Business Continuity Planning with Bareos and rear

Gratien D'haese
IT3 Consultants
http://www.it3.be

Open Source Backup
Conference

Who am I ?

- **Independent Unix System Engineer since 1996**
- **Unix user since 1986**
- **Linux user since 1991**
- **Open Source contributor:**
  - **Upgrade-UX**
  - **Relax and Recover (rear)**
  - **SIM Installation and Logging (WBEMextras)**
  - **Adhoc Copy and Run (adhocr)**
  - **Config-to-HTML (cfg2html v6.x)**
  - **Make CD-ROM Recovery (mkCDrec)**
  - **https://github.com/gdha**
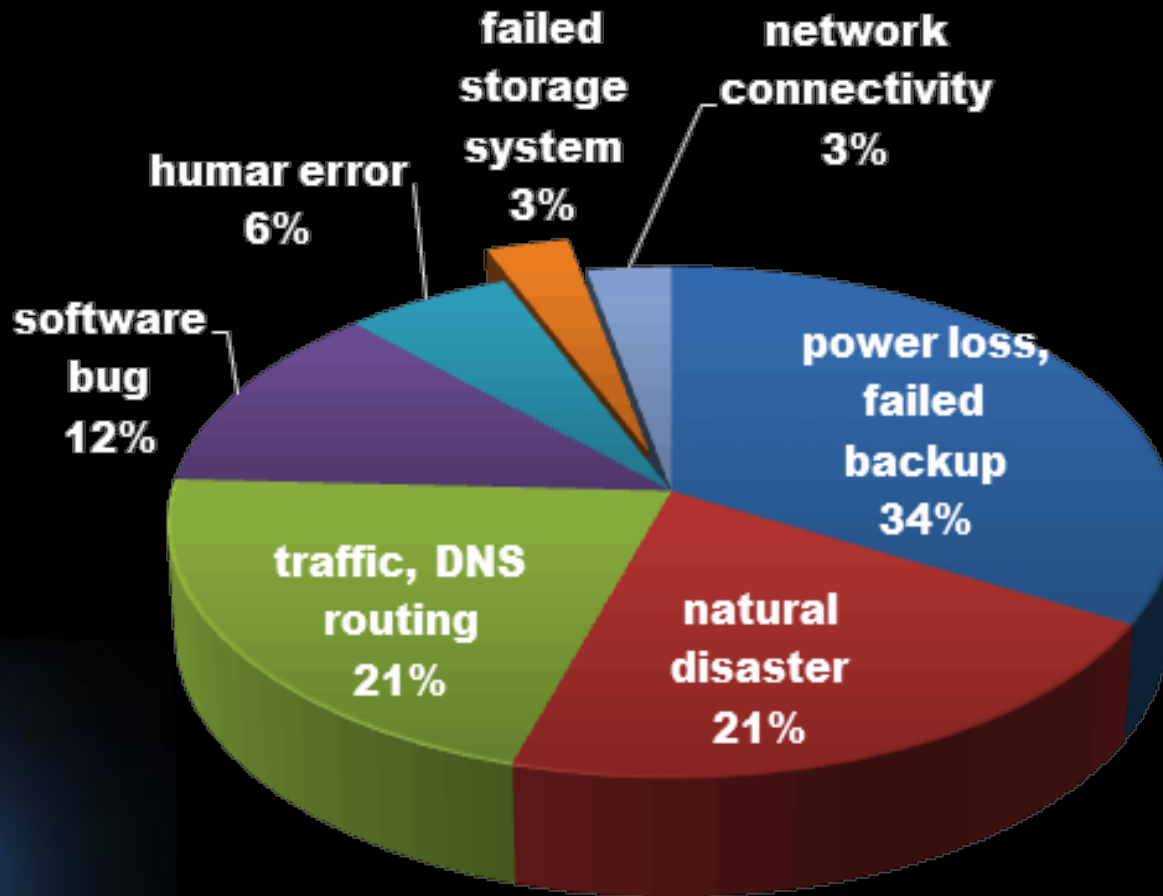
Buzz Words

