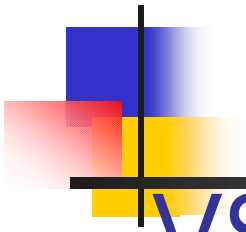


VSE/ESA Disaster Recovery

Disaster Recovery - Simple Definition and Question

- The ability, using a set of backup tapes and alternate hardware, to recreate your system (operating system, data and communications facilities) to the level required for production use and support of critical systems.
- First really important question - do you really need disaster recovery?

How badly $$$$?

More Questions

- If yes - What systems must be available at the disaster recovery site and when?
  - immediately? Payroll?
  - with 1 week? Accounting?
  - within 1 month? Programming?
- How much are we prepared to spend? On this insurance policy?
- Odds are you may never use it!

Cost?

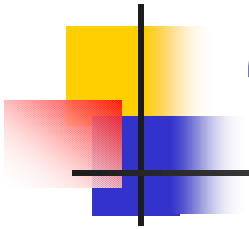
- Cost of Disaster Recovery site
- Personnel cost of building a DR procedure
- Cost to maintain DR procedure
- Disaster Recovery testing cost
- Spare or special equipment cost
- Cost when a Disaster is declared
- < >Cost of not doing Disaster Recovery

Disaster Recovery Definitions

- Hot Site - a facility with equipment installed and waiting for a disaster recovery team with recovery media and plan.
- The Plan - Every piece of documentation necessary for a successful Disaster Recovery
- Disaster Recovery Backups - a complete synchronized set of backups from which a viable production system can be built

“Hot Site” Site Selection

- Cost? How much recovery can you afford$?
- Recovery requirements?
  - Up and running in 24 hours$$? 48 hours$? 1 week?
- Vendor?
  - Sungard, Computer Solutions, Mainframe Solutions, IBM
  - other

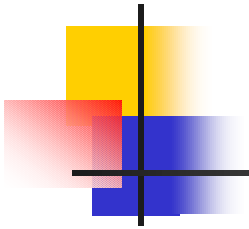


“Hot Site” Site Selection

- Vendor Location?
- Vendor “Hot Site” location?
- Vendor capability and capacity?
- Vendor VSE experience?
- How much test time is available?

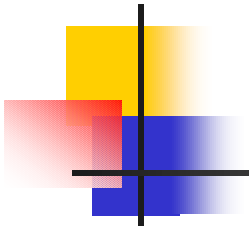
“Hot Site” Site Selection

- Co-operative business site?
- Build you own site?
- Location
  - across town? (community disaster)
  - across the state? (city disaster)
  - across the country? (regional disaster)



Hot Site Facilities Computer

- Naturally a computer system that fits your disaster recovery requirements
  - CPU, Memory, Disk Drives, Tape Drives, Communications Controllers
  - The ability to support your device addresses
  - The ability to utilize your CPU serial number
- It may only need to support a subset of the total applications and users!



Hot Site Facilities

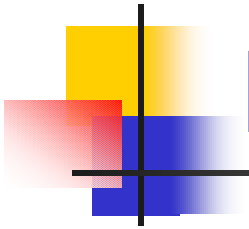
- Temporary offices
- Temporary operators
- Remote Operations
- Remote Console
- Technical support
- Phones
- Perscriptions/medical issues

Hot Site Facilities Other

- Manuals Operating System, other products, applications
- Scratch tapes, stock paper and other consumables
- Specialized communications equipment
- Nearby food, hotel facilities, transportation
- Mail services, couriers

Disaster Recovery Personnel

- Who is going to accomplish the recovery?
- Who will be available?
  - Operations, applications(with or without technical support?), technical support
  - Hot Site Personnel?
- Design the plan and documentation with them in mind



Backup Strategy

- Daily/Weekly backups?
- Complete backups?
- Cumulative backups?
- Single/Dual backups?
- Offsite storage?
  - On what out/in schedule?

The Plan

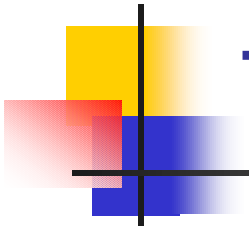
- Can be a simple text document
- Can be a PC program specifically for disaster recovery
- Can be a Disaster Recovery vendor supplied facility
  - These typically have a basic plan outlined and you supply your unique variations
- Can be a copy of a successful plan

The Plan

- The complete document with everything required for successful recovery.
  - Complete Disaster Recovery Inventory
  - Hotsite contract
  - Travel information to Hotsite
  - Lodging/support services information
  - Complete contact listings with addresses/phones
    - Company personnel, vendors, contractors, etc.

