

I. Introduction (Slides 1-2)

Slide 1: Title Slide

- "Data Recovery and Resilience Strategies"
- Your name (and co-presenter, if any), organization or course, date

Slide 2: Agenda & Objectives

- **Agenda:**
 - Real-World Cases & Recovery Techniques
 - The Backup Landscape (Full, Differential, Incremental)
 - Designing Disaster Recovery (DR) Strategies
- **Objectives:**
 - Understand key causes of data loss
 - Learn practical recovery methods
 - Compare backup approaches
 - Build resilient recovery strategies

II. Real-World Data Loss & Recovery Techniques (Slides 3-6)

Slide 3: Common Causes of Data Loss

- **Physical Failure:**
 - Hardware damage, power surge, overheating
- **Logical Failure:**
 - File system corruption, accidental formatting
- **Human Error:**
 - Accidental deletions, overwrites
- **Malware/Ransomware:**

- Data encrypted/deleted
- **Catastrophic Loss:**
 - Natural disaster, theft, major outage

Slide 4: Case Studies of Data Loss

- **Case 1:** Ransomware – isolated systems, restore from clean backups
- **Case 2:** Accidental Deletion – file pointers gone, logical recovery window
- **Case 3:** Failed Hard Drive – physical repair in clean room, costly

Slide 5: Data Recovery Techniques: Logical

- *File Carving:* Recovers files by identifying data signatures
- *File System Repair:* CHKDSK (Windows), fsck (Linux), repairs metadata
- *Unformat Tools:* Restore partition tables/volume headers
- *Popular tools:* Recuva, TestDisk, EaseUS^{[1][2]}

Slide 6: Data Recovery Techniques: Physical

- *Clean Room Environment:* Necessary for hard drive repairs
- *Specialized Hardware:* E.g., PC-3000 interfaces with failed drives^[1]
- *Donor Drives:* Match model/firmware for replacement parts
- *Professional Services:* Use for high-value recoveries^[3]

III. Comparing Backup Types and Tools (Slides 7-10)

Slide 7: Backup Type 1 – Full Backup

- Copies *all* selected data
- **Pros:** Fastest restore (minimal steps)
- **Cons:** Largest storage, longest backup window^{[4][5]}

Slide 8: Backup Types 2 & 3 – Incremental vs Differential

- **Incremental:**

- Only new/changed data since last backup (full or incremental)
- **Pros:** Fastest backups, least storage
- **Cons:** Slowest restore (need *all* increments)
- **Differential:**
 - All changes since last *full* backup
 - **Pros:** Faster restore, good balance
 - **Cons:** Backups grow larger with time

Slide 9: Visual Comparison: Backup Types

- Diagram (boxes/arrows):
 - Full: One backup = restore
 - Incremental: Full + many small files to restore
 - Differential: Full + latest diff needed^[5]
- (You can find inspiration for diagrams online or ask your designer.)

Slide 10: Tools of the Trade

- **Enterprise Tools:** Veeam, Commvault (deduplication, centralized management)
- **End-User:** Windows Backup, Time Machine (easy local)
- **Cloud/SaaS:** AWS S3, Azure Blob Storage (offsite, scalable)
- *Tip: List logos for visual impact*

IV. Designing Recovery Strategies (Slides 11-14)

Slide 11: Key Recovery Metrics

- **RTO (Recovery Time Objective):** Max acceptable downtime
- **RPO (Recovery Point Objective):** Max acceptable data loss
- *Simple chart/visual: time vs. data lost*

Slide 12: Strategy for Localized Failures

- Use Differential Backups & local disk snapshots

- Prioritize quick restore
- Example: User accidentally deletes a file – instant snapshot restore

Slide 13: Strategy for Regional/Catastrophic Failures

- **3-2-1 Rule:**
 - 3 copies total
 - 2 media types
 - 1 offsite copy (air-gapped/cloud)^[6]
- Diagram: Show flow from local to offsite

Slide 14: Testing & Validation

- Regular DR drills (simulate actual recovery)
- Integrity checks of backups
- "An untested backup is not a backup."

V. Conclusion & Q&A (Slide 15)

Slide 15: Key Takeaways

- Recovery requires logical and physical techniques
- RTO/RPO balance speed and data loss
- 3-2-1 Rule + regular testing = resilience
- Invite questions