

Outline of Sony Verifier

1.1 Introduction

A Licensee who is required to perform the verification according to the corresponding Test Specification (this Test Specification) will make a BD-ROM Commercial Audiovisual Contents as a licensed BD-ROM Product. The BD-ROM Commercial Audiovisual Contents will be made with a BD-ROM Tool such as authoring tool which is also a licensed BD-ROM Product made by a BD-ROM Tool licensee. The disc replicator who is a licensee of BD-ROM Media will make a BD-ROM Movie Media from data created by a licensee of Commercial Audiovisual Contents. In general, Cutting Master Format, so called BDCMF, is used as the data transferred from the BD-ROM Commercial Audiovisual Contents licensee to the replicator. Therefore the BD-ROM Commercial Audiovisual Contents is required to verify the created data (Commercial Audiovisual Contents) that it is exactly in conformance with the specification of System Description, Blu-ray Disc Read Only Format part2 and part3, according to the applicable BD-ROM FLLA before transferring the created data (BDCMF) to the replicator.

The Verifier is an official test tool to perform such verification for BD-ROM Commercial Audiovisual Contents. However since the Verifier does not have an execution environment, the exact behavior when the BD-ROM Movie Media is played back on a BD-ROM Movie Player cannot be checked.

Sony provides two types of Verifier which checks the syntax and semantics of data structure and the relationship to verify whether those are compliant with the corresponding specifications or not.

- BDRM-VRF001 BD-ROM File System and AV Verifier
(Format Compliance Check for BD-ROM Part2 and BD-ROM Part3)
- BDRM-CVRF001 BD-ROM Commercial Audiovisual Content Verifier
(Format Compliance Check for BD-ROM Part2 and BD-ROM Part3)

Data which is made by BD Authoring system and eventually will become content on BD-ROM disc takes several forms during the Authoring process. An example of manufacturing process for BD-ROM Commercial Audiovisual Content is shown in a figure below.

Authoring system makes data (BDCMF) for movie content. Therefore Verifier should deal with these data forms. But these shall not be encrypted by AACS or encoded with BD+, otherwise the data cannot be checked. Because the Verifier does not have function for AACS decryption and BD+ decoding.

With regard to such input data form, the followings are considered;

- 1) same data structure (without AACS encryption and BD+ encoding) stored on BD-RE or BD-R,
- 2) raw disc image data (without AACS encryption and BD+ encoding) stored on HDD or other memory device like a flash memory,
- 3) BDMV (same directory and file structure as BD-ROM without AACS encryption and BD+ encoding) stored on HDD or other memory device like a flash memory, or
- 4) BDCMF data (type A)

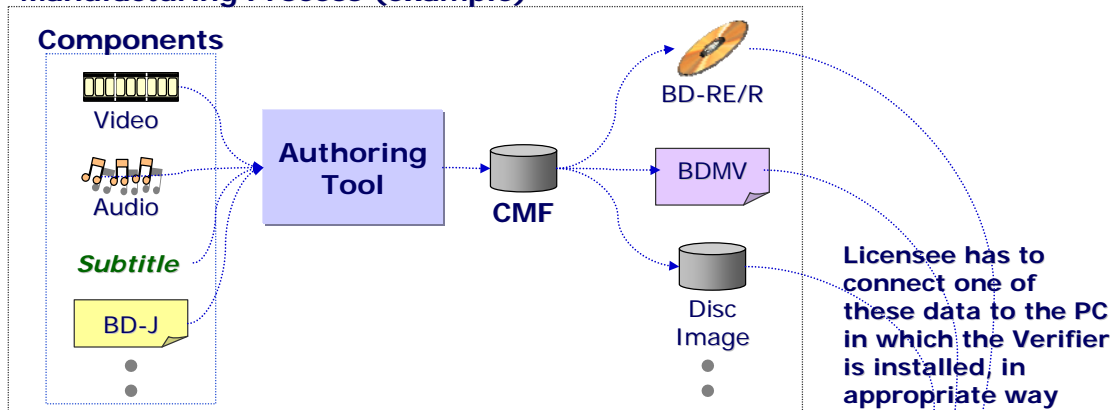
BDROM-VRF001 supports to verify all types of data form described above 1) to 4). However BDROM-CVRF001 supports only BDCMF data. (UD.DAT in BDCMF data)

