

HP EVA3000/5000 使用及维护指南

version 1.0

TSG CHP





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EVA3K/5K 管理员手册

EVA3K/5K是HP StorageWorks Disk Array家族成熟的旗帜性产品,具有以下几个方面的优点:

- 独一无二的虚拟化特性:提供最新架构,提高性能,优化磁盘的使用率,便 于动态的存储扩展
- 可管理性: 可管理大型 SAN 配置, 缩短管理时间, 降低成本
- 性能:出众的自我调谐功能以较少的时间完成更多的任务,按需扩展容量, 同时最大限度地减少数据管理的复杂性
- 控制器软件:出色的设计大大提高系统的性能和磁盘的使用率,同时使动态的存储扩展易如反掌
- 几乎即时的快速克隆: 可立即使用克隆复制, 大大节省时间
- 几乎无需容量的快照(Vsnap): 在进行本地复制操作期间,节省客户磁盘空间,提高磁盘利用率
- 支持: 使部署更加有效,并且实现主动服务,用于长时间维护一个稳定、高可用性的 EVA 存储平台

因此,HP StorageWorks企业虚拟阵列EVA系列是一个高性能、大容量以及高可用的"虚拟"RAID存储解决方案,它适合于高端企业级存储的应用,并且消除了采用传统架构的存储在时间、空间及成本方面的限制。

同时, EVA存储可满足数据中心的关键任务的需求, 它有效地提供了存储的利用 率及可扩展性, 并满足了应用程序对事务处理1/0、MB数据传输速率的性能要求, 以 及对无缝的容量扩展、瞬时的数据复制及简化的存储管理的要求。

下面我们简单介绍EVA存储系统的配置和管理方面的一些知识。

一、EVA 系统简介

1.1、EVA 系统硬件构成

EVA3000/EVA5000 由以下硬件部分组成: 1、EVA 机柜(有 22U 和 41U 两种),下图为 EVA 整体图;





4、如是 EVA5000,有时还需配置 loop switch(2C6D 必须要配置 LOOP SWITCH);

5 SMA

EVA中有一台PC服务器专门用来管理EVA,但是没有自带显示器和键盘鼠标,所以要预先备好。这台PC服务器被称为Storage Management Appliance,以下简称为SMA,SMA管理员帐户和密码为:administrator/adminXXXXX(XXXXX为SMA序列号的最后六位倒过来,注意大小写;



红圈中的就是 WWN 及 Checksum。



G3 在SMA上,我们安装了windows操作系统和IE浏览器,需要特别强调的是,该 windows和IE不同于普通的windows系统和IE浏览器,请不要擅自安装windows和IE 补丁,以免造成系统故障;可以安装我们认证的防病毒软件如诺顿、趋势等,千万 不要擅自安装别的应用或工具软件。

SMA本地两块硬盘是raid1(镜像),以确保系统的高可用性。

1. 2、EVA 系统连线图

EVA3000/5000存储系统是基于 SAN 的架构的,因此在与主机相连时必须要通过 SAN switch 连接, EVA 不支持主机 FCA 与 EVA 直连。在做系统设计时,我们强烈建议使用双光纤交换机、主机使用双 FCA 卡以确保系统的高可用性。下图为一个无单点故障的系统连接示意图和 EVA5000 光纤连接图:



FP = Fibre (Host) Port FCA = Fibre Channel Adapter



1. 3、EVA 系统容量

EVA 作为企业级的存储系统,除了具有管理方便,性能优等优点外,还具有容量大的特点,且便于扩展,下面是几种典型配置的容量说明:

Model	Drive have	Maximur	Maximum capacity		
Model	Drive bays	36GB	72GB	146GB	
Enterprise 2C2D (eva5000)	28	1.0TB	2.0TB	4.0TB	
Enterprise 2C6D (eva5000)	84	3.1TB	6.1TB	12.2TB	
Enterprise 2C12D (eva5000)	168	6.1TB	12.2TB	24.4TB	
Enterprise 8C8D (eva5000)	112	4.1TB	8.2TB	16.4TB	
Enterprise 2C2D (eva3000)	28	1.0TB	2.0TB	4.0TB	

1. 4、EVA 系统的开机和关机顺序

EVA 作为企业的核心数据存储系统,如何正确的开机和关机对数据安全有着很大的影响。在日常维护中,请务必按照正确顺序进行开关机。

1. 4. 1、EVA 系统的开机顺序

正确的开机顺序为:

- 1、开机柜总电源;
- 2、开光纤交换机电源,开EVA 机柜电源(此时硬盘柜自动加电);
- 3、启动 SMA;
- 4、等待10分钟待光纤交换机和硬盘柜状态正常后开控制卡电源;
- 5、等待3分钟待控制卡状态稳定后开主机电源,启动进入操作系统
- 6、起集群服务及应用;

1. 4. 2、EVA 系统的关机顺序

正确的关机顺序为:

- 1、停集群服务和节点
- 2、shutdown 服务器;
- 3、通过 sma 关闭 eva 的控制卡;
- 4、关闭 eva 控制卡后的开关;
- 5、关闭 SMA;
- 6、关闭 SAN SWITCH;
- 7、关闭 EVA 机柜电源;

关闭控制卡如下图:

Shut Down Controllers

Cancel	?
Controller Shutdov	vn
Restart	Shut down and restart this controller only
Power down	Shut down this controller and power off. Disable cache battery backup power.
System Shutdown	
Power down	Shut down both controllers and all disk drives and power them off. Disable all cache battery backup power.
0	Shutdown delay (0—60 minutes)

二、如何配置 EVA 存储系统

EVA 的配置主要有如下步骤:

- 1. 准备相关信息
- a. 列出需要使用eva存储的主机名、ip等信息.
- b. 列出所有需连接eva的主机的Fibre Channel adapters (FCAs).
- c. 查出FCA卡的WWN号.
- 2. 升级相关软件,如command view等(此项为可选项).
- 3. 初始化EVA存储.
- 4. 升级firmware(为可选项)
- 5. 创建disk group.
- 6. 创建主机列表.
- 7. 创建virtual disks.
- 8. 创建 snapshots and snapclones. (需购买相关的license)

2. 1、初始化 EVA

点击初始化图标, eva 将初始化, 初始化过程中要求输入存储的名称, 如 EVA3000/EVA5000等,该名称将在面板上显示。初始化会导致所有的数据都会丢失! 初始化全过程如下图:

点击 initialize:

Initialize an HSV Storage						
Syste	em		Page 1 Page 2 Page 3 Page 4			
Finish	Advanced options	Cancel	?			

