

# **IVI Foundation**

## **Meeting Summaries**

**Oct. 13 - 15, 2010**

**Boston, MA**

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## Chapter 1 Meeting Attendees

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John Ryland	Keithley Instruments	jryland@keithley.com
Jon Bellin	National Instruments	jon.bellin@ni.com
Kirk Fertitta	Pacific Mindworks	kirk@pacificmindworks.com
Rob Purser	The Mathworks	rob.purser@mathworks.com
Santanu Pradhan	Tektronix	santanu@tek.com
Scott Rust	National Instruments	scott.rust@ni.com
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Tom Sarfi	VTI Technologies	tsarfi@vtiinstrumentation.com
Yves Maumary	Agilent Technologies	yves_maumary@agilent.com

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## Chapter 2 .NET Working Group

### General Meeting Info:

Date of Meeting: October 13, 2010

Location: Boston, MA

Chairperson: Joe Mueller

Minutes Prepared By: John Harvey

### Meeting Attendees:

Name	Company	Email
Arun Veeramani	National Instruments	arun.veeramani@ni.com
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Jon Bellin	National Instruments	jon.bellin@ni.com
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Santanu Pradhan	Tektronix	santanu@tek.com
Scott Rust	National Instruments	scott.rust@ni.com
Tom Fay	Agilent Technologies	tom_fay@agilent.com
Tom Sarfi	VTI Technologies	tsarfi@vtiinstrumentation.com
Yves Maumary	Agilent Technologies	yves_maumary@agilent.com

## Agenda:

08:30-08:45 Meeting Logistics

Review agenda & action items.

08:45-10:45 Code review of the Waveform and Spectrum classes

10:45-11:00 Break

11:00-12:30 .NET Shared Components.

What's still needed?

Creating version 1.0.0.0.

Testing version 1.0.0.0.

Schedule.

12:30-01:30 Lunch

01:30-02:30 Adding Ivi.NET to IviACPwr and the IviFgen extensions.

02:30-03:00 Carry-over from WG discussions

03:00-03:15 Break

03:15-EOD Interop testing / hands on

## Review Action Items

Date Added	Description	Assigned To / Updates	Target Date
General			
2010-06-07	Make sure that all changes to the specs approved by the WG in this meeting are posted to the .NET WG page before the technical committee vote on the Ivi.NET changes.	John Harvey 6/9/2010 – DONE before the technical committee vote.	June 9
2010-06-08	Notify Kevin Lam and Ray Martin to go ahead with getting approval for the C/COM ACPwr spec.	John Harvey 6/8/2010 – DONE.	June 9
2010-06-08	Change the specs to require the approval of the Ivi.NET working group	John	June 9

	for the registration of all IVI.NET drivers released before 9 June, 2011.	6/8/2010 – DONE.	
2010-06-08	Schedule weekly IVI.NET WG meetings starting June 22.	John 6/18/2010 – DONE.	June 21
2010-06-08	Correct SpecAn Assembly properties to refer to “Scope” rather than “SpecAn”	Kirk Fertitta 9/7/2010 – DONE.	July 23
2010-06-08	Remove the trace “Size” property from the IVI.NET assemblies.	Kirk Fertitta 9/7/2010 – DONE.	July 23
2010-06-08	Determine whether .NET 2.0 assemblies will show up in the Visual Studio 2010 Add Reference dialog and under what circumstances. Make a recommendation.	Kirk, David, Rob 7-27-2010 - David did some testing – all 2.0 assemblies do show up if the project target the entire framework. Some do not show up if the project targets just the client profile. 8-10-2010 - Rob is OK with this, and Kirk indicated that he was via email. DONE.	July 31
2010-06-08	Create a new version (v. 1.0.0.0) of the shared components installer with complete Waveform and Spectrum classes, documentation changes, and other known misc. changes	Kirk (assembly DLLs) David (installer)	October 22
Waveform / Spectrum Changes			
2010-06-08	Finish Implementing the Waveform and Spectrum Classes.	Rob Purser 9-21-2010 – DONE pending today’s feedback – some changes needed. 9-28-2010 – DONE – Spec editorial changes done and ready for review. Will review code at Boston meeting.	October 13
2010-06-08	Create unit tests.	Rob Purser 9-21-2010 – DONE pending today’s feedback – some changes needed.	October 13

		9-28-2010 – DONE – Will review at Boston meeting.	
Improve IntelliSense Help			
2010-06-08	<p>Improve IntelliSense help with the following:</p> <p>MANDATORY: Change IVI terminology to .NET terminology. For example, change “attribute” to “property”.</p> <p>ENCOURAGED: In parameter help, refer to corresponding properties where applicable.</p> <p>ENCOURAGED: Use cref tags for enum types, so that we could jump from parameters and properties to the corresponding enumeration / values.</p>	<p>See list of responsible editors in list below.</p> <p>All DONE by Sept. 28.</p>	September 21
	Get instructions to everyone on what needs to be done	John (By June 25) – DONE.	
	IviDriver, IviDcPwr, IviLxiSync	John – DONE.	
	IviScope	Santanu – DONE.	
	IviDmm	David – DONE.	
	IviFgen, IviPwrMeter, IviCounter, IviUpconverter	John – DONE.	
	IviSpecAn, IviRFSigGen	Johannes – DONE.	
	IviDownconverter	Joe – DONE.	
	IviDigitizer	Yves – DONE.	
	IviSwtch	Jason – DONE.	
	Correct comments for factory code.	John – DONE.	
Editorial Changes			
2010-10-	Make changes to specs per Oct. 5, 2010 WG notes and distribute to the WG for	John Harvey – DONE – Oct. 7	October 5

05	review.		
2010-10-05	Post changes for review.	John Harvey – DONE – Oct. 7	October 6
New Attributes			
2010-02-10	Make a proposal for adding new attributes to the assemblies that contain supported instrument models and/or specific driver base classes.	Rob Purser	v. 2
	Add new attributes to specs.	John Harvey	v. 2

## Waveform/Spectrum Code Review.

Rob Purser led the group in a review of the code for the Waveform and Spectrum classes.

Rob chose not to implement a common base class to keep the code for each class all in one place. The code is more understandable that way. Joe Mueller noted that we might choose to implement a Wavelength class in the future, which could affect how the code is partitioned. People were fine with this aspect of the implementation, esp. since this is an implementation detail that does not affect the spec.

The Data property set method makes a copy of the input array into the waveform class' array. This would be a performance issue. Joe noted that, given the existence of PutElements, the Data set method should not do a copy. It should just store the pointer. We should clarify the spec (6.2.1) to make sure that's what it says.

