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8. IVI MARKETING COMMITTEE MEETING MINUTES

9. IVI BOD MEETING FEB 2, 2014

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## 1. Meeting Attendees

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bellin</td>
<td>Jon</td>
<td>National Instruments</td>
</tr>
<tr>
<td>Cherian</td>
<td>Vinod</td>
<td>Mathworks</td>
</tr>
<tr>
<td>Fertitta</td>
<td>Kirk</td>
<td>Pacific MindWorks</td>
</tr>
<tr>
<td>Harvey</td>
<td>John</td>
<td>Agilent</td>
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<tr>
<td>Helsel</td>
<td>Bob</td>
<td>Bode Enterprises LLC</td>
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<tr>
<td>Kruger</td>
<td>Adri</td>
<td>National Instruments</td>
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<td>Mondrik</td>
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<td>National Instruments</td>
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<td>Mueller</td>
<td>Joe</td>
<td>Agilent Technologies</td>
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<tr>
<td>Rohacek</td>
<td>David</td>
<td>National Instruments</td>
</tr>
<tr>
<td>Ryland</td>
<td>John</td>
<td>Keithley Instruments</td>
</tr>
<tr>
<td>Schink</td>
<td>Steve</td>
<td>Agilent</td>
</tr>
<tr>
<td>Wolle</td>
<td>Jochen</td>
<td>Rohde &amp; Schwarz</td>
</tr>
<tr>
<td>Allegra</td>
<td>Alexis</td>
<td>RADX Technologies</td>
</tr>
</tbody>
</table>
2. IVI.NET Working Group Meeting

General Meeting Info:
Date of Meeting: February 5, 2014
Location: San Diego, CA
Chairperson: Joe Mueller
Minutes Prepared By: John Harvey

Meeting Attendees:

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Harvey</td>
<td>Agilent Technologies</td>
<td><a href="mailto:john_harvey@agilent.com">john_harvey@agilent.com</a></td>
</tr>
<tr>
<td>Jochen Wolle</td>
<td>Rhode &amp; Schwarz</td>
<td><a href="mailto:jochen.wolle@rohde-schwarz.com">jochen.wolle@rohde-schwarz.com</a></td>
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<td>Keithley</td>
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</tr>
<tr>
<td>David Rohacek</td>
<td>National Instruments</td>
<td><a href="mailto:david.rohacek@ni.com">david.rohacek@ni.com</a></td>
</tr>
<tr>
<td>Jon Bellin</td>
<td>National Instruments</td>
<td><a href="mailto:jon.bellin@ni.com">jon.bellin@ni.com</a></td>
</tr>
<tr>
<td>Alexis Allegra</td>
<td>RADX</td>
<td><a href="mailto:alexisallegra@radxtech.com">alexisallegra@radxtech.com</a></td>
</tr>
<tr>
<td>Kirk Fertitta</td>
<td>PMW</td>
<td><a href="mailto:kirk@pacificmindworks.com">kirk@pacificmindworks.com</a></td>
</tr>
</tbody>
</table>

Agenda:
Wednesday 11:30-12:30 / 1:30-3:30.

- Review action items
- Review Class Approval Table
- Review presentation on fixing PIA issues in VS 2010-2013
- Discuss strategy for testing policy files

Old Action Items:

<table>
<thead>
<tr>
<th>Date Added</th>
<th>Description</th>
<th>Assigned To / Updates</th>
<th>Target Date</th>
</tr>
</thead>
</table>

IVI Foundation Meeting Minutes 4 Feb. 2014
<table>
<thead>
<tr>
<th>Date</th>
<th>Task Description</th>
<th>Responsible</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-10-10</td>
<td>Touch bases with Ametek to see if they have an interest in the .NET API for the ACPwr spec.</td>
<td>Kirk</td>
<td>2012-11-01 DONE</td>
</tr>
<tr>
<td>2012-10-10</td>
<td>Review and Approve new shared components w/ Waveform/Spectrum changes</td>
<td>Kirk</td>
<td>2013-12-01 DONE</td>
</tr>
<tr>
<td>2013-06-20</td>
<td>Work through the implications of the NI versioning proposal to validate for IVI.NET and VISA.NET.</td>
<td>WG</td>
<td>2013-10</td>
</tr>
<tr>
<td>2013-06-20</td>
<td>Schedule WG meetings between now and February as needed, starting October 29.</td>
<td>John</td>
<td>2013-10-18 DONE</td>
</tr>
<tr>
<td>2013-10-14</td>
<td>John will review IVI-3.17 and depending on what he finds, will either go ahead and create a change document or refer the work to David.</td>
<td>John Harvey</td>
<td>TBD DONE</td>
</tr>
<tr>
<td>2013-10-14</td>
<td>Kirk will need to change the Shared Components web page to make old versions of the installer available.</td>
<td>Kirk Fertitta</td>
<td>TBD</td>
</tr>
<tr>
<td>2013-10-14</td>
<td>NI will have to modify the current 1.1 installer to add the build number to the directory name, and to not install old versions of files to the GAC (and maybe a few other small details).</td>
<td>David Rohacek</td>
<td>TBD DONE</td>
</tr>
<tr>
<td>2013-10-14</td>
<td>Joe will review IVI-3.18 to verify that all of the text related to the edits made at the last meeting have been changed and are correct.</td>
<td>Joe Mueller</td>
<td>TBD DONE</td>
</tr>
<tr>
<td>2013-10-14</td>
<td>John will create a change document for IVI-3.18.</td>
<td>John Harvey</td>
<td>TBD</td>
</tr>
</tbody>
</table>
NI will propose an editorial change - a factual statement that tells driver developers that the older the version of the Shared Components they target, the more it will be consistent with systems whose owners have not or cannot update their systems to the latest version

John Bellin

John will modify IVI-3.4 so that the content matches the changes made to IVI-3.17, create a change document, and post for review.

John Harvey

2013-10-14

2013-10-21

**Action Items Reviews**

All of the specification changes referenced in the above table were posted for review and the review periods passed without comment. The changes to IVI-3.17 will be voted on in the TC on Friday. The other changes were editorial changes.

David noted that he has requested that we add information about the technical changes to the IVI.NET Shared Components to the Revision History posted on the downloads page.

**Assembly Approval Table**

<table>
<thead>
<tr>
<th>Class</th>
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<tbody>
<tr>
<td>ACPwr</td>
<td>No .NET API</td>
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<tr>
<td>Counter</td>
<td>Provisional</td>
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<tr>
<td>DCPwr</td>
<td>Approved</td>
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<tr>
<td>Digitizer</td>
<td>Provisional</td>
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<tr>
<td>DMM</td>
<td>Approved</td>
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<tr>
<td>Downconverter</td>
<td>Provisional</td>
</tr>
<tr>
<td>Fgen</td>
<td>Provisional</td>
</tr>
<tr>
<td>LxiSync</td>
<td>Provisional</td>
</tr>
</tbody>
</table>
Review Presentation on PIA Issues

John reviewed the PIA presentation with the group.

Dan Mondrik asked how VS 2010-13 finds 64-bit libraries in the GAC on a 32-bit OS?

Jon asked that John draft a motion for the technical committee for a major change to IVI-3.14. John drafted the following text:

_The IVI.NET WG proposes a major change to IVI-3.14: Primary Interop Assembly Specification to remove the type library PrimaryInteropAssemblyCodeBase registry value from the IVI-COM and VISA-COM type library keys._

This is a major change because it has the effect of resolving PIA references from GAC’d PIA assemblies, and this means that customers may not see those comments as part of IntelliSense when programming with the PIAs.

The IVI.NET WG will make the necessary changes to IVI-3.14: Primary Interop Assembly Specification, bearing in mind the following:

- When changing the PIA spec, Jon felt that we needed to allow driver vendors to use the currently spec’d registry values or the new ones depending on their business needs.
- The IVI.NET WG will investigate Dan’s question above (how VS 2010-13 finds 64-bit libraries in the GAC on a 32-bit OS?).

Strategies for Testing Policy Files

Situations to test:

(1) Test that a driver/client built against an earlier version of the shared components will still run against a later version of the shared components.

   a. This would imply that the policy file provided with the shared components assembly would redirect references in the driver/client from the older version of the shared components assembly to the newer one.
b. Any incompatibilities between the older API and the newer one should result in a test failure.

c. The entire assembly API syntax need to be tested: interfaces, classes, exceptions, enumerations, etc.

(2) Make sure that the user who does not want the redirection can turn it off (with an app or machine policy file) and that will work.

a. Run installer tests to verify that when we install a newer version of the shared components, the older ones are still intact.

Potential solutions for #1:

- Use Nimbus to generate one or more drivers, and use Nimbus generated unit tests as the test client (since the tests are already fairly complete).
  - We would need to be able to target specific versions of the shared component assembly.
  - We could generate the driver initially with Nimbus, then extract the source and make minor changes outside of Nimbus moving forward. If a major change was needed, we could move back to Nimbus and regenerate the new driver.
  - The safe approach would be to have a test driver for Ivi.Driver and then one for each class.
  - The unit tests could retain the MS Test infrastructure and then be run under MS test moving forward.
  - Need to take into account runtime redirection and build-time redirection. The runtime scenario is the higher priority.

- Use Nimbus to generate one or more drivers, and hand-write a test client.
  - Have to write a lot of client code by hand, but the result is flatter and more self-contained.
  - Don’t get whatever advantages there are in using a test harness.

Consensus on moving forward:

- We should move forward with the approach of using Nimbus to create a test driver and a set of unit tests that can be used as the client.
- The most important objective is to test that we don’t break runtime compatibility.
- Realize that we may need to add some driver/client code to test additional items like exceptions.

Issues related to actually doing the work...

- Who will do the work? When?
- John suggested that we have enough direction to move forward, but people are not prepared to commit to the effort at this point. However, we have enough direction to allow someone to create a test for Ivi.Driver and/or an instrument class assembly without feeling like they are wasting time. Let’s coordinate this in the IVI.NET WG meeting moving forward.
Schedule
We will continue with weekly meetings on Tuesdays, 10am Mountain Time, starting February 18, 2014.
New Action Items:

<table>
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<tr>
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<tr>
<td>2013-10-14</td>
<td>Kirk will need to change the Shared Components web page to make old versions of the installer available.</td>
<td>Kirk Fertitta</td>
<td>TBD</td>
</tr>
<tr>
<td>2014-02-05</td>
<td>Add information about the technical changes to the IVI.NET Shared Components to the Revision History posted on the downloads page.</td>
<td>John Harvey / Kirk Fertitta</td>
<td>2014-02-15</td>
</tr>
<tr>
<td>2014-02-05</td>
<td>The note on the downloads page regarding the IWaveform implementation in the IVI.NET Shared Components is now incorrect and needs to be removed. Add information about the incompatibility between 1.0 and 1.1 to the revision history document.</td>
<td>John Harvey / Kirk Fertitta</td>
<td>2014-02-15</td>
</tr>
<tr>
<td>2014-02-05</td>
<td>Make the necessary specification changes to IVI-3.14 for the PIA change.</td>
<td>John Harvey</td>
<td>2014-02-18</td>
</tr>
<tr>
<td>2014-02-05</td>
<td>Make meeting arrangement for weekly meetings Feb 18 for a month, then bi-weekly after March 18.</td>
<td>John Harvey</td>
<td>2014-02-15</td>
</tr>
</tbody>
</table>
3. VISA.NET Working Group

**General Meeting Info:**
- **Date of Meeting:** October 15, 2013
- **Location:** Dallas, TX
- **Chairperson:** John Harvey
- **Minutes Prepared By:** John Harvey

**Meeting Attendees:**

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Pete Stone (phone)</td>
<td>Agilent Technologies</td>
<td><a href="mailto:pete_stone@agilent.com">pete_stone@agilent.com</a></td>
</tr>
</tbody>
</table>

**Agenda:**

Thursday Feb. 6, 8:30-12:30.

- Review Action Items (~15 min.)
- Address comments in the specs.
  - Add new VISA error code to VISA.NET API
- Address any TODO comments in the code.

Thursday Feb. 6, 1:30-3:30.

- Discuss the “big picture” of all the spec changes. Have we got any incidental changes covered?
- Schedule for prototyping, reviewing, and approving VISA.NET spec changes and components.

**Old Action Items**

<table>
<thead>
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<th>Date Added</th>
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<th>Target Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013-02-26</td>
<td>Clarify the language in 4.3 regarding asynchronous operations. (Do this as part of the VISA.NET changes.)</td>
<td>Dan Mondrik</td>
<td>DONE – VISA WG</td>
</tr>
<tr>
<td></td>
<td>Set up future phone meetings starting October 24.</td>
<td>John Harvey</td>
<td>2013-11-21 Done</td>
</tr>
</tbody>
</table>

**Address comments in the specs.**

We worked though all of the comments in the specification, and resolved all except the Scanf timeout related comment in Section 9.4.14 - Scanf, RULE 9.4.13

With regard to the timeout comment, NI proposed some source code alternatives, and reviewed the changes with Kirk. After the discussion, Dan and Kirk both thought it was worth trying to achieve the desired timeout behavior by modifying the MessageBasedReaderWriter class. They agreed it would be very difficult to achieve the same effect by putting a try/catch around all of the format-specific (outside of the MessageBasedReaderWriter class) calls to Read. Dan and Kirk will work on finalizing this implementation offline by 2/27/2014.