Backup and Replication

Snapshots

Cloud disaster recovery
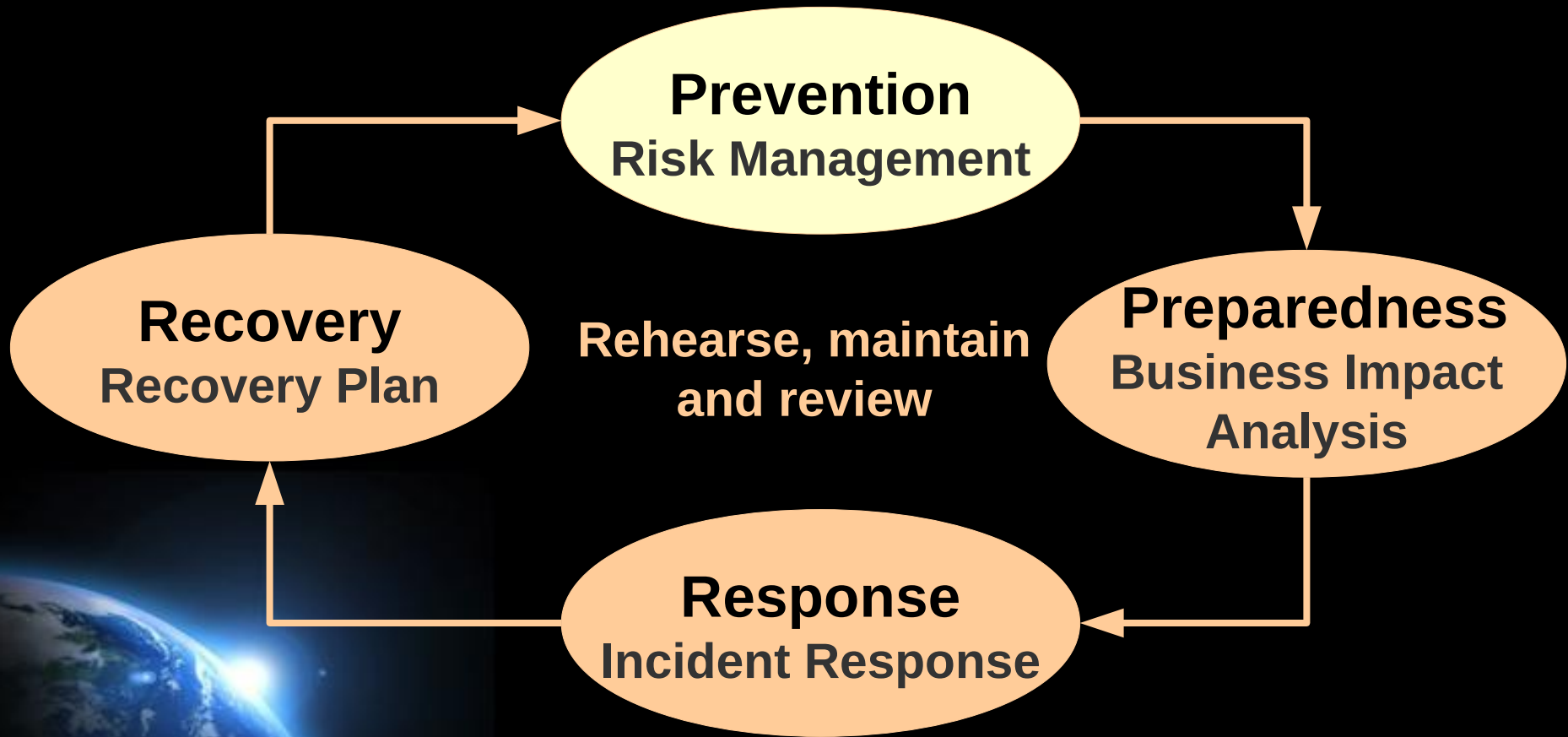
Business Continuity

Types of Business Interruptions

Data from IBM

Business Continuity Planning

- Goal = minimize service interruption
- Business continuity (BC) specifies how a company plans to restore core business operations when disasters occur

Business Continuity Planning Processes

Prevention
Risk Management

Preparedness
Business Impact Analysis

Recovery
Recovery Plan

Response
Incident Response

Rehearse, maintain and review

Prevention
Risk Management

- Evaluate Risk
  - Step 1: identify risks that could impact your business
  - Step 2: analyze risks to assess their impacts
  - Step 3: prioritize risks
  - Step 4: treat risks to minimize their impact
  - Step 5: develop and review your risk management plan

Prevention
Risk Monitoring

- As business change the risks change accordingly : periodic review required

- Monitor and review the strategies to manage the risks : update!

- Why?
  - Reducing insurance fees
  - Reducing the time when business is unable to operate
  - Reducing loss, damage to equipment in general

Prevention
is a lot more…

Quality control

Back-up of data (incl. off site)