There was some discussion about whether the implementations should be thread safe or not. We decided to explicitly say that the implementations are not thread safe. This follows the pattern of Collection<T>. We may need to propose text regarding this for the spec. We may also want to make statements about PrecisionTimeSpan and PrecisionDateTime. John noted that this shouldn't be necessary since they are already are thread safe – once past the constructor, the internal values never change.

There was some discussion of allowing Start and Stop frequencies to be the same, to support zero-span mode in SpecAn's. It appeared that methods in the SpecAn specification would need overloads to accomplish this. Johannes suggested that we add overloads to Fetch/Read Y Trace that allow waveforms to be returned when time based traces are being returned. There was consensus to do this. The implementation works as is. Johannes will provide the overloads and a short explanatory note to John, who will change the spec. Kirk will add to assemblies.

Johannes also caught two references to complex spectrum in the SpecAn specification that need to be removed.

There was discussion about what negative values are supported by the implementation. We support negative time and frequency intervals, and negative frequencies. Rob may augment unit tests to test these.

## **.NET Shared Components.**

### **What's Still Needed?**

- Waveform/Spectrum implementation changes.
- Two new SpecAn overloads.
- PrecisionTimeSpan anomaly reported by Rob. John needs to investigate.
- All documentation changes have been made by Kirk.
- Kirk needs to make the Lock Manager changes discussed in WG phone meetings.
- Kirk will add compiler warnings to assemblies per next item 1.6.2. These warnings are intended to warn customers away from interfaces that are subject to change. The warning will contain a URL that has more information.

The URL page will have the following text: "Some IVI.NET classes have not been tested with a full driver implementation at this time. If you try to use one of these classes, you will receive a build warning indicating that the interfaces may experience some minor changes. As drivers that implement the class are released by IVI Foundation members, these warnings will be removed"

The URL will also have the following email links for customers to contact: John Harvey, Kirk Fertitta, David Rohacek.

This page will be made available at the same time that we publically post the IVI.NET Shared Components. John will create the page.

### **Creating Version 1.0.0.0**

John asked if we want to release all of the classes when we release the first, or if we want to release classes as drivers are ready for release.

- This would be extra work for NI as the installer creators.
- This would be extra work for tool providers like PMW who would have to adapt tools to partial shared components.
- David suggested that we add a compile switch that would warn the user against using classes that haven't been implemented yet. We could not only warn developers that classes may still change, but also encourage them to report soon-to-be-released drivers.
- Versioning – new files need to be versioned to be updated in the install correctly. We will not provide policy files when we remove compiler warnings for "released" assemblies – we want programs compiled against the "pre-release" versions to fail.

- Kirk will add the warnings. The first choice is to add a warning at the assembly level. If that isn't possible, he will add them to the factory classes.

### **Testing Version 1.0.0.0**

The IVI Foundation will not do testing, but will rely on vendor specific testing, as for other IVI shared components.

### **Schedule**

Finish changes to components.

- Waveform/Spectrum implementation changes. October 15.
- Two new SpecAn overloads. November 10.
- PrecisionTimeSpan anomaly reported by Rob. John needs to investigate. November 10.
- Kirk needs to make the Lock Manager changes discussed in WG phone meetings. November 10.
- Kirk will add compiler warnings to assemblies per next item 1.6.2. November 10.
- John will add new Fgen .NET APIs for new Fgen material. November 5.

PMW - Build new components. November 12.

NI – Build Installer. November 19.

David asked how the release schedule would work if several classes were ready to be released, but on slightly staggered schedules. Joe suggested staging releases to correspond with IVI meetings.

- Expectation – 3 to 4 releases to get all of the classes released. 3 is preferred to keep churn to a minimum.
- Members with drivers to release must give the WG a month advanced notice to allow for the logistics involved in releasing classes.
- We will not release new versions of the installer any more frequently than each two months.

### **IVI.NET for Fgen and ACPwr.**

Yves delivered the Fgen spec to John a couple of weeks ago. Yves modified the pre-IVI.NET spec (3.0). John has integrated the new C/COM material into the spec, but has not added new .NET info for that material.

- Evan noted that some of the new material may be changing somewhat.
- John needs someone to review the integration of that material into the spec. Yves will do the review by Oct. 22. Any material to be added at this meeting will be added to this version of the spec.
- After Yves reviews the spec, he will send it to John. John will add the .NET API to the additional material. That will get us to one copy to be used by both the Fgen WG and .NET WG. John will add the .NET API by Oct. 29. We will start reviewing in the IVI.NET WG on Nov. 9. Rob will review the spec for consistency with IVI.NET standards/guidelines.

- John will have the assemblies done by November 5. David will review the assemblies for consistency with the spec.

ACPwr spec will be voted on at the Technical Committee meeting or within two weeks thereof. The strategy is to wait until after the vote, and to do the work to add the .NET API as the WG has the time. We will not include it in version 1.0.0.0 of the IVI.NET Shared Components.

## Working Group Carryover.

There are currently five specs being reviewed with editorial changes. The review period ends today, and we will notify the technical committee on Friday that the changes have been made and reviewed.

We quickly reviewed the changes.

John reviewed the process for submitting a FogBUGZ defect. IVI.NET defects will be reviewed at least once per month in the IVI.NET WG meetings.

## Waveform/Spectrum Changes

Rob had completed changes to the Waveform and Spectrum classes that were identified in the morning code review session, and reviewed them for the group.

## Meeting Schedule

John will schedule weekly meetings through Dec. 14, and one for Jan. 11. We'll decide then what we need moving forward.

## Action Items

Date Added	Description	Assigned To / Updates	Target Date
General			
2010-10-13	Schedule .NET WG phone meetings.	John Harvey  DONE – 10-20-2010	10-22-2010
2010-10-13	Review integration of .NET material from the current approved spec into the current Fgen WG draft and send to John Harvey	Yves Maumary	10-22-2010
2010-10-13	Add topics to IVI.NET WG agenda. <ul style="list-style-type: none"> <li>• Clarify the description of the Data set method in the spec (6.2.1).</li> <li>• Discuss clarifying the thread safety of IVI classes described in IVI-3.18.</li> </ul>	John Harvey	10-26-2010
2010-10-13	Create overloads for Fetch/Read Y Trace using Waveform (Johannes) and send to John	Johannes Ganzert	10-29-2010

