

COMMUNITY COLLEGE

Information Technology Services

Disaster Procedures and Recovery Manual

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OVERVIEW OF THIS DOCUMENT

This document outlines the disaster preparedness, planned activities for during a disaster and disaster recovery procedures as they apply to CGCC's Information Technology Services Data Center. The procedures include detailed specifics of what is performed, at what location, and by whom. Included with the procedures, are lists outlining the required equipment, software, user names and required passwords.

Due to the network access level necessary to perform these tasks, this document should be considered highly confidential. Draft copies will NOT include password information.

This document is broken down into 10 sections:	Page
1.0 Introduction	<u>4</u>
2.0 Contact Information	<u>5</u>
3.0 Disaster Preparation	<u>7</u>
3.1 <u>Alert Notification</u>	<u>8</u>
3.2 Electrical Power Supply to the Data Center and Wire Closets	<u>9</u>
3.2.1 Uninterrupted Power Supply (UPS)	<u>9</u>
3.2.2 American Power Conversions (APC) Edge Units (Wire Closets)	<u>12</u>
3.2.3 <u>Generator</u>	<u>14</u>
3.3 Data Protection	<u>15</u>
3.3.1 Offsite (cloud) Backup	<u>15</u>
3.3.2 Tape Backup System	<u>15</u>
3.3.3 Storage Area Network (SAN) Snapshot & DR Unit	<u>19</u>
3.3.3.1 Windows/Netware SAN Volume Recovery in VMWare	<u>20</u>
3.3.3.2 Microsoft Windows Server Data (D:\) Volume Recovery	<u>29</u>
3.3.3.3 Novell Netware Server Data (VOL1:\) Volume Recovery	<u>37</u>
3.3.3.4 Windows/Netware OS. Boo Partition & Complete Server F	Restore46
3.3.4 VMWare Virtual Server Hosting	<u>58</u>
3.3.5 User Security Redundancy (eDir & Windows domain)	<u>59</u>
3.3.6 Moodle Backup	<u>59</u>
3.4 Hardware & Network Infrastructure Precautions	<u>60</u>
3.4.1 <u>Server Hardware</u>	<u>60</u>
3.4.2 Cisco POE Wire Closet Switches (extra & stored configurations)	<u>61</u>
3.4.3 Core Switch Hardware & Route redundancy	<u>61</u>
3.4.4 Physical Security	<u>62</u>
3.4.5 Environmental Controls	<u>63</u>
3.5 <u>Future Plans</u>	<u>64</u>
4.0 Mid-Disaster Procedures	<u>65</u>
4.1 Activity Checklist	<u>65</u>
4.1.1 Communication	<u>65</u>
4.1.2 Power Outage	<u>66</u>
4.1.3 Environmental Unit Failure (Heat)	<u>66</u>
5.0 Data Center Shutdown Procedures	<u>67</u>

Secure Document

5.1 Partial Shutdown	<u>70</u>
5.2 Complete Graceful Shutdown	<u>71</u>
5.2.1 Process the Shutdown steps as outlined section 5.0 in the following of	order72
5.2.2 Phone System Shutdown	<u>74</u>
5.2.3 VMWare Servers	<u>74</u>
5.2.4 <u>SAN</u>	<u>75</u>
5.2.5 APC Shutdown	<u>75</u>
5.2.6 Liebert Units	<u>75</u>
6.0 Emergency (Quick) Shutdown (15 min or less power or over 95 degrees)	<u>76</u>
7.0 Data Center Startup Procedures	<u>78</u>
7.1 Process the STARTUP steps as outlined section 6.0 in the following order	<u>79</u>
8.0 Hood River Indian Creek Campus – Startup & Shutdown	<u>81</u>
9.0 Disaster Recovery	<u>84</u>
10.0 Document Modification Log	<u>85</u>

Each section contains:

- Required Equipment & Software
- Detailed Instructions of activities
 - Primary Lead Person

1.0 INTRODUCTION

Disaster recovery is the process, policies and procedures related to preparing for recovery or continuation of technology infrastructure critical to an organization after a <u>natural</u> or human-induced disaster.

Disaster recovery planning is a subset of a larger process known as business continuity planning and should include planning for resumption of applications, data, hardware, communications (such as networking) and other IT infrastructure. A business continuity plan (BCP) includes planning for non-IT related aspects such as key personnel, facilities, crisis communication and reputation protection, and should refer to the disaster recovery plan (DRP) for IT related infrastructure recovery / continuity. This document focuses on disaster recovery planning as related to IT infrastructure.

Each section begins with basic information regarding the section. This includes a chart for the areas of protection/recover as shown below.

Since some systems are put in place to protect a variety of areas, the following chart accompanies each systems introduction section. An example of a system protecting multiple areas is the use of UPS's. By protecting and providing a consistent power supply, we protect all aspects of BCP. Power keeps the Infrastructure working, power keeps the Hardware working, steady power helps prevent the hardware from corrupting Data, and consistent power reduces application error.

Applications	Data	Hardware	Infrastructure	
			Data Center	Edge

Areas of recovery / protection

2.0 CONTACT INFORMATION

This is followed by the primary & secondary Lead information:

Lead Staff	Name	Home Phone	Mobile Phone
CGCC	Bill Bohn		
Primary			
CGCC	Adam Gietl		
Secondary			
Tech III	Richard Jepson		
Online Specialist	Danny Dehaze		
Tech I/Lab Aide	Ron Watrus		
Vendor	Name	Office	Mobile
Compositions	CoDilat Quanant		
Compellent	CoPliot Support		
	controller 1D # s		
	Hsn#(same as controller #)		
C2ITSystems	Tech		
,	Phil Thompson		
Dell	Server Support		
	ID# 7 digit TAG		
	Account Rep		
	Pleschette Fontenet		
ESD	Internet, Firewall, DNS		
	Eric Harrison,		
	eharrison@mesd.k12.or.us		
	Dan Young,		
	Cody Harmon		
	NOC		
	noc@cascadetech.org		
	<u>noole ou ou ou on org</u>		
eThink	Claire Machia		
Education	claire.machia@eThinkEduca		
	tion.com		
Fire	Fire Dept		
HREC	John Gerstenberger		
	Simien		
	HRICC<-to->TDC		

	Service from HRICC->HREC	
Insight Web	Paul Irving	
Publishing		
Integra	ApplicationXtender	
	Tech Support	
	Beau Brazier	
	haav hraziar@integraECM a	
	loe Roche	
	ioe roche@integraECM.com	
LS Networks	Circuit ID	
	CACHE/Columbia Gorge	
	Comm. College,	
	HDRV-THDL	
	Service from HREC->TD	
	Mark Waldo	
	Sr. NOC Engineer	
	mwaldo@isnetworks.net	
	Lief Hanson	
LS Networks	LS Networks	
	921 SW Washington St.,	
	Ste 370	
	Portland, OR 97205	
	www.lsnetworks.net	
Iviatrix		
	Jason Dow Krizzia Muebleck	
	Acct Ren:	
	Tim Lopez	
May	Mike Neeley	
Technologies		
Microsoft	Technical Support	
	Server OS Support	
NeWest	RMS – Support	
Technologies		
Novacaat		
INUVACUASI	Tech [:] Rob Aronson	
	Tech: John Walls	

	Northwest Rep:	
	PJ Anderson	
Novell	Technical Support	
Pacific Office	Copier Support	
Automation	Acct Manager	
	Jeff Simon	
Police		
Series25 Live	Account Manager	
	Andrew Van Dyk	
	avandyk@collegenet.com	
Symantic	Technical Support	
Backup Exec	ID:	
SYN-Apps	SA-Announce	
	Tech	
	Greg Banse	
VMWare	Virtual environment	
	Acct:	
	helpdesk@cgcc.cc.or.us	

3.0 DISASTER PREPARATION

This section reviews the areas of preparedness, the equipment in place, the procedures used on the equipment, and the person(s) responsible for the activities.

3.1 Alert Notification

All of the College's critical systems incorporate an alert notification in case of problems. Each system alert parameters are set based on that system's purpose and monitoring capability. This document outlines each of the systems parameters and recipients.

For ease of future maintenance, all systems send their alert to a single email account: ZX-CriticalAlerts@cgcc.edu

The ITS Department configures the Critical Alerts account to recognize what system sent the email, and who to be notified by email &/or text messaging. By using this single, central notification account, modifying the specific recipient list can be done in one place, versus modifying each system when an email or text message address changes.

CriticalAlerts account rule configuration is defined for sending alerts based on: (check CriticalAlerts account for notification list) Subject of "HVAC" & "Critical" Subject of "HVAC" & "General" Or forwarding ANY message submitted

3.2 Electrical Power Supply to the Data Center and Wire Closets

3.2.1 Uninterrupted Power Supply (UPS)

American Power Conversions (APC) Data Center UPS

Areas of recovery / protection				
Application	Data	Hardware	Infras	structure
S			Data Center	Edge
✓	✓	1	1	

S Da	a Edge
Cen	er
Primary Contacts:	

	· · · · · · · · · · · · · · · · · · ·		
	Name	Home Phone	Mobile Phone
Primary	Adam		
Secondary	Bill Bohn		
Past	Chris McQuade		
Vendor Support	APC	T	

Description:

The Data Center APC UPS is located in the Data Center. It consists of four different functional units, Batteries, distribution, Management, and Monitoring

The APC UPS functions primarily to provide uninterrupted power for a short period of time. Short period of time means that the unit will provide consistent clean power for power spikes, dips or during an outage until the generator provides emergency power. The system will provide roughly one (1) hour of power once the generator stops.

Scope of protection:

This unit protects all of the electrical equipment inside the black cabinets and mounted on the back set of racks. It does NOT provide power to lights or environment control units.

Parameters of protection:

Provides clean uninterrupted power to the above scope for one (1) hour.

Monitoring/Notification:

There are two monitoring unit hubs, one located in each cabinet row. The front row uses one temperature monitor and one temperature/humidity monitor. The back row uses two temperature monitors and one temperature/humidity monitor. (This is also outlined in the Environment section)

All monitors are set with the following event settings:

- High temperature
- Low temperature
 - High humidity
 - Low humidity
- Fast short term temperature gain/loss
 - Long term temperature gain/loss
- All monitors are set to text and email the following:

o <u>ZX-CriticalAlerts@cgcc.edu</u>

This account forwards the message based on the sender. Recipients for the APC unit include:

• B.Bohn, A.Gietl, J.Austin

#1) Login Instructions for APC-Infrastruxure Server (monitored in Xymon)

This is the Main APC server that monitors the APC, all power and environmental components of the Server Room rack infrastructure. This server sends out an e-mail notification of a power alarm or an environmental alarm conditions in the server room. Prerequisite: User will be prompted to install APC client software from website below. **Highly Recommend using citrix.cgcc.edu to login to APC-Infrastruxure Mgr** Using Internet Explorer, accept and install the InfraStruxure Mgr. Software if you do not already have this software. After software installed, login to

To check an alarm state double click on the device that has an alarm condition marked with a Red X. You will then be able to see the alarm conditions and generate log files by drilling into the device.

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💼 🖬 🤊 - 🙂 🔻	🖉 APC InfraStruXure Manager - Windows In	ternet Explorer								_0×			σx
Home Insert Page Lay	out Re Carlos v le http://10.1.1.170/clent_installed.	html						- 8 4	🖌 🗙 🔁 Bing	P -			
🚔 🔏 Cut	File Edit Vew Favorites Teols Help										A A 8	Find -	
La Copy											- 7A	Replace	
Paste J Format Painter	I - abe > Wewontes 🥦 🖉 suggested sites • 🐔 W	eb blice Gallery									Change Styles *	Select *	
Clipboard 🕞	Fo 🏀 APC InfraStruiture Manager								🚹 • 🔂 - 🖾 🛞 • Page	 Safety Tools 	9	Editing	
				•						*			69
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		www.apc.com											
				-									
			_		The Infrast	uxure Ma	nager client						
		InfraStruXure Manager - conne	ted to: apc_00C0E	37A489D4.									
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		Device Status 🖉 Power Zo	nes 🗐 Reports	🗊 Logs 📓 Physic	al Layout 🏦 In	ident Man	agement						
		E- Al Devices Devic	ies										
		- Unassigned Host	natie	System Name	Model Name	Status	IP Address	1					
		HSB Data Center New Group	92.168.1.2	Symmetra80K U	Symmetra 80K	Normal	192.168.1.2						
		New Group	92.168.1.7	RackPDU RackPDU	Metered Rack P	Nomal	192,168,1.7						
		E New Group	92.168.1.3	Power Distrib	InfraStrukture PDU	Nomal	192.168.1.3						
		Q1	92.168.1.13	RackPDU	Metered Rack P	Nomal	192.168.1.13						
		8	92.168.1.14	RackPDU RackPDU	Metered Rack P	Nomal	192.168.1.14						
			92.168.1.8	RackPDU	Metered Rack P	Nomal	192.168.1.8						
			92.168.1.6	RackPDU	Metered Rack P	Nomal	192.168.1.6						
			92.168.1.15	RackPDU	Metered Rack P	Nomal	192.168.1.15						
		Ø1	92.168.1.11	EMU Row 1	Environmental M	Normal	192.168.1.11						
		Hos	Iname: 19215816					Contact: Unknown					
		Mod	el Name: Metered	Rack PDU				ocation: Unknown					
			Normal					1					
			Description: Th	e device is operating non	nally.								
			Recommended	Action: No action is req	uired.								
								<u>×</u>					
		12 of 12 devices shown.						11.					
										-			
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													•
Page: 9 01 43 W0105: 6,645 3										10 - C - C - C	= 113% (-)		(+)
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E-Mail Notifications are listed under the following menu: System Management->Network->Notification Settings There you can input the e-mail address for the recipient of an alarm state e-mail. In this case we use <u>ZX-CriticalAlerts@cgcc.edu</u> as our broadcast alarm e-mail.

3.2.2 American Power Conversions (APC) Edge Units (Wire Closets)

	Areas of recovery / protection				
Application	Data	Hardware	Infras	structure	
S			Data	Edge	
0			Center		
		1		1	

Areas of recovery / protection

Primary Contacts:

	Name	Home Phone	Mobile Phone
Primary	Adam Gietl		
Seconda	Bill Bohn		
ry			
Past	Chris McQuade		
Vendor	APC		
Support			

Description:

The Edge APC UPSs are located in each wiring closet. The closets provide clean power to network switches that provide services to the end devices (computers, printers, scanners, & phones).

Each closes houses UPS(s) sufficient to power the closets equipment for up to a half an hour. These UPSs function to provide uninterrupted power for a short period of time. Short period of time means that the unit will provide consistent clean power for power spikes, dips or during an outage. The system will provide roughly one half (.5) hour of power.

