Recovery as a Service

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SunGard Availability Services
Sandy Storm – A Natural Calamity

Healthcare Provider in New York

Impact:
1. Shutdown for 96 hours.
2. NY + other US locations that had no ‘Sandy’ effect.
3. Furious customers.

Consequences:
1. Organizational shakeup.
2. CIO fired.

... and 10,000+ small to large cap businesses
And, It is not just “Force Majeure”

(Source: SunGard Availability Services US data) – Chart 6 – Since 1999 – 05 February 2014
DR is more than simple system recovery

Safeguard Against

- System Disruptions
- Natural Calamities

BCM Drivers

- Availability
- Compliance

Possible Impacts

- Corporate Reputation
- Govt. Regulations
- Financial Prudence
- Industry Regulations
- External Security Threats
- Industry Best Practices

Audit Defined

“About 50% of the businesses that suffer from a major disaster without a BC/DR plan in place, never re-open for business.”

- American Management Association
I agree that DR is important but…

60% of the organizations are inadequately prepared for DR.
- In spite of next generation compute, storage and networking and declining cost.
- Question - So, is preparing, testing and improving a real thing for enterprises? Gartner say "YES".

# of disasters are increasing.
- Organizations are becoming more critical to their DR postures.
- Per Gartner more 60% of the enterprises, want to perform DR test at least 2 time a year.

Why don’t enterprise test more and be more compliant?

Nobody wants to pay more for Insurance.
- DR is a regulated function in most companies. It is important. However delivering projects that impact companies top or bottom line is key. DR comes later.

DIY. We don’t outsource.
- But we don’t gain much. Per Gartner, even though outsourcing of production data centers in increasing 10%. Outsourcing of DR function is decreasing. While service providers can protect/vault data and recovery systems. They do not provide end to end value.

DR Testing is time consuming.
- Traditional players in DR offer “managed recovery” capabilities but the pricing is still expensive and inflexible.
Let us breakdown DR

**IT Disaster Recovery Lifecycle**

1. Business Continuity Management
   - Analyze Business Impact
   - Assess Risk
   - Develop BCM Strategy & Plan
2. IT DR Plan
   - Create Systems/Application Portfolio
   - Design IT Controls/Data Protection & Recovery Plans
   - Develop SOP Procedures
   - Test IT Disaster Recovery Procedures
   - Generate Test Report
   - Review for Compliance with Internal & External Auditors
   - Remediate Gaps
   - Improve

**Systems/Data Protection:** ✓

**Data Transport:** ✓

**Systems/Data Recovery:** ✓

**Enterprise Recovery:**

**Test Execution:** ✗

**Compliance:** ✗

Symantec, IBM, EMC and Commvault hold ~70% of the enterprise backup market. Backup is a mature market.

85% of enterprise hardware is x86, of which >50% are virtualized.

VMware has >90% of the market share. Virtualization is mainstream.

Storage and Networking costs are declining drastically. Credit Suisse predicts >16% growth for SAN/NAS systems and an equivalent growth on Network equipments. through 2015.
## Availability is a spectrum

### Highly Available Active/Active
- **Local or Metro Clusters**
  - Mostly Synchronous Replication. Impacts Production Performance
  - RPO ~0 and RTO ~0. Your infrastructure is always-on
  - Redundant infrastructure at Target. 2x Capacity across stack. $$$
  - Expensive Bandwidth
  - Function f(distance). < 10 miles. Data centers in vicinity
  - Does not necessarily protect you from regional outage (earthquake)
  - LTDR is separate

### Highly Available Active/Passive
- **Geo Clusters**
  - Asynchronous Replication.
  - RPO is dependent on Bandwidth and Applications Consistency. <15 min
  - So is the effective RTO
  - Redundant infrastructure on Standby at Target. ~2x Capacity. $$$
  - Distance <100 miles. Data centers spread out
  - Protects you from regional outage
  - LTDR is separate

