存储管理平台



TPC集中存储管理平台

- 进行存储设备信息收集

Storage Subsystems: By Storage Subsystem

Created by: administrator Printed: 2006-9-14 13:43:00

| Name | Disk Capacity | Disk Unallocated Space | Number of Disks | Number of LUNs | LUN Capacity | Usable LUN Capacity | LUN Capacity Visible to Data Manager | LUN Capacity Not Visible to Data Manager | Overhead | Formatted Capacity | Formatted Space with No Volumes | Total Overhead | Undefined Disk Group or Array Site Capacity | Cache | Manufacturer |
|---------------------------------|---------------|------------------------|-----------------|----------------|--------------|---------------------|--------------------------------------|--|-----------|--------------------|---------------------------------|----------------|---|----------|--------------|
| TOTAL => | 14.86 TB | 8.94 TB | 210 | 80 | 5.44 TB | 5.44 TB | 170.00 GB | 5.27 TB | 811.76 GB | 6.36 TB | 1.24 TB | 339.70 GB | 7.24 TB | 17.75 GB | - |
| DS8000-2107-7547491-IBM | 4.25 TB | 4.25 TB | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 388.00 GB | 388.00 GB | 155.89 GB | 3.72 TB | N/A | IBM |
| DS6000-1750-6887871-IBM | 2.12 TB | 2.12 TB | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.12 TB | N/A | IBM |
| DS6000-1750-13ADAGA-IBM | 1.99 TB | 1.33 TB | 32 | 8 | 340.00 GB | 340.00 GB | 170.00 GB | 170.00 GB | 340.00 GB | 444.00 GB | 104.00 GB | 507.81 GB | 1.06 TB | N/A | IBM |
| DS4800-DS4800-2_QBJ_SPDB | 4.64 TB | 243.32 GB | 70 | 67 | 4.39 TB | 4.39 TB | 0 | 4.39 TB | 331.30 GB | 4.16 TB | 81.27 GB | N/A | 67.87 GB | 16.00 GB | IBM |
| DS4300-DS4300T_1_ZhaoXP_Parkson | 1.86 TB | 1.01 TB | 28 | 5 | 730.66 GB | 730.66 GB | 0 | 730.66 GB | 140.46 GB | 1.39 TB | 694.53 GB | 0 | 271.46 GB | 1.75 GB | IBM |

- 性能趋势展示

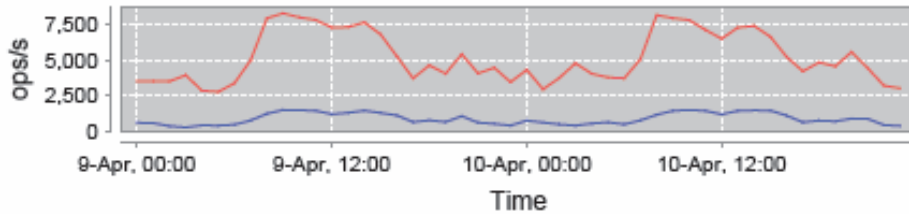
Subsystem Performance Summary

| Name | Wrt-cch delay% (%) | | Tot Hit% (%) | | Tot I/Os (ops/s) | | Tot Xfer (KB/op) | |
|--------------------|--------------------|-----|--------------|------|------------------|---------|------------------|--------|
| | Avg | Max | Avg | Max | Avg | Max | Avg | Max |
| ESS-2105-29082-IBM | 0.0 | 0.0 | 63.17 | 77.0 | 6074.25 | 9754.33 | 13.527 | 25.723 |

Subsystem Statistics

Total I/O Rate (overall)

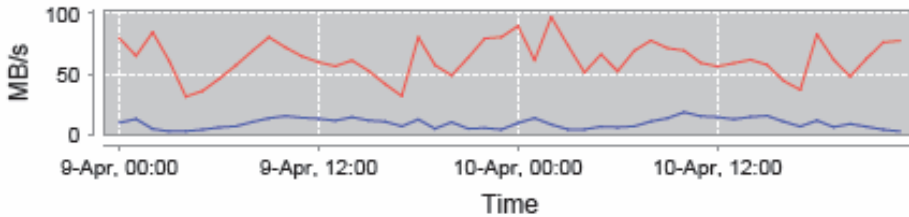
ESS-2105-29082-IBM



— Read I/O Rate (overall) — Write I/O Rate (overall)