Scope of protection:

These units protect the electrical switching equipment inside each of the network wiring closets. It does NOT provide power to lights or environment control units. Due to our phones using power over Ethernet (POE), phone units will remain in operation as long as the closet UPS provides power to that closet's switch(s).

Parameters of protection: Provides clean uninterrupted power to the above scope for one half (.5) hour.

Monitoring/Notification:

#1) UPS-B3F1 (monitored in Xymon)
 Bdlg. 3, Floor1 APC 1500 UPS inside the Main Server Room
 Used for backup temp probe in core-switch rack and Bdlg. 3 main power. E-mail recipient: <u>ZX-CriticalAlerts@cqcc.edu</u>

 #2) UPS-B2F2 (monitored in Xymon) Bdlg. 2, Floor2 APC 1500 UPS in the old server room.
 Used for temp probe in switch rack. Monitors Disaster Recovery server room temp and power fluctuations in Bdlg. 2. Also provides monitoring for battery back-up status on our Internet connection. E-mail recipient: <u>zx-criticalalerts@cgcc.edu</u>

#3) UPS-B2B (monitored in Xymon)
 Bdlg. 2 APC 1500 UPS in Basement in the Telco Room.
 Used for temp probe in B2B switch rack. Internet fiber x-connect room.
 E-mail recipient: <u>zx-criticalalerts@cqcc.edu</u>

#4) UPS-B1F3 (monitored in Xymon)
Bdlg. 1 Floor 3 APC 1500 UPS in wiring closet.
Used for temp probe in B1F3 switch rack. Student Lab PCs
E-mail recipient: <u>zx-criticalalerts@cgcc.edu</u>

#5) HRC-UPS (monitored in Xymon)
Bdlg. 1 HRC – APC 1500 UPC in 1st. floor HRC data center. Used for temp probe in Hood River Campus data center. Monitors power fluctuations at Hood River Campus. E-mail recipient: <u>zx-criticalalerts@cgcc.edu</u>

3.2.3 Generator

	=				
Application	Data	Hardware	Infras	structure	
S			Data Center	Edge	
1	1	~	1		
		Primary Co	ntacts:		
	Ν	lame	Hom	e Phone	Mobile Phone
Primary	Jim	Austin			
Secondar	Ino	Olivan			
У					
Vendor	Get Supp	oort company	Support	Company	Refueling
Support	Get refue	ling company			Company

Areas of recovery / protection

Description:

The generator is located outside the ITS Department, just west of Building Three. It uses a 100 gallon diesel tank for fuel.

Scope of protection:

What it protects: The generator provides emergency power to the Data Center. Specifically, power to the APC UPS, lights, the Liebert environment control units and the Liebert control computers. It does NOT provide power to any other area of the College.

Parameters of protection:

Provides power to the Data Center computer & Environment Control units for roughly eight (8) hours.

Monitoring/Notification: None.

3.3 Data Protection

3.3.1 Off Site (cloud) Backup



Description:

The College subscribes to CrashPlanPro to backup critical data off site. This off site backup fulfills the need to recover from a disaster that removes all on-site recovery options. The off-site data is updated on an hourly basis, so the data is never older than one hour. Recovery options include a menu driven select and recover option, as well as requesting a drive be sent to restore large amounts of data.

The data is encrypted with 448 bit encryption, as well as password protected. Nobody, including the vendor can recover the data without the password.

Data backed up by this method include:

- RogueNet (includes RogueNet and Charters)
 - DocImg
 - Archive
 - Thor
 - Isis

Scope of protection:

What it protects: CrashPlanPro backs up data from the core systems listed above. The data is stored offsite to protect against failure of onsite backups. See below for backup schedule.

Parameters of protection:

The schedule is based on the quickest availability of all our current backups. Some backups are done as quickly as 15 minutes. It keeps versioning of files when they are changed. A typical setup is as followed. There are backups and versioning done every 15 minutes. The retention for the last week is every 15 minutes. The retention for the last 90 days is every day. The retention for the last year is every week. The retention for previous years is every month. Beyond that, no files are deleted.

Steps to install CrashPlanPro.

Log onto the CrashPlanPro website and on the left hand side, click on Devices. Near the top is an image of a computer monitor, click on that and then choose the OS that the software will be installed on. Once it is downloaded, copy the installer to the server that CrashPlanPro will be installed on. Follow the steps to install and login using the CrashPlanPro credentials

3.3.2 Tape Backup System

	F	areas of recovery	/ / protection	n
Application	Data	Hardware	Infras	structure
s			Data	Edge
9			Center	
✓	✓			

Areas of recovery / protection

	Primary	Contacts:	
	Name	Home Phone	Mobile Phone
Primary	Adam Gietl		
Seconda	Bill Bohn		
ry			
Past	Chris McQuade		
Vendor	Dell Power Vault TL2000		
Support	Symantec - BackupExec		

Description:

The College uses a robotic tape library system. It uses a single tape drive, and automatically changes tape based on a programmed schedule and configuration. The unit holds up to 23 2.5TB tapes. Backup sets can and do span multiple tapes. The backup unit resides in the Data Center.

Tape drive unit: Dell PowerVault Tape type: LTO6 – 2.5 TB capacity Backup Software: Veritas BackupExec

Scope of protection:

What it protects: The tape backup unit backs up all of data stored on all of the Colleges servers. The tape system does NOT backup any data stored on local computer drives.

Please see the below parameters of protection for the backup schedule.

Parameters of protection:

The schedule is based on a two week nightly rotation for Monday through Thursday, and a four week rotation schedule for Friday, and a monthly rotation schedule for monthly backups. Friday is used for the full data backup to allow backup time to run past 8am Saturday morning. Any other day may slow network performance during a regular business day.

	Backup schedule:
DAY	DESCRIPTION
Friday-1	Full backup of all data.
Monday-1	Full backup of key systems: RogueNet (RN) & GroupWise
	(GW), and differential of all other data (differential = all files
	modified since they were last backed up to tape)
Tuesday-1	Full backup of key systems: RN & GW, and differential of all
	other data
Wednesda	Full backup of key systems: RN & GW, and differential of all
y-1	other data
Thursday-	Full backup of key systems: RN & GW, and differential of all
1	other data
Friday-2	Full backup of all data.
Monday-2	Full backup of key systems: RN & GW, and differential of all
	other data
Tuesday-2	Full backup of key systems: RN & GW, and differential of all
	other data
Wednesda	Full backup of key systems: RN & GW, and differential of all
y-2	other data
Thursday-	Full backup of key systems: RN & GW, and differential of all
2	other data
Friday-3	Full backup of all data.
Friday-4	Full backup of all data.
Monthly	No data just applications and non-data related files. Manually
	rotated and stored in same location of Monday tapes.

Job Details:

Friday: Full Backup on two tapes, starts at 11:00PM same day Monday – Thursday: Differential (only files modified since last backup) on one tape, Full starts at 1:00AM the *next calendar date*, Differential starts at 2:00AM. Differential is written to a network drive first, and then backed up to tape. This saves on wear on the tape drive unit. Monthly – second Saturday of each month, starts at 7:00PM

Archive Drive Backup (Archive):

Due to the volume of data, the archive data uses a different schedule. A full backup is run every 84 days (every 12 weeks). As of May 2013 it was almost filling two tapes. Differential backups should be scheduled weekly (as of May 2013, this has not been established yet)

Monthly tapes are rotated out of the unit and moved to another building. *In CGCC Charter System, follow Standard Operating Procedure (SOP) #00025 listed below

"Monthly Backup Tape Off Location Rotation" -Tested 1/25/11 –CM

FA	Eall	Delete		Print	ChngLog	Exit		
	8-Utilizi	na technoloav	*			Ap	proval Status -	ted
tle	Month	k Rackup Topo Off L	acation Dotation				Approv	ed
10.	INIONUI	у Баскир таре ОП С	ocation Rotation					
	tape wit	h the next needed tape.						¥
Primary Contact:	BILL BO	DHN		Establis	hed: 01/28/2011	(Closed /	1
Sc	ope	Prerequisites	(Procedure(s	References	Definitions	Parent/Child	Appr	oval
		Title			Descripti	on	Lead	Doc
▶ 1. V	Validate mo	nthly backup job was succ	essful & note Tape Media La	abel				
2. F	Right click o	n the tapes slot and selec	EXPORT -**Add move to va	ult Right-click or	the tape slot & select E	XPORT, then		
3.1	Run the Exp	ort job - do not click ok unt	I you recover the tape from I	O slot If you click Of	before accessing the t	ape, then yo		+ +
4. 1	Take tane to	Vault location	ID to relocate back into the	Vault location	is in Building Two Floo	Two wiring		+ +
6. F	Recover ne	t needed tape by tape labe	I ID	Vaultiocation	To in Danaing Two Tioo	Two wining		
7.1	Import tape	from the vault into the oper	slot- ** select to Inventory T	Tape When import	ing, be sure to check the	box to invent		
8. \	Validate that	t all previous actions are re	ferenced correctly by BE	If the new tap	e shows up as scratch,	or blank medi		
i						100	2	
				10				
				6				

Monitoring/Notification:

Completed job notification emailed to the HelpDesk daily. Job errors are emailed to HelpDesk, A.Gietl and B.Bohn.

Fundamental Steps for Tape Restore

*Must have access to the Symantec Backup Exec 12.5 for Windows Servers Client on a PC

*User must have a valid Domain Account.

Conne	ct to Media S	erver X
Server: N	ITHOOD	•
Logon ir	nformation	
	<u>U</u> ser name:	
	Password:	
	<u>D</u> omain:	NT-DOMAIN 👻
	Backup Exe	c Services on MTHOOD: Running
Service	s	OK Cancel

Enter valid Domain User/Pass and Press OK -- You will see the "Job Monitor" window.

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🔒 Symantec Backup Exec - MTH	OOD - [Job Moni	itor]						-					×
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>N</u> etwork	<u>T</u> ools <u>W</u> ind	ow <u>H</u> elp									Searo	h Knowledge Base	Q
Backup Exec 12.	5 for Window	ws Servers										Need Assist	tance?
Destroy - Destroy	Joh Colum	Inh Manitan	Allerta										
Backup • Restore •	Job Setup	JOD MONILOI	Alerts	ceports De	evices	Media							
General Tasks 🔹	Job List	Calendar	System Sumr	nary									
Hold job queue	Current Jobs -	7 Items								Filter: Al	l jobs		- 🖤
Hold schedule	State	Name	Device Name	Job Type	Current Op	Job Status	Priority	Percent	Start Time	Elapsed Time	Byte Count	Job Rate	
Properties	Scheduled	A-Full Data Sele	IBM LTO4 Tape	Backup		Scheduled	Medium	None	3/1/2011 10:00:0	None	None	None	
	Scheduled	B2-Differential D	IBM LTO4 Tape	Backup		Scheduled	Medium	None	3/1/2011 11:00:0	None	None	None	
Active Job Tasks 🔹	Scheduled	A1-Full Data Sel	IBM LTO4 Tape	Backup		Scheduled	Medium	None	3/4/2011 9:00:00 PM	1 None	None	None	
Cancel	Scheduled	B2-Differential D	IBM LTO4 Tape	Backup		Scheduled	Medium	None	3/4/2011 11:00:0	None	None	None	
Cancel all	Scheduled	C-Monthly Syste	IBM LTO4 Tape	Backup		Scheduled	Medium	None	3/5/2011 4:00:00 PM	1 None	None	None	
Hold all schedules	Scheduled	A1-Full Data Sel	IBM LTO4 Tape	Backup		Scheduled	Medium	None	3/11/2011 9:00:0	None	None	None	
Respond to alert	Scheduled	B2-Differential D	IBM LTO4 Tape	Backup		Scheduled	Medium	None	3/11/2011 11:00:	None	None	None	
Scheduled Job Tasks 🔹 🔕													
Run now	Job History - 1	54 Items								Filter: Al	ljobs		- 🕎
Test run	Name				Device Nam	e	Job Type	Job Status	Percent Complete	Start Time		End Time	•
Increase priority	B2-Differen	tial Data-NetWare-4	-Monday-Thursday	Append - Differe	IBM LTO4 Ta	pe Drive	Backup	Successful	100%	3/1/2011 2:58:49	AM	3/1/2011 7:15:19 .	4
Decrease priority	🐼 A-Full Data	Selections-BothOS-	3 -Monday-Thursda	y OverWrite - Fu	. IBM LTO4 Ta	pe Drive	Backup	Successful	100%	2/28/2011 10:00:	01 PM	3/1/2011 2:58:46 .	4 E
December	B2-Differen	tial Data-NetWare-2	a-Friday Append - F	ull-T2-Friday Ap	IBM LTO4 Ta	pe Drive	Backup	Complete	100%	2/26/2011 1:00:2	0 AM	2/26/2011 7:56:0	e
Custom Filter Tasks 🛞	A1-Full Dat	a Selections-BothOS	-1a-Friday OW - Fu	II-T1-Full OW &	IBM LTO4 Ta	pe Drive	Backup	Successful	100%	2/25/2011 9:00:0	5 PM	2/26/2011 1:00:1	
Manage custom filters	🙀 🐺 B2-Differen	tial Data-NetWare-4	-Monday-Thursday	Append - Differe	IBM LTO4 Ta	pe Drive	Backup	Complete	100%	2/25/2011 3:06:0	9 AM	2/25/2011 7:23:2	
	🗛 A-Full Data	Selections-BothOS-	3 -Monday-Thursda	y OverWrite - Fu	. IBM LTO4 Ta	pe Drive	Backup	Complete	100%	2/24/2011 10:00:	03 PM	2/25/2011 3:06:0	:
	B2-Differen	tial Data-NetWare-4	-Monday-Thursday	Append - Differe	IBM LTO4 Ta	pe Drive	Backup	Complete	100%	2/24/2011 2:54:0	7 AM	2/24/2011 7:11:2	4
	😨 A-Full Data	Selections-BothOS-	3 -Monday-Thursda	y OverWrite - Fu	. IBM LTO4 Ta	pe Drive	Backup	Successful	100%	2/23/2011 10:00:	00 PM	2/24/2011 2:54:0	4
	B2-Differen	tial Data-NetWare-4	-Monday-Thursday	Append - Differe	IBM LTO4 Ta	pe Drive	Backup	Complete	100%	2/23/2011 2:54:0	9 AM	2/23/2011 7:06:2	4
	A-Full Data	Selections-BothOS-	3 -Monday-Thursda	y OverWrite - Fu	. IBM LTO4 Ta	pe Drive	Backup	Successful	100%	2/22/2011 10:00:	04 PM	2/23/2011 2:54:0	4
	B2-Differen	tial Data-NetWare-4	-Monday-Thursday	Append - Differe	IBM LTO4 Ta	pe Drive	Backup	Complete	100%	2/22/2011 3:05:1	3 AM	2/22/2011 7:24:2	4
	A-Full Data	Selections-BothOS-	3 -Monday-Thursda	y OverWrite - Fu	. IBM LTO4 Ta	pe Drive	Backup	Complete	100%	2/21/2011 10:00:	03 PM	2/22/2011 3:05:1	!
	B2-Differen	tial Data-NetWare-2	a-Friday Append - F	ull-T2-Friday Ap	IBM LTO4 Ta	pe Drive	Backup	Complete	100%	2/19/2011 1:12:0	1 AM	2/19/2011 8:30:5	
	A1-Full Dat	a Selections-BothOS	-1a-Friday OW - Fu	II-T1-Full OW &	IBM LTO4 Ta	pe Drive	Backup	Successful	100%	2/18/2011 9:00:0	1 PM	2/19/2011 1:12:0	·· 4
	B2-Differen	tial Data-NetWare-4	-Monday-Thursday	Append - Differe	IBM LTO4 Ta	pe Drive	Backup	Complete	100%	2/18/2011 2:20:0	5 AM	2/18/2011 6:36:2	*
	A-Full Data	Selections-BothOS-	3 -Monday-Thursda	y OverWrite - Fu	. IBM LTO4 Ta	pe Drive	Backup	Successful	100%	2/17/2011 10:00:	JO PM	2/18/2011 2:20:0	4
	B2-Differen	tial Data-NetWare-4	-Monday-Thursday	Append -Differe	IBM LTO4 Ta	pe Drive	Backup	Complete	100%	2/17/2011 2:32:5	D AM	2/17/2011 6:48:4	*
	A-Full Data	Selections-BothUS-	s -Monday-Thursda	y Overwrite - Fu	. IBM LTO4 Ta	pe Drive	Васкир	Successful	100%	2/16/2011 10:00:	DIPM	2/1//2011 2:32:4	
	Impact Lib	101ary 00005			TPM Library F	labet	Inventory	Successful	100%	2/16/2011 9:25:2	O AM	2/16/2011 9:27:0	
	Emport Libr	ary 00009			TPM Library F	lobot	Export	Successful	100%	2/10/2011 9:24:0	D AM	2/16/2011 9:24:4	
	B2-Differen	tial Data-NetWare 4	-Monday-Thursday	Append - Difform	IBM LTO/ To	ne Drive	Backup	Complete	100%	2/15/2011 11:00-	05 PM	2/16/2011 9:22:4.	
	A-Full Data	Selections-Bothos	-Monday-mursday	Append - Diriele	IBM LTO4 TA	pe Drive	Backup	Eailed	100 %	2/15/2011 11:00:	04 PM	2/15/2011 3:10:1	
	B2-Differen	tial Data-NetWare-4	-Monday-Thursday	Annend - Differe	IBM I TO4 Ta	pe Drive	Backup	Complete	100%	2/15/2011 4:20:2	9 AM	2/15/2011 10.39:	
A armantas	A-Full Data	Salactions-RothOS.	R -Monday-Thursday	v OvarWrita - Fil	TRMITO4Ta	na Driva	Backup	Complete	100%	2/14/2011 10:00:	nn pM	2/15/2011 4-20-2	· · · ·
Symantee.	•												×.
Ready								5 7 Schedule	d Jobs, 0 Jobs on hol	d, 0 Active Jobs	8	MTHOOD	