### At-Disaster (ATOD)
- **Active/Dormant**
  - **Host based**
  - **Fabric based**
  - **Hypervisor based**
  - **Storage Array based**
  - Asynchronous Replication.
  - RPO is dependent on Bandwidth and Applications Consistency. <1 hour
  - So is the effective RTO
  - Dormant Infrastructure at Target (except Storage)
  - Not a function of distance. Data centers can be anywhere
  - Function of Assumptions/Model
  - Data reduction efficiencies (compression, de-dupe)
  - Protects you from regional outage
<table>
<thead>
<tr>
<th>Feature</th>
<th>Compute</th>
<th>Network</th>
<th>Storage</th>
<th>Apps</th>
<th>Performance</th>
<th>Impact At Disaster</th>
<th>Spend</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active/Active Local &amp; Metro</strong></td>
<td>2x</td>
<td>2x</td>
<td>2x+</td>
<td>2x</td>
<td>Target = Source</td>
<td>~Zero</td>
<td>$+$</td>
</tr>
<tr>
<td><strong>Active/Active Geo</strong></td>
<td>2x</td>
<td>2x</td>
<td>2x+</td>
<td>2x</td>
<td>Target = Source</td>
<td>&lt;1 hour</td>
<td>$+ ~$</td>
</tr>
<tr>
<td><strong>Host-Based Replication</strong></td>
<td>1x+</td>
<td>1x+</td>
<td>2x+</td>
<td>1x</td>
<td>Target &lt; Source</td>
<td>4 hours+</td>
<td>$+&lt;$/2</td>
</tr>
<tr>
<td><strong>Hypervisor Based Replication</strong></td>
<td>1x+</td>
<td>1x+</td>
<td>2x+</td>
<td>1x</td>
<td>Target &lt; Source</td>
<td>4 hours+</td>
<td>$+&lt;$/2</td>
</tr>
<tr>
<td><strong>Array Based Replication</strong></td>
<td>1x+</td>
<td>1x+</td>
<td>2x+</td>
<td>1x</td>
<td>Target &lt; Source</td>
<td>&lt; 4 hours</td>
<td>$+ &lt;$</td>
</tr>
<tr>
<td><strong>App or Journal Replication</strong></td>
<td>&lt;2x</td>
<td>&lt;2x</td>
<td>2x+</td>
<td>2x</td>
<td>Target &lt;&lt; Source</td>
<td>&lt; 4 hours</td>
<td>$+ ~$</td>
</tr>
<tr>
<td><strong>Disk based Backup/Vaulting</strong></td>
<td>1x+</td>
<td>1x+</td>
<td>&lt;2x</td>
<td>1x</td>
<td>Target &lt;&lt; Source</td>
<td>24 hours+</td>
<td>$+ &lt;$/n</td>
</tr>
<tr>
<td><strong>Tape based Backup</strong></td>
<td>1x+</td>
<td>1x+</td>
<td>1x+</td>
<td>1x</td>
<td>Target &lt;&lt;&lt; Source</td>
<td>72 hours+</td>
<td>$+ &lt;$/nn</td>
</tr>
</tbody>
</table>
All Apps/Systems are not equal. Discriminate by Impact and Investments

Protection + Recovery Types

Initial Investment $

Tier 1 Apps

Tier 2 Apps

Business Impact $

A/A A/P

Disk-Based Backup Tape-Based Backup

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Host-Based Replication to Dormant VMs in Cloud.
Low RPO/RTO. Storage Agnostic. Reduced TCO. Push-button failover

How it works...
1) Replication agent is installed on the source Windows/RH Linux server(s). The agent compresses and sends OS, Apps and user data changes to “Master Target” via a secure Internet connection (VPN).
2) For environments with very high change rates a Process Server can be used to off-load replication & compression.
3) “Master Target” stores all the changes in individual VMDK files for each protected server.
4) Upon Failover Request, SunGard promotes the VMDK file(s) from the Master Target to a production VMs.
5) ATOT/D end users access the recovered environment by way of a Client Based VPN or site-to-site VPN to an alternative facility.
Customer’s DR Capacity < Production Capacity and do not expect the same level of performance between Production and DR

Example, Customers with EMC VMAX (High End) and VNX (Mid Range) in Production, requiring a target VNX array with Medium Performance 80% of the customer base
How it works...

1) VMware’s Storage-based Site Recovery Manager is used to replicate to a target storage array and DR SRM instance at SunGard over a secure VPN.

2) ATOT/D for:
   • Always-On Recover2Cloud compute infrastructure: VMware’s SRM orchestration engine is used to recover VM’s into the Always-On infrastructure.
   • On-Demand Recover2Cloud compute infrastructure: the target storage array and DR SRM instance are attached to the On-Demand infrastructure, then VMware’s SRM orchestration engine is used to recover the VMs.