Total Data Rate

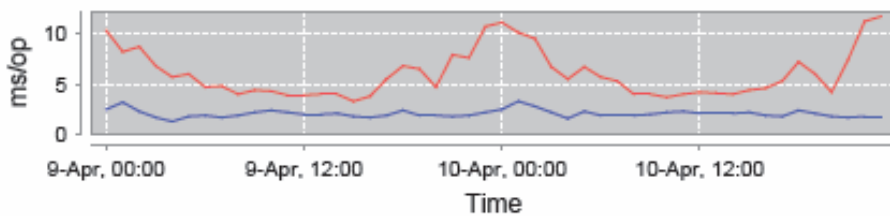
ESS-2105-29082-IBM



— Read Data Rate — Write Data Rate

Overall Response Time

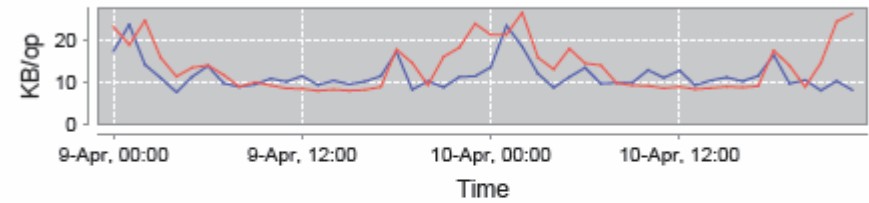
ESS-2105-29082-IBM



— Read Response Time — Write Response Time

Overall Transfer Size

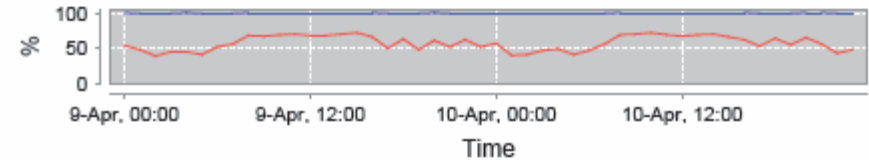
ESS-2105-29082-IBM



— Read Transfer Size — Write Transfer Size

Total Cache Hits Percentage (overall)

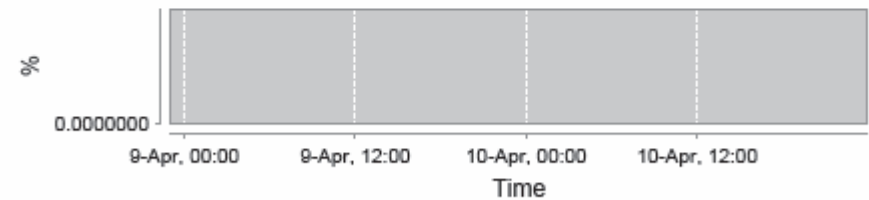
ESS-2105-29082-IBM



— Read Cache Hits Percentage (overall)
— Write Cache Hits Percentage (overall)

Write-cache Delay Percentage

ESS-2105-29082-IBM



— Write-cache Delay Percentage

TPC集中存储管理平台

TPC集中存储管理平台

Analytics

Requires SE

TPC 性能影响 (Impact) 分析报告 (1)

