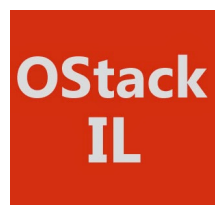


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# Surviving the Worst: Disaster Recovery for OpenStack

Ronen Kat, IBM Research – Haifa  
Ayal Baron, Red Hat

Partially sponsored by



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## Agenda

**What is disaster recovery**

**Disaster Recovery trailer**

**Volume storage replication in Cinder**

**Call for action... the road to disaster recovery**

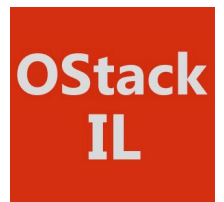
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## History

- **Good things are happening in OpenStack Meetups**
  - Following the 3<sup>rd</sup> OpenStack Israel meetup, IBM Research and Red Hat got together...
- **OpenStack Disaster Recovery initiative**
  - *A new initiative led by Red Hat & IBM Research to design how you can do Disaster Recovery for OpenStack workloads*

**Plan calls for open and pluggable architecture and APIs, allowing integrating products and enablement with the disaster recovery framework**

- **News from Hong-Kong....** *Three Disaster Recovery sessions in the IceHouse summit*
  - *Disaster Recovery in OpenStack Users session - full-house attendance (Michael Factor)*
  - *Cinder design summit session on volume replication (Avishay Traeger)*
  - *Un-conference session – received a lot of community interest and vendor buy-in (Avishay Traeger, Ayal Baron)*



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## What is Disaster Recovery?

- **According to Wikipedia, Disaster Recovery (DR) is "the process, policies and procedures . . . for recovery . . . of technology infrastructure . . . after a *natural or human-induced disaster*."**



Implication: [Surviving a disaster requires geographic dispersion](#)

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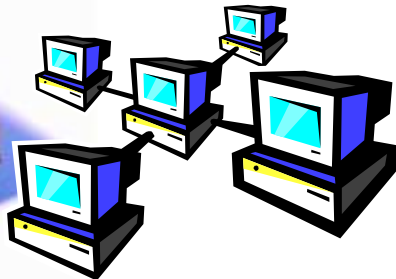
Servers