Staff training

Select the proper staff

Workplace health & safety
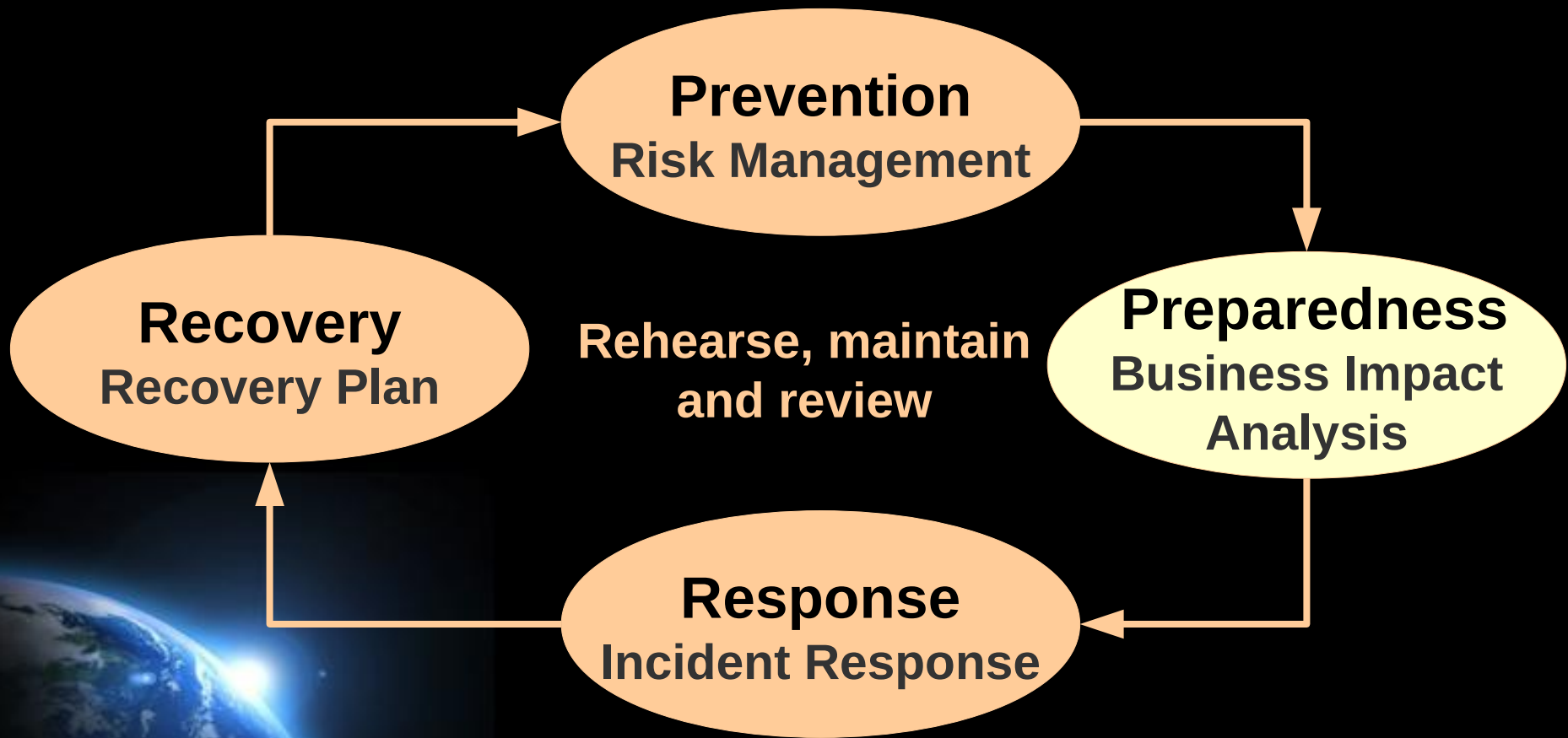
Cloud Computing

Security measurements

Emergency procedures

Maintenance of HW/SW

Evacuation plans

Regular drills & tests

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Preparedness
what can you do?

- Taking action prior to an incident occurring to ensure an effective response and recovery

- Proactive and planning are key!

- It won't happen to me? *Right....*

- Business Impact Analysis (BIA)

Preparedness
Business Impact Analysis

- Discover which processes are vital
- Prioritize and cut scope
  - False assumptions about criticality
  - Understand why certain function are more critical then others
  - At what cost? Management must decide
- Requires cross-departmental collaboration