Complete this step and click **Finish** to initialize your HSV storage system in the simplest way possible. If you'd like more control over the initialization of your HSV storage system, complete the step and click **Adv Options** instead.

STEP 1: Enter a Name

Enter a name for your HSV storage system.

?

hsv3lab

STEP 2: Enter the number of disks

Enter a number of disks between 8 and 44. (You can add more disks later, if you wish.)

8 ?

点击 Advanced options:

Initializ	ze an	I HSV	Storage
System			Page 1 Page 2 Page 3 Page 4
Previous	Next	Cancel	?

Continue with this step to initialize your HSV storage system using advanced options. Click the Next Step button to move to the next page.

STEP 3: Set the system date/time

⊙ Use management appliance date/time	06 Sep 2003 06:35:06
O Use local (browser) date/time	06 Sep 2003 06:36:10
C Use existing controller date/time setting:	06 Sep 2003 06:35:23
C Use a custom date/time setting	
01 - Jan - 2001 -	
STEP 4: Enter the Console I UN ID	

如图示选择 use managerment appliance date/time:

0

Initialize an HSV Storage						
System			Page 1 Page 2 Page 3 P	Page 4		
Previous	Next	Cancel		?		

9

When you initialize your HSV storage system, a default disk group is created. Continue with these steps to specify the attributes of the default disk group. Click the Next Step button to move to the next pages.

STEP 5: Request a disk failure protection level

None 💌	?
None Single Double	

对每个Disk Group来说,都有disk failure保护机制,分别为none, single和double, 其中, none 表示无 spare, single 表示留出 2disk 的空间做 spare, double 表示留出 4disk 空间做 spare;如硬盘空间足够大,建议选择 double,但至少选择 single;

Initialize an HSV Storage								
System				Page 1 Page 2 Page				
Previous step	Finish	Cancel						

Continue with these steps to create the default disk group and initialize your HSV storage system using advanced options.

Page 4

STEP 6: Enter your comments

HSV110	initialized	for	training	use.	
					∇

STEP 7: Initialize your HSV storage system

Click the **Finish** button to initialize your HSV storage system.

comment 内容为可选项。

Initialize an HSV Storage						
System			Page 1 Page 2 Page 3 Page 4			
Previous step	Finish	Cancel	?			

Continue with these steps to create the default disk group and initialize your HSV storage system using advanced options.



STEP 7: Initialize your HSV storage system

Click the Finish button to initialize your HSV storage system.

至此, EVA 的初始化完成。下图为初始化完成后的信息:

Initialized Storage System Properties

Save chang	jes	Set op	tions	View events	Uninitialize	?
Code load	Shu	ut down				

Identification		Condition/State			
Name: hs	v3lab	Operational state: 🔽 Attention			
Node World Wide	Name:		(Initialized)		
5000-1FE1-5000-2	CDO	System	W		
UUID:		Type:	HSV110		
6005-08b4-0001-4	523-0004-0000-	Version:	3010		
001a-0000		Console LUN	0		
Licensed features	5	Time:	06 Sep 2003		
Basic:	Yes		06.40.21		
Snapshot:	Yes		00.10121		
Data replication:	No	Capacity			
Policies		Total:	135.15 GB		
Douico addition:	Manual	Used:	0.00 GB		
Device audicion:		Available:	135.15 GB		
delay:	1 mins				
Comments					
HSV110 initialized	for training use.				

2. 2、创建 disk group

在创建 disk group 要注意每个 group 至少需要 8 块 disk 才可以; 创建 disk group 的过程如下:

Disk Group Folder Properties

Create disk group

?

Disk Group Folder Properties			
Name:	Disk Groups		
Operational state:	🖌 Good		
Total disk groups:	1		
Total grouped disks:	8		
Total ungrouped disks:	36		

点击 Create disk group:

Creat	te a Disk Group		Page 1 Page 2 Page 3
Finish	Advanced options	Cancel	?

Complete this step and click **Finish** to create a disk group in the simplest way possible. If you'd like more control over the creation of your disk group, complete the step and click **Adv Options** instead.

STEP 1: Enter a Name

Enter a name for your disk group.

|--|

输入 group 名称, next:

Create a Disk Group			Page 1 Page 2 Page 3
Previous step	Next step	Cancel	?

Continue with these steps to create a disk group using advanced options. Click the **Next Step** button to move to the next page.

STEP 2: Enter the number of disks

Enter a number of disks between 8 and 36.

10	?
----	---

STEP 3: Select a requested disk failure protection level

	Single 💌	?
ļ	None	
	Single	
	Double	

选择 disk group 中的硬盘数目和 protection level:

C	reate a Dis:	k Gro	up	Page 1 Page 2 Pa	ge 3
	Previous step	Finish	Cancel		?

Continue with these steps to create your disk group using advanced options.

STEP 4: Enter the occupancy alarm level

95 🕠 ?

STEP 5: Enter your comments

Just some scratch disks.	
	▼ 5

STEP 6: Create your disk group

Click the **Finish** button to create your disk group.

输入 alarm level,建议为 default 值(95%),设好该值后,在分配空间时,不 要使用超过可用空间的 95%,否则会 alarm,该选项主要是在用户数据量大空间不 够时提醒用户做扩容等;

All Storage Network	Disk Group P	roperties	•		
🗄 😂 havSlab	Save changes	Add disks	Locate	Delete	?
∽C⊒ Virtual Disks -C⊒ Hosts	General	Vdisks			
🗆 💁 Disk Groups	Identification			Condition/State	
부행 Other Scratch Disks 미행 Scratch Disks	Name: Scratch Di	sks		Operational state:	🗹 Good
- 🥰 Disk 001	UUID:			Leveling state:	🗹 Inactive
🔏 Disk 008	6005-08b4-0001-45	23-0004-0000	-	Leveling progress:	: n/a
🕰 Disk 009	0045-0000			RSS Disk state:	Mirrared
🔏 Disk 011	Capacity			Disk failure protec	tion
- 🍕 Disk 013	Total:	270.7 GB		Requested level:	Dingle .
- 🥰 Disk 015 - 🛄	Available: Vraid0	270.51 GB		Actual level:	Single
🥰 Disk 021	Vraid5	216.44 GB	1	Occupancy	
Sisk 026	Total disks:	10		Total:	O GB
General Disk 029	2			Alarm level:	95 %
Default Disk Group	Comments				
□ Data Replication ⊐120 Hardware	Just some scratch	disks.			
<u>.</u>					

2. 3、如何浏览和更改组的属性



Save changes — 保存对该页所做的改动。

Add disks —添加新的物理盘到该group中.

