Blu-ray Disc™

CONTENTS

INTRODUCTION

- Blu-ray (BD) is a next-generation optical disc format.
- The format was developed to enable recording, rewriting and playback of high-definition video (HD), as well as storing large amounts of data.
- The companies that have jointly established the BD specifications are
  - Hitachi, Ltd
  - LG Electronics
  - Matsushitha Electrical Industrial Co. Ltd
  - Mitsubishi Electric Corporarion

(Contd…)

- Pioneer Corporation
- Samsung Electronics Co. Ltd
- Sony
- Thomson
- Royal Phillips Electronics
- Sharp Corporation

- The name Blu-ray is derived from the blue-violet laser it uses to read and write to the disc.
- The “e” was intentionally left out of the name due to trademark restrictions

CHARACTERISTICS OF BLU-RAY

- Life Span
- Content Protection
- Cost
- Capacity
- Robustness of disc
- Compatible

Life Span

- In the case of ordinary discs, the disc life is less .
- In the rewritable versions, as re-writing is done repeatedly to one area of the disc most probably, the inner perimeter limiting the disc life.
- BDFS (Blu-ray Disc File Structure is designed so as to avoid this problem, by using a system that uses free disc spaces with equal frequency

Content Protection

- Strongest content and copy protection schemes ever developed
- *Incorporation of Robust copy mechanism*