Supported data form to be verified

Supported form	1) BD-RE/-R	2) Disc Image	3) BDMV structure	4) CMF
BDROM-VRF001	Yes	Yes	Yes	Yes
BDROM-CVRF001	No	No	No	Yes

Manufacturing Process and Verify of BD-ROM Commercial Audiovisual Content

Manufacturing Process (example)



Verify (Self-Test)



1.2 System Requirements

To run the Verifier, the computer system needs to meet the following requirements as a minimum.

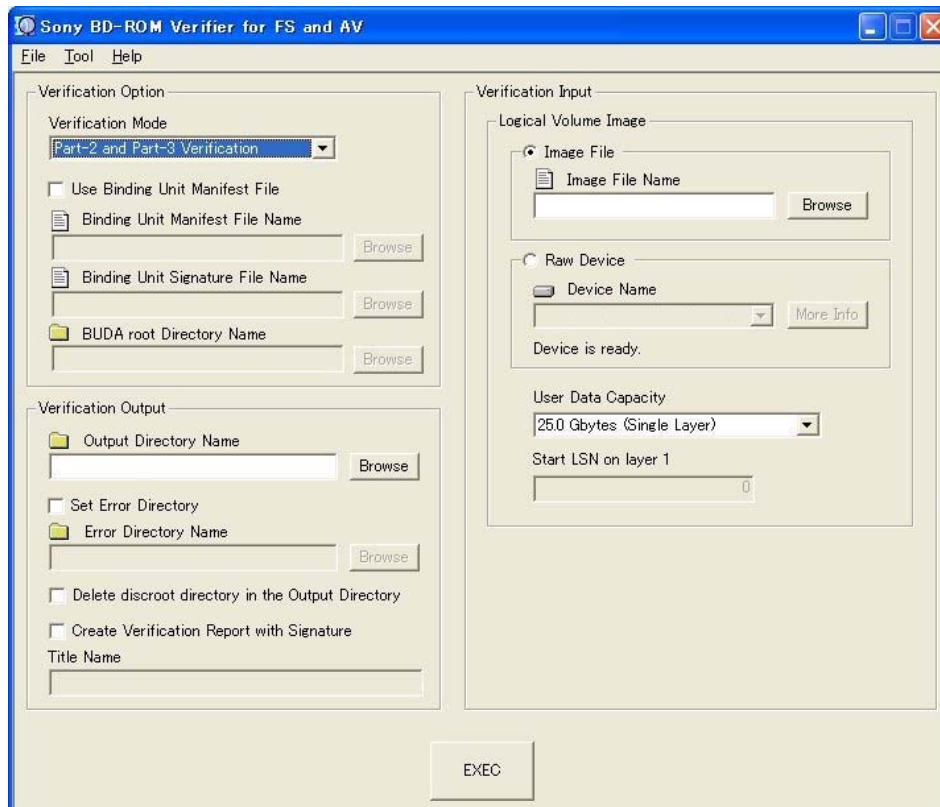
[Note] The Personal Computer System, especially for CPU, memory and so on, affects the runtime of the verification.

- Operating system Microsoft Windows 2000 Professional, Microsoft Windows XP
- Computer with a Pentium(R) 300MHz processor or higher
- Memory 256MB minimum
- Hard disk a minimum of 100MB of free disk space.
(Verifier execution requires free disk space larger than the size of input data)
- Display High-resolution display of SVGA (800x600) or higher;
56 colors or higher,
High Color (65536 colors) or higher recommended
- Disc device CD-ROM drive
- Other USB port for installing the Sentinel SuperPro USB key,
- Appropriate interface (or means) for connecting a TARGET to be verified

1.3 Process of Verifier

Note: detailed operation is described in the Operation Manual of Sony Verifier.