**Code TODOs**

John will go through the code and organize the using statement to eliminate all unused using statement while retaining “using System”;

Pankaj will be finishing the GlobalResourceManager by early March. He has completed work on the conflict manager.

WRT to a question about adding SScanf or SPrintf, Kirk noted that they are already available as static methods on the FormattedReader and FormattedWriter classes. Kirk noted that vendors who do not use the IVI Foundation’s implementation may get different results from their formatted I/O than these methods.

There is one longer term TODO related to making sure the assembly info is correct. We will do that as we get closer to release.

There are several TODOs left in the Formatted I/O implementation code. Kirk will review these by March 14.
**Review the state of the specs**

4.3.6 – Main VISA.NET spec. (Agilent)

- Completely new.
- Status: Accepted all changes and distributed the latest copy.

4.3.5 – VISA Shared Components (NI)

- Added .NET info for VISA.NET.
- Status:
  - There have been some minor changes to the API. Changed the ordering of some parameters to be more consistent in the source. These changes need to be reflected in the spec.
  - There some minor data inconsistencies that need to be addressed.
  - Pankaj will make these changes by 3/6/2014

4.3 – VISA (NI & Agilent)

- C.f. VISA WG notes. Moving forward these changes will be tracked in the VISA WG.

**Action Items / Prototyping / Testing / Scheduling**

Spec status is detailed above.

Shared Components for prototyping

- VISA.NET Interfaces & associated types (VISA.NET Assembly) – Ready today
- FormattedIO (VISA.NET Assembly) – Ready today
- Conflict Manager (Separate DLL) – Ready 3/6, pending review
- Global Resource Manager (VISA.NET Assembly) – Ready 3/20, pending review
- VISA.NET Shared Components Installer – End of April, exact date TBD.
- VISA Shared Components Installer needs to be changed before the VISA.NET installer is ready – End of April, exact date TBD.

Prototyping & Testing

- Agilent has a working (that might be optimistic, since testing has been minimal) prototype of VISA.NET based on the currently check-in code.
  - Will be doing some intensive test development and debugging over the next three months.
  - Will integrate GRM and conflict manager in when available.
  - Will assume that installer can be tested relatively late in the game.
• NI has made changes to the conflict manager code, and is ramping up for VISA.NET implementation.
  o After GRM is complete, NI will work on completing the VISA.NET implementation.
• PMW has the Nimbus VISA.NET.
  o PMW is done with the formatted I/O implementation – will be monitoring it ongoing.
  o PMW contributed unit tests to the IVI Foundation along with the formatted I/O code. They have already been successfully (mostly) run at least once by both NI and Agilent.
  o PMW test assumptions r.e. NI & Agilent
    ▪ NI & Agilent run the unit tests with their VISA.NET implementations underneath.
• Tektronix will start prototyping in the near future.
  o We will followup with Archana in phone conferences.

Schedule – Reference the action items for schedule details for WG items.

We will continue the scheduling discussion in phone meetings after resolving outstanding spec comments on FormattedIO.

**Meeting Schedule**
The next phone meeting will be February 20, 2014. John will send out a reminder, and set up the weekly meetings starting on that date. The normal time is 9:00 Mountain time on Thursdays.

**New Action Items**

<table>
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<th>Target Date</th>
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<tbody>
<tr>
<td>2014-02-06</td>
<td>WRT the Scanf comment, clarify the rational for ignoring a pending exception on a raw read in the special case of the buffer being exactly empty. C.f. VISA rule 6.2.16.</td>
<td>Dan Mondrik</td>
<td>2014-02-27</td>
</tr>
<tr>
<td>2014-02-06</td>
<td>WRT the Scanf comment, integrate changes suggested by NI to the existing source.</td>
<td>Kirk Fertitta</td>
<td>2014-02-27</td>
</tr>
<tr>
<td>2014-02-06</td>
<td>WRT the Scanf comment, try to achieve the desired timeout behavior by modifying the MessageBasedReaderWriter class.</td>
<td>Kirk Fertitta, Dan Mondrik, Pankaj Adhikari</td>
<td>2014-02-27</td>
</tr>
<tr>
<td>2014-02-06</td>
<td>Go through the code and organize the using statement to eliminate all unused using statement while retaining “using System”;</td>
<td>John Harvey</td>
<td>2014-02-20</td>
</tr>
<tr>
<td>2014-02-06</td>
<td>Finish the Global Resource Manager implementation and check in. Finish minor changes</td>
<td>Pankaj Adhikari</td>
<td>2014-03-06</td>
</tr>
</tbody>
</table>
to the conflict manager and update 4.3.5 accordingly.

<table>
<thead>
<tr>
<th>Date</th>
<th>Task</th>
<th>Assignee</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-02-06</td>
<td>Review &amp; address TODOs in the formatted I/O code.</td>
<td>Kirk Fertitta</td>
<td>2014-03-13</td>
</tr>
<tr>
<td>2014-02-06</td>
<td>Set up weekly phone meetings between now and the next meeting, starting Feb. 20</td>
<td>John Harvey</td>
<td>2014-02-18</td>
</tr>
<tr>
<td>2014-02-06</td>
<td>Decide whether we are ready for a formal review of the spec or not. If so, John will post the specs on April 4 for a 45 day review.</td>
<td>John Harvey</td>
<td>2014-04-03</td>
</tr>
</tbody>
</table>

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4. VISA Working Group Meeting

**General Meeting Info:**

Date of Meeting: February 5, 2013

Location: San Diego, CA

Chairperson: Dan Mondrik

Minutes Prepared By: Dan Mondrik

**Meeting Attendees:**

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<tr>
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<td>Teresa Lopes</td>
<td>Teradyne</td>
<td><a href="mailto:teresa.lopes@teradyne.com">teresa.lopes@teradyne.com</a></td>
</tr>
<tr>
<td>Vinod Cherian</td>
<td>MathWorks</td>
<td><a href="mailto:vinod.cherian@mathworks.com">vinod.cherian@mathworks.com</a></td>
</tr>
<tr>
<td>John Ryland</td>
<td>Keithley</td>
<td><a href="mailto:jryland@keithley.com">jryland@keithley.com</a></td>
</tr>
</tbody>
</table>
**Agenda:**

Wednesday 3:30-5:30

- Discuss VISA shared components 1.6 installer changes and issues
- Review changes to VPP-4.3 and VPP-4.3.2
- Discuss the scope of extending the functionality of viFindRs skepticism to improve ease of use with LXI devices

**VISA Shared Components Installer Changes**

Changes:

1. We switched the installer technology from Wise to Wix. This was for the long term maintainability of the installers.
2. We shipped a new version of the USBTMC driver. We now ship a single driver for all Windows OSes unlike the previous version of the installer, where we shipped different drivers on pre-Win8 and post-Win8 OSes.
3. We put the files in an external CAB instead of having them embedded in the MSI. For ease of distribution, we also provide self-extracting executables that contain an MSI and its corresponding CAB.

Over the last few months, John, Kirk and Guido have all, independently, asked for a reason behind the change 3. We had two primary motivations for using external CABs.

1. Unlike previous versions of the Windows Installer, the version 5.0 (and above) of Windows Installer (that ships with Windows 7 and higher) caches a full MSI instead of caching a version with embedded CAB stripped. We have seen measurable improvements in installation speed and footprint when using external CABs with our installers.
2. While porting the VISA Shared Components installers to WiX, we were evaluating the possibility of using various WiX extensions (such as UI and Difxapp) for ease of development and maintenance. After reading the terms of those extensions, we were advised that using those extensions in an MSI would have some legal implications for the the MSI and its contents. We were also advised that splitting the files into an external CAB could potentially mitigate some of those legal implications. However, the MSIs themselves would still have those legal implications. While our intent was to use these extensions for this release, we realized that we would need more time to confirm our interpretation and also get agreement from IVI Foundation that it was OK with the legal implications for the MSIs. Therefore, we decided to defer the discussion to
another release with the intent to propose this to the IVI Foundation as we believe this is important for the maintainability of these installers.

**Customer Confusion about VISA Shared Components installer download**

In a related discussion, there was a question of whether the VISA shared components installer should be on the public IVI downloads page, since customers need to install a vendor-specific VISA in addition. In many cases, customers install only this and then complain that VISA is not working.

The IVI downloads page says “The VISA Shared Components are typically installed when installing a VISA library from a specific vendor. However, the VISA Shared Components are offered here as a separate installer if users wish to install them on a system that does not have VISA. For instance, if you wish to use an IVI driver in simulation mode, you can install the VISA Shared Components without having a full VISA library on your system.” This does not make it clear that it will not work on its own, and we could reword the text.

Another option discussed is making the page with the VISA shared components installer not be navigable from the public IVI web page. It must be publicly accessible so that vendor companies can give the end customer the correct URL.

Another option is to make the installer detect the absence of any VISA on the system and pop up a warning message during installation to make sure the user is aware of this. For example, it could check whether visa32.dll exists on the system. Such a pop-up would not happen during an upgrade scenario. This would solve the problem for the clean machine use case. We would need a command-line option to prevent this check, in the case where a vendor-specific VISA installation is installing the shared components as the first step.

There was not a clear outcome at the meeting, so we will revisit this later.

**Changes to VPP 4.3 and VPP 4.3.2**

Changes:

1. Adding clarifications (rules, permissions and observations) regarding when multiple calls to viReadAsync, viWriteAsync and viMoveAsync must be performed in order.
2. Adding clarifications (rules, permissions and observations) to uses of the 'openTimeout' parameter to viOpen.
3. Adding a new error code VI_ERROR_LINE_NRESERVED to facilitate better mapping of PXI-9 trigger error codes.
4. Updating the version to 5.2

We improved the spec wording slightly during the meeting. All those present agreed that the changes are good. If anyone wants a copy of the new drafts they can contact Ted Wang.

**Extensions to viFindRsrc**

Need to scope the discussion to what set of things we definitely need to have.
John Ryland says the most important part is to have an mDNS LXI device returned from viFindRsnc without having had to open a vendor-specific configuration utility. From John’s view, they are moving away from VXI-11 so having the same experience with a VXI-11 LXI device is less important.

Guido has also in the past requested the same ability for VXI-11 devices. Because the client-side logic to detect and return these devices takes more time, this introduces potential issues such as timeouts.

Vinod pointed out that plugging in an mDNS LXI device is viewed somewhat similarly to plugging in a USB device. Users would like to have a similar programmatic experience with those.

Would it be possible to filter based on IP address? In other words, if you plug in the LXI device directly to the computer, and it has a link-local address, you may be only interested in those. You could call viFindRsnc with “TCPIP::169.254.?*::INSTR”.

Assuming that the scope is limited (for now) to include only mDNS, there is still the question of how that functionality gets exposed.

For the mDNS device detection concern, we strongly encourage VISA vendors to be able to report mDNS instruments without manual configuration in a way that is consistent with USB devices. We believe that it is appropriate to add clarifications to the spec, without requiring new functions or attributes. We will address this in a future meeting.

One other issue is preconfigured entries containing addresses for TCPIP resources that are potentially stale. Guido wants a way to exclude these, to ensure that he’s getting only what’s current. The archetypal cause is the LAN/LXI device using DHCP getting a new address. With an mDNS device this would generate a new announcement, but with a VXI-11 device this would not; the latter is a common cause of such stale entries. The only solution at this point is to run the vendor-specific configuration utility and remove them.