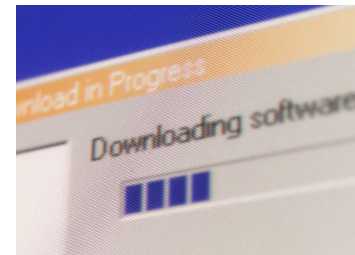
Storage



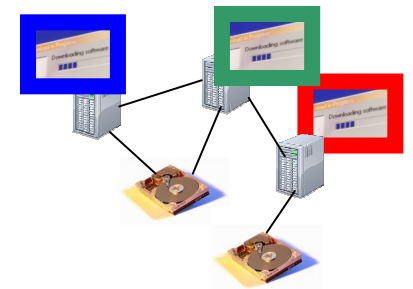
Network



Software



Configuration



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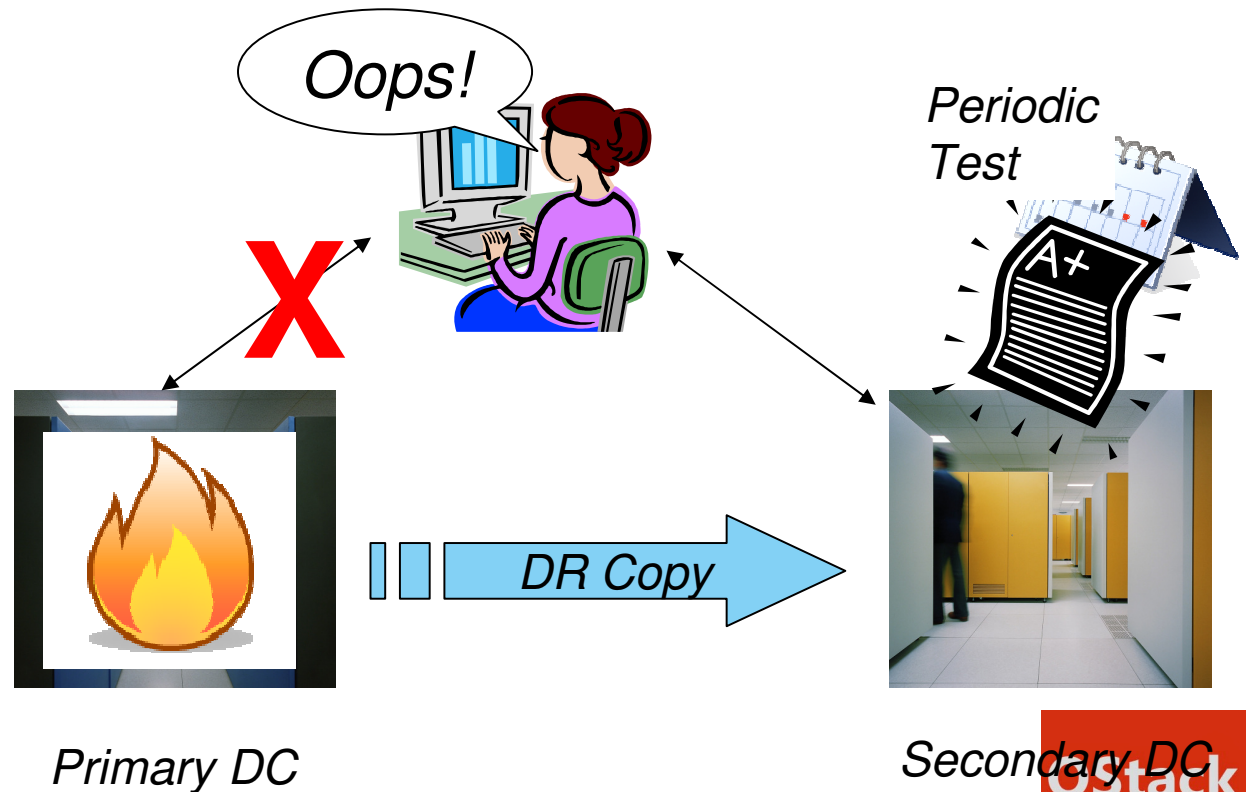
- **Up front (good path)**

