CompactFlash Association

CompactFlash Association
2022 Fall General Meeting

Day 1

November 16 (Wed)　14:00-17:30 (Hawaii Time)






Welcome by Chairmen

CFA
CompactFlash
Association

Welcome by CFA Board of Directors Chairmen

Nobuhiro Fujinawa
Nikon Corporation

Hiroshi Noda
Canon, Inc.

Attendee Introduction

CFA
CompactFlash
Association

Attendees (in order of company name)

Count	Name	Company	Country
1	Fabian Ebenhoch	Angelbird Technologies GmbH	Austria
2	Hiroshi Noda	Canon, Inc.	Japan
3	Hiro Ino	CompactFlash Association	USA
4	Martin Wood	Delkin Devices, Inc.	USA
5	Jovanne Sanchez	Delkin Devices, Inc.	USA
6	Frank Chen	Exascend Co., Ltd.	Taiwan
7	Shingo Aso	Nextorage Corporation	Japan
8	Kenichi Satori	Nextorage Corporation	Japan
9	Nobuhiro Fujinawa	Nikon Corporation	Japan
10	Hiroki Atarashi	Nikon Corporation	Japan
11	Farshid Tabrizi	Other World Computing, Inc.	USA
12	Wes Brewer	ProGrade Digital, Inc.	USA
13	Hiroshi Machida	Sony Corporation	Japan
14	Kimiyasu Namekawa	Sony Corporation	Japan
15	Yuichiro Shimada	Sony Corporation	Japan
16	Jet Woo	TenaFe, Inc.	USA
17	Muralitharan Jayaraman	Western Digital Technologies, Inc.	India
18	Sharlene Chin	Western Digital Technologies, Inc.	USA

Two-Day Agenda Review

CompactFlash Association




Schedule

US Hawaii Time	Japan Time	India Time	Central Europe ST	US PST	Meeting	Duration	Agenda	Presenter
2022-11-16 08:00-12:00					2022 Board of Directors Meeting	4:00		Hiro Ino (CFA) - President
2022-11-16 12:15-13:45					Lunch	1:30	Tropics Bar & Grill	
2022-11-16 14:00-14:30	2022-11-17 09:00-09:30	2022-11-17 05:30-06:00	2022-11-16 00:00-00:30	2022-11-16 16:00-16:30	Semi-Annual General Meeting	0:10	Welcome by Chairmen	Nobuhiro Fujinawa (Nikon) and/or Hiroshi Noda (Canon)
						0:10	Attendee Introduction	Hiro Ino (CFA) - President
						0:10	Two-Day Agenda Review	Hiro Ino (CFA) - President
2022-11-16 14:30-15:00	2022-11-17 09:30-10:00	2022-11-17 06:00-06:30	2022-11-16 00:30-01:00	2022-11-16 16:30-17:00	Annual Executive Member Meeting	0:30	Election of Directors for 2023	Hiro Ino (CFA) - Election Inspector
2022-11-16 15:00-16:00	2022-11-17 10:00-11:00	2022-11-17 06:30-07:30	2022-11-16 01:00-02:00	2022-11-16 17:00-18:00	Semi-Annual General Meeting	1:00	CFA Operations	Hiro Ino (CFA) - President
2022-11-16 16:00-17:00	2022-11-17 11:00-12:00	2022-11-17 07:30-08:30	2022-11-16 02:00-03:00	2022-11-16 18:00-19:00		1:00	CFexpress Technical Workgroup	Kenichi Satori (Nextorage) - Workgroup Chairperson
2022-11-16 17:00-18:00	2022-11-17 12:00-13:00	2022-11-17 08:30-09:30	2022-11-16 03:00-04:00	2022-11-16 19:00-20:00		1:00	VPG Profile Technical Workgroup	Hiroshi Noda (Canon) - Workgroup Chairperson
2022-11-16 19:00-21:00					CFA Welcome Dinner for Members	2:00	Bali Oceanfront	

US Hawaii Time	Japan Time	India Time	Central Europe ST	US PST		Duration	Agenda	Presenter
2022-11-17 09:00-10:30	2022-11-18 04:00-05:30	2022-11-18 00:30-02:00	2022-11-17 19:00-20:30	2022-11-17 11:00-12:30	Semi-Annual General Meeting	1:30	VPG Profile Technical Workgroup	Hiroshi Noda (Canon) - Workgroup Chairperson
2022-11-17 10:30-11:00	2022-11-18 05:30-06:00	2022-11-18 02:00-02:30	2022-11-17 20:30-21:00	2022-11-17 12:30-13:00		0:30	Product Compliance Workgroup	Hiroshi Noda (Canon) - Workgroup Chairperson
2022-11-17 11:00-12:00	2022-11-18 06:00-07:00	2022-11-18 02:30-03:30	2022-11-17 21:00-22:00	2022-11-17 13:00-14:00		1:00	Marketing Workgroup	Hiro Ino (CFA) - President
2022-11-17 12:15-13:45					Lunch	1:00	Tropics Bar & Grill	
2022-11-17 14:00-14:30	2022-11-18 09:00-09:30	2022-11-18 05:30-06:00	2022-11-18 00:00-00:30	2022-11-17 16:00-16:30	Semi-Annual General Meeting	0:30	Marketing Workgroup	Hiro Ino (CFA) - President
2022-11-17 14:30-15:00	2022-11-18 09:30-10:00	2022-11-18 06:00-06:30	2022-11-18 00:30-00:30	2022-11-17 16:30-17:00		0:15	Wrap-Up and Action Item Review	Hiro Ino (CFA) - President
						0:15	Closing Remarks by Chairmen	Nobuhiro Fujinawa (Nikon) and/or Hiroshi Noda (Canon)
2022-11-17 15:00-17:00					2023 Board of Directors Meeting	2:00		Hiro Ino (CFA) - President
2022-11-17 19:00-21:00					CFA Dinner for Members	2:00	Ruth's Chris Steakhouse	

2022 Annual Executive Member Meeting

CompactFlash Association

2022-2023 Directors Election

- Hiro Ino, President of CFA will preside as Inspector of Election
- Slate of Candidates Approved by Current (2021-2022) Board of Directors (in order of nomination)