**New Action Items:**

<table>
<thead>
<tr>
<th>Date Added</th>
<th>Description</th>
<th>Assigned To / Updates</th>
<th>Target Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-02-05</td>
<td>Prototype checking existence of VISA and warn from installer when not present.</td>
<td>Ted Wang</td>
<td></td>
</tr>
<tr>
<td>2014-02-05</td>
<td>Decide if installer warning addresses customer download experience issues.</td>
<td>Kirk Fertitta</td>
<td></td>
</tr>
<tr>
<td>2014-02-05</td>
<td>Pass copy of VISA specs to all interested parties, including Pete Stone and Guido</td>
<td>Dan Mondrik</td>
<td></td>
</tr>
</tbody>
</table>
Technical Committee

**General Meeting Info:**

- **Date of Meeting:** June 21, 2013
- **Location:** Long Beach, CA
- **Chairperson:** Jon Bellin
- **Minutes Prepared By:** Vesna Jadric

**Topics To Be Discussed:**

- Review Agenda
- Review Voting Members In Attendance
- Patent Call
- Approve minutes from the February 2013 Technical Committee Meeting
- Review outcome of recent eVotes, IPR Declarations, Editorial Changes, and Reviews
- Review Action Items from Previous Meeting
- Review Spec Status Document
- Working Group Topics
  - Vote on IVI-3.1 and IVI-3.5 specifications for the following minor changes:
    - Naming of qualified repeated capabilities
    - Adding a new “IVI Generation” item in the Compliance Documentation
    - Allowing explicit implementation of IlviDriver
  - Discuss IVI.NET change for IWaveform interface (John Harvey)
- IVI DoD Quality WG
  - Update on Implementation of IVI Generations Concept and Compliance Equivalence Tables
• Motions for creating the IVI-2003 and IVI-2014 generations

• New Business
  • Discuss updating IVI-3.1, Section 5.14 to allow signed 8-bit integer data type
  • Discuss updating IVI-3.1, Section 5.12.1 to expand vendor specific error code range
  • Discuss editorial change in IVI-3.2 to clarify that C functions that have a ViChar array output parameter cannot return warnings
  • Discuss updating IVI-3.4 to add a new section about Asynchronous I/O for IVI.NET drivers (David Rohacek)

• Discuss Upcoming Meetings

• New Action Items

Voting Members In Attendance

<table>
<thead>
<tr>
<th>Present</th>
<th>Organization Name</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aeroflex Corporation</td>
<td>Mark Meldrum / Marv Rosner</td>
</tr>
<tr>
<td>X</td>
<td>Agilent Technologies</td>
<td>Joe Mueller</td>
</tr>
<tr>
<td></td>
<td>Bustec Ltd.</td>
<td>Fred Bloennigen</td>
</tr>
<tr>
<td></td>
<td>EADS North America Test &amp; Services</td>
<td>Chris Gorringe</td>
</tr>
<tr>
<td></td>
<td>Keithley Instruments</td>
<td>John Ryland</td>
</tr>
<tr>
<td></td>
<td>MathWorks</td>
<td>Rob Purser / Vinod Cherian</td>
</tr>
<tr>
<td>X</td>
<td>National Instruments</td>
<td>Jon Bellin</td>
</tr>
<tr>
<td></td>
<td>Pacific MindWorks, Inc.</td>
<td>Kirk Fertitta</td>
</tr>
<tr>
<td></td>
<td>Rockwell Collins</td>
<td>Jason Scharles</td>
</tr>
<tr>
<td>X</td>
<td>Rohde &amp; Schwarz</td>
<td>Jochen Wolle</td>
</tr>
<tr>
<td></td>
<td>Tektronix</td>
<td>Santanu Pradhan / Mike</td>
</tr>
<tr>
<td>Present</td>
<td>Organization Name</td>
<td>Name</td>
</tr>
<tr>
<td>--------</td>
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<td>--------------------</td>
</tr>
<tr>
<td>X</td>
<td>Teradyne, Inc.</td>
<td>Teresa Lopes</td>
</tr>
<tr>
<td></td>
<td>VTI Instruments</td>
<td>Sangram Gaikwad / Tom Sarfi</td>
</tr>
</tbody>
</table>

There are 4 voting members in attendance, which satisfies the requirements for a quorum of 4 Voting Members. (Quorum is 25% of Voting Members. There are currently 13 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 that 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.

---

**Approve minutes from the February 2013 Technical Committee Meeting**

The minutes from the February 2013 Technical Committee Meeting are posted on the IVI Foundation web site.

No issues were brought up with the minutes. The minutes are accepted.

**Review outcome of recent IPR Declarations, eVotes, and Reviews**
IVI.NET Shared Components

On March 11th, Vesna Jadric sent out the following email regarding the review for the IVI.NET Shared Components version 1.0.3.

From: <vesna.jadric@ni.com>
To: IVI-Foundation-Members-1@ivifoundation.org
Date: 03/11/2013 03:12 PM
Subject: IVI.NET Shared Components 1.0.3 Review (2 weeks)

Greetings:

The IVI.NET Shared Components 1.0.3 is now available for review at the following URL:


This version of the IVI.NET Shared Components:

1) Created the v4.5 framework folder to contain drivers that require .NET Framework 4.5
2) Resolved issue where uninstalling one SxS version of the IVI.NET Shared Components would remove empty version-specific assembly folders even if another SxS version of the IVI.NET Shared Components was on the system

The review will continue until March 25, 2013.

Please contact me with feedback.

Thanks,

Vesna Jadric
Instrument Drivers/IVI | National Instruments | 512-683-5360

The review period concluded with no feedback. The 1.0.3 revision has been posted to the Shared Components web page.
IVI.NET Changes

On April 26th, John Harvey announced IVI.NET editorial and minor changes via the email below.

From: <john_harvey@agilent.com>
To: IVI-Foundation-Members-1@ivifoundation.org
Date: 04/26/2013 04:47 PM
Subject: IVI.NET Specification Review.

Greetings:

The IVI.NET working group is proposing a set of changes to several specifications. The changes are documented in the IVI.NET WG page of the IVI Foundation web site. All of the changes are editorial changes, except for one minor change to the IWaveform interface. The affected specifications are:

IVI-3.18 .NET Utility Classes and Interfaces Specification
IVI-4.6 IviSwtch Class Specification
IVI-4.7 IviPwrMeter Class Specification
IVI-4.12 IviCounter Class Specification
IVI-4.15 IviDigitizer Class Specification

The details of the changes, along with a change document, can be found at:

The review period for these editorial changes is April 26 – May 28, 2013.

Please contact me with feedback.

Best Regards,

John Harvey

Agilent Technologies
The review period for these changes has ended with the following feedback:

From: <jon.bellin@ni.com>
To: john_harvey@agilent.com
Cc: IVI-Foundation-Members-1@ivifoundation.org
Date: 06/03/2013 02:44 PM
Subject: IVI.NET Specification Review.

I have a comment.

I am not comfortable treating the modification to IVI_3.18 as a minor change (instead of a major change) unless either:

1. We release the revised spec right after the June meeting AND post something to the IVI web site warning that the IVI.NET Shared Components are not yet in sync with the spec; OR

2. We wait until all the technical implementation questions are resolved AND post something to the IVI web site warning that IWaveform as represented in the spec and the shared components are going to be invalidated.

Jon Bellin

Editorial changes have been implemented and will be posted on the web site soon. The minor change in the IVI-3.18 specification will not be posted until the technical issues are resolved and agreed on. The following note has been posted on the IVI Shared Components web site:

“Special note on IWaveform

Please take note that the IVI Foundation is making a breaking change to the IWaveform interface. Driver developers are encouraged not to implement this interface until a new release of IWaveform is made available with the next release of the IVI.NET Shared Components.”

Please note that we are taking the liberty of making this break in change because none of the instrument classes affected by this change have been unconditionally released and we believe that no released drivers are affected by the change.
IVI-3.1 and IVI-3.5 Minor Changes

On May 16th, Vesna Jadric announced IVI-3.1 and IVI-3.5 minor changes via the email below.

From:  <vesna.jadric@ni.com>
To:  IVI-Foundation-Members-1@ivifoundation.org
Date:  05/16/2013 02:04 PM
Subject: Minor Change: IVI-3.1: Driver Architecture Specification and IVI-3.5: Configuration Server Specification (21-day review)

Greetings:

At the last Technical Committee meeting in Orlando, there was a discussion about the naming of qualified repeated capabilities. NI is proposing minor changes to IVI-3.1 and IVI-3.5 to address the feedback we have received. The change document and updated specifications are now posted on the IVI-3.1 working group web site:

IVI 3.1 and IVI-3.5 Proposed Changes - Repeated Capabilities.docx
IVI-3.1_Architecture_2013-05-16_Repcap_Changes.docx
IVI-3.5_ConfigurationServer_2013-05-16_Repcap_Changes.docx

The review period for this minor change is May 16, 2013 - June 14, 2013.

Please contact me with any feedback.

Best regards,

Vesna Jadric
Instrument Drivers/IVI | National Instruments | 512-683-5360

The review period for these minor changes has ended with no feedback. The specifications are now ready for vote.

IVI-3.1 Minor Changes

On May 16th, Vesna Jadric announced IVI-3.1 minor changes via the email below.

From:  <vesna.jadric@ni.com>
Greetings:

NI was tasked with updating the IVI-3.1 specification to add a new “IVI Generation” item in the Compliance Documentation sections 5.23 and 5.23.1. The change document and updated specification are now posted on the IVI-3.1 working group web site:

IVI 3.1 Proposed Change - IVI Generation Compliance.docx

IVI-3.1_Architecture_2013-05-16 IVI Generation.docx

The review period for this minor change is **May 16, 2013 - June 14, 2013.**

Please contact me with any feedback.

Best regards,

Vesna Jadric
Instrument Drivers/IVI | National Instruments | 512-683-5360

The review period for these minor changes ended with no feedback, however several minor changes were made during this IVI Foundation meeting. The specifications are now ready for vote.

**IVI-3.1 Minor Changes**

On May 16th, Vesna Jadric announced IVI-3.1 minor changes via the email below.

<table>
<thead>
<tr>
<th>From:</th>
<th><a href="mailto:vesna.jadric@ni.com">vesna.jadric@ni.com</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>To:</td>
<td><a href="mailto:IVI-Foundation-Members-1@ivifoundation.org">IVI-Foundation-Members-1@ivifoundation.org</a></td>
</tr>
<tr>
<td>Date:</td>
<td>05/16/2013 02:05 PM</td>
</tr>
<tr>
<td>Subject:</td>
<td>Minor Change: IVI-3.1: Driver Architecture Specification (21-day review)</td>
</tr>
</tbody>
</table>
Greetings:

NI was tasked with updating the IVI-3.1 specification, sections 5.17.1, 5.17.4, and 5.17.5, to allow explicit implementation of IIviDriver. The change document and updated specification are now posted on the IVI-3.1 working group web site:

IVI 3.1 Proposed Change - Allow Explicit Implementation of IIviDriver.docx

IVI-3.1_Architecture_2013-05-15_1.docx

The review period for this minor change is May 16, 2013 - June 14, 2013.

Please contact me with any feedback.

Best regards,

Vesna Jadric
Instrument Drivers/IVI | National Instruments | 512-683-5360

The review period for these minor changes has ended with no feedback. The specifications are now ready for vote.

**Review Action Items from June 2013 Meeting**

<table>
<thead>
<tr>
<th>Owner</th>
<th>Action Item</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vesna Jadric</td>
<td>Record all resolutions in the lifecycle document</td>
<td>[03/05/2013] Complete.</td>
</tr>
<tr>
<td>David Rohacek</td>
<td>Create the Change Document for the IVI-3.1 minor change to allow explicit implementation of IviDriver.</td>
<td>[05/16/2013] Complete.</td>
</tr>
<tr>
<td>Vesna Jadric</td>
<td>Send to the membership, by April 15, a message explaining our intention to create an IVI-2014 generation and an IVI-2003 generation, the spec versions required for each, the requirement that new drivers comply by January 1, 2015, the potential impact to driver suppliers, and the</td>
<td>[04/15/2013] Complete.</td>
</tr>
<tr>
<td>Owner</td>
<td>Action Item</td>
<td>Status</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Vesna Jadric</td>
<td>Plan to vote on this at the June 2013 meeting.</td>
<td></td>
</tr>
<tr>
<td>John Harvey</td>
<td>Pull together the compliance equivalence and generations tables and provide by March 22 to the Marketing Committee, along with basic explanatory text.</td>
<td>[06/05/2013] Complete.</td>
</tr>
<tr>
<td>Joe Mueller</td>
<td>Action item: Joe to pull together by the June meeting a set of technical content regarding the generations concept and IVI-2014 in particular to be the basis of customer and driver supplier communication by the Marketing Committee. Joe will set up monthly calls to discuss the content. Participants: Jon Bellin, Vesna Jadric, Adri Kruger, Vinod Cherian, John Harvey, Steve Schink.</td>
<td>[06/10/2013] Complete.</td>
</tr>
<tr>
<td>Vesna Jadric</td>
<td>Include motions for creating the IVI-2003 and IVI-2014 generations in the agenda for the Technical Committee meeting at the June 2013 IVI Foundation meeting.</td>
<td>[05/22/2013] Complete.</td>
</tr>
<tr>
<td>Joe Mueller</td>
<td>Notify the Foundation via the listserver that the Joe will be presenting the education material at the LXI event in Beijing in May.</td>
<td>[05/17/2013] Complete.</td>
</tr>
<tr>
<td>Jon Bellin</td>
<td>Let Kirk know the results of the discussion and explain that a specific spec change request is needed from him if he wants to pursue the issue.</td>
<td>[02/27/2013] Complete.</td>
</tr>
</tbody>
</table>
Review Spec Status Document

The group reviewed and edited the Spec Status Document.

IVI_Spec_Lifecycle_Status.xlsx

Working Group Topics

Vote on IVI-3.1 and IVI-3.5 Specification Changes (Repeated Capabilities)

Sections 2.7 and 4.4.5.3 in IVI-3.1 and Section 11.3.1 in IVI-3.5 were updated to:

- Expand the term "qualified repeated capability identifier" such that the qualifier can be a custom class name or an IVI-defined class name.
- Allow the qualifier portion of the qualified physical identifier to be any repeated capability identifier, not just a qualified repeated capability identifier.

The review period for this minor change has ended on June 14, 2013. No feedback has been received.