	and Kirk for spec and assembly changes.		
2010-10-13	Add new Fgen .NET APIs for new Fgen material to the .NET Fgen assembly. Send to Kirk for inclusion in .NET assemblies and David for review, and to other WG members.	John Harvey	11-5-2010
2010-10-13	Investigate PrecisionTimeSpan defect and either fix or report back to the WG.	John Harvey	11-10-2010
2010-10-13	Make LockManager changes as discussed in WG phone meetings.	Kirk Fertitta	11-10-2010
2010-10-13	Add compiler warnings for classes that aren't fully tested, and that may still change. See Boston meeting minutes for details.	Kirk Fertitta	11-10-2010
2010-10-13	Add new Fgen .NET APIs for new Fgen material to the current FGen WG draft. Send to Rob for review, and post.	John Harvey	11-10-2010
2010-10-13	Remove references to complex spectrums in the SpecAn specification (4.3.10, 4.3.14)	John Harvey	11-10-2010
2010-10-13	Change SpecAn assembly to include overloads for Fetch/Read Y Trace using Waveform.	Kirk Fertitta	11-10-2010
2010-10-13	Change SpecAn specification to include overloads for Fetch/Read Y Trace using Waveform.	John Harvey	11-10-2010
2010-06-08	Complete all known changes to the IVI.NET assemblies (including Waveform and Spectrum classes, Fgen extensions, documentation changes, and other known misc. changes), build the assemblies with version 1.0.0.0, and deliver to NI	Kirk (assembly DLLs)	11-12-2010
2010-06-08	Create version 1.0.0.0 of the shared components installer with all changes from Kirk.	David (installer)	11-19-2010
Waveform / Spectrum Changes			

2010-10-13	Revise Waveform and Spectrum implementations per discussion	Rob Purser	October 15
2010-10-13	Augment waveform class unit tests to test negative times, intervals, and frequencies.	Rob Purser	???
Create and Document ACPwr .NET API			
2010-10-13	ACPwr .NET spec changes	N/A	???
2010-10-13	ACPwr .NET assembly creation	N/A	???
New Attributes			
2010-02-10	Make a proposal for adding new attributes to the assemblies that contain supported instrument models and/or specific driver base classes.	Rob Purser	v. 2
	Add new attributes to specs.	John Harvey	v. 2

## Chapter 3 IVI Data Conversion Working Group – Meeting Minutes

### General Meeting Info:

**Date of Meeting:** October 14<sup>th</sup>, 2010

**Location:** Boston

**Chairperson:** Yves Maumary

**Minutes Prepared By:** Yves Maumary

### Meeting Attendees:

Name	Company	Phone	Email
Yves Maumary	Agilent Technologies	+41 22 884 3221	<a href="mailto:yves_maumary@agilent.com">yves_maumary@agilent.com</a>
Evan Cone	National Instruments		<a href="mailto:evan.cone@ni.com">evan.cone@ni.com</a>

### Patent Call

Please be aware that this meeting is being held under the Intellectual Property Rights policy adopted by IVI Foundation. If you do not have a copy of this policy, please see me during this meeting. You may also view and download a copy of that policy at the **Membership → IVI Legal Documents** section of the Consortium website.

At this time, I would ask that anyone in attendance inform me if they are personally aware of any claims under any patent applications or issued patents that would be likely to be infringed by an implementation of the specification or other work product which is the subject of this meeting. You need not be the inventor of such patent or patent application in order to inform us of its existence, nor will you be held responsible for expressing a belief that turns out to be inaccurate.

- Nothing new.

### Last Meeting Minutes

The minutes from the previous meetings (September 1<sup>st</sup>) are approved – thanks Evan.

## **Topics To Be Discussed**

- Review action items
- Discuss feedback (see above)
- Plan the addition of the .NET sections for the new extensions and merge of the revision 4.0
- Discuss schedule: prototyping period, review and implement changes, submission of draft for 45 days review period inside IVI, voting

## Review Action Items from Previous Meeting

Owner	Action Item	Status
Yves	<del>Draft description for the new CreateWaveform &amp; CreateWaveformCollection .NET functions used to instantiate Waveform &amp; WaveformCollection objects. The Fetch/Read functions could also mention these functions for .NET.</del>	(17/03/10) There was a discussion in the .NET WG about which .NET collection class to use for multi-record fetch/read. See discussion in minutes from previous meeting (March 17 <sup>th</sup> , 2010). (14/04/10) John Harvey has taken over this action item and will complete it for April 23 <sup>rd</sup> . (23/04/10) Completed – IviDigitizer draft posted for .NET review period.
Yves	<del>Issue with Sparse Markers and Agilent AWG (marker and waveform data must be provided together): can we do it with Data Markers instead? If not, can we make another suggestion for the Sparse Markers? Get feedback from AWG specialists in Agilent.</del>	(03/03/10) Add a CreateChannelWaveformInt32 so we can use Data Markers also for 16-bit AWGs.
Evan	<del>Draft the new IviFgen 3.3 section.</del>	(03/06/10) Done.
Yves & Evan	<del>Check with existing AWGs about the trigger delay. Can we specify a delay? Is it absolute or cumulative with the intrinsic delay of the AWG?</del>	(03/03/10) It's cumulative, but the resolution is much coarser than intrinsic delays anyway. It appears that values used for such delays are much larger and the error due to any intrinsic delays is negligible.
Yves	<del>Ask John Harvey about COM prototyping for the new IviFgen extensions.</del>	(03/03/10) This was apparently a misunderstanding. We therefore need to find a volunteer for an IVI-COM prototype.
Yves	<del>Finish editing the draft and send it to the WG.</del>	(07/06/10) Done.
John	<del>The Fetch/Read functions could also mention these (Create) functions for .NET.</del>	(23/04/10) Completed – IviDigitizer draft posted for .NET review period.
John	<del>Correct the allowed null value to 'null' object for the waveform(s) parameter of the fetch/read calls.</del>	(23/04/10) Completed – IviDigitizer draft posted for .NET review period.
Yves	<del>Add recommendation in description of ArbSeq extension group about drivers implementing ArbSeq also implementing ArbSeqDepth.</del>	(08/06/10) Done. No need to add this because ArbSeqDepth ONLY required if supporting seq of seq.
Evan	<del>Add recommendation in IviFgen 3.3 section about drivers implementing ArbSeq also implementing ArbSeqDepth.</del>	(08/06/10) Done. Decided not to require ArbSeqDepth if ArbSeq supported. Section 3.3 does say that