After installing the Verifier software and execute "bdromvfr.exe" it in the installed directory. The following main dialog is displayed. (in case of BDR0M-VRF001)



Before starting the verification, appropriate setting and option-selection are required. Following tables indicate the settings and options.

Verification Option	
Verification Mode	select conformance type: Part2/3, Part2 or Part3 in the pull-down- box
Use Binding Unit Manifest File	if the content is BD-Live, select this option, and appropriate path names of the following three files
Binding Unit Manifest File Name	set the exact path name of BUMF
Binding Unit Signature File Name	set the exact path name of BUSF
BUDA root Directory Name	set the exact directory name where BUDA is stored

[Note] In case of BD-Live content, Sony's Verifier creates the virtual package according the manifest and checks such virtual content on VFS. This virtual content after VFS updating shall not be encrypted by AACS and encoded with BD+.

Verification Output	
Output Directory Name	set the directory name where the log information is stored after verification
Set Error Directory	select this option, if you want to get the detailed error information
Error Directory Name	set the directory name where the detailed error information is stored after verification
Delete discroot directory in the Output Directory	select this option, if you want to delete discroot directory after verification
Create Verification Report with Signature	when this option is selected, the signature is written to the Verification Report (always check this option)
Title Name	write the Title Name (this field is available when the Signature option is checked)

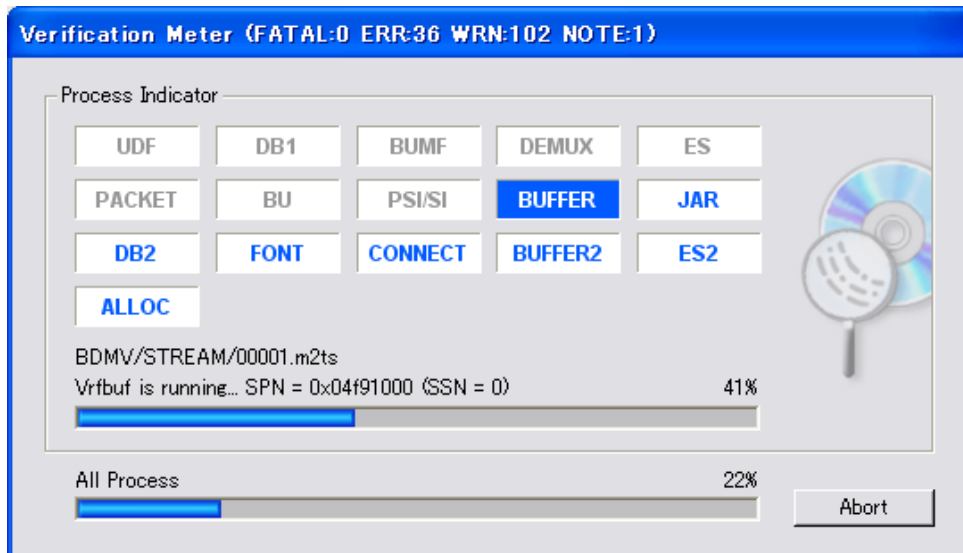
Logical Volume Image	
Image File	select this option, if you want to check the Image data
Image File Name	set the name of such Image File
Raw Device	select this option, if you want to check the data on BD-RE/R
Device Name	set the BD drive name
User Data Capacity	set the capacity of BD disc you want to store data on
Start LSN on layer 1	

After setting of above items and options, click "EXEC" button in the dialog. Then the verification will start. And the verification result is stored in the requested directory after the verification is finished.

In case of BDR0M-CVRF001:

The verifier supports only BDCMF type of data to be verified. So, in order to verify the UD.DAT in BDCMF, you have to select the option of UD.DAT file in the "UD.DAT File Name" box and set a path name of your BDCMF.CMF file in the "BDCMF.CMF File Name" box of Verification Input.