Resolution (2013-06-21:#1): Joe Mueller moves that the IVI Foundation approve the IVI-3.1 and IVI-3.5 specifications to expand the term "qualified repeated capability identifier" such that the qualifier can be a custom class name or an IVI-defined class name, and allow the qualifier portion of the qualified physical identifier to be any repeated capability identifier, not just a qualified repeated capability identifier. Seconded by Teresa Lopes.

The vote was 3-0-0. The resolution is approved.

Action item: Vesna to record this resolution in the lifecycle document.

Vote on IVI-3.1 Specification Change (IlviDriver)
Sections 5.17.1, 5.17.4, and 5.17.5 in IVI-3.1 were updated to allow explicit implementation of IlviDriver.

The review period for this minor change has ended on June 14, 2013. No feedback has been received.

Resolution (2013-06-21:#2): Teresa Lopes moves that the IVI Foundation approve the IVI-3.1 specification to allow explicit implementation of IlviDriver. Seconded by Jochen Wolle.

The vote was 3-0-0. The resolution is approved.

**Action item:** Vesna to record this resolution in the lifecycle document.

**Discussion on IVI.NET IWaveform Changes**

The minor change in the IVI-3.18 specification will not be posted until the technical issues with the IWaveform interface are resolved and agreed on. This might introduce new changes in the IVI-3.18 spec so there will be no voting on the current changes at this time.

We expect that the current draft of changes will stay as is. There will be additional change to either IVI-3.18 or IVI-3.1 that describe the .NET versioning strategy and policies that will be used to integrate these changes.

**IVI DoD Quality WG - Implementation of IVI Generations Concept and Compliance Equivalence Tables**

**Update from the IVI DoD Quality WG:**

The working group finalized the Compliance Equivalence tables and the IVI Generation Baseline Summary table, and came up with prose suitable to post on the web site. The working group is ready to hand this over to the Marketing working group.
Action Item: We will finalize the text to post to website to describe IVI-2014 and IVI Generations in general at the BoD meeting directly following this meeting.

Action Item: Jon and Vesna will meet with Adri to design the exact location of explanatory text around the following documents on the website:

- Compliance Equivalence Tables and IVI Generation Baseline Summary Table
- General Explanation of IVI Generations
- Explanation of IVI-2014

Action Item: Adri will work with Bob to post this material on the website.

Motions for creating the IVI-2003 and IVI-2014 generations:

Resolution (2013-06-21:#3): Jochen Wolle moves that the IVI Foundation establish an IVI-2014 generation that includes the changes to IVI-3.1 and IVI-3.4 from the IVI DoD Quality working group, the changes to IVI specifications to accommodate Windows 8, and any other spec updates or new specs the technical committee sees fit to include. Seconded by Joe Mueller.

The vote was 3-0-0. The resolution is approved.

Resolution (2013-06-21:#4): Joe Mueller moves that the IVI Foundation establish an IVI-2003 generation so that existing drivers have a generation with which they can claim compliance. Seconded by Teresa Lopes.

The vote was 3-0-0. The resolution is approved.

Action item: Vesna to record these resolutions in the lifecycle document.

Vote on IVI-3.1 Specification Change (IVI Generation in Compliance Document)
Drivers compliant with IVI-2014 or later will need to declare their IVI Generation in the compliance document that ships with the driver. Section 5.22 in IVI-3.1 has been updated to specify the exact format of the IVI Generation declaration in the compliance document.

The review period for this minor change has ended on June 14, 2013. No feedback has been received but changes were made during this IVI Foundation meeting.

Resolution (2013-06-21:#5): Teresa Lopes moves that the IVI Foundation approve the IVI-3.1 specification to add a new “IVI Generation” item in the Compliance Documentation section. Seconded by Jochen Wolle.

The vote was 3-0-0. The resolution is approved.

**Action Item:** Vesna to record this resolution in the lifecycle document.

**Action Item:** Vesna will make sure that the Equivalence tables will show that the first version of IVI-3.1 for IVI-2014 is 3.5.

**New Business**

**Signed 8-bit Integer Data Type**

Kirk Fertitta reported an issue with the IviDigitizer specification where the IVI-C Fetch Waveform Int8 function calls out “ViInt8[]” as the data type for the WaveformArray parameter, but IVI-3.1 does not list ViInt8[] as an allowed data type.

NI is proposing to change IVI-3.1, Section 5.14 to allow signed 8-bit integers and arrays of 8-bit integer values for IVI-C, IVI-COM, and IVI.NET as shown below.

<table>
<thead>
<tr>
<th>Type Description</th>
<th>C API Type Name</th>
<th>COM API Type Name</th>
<th>.NET API Type Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boolean value</td>
<td>ViBoolean</td>
<td>VARIANT_BOOL</td>
<td>System.Boolean</td>
</tr>
</tbody>
</table>

Table 4-1. Compatible Data Types for IVI Drivers
Signed 8-bit integer

<table>
<thead>
<tr>
<th></th>
<th>ViInt8</th>
<th>CHAR</th>
<th>System.SByte</th>
</tr>
</thead>
<tbody>
<tr>
<td>Array of signed 8-bit integer values</td>
<td>ViInt8[]</td>
<td>SAFEARRAY(CHAR)</td>
<td>System.SByte[]</td>
</tr>
</tbody>
</table>

Unsigned 8-bit integer

<table>
<thead>
<tr>
<th></th>
<th>ViByte</th>
<th>BYTE **</th>
<th>System.Byte</th>
</tr>
</thead>
<tbody>
<tr>
<td>Array of unsigned 8-bit integer values</td>
<td>ViByte[]</td>
<td>SAFEARRAY(BYTE) **</td>
<td>System.Byte[]</td>
</tr>
</tbody>
</table>

Signed 16-bit integer

<table>
<thead>
<tr>
<th></th>
<th>ViInt16</th>
<th>N/A</th>
<th>System.Int16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Array of 16-bit integer values</td>
<td>ViInt16[]</td>
<td>SAFEARRAY(SHORT)</td>
<td>System.Int16[]</td>
</tr>
</tbody>
</table>

Signed 32-bit integer

<table>
<thead>
<tr>
<th></th>
<th>ViInt32</th>
<th>LONG</th>
<th>System.Int32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Array of 32-bit integer values</td>
<td>ViInt32[]</td>
<td>SAFEARRAY(LONG)</td>
<td>System.Int32[]</td>
</tr>
</tbody>
</table>

Signed 64-bit integer

<table>
<thead>
<tr>
<th></th>
<th>ViInt64</th>
<th>__int64</th>
<th>System.Int64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Array of 64-bit integer values</td>
<td>ViInt64[]</td>
<td>SAFEARRAY(__int64)</td>
<td>System.Int64[]</td>
</tr>
</tbody>
</table>

Signed Decimal

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>System.Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>64-bit floating point number</td>
<td>ViReal64</td>
<td>DOUBLE</td>
<td>System.Double</td>
</tr>
<tr>
<td>Array of 64-bit floating point values</td>
<td>ViReal64[]</td>
<td>SAFEARRAY(DOUBLE)</td>
<td>System.Double[]</td>
</tr>
<tr>
<td>Array of 32-bit floating point values</td>
<td>ViReal32[]</td>
<td>SAFEARRAY(FLOAT)</td>
<td>System.Single[]</td>
</tr>
</tbody>
</table>

Pointer to a C string

<table>
<thead>
<tr>
<th></th>
<th>ViString or ViChar[]</th>
<th>BSTR</th>
<th>System.String or System.Text.StringBuilder</th>
</tr>
</thead>
<tbody>
<tr>
<td>An IVI-C or VISA resource descriptor</td>
<td>ViRsrc</td>
<td>BSTR</td>
<td>System.Int32</td>
</tr>
</tbody>
</table>

An IVI-C or I/O library session handle

<table>
<thead>
<tr>
<th></th>
<th>ViSession</th>
<th>LONG</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>An IVI or VISA return status type</td>
<td>ViStatus</td>
<td>HRESULT</td>
<td>N/A</td>
</tr>
</tbody>
</table>

A constant C string

<table>
<thead>
<tr>
<th></th>
<th>ViConstString</th>
<th>BSTR</th>
<th>System.String</th>
</tr>
</thead>
</table>

An attribute ID

<table>
<thead>
<tr>
<th></th>
<th>ViAttr</th>
<th>N/A</th>
<th>N/A</th>
</tr>
</thead>
</table>

Enumeration

<table>
<thead>
<tr>
<th></th>
<th>ViInt32</th>
<th>&lt;Etype&gt;</th>
<th>&lt;Etype&gt;</th>
</tr>
</thead>
</table>

Interface Reference

<table>
<thead>
<tr>
<th></th>
<th>N/A</th>
<th>&lt;Itype&gt;</th>
<th>&lt;Itype&gt;</th>
</tr>
</thead>
</table>

[**] Switching from BYTE to UCHAR in IVI-COM would be a breaking change and thus a Major Change. Do we really want to do it? If so, could we get away with grandfathering existing drivers without creating incompatibilities from the driver developer or user perspective? We would need to investigate whether in various circumstances driver developers and users would see errors or warnings. Unless there really are no incompatibilities, NI would prefer just leaving BYTE as is for unsigned and using CHAR for signed. The inconsistency is better than creating incompatibilities, especially since BYTE and CHAR will not be used very often in drivers. Furthermore, BYTE is really a more appropriate name for what we want an unsigned 8-bit integer for. The problem is that COM does not have a compliant SBYTE type.

How to change IviDigitizer .NET?

Change the IviDigitizer spec to use System.SByte, on the assumption that no IVI.NET Digitizer drivers have been released.
Leave the IviDigitizer COM signature at SAFEARRAY(BYTE) to avoid the type library change.

Resolution (2013-06-21:#6): Jochen Wolle moves that we make a Minor Change to update Table 5-6 in IVI-3.1, Section 5.14 to allow signed 8-bit integers and arrays of 8-bit integer values for IVI-C, IVI-COM, and IVI.NET. Seconded by Joe Mueller.

The vote was 3-0-0. The resolution is approved.

Resolution (2013-06-21:#7): Joe Mueller moves that we make a Minor Change to the IviDigitizer spec to use System.SByte instead of System.Byte, on the assumption that no IVI.NET Digitizer drivers have been released. Seconded by Teresa Lopes.

The vote was 3-0-0. The resolution is approved.

**Action item:** Vesna to record these resolutions in the lifecycle document.

**Action item:** Vesna to run Minor Change process that does not require IPR for IVI-3.1 to allow signed 8-bit integer data type. Work with Jon and David to create wording regarding the fact that SByte is not CLS compliant.

**Action item:** John Harvey or Vesna Jadric to run Minor Change process that does not require IPR for IviDigitizer spec to use System.SByte. John will work with IVI.NET WG to decide if we need to include the CLS compliant attribute in the specification.

**Action Item:** John Harvey to make a change in the Shared Components source code. John will discuss the schedule for releasing the modified Shared Components with the IVI.NET WG.

Vendor Specific Error Code Ranges
NI is running out of vendor specific/specific driver error codes so NI is proposing to change Table 5-3 in IVI-3.1, Section 5.12.1 to expand the “Vendor specific errors and warnings” range. NI’s original proposal grabbed 0x7 – 0xF for IVI-C and 0x8 – 0xF for IVI-COM. John Harvey requested that 0x7 is not used because it might conflict with IVI-COM’s use of 0x7 and requested that we don’t use the entire range up to 0xF. NI agreed to modify the proposal to use 0x8 – 0xB for all IVI driver types. Note that this will not affect IVI.NET because it uses exceptions.

### Table 4-2. Status Code Types and Ranges

<table>
<thead>
<tr>
<th>IVI-COM bits 15-12</th>
<th>IVI-C bits 15-12</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x0 (0000)</td>
<td>0x0 (0000)</td>
<td>VISA errors and warnings, defined in VPP-4.x - VXIplug&amp;play VISA Specifications.</td>
</tr>
<tr>
<td>0x7 (0111)</td>
<td>0x0 (0000)</td>
<td>Common errors and warnings defined in Section 11, <em>Common IVI-C and IVI-COM Error and Completion Codes</em>, in <em>IVI-3.2: Inherent Capabilities Specification</em>.</td>
</tr>
<tr>
<td>0x1 (0001)</td>
<td>0x1 (0001)</td>
<td>Errors and warnings defined by IVI shared components, and errors and warnings defined in <em>IVI-3.3: Standard Cross Class Capabilities Specification</em>.</td>
</tr>
<tr>
<td>0x2 (0010)</td>
<td>0x2 (0010)</td>
<td>Errors and warnings defined in the individual IVI class specifications.</td>
</tr>
<tr>
<td>0x3 (0011)</td>
<td>0x3 (0011)</td>
<td><em>reserved</em></td>
</tr>
<tr>
<td>0x4 (0100)</td>
<td>0x4 (0100)</td>
<td>Errors and warnings defined by individual IVI specific drivers.</td>
</tr>
<tr>
<td>0x5 (0101)</td>
<td>0x5 (0101)</td>
<td>Errors and warnings defined by individual IVI-MSS role components.</td>
</tr>
<tr>
<td>0x6 (0110)</td>
<td>0x6 (0110)</td>
<td>Vendor specific errors and warnings.</td>
</tr>
<tr>
<td>0x8 - 0xB</td>
<td>0x8 - 0xB</td>
<td><em>reserved</em></td>
</tr>
<tr>
<td>(1000)-(1011)</td>
<td>(1000)-(1011)</td>
<td></td>
</tr>
<tr>
<td>0xC - 0xF</td>
<td>0xC - 0xF</td>
<td><em>reserved</em></td>
</tr>
<tr>
<td>(1100)-(1111)</td>
<td>(1100)-(1111)</td>
<td></td>
</tr>
</tbody>
</table>

Resolution (2013-06-21:#8): Teresa Lopes moves that we make a Minor Change to update Table 5-3 in IVI-3.1, Section 5.12.1 to expand the “Vendor specific errors and warnings” range to include the following values for bits 15-12: 0x6 and 0x8 through 0xB. Seconded by Jochen Wolle.