Locate — 定位组中的某个disk的位置, locate off取消locate动作.

Delete — 删除组, 会删除组内的数据. 不能删除Default Disk Group. 更改disk group name, disk failure protection level, occupancy alarm level, and comments by entering new values and clicking *Save changes*.

2. 4、添加主机

2. 4. 1、准备工作

在SAN的架构中,EVA和主机通过SAN交换机相连,主机通过FCA卡访问EVA。 EVA通过command view eva软件允许主机访问相应的disk。

Command View EVA 有以下功能:

- 创建一个host folder.
- 添加host.
- 更改 host 属性:
- 添加 FCA.
- 删除 FCA.

- 删除 host.
- 在添加主机前, 先做如下准备工作:
 - 主机名
 - IP address (optional)
 - World Wide ID (WWID) of one FCA
 - Operating system type

添加主机包括以下:

- 1. Collect the host information listed above.
- 2. Create a host folder (if desired).
- 3. Add a host (to a folder if desired).
- 4. Add more FCAs.
- 5. Verify that the host has been added.

我们可以根据需要,随时添加相关主机。

2. 4. 2、创建 host folder

(此步骤为可选项)

我们可以根据需要创建相关的host folder,如根据应用类别或操作系统类别等;

Example 在图示中,我们创建了名为 hsv3lab的host folder.

The buttons on the Host Folder Properties page launch the following functions:

Create folder - 创建host folder.

Add host — 在当前folder中添加host

如需创建host folder, 在 Host Folder Properties页点击*Create folder*. 步骤: 1. Enter a name — 输入host folder的名称. 2. 点击 *Finish*.

?

-

Example 下例是添加一个host folder的图示

Create a Folder

Finish Cancel

Complete the steps below to create your folder.

STEP 1: Enter a Name

Enter a name for your folder.

HP Servers

STEP 2: Enter comments

Enter any comments you'd like to attach to your folder.

This folder contains all HP host definitions.

2. 4. 3、添加主机

添加主机的过程如下:

A HSV Storage Network	Host Folder Properties
🖹 😽 hsv3lab	Save changes Add host Create folder Delete ?
⊡⊡ Virtual Disks ⊡⊖s Hosts	
- HP Servers	Host Folder Properties
🕀 🔁 alpha	Name: HP Servers
-	Total hosts: (not including subfolders)
⊡ Disk Groups	Total host folders: (not including subfolders)
Data Replication	Comments:
≕ ⊡ Hardware	This folder contains all HP host definitions.

点击Add host:

Add a Ho	st	Page 1 Page 2 Pa	ge 3
Next step	Cancel		?

Complete these steps and click Next Step to add your host.

STEP 1: Enter the Name

Enter your host's LAN node name.

HP1

STEP 2: Enter the IP address

If your host uses a static LAN IP address, enter the address. Skip this step if your host uses dynamic IP addresses.

-NA-

🗹 Dynamic IP Assignment 📍

输入主机名(该名称为用户自己定义的,不一定与实际主机名相同) IP地址为可选项,可以不输,建议输入,便于识别该主机;

9

Adding a host (3 of 4)

1	Add a Host			Page 1 Page 2 Page	e 3	
	Previous step	Next step	Cancel	1	?	

Complete this step and click Next Step to continue adding your host.

STEP 3: Enter an adapter port World Wide Name

Click to select from list Click to select from list	t 🗾 —OR—	Enter	a port WWN 💡
1000-0000-c926-99ae STE 1000-0000-c927-6243	ystem attributes		
Hewlett Packard HP-UX	Custom mode n ∙_ ? n∕a	umber:	Direct eventing:
└ Tru64 UNIX VMS Microsoft Windows	,		
Sun Solaris Hewlett Packard HP-UX			
Unknown Custom			

选择FCA卡的WWN号和操作系统类型,一台主机可以有多个FCA卡,这样就可以有多条path访问.每块卡都要添加,且多path时需要购买secure path软件(Tru64 unix系统除外)。

注: 在更换FCA卡后,必须要将该卡的WWN号重新添加到该host中。否则,这条 path无法使用。

Add a Host			Page 1 Page 2 Pa	age 3
Previous step	Finish	Cancel		?

Continue with these steps to add your host.

STEP 5: Enter your comments



STEP 6: Add your host

Click the Finish button to add your host.

comment内容为可选项

2. 4. 4、如何修改 host 的属性

Se HSV Storage Network ∃ Storage Network ⊡ Storage Network	Save changes De	lete host Move ?				
Hosts HP Servers	General Prese	General Presentation Ports				
□ 😋 alpha □ 🚍 hsv3alpha	Node name:	hsv3alpha				
intel Initel Initel Initel Disk Groups Data Replication	Operating System:	Dynamic IP Assignment Type: Tru64 UNIX Custom type: n/a				
🗄 🛅 Hardware	UUID: Comments:	Direct eventing: Disabled 6005-08b4-0001-4523-0002-c000-01a3-0000				

可以更改更改以下相关信息:

Operating system type, custom type, and direct eventing , Comments 如需更改其他信息,需要删除该主机再重新添加。更改完后须点击save changes; 这里,暂不演示更改的过程,我们继续浏览别的信息,点击presentation: 每个按键的说明如下:

Save changes — 保存所做的改动

Delete host — 删除相应的host。

Move — move当前host到别的目录等.

Host Properties

	?			
General Presentation Ports				
Vdisk	LUN			
Scratch Disks\Clone002\ACTIVE				
Scratch Disks\Vdisk001\ACTIVE	2			
Scratch Disks\Vdisk003\Snap003				

从图中可以看出有哪些disk可以给本主机使用,其lun ID为多少。 点击ports:

Host Properties						
Add port	Delete port					?
General	Presentatio	n	Ports			
Total adapter ports: 2						
FC Adapter F	Port WWN					
1000-0000-c92a-43aa						
1000-0000-c9	92a-45ff					

可以删除或添加port(这里的port就是主机的FCA),特别在更换FCA卡时要更 改该项。

?