Owner	Action Item	Status
		if seq of seq supported, then ArbSeqDepth MUST be implemented.
Kirk	<del>Correct the RAW properties AcquisitionStatus.IsXXX to be R/O.</del>	(01/09/10) Done. (15/10/10) Verified by Yves.
Kirk	<del>Correct Source parameter of the Configure SampleClock method: correct type is IviDigitizerSampleClockSourceEnum.</del>	(01/09/10) Done. (15/10/10) Verified by Yves.
Yves	Modify the IviDigitizer specification to use the correct enum (should be IviDigitizerSampleClockSourceEnum), or make sure John Harvey does it.	(23/06/10) Will be done by Yves, from the draft posted on the IVI.NET WG page. (14/10/10) Done by Yves, updated file sent to John Harvey.
Yves	<del>Remove the EventMarker extension</del>	(08/07/10) Done
Yves	<del>Post draft</del>	(08/07/10) Done
Yves	<del>Review the COM hierarchy wrt the spec.</del>	(18/08/10) Done
Evan	<del>Review the C hierarchy wrt the spec.</del>	(18/08/10) Done
Yves	Do the formatting and cross-references corrections.	(14/10/10) Done

## Record of Discussions:

### Prototyping feedback

We started the meeting with all Boston present attendees to get a wider opinion for the first couple items of the feedback from the prototyping started by NI:

1. Should the Datamarker rep cap collection be pre-populated, like channel? IVI is unclear about whether we can post-populate repeated capability collections. The IVI engine does not appear to support this. What changes in the spec if it is not post-populated? (Enabled instead of added).
2. Same issue (even more severe) for SparseMarkers, which almost certainly need to be post-populated.

Those questions arose when starting the prototyping at NI. Some of the tools they use do not support such 'dynamic' rep caps, and it was unclear whether the IVI standard has provisions for it.

Kirk answered that dynamic rep caps *are* possible (and perfectly legal by the IVI specs – they are used by e.g. LXI), the only caveat being that an installer cannot know what rep caps will be there and hence cannot populate the Config Store. Joe suggested we check the LXI specs for guidelines on standard

naming. Kirk thought that the current IviFgen spec draft has proper naming. [We checked with the IVI-3.15: IviLxiSync Specification, and the naming is consistent.]

NI will see how to add support for dynamic rep caps in their tools/process.

We then broke up to another room, with Evan and Yves implementing the following editorial changes into the draft revision 5.0 document (which is a merge of the revision 4.0 with .NET sections, and the Arb extensions without .NET sections – prepared by John Harvey):

1. Remove reviewing comments.
2. The "Invalid Waveform Channel" error mentioned in section 6.3.2 needs to be added to the Error codes section in Chapter 31.
3. Mismatches between attribute names defined in the table 32-4 and the attribute pages themselves, e.g. IVIFGEN\_ATTR\_DATA\_MARKER\_AMPLITUDE vs IVIFGEN\_ATTR\_DATAMARKER\_AMPLITUDE. This was discussed in a previous phone conf, and the decision was to use DATAMARKER (remove the '\_'). The table was thus corrected.
4. Same was done for the SparseMarkers
5. We also noticed that section 6.3.2 was missing the additional specific error code 'InvalidWaveformChannel', so we put it back (as well as add it in chapter 31).

### **Addition of the .NET sections**

The addition of the .NET sections for the new extensions will be done by John Harvey (thanks for the offer!) after review by Yves of the merged document (merge of the revision 4.0 with .NET sections, and the Arb extensions without .NET sections). See also the minutes of the IVI.NET meeting for the completion schedule of the .NET specs.

### **Schedule**

Discussing schedule: prototyping period, review and implement changes, submission of draft for 45 days review period inside IVI, voting.

NI is currently doing prototyping against the IVI-C API.

Agilent will do prototyping against the IVI-COM in November.

We have scheduled a conf call on December 8<sup>th</sup> to have a status on the progress of the prototyping. We will see at that point whether the prototyping needs to be prolonged, or if we can safely go ahead to implement the changes in view of a submission of the draft before Christmas. This would allow the 45-day review period to be over for the next IVI Meeting.

### **Action Items Created:**

<b>Owner</b>	<b>Action Item</b>	<b>Status</b>
Yves	Ask John Harvey why the specific error 'InvalidWaveformChannel' disappeared in the	

Owner	Action Item	Status
	merge process.	
Yves	Review merged document from John Harvey, due October 22 <sup>nd</sup> .	

## Next Meeting

The next meeting is scheduled for December 8th, 4:30 pm (Central European Time). Yves will send out a reminder message at the beginning of that week.

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## Chapter 4 VISA.NET Working Group

### General Meeting Info:

**Date of Meeting:** October 14, 2010

**Location:** Boston, MA

**Chairperson:** John Harvey

**Minutes Prepared By:** John Harvey

### Meeting Attendees:

Name	Company	Email
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## Agenda:

10:30-10:45 Meeting logistics.

10:45-11:00 General review.

11:00-12:30 Conflict Manager Presentation & Discussion.

12:30-01:30 Lunch.

01:30-02:00

- VISA viFindRsc & HiSLIP Discovery.
- VISA VXI Attribute Requests.
- VISA Misc. Topics.

02:00-02:30 Overall convergence of VISA interfaces.

02:30-05:30 Formatted IO Discussion.

- API Presentations by NI and PMW.
- NI Proposal on approach to formatted IO & discussion.
- Break somewhere in here.
- Detailed API Discussions.

## Review Action Items

<i>Date Added</i>	<i>Description</i>	<i>Assigned To / Updates</i>	<i>Target Date</i>
<b>General</b>			
2010-06-09	Initiate a technology form submission of VisaNS.	Jon Bellin 8/31/2010 – Sent documents to Joe Mueller.	??
	Initiate a technology form submission of PMW API.	Kirk Fertitta 9/30/2010 – Sent documents to Joe Mueller.	??

## General Review

John Harvey gave an overview of the progress since the WG was established in Munich and the present. Meetings began in September.

## Conflict Manager Presentation

Jim Piotrowski gave a presentation on the existing C (64-bit) and COM conflict resolution process. This process is used to decide, when multiple VISAs are installed, which implementation of VISA is used for a particular connection. Slides are attached.

There was some discussion of install requirements and the need for a separate .NET installer. Kirk Fertitta asked if vendors could bundle installers so that users don't have to make a separate step of installing the .NET VISA shared components.

Kirk asked about allowing side-by-side installs of VISA.NET versions, and what the conflict resolution implications would be.

Kirk also asked if the IVI.NET resource manager really needed a dependency on the C conflict manager. There was considerable discussion of this point.