Fundamental Steps for Tape Restore (Cont.)

SQL specific information: Some of the backup data is from SQL databases. This data must be exported out of SQL before it can be backed up to tape. The following describes the process and disk locations.

RMS (Retail Management System) RMS runs of three different servers, each running an instance of SQL. RMS-HQ2, RMS-TDC2, RMS-HRC2 RMS-HQ2 – database name RMS-HQ RMS-TDC2 – database name CGCCPOS RMS-HRC2 – database name CGCCPOSHR Each server runs a scheduled task to run the SQL export to the local "backup" folder. POSBackup.bat consists of the following commands:



POSBackup.bat removes the 0 (zero) file, exports the local SQL data to a new 0 file, then copies it to the HQ server. RMS-HRC runs at 7:00 PM, RMS-TDC runs at 7:30 PM, RMS-HQ runs at 8:00 PM nightly. The HQ batch file does not do the xcopy since it is going directly to the backup folder.

The RMSIncrement.bat is a scheduled task that runs on the HQ server at 9:00 PM. This program increments the existing backup export files to make a consistent set of three for each server. This batch file consists of the following:





The most current export is the file marked with a 0 (zero). If the zero file does not exist, then none of the rename commands are run. Otherwise, version 3 is removed, then #2 renamed to #3, and #1 renamed to #2, then #0 renamed to #1. Thus there should always be three version of backups.

All version of all three servers are backed up to tape following the nightly "full data" settings.

3.3.3 Storage Area Network (SAN) SnapShot & DR Unit

Aroon of ronovory / protoction

	F	Areas of recov	/ery/p	JIOLECII	JI	
Application	Data	Hardwar	re	Infras	structure	
S				Data Center	Edge	
1	1					
		Primary	Conta	cts:		
	Nar	ne		Pho	ne #1	Phone #2
Primary	Adam	Gietl				
Seconda	Bill B	ohn				
ry						
Past	Chris Mo	cQuade				
Vendor	Compeller	nt CoPilot				
Support	Servi	ices				
	Customer Ic					

Description:

The Storage Area Network provides a shared pool of drives (disk space) and related storage handling features. The SAN is used for data storage as well as housing the virtual files from the Colleges virtual servers. Servers can connect to the SAN via CAT6 Ethernet or fiber. This system provides a number of protections to the entire system, as well as having a number of protection system built into its own system.

Since the SAN provides a critical aspect to the entire network operation, the SAN system implements a number of built in fault tolerant features.

The units are identified by a numbering system as follows:

- Controller Primary Data Center Controllers
 - o Main Drive array T1 = 12x Seagate 600 GB 15K drives
 - o Main Drive array T2 = 16x Seagate 400 GB 10k drives
 - o Main Drive array T3 = 6x Seagate 2 TB 7.2K drives
 - Controller Disaster Recovery Controller
 - DR Drive array = 16 x Seagate 140 GB 10K drives

Scope of protection:

SAN Hardware

- The main drive array houses 12 tier 1, 16 tier 2, and 6 tier 3 hot swappable drives. Up to one drive can fail in each tier and the system will remain in operation.
 - The main drive array is accessed via two separate Controller units. Each controller unit provides access for separate sets of servers. If either Controller fails, the services are migrated to the other Controller.
 - Each Controller has two processors, either can fail, and the unit will remain operational.
 - Each controller has three redundant power supplies.

SAN Software

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- Replays The SAN protects data integrity and user error with Replays. Replays are copies of the volume at a particular moment in time. "Replays" are also known as "SnapShots" on other systems.
- Copy to disaster recovery unit. Key data is migrated in real-time to a disaster recovery unit in Building Two.
 - The DR unit is a duplicate of the main unit, but only runs with a single control unit.

Parameters of protection: SnapShots are scheduled to make images. These images are also given a period of time to be kept before automatically being discarded. The SnapShot details are as follows: Snapshot schedule: GroupWise: Weekly Sat @ 1am – keep for 4 weeks Daily @ 1am – keep 7 days hrs Daily 7 am – 7pm once every 3 hrs – keep 12 hrs RoqueNet: Daily @ 1am – keep 2 weeks

RogueNet: Daily @ 1am – keep 2 weeks Weekly Sat @ 1am – keep 4 weeks Daily 7am – 7pm once every hour - keep for 12 hrs

VMware Virtual Systems: Monthly – keep for 4 weeks Lead on SnapShots & DR replication: Adam Gietl

Section 3.3.3.1 – Windows/Netware SAN Volume Recovery in VMWare

NOTE: In the event of server or volume corruption, both the actual server and or attached volumes can be restored from the SAN and connected back to hardware by the same methods listed herein. However, total server recovery is slightly different and requires a few more steps that will be covered.

NOTE2: CGCC SAN volume practices utilize two types of VMWare "Datastores"

- "Shared Storage" This is a disk that has been mapped to each host the VMWare Cluster formatted as vmfs3. Hence the name "Shared Storage" Virtual Machines (servers) are created and their "Virtual Disk" hard disk 1 (C:\) is typically stored on this "Shared Storage" volume. The volume naming scheme is as follows: "sharedstorage(LUNID)_servername"
- "Mapped Raw LUN" This is a disk that has been allocated for a Servers' Data volume (D:\) or (VOL1) It is typically formatted when it gets attached to a server and mounted as a hard disk 2. Recovered "Mapped Raw LUN" disks can only be recovered on a compatible OS. Additionally, because these raw data disks are not formatted as vmfs3 they do not mount in the cluster. In this case the cluster serves as just a pass-through so these "Mapped Raw LUN" disks can be handily mounted directly to the server VM itself. Coincidentally, these volumes are also in a "Shared Storage" failover architecture. If the

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VMWare ESX host fails the "Mapped Raw LUN" disk will also auto-migrate with its' associated server VM.

Monitoring/Notification: 7/24/365 Compellent Central Operations Monitoring, http://xymon.cgcc.cc.or.us, Email & text notification to B.Bohn & A.Gietl

Prerequisites:

• I/E or Firefox Web - Browser Access from the CGCC LAN or CGCC Citrix Connection if off-campus

https://citrix.cgcc.edu and the latest version of VMWare vSphere Client is installed

- Familiarity with logging into and navigating in a Virtual Server VMWare (ESX) environment using the vSphere client
 - Familiarity with Windows and Netware Server disk mounting operations
- Familiarity with establishing Windows and Netware file system permissions
- NOTE: Windows and Netware file share rights will need to be re-established after mounting a recovered volume

Instructions:

1.) Analyze what volume or server is down or corrupt. Note the name.



2.) Login to Compellent SAN

3.) Expand Storage, Expand Volumes and Find the Volume you want to recover and select it by double clicking on the volume. For this example we will do a recover of a server using volume "Students-D" (pic)

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4.) Snapshots in this case are referred to as "Replays" in compellent SAN terminology. In this next step we will select what "Replay" we want to recover. Click the Replay TAB at the top of the Screen. You will see the replays and their respective date the replay was taken. (pic)

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5.) ****IMPORTANT***** (pic)

The best scenario for success is to recover the Replay when the "closest date" was taken. In order to recover a replay, rt. Mouse Click the replay and select local recovery. This will generate the

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replay that we will restore into the VMWare cluster. You will then be asked to name the recovery volume, i.e. (Students-d: View 1) you can also put a date in here to specify the recovery time. You will then be asked to map the volume to a server. Skip this step and press "Cancel" the volume will be mapped later.



6.) Now that the volume has been recovered in the SAN, the volume must be mounted to the VMWare Cluster. Log in to the "VMware vSphere Client" When prompted to login you can use your standard (NT-DOMAIN) account. just by selecting the checkbox that says "Use Windows session

credentials" then press Login. If unable to log in via this method you can use the default username



7.) **"Identifying the next LUN avail. to restore the volume to VMWare Cluster."** After logged in to VMWare vSphere you will see a listing of all VMs running on our network. Select "VMWare12.cgcc.cc.or.us" by highlighting it, then select the Configuration Tab. Then click on Storage Adapters in blue text in the center of the window. (pic)

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vcenter2.cgcc.cc.or.us - vSphere	Client					<u>_ ×</u>
	ventory				- Search Inventory	0
					Search Inventory	4
5° C 8°						
E 🚱 vcenter2.cgcc.cc.or.us	vmware1.cgcc.cc.or.us VMware ESX	4.1.0, 260247				
CGCC	Getting Started Summary Virtual M	achines Performance Configuration Task	s & Events Alarms	Permission	s Maps Storage Vit	ews Hardwared b
vmware1.cgcc.cc.or		Storage Adapters		1	Refresh	Rescan All
vmware2.cgcc.cc.or	Hardware	Davica	ine In	M/NL	Kerresii	A COLONNAIR COLONNAI
vmware3.cgcc.cc.or	Processors	PowerEdge P610 SATA IDE Controll	ype w	WIN		_
Admin-1 VM	Memory	witha2	lock SCSI			
Admin-2 VM	Storage	wmbba32 B	lock SCSI			
Altera	Networking	ISP2432-based 4Gb Fibre Channelt	o PCI Express HBA			
APOLLO	 Storage Adapters 	🙆 vmhba1 F	ibre Channel 20	:00:00:1b:32:	:00:f7:dc21:00:00:1b:3	32:00:f7:dc
ATHENA	Network Adapters	Dell PERC 6/i Integrated				
CITRIX5	Advanced Settings	🔿 umbhan 🦷	CST			<u> </u>
	Power Management	Details				
DFServer	Software	vmbha1				
DFServer2	Joitware	Model: ISP2432-based 4Gb Fibre (Channel to PCI Expres	sHBA 🖌		
Fundware	Licensed Features	WWN: 20:00:00:1b:32:00:f7:dc 2	1:00:00:1b:32:00:f7:	dc /		
GRPWISE1	Time Configuration	Targets: 2 Devices: 44	Paths:	44 /		
GWAVA	DNS and Routing	Mourie Davison Daths		/		
GWIA	Authentication Services	View: Devices Patits		*		
KeyScan	Power Management	Name	Runtime Name	LUN /	Type Transp	port 🔺
Layton	Virtual Machine Startup/Shutdown	COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T0:L0	0	disk Fibre (Channel
McAree_WSUS	Virtual Machine Swapfile Location	COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T0:L1	1	disk Fibre (Channel
NM1	Security Profile	COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T0:L2	2	disk Fibre (Channel
NM2	System Resource Allocation	COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T0:L3	3	disk Fibre (Channel
PRNTSRVR	Advanced Settings	COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T0:L4	4	disk Fibre	Channel
REG1	20	COMPELNT Fibre Channel Disk (naa	vmnba1:C0:T3:L5	5	disk Fibre	Channel
reg2		COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T0:L0	0	disk Fibre	Channel
RMS-HO		COMPELINT Fibre Channel Disk (naa	vmhba1:C0:T0:L8	8	disk Fibrei	Channel
RMSServer		COMPELINT Fibre Channel Disk (naa	vmhba1:C0:T3:L9	9	disk Fibre (Channel
RMS-TDC		COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T0:L10	10	disk Fibre	Channel
RNDEV2		COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T3:L11	11	disk Fibre (Channel
RogueNet		COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T3:L13	13	disk Fibre (Channel
Students		COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T3:L14	14	disk Fibre (Channel
VCenter2		COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T3:L15	15	disk Fibre (Channel
vCenter3		COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T3:L17	17	disk Fibre (Channel
WEBACC	1	COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T0:L18	18	disk Fibre (Channel
👸 xymon		COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T3:L19	19	disk Fibre (Channel
zentdc		COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T0:L20	20	disk Fibre (Channel
ZEUS		COMPENDED NITE Channel Disk (and		21	dial. milana d	
	1					
Recent Tasks			Name, Target	or Status conta	ains: •	Clear ×
Name	Target	Status Details			[]	Initiated by VCer
I • [•
Tasks 🞯 Alarms						localadmin /

8.) Locate the next avail. LUN by clicking on the LUN menu arrow this will ascend/descend highest to lowest.