The vote was 3-0-0. The resolution is approved.

**Action item:** Vesna to record this resolution in the lifecycle document.
Action item: Vesna to run Minor Change process that does not require IPR for IVI-3.1 to expand the “Vendor specific errors and warnings” range.

Editorial change in IVI-3.2

Based on customer’s feedback, NI suggests adding a note in IVI-3.2, Section 3.1.2.1 to clarify that C functions that have a ViChar array output parameter and an input parameter that specifies the size of the ViChar array cannot return warnings.

Proposed text:
3.1.2.1 Additional Compliance Rules for C Functions with ViChar Array Output Parameters

This section specifies additional compliance rules for C functions that have a ViChar array output parameter and an input parameter that specifies the size of the ViChar array. The functions in this specification that have such parameters are the Get Attribute ViString, Get Error, Get Next Coercion Record, and Get Next Interchange Warning functions.

- The user is responsible for allocating a ViChar array and passing the address of the array in the ViChar array output parameter. The array serves as a buffer into which the IVI-C driver copies a string.

- The name of the input parameter that specifies the size of the array is the name of the array followed by BufferSize and is the parameter that immediately precedes the ViChar array output parameter. For example if the name of the ViChar array output parameter is errorDescription, the name of the buffer size parameter is errorDescriptionBufferSize. The user passes the number of bytes in the buffer as the buffer size parameter.

- If the string that the function attempts to copy contains more bytes (including the terminating NUL byte) than the user indicates in the buffer size parameter, the function does the following:
  - Copies (buffer size–1) bytes into the buffer
  - Places an ASCII NUL byte at the end of the buffer
  - Returns in the return value the buffer size that the user must pass to get the entire string.

For example, if the value is 123456 and the buffer size is 4, the function places 123 followed by a NUL byte into the buffer and returns 7. If the function encounters an error, the function returns the corresponding error code instead of the required buffer size.

- If the user passes a negative number for the buffer size parameter, the function copies the value into the buffer regardless of the number of bytes in the value.

- If the user passes 0 for the BufferSize parameter, the function allows the user to pass VI_NULL for the output buffer parameter and returns the buffer size that the user must pass to get the entire value including the NUL byte.

Note: The preceding compliance rules imply that functions that have a ViChar array output parameter and an input parameter that specifies the size of the ViChar array cannot return warnings. This is because a positive return value indicates the buffer size needed to get the entire parameter value.

Note: The preceding compliance rules regarding ViChar array output parameters and corresponding buffer size parameters do not apply to the Self Test, Revision Query, Error Query, and Error Message functions. These functions do not have buffer size parameters.

Resolution (2013-06-21:#9): Jochen Wolle moves that we make an Editorial Change to add a note in IVI-3.2, Section 3.1.2.1 to clarify that C functions that have a ViChar array output parameter and an input parameter that specifies the size of the ViChar array cannot return warnings. Seconded by Joe Mueller.

The vote was 3-0-0. The resolution is approved.
Action item: Vesna to record this resolution in the lifecycle document.

Action item: Vesna to run Editorial Change process for IVI-3.2 to clarify that C functions that have a ViChar array output parameter cannot return warnings.

Asynchronous I/O change in IVI-3.4 for IVI.NET

National Instruments proposes a minor change to IVI-3.4 to recommend that IVI.NET specific drivers that implement asynchronous I/O methods use the Microsoft Asynchronous Programming Model (APM). This is a recommendation rather than a requirement because, in general, we do not want to preclude the use of new parallel programming extensions to the .NET languages in .NET Framework 4.0 and higher.

Resolution (2013-06-21:#10): Joe Mueller moves that we make a Minor Change to IVI-3.4 to add a new section for Asynchronous I/O for IVI.NET drivers to include the recommendation that IVI.NET specific drivers that implement asynchronous I/O methods do so using the Microsoft Asynchronous Programming Model (APM). Seconded by Teresa Lopes.

The vote was 3-0-0. The resolution is approved.

Action item: David and Vesna to create the change document for asynchronous I/O change in IVI-3.4 for IVI.NET.

Action Item: Vesna to record this resolution in the lifecycle document.

Action Item: John Harvey to run this as a Minor Change that does not require IPR.

Discuss Upcoming Meetings

The next meeting will be October 14-16, 2013 (Monday - Wednesday) in Dallas, TX.
### Working Group

<table>
<thead>
<tr>
<th>Working Group</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run of IVI Education Material (Tuesday afternoon)</td>
<td>4 hr</td>
</tr>
<tr>
<td>VISA.NET (Tuesday)</td>
<td>6 hr</td>
</tr>
<tr>
<td>VISA (on same day as VISA.NET) (Tuesday)</td>
<td>2 hr</td>
</tr>
<tr>
<td>IVI.NET (Monday morning)</td>
<td>4 hr</td>
</tr>
<tr>
<td>Marketing Committee General including review of IVI Generations content on the web site (Monday afternoon)</td>
<td>2 hr</td>
</tr>
<tr>
<td>Shared Components Management (Monday afternoon)</td>
<td>1 hr</td>
</tr>
<tr>
<td>Technical Committee Meeting and BoD (Wednesday morning)</td>
<td>3 hr</td>
</tr>
</tbody>
</table>

Meeting will conclude on 11:30AM on Wednesday and no lunch will be served.

**Action Item:** Vesna to let Bob know about no lunch on Wednesday.

Criteria for IVI meeting locations:

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, Boston, Austin)
- Hotel journey is 20 minutes on Google maps.
- Sleeping room price should not exceed $169.
- Meeting fees should not exceed $400.
- Internet bundled into the cost.

February 2014 meeting:

Possibilities: **San Diego**, Atlanta, Orlando

(May or) June 2014 meeting:

Possibilities: Munich, **Singapore**, Baltimore/Washington, Tampa (week after Int’l Microwave Symposium), San Diego, St. Louis, Chicago, Denver
October 2014 meeting:

Possibilities: Baltimore/Washington, Singapore, Munich, San Diego, St. Louis, Chicago, Denver

**Summary of Action Items Created at the June 2013 Technical Committee Meeting**

<table>
<thead>
<tr>
<th>Owner</th>
<th>Action Item</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vesna Jadric</td>
<td>Record all resolutions in the lifecycle document.</td>
<td></td>
</tr>
<tr>
<td>Jon Bellin, Vesna Jadric,</td>
<td>Jon and Vesna will meet with Adri to design the exact location of explanatory text around the following documents on the web site:</td>
<td></td>
</tr>
<tr>
<td>Adri Kruger</td>
<td>• Compliance Equivalence Tables and IVI Generation Baseline Summary Table</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• General Explanation of IVI Generations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Explanation of IVI-2014</td>
<td></td>
</tr>
<tr>
<td>Adri Kruger</td>
<td>Work with Bob to post IVI Generations material on the web site.</td>
<td></td>
</tr>
<tr>
<td>Vesna Jadric</td>
<td>Make sure that the Equivalence tables will show that the first version of IVI-3.1 for IVI-2014 is 3.5.</td>
<td></td>
</tr>
<tr>
<td>Vesna Jadric</td>
<td>Run Minor Change process that does not require IPR for IVI-3.1 to allow signed 8-bit integer data type. Work with Jon and David to create wording regarding the fact that SByte is not CLS compliant.</td>
<td></td>
</tr>
<tr>
<td>John Harvey or Vesna Jadric</td>
<td>Run Minor Change process that does not require IPR for IviDigitizer spec to use System.SByte. John will work with IVI.NET WG to decide if we need to include the CLS compliant attribute in the specification.</td>
<td></td>
</tr>
<tr>
<td>John Harvey</td>
<td>Based on the action item above, make a change in the Shared Components source code. John</td>
<td></td>
</tr>
<tr>
<td>Owner</td>
<td>Action Item</td>
<td>Status</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Vesna Jadric</td>
<td>will discuss the schedule for releasing the modified Shared Components with the IVI.NET WG.</td>
<td></td>
</tr>
<tr>
<td>Vesna Jadric</td>
<td>Run Minor Change process that does not require IPR for IVI-3.1 to expand the “Vendor specific errors and warnings” range.</td>
<td></td>
</tr>
<tr>
<td>Vesna Jadric</td>
<td>Run Editorial Change process for IVI-3.2 to clarify that C functions that have a ViChar array output parameter cannot return warnings.</td>
<td></td>
</tr>
<tr>
<td>Vesna Jadric</td>
<td>Create the change document for asynchronous I/O change in IVI-3.4 for IVI.NET.</td>
<td></td>
</tr>
<tr>
<td>David Rohacek</td>
<td>Create the change document for asynchronous I/O change in IVI-3.4 for IVI.NET.</td>
<td></td>
</tr>
<tr>
<td>John Harvey</td>
<td>Run Minor Change process for IVI-3.4 to add a new section for Asynchronous I/O for IVI.NET drivers.</td>
<td></td>
</tr>
<tr>
<td>Vesna Jadric</td>
<td>Let Bob know about no lunch on Wednesday.</td>
<td></td>
</tr>
<tr>
<td>John Harvey</td>
<td>Post editorial IVI.NET changes made in:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IVI-4.6 IviSwtch Class Specification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IVI-4.7 IviPwrMeter Class Specification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IVI-4.12 IviCounter Class Specification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IVI-4.15 IviDigitizer Class Specification</td>
<td></td>
</tr>
</tbody>
</table>

**Adjourn**

Meeting Adjourned.
5. Technical Committee

General Meeting Info:

Date of Meeting: Feb 07, 2014
Location: San Diego, CA
Chairperson: Jon Bellin
Minutes Prepared By: David Rohacek

Topics To Be Discussed:

- Review Agenda
- Review Voting Members In Attendance
- Patent Call
- Approve minutes from the October 2013 Technical Committee Meeting
- Review outcome of recent eVotes, IPR Declarations, Editorial Changes, and Reviews
- Review Action Items from Previous Meeting
- Review Spec Status Document
- Working Group Topics
  - Vote on IVI-3.17 Minor Change – IVI.NET Installation Directories
  - Vote on IVI-6.4 Specification – New Specification
- New Business
  - VPP-4.3 and VPP-4.3.2 Specification Updates (Dan Mondrik)
  - Issues with IVI-COM PIAs (John Harvey)
- Discuss Upcoming Meetings
- Discussion of Nature of Agendas as well as Length and Frequency of Meetings, in 2015 and Beyond
• New Action Items

**Voting Members In Attendance**

<table>
<thead>
<tr>
<th>Present</th>
<th>Organization Name</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aeroflex Corporation</td>
<td>Mark Meldrum / Marv Rosner</td>
</tr>
<tr>
<td>X</td>
<td>Agilent Technologies</td>
<td>Joe Mueller</td>
</tr>
<tr>
<td></td>
<td>Bustec Ltd.</td>
<td>Fred Bloennigen</td>
</tr>
<tr>
<td></td>
<td>EADS North America Test &amp; Services</td>
<td>Dan Masters</td>
</tr>
<tr>
<td>X</td>
<td>Keithley Instruments</td>
<td>John Ryland</td>
</tr>
<tr>
<td>X</td>
<td>MathWorks</td>
<td>Rob Purser / Vinod Cherian</td>
</tr>
<tr>
<td>X</td>
<td>National Instruments</td>
<td>Jon Bellin</td>
</tr>
<tr>
<td>X</td>
<td>Pacific MindWorks, Inc.</td>
<td>Kirk Fertitta</td>
</tr>
<tr>
<td></td>
<td>Rockwell Collins</td>
<td>Jason Schares</td>
</tr>
<tr>
<td>X</td>
<td>Rohde &amp; Schwarz</td>
<td>Jochen Wolle</td>
</tr>
<tr>
<td></td>
<td>Tektronix</td>
<td>Archana Akkalkot / Mike Wadzita / Santanu Pradhan</td>
</tr>
<tr>
<td>X</td>
<td>Teradyne, Inc.</td>
<td>Teresa Lopes</td>
</tr>
<tr>
<td></td>
<td>VTI Instruments</td>
<td>Sangram Gaikwad / Tom Sarfi</td>
</tr>
</tbody>
</table>

There are 7 voting members in attendance, which satisfies the requirements for a quorum of 4 Voting Members. (Quorum is 25% of Voting Members. There are currently 13 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 that 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.

Approve minutes from the October 2013 Technical Committee Meeting

The minutes from the October 2013 Technical Committee Meeting are posted on the IVI Foundation web site.