- Planning
- Copy
- Testing

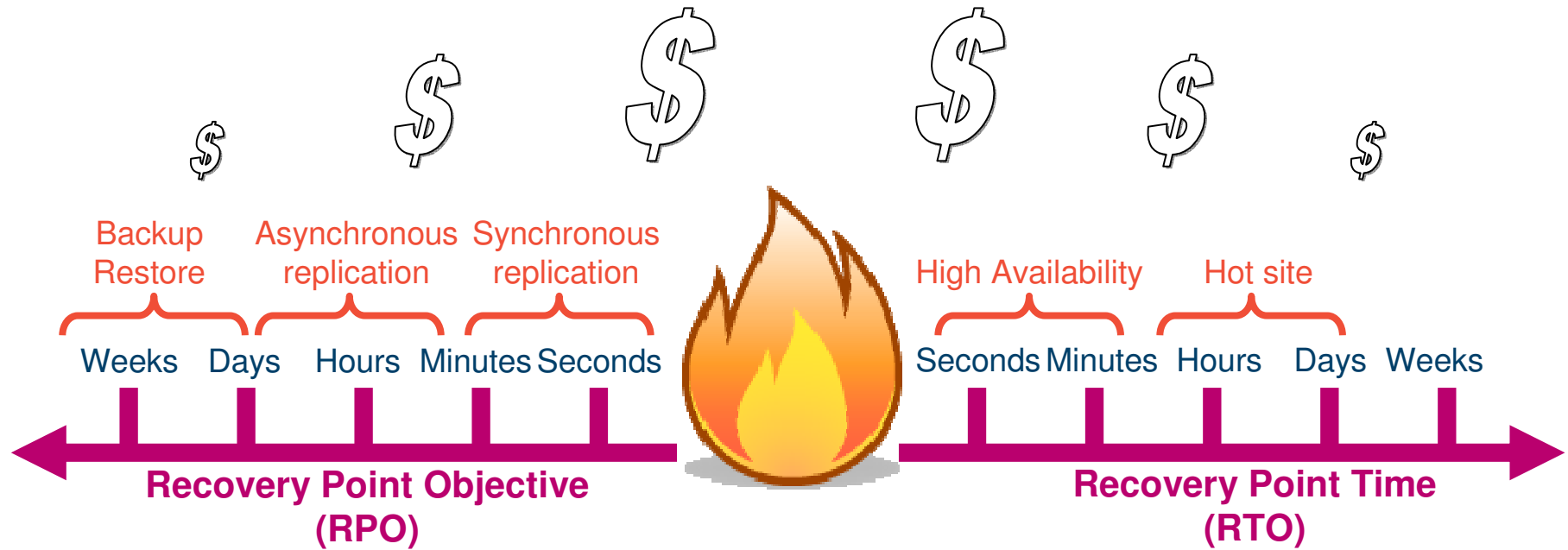
- **Detection**

- **Recovery**

- Infrastructure
- Application



# Recovery Point Objective and Recovery Time Objective



How far back in time a disaster takes one's data

How long until operational after a disaster