#	Candidate	Company	Vote For	Vote Against	Abstain
1	Wes Brewer	ProGrade Digital, Inc.			
2	Nobuhiro Fujinawa	Nikon Corporation			
3	Farshid Tabrizi	Other World Computing, Inc.			
4	Hiroshi Noda	Canon, Inc.			
5	Kenichi Satori	Nextorage Corporation			
6	Hiroshi Machida	Sony Corporation			
7	Edward Hsieh	SiliconMotion, Inc.			
8	Fabian Ebenhoch	Angelbird Technologies GmbH			
9	Sharlene Chin	Western Digital Technologies, Inc.			
10	Hiro Ino	CompactFlash Association	N/A	N/A	N/A

- 9 out of 10 seats are open for election. One seat reserved for President of CFA, ex officio.
- Executive Member representatives in attendance will vote. Majority required for candidate to be elected.
- Quorum Established? (>=10 out of 17 Executive Members)
- Open Election

CompactFlash Association
2022 Fall General Meeting

Day 1

November 16 (Wed)　14:00-18:00 (Hawaii Time)




CFA Operations

Hiro Ino

CFA CompactFlash Association

Agenda

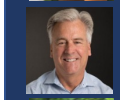
1. 2023 CFA Director Election Results
2. 2023 CFA Officer Appointments
3. 2023 CFA Organization Change
4. CFA Member Status
5. CFA License and Sublicense Agreement Review
6. New Communication Platform for CFA Workgroups
7. Introduction of VPG Profile Certified Product Database (Beta)

2022-2023 Directors Election

- 10 Executive Members were present establishing a quorum
- All candidates on the slate were elected for 2022-2023 CFA Directors
- Final vote count was as follows:

#	Candidate	Company	Vote For	Vote Against	Abstain
1	Wes Brewer	ProGrade Digital, Inc.	10	0	0
2	Nobuhiro Fujinawa	Nikon Corporation	10	0	0
3	Farshid Tabrizi	Other World Computing, Inc.	9	0	1
4	Hiroshi Noda	Canon, Inc.	10	0	0
5	Kenichi Satori	Nextorage Corporation	10	0	0
6	Hiroshi Machida	Sony Corporation	10	0	0
7	Edward Hsieh	SiliconMotion, Inc.	9	0	1
8	Fabian Ebenhoch	Angelbird Technologies GmbH	8	0	2
9	Sharlene Chin	Western Digital Technologies, Inc.	10	0	0
10	Hiro Ino	CompactFlash Association	N/A	N/A	N/A

CompactFlash Association Board of Directors (2022-2023) = 10

	**Nobuhiro Fujinawa**	Nikon Corporation		**Edward Hsieh**	SiliconMotion, Inc.
	**Hiroshi Noda**	Canon, Inc.		**Hiroshi Machida**	Sony Corporation
	**Wes Brewer**	ProGrade Digital, Inc.		**Kenichi Satori**	Nextorage Corporation
	**Sharlene Chin**	Western Digital Technologies, Inc.		**Farshid Tabrizi**	Other World Computing, Inc.
	**Fabian Ebenhoch**	Angelbird Technologies, GmbH		**Hiro Ino**	CompactFlash Association

CompactFlash Association Officers (2022-2023)