No issues were brought up with the minutes. The minutes are accepted.

Review outcome of recent IPR Declarations, eVotes, and Reviews

IVI-3.1 Editorial Change

On November 12th, Vesna Jadric announced IVI-3.1 editorial change via the email below.

From: <vesna.jadric@ni.com>
To: IVI-Foundation-Members-1@ivifoundation.org
Date: 11/12/2013 02:17 PM
Subject: Editorial Change: IVI-3.1: Driver Architecture Specification (2 weeks review)

Greetings,

At the October IVI Foundation meeting in Dallas, it was suggested that we need to find a place in IVI-3.1 that advises driver developers that the older the version of the IVI Shared Components they use to build their driver, the more it will be consistent with systems whose owners have not or cannot update their systems to the latest version of the shared components. I was tasked with working with Jon Bellin to determine the best location and wording to use in
IVI-3.1 and then to run the Editorial Change process for IVI-3.1. It was suggested that the location should not be specific to C, COM, or .NET. However, after further thought, Jon Bellin, David Rohacek, and I concluded that version dependency between drivers and the shared components has been and is very likely to be is a non-issue for IVI-C and IVI-COM. We discussed this with John Harvey, and he agreed. So we decided to restrict the editorial change to IVI.NET. John suggested text that we liked very much, so that is what is included in the change document.

The change document and the updated specification are posted to [IVI-3.1 web site](#).

The review period for this editorial change is **November 12 - 26, 2013.**

Please contact me with any feedback.

Thanks,

Vesna Jadric
Instrument Drivers/IVI | National Instruments | 512-683-5360

The review period for the IVI-3.1 editorial change has ended without objections. The editorial changes are accepted and have been posted.

**IVI-3.17 Minor Change - IVI.NET Installation Directories**

On November 12th, John Harvey announced IVI-3.17 minor change via the email below.

From: <john_harvey@agilent.com>
To: IVI-Foundation-Members-1@ivifoundation.org
Date: 11/12/2013 05:31 PM
Subject: IVI-3.17 Specification Changes

Greetings,

The IVI.NET WG has reviewed a set of changes related to the name of IVI.NET installation directories proposed at the October IVI Foundation meeting in Dallas, made some changes, and created a new draft of the IVI-3.17 specification, along with a change document. The change document and the updated specification are posted to the IVI.NET WG web page.
The review period for this minor change is **November 12 – December 3, 2013**.

Please contact me with any feedback.

Thanks,

John Harvey
Agilent Technologies

The review period for this minor change has ended with no feedback. The specification is now ready for vote.

**IVI-3.18 Editorial Change**

On November 12th, John Harvey announced IVI-3.18 editorial change via the email below.

From: <john_harvey@agilent.com>
To: IVI-Foundation-Members-1@ivifoundation.org
Date: 11/12/2013 05:31 PM
Subject: IVI-3.18 Specification Changes

Greetings,

The IVI.NET WG has reviewed a set of changes related to the description of the time axis properties in the IWaveform interface proposed at the October IVI Foundation meeting in Dallas, made some changes, and created a new draft of the IVI-3.18 specification, along with a change document. The change document and the updated specification are posted to the IVI.NET WG web page.

The review period for this editorial change is **November 12 - December 3, 2013**.

Please contact me with any feedback.

Thanks,

John Harvey
Agilent Technologies
The review period for the IVI-3.18 editorial change has ended without objections. The editorial changes are accepted and have been posted.

VISA Shared Components
On November 14th, Kirk Fertitta announced review of VISA Shared Components via the email below.

From: <kirk@pacificmindworks.com>
To: IVI-Foundation-Members-1@ivifoundation.org
Date: 11/14/2013 10:25 AM
Subject: VISA Shared Components 1.6.0 available for review

The VISA Shared Components 1.6.0 is now available for review at the following URL:


The review will end on November 25, 2013. Please send any questions or comments or bug reports to kirk@pacificmindworks.com.

Regards,

Kirk Fertitta
Chief Technical Officer
Pacific MindWorks, Inc.
Ph: 858-521-1382 x237
Fax: 858-521-1385
The review period has ended with no feedback. The VISA Shared Components 1.6.0 have been posted.

IVI-4.2 Editorial Change

On November 21st, Vesna Jadric announced IVI-4.2 editorial change via the email below.

From: <vesna.jadric@ni.com>
To: IVI-Foundation-Members-1@ivifoundation.org
Date: 11/21/2013 12:33 PM
Subject: Editorial Change: IVI-4.2 IviDmm Class Specification (6-day review)

Greetings:

National Instruments proposes to make an editorial change in the IVI-4.2 spec, Section 19, to correct the attribute value names for the Auto Range attribute.

More details about the issue can be found in the change document posted on the IVI-4.2 web site.

The review period for this editorial change is November 21 - December 03, 2013.

Please contact me with feedback.

Best Regards,

Vesna Jadric
Instrument Drivers/IVI | National Instruments | 512-683-5360

The review period for the IVI-4.2 editorial change has ended without objections. The editorial changes are accepted and have been posted.

IVI-4.12 Editorial Change

On November 21st, Vesna Jadric announced IVI-4.12 editorial change via the email below.

From: <vesna.jadric@ni.com>
To: IVI-Foundation-Members-1@ivifoundation.org

Date: 11/21/2013 02:11 PM

Subject: Editorial Change: IVI-4.12 IviCounter Class Specification (6-day review)

Greetings:

National Instruments proposes to make an editorial change in the IVI-4.12 spec, Section 5.3.1, to correct the .NET method prototype for the Configure Filter method.

More details about the issue can be found in the change document posted on the IVI-4.12 website.

The review period for this editorial change is November 21 - December 03, 2013.

Please contact me with feedback.

Best Regards,

Vesna Jadric
Instrument Drivers/IVI | National Instruments | 512-683-5360

The review period for the IVI-4.12 editorial change has ended without objections. The editorial changes are accepted and have been posted.

IVI-3.4 Editorial Change

On December 9th, Vesna Jadric announced IVI-3.4 editorial change via the email below.

From: <vesna.jadric@ni.com>

To: IVI-Foundation-Members-1@ivifoundation.org

Date: 12/09/2013 10:10 AM

Subject: Editorial Change: IVI-3.4: API Style Guide Specification (6-day review)
Greetings,

At the October IVI Foundation meeting in Dallas, it has been decided to make an Editorial Change in IVI-3.4, Sections 16.1.3 and 16.1.4, to make the Session and System attributes read-only. The changed document is attached below.

The change document and the updated specification are also posted to IVI-3.1 web site.

The review period for this editorial change is December 09 - 20, 2013.

Please contact me with any feedback.

Thanks,

Vesna Jadric
Instrument Drivers/IVI | National Instruments | 512-683-5360

The review period for the IVI-3.4 editorial change has ended without objections. The editorial changes are accepted and have been posted.

IVI-6.4 Major Change – New Specification Review

On December 11th, Larry Ostheimer announced IVI-6.4 review via the email below.

From: <larry_ostheimer@agilent.com>
To: IVI-Foundation-Members-1@ivifoundation.org
Date: 12/11/2013 04:10 PM

Greetings:

The File Format Working Group is recommending that the IVI Technical Committee adopt an IVI file format standard to be known as “IVI-6.4: File Format Specification”. The work was requested by the Technical Committee in 2012 and is now complete.
The draft specification is posted on the IVI website in the members only page dedicated to the File Format Working Group.

The 45 day review period for this new IVI specification is from December 12, 2013 through January 25, 2014.

Please contact me with feedback.

Regards,
Larry Ostheimer
Agilent Technologies
707-577-5924

The review period for this major change has ended on January 25\textsuperscript{th}. The WG received some feedback and made edits in the final draft. The edits were minor and no additional review period or IPR declaration is required. The specification is now ready for vote.

IVI-6.4 IPR Declaration

The IPR Declaration for the IVI-6.4 specification concluded on January 25, 2014. The results are listed below.

<table>
<thead>
<tr>
<th>Company</th>
<th>Voting Member Representative</th>
<th>Option 3A</th>
<th>Option 3B</th>
<th>Option 3C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeroflex</td>
<td>Marv Rosner</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agilent</td>
<td>Joe Mueller</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Bustec Ltd.</td>
<td>Torsten Rissel</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>EADS North America Test &amp;</td>
<td>Dan Masters</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Note: According to the consortium’s IP policy, in the event that a member fails to respond to the IPR declaration request, they are deemed to have elected to Option 3A.

IVI.NET Shared Components

On December 18th, Kirk Fertitta announced review of IVI.NET Shared Components via the email below.

From: <kirk@pacificmindworks.com>

To: IVI-Foundation-Members-1@ivifoundation.org

Date: 12/18/2013 11:20 AM

Subject: IVI.NET Shared Components 1.1.0 available for review

The IVI.NET Shared Components 1.1.0 are now available for review at the following URL:


The review will end on January 10th, 2014. Please send any questions or comments or bug reports to kirk@pacificmindworks.com.
The review period has ended with no feedback. The IVI.NET Shared Components 1.1.0 have been posted.

IVI-3.4 Editorial Change

On January 22nd, John Harvey announced IVI-3.4 editorial change via the email below.

From: <john_harvey@agilent.com>
To: IVI-Foundation-Members-1@ivifoundation.org
Date: 01/22/2014 01:49 PM
Subject: Review Period for IVI-3.4 Changes

Greetings,

The IVI.NET WG has reviewed a set of changes related to making the versioning language in IVI-3.4 consistent with changes to IVI-3.17 as discussed at the October IVI Foundation meeting. The change document and the updated specification are posted to the IVI.NET WG web page, http://ivifoundation.org/membership/committees/DotNET/Default.aspx.

The review period for this change is January 22 – February 5, 2014.

Please contact me with any feedback.

Kirk Fertitta
Chief Technical Officer
Pacific MindWorks, Inc.
ph: 858-207-6198
fax: 858-521-1385
Thanks,
John Harvey
Agilent Technologies

The review period for the IVI-3.4 editorial change has ended without objections. The editorial changes are accepted and shall be posted.

**Action item:** John Harvey to post this change.

---

**Review Action Items from October 2013 Meeting**

<table>
<thead>
<tr>
<th>Owner</th>
<th>Action Item</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Harvey</td>
<td>Make a change in the IVI.NET Shared Components source code for System.SByte in IviDigitizer and for versioning changes. Release of these components is now possible because we have agreed on .NET versioning with respect to installation directories.</td>
<td>[01/20/2014] Complete. Included in the IVI.NET Shared Components 1.1 release.</td>
</tr>
<tr>
<td>John Harvey and David Rohacek</td>
<td>Create a change document by November 15th to propose the changes to IVI-3.17 to implement the installation directory changes for IVI.NET versioning.</td>
<td>[11/13/2013] Complete.</td>
</tr>
<tr>
<td>Vesna Jadric</td>
<td>Run Editorial Change process for IVI-3.4 to make the Session and System attributes read-only.</td>
<td>[12/20/2013] Complete.</td>
</tr>
<tr>
<td>Owner</td>
<td>Action Item</td>
<td>Status</td>
</tr>
<tr>
<td>-------</td>
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</tr>
<tr>
<td></td>
<td>to build drivers, and then to run the Editorial Change process for IVI-3.1.</td>
<td></td>
</tr>
</tbody>
</table>

**Review Spec Status Document**
The group reviewed and edited the Spec Status Document.

![IVI_SpecLifecycleStatus.xlsx](IVI_SpecLifecycleStatus.xlsx)

**Working Group Topics**

**Vote on IVI-3.17 Minor Change - IVI.NET Installation Directories**
The need for changes to the IVI.NET Install Directories was identified in the IVI.NET WG meeting in October, 2013. The directory names currently include the major/minor version numbers of the installer, and are being changed to include the major, minor, and build version numbers of the installer. Additional changes were made to support side-by-side design-time capabilities.

The review period for this minor change has ended on December 03, 2013. No feedback has been received.

Resolution (2014-02-07:#1): Joe Mueller moves that the IVI Foundation approve the minor change to the IVI-3.17 specification to change the IVI.NET installation directories to support side-by-side design-time capabilities.

Seconded by Kirk Fertitta.

The vote was 6-0-0. The resolution is approved.
Action item: Vesna to update the In Progress tab of the lifecycle document.

Vote on IVI-6.4 Specification – New Specification
The File Format Working Group is recommending that the IVI Technical Committee adopt an IVI file format standard to be known as “IVI-6.4: File Format Specification”. The work was requested by the Technical Committee in 2012 and is now complete.

The review period for this major change has ended on January 25, 2014. Minor feedback has been received and addressed.


The vote was 6-0-0. The resolution is approved.

Action item: Vesna to update the In Progress tab of the lifecycle document.

New Business

VPP-4.3 and VPP-4.3.2 Specification Updates
The VISA Working Group recommends that the IVI Foundation update VPP-4.3 and VPP-4.3.2 to include:

- Adding clarifications (rules, permissions and observations) regarding when multiple calls to viReadAsync, viWriteAsync and viMoveAsync must be performed in order.

- Adding clarifications (rules, permissions and observations) regarding uses of the openTimeout parameter to viOpen.