点击add port:

Add a Host Port

Add port Cancel

Select an unassigned World Wide Name from the list or enter the World Wide Name of a host adapter port into the text box. To skip to a particular list entry, place your cursor in the selection box and repetitively enter the first character of the entry you wish to find.

Click to select from list 💌	-OR-	Enter a port WWN	?
Click to select from list			
1000-0000-c926-99ae			
1000-0000-c927-6243			
1000-0000-c92c-1d3b			

2. 5、如何创建 vdisk folder

EVA 可以允许创建类似于 host folder 的 vdisk folder,用来根据用户需要对 vdisk 进行区分。如根据 vdisk 给不同主机或平台划分等;

HSV Storage Network	Vdisk Folder Prop	e Vdisk ?			
🗄 🗔 Hosts H 🚳 Dick Groups	Vdisk Folder Properties				
Disk Groups	Name:	Vdisks			
⊡ Data Replication	Total Vdisks: (including subfolders)	٥			
	Total Vdisk folders: (including subfolders)	٥			
	-				

如欲创建vdisk folder, 点击 Create folder:

- 1. Enter a name 输入vdisk group的名称.
- 2. 输入comment (optional).
- 3. 点击 *Finish*.

2. 6、如何创建 vdisk

在同一个 Disk Group 里可以划分多个 VD, 而这些 VD 的冗余机制可以为 Raid0, Raid1, Raid5。Raid0, stripe, 是没有任何冗余的。任何一个物理磁盘损坏,都会导致数据的丢失。不建议采用;

Raid1, mirror 方式。

Raid5, 采用 4+1 冗余。

EVA 采用的为虚拟存储技术,与传统的 raid 技术不同,虚拟 raid 所有创建的 raid0、raid1、raid5 是分布在 disk group 内的所有 disk 上。下图为虚拟存储的 raid 示意图:

Moderately redundant volume (VRAID5)							
No redundancy volume (VRAID0)							
Highly redundant volume (VRAID1)							
VRAID1 pair VRAID1 pair VRAID1 pair VRAID1 pair 体创建步骤如下:							
Create a Vdisk Family Finish Cancel	择Vdsik或具中的某个Vdsik folder,点击create vdisk: Create a Vdisk Family Finish Cancel ?						
Disk group name Available GB: Scratch Disks 270.51	Vraid0/Vraid5/Vraid1 216.44 135.28 • 9						
Redundancy: O Vraid0 ? C Space available Space 270.51 GB	O Vraid5 ? Image: Constraint of the second seco						
Size: GB							
World Wide Name: Default WWName (format: 6xxx-xxxx-xxxx-xxxx-xxxx-xxxx)							
Write Cache policy: Mirrored write-back ? Read Cache policy: On ?							
Read/write C Read only? OS Unit ID: O ?							
Present to host: None ? Preferred path/mode: No preference ?							

在navigation pane选中Virtual Disks, 与管理Host类似,可以先生成一个 Folder, 来对VD分类。在Content Pane点击Create Folder, 输入一个名字, 点击 Finish确定。

在navigation pane选中Folder, 然后在右边点击Create VD Family. 按需要输入VD的名字, RAID级别, 大小等。

OS Unit Id是针对TRU64/VMS系统的,对于HPUX来说不需要更改。 Present to host,可以在这里选择某一台可以访问到这个VD的host.

Prefer path/mode: 可以选择的方式有:

No Preference------VDISK随机选择控制卡

Path A - Failover Only------VDISK优先考虑在控制卡A上online。如A 故障,切换到B上,但在A修复后不会failback。

Path B - Failover Only------VDISK优先考虑在控制卡B上online。如B 故障,切换到A上,但在B修复后不会failback。

Path A -Failover/Failback----- VDISK优先考虑在控制卡A上online。 如A故障,切换到B上,但在A修复后会failback,重新在A上运行。

Path B -Failover/Failback----- VDISK优先考虑在控制卡B上online。 如B故障,切换到A上,但在B修复后会failback,重新在B上运行。

各操作系统对prefer path/mode的支持如下:

Operating System	Default Behavior	Settings Allowed
Windows/Secure Path	Auto failback done by the host	No Preference
		Path A/B - Failover Only
HP-UX/Secure Path	Auto failback done by the host	No Preference
		Path A/B - Failover Only
Sun Solaris/Secure Path	Auto failback done by the host	No Preference
		Path A/B - Failover Only
IBM AIX/Secure Path	Auto failback done by the host	No Preference
		Path A/B - Failover Only
HP Tru64 UNIX	Host follows the unit	 All settings allowed.
		Recommended setting: Path A/B - Failover/Failback
HP OpenVMS (7.3 and below)	Attempts to move the unit to the	No Preference
	first path discovered	Path A/B - Failover Only

HP OpenVMS (7.3-1 and	Host follows the unit	•	All settings allowed.
greater)		•	Recommended setting: Path A/B - Failover/Failback
Linux/Secure Path	Auto failback done by the host	•	No Preference
		•	Path A/B - Failover Only
Novell NetWare/ Secure Path	Auto failback done by the host	•	No Preference
		•	Path A/B - Failover Only

点击Next Step,选择一个LUN ID。每个VD的LUN ID就是不同的,而对 就不同的Host,同一个VD对就的LUN ID最好是一样的。 点击Finish确定。



点击OK,后台将会对group的disk做leveling,生成VD需要一点时间, 取决于这个 VD的大小。

2. 7、如何更改 vdisk 属性

在左侧选择需要更改的 vdisk:

Vdisk Active Member Properties Create snapshot Save changes Create Snapclone ? General Presentation Data Replication Identification Condition/State Name: ACTIVE **Operational State:** 🖌 Good Family Name: Vdisk001 Date/Time World Wide LUN Name: 06-Sep-2003 Created: 11:31:20 6005-08b4-0001-4523-0004-000 **Cache Policies** UUID: 6005-08b4-0001-4523-0004-0000-Write: Mirrored write-back -0092-0000 On 🔻 Read: Attributes Type: Original Disk Group: Scratch Disks 100 Capacity Req: GB **Capacity Used:** 100 GB Redundancy: Vraid1 Write Protect: No 💌 Comments

该页可以修改的选项为cache policies, vdisk大小,写保护等;点击 presentation:

Vdisk Active Member Properties

Save changes	Present			?		
General	Presentation	Data Repli	cation			
Presentation Properties						
OS Unit ID:		0				
Preferred path/mode:		No preference		•		
Presentations						
Host			LUN	FC Reservation		
Not presented						

该页可以修改os id及prefer mode。同时,还可以present/unpresent vdisk给主机.