Questions that arose in this discussion, for the future consideration of the working group:

- Does the data need to reflect different preferences/choices for .NET and C/COM? For example, should we include data that allows a customer to use Vendor A's VISA.NET for some interfaces or devices when using VISA.NET, and Vendor B's C VISA for the same interfaces or devices when using VISA C.
- Is it a safe assumption that the conflict resolution data should be represented in a single schema and a single file that is used by C, COM, and .NET?
- If so, is it a safe assumption that the logic related to the data can be implemented in a single, unmanaged implementation?
  - What if elements of the .NET solution rely on things that can only be done in a managed environment? Should we avoid elements that rely on a managed environment?
- Is it a safe assumption that a .NET API for the conflict resolution manager is needed? If so, should there be a single API or should vendors provide vendor specific .NET APIs? Do we even need to standardize the API?
- Verify what was decided in phone meetings wrt having a separate installer for VISA.NET components.
- Should the IVI Foundation facilitate getting to Vendor B's VISA C implementation from Vendor A's VISA.NET implementation? If so, how much flexibility should we facilitate?
  - For example, should we create a router for 32-bit Windows? If so, it would not be named visa32.dll, but would be distributed as part of the shared components.
- Should we collect use cases to justify the decisions? These would be useful for testing proposed decisions and making sure that the decisions meet use case criteria?

- What about cases where there is a legacy VISA C/COM or C only implementation on the same machine as a new VISA.NET implementation from another vendor?
- Make sure that we consider both cases where there are static customer choices that are not overridden if the chosen VISA is not present, and also cases where choices made dynamically and saved for future reference, but may be overridden if the preferred VISA is not present.

## **VISA Topics**

### **VISA viFindRsrc & HiSLIP Discovery.**

(really a more general discussion point)

Rohde & Schwarz sent out a message proposing that we add an attribute to indicate “slow” viFindRsrc is permitted or an attribute with same meaning. The intent is to get VISA’s to support LAN based discovery as part of viFindRsrc.

Discussion:

Dan Mondrik noted that NI already immediately reports instruments that announce themselves via mDNS.

From the spec point of view, it doesn’t appear that a change is needed.

The question is, do we specify behavior related to mDNS device detection? Joe Mueller suggested that since VISA doesn’t currently specify discovery, we should not make a change. No one disagreed – there will be no change to the specs on this issue.

### **VISA VXI Attribute Requests.**

VTI Technologies has made a proposal that we add three attributes to VISA to support additional VXI capabilities. They would like to know what to do to work these through the process.

Joe Mueller suggested that he needed to contact Dan Modrik and work through the process via direct contacts and phone meetings. Dan will organize a phone meeting to discuss the content of the proposal with VTI Technologies and Agilent.

### **VISA Misc. Topics.**

Agilent requested that a revision history for the VISA Standard Components be posted to the web site. Jim Piotrowski will follow through with Kirk Fertitta.

John Harvey asked when the VISA 5.0 specs will be posted. Jim inadvertently sent them to the wrong people for posting – he will send to Bob Helsel in the next week.

Kirk Fertitta asked that installer versions be reflected in the Programs and Features dialog. Jim will follow up for VISA. Jon will notify the right NI person for IVI Shared Components.

## Overall convergence of VISA Interfaces

There are three categories of interfaces:

- Resource Manager (discussed earlier)
- Core session and interface interfaces.
- Formatted I/O (Next discussion)

Kirk Fertitta in general likes making the resource manager API static methods, and that's a change that is acceptable to NI.

Jim Piotrowski noted that the core session and interface API is pretty similar and non-controversial. Reconciling these will be pretty straightforward.

## Formatted I/O Discussion

### PMW & NI API Presentations

David Rohacek gave us a presentation of the NI API. Slides are attached.

Kirk Fertitta gave us a presentation of the PMW API. Slides and code were posted previously on the VISA.NET WG page.

NI and PMW code are both posted on the VISA.NET web page.

### NI Proposal: Approach to Formatted I/O

David Rohacek gave us a presentation of the NI proposal. Slides are attached.

Design Questions:

- Is it OK for the common implementation to rely on VISA-C being on the system?
  - Kirk thought that there would be trouble interleaving the two approaches if one was written entirely in managed code and one was delegated to an unmanaged implementation – there would be difficulties managing buffers between the two implementations.
- Do we need to design an internal abstraction to facilitate migration to a pure .NET implementation of VISA.NET?
  - This could be in the form of an interface that abstracts underlying I/O for formatted I/O. The implementations could defer to a VISA C implementation or to a managed code implementation.
  - If the formatted IO is done 100% in .NET, no additional abstraction is needed.

Dan Mondrik noted that the group has used consistency with .NET patterns as a design criterion in the past.

David Rohacek noted that there is another option that involves format providers that is appropriate for .NET.

John Harvey noted that consistency between driver and native VISA.NET patterns of use was important to Agilent, along with maintaining a paradigm that was easy for native VISA.NET users (e.g. both proposed alternatives).

## Meeting Schedule

The next meeting will be November 11. Meetings will be planned for Nov. 11, 18, December 2, 9, 16, and January 6. We will continue the discussion of formatted I/O options on Nov. 11.

## Action Items

<i>Date Added</i>	<i>Description</i>	<i>Assigned To / Updates</i>	<i>Target Date</i>
<b>General</b>			
10/14/2010	Schedule meetings through Dec. 16, & Jan. 13	John Harvey	10/21/2010
10/14/2010	Verify what was decided in phone meetings wrt having a separate installer for VISA.NET components.	John Harvey	10/21/2010
10/14/2010	Create use cases for conflict management for .NET.	All – John Harvey will coordinate	TBD in phone meetings
10/14/2010	Organize phone meeting w/ VTI Technologies & Agilent to discuss new VXI properties for VISA.	Dan Mondrik	11/15/2010
10/14/2010	Add a VISA Standard Components revision history to the shared components web page.	Jim Piotrowski, Kirk Fertitta	11/15/2010
10/14/2010	Post VISA 5.0 specifications	Jim Piotrowski, Bob Helsel	11/15/2010
10/14/2010	Tweak installer to show version in Add/Remove Programs	Jim Piotrowski, Jon Bellin	Next time they are touched.