Preparedness
Business Impact Analysis

- Executive staff defines mission critical applications
  - Agree upon what is acceptable downtime (Recovery Time Objective or RTO)
  - Agree upon your recovery point objective (Recovery Point Objective or RPO)
  - Zero downtime is an utopia and becomes extremely expensive
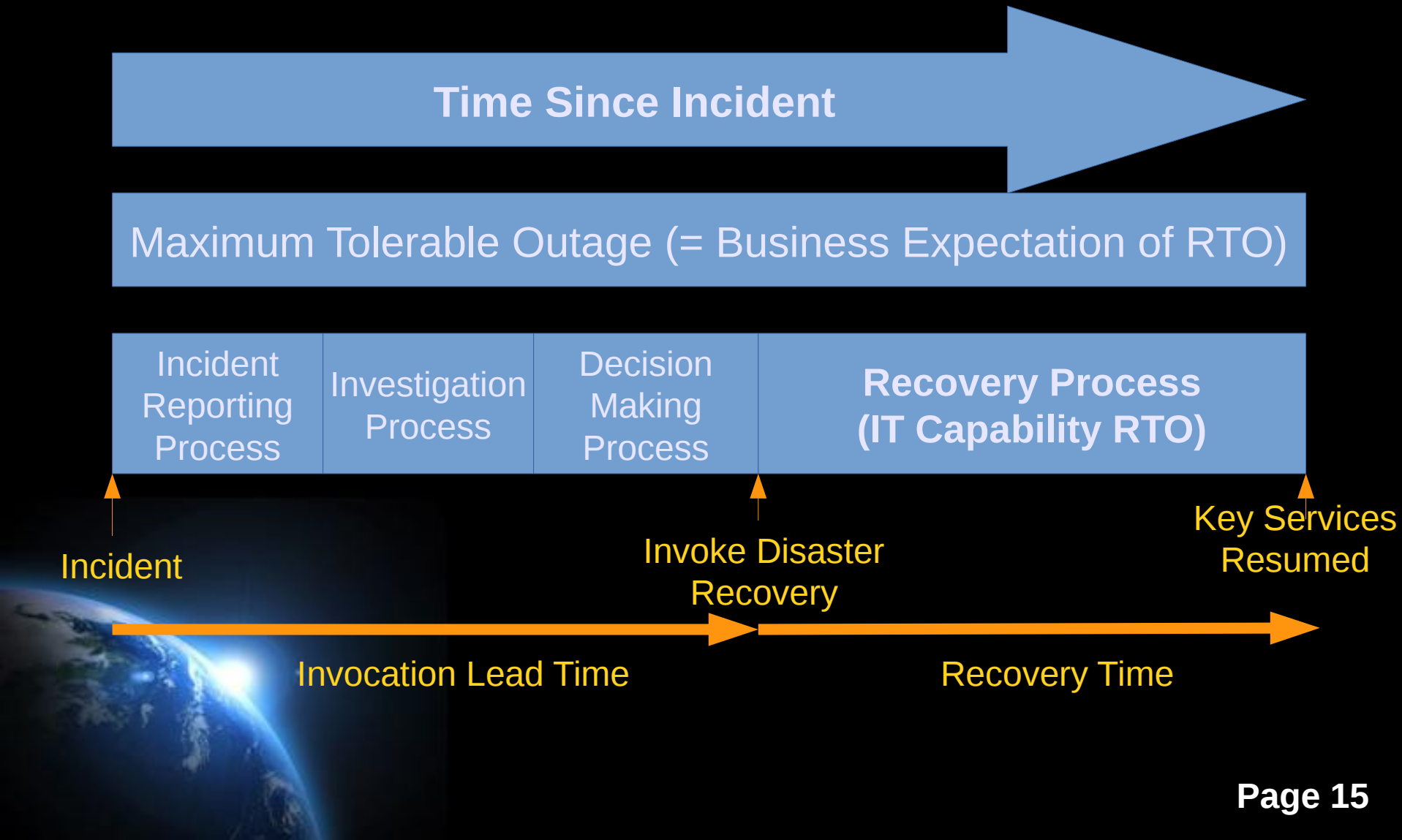 - You need to guide the executives

Business Impact Analysis
RPO - RTO

- RPO: Recovery Point Objective
  - How much data are we prepared to lose
    - Zero data loss?
    - Weekly, daily, or in between backups?
- RTO: Recovery Time Objective
  - How much downtime can we afford?
  - Lower recovery time = higher cost
  - Focus on critical processes

Business Impact Analysis MTO

Time Since Incident →

Maximum Tolerable Outage (= Business Expectation of RTO)

Incident Reporting Process	Investigation Process	Decision Making Process	**Recovery Process (IT Capability RTO)**

↑ **Incident**

↑ **Invoke Disaster Recovery**

↑ **Key Services Resumed**

Invocation Lead Time →
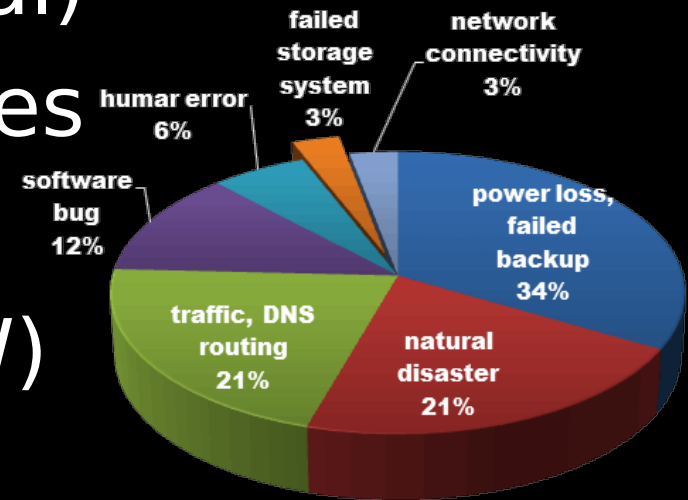
Recovery Time →

Business Impact Analysis Example BIA

- Company X is a mail order retailer
- Almost all revenue is from on-line sales
- Online catalog of 25.000 items
- Online community message board
- Office in one location, including warehouse, IT and call center