所有修改做完后都必须要点击"save changes"方可生效。 在修改vdisk配置时应注意:

尽管EVA支持在线增大vdisk的空间(出于数据安全的考虑,不可以减小),但必须操作系统支持在线扩容才可以。支持在线扩容的系统有WINDOWS2000及以上版本、tru64、hp-ux等(某些系统需要购买相关软件)。如果操作系统不支持,请不要进行扩容,以免数据丢失。如确需扩容,建议先进行系统备份在重建vdisk,最后把数据在恢复到新的vdisk上。

2.7、如何使主机访问 vdisk

在上图中,点击present:

Present Vdisk

Present Vdisk	Select None	Select All	Assign LUN	?
Cancel				

Select one or more hosts to which your Vdisk will be presented. Only those hosts without existing presentations to your Vdisk are shown.

Click the **Present Vdisk** button after you have made your selections.

Reg HSV Storage Network	
Hosts	
- 🔁 HP Servers	
HP1	
😋 alpha	
hsv3alpha	
intel	
hsv3intel	

选择需要访问该vdisk的主机,点击"present disk";

Present Vdisk			Page 1 Page 2	
Previous step	Finish	Cancel	?	
Complete the steps	below to) present y	our Vdisk.	-

STEP 2: Select a LUN:

Available LUNs for this host: |4 💌 🔋

STEP 3: Present your Vdisk

Click the Finish button to present your Vdisk.

选择该vdisk的lun id号,点击finish;至此,该host就可以访问该vdisk 啦。

三、如何维护 EVA 存储系统

3. 1、如何浏览 EVA 系统状态

1、在SMA桌面上双击IE浏览器图标,出现如下界面:



注:如未能出现该页,请访问:http://localhost即可,不需加端口号! 2、点击Devices,再点击 Command view eva;

		Content pan	e
hp StorogeWorks command view eva Roat View Agent Options	Appliance:		
	HSV Storage Net	work Properties 🗸 🔶	
🗄 🎒 hsvƏlab	Discover HSV Storage System Net	work Properties	?
ē ₩ hsv3lab	Discover HSV Storage System Net Name:	work Properties HSV Storage System Network	?
H 🎁 hsv3lab	Discover HSV Storage System Net Name: Total HSV systems:	work Properties HSV Storage System Network 1	?
e 🌐 hsv3lab	Discover HSV Storage System Net Name: Total HSV systems: Total storage space:	work Properties HSV Storage System Network 1 978.30 GB	?
nsvƏlab	Discover HSV Storage System Net Name: Total HSV systems: Total storage space: Storage space used:	work Properties HSV Storage System Network 1 978.30 GB 271.64 GB	?

3、点击右边的 discover:

hp StorogeWorks command view eva Root View Agent Options	Appliance; HSVSSANAPP 16.11 Help	2.137.41	
HSV Storage Network 비행 hev3lab 만 Virtual Disks 만 Hosts	Disk Group Folder	r Properties ?	4
Disk Groups	Name:	Disk Groups	
Data Replication	Operational state:	🔽 Good	
Digital Haroware	Total disk groups:	2	
	Total grouped disks:	33	
	Total ungrouped disks:	10	
	•		•

4、点击EVA主机名一》hardware,展开菜单,可以看到eva的组成硬件, 如控制器、硬盘架、硬盘等信息,观察有无告警或错误信息,如有,点击告 警位置,查看详细信息,同时收集系统日志,与hp响应中心联系;下图是如 何查看controller enclosure的信息的步骤;

GeneralHost PortsDevice PortsIdentificationConditionName:Controller BOperationType:HSV Storage SystemState:Manufacturer:Hewlett-Packard CompanyOperationModelHSV110OperationNumber:CC00EFvcsp-3010WriteCapacityCapacity	Enclosure on/State onal Good lemory onal Good
IdentificationConditionName:Controller BOperationType:HSV Storage SystemState:Manufacturer:Hewlett-Packard CompanyOperationModel Number:HSV110OperationSoftware version:CC00EFvcsp-3010Write capacity	on/State onal Good lemory onal Good
Name:Controller BOperation State:Type:HSV Storage SystemCache MManufacturer:Hewlett-Packard CompanyOperation State:Model Number:HSV110Operation State:Software version:CC00EFvcsp-3010Write capacity	onal 🖌 Good Iemory onal 🖌 Good
Type:HSV Storage SystemOracle IManufacturer:Hewlett-Packard CompanyOperationModel Number:HSV110State:Software version:CC00EFvcsp-3010Write capacity	lemory onal 🔽 Good
Manufacturer:Hewlett-Packard CompanyCache MModel Number:HSV110OperationSoftware version:CC00EFvcsp-3010Write capacity	lemory onal 🔽 Good
Model Number:HSV110Operation State:Software version:CC00EFvcsp-3010Write 	onal 🗹 Good
Software CCOOEFvcsp-3010 Write capacity	
TO STOLL	256 MB
Serial P4889B49ILV00N Read capacity	y: 512 MB
World Wide Node Name: Mirror PA	ath: 🗹 Good
5000-1FE1-5000-2CD0 State:	ort 🗹 Good
UUID:	
5005-08b4-0001-4529-0000-0000-	n
0000-0000 Enclosus number	re 7

Controller Properties

Controller Properties

Locate Shut down Code load	?
General Host Ports	Device Ports Enclosure
Port 1:	
World Wide Name:	50001FE1 50002CD9
Address:	06-10-00
Operational State:	🖌 Good
Connection state:	🖌 Logged into fabric
Speed:	1Gb/s
Port 2:	
World Wide Name:	50001FE1 50002CD8
Address:	07-10-00
Operational State:	🖌 Good
Connection state:	✔ Logged into fabric
Speed:	1Gb/s