Board of Directors

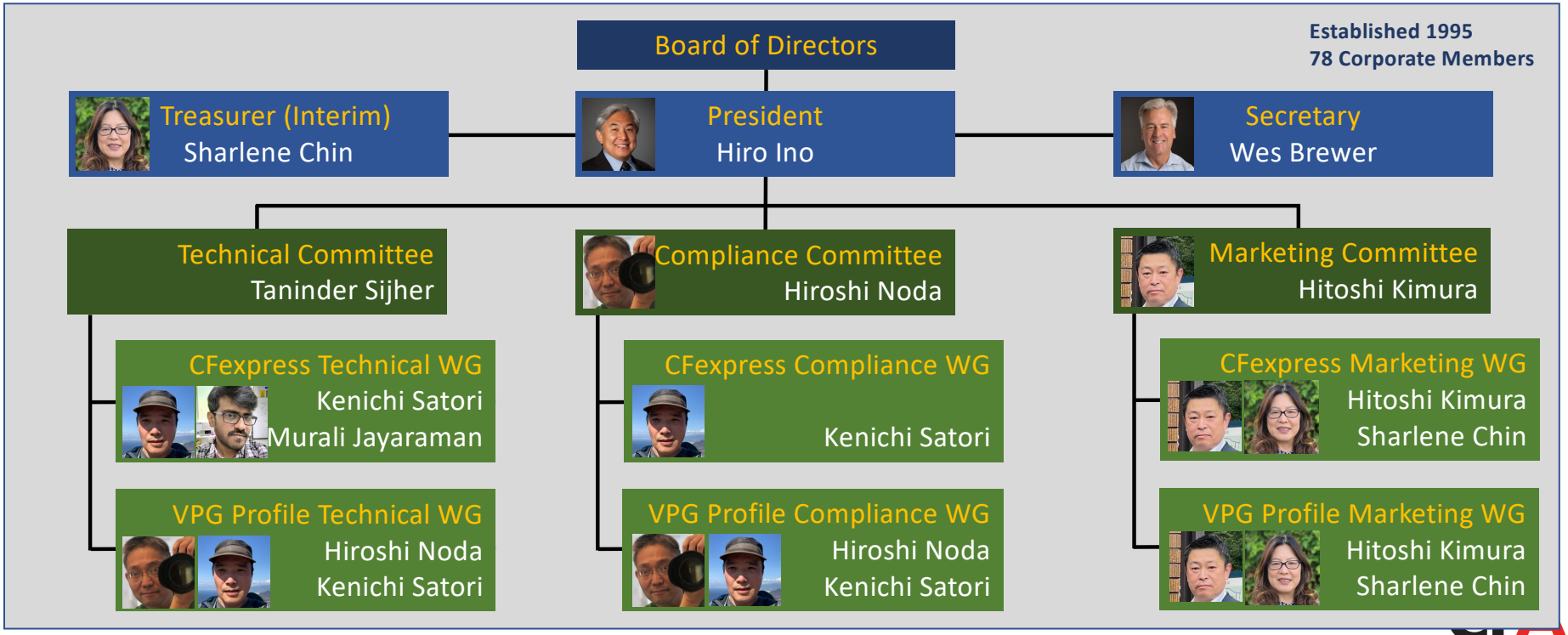
Established 1995
78 Corporate Members

Treasurer
Sharlene Chin

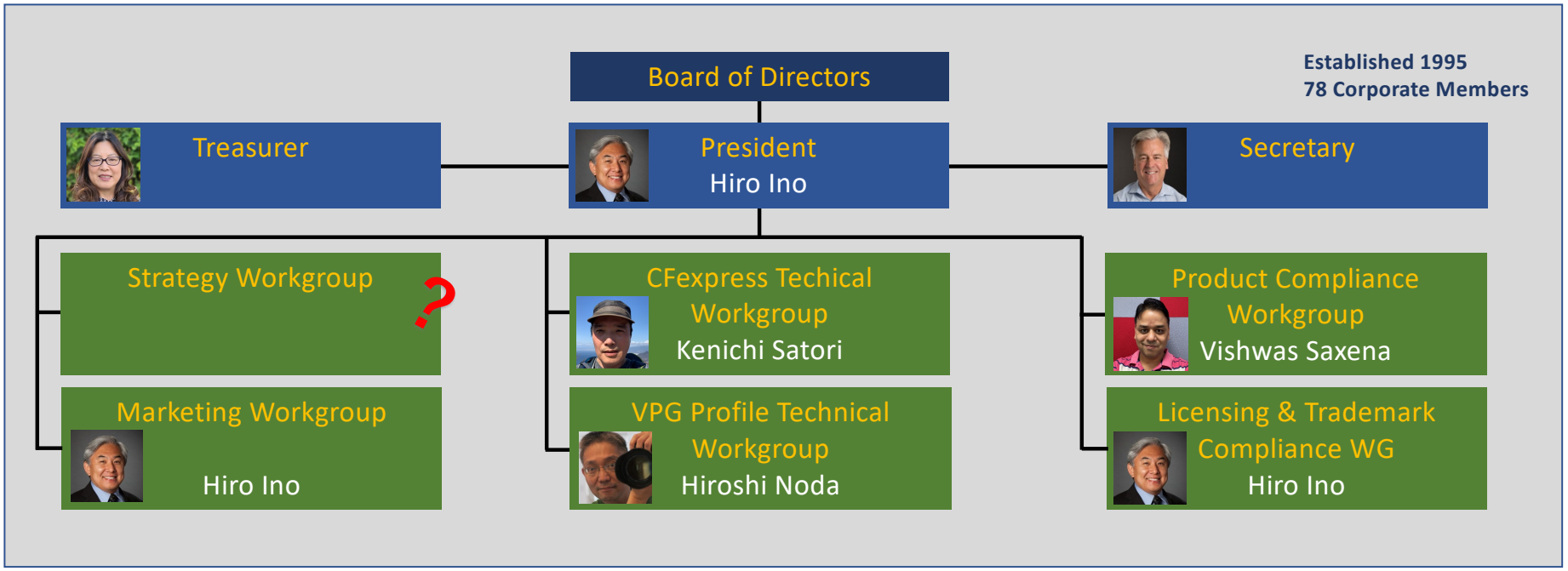
President
Hiro Ino

Secretary
Wes Brewer

CompactFlash Association Organization (2021-2022)



CompactFlash Association Organization (2022-2023)








CompactFlash Association Organization

Strategy Workgroup (TBD)	Define CFA roadmap
Marketing Workgroup	Evangelize CFA and CFA-defined specifications to the public Support member marketing activities
CFexpress Technical Workgroup	Define CFexpress product specifications, test specifications, and development of test fixtures and tools for host/card validation
VPG Profile Technical Workgroup	Define VPG Profile specifications, test specifications, development of test tools, and creation/execution of certification programs
Product Compliance Workgroup	Support compliance and interoperability between members' hosts and cards pre and post production
Licensing & Trademark Compliance	Enforce licensing and trademark compliance worldwide

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2022 CFA Member Status

- Total Member Companies = 78 (plus 7 in penalty box)

- New Member Companies = 7
  1) TenaFe, Inc. (USA)
  2) Other World Computing, Inc. (USA)
  3) HonchiTech (China)
  4) Shenzhen Lingdechuang Technology Co., Ltd. (China)
  5) Rohde & Schwarz GmbH & Co, Ltd. (China)
  6) Shenzhen Dajingyu Technology Co., Ltd. (China)
  7) Victor Hasselblad AB (Sweden)

- Upgraded to Executive Membership = 2
  1) Wise Advanced Co., Ltd.
  2) Exascend (Hong Kong) Co., Ltd.

- Members Left = 2
  1) Kingston Technology Company (USA)
  2) NKI Systems (USA)

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CFA License and Sublicense Agreement Review

- Section 6: Certification of Specification

Is the current process working for CFexpress? Is there a need to change this?

6. Certification of Specification. Prior to any marketing or distribution by Licensee, all Licensed Products using a Licensed Mark (except for flash memory host products) must be certified in accordance with a certification plan to be developed and implemented by the CFA and ratified by its Members ("Certification Plan"). The Certification Plan will include a set of tests the purpose of which will be to ensure the compatibility of all Licensed Products with the applicable Specifications and other standards agreed to by CFA and the members. Licensee agrees not to use any Licensed Mark on any Licensed Products that have not been certified pursuant to the aforementioned Certification Plan; Licensee further agrees to immediately cease the use of all of the Licensed Marks on any Licensed Product that fails to meet the applicable Specification. Licensee agrees that the foregoing are material provisions of the Agreement.




CFA License and Sublicense Agreement Review

- Section 7: Trademark Quality Standards

  This is not actively enforced.

7. Trademark Quality Standards.

a. Upon CFA's request, Licensee shall furnish to CFA, at no expense to CFA, samples of all materials and products containing the Licensed Marks that Licensee currently distributes or intends to distribute, provided, however, if the Licensed Marks are contained in confidential or proprietary materials, Licensee shall furnish to CFA such materials containing the Licensed Marks but may remove or redact any confidential or proprietary information contained therein. CFA shall supervise the control of the quality of the trademark appearance on all materials and products bearing the Licensed Marks and Licensee's use of the Licensed Marks conforms to the requirements set forth in the CompactFlash Association Logo Usage Guidelines established by CFA from time to time (the "Logo Usage Guidelines") . If CFA notifies Licensee that the Licensed Marks are being used in a manner that could diminish SanDisk's or CFA's rights in or protection of the Licensed Marks, Licensee agrees, at Licensee's sole cost and expense, to make whatever changes and/or corrections CFA requires as necessary to protect the Licensed Marks.

b. Licensee agrees that it shall not engage, participate or otherwise become involved in any activity or course of action that diminishes and/or tarnishes the image and/or reputation of the Licensed Marks.

c. CFA shall have the right to inspect Licensee's operations and facilities during normal business hours upon reasonable prior notice and with the prior consent of Licensee (such consent not to be unreasonably withheld), to the extent necessary to ensure that the foregoing quality standards have been and are being met by Licensee.

d. Licensee agrees to comply with all applicable local, state and federal laws and, at all times, to conduct its activities under this Agreement in a lawful manner.