3) ATOT/D end users access the recovered environment by way of a Client Based VPN or site-to-site VPN to an alternative facility.
**Host Based Replication**

- **Applications** - Lawson, JDE, DB2
- **Local Filesystem**
- **Kernel Drivers**
- **Disk/s**
- **InMage Agent**

Async Replication over IP

- **Virtual Disk/s**
- **Receiver**
- **Kernel Drivers**
- **Local Filesystem**
- **Applications**

**Journal Based Replication**

- **Applications - Lawson, JDE, DB2**
- **Program/s**
- **Object/s**
- **Remote Journal Receivers**
- **Offload Engine**

**For Host Based Replication**

- All writes to disks are captured by agent on the host (physical or virtual server)
- Offloaded to a process server in customer’s premise across multiple servers
- Process Server replicates data into “virtual disks” through the Receiver
- “Virtual disks” are detached from the Receiver and attached to VMs on ATOT/D

**For Journal Based Replication**

- Applications contains Programs. Program contains Objects. Objects are journal
- Always-On Target server, replicating journal entries
- ATOT/D, Recover target by “replaying” journals @ remote side
- Failback operates similar to failover, in the opposite direction

**What is in Common?**

- Host based replication
- Compressed, Asynchronous IP Replication
- Storage array agnostic

**What is Different?**

<table>
<thead>
<tr>
<th>Host Based</th>
<th>Journal Based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application agnostic (for crash consistency)</td>
<td>Needs application expertise</td>
</tr>
<tr>
<td>Live to Dormant replication</td>
<td>Live to Live replication</td>
</tr>
<tr>
<td>No licensing requirements (required only during DR)</td>
<td>Secondary licenses at DR required</td>
</tr>
<tr>
<td>Third-party product</td>
<td>Native</td>
</tr>
</tbody>
</table>
The economic argument for Multi-tenancy

$1 + 1 = 3$

Scale and Scope Efficiency Zone

Customer's Capacity Acquisition Function - Self

Customer's Capacity Acquisition Function - Provider

Customer Savings %

Acquisition Cost $

Capacity
In Summary,

- HA and DR are relevant for the legacy world. New world applications are blurring the lines
- It is all about the business requirements
- Don’t over engineer the target. Look for the right performance
- Not all applications and systems are equal. Tier ‘em
- Make the best use of the utility model for the cloud for DR
- Choose the right approach to protect and recover
- Know when to un-cloud
About SunGard
SunGard is a leader in Business Continuity
SunGard ranked #2 overall

#1 ranking for:

- Current DRaaS Offering
- Recovery Objective Capabilities
- Data Transfer Technologies
- Value Proposition & Vision
- Growth
- Partnerships

“RaaS Wave”, 2014

“Critical Capabilities for RaaS”, 2013
SunGard ranked #2 overall to NTT

#1 in overall product viability

#1 in App and data recovery
SunGard RaaS Portfolio
“Right sizing” solutions with a tiered availability by SLA approach

### Tiered recovery of applications based on business process criticality

<table>
<thead>
<tr>
<th>Tier</th>
<th>RTO/RPO</th>
<th>Server replication</th>
<th>SAN replication</th>
<th>Disk backup</th>
<th>Tape</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>2-4hrs/15min</td>
<td>4-12hrs/15min</td>
<td>12-24hrs/24hrs</td>
<td>48+hrs/1week</td>
<td></td>
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</tbody>
</table>

### Data protection

<table>
<thead>
<tr>
<th>Tier</th>
<th>R2C Server Replication</th>
<th>Managed vaulting for NetApp or hosting</th>
<th>Mgd Vaulting for Evault, Avamar, NetBackUp or Hosting</th>
<th>Tape libraries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td></td>
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### System recovery

<table>
<thead>
<tr>
<th>Tier</th>
<th>R2C Server Replication</th>
<th>R2C SRM or Hotsite</th>
<th>R2C for Vaulting or Hotsite</th>
<th>Hotsite</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
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<tr>
<th>Tier</th>
<th>R2C Server Replication</th>
<th>R2C Server Replication or Hotsite</th>
<th>R2C for Vaulting or Hotsite</th>
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### RISC Unix

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<tr>
<th>Tier</th>
<th>R2C Server Replication</th>
<th>R2C Server Replication or Hotsite</th>
<th>R2C for Vaulting or Hotsite</th>
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<table>
<thead>
<tr>
<th>Tier</th>
<th>Dedicated Colo</th>
<th>Hotsite</th>
<th>R2C for Vaulting or Hotsite</th>
<th>Hotsite</th>
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### DR program

- Managed Recovery Program (Procedure Development, Execution, Testing, and Lifecycle Management of DR)
- Workgroup (Workplace, voice, and workforce recovery)