Controlle	r Pro	perties
-----------	-------	---------

Locate S	hut down	Code load				?	
General	Host	Ports	D	evice Ports	Enclo	osure	
Location				Temperature			
Enclosure nu	ımber:	7		I2C Sensor 1:		68°F / 20°C	
Blowers				I2C Sensor 2:		77°F / 25°C	
FRU Type	Blower	only		Overtemp Thre	shold:	131°F / 55°C	
Blower 1				Cache Battery	System	1	
Installed?	Yes			Operational	🔽 Go	bod	
Actual speed	1: 4050 R	PM		State:	_		
Blower 2				Battery voltage	je: 2.32 VDC		
Installed?	Yes			Battery Module	: 1		
Actual speed	1: 3930 R	PM		Installed?	Yes		
Power				Operational state:	Go	bod	
12 VDC Volta	age: 11.87 '	VDC		Battery Module	2		
5 VDC Voltaç	je: 4.99 V	DC		Installed?	Yes		
3.3 VDC Voltage:	3.28 V	DC		Operational state:	Go	bod	
2.5 VDC Voltage:	2.50 V	DC		Battery Charge	er		
2.0 VDC Voltage:	2.01 V	DC		Operational state:	G	bod	

5、展开disk group及vdisk菜单,可以看到相关信息,观察有无告警或 错误信息,如有,点击告警位置,查看详细信息,同时收集系统日志,与hp 响应中心联系;

Disk Enc	losure Properties		
Save chan	iges Locate		?
General	Power	Cooling	I/O-Comm
Identificatio	n	LED Display	
Name: World Wide I	Disk Enclosure 10	Operational state:	🖌 Good
5000-1FE1-0	016-75E0	Language:	English
Location		EMU	
Loop Pair:	LoopPair2	Operational state:	🗹 Good
Audible Alar	m	Firmware	02020071
Operational State:	🗹 Good	version:	
Alarm:			
Last Enclosu	ire Event		
No events log	jged		
Comments			

1

Disk Enclosure Properties

Locate				?	
General	Power		Cooling I/	/O-Comm	
Power Supply 1			Power S	Supply 2	
Power Supply 1	Properties				
Condition/State:			Alarm Thresholds:		
Operational	Good		5 VDC Voltage Ala	nrms	
state:			OverVolt Warn:	5.7 VDC	
5 VDC)utput:		OverVolt Critical:	5.7 VDC	
Voltage:	5.5 Volts		UnderVolt Warn:	5.1 VDC	
Current:	11.7 Amps		UnderVolt Critical:	5.1 VDC	
		5 VDC Current Alarms			
vultaye:	12.5 VOILS		OverCurrent		
	larmaci		Warn:	20.0 Amps	
AC Failure:	No		OverCurrent Critical:	24.0 Amps	
5 VDC			12 VDC Voltage Alarms		
Voltage:	None		OverVolt Warn:	13.1 VDC	
Current: 12 VDC	None		OverVolt Critical:	13.3 VDC	
Voltage:	None		UnderVolt Warn:	11.9 VDC	
Current:	None		UnderVolt Critical:	11.8 VDC	
			12 VDC Current A	larms	
			OverCurrent Warn:	22.5 Amps	
			OverCurrent Critical:	26.5 Amps	

Disk Enclosure Properties

Locate			?			
General	Power	Cooling	/O-Comm			
Sensor-Genera	al Sensor–Threshold	ls Blower 1	Blower 2			
Temperature So	Temperature Sensor General Properties					
Sensor	Status	Temperature	Alarms			
PS1TEMP	ок	96.8°F / 36.0°C	None			
PS2TEMP	ок	91.4°F / 33.0°C	None			
EMUTEMP	ок	77.0°F / 25.0°C	None			
DISK1TEMP	ок	87.8°F / 31.0°C	None			
DISK2TEMP	ок	82.4°F / 28.0°C	None			
DISK3TEMP	ок	82.4°F / 28.0°C	None			
DISK4TEMP	ок	75.2°F / 24.0°C	None			
DISK5TEMP	ок	77.0°F / 25.0°C	None			
DISK6TEMP	ок	73.4°F / 23.0°C	None			
DISK7TEMP	ок	75.2°F / 24.0°C	None			
DISK8TEMP	ок	80.6°F / 27.0°C	None			
DISK9TEMP	ок	80.6°F / 27.0°C	None			
DISK10TEMP	ок	84.2°F / 29.0°C	None			
DISK11TEMP	ок	80.6°F / 27.0°C	None			
DISK12TEMP	ок	75.2°F / 24.0°C	None			
DISK13TEMP	ок	87.8°F / 31.0°C	None			
DISK14TEMP	ок	93.2°F / 34.0°C	None			

3. 2、如何查看和收集系统日志

EVA系统日志有四类:

- Management Agent Event Log
- Controller Event Log
- Controller Termination Event Log
- NT Event Log

前三个log我们可以通过EVA的command view来获得,NT event log必须 通过windows的event log获得。

3. 2. 1、如何查看系统日志

通过 IE 经过 command view, 选中左侧 EVA 系统名称; 选择 view events;

View Events	
ок	?
Management Agent Event Log	
Controller Event Log	
Controller Termination Event Log	

选择 "Management Agent Event Log":

Management Agent Events

OK Get ever	ntfile	Filter event	s 🛛 Clear	log 7		
Date /Time	Severity	Alarm	Code	Appliance/Storage System		
Date/ fime	Descriptic	n				
13:26:5B	×	Yes	24157	SCell:hsv3lab		
4-Apr-2003	SC Event (Virtual Disk	code: 9 cc identified i	51 5 - The : In the handl	state of the internal Logical Disk associated with the e field has transitioned to the DEVICE DATA LOST state.		
13:26:59		Na	9012	HSV3SANAPP		
4-Apr-2003	Operation	on a fast vi	rtual disk de	eletion completed		
13:26:39	 Image: A set of the set of the	Na	10024	HSV3SANAPP		
4-Apr-2003	Disk Group Data Lost Error Resolution Sequence 1 - Marked					
13:26:4B		Na	10025	HSV3SANAPP		
4-Apr-2003	Disk Group Data Lost Error Resolution Sequence 2 - Affected Units Deleted					
13:23:04	×	Yes	24077	SCell:hsv3lab		
4-Apr-20D3	SC Event Code: 9.6 bf 5 - The state of the Volume identified in the handle field has transitioned to the MISSING state.					
13:23:04	×	Yes	24130	SCell:hsv3lab		
4-Apr-2003	SC Event Code: 9 3e 42 e - The Physical Disk Drive identified in the handle field has disappeared.					
13:23:04	×	Yes	24154	SCell:hsv3lab		
4-Apr-2003 SC Event Code: 9 09 51 5 - The state of the Disk Group identified in the handle field transitioned to an INOPERATIVE state.						