- Adding a new error code VI_ERROR_LINE_NRESERVED to facilitate better mapping of PXI-9 trigger error codes.

- Updating the version to 5.2
Resolution (2014-02-07:#3): Kirk Fertitta moves that the VISA Working Group implement a minor change to the VPP-4.3 and VPP-4.3.2 specifications to add clarifications regarding multiple Async calls, clarifications regarding uses of the openTimeout parameter to viOpen, and a new VI ERROR_LINE_NRESERVED error code. Seconded by Vinod Cherian.

The vote was 6-0-0. The resolution is approved.

Action item: Vesna to add this effort to the In Progress tab of the lifecycle document.

Issue with IVI-COM PIAs and VISA-COM PIAs
The IVI.NET Working Group has been looking at an issue with IVI-COM PIAs that affects both the IVI Shared Components and the VISA Shared Components. John Harvey presented the following slides:

Currently, during Shared Component installation, the PrimaryInteropAssemblyCodeBase registry value is added to the type library registry key for each IVI-COM PIA so that Visual Studio can find the PIA in the file system. The way we would like this to work is that independent registry values for 32-bit and 64-bit apps point to the 32-bit and 64-bit type libraries, respectively. In Vista, this was the case, but in Windows 7 and 8 they values must be the same. Therefore PrimaryInteropAssemblyCodeBase must point to either the 32-bit PIAs for both 32-bit and 64-bit apps, or to the 64-bit PIAs for both 32-bit and 64-bit apps.

The build tools that come with MSVC 2005/2008 were able to use the information from 32-bit PIAs to build 64-bit apps, and were not able to use 64-bit PIAs for this purpose. The build tools that come with MSVC 2010/2012 cannot use the information 32-bit PIAs to build 64-bit apps – they report an error in this case. Thus, we cannot set the PrimaryInteropAssemblyCode value such that a Windows 7 or 8 user would be able to successfully build a 64-bit app using IVI-COM PIAs in both MSVC 2005/2008 and MSVC 2010/2012.
This applies to the type libraries in the IVI-COM Shared Components and the VISA-COM Shared Components. It also applies to type libraries in IVI-COM specific drivers that distribute PIAs in the same way that the IVI Foundation does.

There is no solution that is both non-risky and without loss of some functionality. The working group decided that the best solution is for the PIAs to stop adding PrimaryInteropAssemblyCodeBase to the registry and to rely instead on PrimaryInteropAssemblyName, which finds the correct bitness of the PIA via the GAC and doesn’t have the problem. The biggest drawback to this solution is that customers will not see the XML comments as part of Intellisense, unless they explicitly browse to the PIA in the file system to add reference to it in their MSVC project.

Note: The Technical Committee decided to make this a minor change rather than a major change for the following reasons: 1) we will grandfather-in existing drivers; 2) the user impact is only in documentation and not in executable code; 3) from an executable perspective, the existing PIAs already have the above issue with regard to 64-bit.

Resolution (2014-02-07:#4): Joe Mueller moves that the IVI.NET working group implement a minor change to IVI-3.14: Primary Interop Assembly Specification to remove the type library PrimaryInteropAssemblyCodeBase registry value from the IVI-COM and VISA-COM shared components type library keys (which means that customers may not see the XML comments as part of Intellisense when programming with the PIAs) and to require that IVI-COM drivers released after July 1, 2014, not include the type library PrimaryInteropAssemblyCodeBase registry value. Seconded by Kirk Fertitta.

The vote was 6-0-0. The resolution is approved.

**Action item:** Vesna to add this effort to the In Progress tab of the lifecycle document.

**Action item:** John Harvey to propose the change to IVI-3.14 to implement this resolution and send it for review.

**Action item:** Vesna to run an eVote as soon as the review period completes.

**Action item:** David and Dan to implement and send for review the updated IVI Shared Components and VISA Shared Components installers so they can be posted as soon as possible after the eVote.
Designation and File Extension for Files That Comply With the IVI File Format Specification

Joe Mueller suggested that it would be a good idea for the IVI-6.4 specification to require that vendors implementing the IVI File Format Specification use a specific file extension and a specific name to refer to use when referring to files that conform to the format.

Vinod Cherian pointed out that the working group had considered this and concluded that using the HDF5 file extension is appropriate for these files.

Agreement was reached that the working group needs to explicitly specify the file extension to be used and to specify a name to use when referring to files that conform to the format.

Action item: Vesna to communicate to Larry this request from the Technical Committee. If the working group acts expeditiously (start the review by March 7th, 2014), this change to the specification will be only an editorial change.

Discuss Upcoming Meetings

The next meeting will be May 19-21, 2014 (Monday - Wednesday) in Singapore.

Jochen Wolle gave a presentation and video on Singapore and the R&S facility.

Wednesday, May 21, will be “LXI and IVI Day”, which will be like a trade show in which companies can market their products, hopefully related to IVI and/or LXI. That means that our regular agenda needs to be limited to two full days. Also, the IVI Education Material session will be on “LXI and IVI Day”.

<table>
<thead>
<tr>
<th>Working Group</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared Components Management</td>
<td>1 hr</td>
</tr>
<tr>
<td>Web Forum</td>
<td>3 hr</td>
</tr>
<tr>
<td>IVI.NET</td>
<td>2 hr</td>
</tr>
<tr>
<td>VISA</td>
<td>2 hr</td>
</tr>
<tr>
<td>VISA.NET</td>
<td>4 hr</td>
</tr>
<tr>
<td>Working Group</td>
<td>Time</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>IVI Education Material</td>
<td>0 hr (will be on Wednesday)</td>
</tr>
<tr>
<td>Marketing Committee General (overlap with VISA.NET)</td>
<td>2 hr</td>
</tr>
<tr>
<td>Technical Committee Meeting, BoD</td>
<td>4 hr</td>
</tr>
</tbody>
</table>

Criteria for IVI meeting locations:

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, Boston, Austin)
- Hotel journey is 20 minutes on Google maps.
- Sleeping room price should not exceed $169.
- Meeting fees should not exceed $400.
- Internet bundled into the cost.

October 2014 meeting: Oct 15-17

**Baltimore/Washington**

Note: consider expanding time devoted to Web Forum, Online Training, and other promotional activities (see section 1.12, below).

February 2015 meeting:

Possibilities: St. Louis, Las Vegas, Phoenix, Atlanta

Note: Avoid Chinese New Year (starting February 18th)

**Discussion of Nature of Agendas as well as Length and Frequency of Meetings, in 2015 and Beyond**

Jon Bellin pointed out that with the initial VISA.NET specification coming to a close, the agendas for meetings in 2015 might be getting lighter. He put on the table, not for an immediate decision, the following possibilities:

1. Increase the time on the agenda for topics such as Web Forum, Online Training, Promotion (including refining materials)
2. Reduce meeting length from 2.5 to 2.0 days.
3. Reduce meeting frequency from three times per year to twice per year, assuming LXI agrees, or IVI skips one

The consensus of the Technical Committee was that the first option is the best. The committee does not want to preclude any new technical initiatives to which foundation members are willing to devote time.

Steve Schink stated that LXI wants to maintain 3 meetings/year at least through the end of 2015 and wants to stay in sync with IVI meetings. If IVI went to 2 meetings/year, LXI would meet when IVI meets and have its own meeting if needed.

**Summary of Action Items Created at the February 2014 Technical Committee Meeting**

<table>
<thead>
<tr>
<th>Owner</th>
<th>Action Item</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vesna Jadric</td>
<td>Record all resolutions in the lifecycle document.</td>
<td>[02/07/2014] Complete.</td>
</tr>
<tr>
<td>John Harvey</td>
<td>John to post the IVI-3.4 changes from February 5.</td>
<td></td>
</tr>
<tr>
<td>John Harvey</td>
<td>John Harvey to propose the change to IVI-3.14 to implement the resolution 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(remove the type library PrimaryInteropAssemblyCodeBase registry value from</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the IVI-COM and VISA-COM shared components type library keys) and send it</td>
<td></td>
</tr>
<tr>
<td></td>
<td>for review.</td>
<td></td>
</tr>
<tr>
<td>Vesna Jadric</td>
<td>Run an eVote as soon as the review period for the IVI-3.4 changes above</td>
<td>[02/10/2014] Complete.</td>
</tr>
<tr>
<td></td>
<td>completes.</td>
<td></td>
</tr>
<tr>
<td>David Rohacek</td>
<td>David and Dan to implement and send for review the updated IVI Shared</td>
<td></td>
</tr>
<tr>
<td>Dan Mondrik</td>
<td>Components and VISA Shared Components installers so they can be posted as</td>
<td></td>
</tr>
<tr>
<td></td>
<td>soon as possible after the eVote.</td>
<td></td>
</tr>
<tr>
<td>Vesna Jadric</td>
<td>Vesna to contact Larry Ostheimer regarding the request from the Technical</td>
<td>[02/10/2014] Complete.</td>
</tr>
<tr>
<td></td>
<td>Committee for IVI-6.4 changes.</td>
<td></td>
</tr>
</tbody>
</table>

**Adjourn**
Meeting Adjourned.
6. IVI Shared Components Meeting

San Diego, CA

Feb 5, 2014

Meeting Notes:

Current State of Shared Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>C Config Server</td>
<td>NI</td>
</tr>
<tr>
<td>IVI Event Server</td>
<td>Agilent</td>
</tr>
<tr>
<td>IVI Session Factory</td>
<td>Agilent</td>
</tr>
<tr>
<td>IVI Shared Component Installer</td>
<td>NI</td>
</tr>
<tr>
<td>IVI.NET Shared Component Installer</td>
<td>NI</td>
</tr>
<tr>
<td>IVI.NET Shared Components</td>
<td>TFS</td>
</tr>
<tr>
<td>IVI-C Shared Components</td>
<td>NI</td>
</tr>
<tr>
<td>IVI-COM Config Server</td>
<td>Agilent</td>
</tr>
<tr>
<td>IVI-COM Type Libraries (newer)</td>
<td>PMW</td>
</tr>
<tr>
<td></td>
<td>These are managed in Nimbus and probably need to be ported to raw Visual Studio.</td>
</tr>
<tr>
<td>IVI-COM Type Libraries (older)</td>
<td>Agilent</td>
</tr>
<tr>
<td></td>
<td>John can move these fairly easily.</td>
</tr>
<tr>
<td>VISA Shared Component Installer</td>
<td>NI</td>
</tr>
<tr>
<td>VISA Shared Components</td>
<td>NI</td>
</tr>
</tbody>
</table>
- John Harvey reported that the source HTML for the .chm files for the earlier type libraries has likely been lost.
- David Rohacek and Jon Bellin reported that many of the build tools are deeply integrated into NI systems and would be prohibitively time consuming to migrate to a shared source control or build system.
- CRT usage in shared components
  - John Harvey expressed desire to figure out who links to which version of the CRT before he upgrades the Agilent-maintained components to newer versions of Visual Studio.
  - Dan Mondrik reported that all of the VISA stuff is built against whatever version of the CRT ships with VS2008.

<table>
<thead>
<tr>
<th>Component</th>
<th>Maintainer</th>
</tr>
</thead>
<tbody>
<tr>
<td>VISA USBTMC driver</td>
<td>Agilent</td>
</tr>
<tr>
<td>VISA.NET Shared Components</td>
<td>TFS</td>
</tr>
<tr>
<td>VISA.NET Shared Components Installer</td>
<td>NI</td>
</tr>
<tr>
<td>VISA-COM Formatted I/O</td>
<td>Agilent</td>
</tr>
<tr>
<td>VISA-COM PIAs</td>
<td>Agilent</td>
</tr>
<tr>
<td>VISA-COM Type Libraries</td>
<td>NI</td>
</tr>
</tbody>
</table>
7. IVI Web Forum

San Diego, CA

*Feb 5, 2014*

**Agenda:**

1. Plan for getting content up.
   a. How much is enough.
   b. Brainstorm questions.
   c. Review DOD feedback.
   d. Figure out how to ask DoD for questions.
   e. Plan for getting harvested content from vendor-specific forums.
2. Discuss getting site styled
   a. Probably a Scott Butler thing.
3. Discuss getting usage guidelines on Forum
   a. Approval for Scott Butler to modify site
4. Discuss getting logo/link text/HTML.
5. Review fee for Bob.
   a. Estimate of 4 hours.
6. Review role of moderators and who they are.
7. Propose allowing announcements of vendor drivers.
   a. Standard text.

**Meeting Notes:**

- Reviewed roles of moderators. Bob is the axe-man in terms of kicking people off the list.
  - Moderators do have special privileges in terms of deleting posts.
- Bob reported that we will be buying insurance. Do we need to insure moderators specifically?
  - Yes, Bob is to get a quote for moderators in addition to the BoD.
• Bob’s fee for his administrator efforts.
  o Typically expected to be less than 4 hours (maximum) per month.
  o Bob willing to offer discounted rate of $75/hr.

• Styling the site and uploading content.
  o Agreement we should pay Scott to upload content for guidelines/legal.
  o In terms of styling, we at least need to get rid of the AnswerHub banner.
    ▪ Get a quote from Scott to do some styling to match the IVI site.
  o Recommendation to get a resolution to spend up to $2K on styling the site.
    ▪ This will be voted on when financial situation is clear.