Business Impact Analysis Potential Risks

- Theft (internal & external)
- Fires, Floods, Earthquakes
- Power Outage
- Server Crash (HW or SW)
- Loss of key personnel
- DDoS or web site hacked/outage
- Water pipe burst

failed storage system 3%
network connectivity 3%
human error 6%
software bug 12%
traffic, DNS routing 21%
power loss, failed backup 34%
natural disaster 21%

Business Impact Analysis Identify Key Processes

- Pending order
- Tracking stock
- Online assistance
- Credit card processing
- Online message board
- Search database
- IT maintenance

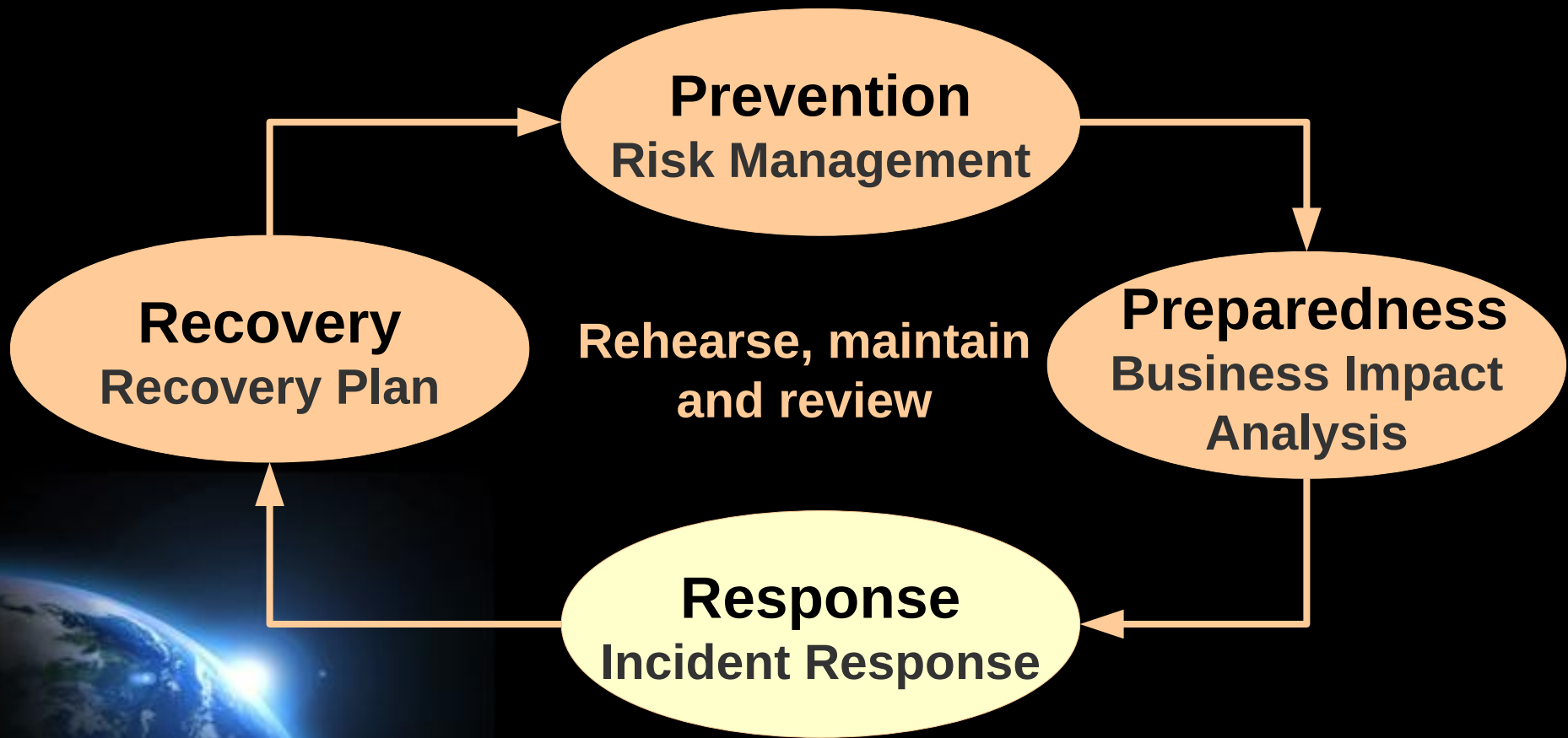# Business Impact Analysis Inter-dependencies

- Pending orders
- Tracking stock
- Online assistance
- Credit card proc.
- Online message board
- Search database
- Stock refill

- IT maintenance
- Public relations
- Legal compliance
- Vendor agreements
- Server room clean-up
- Budgeting
- Emergency loan
- Financial reporting

Business Impact Analysis
Impact on operations

- Online store: high
- Credit card processing: high
- Rebuilding: medium
- Message board: low
- Product search: low
- Financial reporting: low
- Based on revenue value!