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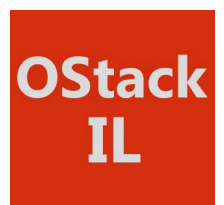
## [Jump to the Demo](#)

### OpenStack Disaster Recovery Trailer

#### Featuring:

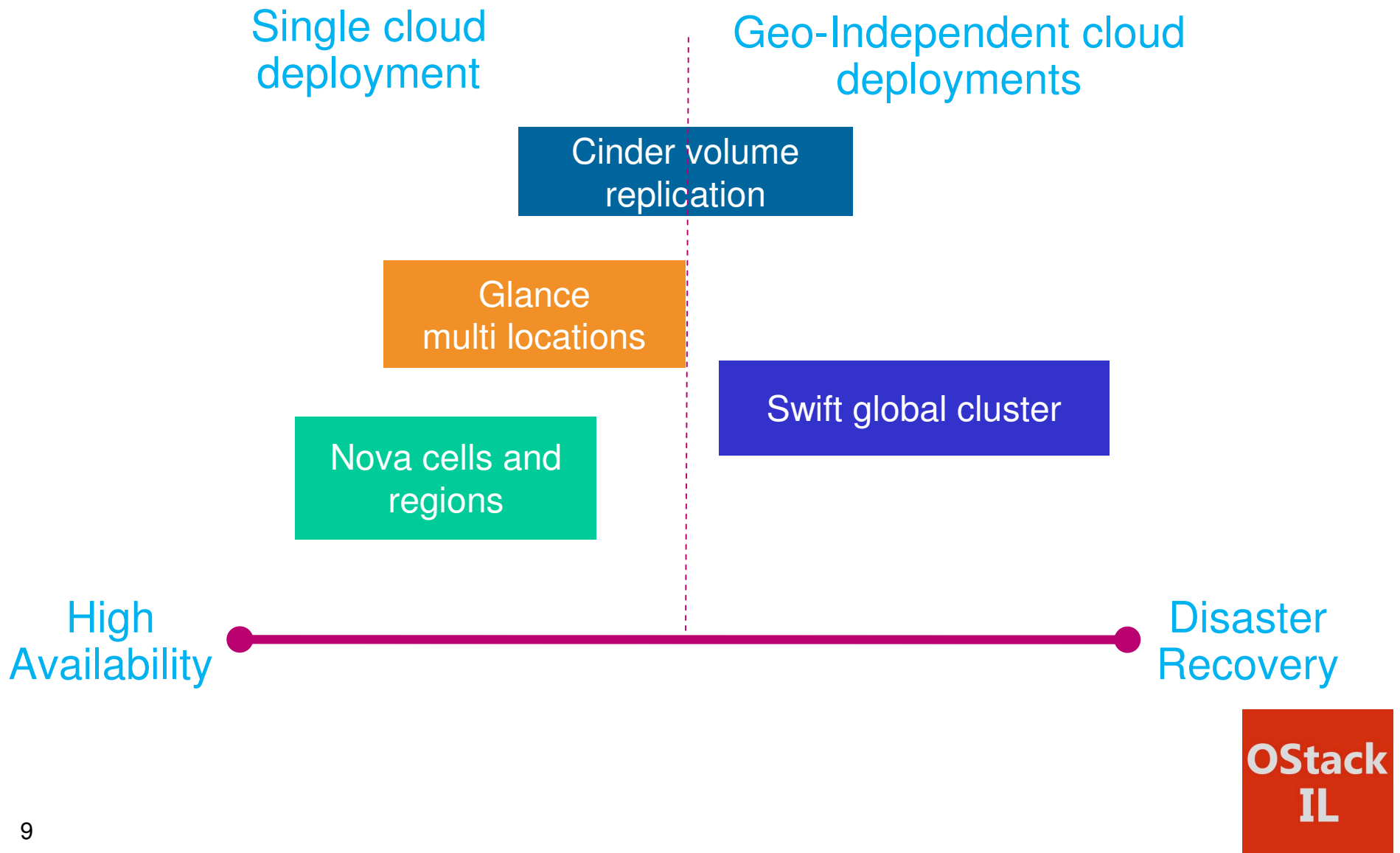
- Backup/restore based disaster recovery

