**1. Introduction**

Storage medium for long-term storage should be selected by considering data access frequency and their archiving capability.

**Information life cycle**

- **Comparison of data media**
  - **Authenticity**
    - BDR: True, HDD: False, CLOUD: ?
  - **Longevity**
    - BDR: Over 30 years, HDD: 5 years, CLOUD: ?
  - **Access**
    - BDR: △, HDD: ○, CLOUD: ?
  - **Migration standard**
    - BDR: ISO, HDD: EET, CLOUD: ?
  - **Obsolescence Risk**
    - BDR: ○, HDD: ○, CLOUD: ?
  - **Disaster Recovery**
    - BDR: ○, HDD: ○, CLOUD: ?
  - **Energy consumption**
    - BDR: ○, HDD: ○, CLOUD: ?
  - **Suitable Use**
    - BDR: COLD Storage, HDD: Temporary Storage, CLOUD: Access

Optical discs are ideal choice for off-line archiving.

**2. Advantages of optical discs for long-term storage**

- **Method of estimating life time of optical discs are defined by the international standards.**

  **International standard life test methods for optical disc**

  - **Format**
    - DVD-R, DVD+R, DVD-RW, BD Recordable disk, BD Rewritable disk
  - **Standard**
    - ISO/IEC 19508:2011

- **Data status during storage is classified into 3 levels by the international guidelines.**

  - **Condition of disk**
    - Level 1: Good
    - Level 2: To be migrated / refreshed in a year
    - Level 3: To be migrated / refreshed immediately
  - **BD Recordable disk**
    - Error rate status > Burst error
    - Lower than 5.0 × 10⁻⁸ and Lower than 1,260 byte
  - **BD Rewritable disk**
    - Higher than 5.0 × 10⁻⁸ and Lower than 1,048 byte
  - **ISO/IEC 10984-1**
    - To be published

**3. Operation workflow of long-term storage using optical discs and international guidelines.**

**4. Proposal for use optical discs according to data amount, application and scale**

- **Medium scale archiving**
  - Approximately 300 million units were shipped in 2012 (total shipped is 4 billion units).
  - Blu-ray drives are also capable of playing CDs and DVDs. No playback problems in generation.

- **Large scale archiving**
  - Disaster resistance
    - The data restoration from optical discs was easily done even the data was hit by serious disaster in 2011, March.
    - Can be restored by our skilled engineer

**5. Conclusion**

Optical disc technology can provide any size of users with safe and easy archiving solutions. Furthermore, this is the only technology having life estimation method and migration standards defined in ISO, which makes the data integrity visible. This is extremely important factor for long term archiving, especially for cold storage.