
Teradyne

Here is the Teradyne feedback.

The main point actually hinges on a non-technical issue. The thought is that we would prefer to see the scan extension decoupled from the spec at large. More specifically, this document should be an atomic spec extension. This could be accomplished by removing the VUR, some repetitive text on existing records and tweaking the name. The corollary to this approach would be that we would have to release a separate extension which would include (at least) the VUR. I have approval within to do so. There are a number of things which we could roll in to an infrastructure extension. One of which would enable various plugin spec extensions such as this. Eventually I would see the memory extension being another atomic addition. If this thought is acceptable, then we would have to agree on a time frame for the infrastructure extension. I think we could put out a document in the next few weeks so as not to jeopardize the scan extension.

Resolution: We will push the VUR type extension as an infrastructure extension. The infrastructure extension project topics will be tightly managed to avoid derailing the schedule.

Additionally, there were a number of typos and such which aren't worth discussing here.

Finally, on the technical side...

1) The PRR proposed PART_TXT and PART_ID re-use might better be handled by a new infrastructure record. If not, some people are uncomfortable with the way it's written now. It's implied that this is mandatory. They would like to see this marked as optional.

Suggestions : Put them in STR (Phil) –

Resolution: Make the description clear that this information is optional...

2) Why is the first cycle defined as 1 in the PSR (and elsewhere)? I can't recall for sure. IT-wise and internally to our tester, we tend to start at 0.

Resolution: Added a flag in the OPT_FLG in PSR to indicate whether the start is 0 or 1.

3) PSR - is there a way to designate a name for the collection of patterns. This could be optional. We have the notion of a pattern set and we would execute a pattern set. The pattern set consists of 1 or more patterns which would be enumerated in the PSR. We would like to see the pattern set name associated with the PSR.

Resolution: PSR_NAM type: C*n

4) STR - is U*4 sufficient for TOF_CNT and TOTL_CNT? As defined as pins x cycles, this could be an immense number.

Resolution: Assumes a practical bound on number of failures that will be captured.

5) STR - how does (for instance) CYCL_OFST and PMR_INDX relate. Take the example in section C, example STR#1. It depicts a CYCL_OFST = { 233, 456, ... } and a PMR_INDX = { 22, 83, 22,... }. I would assume this translates to a single pin failure on cycle 233 and a single pin failure on cycle 456, etc. If there

were 3 pins failing on cycle 233, would the resulting log look like below?

```
CYCL_OFST = { 233, 233, 233, 456, ... }  
PMR_INDX = { 22, 24, 25, 83, ... }
```

This seems consistent with the pins x cycles count concept, but I wanted to make sure. I don't think I saw a specific usage.

Resolution: Add an example to clarify the usage.

6) Didn't we at one time have a compressed mode for fail data similar to the packing in EXP_DATA and such?

Resolution: Non issue in the compressed scan era.

Regards,
John

Advantest

Ajay,
AT approves the draft format. However, we have one question.

1.0 We believe the formats are driven by EDA ATPG/diagnostic tools using STIL based pattern/timing data. Will this have any impact for customers using WGL and VCD based data. Japan still uses WGL format a lot.

Resolution: No, it won't have any impact. All the fields which assume STIL constructs are optional And in general provide a superset of fields that a WGL/VCD file format allows.

Thanks for any clarification.

Regards,
Mani

Verigy
Hi Ajay,

I have two specific questions which came up during an HVMdiag project meeting this week:

- Is there a need to log failures during the launch/capture cycles or during other parallel (non-shift) cycles which are close to them ?
- Is there a need to log failures BETWEEN the shift statements ?

If yes, do we have the need only for the scan outputs or for all device pins ? And how is it defined in STDF V4-2007 ?

Hmm, I just realized that these are actually four questions.

Thanks for your help -- Michael

Synopsys

From: Paul Todaro
Sent: Thursday, April 10, 2008 5:25 AM

To: Cy Hay; Emil Gizdarski
Cc: Gary Green; Paul Todaro
Subject: RE: STDF meeting

Cy,

Here are my comments.