- Heat based deployment on target cloud

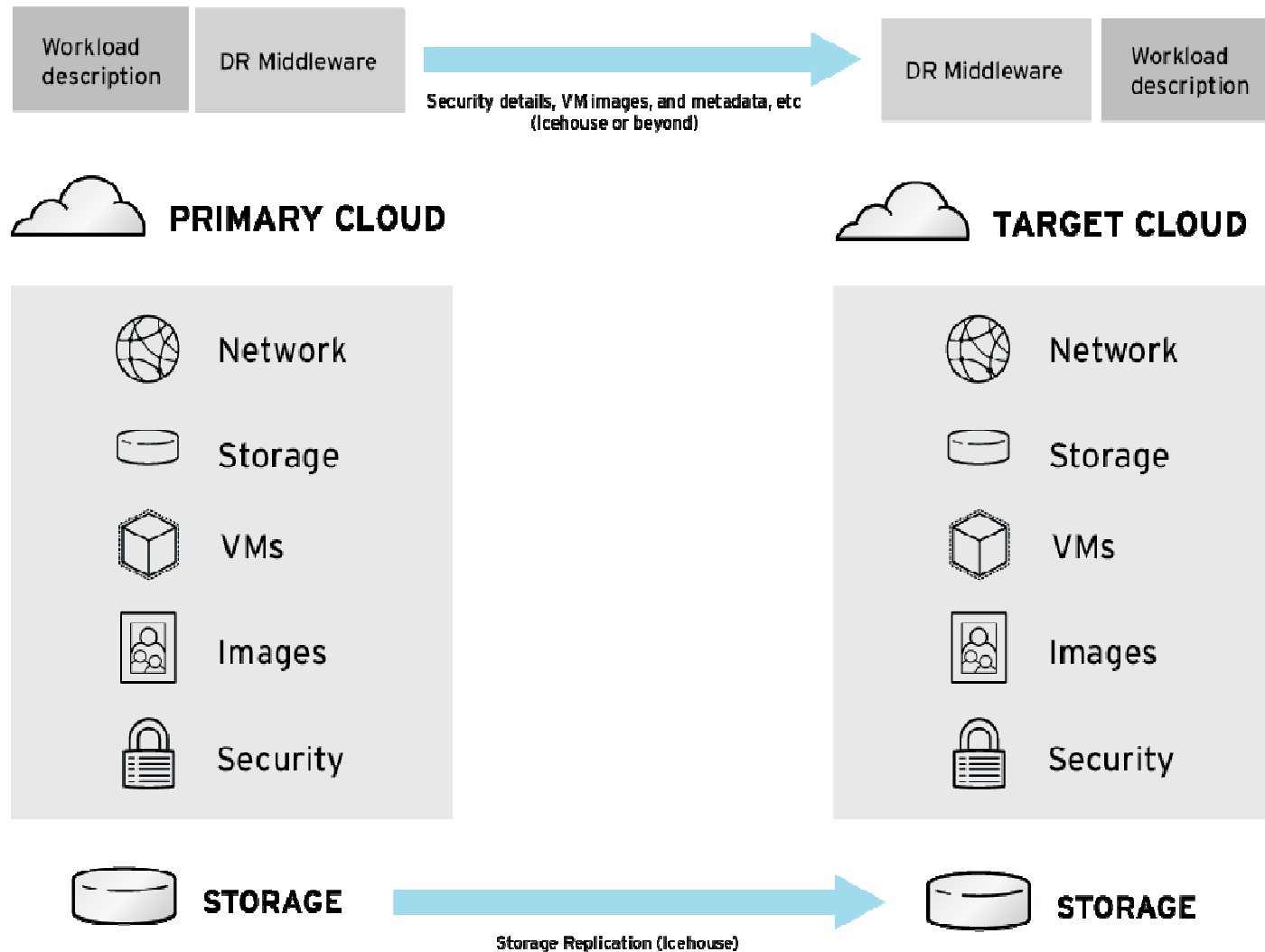




# State of the Art: OpenStack Disaster Recovery



# The Disaster Recovery Infrastructure Puzzle for OpenStack



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# Storage Replication for OpenStack

## **Goal:**

Enable cloud administrators to provide data resiliency levels in a transparent no-hassle manner to end users

## **Method:**

Enable Cinder to manage replication of volumes

## **Mechanism:**

Data replication is performed by the storage backends or using host based replication solutions



## **Control:**

Replication will be managed via volume types, transparently (beyond selecting a volume-type) to the user (both in terms of visibility and maintenance)

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## Storage Replication for OpenStack – Key Points

### The storage admin

Will pre-setup the infrastructure which Cinder volume drivers can discover

### Cinder volume drivers will report

If they can perform volume replication, and with whom

The supported minimal and maximal Recovery Point Objective Objectives

### Cloud administrator will define

Volume types with a targeted Recovery Point Objective

Target Cinder availability zone for replicated volume

### The end-user

Will select an appropriate volume type for its data volumes

Cinder scheduler will orchestrate the placement of the volume with the appropriate resiliency (replication) definitions

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## Storage Replication for OpenStack – Restrictions in Icehouse

Cinder scheduler will support volume replication for a single OpenStack Cinder deployment

Will not coordinate replication across multiple OpenStack Cinder installations

No actions can be taken on the secondary copy except for promoting it to primary

That is, can't attach, detach, snapshot, backup, etc.

All actions are available when volume is promoted

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## The Road from Disaster to Recovery...

***We are just scratching the surface and encourage involvement:***

<https://wiki.openstack.org/wiki/DisasterRecovery>

***Mailing list:*** <https://groups.google.com/forum/#!forum/openstack-disaster-recovery>

***Volume Replication Links:***

***Blueprint:*** <https://blueprints.launchpad.net/cinder/+spec/volume-mirroring>

***Design:*** <https://etherpad.openstack.org/p/icehouse-cinder-continuous-volume-replication-v2>

***Disaster Recovery talk at Icehouse summit:*** <https://ibm.biz/BdRiFM>

***Disaster Recovery Enablement in OpenStack Blog:***

<http://redhatstackblog.redhat.com/2013/11/26/disaster-recovery-enablement-in-openstack>

<http://redhatstack.com>