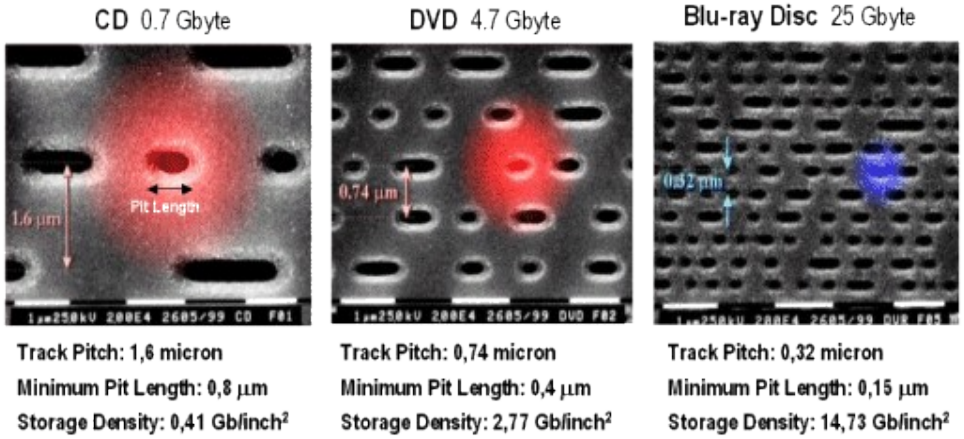
Cost

ong term Profitability model for content roviders

heapest Production cost

Capacity

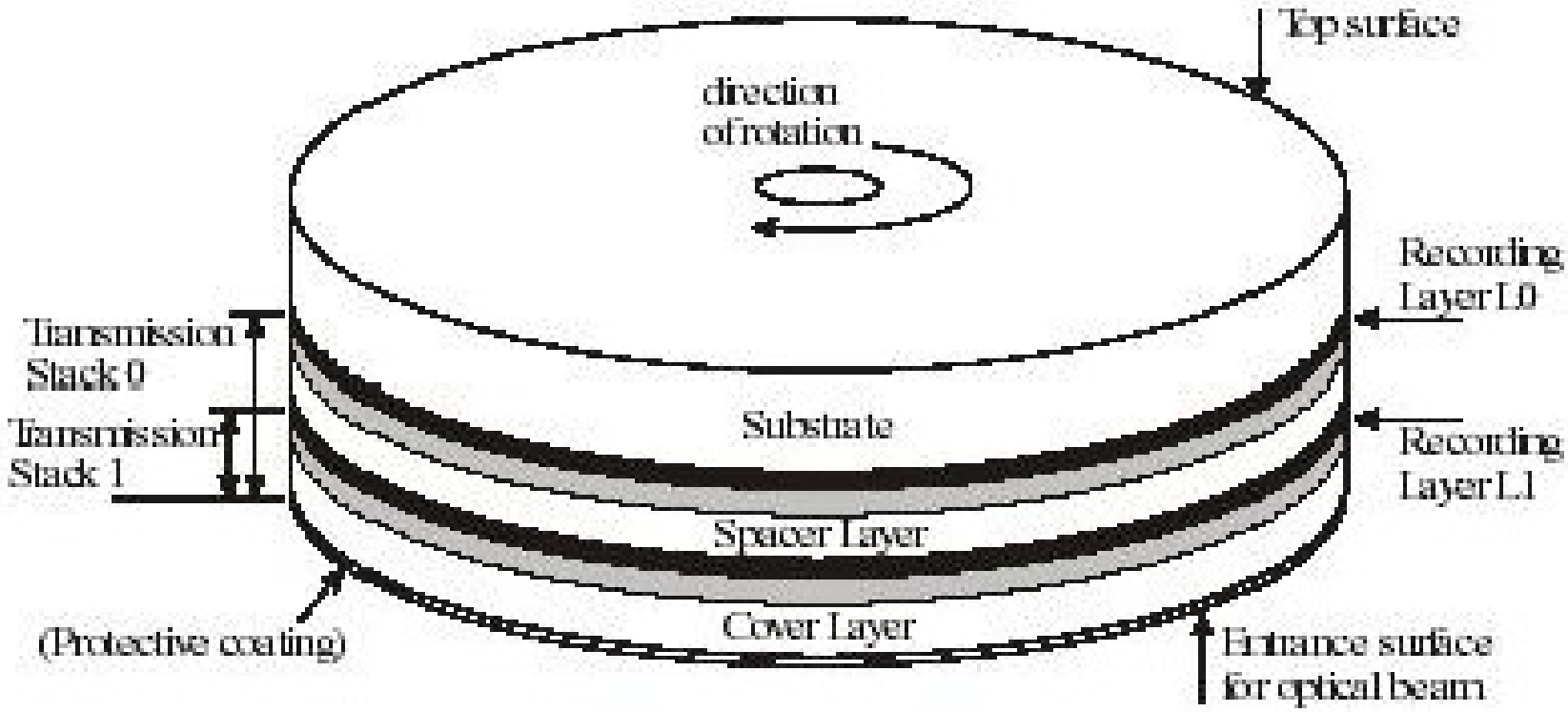
- The Blu-ray disc enables the recording, rewriting and playback of HD video up to 27 GB of data on a single sided single layer. It is enough to put 2.5 hours of HDTV recording on it. It also can record over 13 hours of standard TV broadcasting



Robustness of Disc

- Stronger resistance to scratches and fingerprints The protective layer is hard enough to prevent accidental abrasions and allows fingerprints to be removed by wiping the disc with a tissue. **Compatible**
- The BD drives are designed to be backward compatible, i.e. CDs and DVDs work equally well with the BD drives.