Business Continuity Planning Processes

Prevention
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Preparedness
Business Impact Analysis

Response
Incident Response

Response

- A response team: experts who are able to understand and evaluate the specific crisis
  - Team leader
  - Response team
  - Spokesperson
  - Others...
- The crisis should be their only concern!
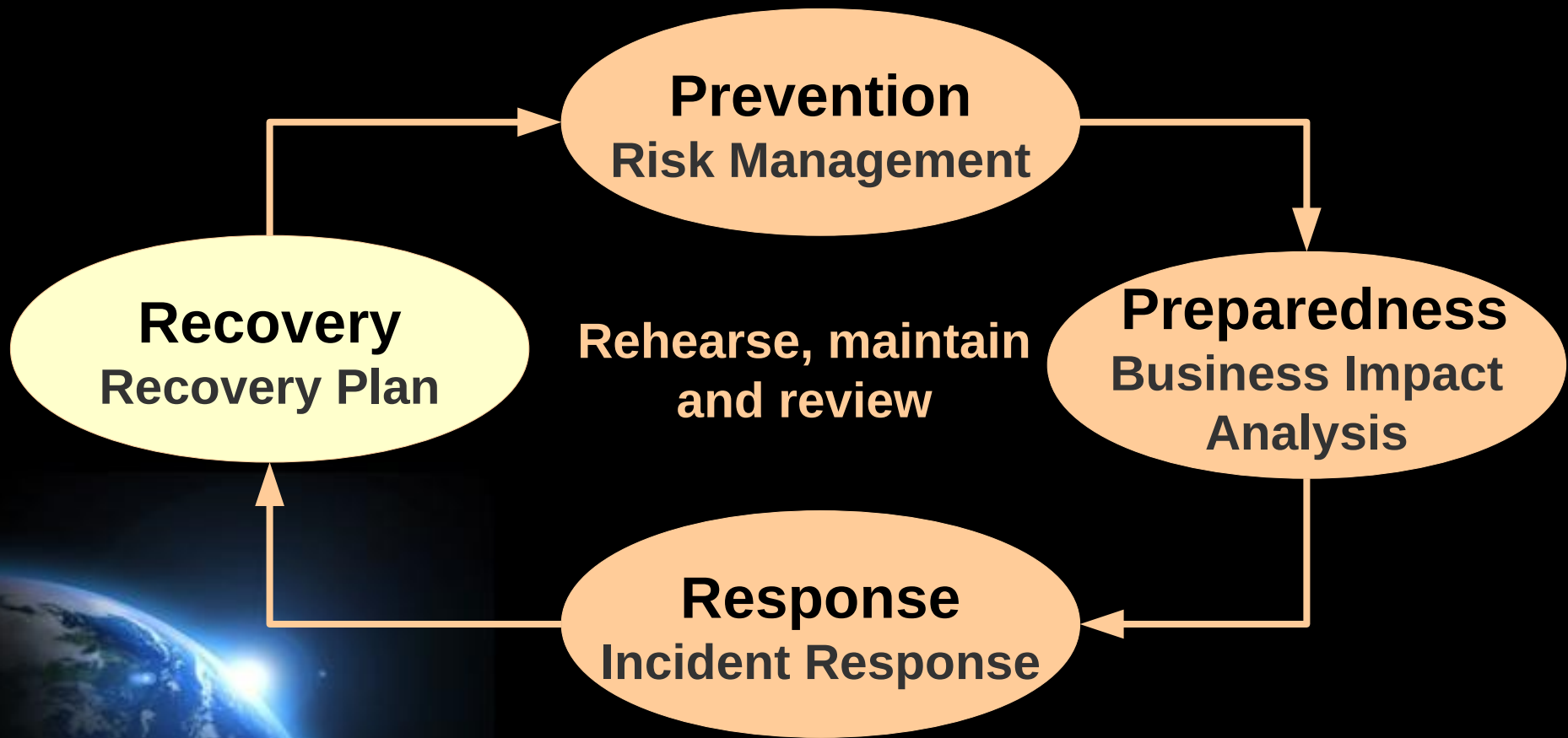
Incidence Response Plan

- Scenario's
- Contact list
- Check lists
- A 'GO' pack:
  - Laptop with all docs; Google doc, …
  - Event logging
  - Evacuation plan
  - Authority list

Activate the response team

- Define the real problem and lay out the strategy to resolve

- Act quickly and do not forget to communicate (twitter,…)

- Assume the worst so you are prepared (escalation)

- Use the Subject Matters Experts effectively

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Recovery

- During the incident we concentrate on disaster recovery
  - We have a DR plan, right?
- What about after the crisis?
  - Damage to property, IT equipment, …
  - Damage to reputation (do not forget communication)
  - Insurance is very important