- 快速访问

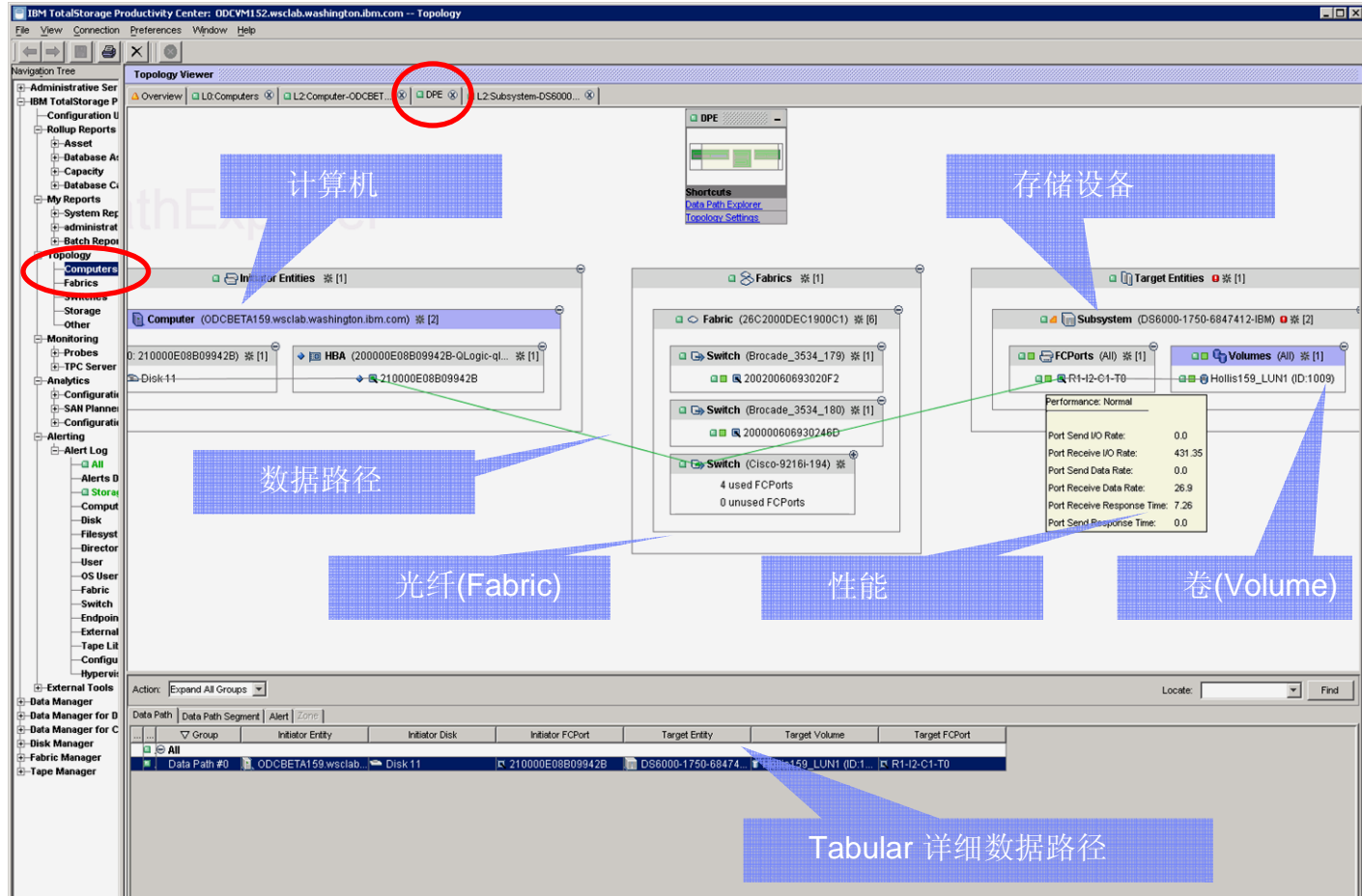
存储基础架构的性能状态

- 端-对-端视图

可查看整个存储路径 (包括 SVC)

- 减少时间

对于问题隔离和问题解决



TPC集中存储管理平台

新的存储配置规划功能

■ 存储配置的建议

IBM TotalStorage Productivity Center: tpcsrv.itsosj.sanjose.ibm.com -- Edit Plan tpcadmin.HostPlan

File View Connection Preferences Window Help

Navigation Tree

- Administrative Services
 - IBM TotalStorage Productivity Center
 - Configuration Utility
 - Rollup Reports
 - Asset
 - Database Asset
 - Capacity
 - Database Capacity
 - My Reports
 - System Reports
 - tpcadmin's Reports
 - Batch Reports
 - Topology
 - Computers
 - Fabrics
 - Switches
 - Storage
 - Other
 - Monitoring
 - Probes
 - TPC Server Probes
 - Analytics
 - Configuration History
 - SAN Planner
 - tpcadmin.HostPlan
 - Configuration Analysis
 - Alerting
 - Alert Log
 - External Tools
 - Data Manager
 - Data Manager for Databases
 - Data Manager for Chargeback
 - Disk Manager
 - Fabric Manager
 - Tape Manager

Edit Plan tpcadmin.HostPlan

The planner automatically allocates storage for one or more hosts, and optionally sets up multipath options and zoning for the new storage.