Then scroll down and note the next available LUN. Write it down. Minimize but leave this window open for later access. (pic)

9.) "Mapping the Recovered Volume to the VMWare Custer" (pic)

From the Compellent SAN Web-Interface Under CGCC Production, expand Storage, expand Volumes. Double click on the volume you wish to map. Click the "Mapping" button. This will show you what servers are mapped to this volume. The volume needs to be mapped to all (4) VMWare Servers in order.

- VMWare12
- VMWare13
- VMWare14
- VMWare15

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10.) Map the volume by clicking the "Map Volume to Server" link. (pic)

You will be prompted to name the volume and then select the server you wish to map to. (pic) In this first instance, we'll pick VMWare1 as the first server to map to. Continue through by accepting the

default selections for (Fiber/ISCI) click continue, select "YES" – If prompted with a "Read-Only Mapping"

Warning, continue on with pressing "YES" but make sure you do not select "Read-Only Mapping" During this

process, we will establish connectivity for the recovered volume to each VMWare host server in the cluster.

11.) **"Inputting the correct LUN ID in the Map Volume to Server"** wizard. *********IMPORTANT**** Input the LUN ID here by deleting anything in the box and inputting the next available LUN ID that was noted in Step **#7**. (pic)

Local Recover	y		A comment		
Back 🔒 R	eturn 🗵 Quit 😰 Advisor				
Mapping	Volume STUDENTS-D: Viev	v 1 to Server V	MWARE1		
New Map	pings:				
Include	Server Port	Туре	Controller Port	LUN	
☑ ⊿	2100001B3200F7DC	FC	5000D31000075F03	54	
	nto Donk umonoingo				Select All Unselect All
Cre	ate Read Only mappings				
					Create Now

12.) Repeat Steps 10-11, for each server respectively.

- VMWare12
- VMWare13
- VMWare14
- VMWare15

13.) "Confirming the volume has been properly mapped." In the VSphere Client Select "VMWare12.cgcc.cc.or.us" by highlighting it, then select the Configuration Tab. Then click on Storage Adapters in blue text in the center of the window.
Click the "Rescan All" to see the newly mapped "Storage Adapters." Repeat for each VMWare host. Confirm the newly mapped LUN or "Storage Adapter" is listed, repeat for each VMWare host.
Very Important

Section 3.3.3.2 – Microsoft Windows Server Data (D:\) Volume Recovery

1.) Now that the recovered volume(s) have been restored from the SAN and the disks have been properly mapped to all the hosts in the VMWare cluster. In this process we will define how these

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newly recovered Hard Disks and their volumes will be associated to a server OS and ultimately accessed.

2.) Log in to vSphere Client, Go to Home -> Inventory -> Hosts and Clusters, expand vSphere.cgcc.cc.or.us, The Dalles (datacenter) expand TD_PE-R620, highlight host server "vmware12.cgcc.cc.or.us" and select the "Configuration" tab. Click the link "Storage Adapters" and find the storage adapter "8Gb Fibre Channel to PCI Express HBA" highlight "vmhba2". Below under "Details" click the "LUN" Menu and sort least to greatest. Note the last LUN number that was created in section 3.2.2.1 you will use this information to mount the new disk. (pic)



3.) In this example we will add a "Mapped Raw LUN" as a D:\ data volume to a Server "Students" The test volume we are recovering is called "Students-D: View 1" LUN #54. (pic)

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4.) Log in to vSphere Client, Go to Home -> Inventory -> Hosts and Clusters, expand vSphere.cgcc.cc.or.us, The Dalles (datacenter) expand TD_PE-R620, highlight guest VM "Students" by clicking on the VM. Then edit the Virtual Machine settings by clicking "Edit Virtual Machine" link under Basic Tasks:

The following screen will appear. Click the Add Button (pic)



5.) Add a new Hard Disk by selecting it. Click Next. (pic)

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Device Type What sort of device do	you wish to add to your virtual machine	?
Device Type Select a Disk Create a Disk Advanced Options Ready to Complete	Choose the type of device you with Serial Port (unavailable) Parallel Port (unavailable) Floppy Drive (unavailable) CD/DVD Drive (unavailable) USB Controller (unavailable) Hard Disk SCSI Device	sh to add. Information This device can be added to this Virtual Machine.
Help		≤Back Next ≥ Cancel

6.) Select "Raw Device Mappings" Click Next. (pic)

evice i voe elect a Disk elect Target LUN elect Datastore ompatibility Mode dvanced Options eady to Complete	A virtual disk is composed of one or more files on the host file system. Together these files appear as a single hard disk to the guest operating system. Select the type of disk to use. Disk C Create a new virtual disk C Use an existing virtual disk Reuse a previously configured virtual disk. C Raw Device Mappings Give your virtual machine direct access to SAN. This option allows you to use existing SAN commands to manage the storage and continue to access it using a datastore.
--	--

7.) This screen should show the recovered volume from Section 3.2.2.1 Note the LUN #ID is the same that was mapped to the cluster for recovery. Select the volume by clicking on it. Click Next. (pic)

Select and Configure a Which LUN would you li	Raw LUN ke to use for this raw disk?				
Device Type Select a Disk	Name, Identifier, Path ID, LUN or C	apacity contains: +			Cle
Select Target LUN	Name	Path ID	LUN	Capacity	F
Select Datastore	COMPELNT Fibre Channel Disk (naa	vmhba2:C0:T0:L54	54	50.00 GB	l

8.) "Select the datastore on which to store the LUN Mapping"

Select "Store with Virtual Machine" This will store the LUN mapping info with the VM itself. Click Next. (pic)

Device Type Select a Disk Select Target LUN Select Datastore Compatibility Mode Advanced Options	Select the datastore on which to store the Lt this datastore to access the virtual disk. Store with Virtual Machine Specify datastore	UN mapping. You will use the	disk map on
Ready to Complete	Datastore	# Hosts	
	sharedstorage01 sharedstorage03_Admin-1_VM sharedstorage04_RMS+HQ_VM sharedstorage05_RNDEV2 sharedstorage07_WEBACC_SERVER sharedstorage09_GWIA sharedstorage10_NM1 sharedstorage10_NM1 sharedstorage13_ROGUENET1 sharedstorage13_ROGUENET1 sharedstorage17_ZEUS_C:-SYS	4 4 4 4 4 4 4 4 4 4 4	E

9.) Under the next screen "Select Compatibility Mode" the default setting is "Physical" leave this to the default. Click Next. Under the next screen under "Advanced Options / Virtual Device Node" leave the default setting. Click Next. Ready to finish completing the "Add Hard Disk" Review the settings.

Add Hardware Ready to Complete Review the selected optio	ns and click Finish to add	the hardware.
Device Type Select a Disk Select Target LUN Select Datastore Compatibility Mode Advanced Options Ready to Complete	Options: Hardware type: Create disk: Virtual Device Node: Disk mode: Target LUN: Compatibility mode: Mapped datastore:	Hard Disk Use mapped system LUN SCSI (0:2) Persistent Channel Disk (naa.6000d31000075f000000000000 Physical Store with VM
Help		<u>Sack</u>

Click Finish. (pic)

10.) You will now see the new "Hard Disk (adding)" listed in the "Students" – Virtual Machine Properties. Press OK. VMWare will then add the new disk accordingly and respond with a 100% complete. (pic)

a share i terrere i		Virtual Machine Version
Show All Devices	Add Remove	Physical LUN and Datastore Mapping File //mfs/devices/disks/naa.6000d31000075f00000000000000000000000000000000
Hardware	Summary	
Memory	2000 MB	
CPUs	1	100 Jan 1 4 (1)
Video card	Video card	Virtual Device Node
SCSI controller 0	LSI Logic Parallel	SCSI (0:2)
Hard disk 1	Virtual Disk	
Hard disk 2	Mapped Raw LUN	Compatibility Mode
CD/DVD Drive 1	Client Device	C Virtual C Physical
Network adapter 1	10.x Network	
New Hard Disk (adding)	Mapped Raw LUN	
	\	
Windows Server 2003 r2 Standard Ed. Volume Mounting Instructions

11.) Log in to vSphere Client, Go to Home -> Inventory -> Hosts and Clusters, expand vSphere.cgcc.cc.or.us, The Dalles (datacenter) expand TD_PE-R620, highlight guest VM "Students" by clicking on the VM. Then open a console to the VM. (rt. Mouse click – Open Console) Log On to the Server "STUDENTS" with **Console** credentials. *see IP Table for

12.) On the "Students" Server, Click Start->My Computer->rt. Mouse click->manage This will bring up the local "Computer Management" window. Select "Disk Management" (pic)



🛃 Students on vmware4.cgcc.cc.or.us		- • ×
<u>File</u> Vie <u>w</u> VM		
Computer Management		- LON ^
Eile Action View Window He		
Computer Management (Local)	Volume Layout Type File System Status Capacity □ (C:) Partition Basic NTFS Healthy (System) 39.99 GB	Free Space % 32.87 GB 82
	DATA (D:) Partition Basic NTFS Healthy 49.99 GB	49.90 GB 99
E Stated Folders	DATATED Partition Basic NTFS Healthy 49.99 GB	49.90 GB 99
🕀 🦓 Performance Logs and Alert:		
E Storage		Ξ.
Disk Defragmenter		
Disk Management	•	
	Basic (C-)	
	39.99 GB 39.99 GB NTFS Online Healthy (System)	
	All and a second	
	Basic DATA (D:) 49.99 GB	
	Online Healthy	
	@Disk 2	
	Data (+:) 49.99 GB 49.99 GB 49.99 GB 10-10	
	Chine Freaking	
	DVD (E:)	
	No Media	
▲ [m	, *

13.) In this window you will see the newly mounted windows volume DATA (F:) (pic)

14.) Browse the volume by rt. Mouse clicking the volume and select "Explore" Recover Data as needed. (pic)

Note: If intending to use this volume for production, Windows File Share Rights and Windows Security Permissions will need to be re-established for this volume.



Section 3.3.3.3 – Novell Netware Server Data (VOL1:\) Volume Recovery

 Now that the recovered volume(s) have been restored from the SAN and the disks have been properly mapped to all the hosts in the VMWare cluster. In this process we will define how these newly recovered Hard Disks and their volumes will be associated to a server OS and ultimately accessed.

2.) Log in to vSphere Client, Go to Home -> Inventory -> Hosts and Clusters, expand vSphere2.cgcc.cc.or.us, CGCC (datacenter) expand VMWare_Cluster, highlight host server "vmware1.cgcc.cc.or.us" and select the "Configuration" tab. Click the link "Storage Adapters" and find the storage adapter "4Gb Fibre Channel to PCI Express HBA" highlight "vmhba1". Below under "Details" click the "LUN" Menu and sort least to greatest. Note the last LUN number that was created in section 3.2.2.1 you will use this information to mount the new disk. (pic)



3.) In this example we will add a "Mapped Raw LUN" as a VOL1:\ data volume to a Server "ATHENA"

The test volume we are recovering is called "Athena_Vol1_View 1" LUN #55. (pic)



NOTE: Novell Netware volume titles like "VOL1" and "VOL2" are eDirectory specific and can only be mounted on another Novell Netware server that does not have any volumes with the same name. The volume name is embedded in the volume itself. The server must see it at a "VOL1" or "VOL2"

4.) Log in to vSphere Client, Go to Home -> Inventory -> Hosts and Clusters, expand vSphere2.cgcc.cc.or.us, CGCC (datacenter) expand VMWare_Cluster, highlight guest VM "NM2" by clicking on the VM. Then edit the Virtual Machine settings by clicking "Edit Virtual Machine" link under Basic Tasks:

🛃 St	udents - Virtual Machine P	roperties	
Hard	ware Options Resources		Virtual Machine Version: 4
	Show All Devices	Add Remove	
Har	dware	Summary	
111	Memory	2000 MB	
	CPUs	1	
	Video card	Video card	
	SCSI controller 0	LSI Logic Parallel	
	Hard disk 1	Virtual Disk	
	Hard disk 2	Mapped Raw LUN	
	CD/DVD Drive 1	Client Device	
19	Network adapter 1	10.x Network	

The following screen will appear. Click the Add Button (pic)

5.) Add a new Hard Disk by selecting it. Click Next. (pic)

Device Type Select a Disk Create a Disk Advanced Options Ready to Complete	Choose the type of device you wis Serial Port (unavailable) Parallel Port (unavailable) Floppy Drive (unavailable) CD/DVD Drive (unavailable) USB Controller (unavailable) Ethernet Adapter (unavailable) Hard Disk SCSI Device	h to add. — Information — This device can be added to this Virtual Machine.
1		

elect a Disk	
evice Type elect a Disk elect Target LUN elect Datastore ompatibility Mode dvanced Options eady to Complete	A virtual disk is composed of one or more files on the host file system. Together these files appear as a single hard disk to the guest operating system. Select the type of disk to use. Disk C create a new virtual disk C use an existing virtual disk Reuse a previously configured virtual disk. Raw Device Mappings Give your virtual machine direct access to SAN. This option allows you to use existing SAN commands to manage the storage and continue to access it using a datastore.
Help	≤ Back Next ≥ Cance

6.) Select "Raw Device Mappings" Click Next. (pic)

7.) This screen should show the recovered volume from Section 3.2.2.1 Note the LUN #ID is the same that was mapped to the cluster for recovery. Select the volume by clicking on it. Click Next. (pic)

Which LUN would you li	Raw LUN ke to use for this raw disk?				
<u>Device Type</u> Select a Disk	Name, Identifier, Path ID, LUN or C	apacity contains: •			Clea
Select Target LUN Select Datastore	Name COMPELNT Fibre Channel Disk (naa	Path ID vmhba1:C0:T0:L55	LUN 55	Capacity	Ha
Compatibility Mode Advanced Options Ready to Complete					
	۲			-1	

8.) "Select the datastore on which to store the LUN Mapping" Select "Store with Virtual Machine" This will store the LUN mapping info with the VM itself. Click Next. (pic)

<u>Select a Disk</u> Select Target LUN	Select the datastore on which to store the LL this datastore to access the virtual disk.	JN mapping. You will use th	e disk map on
Select Datastore Compatibility Mode	 Store with Virtual Machine Specify datastore 		
Advanced Options Ready to Complete			
	Datastore	# Hosts	^
	sharedstorage01	4	
	sharedstorage03_Admin-1_VM	4	=
	sharedstorage04_RMS-HQ_VM	4	
	sharedstorage05_RNDEV2	4	
	sharedstorage0/_WEBACC_SERVER	4	
	sharedstorageu8_NetMon	4	
	sharedstorage_09_GWIA	4	
	sharedstorage11_NM2	4	
	sharedstorage13_ROGLENET1	4	
	sharedstorage17_7EUS_C:-SVS	4	+

9.) Under the next screen "Select Compatibility Mode" the default setting is "Physical" leave this to the default. Click Next. Under the next screen under "Advanced Options / Virtual Device Node" leave the default setting. Click Next. Ready to finish completing the "Add Hard Disk" Review the settings.