A Proposal for Rapid Progress on VISA.ppt



NIFormattedIOSummary.pptx

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## Chapter 5 Technical Committee

### General Meeting Info:

**Date of Meeting:** October 14, 2010  
**Location:** Boston  
**Chairperson:** Scott Rust  
**Minutes Prepared By:** Scott Rust

### Topics To Be Discussed:

- Review Agenda
- Review Voting Members In Attendance
- Patent Call
- Approve minutes from the June 2010 Technical Committee Meeting
- Review outcome of recent eVotes, IPR Declarations, Editorial Changes, and Reviews
- Review Action Items from Previous Meeting
- Review Spec Status Document
- User Presentation - Howard Haugstad (Rockwell Automation)
- Working Group Topics
  - Editorial Change to IVI-3.1 Regarding DLL size
  - Issues with VPP 6 Installation Instructions for G-Based Drivers
  - Vote on IVI AC Power Supply Specification
- New Business
  - Release schedule and plan for new version of shared components
  - Discuss requested changes to VISA specification for VXI and PXI
- Discuss Upcoming Meetings

### Voting Members In Attendance

Present	Organization Name	Name
	Aeroflex Corporation	Marv Rozner

Present	Organization Name	Name
X	Agilent Technologies	Joe Mueller
X	Ametek Programmable Power	Kevin Lam
	BAE Systems	Wade Lowdermilk
X	DRS-SSI	Don Essner
X	Keithley Instruments	John Ryland
X	National Instruments	Scott Rust
	Nokia	Torben Christensen
X	Pacific MindWorks, Inc.	Kirk Fertitta
X	Pacific Power Source, Inc.	Eric J. Lord
	Phase Matrix	Michael Granieri
X	Rohde & Schwarz	Jochen Wolle
X	Rockwell Collins	Jason Schares
X	Tektronix	Santanu Pradhan
	Teradyne, Inc.	Teresa Lopes
X	The MathWorks, Inc.	Rob Purser
	TYX/EADS	Chris Gorringe
	VTI Instruments	Steven Ross

There are 11 voting members in attendance, which satisfies the requirements for a quorum of 5 of Voting Members. (Quorum is 25% of Voting Members. There are currently 18 Voting Members.)

#### **Patent Call**

Please be aware that this meeting is being held under the Intellectual Property Rights policy adopted by IVI Foundation. If you do not have a copy of this policy, please see me during this meeting. You may also view and download a copy of that policy at the [Organization>>Legal Documents](#) section of the Consortium website.

At this time, I would ask that anyone in attendance inform me if they are personally aware of any claims under any patent applications or issued patents that would be likely to be infringed by an

implementation of the specification or other work product which is the subject of this meeting. You need not be the inventor of such patent or patent application in order to inform us of its existence, nor will you be held responsible for expressing a belief that turns out to be inaccurate.

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### **Approve minutes from the June 2010 Technical Committee Meetings**

June meeting minutes to be approved at the February 2011 IVI Foundation meeting

**Action Item: Scott Rust approve the June 2010 Technical Committee Meeting minutes at the February 2011 Technical Committee meeting**

### **Review outcome of recent IPR Declarations, eVotes, and Reviews**

#### **AC Power Review Period**

On July 15, 2010, the AC Power Supply WG announced the 45-day review period for the AC Power Supply Specification. The review period was scheduled to conclude on August 20, 2010.

From: "Kevin Lam" <Kevin.Lam@ametek.com>  
To: IVI-Foundation-Members-1@ivifoundation.org  
Date: 07/15/2010 08:50 AM  
Subject: IVI-4.5 AC Power Source Class Specification Version 1.0 ready for review

Hello All,

The AC Power Source Class Specification is open for 45-day review period and will conclude on August 30, 2010.

The IVI-4.5 AC Power Source Class Specification Version 1.0 is posted on the IVI Foundation Website at:

<http://ivifoundation.org/membership/committees/IviACPwrSrc/Default.aspx>

Please forward any comments or corrections to [kevin.lam@ametek.com](mailto:kevin.lam@ametek.com).

Regards,

Kevin

Minor feedback was received on the specification that was included in the draft. Updated draft is posted on the working group page. The group recommends that the Technical Committee vote to approve the AC Power Supply Specification at the October meeting.

### AC Power IPR Declaration

The IPR Declaration for the AC Power Specification concluded on August 23, 2010. The results are listed below. All voting members participated in the IPR Declaration.

Company	Voting Member Representative	Option 3A	Option 3B	Option 3C
Aeroflex	Marv Rozner	x		
Agilent	Joe Mueller		x	
AMETEK	Kevin Lam	x		
BAE Systems	Wade Lowdermilk	x		
DRS Sustainment Systems	Don Essner	x		
EADS/TYX	Chris Gorringe		x	
Keithley	John Ryland		x	
The MathWorks, Inc.	Rob Purser		x	
National Instruments	Scott Rust		x	
Nokia	Torben Christensen	x		
Pacific MindWorks, Inc.	Kirk Fertita		x	
Pacific Power	Eric Lord		x	
Rockwell Collins	Jason Schares	x		
Rohde & Schwarz	Jochen Wolle		x	
Tektronix	Paul Nelson	x		
Teradyne	Teresa Lopes	x		

VTI Instruments	Sangram Gaikwad		x	
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**VISA 5.0 IPR Declaration**

The VISA 5.0 IPR Declaration concluded on August 9, 2010. The results of the IPR Declaration are shown below. All voting members participated in the IPR Declaration.

Company	Voting Member Representative	Option 3A	Option 3B	Option 3C
Aeroflex	Marv Rozner	x		
Agilent	Joe Mueller		x	
AMETEK	Kevin Lam	x		
BAE Systems	Wade Lowdermilk	x		
DRS Sustainment Systems	Don Essner	x		
EADS/TYX	Chris Gorringe		x	
Keithley	John Ryland		x	
The MathWorks, Inc.	Rob Purser		x	
National Instruments	Scott Rust		x	
Nokia	Torben Christensen	x		
Pacific MindWorks, Inc.	Kirk Fertita		x	
Pacific Power	Eric Lord		x	
Rockwell Collins	Jason Schares	x		
Rohde & Schwarz	Jochen Wolle		x	
Tektronix	Paul Nelson	x		
Teradyne	Teresa Lopes	x		
VTI Instruments	Sangram Gaikwad		x	

## IVI.NET Editorial Changes

On October 7<sup>th</sup>, John Harvey announced IVI.NET editorial changes via the email below