选择"Filter events"对信息进行筛选:

Management Agent Events

ОК	Get ev	ent file	Filter ever	nts Clea	ar log		?
		Severity	Alarm	Code	Appliance/Sto	rage System	
Date/III	ne	Descri File	Download			×	
13:) 4-Арі	26:58 r-2003	SC Eve Virtual	Conce f looks s save th	files can haim yo Aspicious, or you his file.	ur computer. If the file inf u do not fully trust the sou	ormation below rice, do not open or	associated with the VICE DATA LOST state.
13:2 4-Api	26:59 r-2003	⊡ Operat	Fi Fi	le name: GetEv le type:	ventFile 25034752		
13:8 4-Ap	26:39 r-2003	Disk Gr	FI	iom: nevde	anapp.cxo.cpqcoip.nei		
13:5 4-Api	26:48 r-2003	Disk Gr	Would	you like to open	i the file or save it to your	computer?	Deleted
13:: 4-Ар	23:04 r-2003	SC Eve transitione	— Al <u>v</u> Alv d to the M	yays ask before (NISSING stat	opering this type of file		a handle field has
13:3	23:04	×	Yes	24130		SCell: hsv3lab	
4-Ар	r-2003	SC Event (disappeare	Code: 9 3e d.	42 e - The	Physical Disk Driv	e identified in th	ne handle field has
13:2	23:04	×	Yes	24154		SCell: hsv3lab	
4-Ар	r-2003	SC Event (transitione	Code: 9 c9 d to an IN	9515-The OPERATIVE	state of the Disk state	Group identified	in the handle field has

Filter Events

View filtered events	Cancel	?

You can change the way your event log is displayed using the filter parameters below. To filter your event log, change any parameter's default value to the value of your choice. To refine your event display, you may use as many filter parameters as you wish.

To display the filtered log, click the View Filtered Events button.

Filter by date	Filter by time
• Show events occurring on all dates	• Show events occurring at all times
C Show only events occurring:	C Show only events occurring:
from / / /	from :
to / / / / (mm/dd/yyyy)	to : (hh:mm, 24-hr format)

Filter by severity

Filter by severity	Filter by event code				
Show only events with severity code:	Show only events with event code:				
All	All (Enter 4/5-digit number)				

Filter by status

	· ·					
Show	only	events	with	an	alarm	status
of: 🗛	▼					

(Enter 4/5-digit number) Filter by appliance name

	<u>, , , , , , , , , , , , , , , , , , , </u>	_
IS	Show only events occurring at	
	appliance: All	
	(Enter appliance name)	

如选择 controller events,则如下图:

Controller Events (Initialized system)

OK Get log fi	le Get	parse file	Send parse file		?	
Display Range: 1-4	00 🔽	Previous <u>c</u>	roup Next group			
Controllers:	Controller B: 5005-08b4-0001-4529-0000-0000-0000 Controller A: 5005-08b4-0001-4523-0000-0000-0000					
Date/Time	Severity	Event Cod	е	Sequence #		
Controller	Descriptio	n				
17:43:23:368	▽		06014a08	#1965		
15-Apr-2003 Controller A	A Fibre Channel port on the HSV110 controller has failed to respond. Corrective action code: 4a					
17:42:53:806			09070005	#1964		
15-Apr-2003 Controller A	The state of the Fibre Channel port identified in the attribute.value.str field and located on the rear panel of the HSV110 controller identified in the handle field has transitioned to the NORMAL state. Corrective action code: 00					
17:42:11:21			Odf00011	#1963		
15-Apr-2003 Controller A	The status has changed on one or more of the drive enclosures. Corrective action code: 00					
17:41:48:742	X		060f4013	#1962		
15-Apr-2003 Controller A The Drive Enclosure Environmental Monitoring Unit is able to communicate with a physical disk drive but this HSV110 controller is unable to communicate with that physical disk drive on the Fibre Channel bus.					with a physical hysical disk More details	

点击 more detail 看该事件的详细描述:



3. 2. 2、如何收集系统日志

通过 IE 经过管理界面,选中左侧 EVA 系统名称;选择 view events;点击其中任一 event 选项:

Controller Events (Initialized system)

ОК	Get log fil	e	Get parse file		Send	l parse file					?
Display	Range: 1-4	00	•	Previous g	roup	Next group					
Con	trollers:		Controlle File Down	er B: 5005-0 Ioad)8b4-000)1-4529-0000·	-0000	0000-0000	 		
Date/T Control	ime ller	Se De	?	Some files can l looks suspicious	harm your ci s, or you do	omputer. If the file in not fully trust the so	formatio urce, do	n below not open or	#		
00:00 18-A Con	D: 27: 656 Apr-2003 troller B	Th EX	·	save this file. File name: File type: From:	EventRetri hsv3sanap	ieveParseFile op.cxo.cpqcorp.net			#2360 ime field by a	a call to th	e etails
00:00 18-A Con	0:27:656 pr-2003 troller B	Th EX 🛠		Would you like I	to open the	file or save it to you	r compu	ter?	#2359 ime field by a	a call to th	e etails
00:0(18-A Con	0:27:656 pr-2003 troller A	Tin X	Correctiv	Always ask	before oper de: 00	ning this type of file			#2358 eld.	🗅 More da	etails
00:00 18-A Con	0:27:656 \pr-2003 troller A	The EXI	e system EC\$SET_ Correctiv	time value TIME servic e action co	010100 was set e. de: 00	Od to the value	contai	ined in the ·	#2357 time field by a	a call to th	e etails

选择 get log file 或 get phase file,将其 save 到本地硬盘,然后通过 mail 发送给 hp 响应中心即可。

3.3、如何备份系统配置信息

1、备份 EVA 的配置信息:

在 SMA 上,进入 command view 的管理界面,选择 maintenance,选择 backup 选项,将系统配置信息备份到本地,然后拷贝到别的计算机上保存,大约 80M 左右。以备 SMA 出现故障恢复时用。

2、恢复 EVA 的配置信息

在 SMA 上, 进入 command view 的管理界面, 选择 maintenance, 选择 restore 选 项进行配置信息的恢复;

以上备份和恢复对 EVA 自身的数据和配置无影响,只是为了使 SMA 可以正常管理 EVA 系统。

四、如何联系惠普

在系统出现故障时,请准备好以下材料:

- 1、EVA 序列号(在 EVA 机柜后面的上方横梁中间, 10 位, 如 SGH0404BH3);
- 2、故障现象描述(如硬盘亮红灯,光纤交换机端口亮黄灯等),越详细越好; 迅速拨打惠普公司 24 小时服务热线,联系惠普工程师: 如用具 ALPUA 主机 批打 8008100668 惠莱 0000 服务器用户批打 800810700

如果是ALPHA主机,拨打8008100668,惠普9000服务器用户拨打8008107000 或01065643860(非工作时间);

本文档介绍了 EVA 存储日常的配置和管理的有关知识。如需深入了解 EVA3000/5000 的其他知识,请登陆惠普网站 <u>www.hp.com</u>下载相关文档。我们 坚信,惠普公司专业的服务加上您的支持,我们可以确保您的系统的永续运行!



附录A、ISEE 软件(标准版)介绍

HP ISEE 代表 Instant Support Enterprise Edition, 是 HP 基于 Internet 的远程 支持解决方案。 它安装在客户机器上, 24 小时实时监测客户服务器或存储设备 上的软硬件故障,帮助客户实现机房无人值守。目前在国内已经有很多用户在 EVA 存储系统管理平台上安装了该软件,行业涉及政府、教育、制造、银行等 领域,在 EVA 系统维护方面发挥了很大的作用。该软件具有以下功能和特点: 24X7 监控客户系统

一旦检测到硬件及系统问题,诊断程序即开始运行,收集基本的配置信息,及时向 HP 响应中心及客户发出通知,HP 响应中心主动与客户联系,尽快把问题解决以免造成更大的问题,把对客户业务流程及现金流业务的破坏最小化

快速定位故障

 第一时间主动把问题提交给 HP 响应中心,无须您手工报修及描述问题, 并且由于 ISEE 报错信息全面具体,加快了 HP 工程师的诊断及解决进程。
 另一个方面,由于 ISEE 能够收集到足够的错误信息,大多数的故障诊断 都可通过 ISEE 进行,减少惠普必须到现场的可能,省掉了差旅时间,加快了问题的解决

提高客户的运维效率

• 目前,客户必须同时管理系统和应用,安装 ISEE 后,可以把硬件及系统 级的维护交给 ISEE,客户可以把更多的精力放在应用管理上

减少维护的复杂性和成本

 ISEE 不仅适用于服务器,还适用于存储产品,而且支持的硬件非常广泛, 包括 HP 的 9000 及 Alpha 服务器,还支持 NT 服务器及 EVA 等众多的存储产品。目前我们需要多种工具来管理不同的系统,有了 ISEE,我们可以用 ISEE 来统一管理这些设备,减少了管理的复杂性及成本。

安全可靠

- 一、 数据加密传输
- 1、ISEE 在 2 个关键领域采用加密技术:
- 客户端到服务器和服务器到服务器的网络通信安全
- 软件安全 (检测支持脚本)

2、ISEE 采用如下行业标准加密和授权技术来保证 安全的远程支持服务:

- Secure Sockets Layer 3.0 (https/SSL)
- X.509 数字认证标准
- MD5 消息分类
- RSARC4 128 位私人密钥加密

• RSA 2048 位公共密钥加密

3、对 ISEE 的访问将严格限制在 HP 支持中心解决该系统 故障的支持专家

• 对 ISEE 客户端的访问严格限制,只有处理该问题的惠普支持专家可以 访问

二、 防止攻击

- ISEE 只发送底层的硬件及系统信息,与应用无关,这样的数据对黑客没 有意义。
- 可以按需连接 Internet: 只有在有 ISEE 事件时才连接 Internet, 没有 ISEE 数据发出,则没有 Internet 连接。

<u>实现真正的无人值守</u>

- 把您的硬件及系统级的值守交给 ISEE, 您的运维人员可把更多的精力放 在应用管理上
- 目前, ISEE 支持如下产品:

	ISEE A.03.50 版的 特性/功能
支持的操作系统	HP-UX, MS Windows Server 2000 and Advanced Server, Windows
	Server 2003 Standard and Enterprise Edition, Red Hat Linux
	TRU64 Unix, Open VMS, Novell Netware, United and SuSe Linux,
	Windows Server 2003 Data Center Edition, Red Hat Enterprise
	Linux Advanced Server, Sun Solaris
支持的存储,,	Virtual Arrays, SANs, network interconnect devices (hubs, bridges,
网络设备和打印	routers); enterprise printers, XP Arrays, Enterprise Virtual Arrays,
机	StorageWorks Switches, Brocades
支持的硬件平台	HP 9000, Netservers, Superdome, Integrity, Keystone servers
	Alpha, ProLiant, VAX, SUNSPARC

ISEE 处理事件的流程如下:



ISEE 的安装要求:

• 客户 Internet 代理服务器和浏览器可以访问 HP 服务器的 80 端口

• 客户防火墙允许每台安装 ISEE 的主机和 HP 服务器通过 80 端口通讯 ISEE 标准版连接示意图:

1、通过路由器和 web 相连;



2、通过 web proxy 与 web 相连;



ISEE 在 EVA 上的安装:

目前, ISEE 在 EVA 系统上的安装有两种方法:

- 3、SMA 通过 router 或 web proxy 和 web 相连,一旦系统检测到事件,会及时向 HP 响应中心及客户发出通知,惠普工程师在收到事件后会进行分析处理,建议采用此种方法;
- 4、如用户由于其他原因的确不能与 web 相连,可以将 SMA 连到内部的 SMTP 邮件服务器所在的网络内,如有事件发生,SMA 会发 mail 到 指定用户邮箱,然后用户需要及时把该邮件转发给 hp 公司工程师, 此方法需要用户经常检查邮箱并配合转发事件邮件。