The structure of dual layer disc



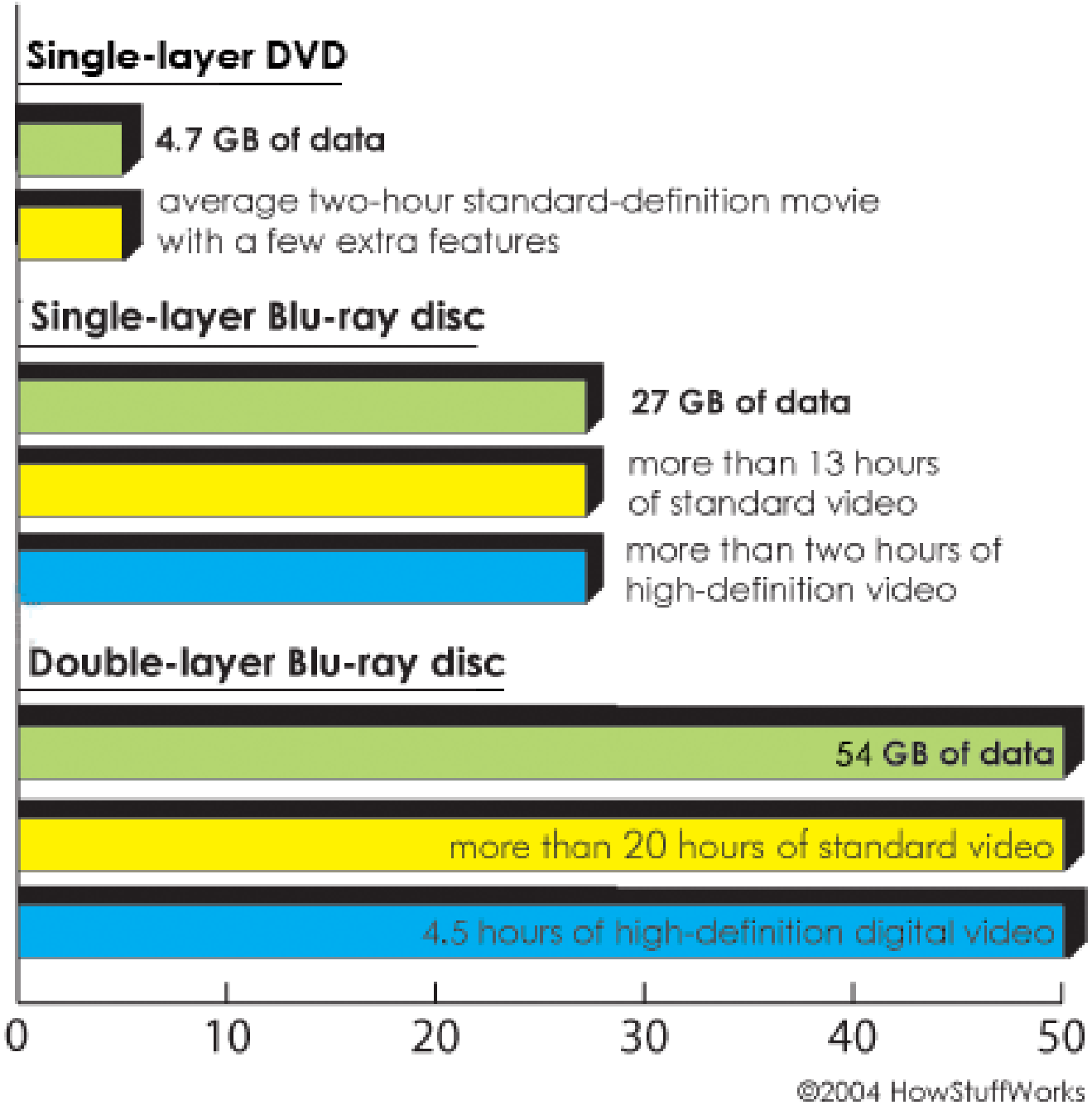
Principal BD Specifications

Capacity	23.3 25 27GB (single layer)
Wave length of the laser	405nm
Numerical Aperture of the objective lens	0.85
Data transfer rate	36Mbps
Thickness of the disc	1.2mm
Diameter of the center hole	15mm
Recording method	Phase change