Click Finish. (pic)

🕢 Add Hardware		
Ready to Complete Review the selected options	and click Finish to add	the hardware.
Device Type Select a Disk	Options:	
Select Taraet LUN Select Datastore Compatibility Mode Advanced Options Ready to Complete	Hardware type: Create disk: Virtual Device Node: Disk mode: Target LUN: Compatibility mode: Mapped datastore:	Hard Disk Use mapped system LUN SCSI (0:2) Persistent COMPELNT Fibre Channel Disk (naa.6000d31000075f00000000000 Physical Store with VM

10.) You will now see the new "Hard Disk (adding)" listed in the "Students" – Virtual Machine Properties. Press OK. VMWare will then add the new disk accordingly and respond with a 100% complete. (pic)

ardware Options Resources		Virtual Machine Version
Show All Devices	Add Remove	Physical LUN and Datastore Mapping File //wnfs/devices/disks/naa.6000d31000075f000000000000000
Hardware	Summary	
Memory	2000 MB	1
CPUs	1	With all Davice Nede
📃 Video card	Video card	vii tuai Device Node
SCSI controller 0	LSI Logic Parallel	SCSI (0:2)
Hard disk 1	Virtual Disk	
Hard disk 2	Mapped Raw LUN	Compatibility Mode
CD/DVD Drive 1	Client Device	C Virtual @ Physical
Network adapter 1	10.x Network	
New Hard Disk (adding)	Mapped Raw LUN	
	Υ.	

Novell Netware 6.5sp8 NSS Volume Mounting Instructions

Log in to vSphere Client, Go to Home -> Inventory -> Hosts and Clusters, expand vSphere2.cgcc.cc.or.us, CGCC (datacenter) expand VMWare_Cluster, highlight guest VM "NM2" by clicking on the VM. Then open a console to the VM. (rt. Mouse click – Open Console to the Server "NM2")

11b.) Alternatively, the Novell Netware Server Console can also be accessed via AdRem FreeCon

12.) In the Console window of "NM2" type nssmu (pic)



13.) In the NSSMU window, select Devices and press F2 – Scan. Verify that the new device shows up after the scan by highlighting it. Confirm the data volume size is correct. Press ESC (pic)

€a ●	MAINT-ITS Options Connect U	SB Device ×
5	NSS Version 3.27 Build	NSS Management Utility NSS Management Utility 163 Server NM2
Ac	Devices	Device Information
	0X2 0X3	ModuleID: 358 Adapter: 1 Device: 1:0 Capacity: 100.00 GB Partitioned Space: 97.65 GB Unpartitioned Space: 2.34 GB Sharable for Clustering: No
	F2=SCan F3=Init F5=Se Connected (no encryption)	ect F6=Share ENTER=Show Partitions ESC=Prev Menu
1	start 🔍 NM2 - NSS Mana	gem 😰 💎 💆 🔽 🚾 3:45 PM

14.) In the NSSMUU select "Volumes" confirm that "VOL1" is listed as a volume. (pic)

NM2 - N55 Management Utility	→ NSS Management Utility SS Management Utility 63 Server NM2
Logical Volumes	Logical Volume Information
VOLL	Owner: .[Supervisor]. State: mounted Encrypted: No Name Space(s): DOS Long Macintosh Unix
e la	Quota: None Free Space: 6.28 GB Used Space: 3.41 GB Purgeable Space: 31.79 MB Number of Objects: 85974 Number of Files: 85972
	Creation Date: Dec 3, 2010 7:54:46 am Last Update: Mar 1, 2011 1:00:51 am Last Archive: Never
Ins=Create Del=Delete F	3=Rename F6=Deactivate F7=Dismount F8=More
🐉 start 🔍 NM2 - NSS Manage	em 😰 📢 💆 🔽 🚾 3:50 PM

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Disaster Preparedness, Procedures & Recovery

Secure Document

15.) To Mount the volume highlight "VOL1" and press F7=mount, this will then mount the volume to the Netware Server. Browse to the newly recovered volume using "Windows Explorer" (pic)

AINT-ITS Options Connect US	B Device 👻 📃 🗖 🗙
NM2 - NSS Management Utility	80
5 🙀 NM2 💽 🌪 🗸	🛛 😴 🗸 🔞 🥥 🦿 🛛 🖳 🔍 NSS Management Utility 💌 🌆
NSS Version 3.27 Build 1	NSS Management Utility .63 Server NM2
Logical Volumes	Logical Volume Information
CC SYS	Host Pool: VOL1 Owner: .[Supervisor]. State: mounted Encrypted: No Name Space(s): DOS Long Macintosh Unix Quota: None Free Space: 69.98 GB Used Space: 27.38 GB Purgeable Space: 535.49 MB Number of Objects: 191255 Number of Files: 158740 Creation Date: Mar 1, 2011 3:25:44 pm Last Update: Mar 1, 2011 3:25:44 pm Last Archive: Never
Ins=Create Del=Delete P	3=Rename F6=Deactivate F7=Dismount F8=More
Start NM2 - N55 Managi	em 🤶 🦉 🖉 🖾 3:54 PM

16.) Browse to the newly recovered volume using "Windows Explorer" Recover Data As Needed. (pic)



O ♥ ♥ Network → CGCC_DTREE → cgcd	· ▶ Cgcc_dtree\.NM2.cgcc ▶ vol1 ▶			▼ 49	Search	vol1 🔎
Organize 🔻 Burn New folder				8	= • E	1 0
Desktop	Name	Date modified	Туре	Size		
Downloads	퉬 4A9ECC49.FPD	9/2/2009 1:49 PM	File folder			
The cent Places	🍌 Apps	11/15/1996 10:42	File folder			
	BACKSP8	4/9/2010 3:52 PM	File folder			
	LASSES	12/9/1996 8:44 AM	File folder			
Documents	\mu etc	4/16/1998 4:46 PM	File folder			
Music	퉬 Ghost	3/24/2002 11:21 AM	File folder			
Pictures	腸 GrpWise	5/12/1998 11:35 AM	File folder			
Videos	🎍 GWTSA	1/16/2004 11:05 AM	File folder			
	퉬 Hold	6/22/2007 7:24 PM	File folder			
I and Disk (C)	퉲 MAILDATA	10/3/1996 3:33 PM	File folder			
Local Disk (C:)	JAILEXE	10/3/1996 3:33 PM	File folder			
	퉬 Maint	12/17/1996 3:13 PM	File folder			
	NW65SP8	4/9/2010 3:45 PM	File folder			
	퉬 Patches	2/18/2006 10:13 AM	File folder			
	퉬 shared	3/20/1998 11:51 AM	File folder			
Users-Archives (\\Terabyte01) (P:)	SYSTEM	4/26/2007 4:12 AM	File folder			
CIVICQUADE (\\ZEUS\VOLL\USERS) (Q:)	퉬 Test	4/26/2007 10:16 AM	File folder			
Shared-Archives (\\Terabyte01) (K:)	퉬 USERS	1/14/1997 10:12 AM	File folder			
	🖷 Sept 17 2006 Songs	9/13/2006 10:43 AM	Microsoft Office	33 KB		
PATH (\\APOLLO\SYS) (X:)	UXACTION	3/1/2011 3:28 PM	Text Document	10,000 KB		
PUBLIC (\\APOLLO\ SYS) (Z:)	VOLDATA.TDF	2/20/2011 3:00 AM	TDF File	470 KB		
🙀 Network 👻						
21 items Offline status: Online Offline availability: Not availab	le					

Section 3.3.3.4 – Windows/Netware OS, Boot Partition & Complete Server Restore

Note: Before restoring a complete server, confirm that the bad or corrupt VM (server) you are restoring is powered off.

 Log in to vSphere Client, Go to Home -> Inventory -> Hosts and Clusters, expand vSphere.cgcc.cc.or.us, The Dalles (datacenter) expand TD_PE-R620, highlight server "CMC" rt. Mouse Click, select Power, shut down guest OS. If no graceful down then OK to just power off the VM.

2.) Rt. Mouse click the VM "CMC" and remove from Inventory. This will remove the existing problematic server from VMWare Inventory but will not remove the data or datastore for further analysis later.

Confirm the server has been removed by verifying it is not in existing inventory.

3.) Log into Compellent SAN, create a local recovery of current replay of volume "CMC" map the volume to each server in the VMWare using the next avail. LUN. In this exercise we will create a "Shared Volume" that can be accessed to restore a complete server. (pic)

CGCC Production - Compellent Store	ige Center -	Windows Internet Ex	cplorer				
C C F Attps://10.1.1.143/Syste	emExplorer.as	p		Certificate Error	🖅 🗙 🔁 Bing		P -
File Edit View Favorites Tools H	ielp						
🙀 Favorites 🛛 🚔 🏉 Suggested Sites 🝷	🙋 Web Si	ice Gallery 🝷					
CGCC Production - Compellent Storage (Center				🏠 • 🔝 * 🖃 🖶 • Pag	ge 🔹 Safety 🕶	Tools • 🕢 *
C compellent			C	GCC Production			-
🕻 Storage Management 🔍 View 🥳	Refresh 🛟	Help			🕑 12:56 PM (🧿 Log Off 🛛 🍥	System Status
Reperties Map Volume to Serve	er 🍃 Remo	ve Mappings from Volum	e 🔯 Expa	nd Volume 📄 Replay	Create Boot From SAN Copy	Сору	
	C General	MC View 1 Mapping Copy/Mir	ror/Migrate	Replays Replay Calenda	r Statistics Charts		
CitrixLic2 CMC	💱 Set L	Ipdate Frequency 🚿 I	Find 🔍 Scr	oll Setting 🥔 Map Volume to :	Server 🛛 🍃 Remove Mapping		
CMC View 1	Status	Server	Type	Server Port	Controller Port	LUN Read	d Only
- Fundware - G:	& Up	VMWARE1	FC	2100001B3200F7DC	1000075F03 1000075F03	56 No	
Fundware_VM	@ Up	VMWARE2	FC	P 2100001B3200A2C9	5000D31000075F03	56 No	
GRPWISE1 - C:_SYS	JUp Do	WMWARE3	FC	210000E08B93C4A3	5000D31000075F03	56 No	
GRPWISE1_VOL1:	@ Up	WMWARE4	FC	210000E08B93E8A6	5000D31000075F03	56 No	
GRPWISE2_C:_SYS GRPWISE2_C:_SYS_F	4						
Done					ternet Protected Mode: On	- 	€ 100% · //

4.) Log in to vSphere Client, Go to Home -> Inventory -> Hosts and Clusters, expand vSphere.cgcc.cc.or.us, The Dalles (datacenter) expand TD_PE-R620, highlight host server "vmware12.cgcc.cc.or.us" and select the "Configuration" tab. Click the link "Storage Adapters" and find the storage adapter "8Gb Fibre Channel to PCI Express HBA" highlight "vmhba2".
Below under "Details" click the "LUN" Menu and sort least to greatest. Note the last LUN number that was created in section 3.2.2.1 you will use this information to create the new "Shared Volume".

5.) In vSphere, Under the Configuration Tab of, vmware12.cgcc.cc.or.us, Click the link "Storage" this will bring up the Datastores configuration screen. Click "Add Storage" (pic)

🛃 vcenter2.cgcc.cc.or.us - vSphere	Client							
Ele Edit View Inventory Administration Plug-ins Help								
🖸 🛃 🔥 Home 👂 🛃 Int	ventory 👂 🛐 Hosts and Clusters						Search Inventory	9
et er oct								
VMWare_Cluster	wmware1.cgcc.cc.or.us VMw	are ESX, 4.1.0,	260247					
vmware2.cgcc.cc.or	us Getting Started Summary	Virtual Machines	Performance Configur	ation Tasks &	Events Alarms Pern	nissions Maps Storage	e Views Hardware Statu	5
vmware3.cgcc.cc.or	us Hardware		View: Datastores Devic	tes				¥
Admin-1_VM	Processors	ī	Datastores			Ref	resh Delete Add St	orage Rescan All
Admin-2_VM	Memory	1	Identification	Status	Device	Capacity Free	Type Last Update	e Alarm 🔺
APOLLO	Storage		datastore1 (1)	📀 Normal	Local DELL Disk (271.00 GB 262.43 GB	vmfs3 3/2/2011 1:	00:25 PM Enable
ATHENA	Networking		sharedstorage_09_	Alert	COMPELNT Fibre	69.75 GB 5.29 GB	vmfs3 3/2/2011 1:	00:25 PM Enable
Calendar	Storage Adapters		sharedstorage01	A Warning	COMPELNT Fibre	199.75 GB 40.24 GB	vmfs3 3/2/2011 1:	00:25 PM Enable
CITIXIIC2	Network Adapters		sharedstorageus_	Warning	COMPELNI FIBRE	149./5 GB 3/.43 GB	vmfs3 3/2/2011 1:	00:25 PM Enable
DFServer2	Advanced Settings		sharedstorage05	Normal	COMPELINT Fibre	39.75 GB 15.37 GB	vmfs3 3/2/2011 1:	00:25 PM Enable
Fundware	Power Management		1	•	COTTICETTIC	0,1,0 00 1510, 00		•
GRPWISE1	Software		Datastore Details					Properties
GRPWISE2	Licensed Features	F						rioperdestri
GWAVA	Time Configuration							
GWIA	DNS and Routing							
GWMobile	Authentication Services							
Keyscan	Power Management							
McAfee WSUS	Virtual Machine Startup/Shu	tdown						
NetMon	Virtual Machine Swapfile Lo	ation						
NM1	Security Profile							
MM2	System Resource Allocation							
PRNTSRVR	Advanced Settings							
REG1								
Recent Tasks	Recent Tasks Name, Target or Status contains:							
Name	Target	Status	Details	Initiated by	vCenter Server	Requested Start Ti 🖙	Start Time	Completed Time
🐔 Rescan all HBAs	vmware1.cgcc.cc.or.us	Ocomplete	d	NT-DOMAIN\	vcenter2.cgcc	3/2/2011 1:00:14 PM	3/2/2011 1:00:14 PM	3/2/2011 1:00:24 PM
Check new notifications	vcenter2.cgcc.cc.or.us	Complete	d	VMware vCen	vcenter2.cgcc	3/2/2011 1:00:01 PM	3/2/2011 1:00:02 PM	3/2/2011 1:00:05 PM
Rescan VMFS	wmware2.cgcc.cc.or.us	Ocomplete	d	System	vcenter2.cgcc	3/2/2011 12:59:04 PM	3/2/2011 12:59:04 PM	3/2/2011 12:59:51 PM
🚰 Tasks 🞯 Alarms								NT-DOMAIN\CMcQuade