Thanks,
Paul

Typos:

Here are my typo/inconsistency inputs to the PDF we could find in
http://stdf.bcsweb.com/images/3/30/Ballot_draft.pdf

Page 8: "The standard" remove capital letter "T"

Page 10: Add "a" in "Design Informtion"

Page 11: remove "1" in "Sort1"

Page 12: remove one "the" in "Information on the the type of datalog."

Page 17: change low "s" to capital letter in "the size of a Scanstructure..."

Page 19: remove "s" in "STDF V4s-2007."

Page 21: add "i" after comma in "field,t must" text for C*12

Page 21: remove capital letter in "where The type" text for U*f

Page 22: remove "\" in "nibbles\" text of N*1

Page 24: add a final point to the sentence finishing with "65k record"

Page 35: remove capital letter in "Are all optional," text of X_COORD,Y_CORRD.

Page 36: "SOFT_BIN:" should be in bold

Page 41: add "t" in front of "he" in "A PSR is referenced by he STR"

Page 41: should the text for OPT_FLG be changed to "Contains ATPG_DESC & FILE_UID & SRC_ID field missing flag bits"?

Page 41: PAT_BGN takes the assumption that Cycle #1 is the first executed. Is there a way to know if the first cycle # is 0?

Resolution: Yes, added a bit to indicate start being 0 or 1 in the PSR definition.

Page 42: there is no field named "LOCAL_CNT" in the table page 41 but I guess it should be LOCP_CNT?

Resolution: Yes, Fixed.

Page 42: the table talks about SRC_ID as an array of PatternInSrcFileID. But the text talks about PatternExec block. Is this compatible?

Resolution: Yes, in STIL based flow.

Page 43: add the abbreviation for Scan Test Record STR in the title as the text does for other records section title.

From "Scan Test Record"

To "Scan Test Record (STR)"

Resolution: Done

Page 43: change the sentence from

"It there are more failures then can be contained in a single record,"

to

"If there are more failures than can be contained in a single record,"

Page 44: the text of the first paragraph is referring to table 14 and 15 but no such tables exists in the document. Should it be table 4 and 5 respectively?

Page 44: CYCL_BASE is said to be referring to CYC_NUM but it should be CYCL_NUM.

Page 45: the text describing DATA_SIZE is referring to a Filed called PAT_DATA. But the table for STR does not contain a Field Names called PAT_DATA. Should it be EXP_DATA instead?

Page 45: the keyword CYCL_NUM could not be found in the reste of the document. It seems to be CYC_NUM. Either correct the field name page 45 to CYC_NUM or modify each CYC_NUM in the rest of the text to CYCL_NUM.

Page 46: remove the tabulation to make the following text: bit 1: Reserved for future
Appearing as: bit 1: Reserved for future

Page 47: there is the description of Z-CHAR but this field is not present in the table before. I guess it is Z_FLG, right?

Page 47: the text for Z-CHAR is referring to table 19. But this table does not exists in the document. Should it be table 5 instead?

Page 47: the FMU_FLAG should be changed to FMU_FLG in the entire page 47.

Page 48: there is a closing bracket but no opening one: "STR records)." in the text for MASK_MAP

Page 48: in the text for MASK_MAP, there is a reference to MASK_MAP_FLAG. But this term is not defined before. I guess it is FMU_FLAG bit 3,4 described in table 7, right?

Page 48: the text for MASK_MAP is referring to table 17. But this table does not exist in the document. Should it be table 7 instead?

Page 48: change the sentence in FAL_MAP paragraph from

FAL_MAP (Failures After Logging Map): : This optional field that contains...

To

FAL_MAP (Failures After Logging Map): : This **is an** optional field that contains...

Page 48: change the sentence in FAL_MAP paragraph from

Each pin that is has at least one failure will have its corresponding PMR index bit set to 1.

to

Each pin that **is** has at least one failure will have **its** corresponding PMR index bit set to 1.

Page 48: there is a closing bracket but no opening one: "STR records)." in the text for FAL_MAP

Page 48: change the sentence in the text for FAL_MAP from :

The FAL_MAP field is controlled by the FAL_MAP bits

to

The FAL_MAP field is controlled by the **FMU_FLG** bits

Page 48: the text for FAL_MAP is referring to table 18. But this table does not exist in the document. Should it be table 6 instead?

Page 48: change CYC_CNT to CYCL_CNT to have the same name in table and description text.