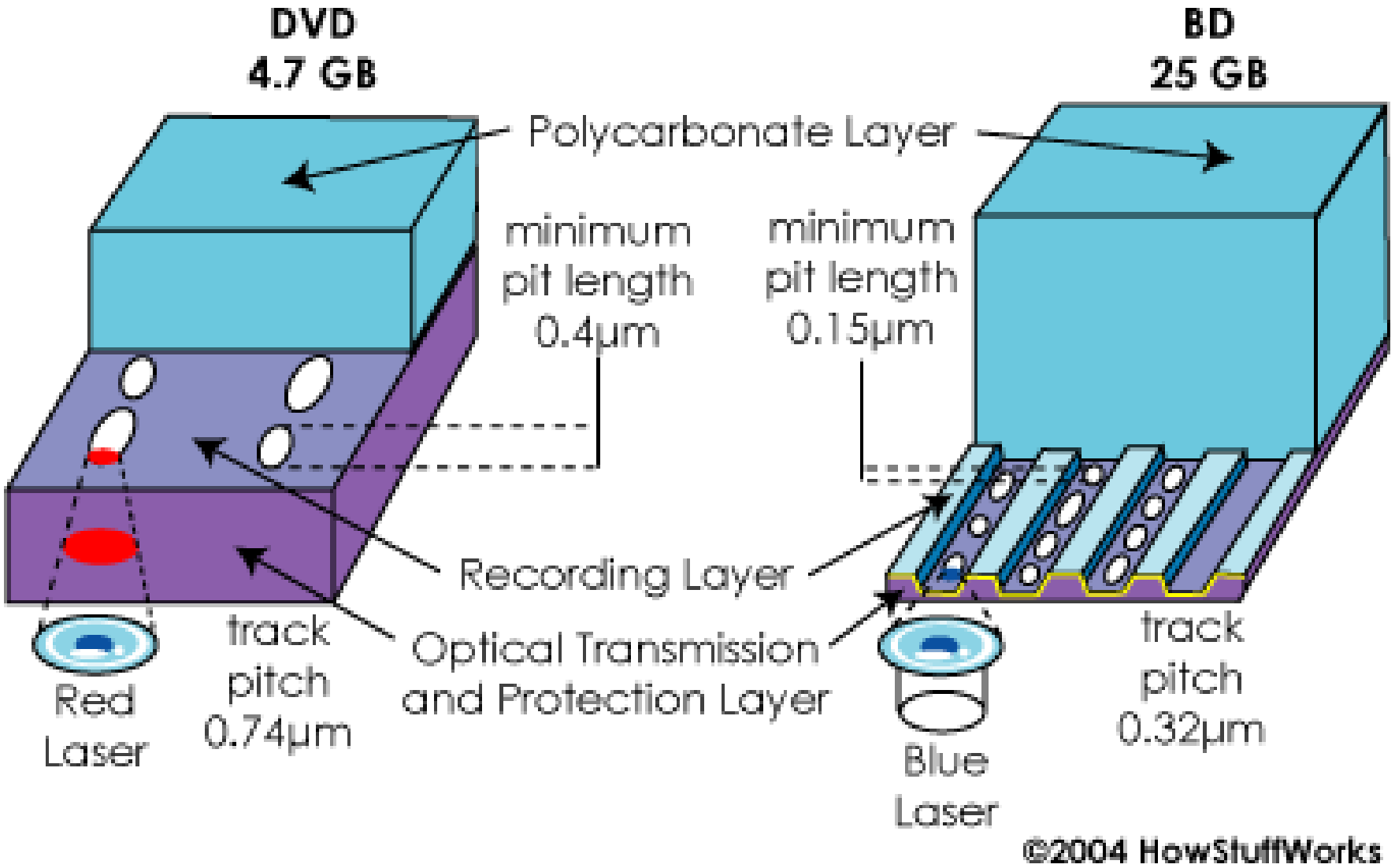
Comparison of CD,DVD and BD specification

Disk diameter	120 mm	120 mm	120 mm	120 mm
Disk thickness	1.2 mm	1.2 mm	1.2 mm	1.2 mm
Laser wavelength	780 nm	650 nm	405 nm	
Numerical aperture	0.45	0.60	0.85	
Minimum pit length	0.83 um	0.4 um	0.138 um	
Data rate	1.2 Mb/sec	11 Mb/sec	36 Mb/sec	
Number of sides	one	-----	one or two	
Number of data layers	One	-----	One or two	
Data capacity	~680 MB	4.7 GB	8.5 GB	
(1L)	27 GB			