CFA License and Sublicense Agreement Review

- Section 9 Cooperation and Protection

  This clause should be reminded to CFA members. It will be part of the charter form the CFA Licensing and Trademark Compliance WG.

  9. Cooperation and Protection.

  a. Licensee agrees to cooperate with and assist CFA and SanDisk, and, with respect to the Licensed Marks, their owners, in protecting and defending the Specifications and the Licensed Marks and shall promptly notify CFA in writing of any infringements, claims or actions by others (which come to the attention of Licensee) with respect to the Specifications or in derogation of the Licensed Marks; provided, however, that CFA (i) shall have the sole right to determine whether any action shall be taken on account of any such infringement, claim or action solely with respect to the Specifications and (ii) SanDisk, or the owner as designated in Exhibit A, shall have the sole right to determine whether any action shall be taken on account of any such infringement, claim or action with respect to the Licensed Marks that are owned by SanDisk, or such owner, as applicable. Licensee shall not take any action on account of any such infringement, claim or action without the prior written consent of, respectively, CFA, SanDisk, or the respective owner.

  b. Licensee agrees not to apply for registration of the Specifications or the Licensed Marks (or any mark confusingly similar thereto) anywhere in the world. SanDisk or the respective owner may elect to apply for registration of the Licensed Marks owned by SanDisk or such respective owner in a particular country(ies) at its expense, and, in such event and if applicable, Licensee agrees to reasonably assist and cooperate with SanDisk, CFA, or the respective owner in connection therewith.






New Communication Platform for CFA Workgroups

- CFA website workgroup communication functions will be retired

  → Migrating to Basecamp

- Membership management will continue to be maintained on CFA website

Introduction of VPG Profile Certified Product Database (Alpha)

- CFA has been working on creating tools for the following:
  - Streamlined process for application of VPG Profile certification
    Application Form
  - A public database with CFA member's VPG Profile certified products
    Public Database
- Launch is targeted for early Q1 2023






CFexpress Technical Workgroup

Kenichi Satori

CompactFlash Association

CFexpress Technical WG

- Performance target for CFexpress Gen4 cards
- Power table
  - PS1 Support
  - Additional condition for Card Boot up period
- HCTM support
- Operating temperature
- Spec development, release Schedule

Performance target for CFexpress Gen4 cards

PCIe bus Theoretical speed

	Gen3	Gen4
x4 (TypeC)	3940 MB/s	7980 MB/s
x2 (TypeB)	1970 MB/s	3940 MB/s
x1 (TypeA)	985 MB/s	1970 MB/s

PCIe Gen3~128b/130b encode
Actual 98.5%

Product actual speed

M.2	Gen3	Gen4
x4	3500 MB/s	7200 MB/s
x2	1780 MB/s	3730 MB/s
x1	890 MB/s	1870 MB/s

From Gen3 M.2 vs CFexpress Performance
M.2 x2 ≒ TypeB
M.2 x1 ≒ TypeA

CFexpress Card	Gen3	Gen4
x4 (TypeC)	N/A	
x2 (TypeB)	1730 MB/s	**3730MB/s**
x2 (TypeA)	890 MB/s	**1870MB/s**

Gen4 CFexpress card performance estimation

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Power Table (PS0)

- **TechWG agreed following power table**

Parameter	Type A	Type B	Type C *	Notes
Maximum Current	Gen4 : 2500mA	Gen4 : 3000mA	Gen4 : 3500mA	This is defined as the absolute maximum value. The current drawn by the media shall not exceed the maximum current at any time.
	Gen3 : 1500mA	Gen3 : 2500mA	Gen3 : 3000mA (CF express 2.0 7500mA)	
	Gen2 : 1200mA	Gen2 : 1500mA	Gen2 : 2500mA (CF express 2.0 4500mA)	
	Gen1 : 900mA	Gen1 : 1200mA	Gen1 : 1500mA (CF express 2.0 3600mA)	
Normal Average Current	Gen4 : 1400mA	Gen4 : 2000mA	Gen4 : 2500mA	The highest averaged current value over any 1s period.
	Gen3 : 800mA	Gen3 : 1550mA	Gen3 : 2000mA (CF express 2.0 3000mA)	
	Gen2 : 500mA	Gen2 : 650mA	Gen2 : 1550mA (CF express 2.0 1250mA)	
	Gen1 : 450mA	Gen1 : 500mA	Gen1 : 650mA (CF express 2.0 950mA)	
Peak Average Current	Gen4 : 2000mA	Gen4 : 2500mA	Gen4 : 3000mA	The highest averaged current value over any 1ms period.
	Gen3 : 1200mA	Gen3 : 2000mA	Gen3 : 2500mA (CF express 2.0 5000mA)	
	Gen2 : 900mA	Gen2 : 1200mA	Gen2 : 2000mA (CF express 2.0 3000mA)	
	Gen1 : 700mA	Gen1 : 900mA	Gen1 : 1200mA (CF express 2.0 2250mA)	

TypeC all current value (Maximum, Normal Average, Peak Average) revised from 2.0
CFexpress 2.0 TypeC card current values are extremely high (not realistic) so modified based on M.2 measurement results

Power table (PS1)

- CFexpress Card operating at PCIe Gen4 support PS1.
- PS1 power is limited to following power table

Parameter	Type A	Type B	Type C	Notes
Maximum Current	Gen4 : 2000mA	Gen4 : 2500mA	Gen4 : 3000mA	This is defined as the absolute maximum value. The current drawn by the media shall not exceed the maximum current at any time.
	Gen3 : --	Gen3 : --	Gen3 : --	
	Gen2 : --	Gen2 : --	Gen2 : --	
	Gen1 : --	Gen1 : --	Gen1 : --	
Normal Average Current	Gen4 : 1000mA	Gen4 : 1550mA	Gen4 : 2000mA	The highest averaged current value over any 1s period.
	Gen3 : --	Gen3 : --	Gen3 : --	
	Gen2 : --	Gen2 : --	Gen2 : --	
	Gen1 : --	Gen1 : --	Gen1 : --	
Peak Average Current	Gen4 : 1500mA	Gen4 : 2000mA	Gen4 : 2500mA	The highest averaged current value over any 1ms period.
	Gen3 : --	Gen3 : --	Gen3 : --	
	Gen2 : --	Gen2 : --	Gen2 : --	
	Gen1 : --	Gen1 : --	Gen1 : --	

Additional requirement for card boot operation

- PCIe Gen4 card will boot with limited power consumption. (“PS0 boot operation current”)
- After receiving “trigger” command, card can consume 100% current of PS0.
- Details are described in following slides.