<p>From: <a href="mailto:john_harvey@agilent.com">john_harvey@agilent.com</a></p> <p>To: &lt;IVI-Foundation-Members-1@ivifoundation.org&gt;</p> <p>Date: 10/07/2010 04:48 PM</p> <p>Subject: Review Period Starting for 5 Specifications with IVI.NET Editorial Changes</p> <p>The IVI.NET Working Group has identified a set of editorial changes to the following specifications:</p> <ul style="list-style-type: none"><li>• IVI-3.1_Architecture Specification</li><li>• IVI-3.2 Inherent Capabilities Specification</li><li>• IVI-3.3 Cross Class Capabilities Specification</li><li>• IVI-3.18 IVI.NET Utility Classes and Interfaces Specification</li><li>• IVI-4.2 IviDmm Class Specification</li></ul> <p>In addition, there is a Change Document that covers all of the changes to the documents except IVI-3.18.</p> <ul style="list-style-type: none"><li>• Change Document for IVI.NET Editorial Changes</li></ul> <p>The review period for these documents start October 7, 2010, and runs through October 14, 2010. Please send comments to John Harvey. By the end of the day on October 14, 2010.</p> <p>The intent is to have the technical committee vote on these changes at the IVI Technical Committee meeting on Oct. 15 in Boston.</p> <p>Regards,</p> <p>John Harvey</p>
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**There was no review feedback regarding the proposed changes. The Editorial Changes are accepted.**

### Review Action Items from June 2010 Meeting

Owner	Action Item	Status
Scott Rust	Update the lifecycle document to indicate that Utility and Classes are in the same state as .NET WG and that the spec has been reviewed as part of the .NET review. And the IPR declaration covers it.	Complete

Owner	Action Item	Status
Jon Bellin and David Rohacek	Fill out technology form (Appendix A of the IPR policy, 2005-05-02) for VisaNS , and submit the form along with the VisaNS definition to Scott Rust, Joe Mueller, and John Harvey.	Complete
Yves Maumary	Correct IviDigitizer specification and run review process	Incomplete. Yves to start the editorial review period today.
Kirk Fertitta	Correct IviDigitizer and IviCounter shared components and send to NI for an installer update and run the review process	Complete
Jon Bellin	Provide new shared components installer with IviDigitizer and IviCounter updates	Complete

Action Item: Scott to sign NI's IPR declaration for VisaNS, scan the documents, and send to John Harvey and Bob H.

Action Item: BoB H to consolidate IPR declarations and other legal scanned documents in the Legal Working Group portion of the IVI Members Only area.

### Review Spec Status Document

The group reviewed and edited the Spec Status Document.



IVI\_Spec\_Lifecycle\_Status.xls

Action Item: John Harvey put links to previous version of the .NET specs in the Member Only areas.

### User Presentation - Howard Haugstad (Rockwell Automation)

Note: The presentation was not available for inclusion.

### Working Group Topics

#### Editorial Change to IVI-3.1 Regarding DLL bitness

Jon Bellin suggested that we make the following editorial change to IVI-3.1, Section 5.17.12: Replace the following:

Microsoft Windows 32-bit Dynamic Link Library (.dll).

with the following:

Microsoft Windows Dynamic Link Library (.dll).

Rationale: According to IVI-3.17 Section 1.3.3 and 2.3.1.1.1, IVI driver suppliers can create installers that contain a 32-bit driver, a 64-bit driver, or both a 32-bit driver and a 64-bit driver. A 32-bit IVI.NET driver will have a 32-bit DLL, and a 64-bit IVI.NET driver will have a 64-bit DLL. The packaging sections for IVI-COM and IVI-C (sections 5.15.10 and 5.16.13) do not specify the bitness of the DLL.

**Action Item: Jon Bellin to run Editorial change process for IVI-3.1 regarding DLL bitness**

#### **Issues with VPP 6 Installation Instructions for G-Based Drivers**

NI gave a brief overview with issues with the installation instructions for G-Based Drivers in the VPP-6: Installation and Packaging Specification

Resolution (2010-10-15:#01): Jon Bellin moves the IVI Foundation modify Section 5 of VPP-6: Installation and Packaging Specification to match current practice for G-Based Drivers. This change will be run as an Editorial Change. Seconded by Joe Mueller. 8 YES votes. 0 NO votes. The resolution is approved.

**Action Item: Jon Bellin to run Editorial change process to update Section 5 of VPP-6: Installation and Packaging Specification to match current practice for G-Based Drivers.**

#### **Vote on the IVI AC Power Supply Specification**

Resolution (2010-10-15:#02): The IVI AC Power Source Working Group moves that the IVI Foundation approve the IVI AC Power Source Specification. 10 YES votes. 0 NO votes. The resolution is approved.

#### **Release schedule and plan for new version of shared components**

Kirk discussed the need to release the Type Libraries for AC Power Source as part of an updated version of the shared components. Goal is to conclude the release of the updated shared components by the end of January 2011.

Action Item: Kirk to run the review and release process for the IVI Shared Components to incorporate the AC Power Source type libraries.

**Discuss requested changes to VISA specification for VXI and PXI**

Action Item: Dan Mondrik to lead VISA working to review the changes requested by the VXI 4.0 Technical Working group, to consider additions for PXI interoperability, and then make recommendations/motions to the IVI Technical Committee on what work to start in the IVI Foundation.

**New Business**

No other new business topics were raised.

**Discuss Upcoming Meetings**

The next meeting will be Feb 7<sup>th</sup> – 9<sup>th</sup>. Location TBD. Goal was to be in Austin. Looks like it is difficult due to already scheduled conferences in Austin. In the case we can't find a suitable hotel, we will go to Las Vegas. Bob to confirm location by the end of October.

Working Group	Time
IVI.NET (including interop)	½ day
Technical Committee Meeting and BoD and Annual Meeting	½ day
Marketing Committee and Camtasia review	2 hrs in track 2 working session, 1 hr for the combined group
Shared Components Management	1 hr
VISA	1/2 day
VISA.NET	1 day
Data Conversion - FGen	1/2 day

VISA.NET should not conflict with IVI.NET. Shared Components Management should not conflict with VISA.NET, IVI.NET.

Criteria for IVI meeting locations (from Feb 2010 TC meeting minutes):

For US meetings:

- Major airport hub that allows most members a non-stop flight (examples: Denver, Dallas, Orlando, Las Vegas, Chicago, St Louis, Los Angeles, Atlanta)
- Hotel journey is 20 minutes on Google maps.
- Sleeping room price should target \$100 but not exceed \$130. Willing to go higher on sleeping room price if it is walking distance to restaurants and avoids rental car.
- Internet bundled into the cost.

The group considered San Diego, Las Vegas, and Austin as the three sites for 2011. Las Vegas and Austin would not be very good for summer. So, Austin-San Diego-Las Vegas, or Las Vegas-San Diego-Austin.

The group expressed willingness to relax the major airport hub slightly to include cities that are still easy to get to, but not necessarily major airport hubs. This includes San Diego and Austin.

The meeting after the February 2011 meeting is tentatively scheduled for May 18<sup>th</sup> – 20<sup>th</sup> in San Diego. The group selected Denver as an alternate location.

Goal is to go to Austin October 3<sup>rd</sup> – 5<sup>th</sup>. Bob will confirm that this date is possible by the end of October 2010.