After the verification is started, in both BDRM-VRF001 and BDRM-CVRF001 cases, the Verifier checks the specification compliance of the authored data with BD-ROM part2 and part3. Syntax and semantics of the authored data and appropriate relation between corresponding data are checked. During the verification, the following dialog which indicates the progress of the verification is displayed.



The meaning of each word in Progress Indicator is as follows.

ITEM	MEANING (when it is blinking)
UDF	Check the UDF File System
DB1	Check the Database without the reference of the AV stream
BUMF	Check the Binding Unit Manifest File
DEMUX	De-multiplex the AV stream and Check the TS packet
ES	Check the Elementary stream
PACKET	Check the PES packet
BU	Check the Browsing Unit
PSI/SI	Check the PSI and SI
BUFFER	Check the data buffering according to BDAV-STD Model
JAR	Check the JAR File
DB2	Check the Database and the combination with the AV stream
FONT	Check the Font file
CONNECT	Check the Seamless and Non seamless connection
BUFFER2	Check the data buffering for seamless connection
ES2	Check the relationship of Elementary streams
ALLOC	Check the File/Data Allocation

When the verification is finished, the verification result is generated as a log file in requested directory in the PC.

1.4 Verifier's Result

[Note] *This Clause will be modified soon, according to the discussion result of Verifier-TF.*

As the result of verification, the Verifier creates the log information file with Sony's certificate in a required directory. An example of such log information is shown below.

When the verifier's result is PASS, the following log will be output.

```
Sony BD-ROM Verifier for FS and AV
Version 1.xx Build xxxx
Copyright 2004-2008 Sony Corporation

Supported specifications :
BD-ROM Part 2 File System Specifications Version 1.x
BD-ROM Part 3 Audio Visual Basic Specifications Version 2.x

Title : xxxxxxxx xxxxxxxx xxxxxxxx
Date  : 2008/xx/xx

Error File Path :
C:¥work¥ERROR

Verification : PASS

Detected 0 fatal errors.
Detected 0 errors.
Detected 0 warnings.
Detected 0 notes.

*** /Disc Package/BDMV/AV Streams/00000 ***

*** /Disc Package/BDMV/AV Streams/00001 ***

*** /Disc Package/BDMV/AV Streams/00002 ***

*** /Disc Package/BDMV/AV Streams/00003 ***

*** /Disc Package/BDMV/Binding Unit Manifest File ***

*** /Disc Package/BDMV/Connection ***

*** /Disc Package/BDMV/Database ***

*** /Disc Package/BDMV/ES Relation ***

*** /Disc Package/BDMV/Font ***

*** /Disc Package/BDMV/JAR ***

*** /Disc Package/UDF/Allocation ***

*** /Disc Package/UDF/File System ***

*** END ***
```

When the verifier's result is FAIL, the following log will be output.

```
Sony BD-ROM Verifier for FS and AV
Version 1.xx Build xxxx
Copyright 2004-2008 Sony Corporation

Supported specifications :
BD-ROM Part 2 File System Specifications Version 1.x
BD-ROM Part 3 Audio Visual Basic Specifications Version 2.x

Title : xxxxxxxx xxxxxxxx xxxxxxxx
Date  : 2008/xx/xx

Error File Path :
C:\work\ERROR

Verification : FAIL

Detected 0 fatal errors.
Detected 2 errors.
Detected 4 warnings.
Detected 0 notes.

*** /Disc Package/BDMV/AV Streams/00000 ***

ERR AVTS1001: 1

*** /Disc Package/BDMV/Binding Unit Manifest File ***

*** /Disc Package/BDMV/Connection ***

*** /Disc Package/BDMV/Database ***

ERR CLPI2006: 1
WRN INDX1003: 1
WRN MOBJ1003: 1
WRN MPLS1003: 1
WRN CLPI1003: 1

*** /Disc Package/BDMV/ES Relation ***

*** /Disc Package/BDMV/Font ***

*** /Disc Package/BDMV/JAR ***

*** END ***
```