The Plan

- Complete notification to all involved of the declared disaster and their involvement
- List of applications that will be supported
- Pick up or shipping plans for all required facilities not physically at the Hotsite
  - Complete set of backups
  - All manuals/documentation
  - All special forms
  - Any special hardware

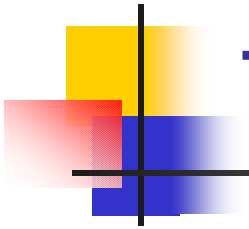


The Plan

- Complete documentation for the recovery process
  - It must be right
  - It must be available
  - It must be understandable
  - It must work
  - It must have answers for all questions
  - It must be standalone self documenting
  - It must have been successfully “monkey” tested
  - It must have everything required

The Plan

- Shipping, receiving and working contacts at the Hotsite and at all locations supported
- Planned staffing and work schedules for production
  - The plan should not state that a person will do something, but that a position will do something
  - Any person(s) may not be available
- Information on gaining access to money for expenses - Credit Cards?



The Plan

- The expected duration at the Hotsite
- A plan for exiting the Hotsite and resuming production at a new or existing location
  - May include building and hardware acquisition
  - And every item that it took to successfully disaster recover
- The Disaster Recovery plan is over only when regular production is resumed at your new or existing location

Disaster Recovery Plan

- Who is responsible for updating the plan?
  - Operations
  - Applications
  - Technical Support
  - Other Personnel
- Include a current copy of the plan with every offsite backup and/or maintain a copy at the Hotsite and everyone gets a current copy

3 Elements of a successful Recovery

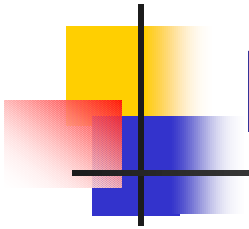
- A COMPLETE synchronized backup set
- Rebuild documentation that the lowest common denominator can understand
- A workable, prior tested, totally successful complete plan

"If it did not work during the last test what makes you think it will work for the real thing???"

Building Blocks of a Successful Plan (VSE)

- Standalone backups with standalone programs for every volume required to IPL
  - DOSRES and SYSWK1, for as delivered environment, + other critical files.
  - SYSRES, Private Libraries, POWER, Editor Source,Disk/Tape Manager Catalog, CICS System files, Master Catalog, Console file, EREP file, Dump Library, Third Part Vendor files, ……..

Building Blocks of a Successful Plan (VM)

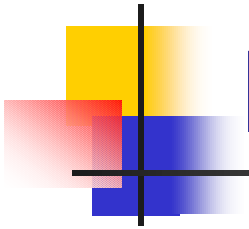


- Standalone restorable backups of the necessary VM disk drives
- Backups of restorable OS under VM

Building Blocks of a Successful Plan (Client Server)

- Appropriate backups of all required servers and service machines
- OS copies and security keys in case backups do not work
- Application software copies and keys in case app does not function after restore

Building Blocks of a Successful Plan



- After IPL, tested JCL to complete file restorations
  - It could be full pack image restores
  - It could be logical file restores with appropriate support jobs
    - example: for VSAM - define catalog, define file, restore file or database
- Cleanup and forward recovery process

Some Elements that can Present Challenge

- Data files should be synchronized at backup, if not must be done at Hotsite startup
- All data from the backups forward must be reapplied/rerun/recovered or abandoned
- The Power files probably have entries that were already processed (LST, RDR, PUN)
- Scratch tapes at the Hotsite must be initialized to work with your Disk/Tape Manager

Some Elements that can Present Challenge

- A method to support remote sites telecommunication lines from the Hotsite
- Shipping “stuff” to/from Hotsite to where it is needed
- Day to day funding and facilities for your employees at the Hotsite
- Travel arrangements to/from Hotsite at initial declaration and during recovery/run

Some Elements that can Present Challenge

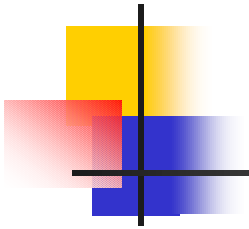
- The last thing done before leaving a Hotsite during testing or production is the complete destruction of the complete images
  - to ensure privacy of company data and assets
  - to protect contracted assets
  - Initialize all disk and tape media with zeros
    - or take them with you
    - or lock them up

Secrets of a Great Plan

- Documentation, simple, readable and understandable
- Successful updates as your systems evolve day to day
- Continuous awareness that Disaster Recovery is an everyday process
- “Devil is in the Details”

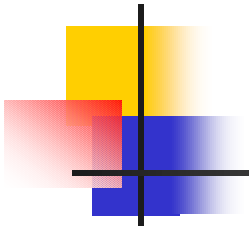
The Last Secret of a Great Plan Testing

- Continuous, planned, successful testing
- Testing that simulates the real thing
- Documenting and correcting all errors found in testing:
  - Immediately
  - Accurately
  - Procrastination not allowed
- Good luck!



Items to Watch

- Hotsite back level doc
- Hotsite VM/VSE problems
- Hotsite VSE experience
- Lack of Systems Programmer during recovery
- Incomplete backups shipped out
- Plan updates incomplete and not timely



Items to Watch

- Plan clarity of documentation and messages
- Failure to record and fix problem areas discovered in the last test
- “Do your restores really work?”
  - Programs and techniques
- “How long does it take to restore?”
- The “plan” is the BIBLE treat it that way!