**Summary of Action Items Created at the October 2010 Technical Committee Meeting**

Owner	Action Item	Status
Scott Rust	Scott Rust approve the June 2010 Technical Committee Meeting minutes at the February 2011 Technical Committee meeting	
Yves Maurmary	Correct IviDigitizer specification and run editorial review process	
Scott Rust	Scott to sign NI's IPR declaration for VisaNS, scan the documents, and send to John Harvey and Bob H.	
Bob Helsel	BoB H to consolidate IPR declarations and other legal scanned documents in the Legal Working Group portion of the IVI Members Only area.	
John Harvey	John Harvey put links to previous version of the .NET specs in the Member Only areas.	
Jon Bellin	Jon Bellin to run Editorial change process for IVI-3.1 regarding DLL bitness	
Jon Bellin	Jon Bellin to run Editorial change process to update Section 5 of VPP-6: Installation and Packaging Specification to match current practice for G-Based Drivers.	

Owner	Action Item	Status
Kirk Fertitta	Kirk to run the review and release process for the IVI Shared Components to incorporate the AC Power Source type libraries.	
Dan Mondrik	Dan Mondrik to lead VISA working to review the changes requested by the VXI 4.0 Technical Working group, to consider additions for PXI interoperability, and then make recommendations/motions to the IVI Technical Committee on what work to start in the IVI Foundation.	

**Adjourn**

Meeting Adjourned.

## Chapter 6 IVI BoD Meeting Oct 15, 2010

Called to order at: 2010-10-15

**Directors in attendance**

Present	Director	Company

X	Don Essner	DRS Sustainment Systems, inc
X	Rob Purser	MathWorks
X	Kirk Fertitta	Pacific MindWorks, Inc.
X	Jason Schares	Rockwell Collins
	Teresa Lopes	Teradyne
X	Joe Mueller	Agilent Technologies
X	Scott Rust	National Instruments
X	Jochen Wolle	Rohde & Schwarz

Quorum is a majority of directors. 7/8 satisfies the requirement.

## Agenda Review

### IVI BOD MEETING OCT 15, 2010

1. DIRECTORS IN ATTENDANCE
2. AGENDA REVIEW
3. REMINDER OF THE IP POLICY, ANTI-TRUST, AND DUTY OF TRUST OF DIRECTORS
4. RESOLUTIONS PASSED BY ELECTRONIC MEANS SINCE LAST MEETING
5. REVIEW MINUTES OF PREVIOUS MEETING
  - 5.1 ACTION ITEMS FROM PREVIOUS MEETING
6. IP DISCLOSURES REPORT
7. FINANCIAL REPORT
8. MOTION FROM TC REGARDING AC POWER SOURCE
9. REPORT FROM MARKETING COMMITTEE
10. MEMBER USE OF FOUNDATION OWNED DOCUMENTATION INCLUDING PROSE AND FIGURES
11. OTHER NEW BUSINESS

## Reminder of the IP Policy, Anti-trust, and Duty of Trust of Directors

The IVI Foundation has an IP policy that could require that some of your corporations' IP be licensed to the IVI Foundation and its members at no cost. Every participant in the IVI meetings should be familiar with the obligations that participation in the standard incurs on your company.

Every member of the consortium is encouraged to familiarize themselves with legal requirements regarding anti-trust violations. Members need to be cautious and refrain from discussing markets and pricing.

Directors have a duty to the IVI Foundation. They are legally and ethically obligated to do the "right thing" for the IVI Foundation since they serve as a principal of that organization, if this conflicts with other responsibilities such as their duty to their employer, they need to take appropriate actions to resolve the conflict of interest.

## Resolutions passed by electronic means since last meeting

No motions were passed by the Board of Directors since the last face-face meeting:

## Review Minutes of Previous Meeting

Posted recently accept inputsthrough the next meeting.

## Action Items from Previous Meeting

ITEM	OWNER	UPDATE
Make proposal to BoD regarding use of consortium materials in documentation	Joe	On the agenda for today.
Discuss work needed on driver registration page to Tango (need to add IVI .NET). Arun to approve (or not) work.	Kirk	Still open, will review for next meeting.

## Financial Report

Bob Helsel provided:



IVI 2010 P&L thru  
10-4-10.xls

We currently have dues of 7.5K for sponsors and 1.5K for general members. Continue for next year.

\*\* Tempoary adjournement for Lunch \*\*

## **Report from Marketing Committee**

No report from the marketing committee was discussed in the Bod since the marketing meeting preceded the BoD and had the same attendees.

## **Member use of Foundation owned documentation including prose and figures**

From previous discussion (both e-mail and last meeting):

- Do not want to limit the grant to members since tool vendors want to use and pass on to their customers
- Do not want to limit to drivers because tool providers also should be able to make use
- Want to grandfather existing documentation
- Probably want to incorporate in a spec somewhere so the decision remains visible and is maintained.

Draft motion:

RESOLUTION: In order to facilitate the distribution of a clear and consistent explanation of the IVI APIs to end users, the IVI Foundation grants anyone publishing documentation for IVI compliant products or documentation

regarding the use of IVI compliant products the right to reproduce material from the IVI specifications, providing they reference the IVI Foundation as the copyright owner and include the following notice:

Content from the IVI specifications reproduced with permission from the IVI Foundation.

The IVI Foundation and its member companies make no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The IVI Foundation and its member companies shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

Documentation published before July, 1, 2011 that reproduces material from the IVI specifications shall have until January 1, 2016 to add the required citation.

To make visible we could put this on the spec download page.

Scott Rust moves we pass the resolution outlined above. Done Essner seconds.

In favor 6

Opposed 0

#### ACTIONS

1. Joe send final prose to Bob and Jon
2. Jon will arrange to incorporate into IVI 3.1

Scott moves that Jon incorporate this into IVI 3.1 and summarize the action at the February meeting.  
Seconded Kirk

In FAVOR 6

Opposed: 0

Motino passes.

## **Motion from TC Regarding AC Power Source**

Technical committee recommends that the BoD confirm the IVI AC Power Source specification.

In favor 6

Opposed 0

ACTION: Bob Helsel move the spec from the working group area to the main spec download area.

## **VISA Updates**

Technical committee moves we approve VISA 5.0 that includes VISA updates for shared USB TMC kernel, HiSLIP, 64-bit VISA format specifiers, and 64-bit VISA-COM updates.

In favor: 6

Opposed: 0

## **Other New business**

Motion to adjourn (Don), Seconded (Jason)

Adjourned 13:40 Eastern