Disaster Recovery

Disaster Recovery (DR) is the process, policies and procedures that are related to preparing for recovery or continuation of technology infrastructure which are vital to an organization after a natural or human induced crisis

Disaster Recovery is not

- Backup, which is mostly about data loss prevention, DR is about *service availability* (low RPO and RTO)

- Data replication to ensure consistency between redundant sites

- DR complements other *High Availability* activities (dealing with DR prevention), DR is for the times when prevention fails

Cloud Disaster Recovery

- Approaches
  - Do it yourself
  - DRaaS
- Techniques
  - Cold DR
  - Warm DR
  - Hot DR
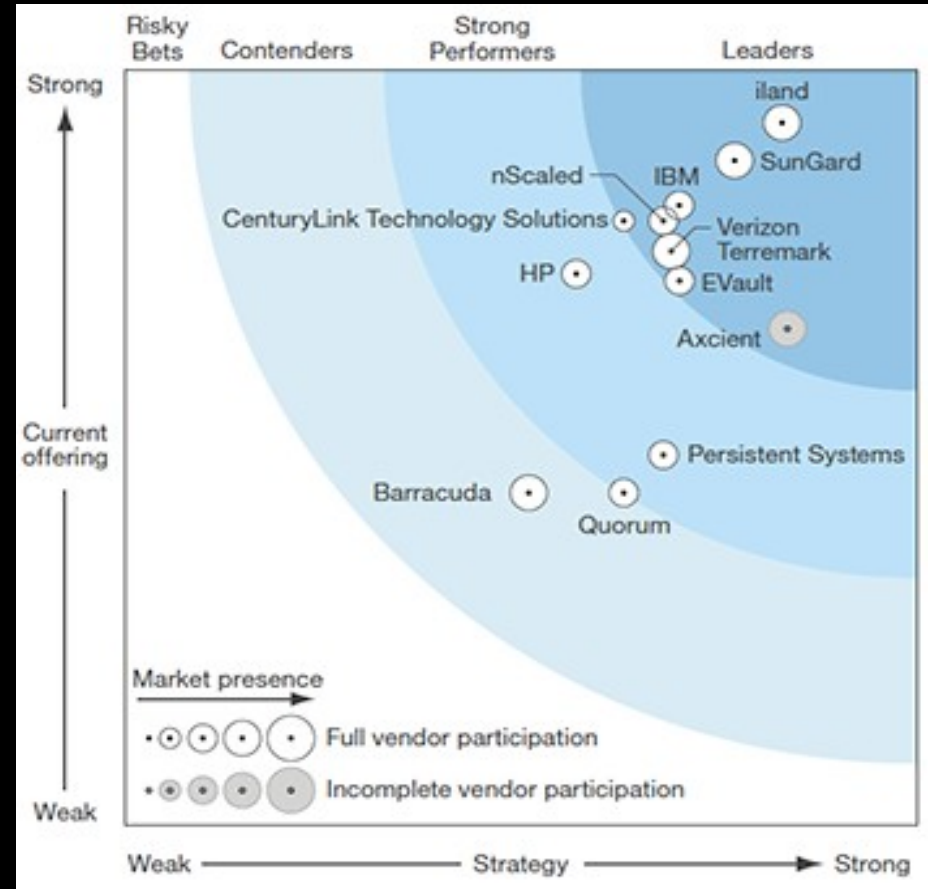
Source: The Forrester Wave:
DraaS Providers, Q1 2014

Critical server: backup system

- In DR site the backup server is key
- Do not forget to create a DR plan for this backup server (rear)
- Synchronize the backup data
  - Disk synchronization
  - Tapes (vaulting)
  - Cloud Storage (if size permits)
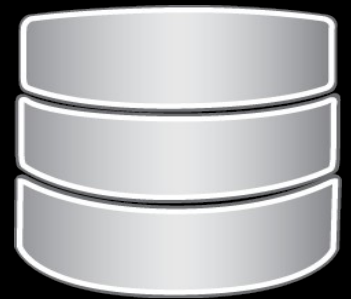
Bareos Backup Server

- Bareos (Backup Archiving REcovery Open Sourced) is a fork of Bacula (2010)
- URL: http://www.bareos.org/en/
- Is an excellent choice as it works with
  - Tapes, disks, deduplication
  - Cloud storage
  - Integration with rear

Relax-and-Recover (rear)

- Open Source Bare Metal Restore (DR)
- URL: http://relax-and-recover.org/
- Online: snapshot of running system
  - Creates bootable image (ISO, PXE, USB)
  - Creates archive via GNU tar, rsync, or
  - Integrates with backup software:
    - Bareos, bacula, rbme, duplicity (open source)
    - Commercial backup software (TSM, NBU, DP, GALAXY, NSR, SESAM)