“PS0 boot operation current”, Trigger Command

- **PCIe Gen4 “PS0 boot operation current"**

	Normal Average Current	Peak Average Current	Maximum Current
TypeA	1,000	1,500	2,000
TypeB	1,550	2,000	2,500
TypeC	2,000	2,500	3,000

Units: mA

- **Trigger Command**
  - **Command exit from “PS0 boot operation current” and switch to PS0**
  - **Command is listed next page**

Trigger Command List

- **Admin Command Set**
  - **Power Management**
  - **Format NVM**
  - **Sanitize**
- **ALL NVM Command Set's commands**

Trigger Command List

- **Admin Command set**
  - **Define only Power Management, Format NVM and Sanitize command as trigger command**

Feature Identifier	Current Setting Persists Across Power Cycle and Reset [2]	Uses Memory Buffer for Attributes	Feature Name
00h	Reserved		
01h	No	No	Arbitration
02h	No	No	Power Management
03h	Yes	Yes	LBA Range Type
04h	No	No	Temperature Threshold
05h	No	No	Error Recovery
06h	No	No	Volatile Write Cache
07h	No	No	Number of Queues
08h	No	No	Interrupt Coalescing
09h	No	No	Interrupt Vector Configuration
0Ah	No	No	Write Atomicity Normal
0Bh	No	No	Asynchronous Event Configuration

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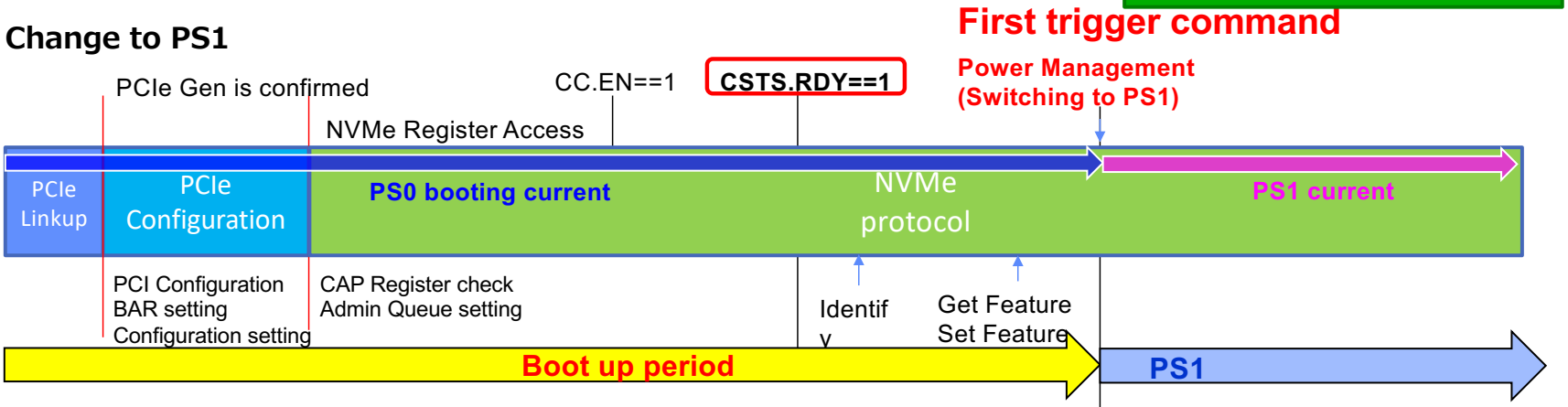
Trigger Command List

- **NVM Command set**
  - **Define all commands as trigger command**

Host with limited heat removal or card power supply

◆Example for TypeA Boot sequence

TypeB and TypeC will support "PS0 boot operation current" with each current table



Power mode	Normal Average Current	Peak Average Current	Maximum Current
PS0 boot operation current	1,000	1,500	2,000

Host with limited heat removal or card power supply and accept "Limited performance"
Host will change PS0 to PS1during "PS0 boot current"

Power mode	Normal Average Current	Peak Average Current	Maximum Current
PS1 current	1,000	1,500	2,000

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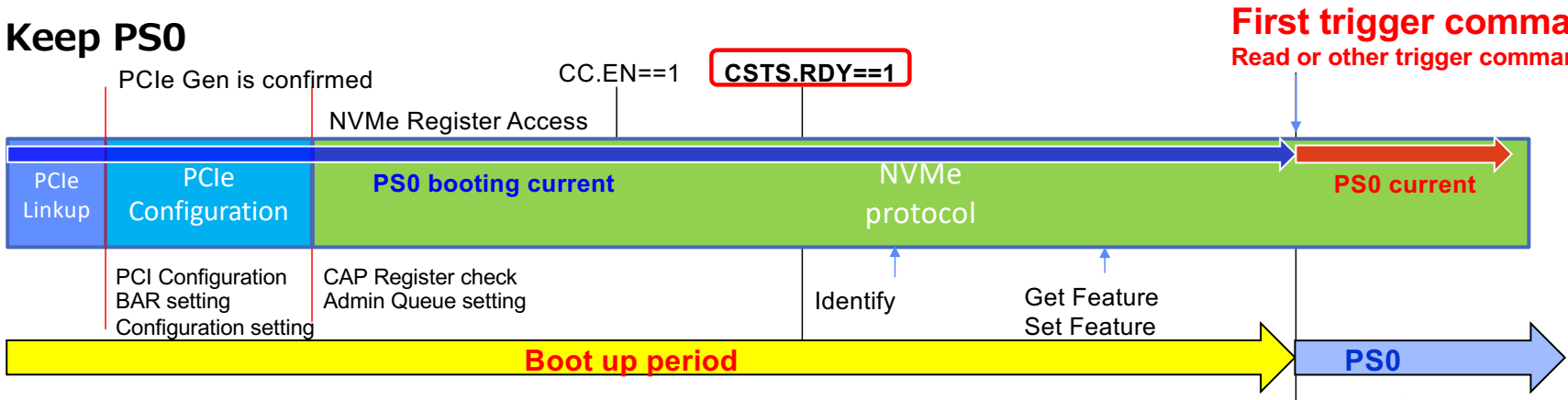
Host with efficient heat removal and enough card power supply