6.) When adding a new storage, Select Disk/LUN and press NEXT. (pic)

🛃 Add Storage	
Select Storage Type Specify if you want to fo	rmat a new volume or use a shared folder over the network.
Disk/LUN Select Disk/LUN Current Disk Layout Properties Formatting Ready to Complete	Storage Type • Disk/LUN Create a datastore on a Fibre Channel, iSCSI, or local SCSI disk, or mount an existing VMFS volume. • Network File System Choose this option if you want to create a Network File System. • Adding a datastore on Fibre Channel or iSCSI will add this datastore to all hosts that have access to the storage media.
Help	Back Next ≥ Cancel

7.) Highlight the volume that was presented to VMWare from step 4, by clicking on it. Confirm the LUN ID is correct. Click NEXT (pic)

🛃 Add Storage					
Select Disk/LUN Select a LUN to create a dat	tastore or expand the current one				
Disk/LUN Select Disk/LUN	Name, Identifier, Path ID, LUN, Capacit	ry, Expandable or VMI	FS Label c •	· []	Clear
Current Disk Layout	Name	Path ID	LUN A	Capacity VMFS Label	Har
Formatting	COMPELNT Fibre Channel Disk (naa	vmhba1:C0:T0:L56	56	40.00 GB	Unk
					Þ
Help			Back	Next ≥ Cance	

8.) ******Very Important******

On the next screen, "Select VMFS Mount Options" We are essentially going to re-mount a similar volume that was previously being used for the "CMC" server. In the VMFS Mount options select

"Assign a new signature"

🛃 Add Storage	
Select VMFS Mount Option Specify if you want to m	ns ount the detected VMFS volume with the existing signature, use a new signature, or format the disk
Disk/LUN Select Disk/LUN Mount Options Current Disk Layout Ready to Complete	 Specify a VMFS mount option: Keep the existing signature Mount the VMFS volume without changing the signature. Assign a new signature Retain the existing data and mount the VMFS volume present on the disk. Format the disk Create a new datastore. References to the existing signature from virtual machine configuration files will need to be updated.
Help	< Back Next > Cancel

9.) Review the disk layout, Click Next. Ready to Complete. Click Finish. (pic)

🛃 Add Storage				<u>_0×</u>			
Ready to Complete Review the disk layout an	nd dick Finish to add storage						
Disk/LUN Ready to Complete	Disk layout:						
Ready to Complete	Device		Capacity	LUN			
	COMPELNT Fibre Chan	nel Disk (naa.6000	40.00 GB	56			
	Location						
	/vmts/devices/disks/n	aa.60000310000/5f000000	100000000095				
	Primary Partitions		Capacity				
	VMFS (COMPELNT Fibr	e Channel Disk (naa.6	39.99 GB				
	File system: Properties Datastore name:						
	Formatting						
	File system:	/MFS-3					
	Block size:	1 MB					
	Maximum file size:	256 GB					
	Signature						
	Original UUID:	02003800006000d3100007	75f000000				
	Assign new UUID:	Yes Format Disk:	No				
Help			< Back	inish Cancel			

 10.) Confirm that each VMWare host in the cluster has the newly created datastore. Click on Configuration Tab, Storage, Name should = "snap-(identifier)-sharedstorage(LUNID)_servername"

To verify click the "Identification" button. (pic)

🛃 vcenter2.cgcc.cc.or.us - vSphere Client		
Eile Edit View Inventory Administration Plug	ig-ins <u>H</u> elp	
🖸 🔯 🧄 Home 🕨 🛃 Inventory I	Hosts and Clusters	ही - Search Inventory Q
6 C H		
E 🛃 vcenter2.cgcc.cc.or.us	vmware1.cgcc.cc.or.us VMware ESX,	4.1.0, 260247
	Getting Started Summary Virtual Ma	achines Performance, Configuration, Tasks & Events, Alarms, Permissions, Mans, Storane Views, Hardware Status
wmware1.cocc.cc.or.us		
vmware2.cgcc.cc.or.us	Hardware	View: Datastores Devices
vmware3.cgcc.cc.or.us	Processors	Datastores Refresh Delete Add Storage Rescan All
vmware4.cgcc.cc.or.us	Memory	Identification
Admin-1_VM	 Storage 	i sharedstorage47_CPH
Altera	Networking	Alert COMPELNTFibre 199.75 GB 15.20 GB vmfs
APOLLO	Storage Adapters	Alert COMPELNT Fibre 49.75 GB 5.24 GB vmfs
ATHENA	Network Adapters	anap-152516f9-sharedstorage19_Athena_c-sys
Calendar	Advanced Settings	😭 snap-3ddd899b-sharedstorage32_CM
ditrixlic2	Power Management	-
DFServer2		
Fundware CDDWICE1	Software	Datastore Details Properties
GRPWISE1	Licensed Features	
GRPWISE3	Time Configuration	Jostion //wfs/volumes/dder45-0
GWAVA	DNS and Pouting	Hardware Acceleration: Unknown 34.47 GB Used
🐻 GWIA	Authoritication Services	5.28 GB 🔲 Free
GWMobile	Addiendcadon Services	Path Selection
KeyScan	Power Management	First (Mware) Properties Extents Storage I/0 C
Layton McAfee McLUS	virtual Machine Startup/Shutdown	Volume Label: snap-3ddd8 COMPELNT Fibre Channel D 39,99 GB Disabled
NetMon	virtual Machine Swaphie Location	Datastore Name: snap-3ddd8 Total Formatted Capacity 39.75 GB
NM1	Security Profile	Total 1 Formatting
MM2	System Resource Allocation	Broken: 0 File System: VMFS 3.33
PRNTSRVR	Advanced Settings	Disabled: 0 Block Size: 1 MB
REG1		ng Antibard Grade Ver
reg2		
RET_LIC_SRVR		
PMSSaprar		
RMS-TDC		
RNDEV2		
RogueNet	-	
Recent Tasks	_,	Name, Target or Status contains: • Clear X
Name Target	Status Deta	ils Initiated by VCenter Server Requested Start Ti
Rescan all HBAs	nware1.cgcc.cc.or.us @ Completed	NT-DOMAIN\ 🙀 vcenter2.cgcc 3/2/2011 2:29:00 PM 3/2/2011 2:29:00 PM 3/2/2011 2:29:10 PM
Rescan VMFS II vm	nware2.cgcc.cc.or.us 😵 Completed	System 😥 vcenter2.cgcc 3/2/2011 2:27:37 PM 3/2/2011 2:27:37 PM 3/2/2011 2:27:42 PM
Rescan VMFS	nware4.cgcc.cc.or.us @ Completed	System vcenter2.cgcc 3/2/2011 2:27:37 PM 3/2/2011 2:27:37 PM 3/2/2011 2:27:47 PM
Rescan VMFS I vm	nware3.cgcc.cc.or.us Scorpleted	System vcenter2.cgcc 3/2/2011 2:27:37 PM 3/2/2011 2:27:37 PM 3/2/2011 2:27:42 PM
Resignature unresolved VMFS v	ware1.cgcc.cc.or.us	NT-DOMAIN, 🐉 vcenter2.cgcc 3/2/2011 2:26:56 PM 3/2/2011 2:26:56 PM 3/2/2011 2:27:37 PM
Tasks 🞯 Alarms		NT-DOMAINICMcQuade

11.) Now that the "snap-(identifier)-sharedstorage(LUNID)_servername" has been successfully mapped to the VMWare cluster and the storage has been configured. The VM or server that exists inside this volume must be brought into the VMWare Inventory and booted. In vSphere click the "Home" link. Select "Datastores" (pic)

vcenter2.cgcc.c	c.or.us - vSphere C	lient					J×
Eile Edit Vie <u>w</u> In	ventory <u>A</u> dministrat Home	ion <u>P</u> lug-ins <u>H</u> elp	5		Sea	arch Inventory	Q
Inventory		/					_
Q	F	Ð					
Search	Hosts and Clusters	VMs and Templates	Datastores	Networking			
Administration							
8	~			3 2	Q2		
Roles	Sessions	Licensing	System Logs	vCenter Server Settings	vCenter Service Status	Licensing Reporting Manager	
Management		/					_
20		2		-			
Scheduled Tasks	Events	Maps	Host Profiles	Customization Specifications Manager			
ecent Tasks			Name, T	arget or Status conta	ins: •	Clear	
lame	1	Target		Status	Details	Initiated by	1
Rescan VMFS		vmware4.cgc	c.cc.or.us	Completed		System	
				1			

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12.) Find the datastore "snap-(identifier)-sharedstorage(LUNID)_servername" datastore that was previously created, highlight it and then click "Browse this datastore" (pic)



13.) In the "Datastore" browser, expand root, expand the VM folder (i.e. "CMC") (pic)

Folders Search	[snap-3ddd899b-sharedstora	ge32_CMC] CMC			
□- <u> </u>	Name	Size	Туре	Path	Mod
CMC	CMC.vmx	2.95 KB	Virtual Machine	[snap-3ddd899b-sharedstorage32	8/18
	CMC.vmxf	1.53 KB	File	[snap-3ddd899b-sharedstorage32	8/18
	CMC.vmsd	0.00 KB	File	[snap-3ddd899b-sharedstorage32	6/4/2
	📇 CMC.vmdk	31,457,280.00 K	Virtual Disk	[snap-3ddd899b-sharedstorage32	7/9/2
	CMC.nvram	8.48 KB	Non-volatile me	[snap-3ddd899b-sharedstorage32	2/10/
	vmware-1.log	1,294.44 KB	Virtual Machine	[snap-3ddd899b-sharedstorage32	6/29
	vmware-2.log	241.22 KB	Virtual Machine	[snap-3ddd899b-sharedstorage32	7/9/2
	vmware-3.log	233.07 KB	Virtual Machine	[snap-3ddd899b-sharedstorage32	7/16
	CMC-a0ac6f1b.vswp	4,194,304.00 KB	File	[snap-3ddd899b-sharedstorage32	7/9/3
	CMC-a0ac6f1b.hlog	0.04 KB	File	[snap-3ddd899b-sharedstorage32	7/16
	vmware.log	752.76 KB	Virtual Machine	[snap-3ddd899b-sharedstorage32	3/1/2
					<u>•</u>

14.) Rt. Mouse Click the "CMC.vmx" and select "Add to Inventory" (pic)

Holdry Anarts	[uses MiddleWis show	Sitterage 12 (1901) CHS		
	1.00	824 Type	1.25	No de
	Control Addition	A 28 KG Settak Mathem 1.23 KG 10 k 1.23 KG 10 k 1.25 KG	 Januar 2006/000 a file sector angle Januar 3006/000 a file sector angle Januar 3006/000 as file sector angle Januar 3006/000 a file sector angle 	9793 9497 9497 9749 9749 9749 9749 9749

15.) In the "Add to Inventory" wizard, "**Name:**" use the following name for recovered VMs "servername-restored-mmddyy" i.e. "CMC-restored-030211" highlight the blue folder "Discovered virtual machine" Click Next (pic)

🛃 Add to Inventory		- 🗆 ×
Name and Location Specify a name and lo	cation for this virtual machine	
Name and Location	Name:	
Host / Cluster	CMC-restored-030211	
Ready to Complete	Virtual machine (VM) names may contain up to 80 characters and they must be unique within each vCenter Server VM folder. Inventory Location: Ventory Location: CGCC Discovered virtual machine	
Help	< Back Next > Ca	ancel

16.) In the Host/Cluster window specify "VMWare_Cluster" highlight it by clicking it. Click Next. (pic)

🛃 Add to Inventory		
Host / Cluster On which host or due	ter do you want to run this virtual machine?	
Name and Location Host / Cluster Specific Host Resource Pool Ready to Complete	CGCC	
Help	≤Back	Next ≥ Cancel

17.) In the "Specify a Specific Host" window any VMWare host will adequately support a restored server. Select any one of the "VMWare(x).cgcc.cc.or.us" hosts 1-4, Click Next. (pic)

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🛃 Add to Inventory	
Specify a Specific Hos On which host within	st the duster should the virtual machine run?
Name and Location Host / Cluster Specific Host Ready to Complete	Choose a specific host within the duster. On dusters that are configured with VMware HA or Manual mode VMware DRS, each virtual machine must be assigned to a specific host, even when powered off. Select a host from the list below: Host Name
	ymware3.cgcc.cc.or.us ymware4.cgcc.cc.or.us ymware2.cgcc.cc.or.us ymware1.cgcc.cc.or.us
Help	_≤Back Next ≥ Cancel

18.) Verify the newly restored VM, Click Finish (pic)

Add to Inventory				
Ready to Complete Click Finish to register	the virtual machine	e with the following options.		
Name and Location	Virtual machine	options:		
Ready to Complete	Name: Folder: Host/Cluster: Specific Host:	CMC-restore-030211 CGCC VMWare_Cluster vmware3.cgcc.cc.or.us		
	Creation o system. In	f the virtual machine (VM) does not inclu stall a guest OS on the VM after creatin	ude automatic installation of the guest o g the VM.	operating
Help			≤ Back Finish	Cancel

19.) In vSphere, Goto Home->Inventory->Hosts and Clusters, Expand VSphere.cgcc.cc.or.us, Expand The Dalles, Expand, TD_PE-R620. Verify that the newly restored VM is listed in Inventory. (pic)



20.) Power On Server by rt. Mouse clicking the guest VM and select Power, Power On! (pic)

D D 0 mm + 4	3 1	vales 1 🕄 Hober	Costaro					- teath and	1008
0 E								Avenue a	
 Accenter2.cpec.ec.ar.us. Big cosoc Accenter2.cpec.ec.ar.us. 		4	Setting Th	gee.ce state	ocar, vonteril vite	Nate Vient	er Server, 4.8.0, 2000	es L'anne l'Anne	
 Statistical Control Contr		- 45 - 49 - 15	Vithat is i fari ver on s po Hosts & invento	e che i e che rito ta Ciust y che	Hosts & Clusters skys the set of on a boot, cantor, or ors view, you can omputing resource	s vtew? mputing in monage o es	examples that turn poor. Unleg the and organize your	1	and a
D ATHENA Calendar D Colordar	1		Basic T		1			1	1
Disever2	1	Paule		•	Emil O	011-8			5
Sentration GRANESTI GRANESTI GRANESTI GRANESTI	Gued Snywood Oper Canade Oper Canade Oper Canade Oper Canade	Gued Sneeked Oper Canade		•	Figuer Off Scareed Reset	Cale5 Cale5 Cale5		livers & Cluster West	
GANA GANA		barbetna Bavle			Shar (Josen Raman Remont Galery	Callen Latit			
KeyScan Laston	2	gane . Tanakita							
The Photos		Hogh interance						Explore P	unher
Recent Tasks		Add (consistent giarts	Latin			. 11-1	er Tauri o Raovoni		
Name -		Report Performance.			e.e. 17m	1	I the start has I w	Tankas Canast	1.0 person and
C Regioner v read machine		Report			Grapheter		HUDHUM. C	anterit aper.	1/2/2011 11
🛐 U vegistervirt.et vedire		Oper in Here 129 dow Remove from 2 non-thry Caleba how Did	Dalaskati S Crayb		Oraplets		NT-DO-MING.	weder2.cpm.	1/2/2011

After powering on the VM, open a console to the server. You will be prompted with the following question. Select "I moved it" Press OK, VMWare will then boot the server normally.