Creator: tpcadmin Name: HostPlan
Description:

Plan involves the following changes:

- Hosts
 - Host azov.itsosj.sanjose.ibm.com
 - Subsystem Device Driver 1 Multipath mode = Fail-Over
 - Data Paths
 - New datapath will be defined as [initiator WWN= 10000000C932A753(azov.itsosj.sanjose.ibm.com), target WWN=5005076801101
 - New datapath will be defined as [initiator WWN= 10000000C932AA9D(azov.itsosj.sanjose.ibm.com), target WWN=5005076801301
 - Zone Configuration Changes
 - Fabric 100000051E35D514
 - ZoneSet TPC_ZONESET_1 will be created
 - Zone xy1 will be created
 - ZoneMember 10000000C932A753(azov.itsosj.sanjose.ibm.com) will be added to the zone
 - ZoneMember (SVC-2145-ITSOSVC01-IBM) will be added to the zone
 - Fabric 100000051E34E895

When to run

Run Now
 Run Once at:
2007 - 六月 - 12 上午 12 : 13

How to handle time zones

Specify which time zone to use:

Use the time zone that the server runs in
 Use this time zone: (GMT+8:00) Asia/Shanghai

Return to Planner Input Save Execute Plan Cancel

TPC集中存储管理平台

新的配置分析

Best Practices & Security

Requires SE

新的监控 & 通知

在最好的实践策略基础上，提供配置验证

自动的

或手工的分析方法，能够被用于所有的 fabrics, a single fabric, 或者 a single zoneset

容易识别

策略violators 会被打标记，并显示在 topology viewer 里

安全事件

关于 zone 的安全 violations，通知 IT administrator

动态alerting的多种方法;

SNMP traps, tech events, emails

优化

通过一个xml格式，优化自己最好的实践策略

Navigation Tree

- Administrative Services
- IBM TotalStorage Productivity Center
 - Configuration Utility
 - Rollup Reports
 - My Reports
 - Topology
 - Monitoring
 - Analytics
 - Configuration History
 - SAN Planner
 - Configuration Analysis**
 - administrator.Test 1
 - Alerting
 - Alert Log
 - External Tools
- Data Manager
 - Data Manager for Databases
 - Data Manager for Chargeback
 - Disk Manager
 - Fabric Manager
 - Tape Manager

Edit Analyzer administrator.Test 1

Creator: administrator Name: Test 1

Description: Test 1

Configuration Analysis

Scope: All Fabrics

Depending on selected scope, some policies do not apply and are grayed out. These policies will be ignored by the configuration c

Select All/Unselect All

1. Each active and connected computer and storage subsystem port must be in at least on
2. Each HBA accesses storage subsystem ports or tape ports, but not both.
3. Each volume is accessed only by computers running the same type and version of opera
4. Each zone contains only HBAs from a single vendor.
5. Each zone contains only a single model of storage subsystem.
6. Each zone is part of a zone set.
7. Each host must be zoned so that it can access all of its assigned volumes.
8. Each computer has only HBAs of the same model and firmware version.
9. For each host type and operating system, every HBA of a given model must have the sa
10. Every SAN switch of a given model must have the same firmware version.
11. Every storage subsystem of a given model must have the same firmware version.
12. Each fabric may have a maximum of x zones.
The maximum number of zones that can be present in a fabric: 9
13. Each zone may have a maximum of x zone members.
The maximum number of zone members that can be present in a zone: 20

IBM TotalStorage Productivity Center

降低了存储的 TCO

通过集中管理降低了管理成本

- 更好的管理数据量的增长
- 使用通用的高级操作管理异构的存储系统
- 通过将存储分层简化了存储管理
- 使用通用的设备驱动和FC HBA负载平衡软件简化了服务器管理
- 降低了存储容量供应的时间
- 提高了大多数存储子系统的性能