◆Example for TypeA Boot sequence

TypeB and TypeC will support "PS0 boot operation current" with each current table



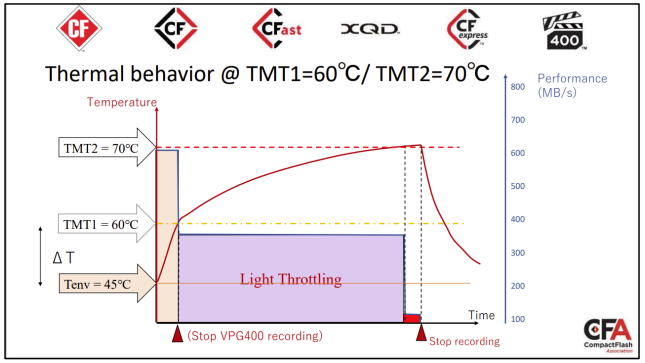
Power mode	Normal Average Current	Peak Average Current	Maximum Current
PS0 boot operation current	1,000	1,500	2,000

Host with efficient heat removal and enough card power supply and expecting "Full performance"
Card operates with PS0 without any additional procedure

Power mode	Normal Average Current	Peak Average Current	Maximum Current
PS0 current	1,400	2,000	2,500

HCTM support

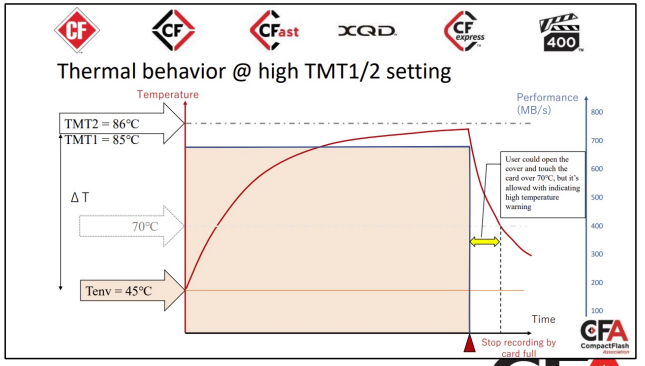
- **HCTM support**
  - **PCIe Gen4 card support HCTM**
  - **HCTM (Host Control Thermal Management) defined in NVMe spec.**
- **Usage**
  - **Host can control card thermal throttling (TMT1, TMT2) between MNTMT,MXTMT**



No HCTM

Host set
TMT1: 60℃→85℃
TMT2: 70℃→86℃

Host can enjoy longer video recording
HCTM parameter MNTMT, MXTMT
depends on
card implementation



HCTM

Operating temperature

Card operating temperature

	CFexpress 2.0	CFexpress 3.0
Type A	Tc (-10~70℃)	Tc (-12~72℃)
Type B	Ta (-10~70℃)	Tc (-12~72℃)
Type C	Tc (-10~70℃)	Tc (-12~72℃)

- All formfactor (TypeA/B/C) card operating temperature is defined by Tc
- CFexpress 3.0 add 2℃ as temperature tolerance

Host thermal requirement

- CFexpress 2.0 has Host thermal requirement
- Host thermal requirement is defined by Ta
- Ta depends on product implementation and cannot defined in spec, we delete this item.

CFexpress Compliance WG

- **Testing for PCIe Gen4 (16GT/s)**
  - Current Test fixture (8GT/s), following are available.
    - Card (TypeA, TypeB)
    - Host (TypeA, TypeB)
  - Current fixture (8GT/s) was designed considering PCIe Gen4 high speed signal (16GT/s) requirement.
  - TechWG will verify current fixture with PCI-SIG Gen4 test platforms. (completed by 2022/12/E)
- **TechWG expects current 8GT/s fixture can be re-used for PCIe Gen4 (16GT/s) card and host.**

Spec development, release Schedule

	2022/Q4	2023/Q1	2023/Q2	2023/Q3	2023/Q4
Logical 3.0 Physical 3.0	★ CFexpress 3.0 Spec Finalize ★-------★ CFexpress 3.0 Spec Drafting		★ CFexpress 3.0 Spec release		
Testing 3.0	★-------★ Test fixture confirmation				




VPG Profile Technical Workgroup

Hiroshi Noda

CFA
CompactFlash
Association

VPG Profile Technical WG

1. Next Generation VPG Profile
2. Proposal and On-Going Discussions Regarding Feasibility with TLC NAND
3. Next Generation VPG Test Specification
4. Next Generation VPG Profile Compliance Tester Status
5. CFA VPG Test fixture

Next Generation VPG Profile

- **Performance: VPG800 and VPG1600**
  - **VPG800: guarantee 800MB/s sequential write**
  - **VPG1600: guarantee 1600MB/s sequential write**
  - **Intermediate number can be added if some applications will require a specific bit rate.**

Next Generation VPG Profile

- **Reduction of Support on PCIe Combinations**
  - **Next VPG will be supported by these configurations in red letters**
  - **VPG1600@Gen4 card may not achieve the same performance when in Gen3.**