NOTE: In the console session select "Start Normally" for Windows Servers. (pic)

🛃 Virtu	ual Machine Question	
?	Virtual Machine Message msg.uuid.altered:This virtual machine might have been moved or copied. In order to configure certain management and networking features, VMware ESX needs know if this virtual machine was moved or copied.	to
	If you don't know, answer "I copied it".	
	O Cancel	
	C I moved it	
	I copied it	
	Of	

22.) Verify that the VM has booted properly by logging into the VM with



3.3.4 VMWare Virtual Server Hosting

	Areas of recovery / protection					
Application	Data	Hardware	Infras	structure		
S			Data Center	Edge		
✓ ✓	✓					

Primary Contacts:

	Name	Home Phone	Mobile Phone
Primary	Adam Gietl		
Seconda ry	Bill Bohn		
Past	Chris McQuade		
Vendor Support	VMWare C2ITSystems		

Description:

The College utilizes local cloud computing technology from VMWare. VMWare provides the ability to virtualize multiple server OS's (Guests) on a single piece of server hardware (Host) that

is connected to a central Storage Area Network (SAN). Additional enhancements also provide the ability to migrate a Guest OS from one physical Host to another Host, without shutting down the OS. Yet another enhancement provides for the automatic OS migration should the infrastructure monitoring system discovers a problem on a Host.

Current VMWare products and version include:

- VMWare12.cgcc.cc.or.us ESXi 6.0
- VMWare13.cgcc.cc.or.us ESXi 6.0
- VMWare14.cgcc.cc.or.us ESXi 6.0
- VMWare15.cgcc.cc.or.us ESXi 6.0

Scope of protection:

What it protects: This technology protects the integrity and "up time" for the College servers.

- This technology changes an OS to an object that can be backed up and restored on any available Host. This gives us the capability to implement major changes to a server or network software package, and have the ability to use a backup of the Guest to return the system as it was before the change.
- 2. Since the OS's are no longer hardware dependant, should there be hardware problems, the Guest can be migrated to another Host. Then when the hardware is fixed, the Guest can be migrated back to the original (or new) Host.

Parameters of protection:

Automatic Guest migration is limited to Hosts that have the exact same motherboard specifications. Currently we have (4) Hosts capable of automatic OS migration.

3.3.5 User Security Redundancy (eDir & Windows domain)

The College operates two network security systems, eDirectory and Windows Domain Services. Each provide access to different areas of the College's network. Users are manually entered in both systems, and passwords duplicated in each system to allow for a single sign-on.

The college duplicates each security system on different servers to provide continuous security services if another security server goes offline. Security servers are as follows:

	Netware eDirectory servers:
NM1	Master Replica
NM2	Read/Write Replica
GrpWis	Read/Write Replica
e1	
Zeus	Read/Write Replica
HRC1	Read/Write Replica

Windows Domain Services

TD-DC1	Master R/W Domain Controller
TD-DC2	Secondary R/W Domain Controller
TD-DC3	Read-Only Domain Controller
HR-DC	Secondary R/W Domain Controller
1	-

3.3.6 Moodle Backup

Moodle is hosted by eThink Education. If there has been a loss of data within Moodle you will need to submit a help ticket with eThink Education to request that the missing data be restored. The request must come from an approved vendor contact, which is listed below.

Primary Contacts

	Name	Email	Primary Phone	Secondary Phone
Primary	Rob Kovacich			
Secondary	Danny Dehaze			
Third	Bill Bohn			
Vendor Support	eThink Education	support@ethink.com	ethink.desk.com	

3.4 Hardware & Network Infrastructure Precautions

		tection					
Application	าร	Data	Hardware		Infrastructure		
					Data Center	Edge	
1		1					
			F	rimar	y Contacts	:	
		Name			Home Pho	ne	Mobile Phone
Primary		Adam Giet	l				
Seconda ry		Bill Bohn					
Past		Chris McQu	uade				
Vendor Support		Dell					

3.4.1 Server Hardware

Description:

The College standardized on Dell servers to maintain consistent operating & support specifications and processes. RAID 5 and dual power supplies are standard configurations for all servers.

Scope of protection:

What it protects: RAID 5 protects data integrity and system "up time". It requires a set of 3 or more hard drives. This technology allows for any one drive to fail without losing data or having the system fail.

The redundant power supplies allow for a one power supply to fail, and not affect the server's operation. Dual power supplies also provide a convenience of not needing to shut down a server when relocating its power source. (One power supply can be relocated at t time without shutting down the server.)

3.4.2 Brocade POE Wire Closet Switches (extra & stored configurations)

Describe the edge switches & configurations & UPS setup Outline where the backup configurations exist

3.4.3 Core Switch Hardware & Route redundancy

Describe the core setup Outline location for backup configurations

3.4.4 Physical Security

Every technology infrastructure distribution point is secured by either the College's security card system or by key. The security cards are managed by Facility Services, and only select employees have physical keys that will open the technology rooms.

3.4.5 Environmental Controls

The data center environment is controlled by two Liebert HVAC units. These units are managed and maintained by the Facility Services Department.

Areas of recovery / protection						_	
Applications		Data	Hardwa	are	Infrastr	ucture	
					Data Center	Edge	
			1		1		
			F	Primar	y Contacts	:	
		Name		Hom	ne Phone	Mobile	Phone
Primary		Jim Austin					
Seconda		Ino Olivan					
ry							
Vendor		Liebert Vendor	???				
Support							

Description:

The College standardized on Dell servers to maintain consistent operating & support specifications and processes. RAID 5 and dual power supplies are standard configurations for all servers.

Scope of protection:

What it protects: RAID 5 protects data integrity and system "up time". It requires a set of 3 or more hard drives. This technology allows for any one drive to fail without losing data or having the system

Two Liebert environmental units CGCC Expectations: 1. Server Room temperature maintained at 70 +/- 3 degrees 2. Humidity maintained at 50% +/- 10% 3. Either single Liebert unit can maintain expectations #1 & #2 4. Email/text event notification capability 5. Automated (scheduled) monthly fail-over test (with event notification) 6. Automatic fail-over (lead/standby) on High or Low temperature levels (76 high, 64 low), with event notification 7. Remote control capability (I.e. for monitoring and switching active unit

Monitoring/Notification: Lieberts send alert to <u>ZX-CriticalAlerts@cgcc.edu</u> APC InfrastruXure temperature & humidity Sends alert to <u>ZX-CriticalAlerts@cgcc.edu</u> as outlined in section 3.1. Different alerts for : "HVAC" & "Critical" or "HVAC" & "General"XXX" in the Subject line (check CriticalAlerts account for notification list)

> Monitor levels: Temperature ranges that trigger an alert:

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Humidity triggers: Extra APC independent Temperature on Data Center Rack

3.5 Future Plans

GWAVA RELOAD for GroupWise

4.0 MID-DISASTER PROCEDURES

This section covers the activities to perform during a disaster. Since we cannot predict every type & scope of a disaster, basic scenarios will be used.

4.1 Activity Checklists

Steps to take in case of fire, earthquake, water disaster, physical property damage, data corruption, power outage, computer virus attack, or hacking attack

4.1.1 Communication

• For fire, bomb threat, physical property damage (taking place), or earthquake with damage -

CALL 911

Communicate to ITS Staff

In the case of a disaster that affects the Data Center, notify the following:

	Name	Home Phone	ſ	Mobile Phone
1	Bill Bohn			
2	Adam Gietl			
3	Richard Jepson			
4	Danny Dehaze			
5	Ron Watrus			

Communicate to Facilities

	Name	Home Phone	Mobile Phone
1	Jim Austin		
2	Ino Olivan		
3	Call Facilities Emergency		
	ph#		

• Once one of the above is notified, they should notify all of ELT, in the following order:

ELT	Phone #1	Phone #2	
Dr. Toda			
Robb Van			
Cleave			
Saundra			
Buchanan			
Karen Carter			
Dan Spatz			
Susan Wolff			

4.1.2 Power outage

- Determine what is providing power to the Data Center, the generator or APC system.
 - You can tell by hearing the generator running, and looking at the displays on the front of the APC units in the Data Center
 - Determine an expected recovery time frame
 - Determine what shutdown is needed
 - > Partial Shutdown (Section 6.1)
 - o Follow these steps if you have <u>over</u> 1 hour AND the Data Center temperature is over 85 degrees and not cooling.
 - Complete Graceful Shutdown (Section 6.2)
 - o Follow these steps if you have <u>under</u> 1 hour and over 15 minutes left of power OR the Data Center temperature is over 90 degrees and not cooling.
 - ➤ Emergency Quick Shutdown (Section 6.3)
 - o Follow these steps if you have 15 minutes or less power left OR the Data Center is over 95 degrees and not cooling.

4.1.3 Environmental Unit Failure (Heat)

- Get current data center temperature and idea of how fast it is raising
 - Determine an expected recovery time frame
 - Determine what shutdown is needed
 - Partial Shutdown (Section 6.1)
 - o If the Data Center temperature is over 85 degrees and not cooling.
 - Complete Graceful Shutdown (Section 6.2)
 - o If the Data Center temperature is over 90 degrees and not cooling
 - Emergency Quick Shutdown (Section 6.3)
 - o If the Data Center is over 95 degrees and not cooling

5.0 DATA CENTER SHUTDOWN PROCEDURES

There are three different shutdown levels, Partial, Complete Graceful, and Complete Quick Emergency. Each is used for different circumstances.

Each shutdown procedure will reference similar terminology & server shutdown steps.

Terminology: Cabinets are the black units in the center part of the Data Center room. Racks are the open air units in the back right corner of the room.

The Dalles Data Center

Identifying equipment locations. Cabinets are numbers by row & cabinet number. For example: Cabinet S1.2 is the second cabinet in row 1. The Racks are numbered 1.1 thru 1.3 The Lieberts are numbered 1.1 & 1.2

The floor plan with related numbering is shown below:



Steps for shutting downing servers

Servers are controlled by KVM units or through our VM virtual infrastructure. The servers are shutdown via one of these methods.

KVM usage:

KVM units utilize one keyboard & mouse to control multiple servers. KVM's are located in Cabinets S1.2, S2.3 & S2.5 To use the KVM slide out the keyboard/monitor & tilt up the monitor To select the server, press: Scroll-Lock, Scroll-Lock, Space-Bar Use the arrow keys to point to a server, and Enter to select the server Press Esc to remove the server list from the screen

> Virtual host access via vSphere Go to the vSphere KVM, select the vSphere Server Login using

> > When prompted by VSphere Select to use domain credentials

Enter the IP:

Select the desired server by name

Right click on the server name, select Power, then select Issue guest shutdown

Or

Select the Console Tab to get to the server's desktop, then Follow the type of server shutdown procedures Login to that server (check IP table for Login information) Click on Start, Shutdown Netware Servers:

Close any major applications by displaying the application list (Press Alt-Esc), selecting the highest numbered application, then follow any onscreen instructions to Exit or Quit *There will be applications listed that cannot be closed, do not worry about those apps.* When you cannot close anything else, Get to the console screen by pressing Alt-Esc, and then selecting One At the console screen type DOWN Enter Y if prompted that there are open files. If the server does not shut down, then issue a power off from vSphere

Windows Servers:

With Windows servers, you can issue a "Shutdown Guest" from vSphere Power options. OR, Login to the desired server using Click on Start, then select Shut Down

Linux Servers:

With Linux servers, you can issue a "Shutdown Guest" from vSphere Power options. OR, Login to the desired server using local credentials then shutdown.
5.1 PARTIAL SHUTDOWN

Follow these steps if you have over 1 hour AND the Data Center temperature is over 85 degrees and not cooling.

Perform a partial shutdown in the case of needing to lessen the heat generation in the Data Center.

SERVER	CABIN ET	Virtual / Physica I	SOFTWARE TO CLOSE		
NETWARE SERVERS					
lsis	S2.3	Р	BackupExec		

WINDOWS SERVERS						
MtHood (Tape)	S2.3	Р	Turn off Tape drive unit			
			too!			
CASAS	S2.5	Р				
EMeter	S2.4	Р				
Citrix3	S2.4	Р				
Citrix2	S2.4	Р				
Terabyte01 &	S2.2	Р	After server off – turn off			
02			external drives			

5.2 COMPLETE GRACEFUL SHUTDOWN

Follow these steps if you have under 1 hour and over 15 minutes left of power OR the Data Center temperature is over 90 degrees and not cooling.

Graceful shutdown means that Data Center equipment is shutdown in an ordered process that helps assure best success for system startup and least possibility for data loss or corruption.

First notify users that the entire system will be shut down.