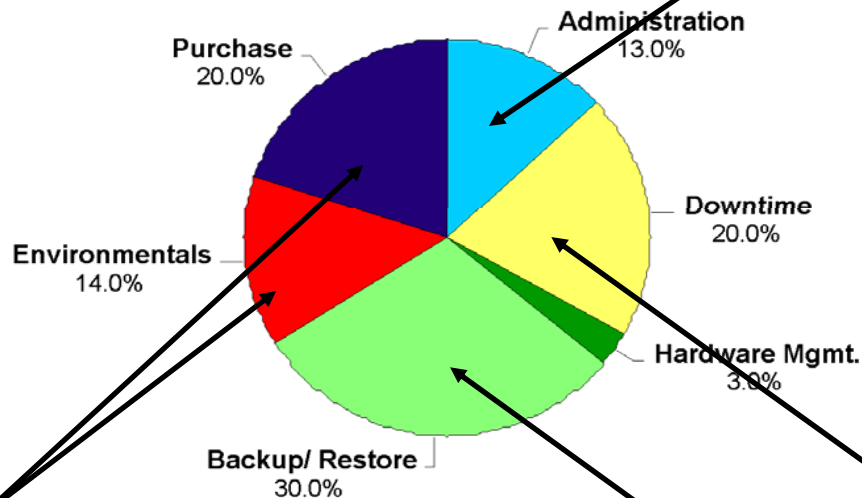
显著降低了当机时间

- 预测空间不足的情况
- 发现SAN的可用性问题

降低了 Backup/Restore 成本

- 监控和自动化备份和归档企业数据操作

LOWERS TCO



更好的使用率降低了购买费用和其他外围费用

- 降低了硬件成本
- 通过通用高级功能降低了存储软件成本
- 基于容量分析是存储购买更加有效率

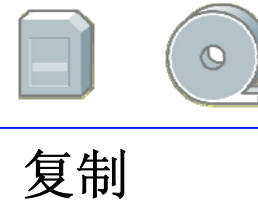
控制存储成本: 容量管理

通过清除**DS8300**
上的数据节省了
4 TBs 管理空间

减少了**4 TB**
备份空间成本

减少了**4 TB**
复制成本

减少了**4 TB**
灾难恢复成本



实现费用节
省

减少了**4TB**
DS8300 费用

节省了**4TB**
备份软件和硬件成本
(备份服务器/第二层存储)

节省了**4TB** 复制费用
(软件/网络)

节省了**4TB** 灾备费用
(软件/网络
硬件/服务)

总结

TPC —集中监控管理企业的存储系统

- 基于标准的规范 **SMI-S**, 使得管理员能够有效的管理异构的存储架构

文件与数据库数据

■ 优化

监控文件系统与数据库的存储容量, 并进行预测

■ 容量供应

基于事件的文件系统扩展

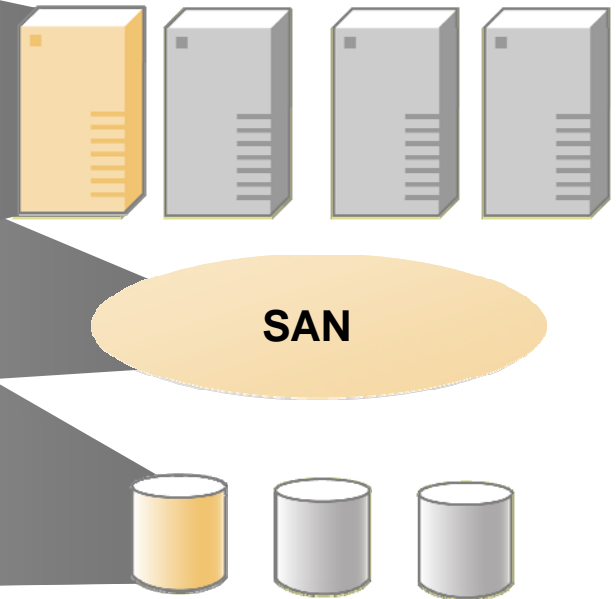
与磁盘供应操作相整合

■ 可用性

SAN 文件系统的监控

挂起 / 继续 / 异步

挂起 / 继续 / 异步



धन्यवाद

Hindi

多謝

Traditional Chinese

ขอบคุณ

Thai

Спасибо

Russian

Gracias

Spanish

شكراً

Arabic

Thank

English

Obrigado

Brazilian Portuguese

You
多谢

Simplified Chinese

Danke
German

Grazie

Italian

Merci
French

நன்றி

Tamil

ありがとうございました

Japanese

감사합니다

Korean