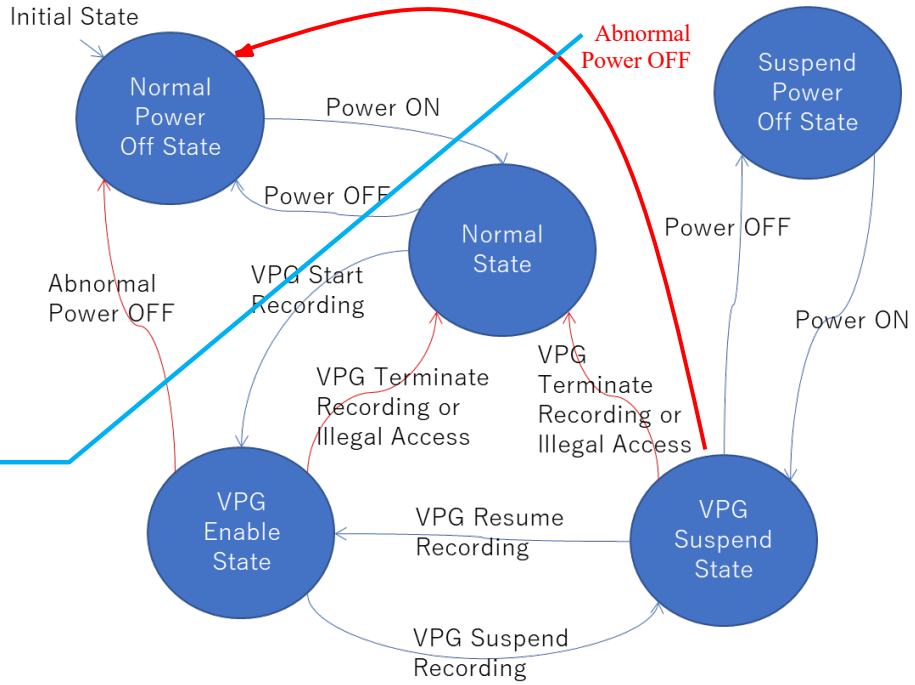
Host			Card	Type A	Type B	Type C
				Gen4	Gen4	Gen4
				x1	x2	x4
				16Gbps	32Gbps	64Gbps
Gen3	x1	8Gbps		-	-	-
	x2	16Gbps			16Gbps	
	x4	32Gbps				32Gbps
Gen4	x1	16Gbps		16Gbps		
	x2	32Gbps			32Gbps	
	x4	64Gbps				64Gbps

Next Generation VPG Profile

- **Making FormatNVM command Mandatory**
  - **Parameter: DWORD10=0**
    - **No secure erase**
    - **Protection information not enabled**
    - **Metadata Setting = 0**
    - **LBA Format = 0**
  - **VPG State shall be *Normal State* with this command**

Next Generation VPG Profile

- **FormatNVM command works as Illegal Access event in VPG Enable State.**
  - **So VPG State shall change into Normal State**



- One more fix
  - This transition path is added, because VPG4.0 lacks the transition from ***VPG Enable State*** to ***Normal Power Off State*** with ***Abnormal Power OFF*** event.

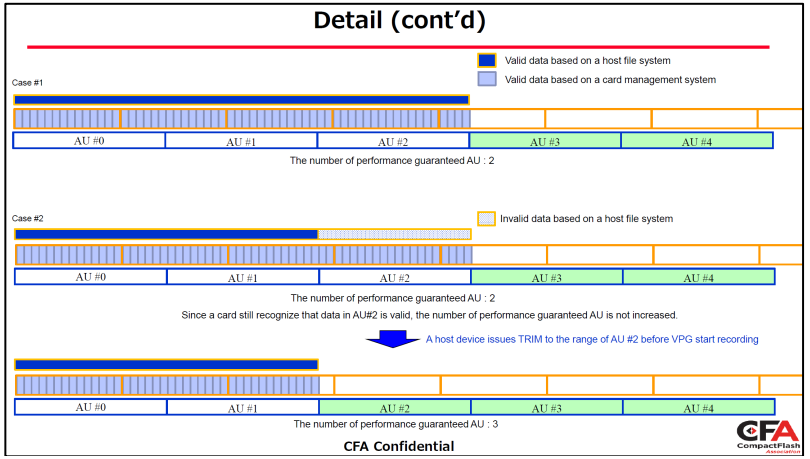
Proposal and On-Going Discussions Regarding Feasibility with TLC NAND

- **Revise AU/RU Size and GW**
  - AU is defined in VPG4.0 as power of 2 (128/256/512MB)
  - TLC NAND Block size isn't fit to such numbers
  - However, the host can not accept AU = NAND Block Size & RU = Optimal Write Chunk Size. This is because there are so many variations of AU/RU depending on the future NAND device.
  - We decide AU={128..1GB} & RU=8MB tentatively and discuss below
- **Writing Procedure for Performance Guarantee**
  - Assuming NAND Block Size not fit to AU, we continue discussion about sequential writing procedure of host
  - Current discussion: how to continue VPG writing after non-VPG host having access to VPG card (see next slide)

Writing Procedure for Performance Guarantee

- Host writes sequentially from AU #0 to #2
  - The number of performance guaranteed AU decreased from 5 to 2
- After stop recording, host deletes AU #2
  - Still the performance guaranteed AU=2
- To increase it, host should issue TRIM to AU #2
  - But it is not predictable how long the TRIM process will takes

- This is not the typical case for the high-bitrate movie shooting, but it's a case of a user mishandling a VPG card



CompactFlash Association
2022 Fall General Meeting

Day 2

November 17 (Thu) 09:00-15:00 (Hawaii Time)




VPG Profile Technical Workgroup

Hiroshi Noda

CFA
CompactFlash
Association

Subjects to be discussed

- Mandating MDTS=32MB, MPS Max=128KB from a “Strongly recommended” in VPG4.0
- A card consuming Gen4 Maximum Current to achieve VPG1600
  - How does it perform when connected to Gen3 host?
- GW size
- Relaxing Random Update test criteria

Next Generation VPG Test Specification

- We will start revising VPG Test Specification after the Next VPG Specification draft have been fixed
- The common initial condition will be relaxed
  - Just issue FormatNVM, no sequential write twice for full capacity