Rear features

- Fully automated recovery
  - On same hardware
  - Similar hardware
- P2V, V2V, V2P, migrate storage (SAN)
- During recovery rear will
  - Prepare storage (partitioning, file systems, mount points)
  - Restore archive from backup
  - Install boot loader

Rear using bareos
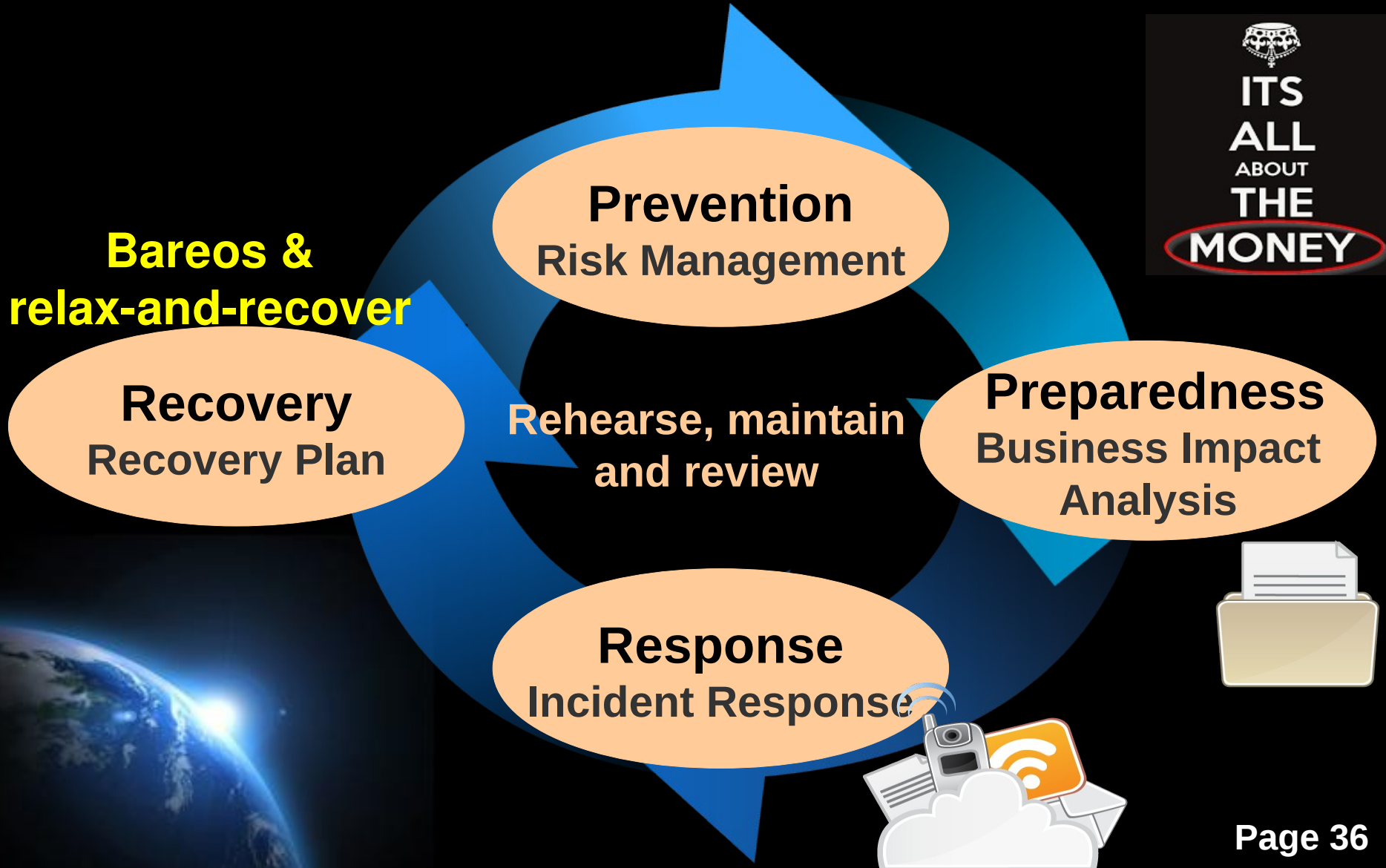
- Clients system of bareos
  - BACKUP=BAREOS
  - Rear -v mkrescue
- Bareos backup server
  - BACKUP=NETFS
  - BACKUP_URL=<external storage>, e.g. NFS, USB, ISO
  - OUTPUT=ISO, USB

Recover system

- Recover bareos client with rear
  - Rear -v recover
  - Recreates all file systems
  - Uses bareos to restore all data
- Recover bareos server with rear
  - Rear -v recover
  - Recreates all file systems
  - Uses external storage to restore data
  - Restore latest backup via tape(s)

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Risk Management

Bareos & relax-and-recover

Recovery
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Preparedness
Business Impact Analysis

Response
Incident Response

ITS
ALL
ABOUT
THE
MONEY

At your service…

htttp://www.it3.be/rear-support