Page 49: change CYC_BASE to CYCL_BASE in page 49 to have the same name in table and description text

Page 49: in text for CYC_BASE, modify the sentence from

tester cycle numbers will be have to decoded into ATPG cycles.

to

tester cycle numbers will **have to be** decoded into ATPG cycles.

Page 49: in table 8 correct

1	PMR_INDX
---	----------

In

1	PMR_IDX
---	---------

Page 49: in table 8 correct

4	PAT_DATA
---	----------

In

4	EXP_DATA
---	----------

Page 49: in DATA_SIZE paragraph correct “pattern/expected data (PAT_DATA)” to “pattern/expected data (**EXP_DATA**)”

Page 49: correct the last bullet of this page from:

For PAT_DATA and NEW_DATA only values possible are 4 or 8.

to

For **EXP_DATA** and NEW_DATA only values possible are 4 or 8.

Page 50: correct the sentence from

DATA_CNT: This field contains the size of the array in bytes (U*1 used as a byte) to represent CAP_DATA, PAT_DATA and NEW_DATA as mentioned above.

to

DATA_CNT: This field contains the size of the array in bytes (U*1 used as a byte) to **represent** CAP_DATA, **EXP_DATA** and NEW_DATA as mentioned above.

Page 50: change sentences from:

TXT_LEN: This field specifies the length of the optional string arrays in the datalog. If this is set to 0 then the optional field USR_TXT is considered missing in the record..

to

TXT_LEN: This field specifies the length of the optional string arrays in the datalog. If this is set to 0 then the optional field **USER_TXT** is considered missing in the record.;

In summary: add an E and remove the last point.

Page 50: in LIM_SPEC paragraph, change “LIM_PMRS array. The first location in this array is, location 0 and...” to “LIM_**INDX** array. The first location in this array is location 0 and...”.

In summary: change PMRS to INDX and remove the comma.

Page 51: change the sentence “that so the temperature need not be present in the STR.”

To

“that so the temperature **does not** need be present in the STR.”

Page 51: remove one “in” in the sentence “element for a particular field that is not masked in **in** the DATA_FLG.”

Page 51: change CYC_BASE to **CYCL_BASE** in last paragraph of page 51 to have the same name in table and description text

Page 51: change the last comma “,” to a final point in the sentence “The size of this array is specified in the LOCL_CNT field,”

Page 52: CAP_DATA paragraph. Remove one “in” in the sentence “This function is generally the same as the EXP_DATA array except is **is** intended to”

Page 52: in BIT_POS paragraph, the keyword "CHAIN_NO" needs to be changed as there is no field in the table named like this. I guess that it should be changed to "CHN_NUM", right?

Page 54: correct PMR_IDX to PMR_INDX in sentence "ATPG_NAM: It is the array ATPG signal names corresponding to the pin in PMR_INDX array."

Page 55: the data type is incorrect for CHN_NUM, BIT_POS and CELL_NAM. The text says that they are array. If yes, then add the notation adopted until now in the whole text.

CHN_NUM k*U*2

BIT_POS k*U*2

CELL_NAM k*S*n

Page 55: change the description of CHN_NUM from "Referenced by the CHN_NO array in an STR record"

To

"Referenced by the CHN_NUM array in an STR record"

Page 55: change the text from:

BIT_POS: This is an array for the bit position within the chain identified by the CHAIN_NO field for the target Flip Flop for which the name is provided in the table.

CELL_NAM: The is an array name of the of Flip Flop at the CHAIN_NO and BIT_POS. Please note the type of this field is S*n where the length of the Flip Flop name is stored in the first two bytes and then the name follows.

To

BIT_POS: This is an array for the bit position within the chain identified by the CHN_NUM field for the target Flip Flop for which the name is provided in the table.

CELL_NAM: The is an array name of the of Flip Flop at the CHN_NUM and BIT_POS. Please note the type of this field is S*n where the length of the Flip Flop name is stored in the first two bytes and then the name follows.

Page 57: correct sentence from "This record contains the description of a scan chain in terms it"

To

"This record contains the description of a scan chain in terms of its"

Page 59: what is ATDF? Should it be corrected to STDF?

Page 63: change "STDF 4-2007" To "STDF V4-2007".

Page 66: is there an error in the cycle # in the table below?