- Send a Novell message to all users attached to Apollo
 - o Right click on the red N in the taskbar
 - o Select Novell Utilities, Send Message, To Users
 - o Select the server Apollo, and click Select
 - o Click the checkbox to "Show only user objects in list"
 - o Type in the message that the system is shutting down

o Click on Send

• From any phone, follow these procedures:

0

5.2.1 Process the shutdown steps as outlined section 5.0 in the following order: SERVER SHUTDOWN ORDER

SERVER	CABIN ET	Virtual / Physic al	SOFTWARE TO CLOSE
	NET	NARE SE	RVERS
Isis	S2.3	Р	BackupExec
WebAcc		V	
Athena		V	Grpwise Student PO
GWIA		V	Internet Agent & MTA
GWAVA- Linux		V	Special shutdown-> Go to gwava's vSphere console Click to enable the screen Login using : Type: shutdown now (Exit will logout)
GrpWise2		V	Admin PO
GrpWise1		V	MTA
Zeus		V	
Apollo		V	

SERVER	CABIN	Virtual	SOFTWARE TO CLOSE
	ET	1	
		Physic	
Mtillood (Topo)	60.0		SERVERS
MitHood (Tape)	52.3	Р	>Turn off Tape drive unit too!
	60 E	D	>For startup, turn rape drive on ist
	52.5		
Elvieter	52.4		
	52.4		
Terabyte01 &	S2.2	Р	>After server off – turn off external
02			arive
			>For startup, turn drive ON before
LINUXBase		V	LINUX
		V	
REI_LIC_SRV			
AMIX-DS		V	
Zentac			
MIGMGR		V	
HelpBox		V	
Intranet		V	Linux
Citrixlic2		V	
Reg1		V	
Reg2		V	
Students		V	
RNDev2		V	
Layton		V	
MtgMgr (AMX		V	
remote mgmt)			
		V	
DFServer2		V	
Docimg		V	
K2Verity		V	
Admin-1		V	
Admin-2		V	
McAfee		V	
PrntSrvr		V	· · ·
GWMobile		V	Linux
Groupwise3		V	Server 2008
Calendar		V	Linux
RogueNet		V	
NetMon		V	
RMS-TDC		V	
RMS-HQ		V	
Titan		V	
vSphere3		V	

Fundware		V	
HVAC	S2.2	Р	
TG2000	S2.2	Р	
VideoSecurity	S2.2	Р	
Keyscan		V	
Citrixlic2		V	
Phone System			See NEXT page 6.1.2
Shutdown			
Nm2		V	
Nm1		V	
RnDev	S2.3	Р	
Admin-2		V	
Domain2 (domain & dns)		V	
Domain1 (domain & dns)		V	
vSphere2		V	
Citrix2	S2.4	Р	
Hosts & vSphere		Р	See NEXT page 6.1.3
SAN		Р	See NEXT page 6.1.4

5.2.2 PHONE SYSTEM SHUTDOWN

1.) From the KVM in S2.5 select each of the following servers and follow the Windows

shutdown steps

a.) Cistera Convergence Server (Yellow Server) Depress and hold pwr button

b.) Unity –

a. You must be at the kvm console

b. Login using (User:

c. Type: Util system shutdown

c.) Cisco CM01 – Publisher (Phones are not connected to this one)

a. You must be at the kvm console

b. Login using (User:

c. Type: Util system shutdown

d.) Cisco CM02 – Subscriber (Phones are connected here – you will lose phone service at

this point)

a. You must be at the kvm console

b. Login using (User:

c. Type: Util system shutdown

5.2.3 VMWARE SERVERS

VSphere client right click on the VM and select shutdown In vSphere, go to each host server, right-click and select to go Enter Maintenance Mode, Disaster Preparedness, Procedures & Recovery

Then shul down. User on all is tool	Then	shut	down:	User	on	all	is	:root
-------------------------------------	------	------	-------	------	----	-----	----	-------

			PW
VMWare1	S1.2	Р	
VMWare2	S1.2	Р	
VMWare3	S1.2	Р	
VMWare4	S1.1	Р	
TDC-vSphe	S1.2	Р	
re			

5.2.4 SAN

Once all of the servers are shut down, you can shutdown the SAN 1.) POWER DOWN SAN (Storage Area Network) – Confirmed by Compellent Co-Pilot support

AT THE SAME TIME:

Depress and hold "Red" power button on Compellent SAN Controller #1, Depress and hold "Red" power button on Compellent SAN Controller#2,

Row 1, Rack2 (S1.2)

2.) Go to Back of Row1, Rack2 and turn off dual-pwr supplies on SAN Disk array, (2) on/off switches located on the left and right hand side of Disk Array

5.2.5 APC SHUTDOWN

1.) Pull ON/Off lever in cabinet in order of: Q2, Q1, A

5.2.6 LIEBERT UNITS

1.) Blue ON/Off button on control panel on the front right side of each unit.

6.0 EMERGENCY (QUICK) SHUTDOWN

Follow these steps if you have 15 minutes or less power left OR the Data Center is over 95 degrees and not cooling.

Emergency Server Room Shutdown Procedure – QUICK manual turn-off 09-30-09 (DRAFT) 2.) Depress and hold pwr button on server "vSphere ", Row1, Rack1

Note: saves vm database and health in current state

- 3.) Depress and hold pwr button on server "VMWare12", Row1, Rack1
- 4.) Depress and hold pwr button on server "VMWare13", Row1, Rack1
- 5.) Depress and hold pwr button on server "VMWare14", Row1, Rack1
- 6.) Depress and hold pwr button on server "VMWare15", Row1, Rack2
- 7.) Turn off DELL 132t Power Vault Tape Back-Up shelf, on/off switch located upper right corner

Row 2. Rack3

8.) Depress and hold pwr button on server "ISIS"

Row2, Rack3

Note: This now completes shutting down all server/ fc and iscsi volumes to SAN, therefore no more I/O to SAN

9.) POWER DOWN SAN (Storage Area Network) – Confirmed by Compellent Co-Pilot support

AT THE SAME TIME:

Depress and hold "Red" power button on Compellent SAN Controller #1, Depress and hold "Red" power button on Compellent SAN Controller#2,



Row 1, Rack2

- 10.) Go to Back of Row1, Rack2 and turn off dual-pwr supplies on SAN Disk array, (2) on/off switches located on the left and right hand side of Disk Array
 - 11.) Power Down Remaining Servers Manually

Row 2, Rack2

- a.) Reg1, Depress and hold pwr button
- b.) Titan, Depress and hold pwr button
- c.) RNDEV, Depress and hold pwr button
 - d.) Citrix, Depress and hold pwr button
- e.) Citrix3, Depress and hold pwr button
- 12.) Power Down Remaining Servers Manually

Row 2, Rack4

- a.) Artemis, Depress and hold pwr button
- b.) Video Server, Depress and hold pwr button
- c.) HVAC Server#1, Depress and hold pwr button
- d.) HVAC Server#2, Depress and hold pwr button

Disaster Preparedness, Procedures & Recovery

13.) Power Down Remaining Servers Manually "PHONE SERVERS"

Row2, Rack1

e.) Cistera Convergence Server (Yellow Server) Depress and hold pwr button

f.) Unity

g.) Cisco CM01 – Publisher (Phones are not connected to this one)

h.) Cisco CM02 – Subscriber (Phones are connected here – you may lose some phones at this

point)

NOW THAT ALL SERVERS HAVE BEEN TURNED OFF – OK to hit "RED" EPO (Emergency Power Off) switch on wall nearest the entry door. "THIS WILL SHUT DOWN EVERYTHING ELSE IN THE ROOM – Except the Liebert HVAC Units.

Systems: that will go offline

a.) APC – UPS, All Data Center Power

b.) All CGCC Networks and Internet

c.) All Phones

d.) Hood River Campus LAN, WAN and Internet

e.) All Analog Devices tied into our Analog Gateway

f.) Liebert Site-Link 4, note: (Except Liebert Units will continue to run)

CONFIRM THAT BOTH LIEBERT HVAC UNITS (1.1 AND 1.2) ARE IN THE "OFF" POSITION, UPPER RT. HAND CORNER

THE SERVER ROOM IS NOW "OFF" Estimated Time To Complete: About 5 Mins.

7.0 DATA CENTER STARTUP PROCEDURES

If the Data Center was completely shut down, follow these steps to bring it back up and running.

1. If the EPO switch was pressed, reset the EPO switch.

2. Verify the following:

- a. The APC system is ON, not showing any errors, and shows that it will supply power for at least 30 minutes
 - *i.* If the toggle switches are OFF turn them ON in the following order:

1. A, Q1, Q2

b. The core switches are up and running

3. Turn on the SAN system

a. Switch on the Disk array – wait 1 minute for drives to come up to speed

b. Switch on Controller

- c. Switch on Controller no need to wait for
 - d. Wait until the system appears to be up and stable
- 4. Startup systems in the reverse order of the shutdown order

7.1 Process the STARTUP steps as outlined section 6.0 in the following order:

SERVER		Virtual	SOFTWARE TO CLOSE
	E 1	/ Physic	
		al	
SAN		P	See NEXT page XXX
Hosts &		Р	See NEXT page XXX
vSphere			, ,
VMWare12	S1.2	Р	
VMWare13	S1.2	Р	
VMWare14	S1.2	Р	
VMWare15	S1.2	Р	
vSphere2	S1.2	Р	
Domain1		V	
(domain &			
dns)			
Domain2		V	
(domain &			
dns)			
Admin-2		V	
Nm1		V	
Nm2		V	
CMC		V	
RnDev	S2.3	Р	
Phone			See NEXT page xxx
System			
Startup			
	NET	WARE SE	RVERS
Zeus		V	
Apollo		V	
GrpWise1		V	ΜΤΑ
GrpWise2		V	Admin PO
Athena		V	Grpwise Student PO
GWIA		V	Internet Agent & MTA
GWAVA- Linux		V	Special shutdown ->
WebAcc		V	
Isis	S2.3	Р	BackupExec *NOTE* Also Turn off the PowerVault Tape Unit, located in S2.3
1	1	1	

SERVER STARTUP ORDER

Disaster Preparedness, Procedures & Recovery					
SERVER	CABIN	Virtual	SOFTWARE TO CLOSE		
	ET	1			
		Physic			
		al			
	WINI	DOWS SE	RVERS		
GWMobile		V			
Titan		V			
RogueNet		V			
Reg1		V			
Reg2		V			
Citrixlic2		V			
Citrix3	S2.5	Р			
Citrix2	S2.5	Р			
McAfee		V			
VideoSecurity	S2.3	Р			
HVAC	S2.3	Р			
TG2000	S2.3	Р			
CASAS	S2.5	Р			
EMeter	S2.5	Р			
Terabyte01 &		Р	>After server off – turn off		
02			external drive		
			>For startup, turn drive ON		
			before starting the server		
PrntSrvr		V			
RNDev2		V			
Layton		V	IT support		
HelpBox		V	IT support		
Xymon		V			
ZenTDC		V			

Layton		V	IT support		
HelpBox		V	IT support		
Xymon		V			
ZenTDC		V			
vSphere3		V			
MtgMgr			Meeting Manager ?		
RMSServer (AMX remote mgmt)		V			
MtHood (Tape)	S2.3	Ρ	>Turn off Tape drive unit too! >For startup, turn Tape drive on 1st		
DocImg		V			
K2Verity		V			
NetMon		V			
Intranet		V	Linux		
Students		V			
DFServer2		V			
Admin-1		V			
Admin-2		V			
FundWare		V			
KeyScan		V			
RMS-TDC		V			
Secure Document Disaster Procedures and Recovery Manual					

Disaster Preparedness, Procedures & Recovery

RMS-HQ	V	
Altera	V	Must login WS only & leave
		logged in.
AMX_DS	V	
Calendar	V	
McAfee_WSU	V	
S		
RET_LIC_SRV	V	
R		

8.0 Hood River Indian Creek Campus –Startup & Shutdown



Overview of Shutdown / Startup Procedures

Shutdown	StartUp
Guest Servers	UPS's
vSphere Services	WAN Switches
Host Servers – physical	LAN Switches
Phone Gateway	Phone Gateway
LAN Switches	Host Servers – physical
WAN Switches	vSphere Services
UPS's	Guest Servers
	SHUTDOWN DETAILS

Steps for Downing Servers Servers are controlled by through our VM virtual infrastructure. The servers are shutdown via one of these methods.

> Virtual host access: Go to the VSphere KVM, select the VSphere Server LocalAdmin – (See the IP table for login information) Select the desired server by name Select the Console Tab Follow the type of server shutdown procedures

Login to that server (check IP table for Login information) Click on Start, Shutdown (If you select Turn Off from VSphere, does it do a windows shutdown (no)???) Use VSphere client go to console of the VM (Guest Menu Ctrl+Alt+Delete) Login, Click on Start, Shutdown Server Shutdown Order: 5-3-10 Zenhrc HRC-RMS HRC-DC HRC1 (Netware) Use VSphere client to log into VMWare7 (10.2.1.15) Shutdown HRC vSphere

VMWare Host shutdown order: Can be shut down via vSphere (10.2.1.150) VMWare5 (10.2.1.12) VMWare6 (10.2.1.13) VMWare7 (10.2.1.15) (recommended individually for shutting down vSphere server here and then the host since vSphere is virtualized)

Netware Servers:

Close any major applications by displaying the application list (Press Alt-Esc), selecting the highest numbered application, then follow any onscreen instructions to Exit or Quit *There will be applications listed that cannot be closed, do not worry about those apps.* When you cannot close anything else, Get to the console screen by pressing Alt-Esc, and then selecting One At the console screen type DOWN Enter Y if prompted that there are open files.

> Windows Servers: Login to the desires server Click on Start, then select ShutDown

Turn off Shoretel Phone Gateway to The Dalles [Location] Turn off third floor UPS's Turn off first floor UPS's – This will shutdown the LAN & WAN switches

STARTUP DETAILS

Physically turn ON UPS's The WAN & LAN switches & phone Gateway will automatically startup Turn ON Shoretel Gateway to The Dalles [Location]

> Turn ON the Virtual Host server(s): Vmware5 Vmware6 Vmware7

Virtual host access: Go to the vSphere KVM, select the vSphere Server (See the IP table for login information) Select the desired server by name and select to turn it ON Server startup order: Using the vSphere Client, directly connect to VMWare7 (10.2.1.15) username: root p: (see ip table) (recommended since vSphere is virtualized) Rt. Click on the HR-vSphere guest VM and select power "on" Wait about 5 mins. to let vSphere server fully boot Using the VSphere Client, connect to Hood River vSphere (10.2.1.150) HRC1 – power on HRC-DC – power on HRC-RMS – power on Zenhrc – power on

Login to that server (check IP table for Login information) to verify it is running correctly. Netware Servers:

Once turned on via the vSphere, view the server console from the vSphere Console option to verify the server is up and running correctly, alternatively you can use ADREM.

9.0 DISASTER RECOVERY

This section differs from the mid-disaster, in that it describes procedures for after an event.

5.1 Tape Restore 5.2 Snapshot Restore 5.3 VM Guest recovery 5.4 Access to the SAN disaster recovery unit 5.5 Any disaster that renders the Data Center inoperable & inaccessible, but the rest of the College intact.

10.0 DOCUMENT MODIFICATION LOG

DATE	WHO	WHAT
7/19/13	WSB	Added information on the newly implemented off-site backup system
		CrashPlanPro
5/8/13	WSB	RMS SQL backup strategy and copies of batch files added
		Archive backup schedule added – full only
5/6/13	WSB	RMS password & vendor phone number
07/15/11	WSB	Added a table for server startup, to be used instead of reverse shutdown
		order. Done due to when shutting down, key servers may be shutdown first,
		whereas when starting they may be restarted first. Ie: priority in shutdown is
		different than priority in startup.
4/02/12	AG	Updated contact lists. Updated server list and priority. Updated index.
11/22/17	AG	Updating most of the document to reflect changes of systems and contacts

Modifications made to this document.