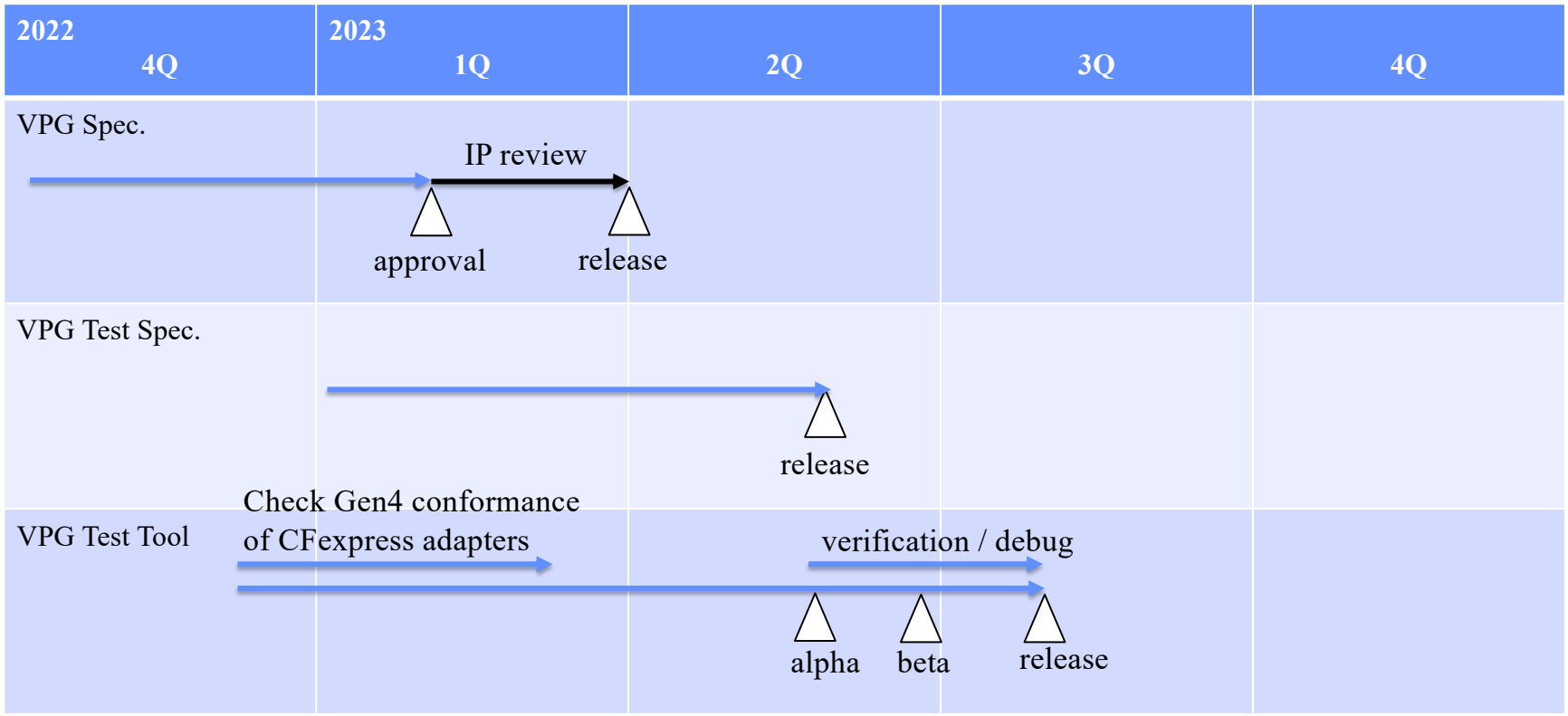
Next Generation VPG Profile Compliance Tester Status

- **PCIe Gen4 Tester**
  - **Candidate: Hirota Smart Tester Gen4**

CFA VPG Test fixture

- **Adaptor Board for PCIe Gen4**
  - **We will confirm the Gen3 board is Gen4-compliant or not**

Milestone (proposal)



Product Compliance Workgroup

CompactFlash Association






Marketing Workgroup

CFA
CompactFlash
Association

(From BoD Meeting) - Decision on Vision and Mission Statement of CFA

VISION STATEMENT

"A vision statement is a short description of an organization's aspirations and the wider impact it aims to create. It should be a guiding beacon to everyone within the organization and something which underpins internal decision-making and determines the intended direction of the organization. In short: the vision is the "why."

To create an inclusive and dynamic ecosystem through broad industry involvement and accessible open-standards framework that will incubate groundbreaking removable media solutions with best-of-breed performance and reliability for a broad range of applications including imaging, automotive, and industrial applications ensuring maximum interoperability and end-user satisfaction.

MISSION STATEMENT

"A mission statement is a short summary of an organization's core purpose, focus, and aims. This usually includes a brief description of what the organization does and its key objectives. In short: The mission is the "what" and the "how."

- **The CompactFlash Association will create a dynamic ecosystem where members' businesses can flourish through open communication and competition**
- **The CompactFlash Association will lead to create the highest-performance open-standard removable media solution to the professional/prosumer digital photography/videography market.**
- **The CompactFlash Association will research and create new solutions that will address the needs of a broad range of applications including Automotive and Industrial applications.**






Marketing Workgroup Initiatives for Discussion

For Members

- **Newsletters on CFA Activity Updates**
  - Send quarterly newsletters to all CFA members through CFA website workgroup or Basecamp
- **Annual CFA Awards**
  - Awards will be given annually during Fall General Meeting
  - Need to decide categories: Card, Host, Readers, Innovation, etc.
  - Selection will be made from products on CFA website press release→ Encourages members to send press releases of new products
- **Market Research**
  - What if CFA conducts market research on CFA-defined cards?
    - Not aware of any market research done by market researchers on CFA-defined cards (market too small)
    - If CFA can collect market data from members and provide market research, it can potentially be another revenue stream for CFA

To the Public

- **China CFA Awareness Campaign**
- **Member Product Database** → Provides official endorsement (not spec guarantee) of member products. Increases traffic into CFA website from end users and media.
- **CFexpress 3.0 Announcement**
- **VPG Profile 5.0 (version TBD) Announcement**
  - Announcement of VPG800 and VPG1600 Logos
  - Messaging on incompatibility with VPG Profile 4.0 and earlier (VPG65/130/200/400)

CFexpress 3.0 and New VPG Profiles: Are New Logos Required?

- Do we need to create a new logo for CFexpress 3.0? Something like the following:

- We will apply for registration of VPG1600 and VPG800 clapboard logos as public announcement approaches. Do we need to create new classes of VPG Profile Logos based on early discussions of implementing VPG profiles for different power states? VPG1600-PS0, VPG800-PS1?

CFA CompactFlash Association

Licensing & Trademark Compliance Workgroup

CompactFlash Association

Charter

- Enforce CFA licensing and trademark compliance worldwide
- Ensure CFA Members understand and follow the CompactFlash Association License and Sublicense Agreement through regular communication
- Orientation and walk-through of the CompactFlash Association License and Sublicense Agreement with new members
- Recommendation for any updates to the CompactFlash Association License and Sublicense Agreement to the Board of Directors

CFA CompactFlash Association

Closing Remarks by CFA Board of Directors Chairmen

Nobuhiro Fujinawa
Nikon Corporation

Hiroshi Noda
Canon, Inc.