File Starting Cycle Ending Cycle

Initial Cycles 1 4

File3 5 2,005

File4 2,006 6,005

File5 6,006 8,505

File6 8,505 12,505

File7 12,525 13,405

For the last two lines I would have written:

File6 8,506 12,505

File7 12,506 13,405

Am I correctly understanding?

Mentor

Here are the feedbacks.

In general, the data fields of each of records are not in alpha numerical order, do you think it's a good idea to sort them? Or I missed something important behind scene?

Resolution: The order is intentional.

- 1) Could we move the Glossary of terms right after Scope of page 8?

Resolution: Yes

- 2) Page 6, the section under figure2, line 5 change to: "the input format of correspondent diagnosis tool"

Resolution

- 3) Page 9 classes of information last bullet:" Fail and expect data and how the data is handled on ATE". For example, how Z is handled on ATE.

Resolution

- 4) In page 11 (in Test identification section), do you think it would be nice to explain what does test suite mean and test pattern file mean. I found out that some people from EDA or ATE area may have different understandings. Here is something we could say (please reword):
 - a. Each test suite is a datalog from one burst
 - b. One burst could consist one or multiple test pattern sets
 - c. Each pattern set is usually one test pattern file which contains certain number of test patterns.
 - d. Each test pattern is a group of vectors consists of input data values and response data value

Resolution: It is defined in the Glossary section. Moving the Glossary in front should clarify the term..

- 5) Page 11: Validation and Synchronization
 - a. (item 4): (Add one more example here) Another example would be an extra cycle may be added during the test mode setup to pulse extra cycle of some set/reset signals.

Resolution:

- 6) Page 12, Format specification, it would be nice to explain what is the cycle based and what is pattern based. Quite a lot of readers are not familiar with it.

Resolution: Check the glossary again.

- 7) Page 41: PAT_BGN: I think we have discussed it and I thought that the number starts with 0 instead of 1. Am I wrong? The reason I am questioning it here is that the test patterns in either STIL or wgl format starts with cycle 0. Is that right?

Resolution: Added a field to allow 0 or 1 as the starting number.

- 8) Page 43: 2nd paragraph, 3rd line: "It there are"-> "If there are".

Resolution:

- 9) Page 48, we talked about MASK_MAP, how about the manually inserted cycles in test program by engineers?

Resolution: manually inserted cycles are handled by PSR.

10) Page 52; PAT_NUM, it indicates the last pattern tested by the tester or last pattern completed test by the tester?

Resolution: Issue is not clear get back to Wu for clarification.

11) ATDF Representation, could you define it in the glossary part?

Resolution: Sure.

12) Last one and the most important one is that we really need some examples in the standard so that people can start working on it quickly.

Resolution: Example files or examples in standard.

Credence

Review Status: Done

Ajay:

I got one feedback from our engineer regarding to our last review. There are some feedbacks do not get into the final version of the STDF version. I believe it must be very good justification that we do not take these inputs. Could you share these justifications with us?

The specific items are the following –

Data Type Codes and Representation:

No "C Type Specifier" for U*8 type (perhaps an unsigned long long ie. 64 bits)

Resolution: Unsigned Long long as the definition

Some records don't follow Rule 1 (Field Names are maximum 8 characters length)

In PSR (page 41): ATPG_DESC

In STR (page 44): CYCL_BASE, DATA_SIZE, DATA_CHAR

In SCR (page 57): MSTR_CLKS, SLAV_CLKS, INVRT_FLG, SCAN_CELLS

Resolution: ATPG_DSC, CYC_BASE, DATA_BIT, DATA_CHR
M_CLKS, S_CLKS, INV_VAL, CELL_LST

Some flag fields don't follow Rule 4 (The flag fields are always defined as data type B*1)

In STR (page 44): Z_FLG and DATA_FLG are U*1

Resolution: Typo, will change to B*1 for DATA_FLG

==> CAUTION: Z_FLG is NOT described

Resolution: It is now called Z_VAL and the two places are consistent in names plus it will remain type U*1

In SCR (page 57): INVRT_FLG is a U*1

⇒ If INVRT_FLG is not a bitfield, it should be renamed.

Resolution: the new name is INV_VAL and type will remain U*1

Thanks,
Daniel