Blu-ray vs. DVD Capacity

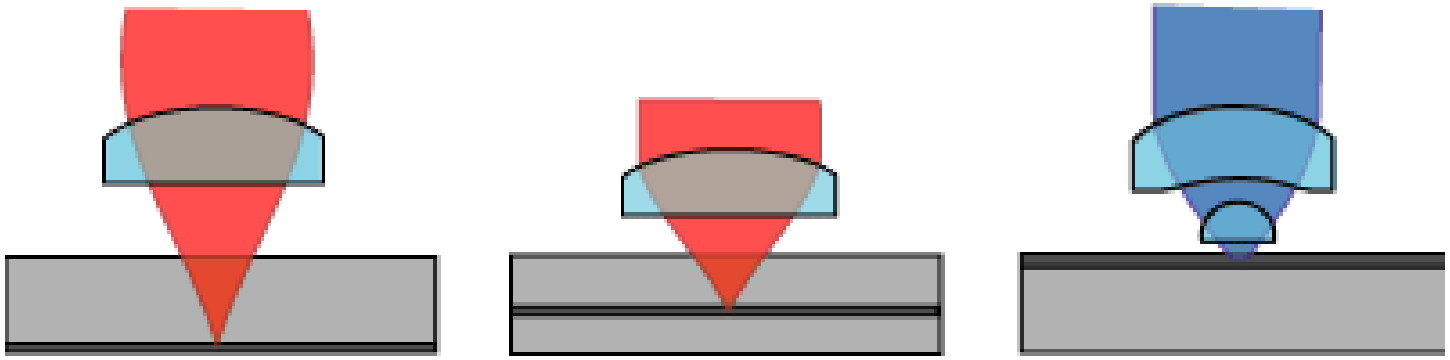


DVD Vs. Blu-Ray Construction

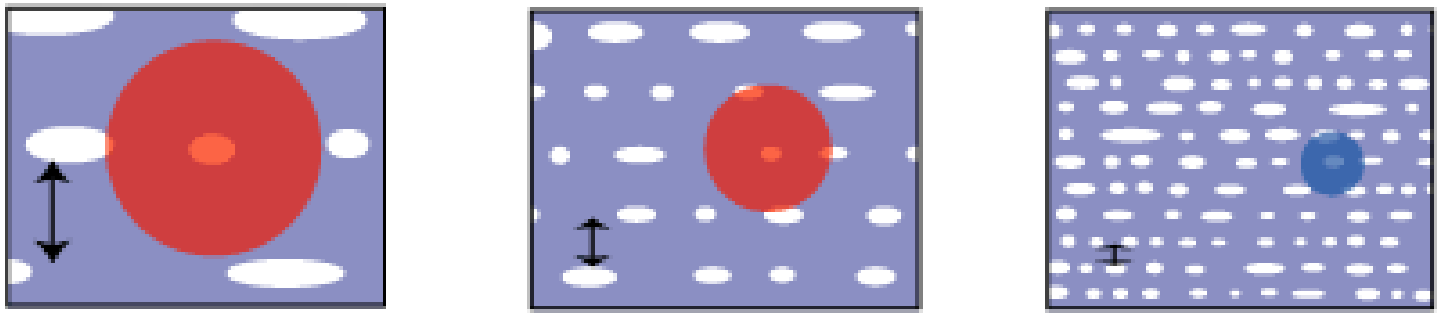


CD vs. DVD vs. Blu-ray Writing

CD	DVD	BD
780-nm Red Laser Lens Aperture = 0.45	650-nm Red Laser Lens Aperture = 0.6	405-nm Blue Laser Lens Aperture = 0.8



One 1.2-mm polycarbonate layer	Two 0.6-mm polycarbonate layers	One 1.1-mm polycarbonate layer



track pitch = 1.6µm	track pitch = .74µm	track pitch = .30µm

Blu-ray disc and CD’s /DVD’s

(Comparison Between Blu-ray n othe

- 1 DVD = 5 to 10 CD’s
- 1 Blu-ray = 5 to 10 DVD’s !!!!!!
- Usage of a blue instead of a red laser
- Improved lens specifications
- Backward compatibility

PROS :

High disc space at almost same cost price
Security
reverse compatibility
high speed data transfer (36Mbps)
online modifications

CONS :

High cost of the disc reader
less data space than AOD (HD-DVD 30 Giga bytes)

Blu-ray Disc Applications

- High definition television recording
- High definition video distribution
- High definition camcorder archiving
- Mass data storage

High definition television recording

- The Blu-ray Disc format offers consumers the ability to record their High Definition television broadcasts in their original quality for the first time, preserving the pure picture and audio level as offered by the broadcaster.
- Next level in home entertainment, offering an unsurpassed user experience Since Blu-ray Disc format incorporates the strongest copy protection algorithms of any format or proposal to date, the format allows for recording of digital broadcasts while meeting the content protection demands of the broadcast industry.

High Definition Video Distribution

- Blu-ray Disc format can store High Definition video in the highest possible quality, without need to compromise on picture quality.
- Depending on the encoding method, there is room for more than seven hours of the highest HD quality video. There is even room for additional content such as special features and other bonus material to accompany the High Definition movie.
- The Blu-ray Disc movie format greatly expands on traditional DVD capabilities, by incorporating many new interactive features allowing content providers to offer an even more incredible experience to consumers.

High Definition Camcorder Archiving

- With its unprecedented storage capacity, allows for the HD video recorded with an HD camcorder to be converted and recorded
- Storage capabilities, without the risk of tape wear

Mass Data Storage

- The growing number of broadband connections allowing consumers to download vast amounts of data

Conclusion

It’s very likely that the technology will be adopted as the next generation optical disc format for PC data storage and replace technologies such as DVD+-R, DVD+-RW, and DVD-RAM.

THANK YOU...