• Discussion of link to forum.
  o Agreement that usage should be unlimited.
  o Agreement on standard logo and standard text for the link.
  o Recommendation to get approval for $500 investment in logo for link.

• Thoughts on going to DoD.
  o Good to review feedback.
  o Bad to stir the pot and solicit feedback.

• How to deal with LXI questions?
  o Probably try to answer them.
  o There’s really no other good question.

• Sources of questions:
  o Vendors to provide 10 (or more) questions from forums by March 1st:
    ▪ Agilent
    ▪ PMW
    ▪ NI (Kirk to contact Vesna)
      ▪ Dan to have his folks come up with questions.
    ▪ John Ryland
    ▪ Vinod
    ▪ Teradyne
    ▪ Rohde
    ▪ Bob (go through history of emails sent directly to him)
    ▪ Alexis

• **General consensus that 50 questions would be fine for launching.**

• What needs to happen before launch?
  o Styling.
  o Guidelines uploaded.
  o 50 questions answered.
  o Insurance bought.
  o Moderators trained.
  o Send notice to list server that a 3-week review process has begun and they can provide feedback and may explicitly veto going live within that period if they feel they need to.
    ▪ Content
    ▪ Guidelines
    ▪ Styling
• Schedule to complete:
  o Questions supplied by 3/1.
  o WG to meet weekly during March and complete questions by 4/1.
  o Site styling and guidelines uploaded by 4/1.
  o Insurance bought by 4/1.
  o Review period from 4/1 to 4/21.
  o Launch 4/22.
• Discussion of vendor announcing drivers and updates.
  o Jon Bellin expressed concern that announcements could be a slippery slope towards
    backdoor product announcements.
    ▪ Jon proposes deferring till the May meeting.
  o Rules for what constitutes a “new driver” or an announcement:
    ▪ Ex: Driver didn’t change, but supports a newer/faster instrument.
  o Potentially could have a rule that any version number change is a “new driver”.
  o Will defer to May meeting.

Brainstorming Session

1. Does IVI support Linux?
2. What technologies does IVI cover?
3. Does using IVI drivers require VISA?
4. Where can I find the IVI Shared Components?
5. Where can I find a list of IVI drivers?
6. What is the difference between a driver from Ni and Agilent for a particular device?
   a. DriverVendor != Manufacturer
7. Do I need the NI Compliance Package for a driver?
8. What things install the IVI Shared Components?
9. I downloaded VISA from the IVI website and I can’t talk to my device?
10. Can I redistribute the IVI drivers that I download from vendors?
11. If I don’t care about interchangeability, can I still use IVI and why?
12. What are IVI generations?
13. Why are repcap indices 1-based in IVI-C and COM?
14. How do I get started developing an IVI driver?
15. Do I have to be an IVI member to build a driver?
16. Where can I get the source code for an IVI driver?
17. Do I need to implement everything in an instrument class to be compliant?
18. Can I create an IVI driver for an instrument that does not fit within an instrument class?
19. Does the IVI Foundation provide an example of building an IVI driver?
20. Does the IVI Foundation provide examples of using IVI drivers?
21. Can I create my own instrument classes?
22. How can I access both instrument-specific and class-compliant functionality in an IVI driver?
23. How do I use an IVI driver in a way that enables interchangeability?
24. How do I edit the IVI Configuration Store?
25. My instrument is a specan that supports two different instrument classes, which should I use?
26. Is there an instrument class spec for:
   a. VNA
   b. BERT
27. Can I support more than one instrument class with an IVI driver?
28. When should I use Configure functions vs set/get attribute?
29. Where can I get all of the legal docs for redist’ing IVI Shared Components?
30. What are the rules surrounding redist of IVI Shared Components?
31. Do IVI drivers support 64-bit user mode?
32. Why does my IVI driver not install on a 64-bit system?
33. Are IVI drivers signed?
34. Can I have multiple VISAs installed on my system and what happens?
35. My VISA-COM PIA doesn’t work.
36. What versions of Visual Studio does IVI work with?
37. What versions of Windows does IVI work with?
38. Where can I get the USBTMC driver?
39. Why do I need the USBTMC driver?
40. Can I use the USBTMC driver connect to a non-USBTMC driver.
8. IVI Marketing Committee Meeting Minutes

GENERAL MEETING INFO: ........................................................................................................... 70
MEETING ATTENDEES: ................................................................................................................ 70
PREVIOUS ACTION ITEMS: .......................................................................................................... 71
PREVIOUS MEETING DISCUSSIONS: ............................................................................................ 72
NEW BUSINESS .......................................................................................................................... 72
Next Meeting ............................................................................................................................... 73
SUMMARY OF NEW ACTION ITEMS: ........................................................................................... 73

General Meeting Info:
Date of Meeting: February 6, 2014
Location: San Diego, CA
Chairperson: Adri Kruger
Minutes Prepared By: Adri Kruger

Meeting Attendees:

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adri Kruger</td>
<td>National Instruments</td>
<td>X</td>
</tr>
<tr>
<td>Kirk Fertitta</td>
<td>Pacific MindWorks</td>
<td>X</td>
</tr>
<tr>
<td>Bob Helsel</td>
<td>IVI Foundation</td>
<td>X</td>
</tr>
<tr>
<td>Jochen Wolle</td>
<td>Rohde &amp; Schwarz</td>
<td>X</td>
</tr>
<tr>
<td>Rob Purser</td>
<td>The Mathworks</td>
<td></td>
</tr>
<tr>
<td>Joe Mueller</td>
<td>Agilent</td>
<td>X</td>
</tr>
<tr>
<td>John Harvey</td>
<td>Agilent</td>
<td>X</td>
</tr>
<tr>
<td>John Ryland</td>
<td>Keithley</td>
<td></td>
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<tr>
<td>Jason Schares</td>
<td>Rockwell Collins</td>
<td></td>
</tr>
<tr>
<td>Jon Bellin</td>
<td>National Instruments</td>
<td>X</td>
</tr>
<tr>
<td>Vesna Jadric</td>
<td>National Instruments</td>
<td></td>
</tr>
</tbody>
</table>

IVI Foundation Meeting Minutes 70
David Rohacek  National Instruments  
Don Essner  DRS  
Mike Woodring  Pacific Mindworks  
Teresa Lopes  Teradyne  
Vinod Cherian  The Mathworks  
Eric Wetjen  The MathWorks  
Tom Fay  Agilent  
Eric Lord  Pacific Power Source  
Kevin Lam  Ametek Programmable Power  
Deborah Homan  Agilent  
Anshul Arora  Tektronix  
Steve Schink  Agilent  
Sheng Miao  Shaanxi Hitech  
Xiaojie Li  Shaanxi Hitech  
Yves  Agilent  

**Previous Action Items:**

<table>
<thead>
<tr>
<th>Owner</th>
<th>Action Item</th>
<th>Deadline</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joe</td>
<td>Record IVI Education Material</td>
<td>December 2013</td>
<td>Open</td>
</tr>
<tr>
<td>Bob</td>
<td>Speak with Chris to find out how the DoD would like to consume the IVI Education Material – This information could help drive how we deliver the content.</td>
<td>November 2013</td>
<td>Closed</td>
</tr>
<tr>
<td>Adri</td>
<td>Work with Bob to send out a letter to vendors to promote the IVI Educational material for San Diego</td>
<td>November 2013</td>
<td>Closed</td>
</tr>
<tr>
<td>Bob</td>
<td>Add item to web page that lets people opt in or contact information for notifications of training in their area.</td>
<td>November 2013</td>
<td>Closed</td>
</tr>
<tr>
<td>Owner</td>
<td>Action Item</td>
<td>Deadline</td>
<td>Status</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Bob</td>
<td>Inset some announcements into LinkedIn groups to generate awareness for IVI Educational Material</td>
<td>Ongoing</td>
<td>Open</td>
</tr>
<tr>
<td>Adri</td>
<td>Get updated equivalence table from BoD meeting – update IVI Generations content and send to Bob for publishing to the web</td>
<td>Post October meeting</td>
<td>Closed</td>
</tr>
<tr>
<td>All</td>
<td>VISA .NET press release</td>
<td>Defer to February</td>
<td>Open</td>
</tr>
</tbody>
</table>

**Previous Meeting Discussions:**
- **Discuss changes made to IVI Education Material** – status of updates
- **IVI Education Material** – Content has been sent out for review. NI is sending a representative to help incorporate CVI and LabVIEW examples. We need to make a decision how what we want to do with the material from here – webcast on demand, video, etc.
  - The Marketing group is in agreement that documenting the content via Camtasia (or similar recording tool). The content should be broken into small chunks (logical).
  - Target the end of the year for publishing the content.
  - Marketing should plan an execution strategy for promoting the content once it is published.
  - We will use the IVI Educational slot during this IVI session (if no students show up) to make a plan for the timeline or the content. Shawn (from NI) will be coming to help with the CVI and LabVIEW content.
- **Autotestcon** was a “success” this year – there was good attendance for the IVI session, however, the overall conference attendance continues to decline. The overall feeling among the IVI marketing group was that we should not attend in 2014 and evaluate if the conference turns around.
- **Support forum** – Work on the support forum has stalled due to liability issues. We should keep a heartbeat on this item.

**New Business**
- **IVI Education material** – Joe will coordinate with Bob and get the content recorded. Deliver outline of how the work will be broken down, what information will be covered and how long each will be. This outline will reviewed by the marketing group before recording.
  - 2 recording on the overview
  - 1 recording on technical content – repeated capabilities
• We need to figure out what we want to do with the login information for IVI Foundation
• Go live for web forum is on April 21. Adri will work with Kirk to plan a press release announcing the go live and plan for how to link on the IVI website
• IVI and LXI day in Singapore – IVI education material will be presented during this event. Vendor booths will be allowed. Bob will be sending out specifics on the reference design.
• LXI is creating generic content to allow members to link to from their documentation. Should IVI do something similar to develop content that would supplement vendor documentation.

Next Meeting

Date of Meeting:

Hosted by: IVI Foundation

Location: Singapore

Dates: May 19-23

Summary of New Action Items:

<table>
<thead>
<tr>
<th>Owner</th>
<th>Action Item</th>
<th>Deadline</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joe</td>
<td>Coordinate with Bob to start the process of recording the videos. Deliverables include outline of recording plan and recordings. Marketing should review the outline and first module</td>
<td>End of March</td>
<td>Open</td>
</tr>
<tr>
<td>Bob</td>
<td>Inset some announcements into LinkedIn groups to generate awareness for IVI Educational Material</td>
<td>Ongoing</td>
<td>Open</td>
</tr>
<tr>
<td>Adri</td>
<td>IVI Generations press release. Work with Bob to figure out how we are going to write it and get the marketing committee to review</td>
<td>March</td>
<td>Open</td>
</tr>
<tr>
<td>Adri</td>
<td>Press release for Web Forum (support forum)</td>
<td>April</td>
<td>Open</td>
</tr>
<tr>
<td>Adri</td>
<td>Coordinate with bob to link to Web forum on website</td>
<td>April</td>
<td>Open</td>
</tr>
<tr>
<td>Adri</td>
<td>Marketing messaging to members on the web forum</td>
<td>April</td>
<td>Open</td>
</tr>
<tr>
<td>Owner</td>
<td>Action Item</td>
<td>Deadline</td>
<td>Status</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
<td>--------</td>
</tr>
<tr>
<td>Joe</td>
<td>Present IVI education material at the IVI and LXI day in Singapore</td>
<td>May</td>
<td>Open</td>
</tr>
</tbody>
</table>
9. IVI BoD Meeting Feb 2, 2014
Called to order at: 9:49 Pacific

Directors in attendance

<table>
<thead>
<tr>
<th>Present</th>
<th>Director</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Joe Mueller</td>
<td>Agilent Technologies</td>
</tr>
<tr>
<td>X</td>
<td>Jon Bellin</td>
<td>National Instruments</td>
</tr>
<tr>
<td>X</td>
<td>Jochen Wolle</td>
<td>Rohde &amp; Schwarz</td>
</tr>
<tr>
<td>X</td>
<td>John Ryland</td>
<td>Keithley</td>
</tr>
<tr>
<td>X</td>
<td>Vinod Cherian</td>
<td>MathWorks</td>
</tr>
<tr>
<td>X</td>
<td>Kirk Fertitta</td>
<td>Pacific MindWorks</td>
</tr>
<tr>
<td>X</td>
<td>Teresa Lopes</td>
<td>Teradyne</td>
</tr>
</tbody>
</table>

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

Agenda Review

IVI BOD MEETING FEB 2, 2014
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. ELECTION OF OFFICERS AND COMMITTEE CHAIRS
6. BOD SUB COMMITTEES
7. INPUTS REGARDING MINUTES OF PREVIOUS MEETING
   7.1 ACTION ITEMS FROM PREVIOUS MEETING
8. RECOMMENDATIONS FROM TECHNICAL COMMITTEE
9. MEMBERSHIP REPORT
10. FINANCIAL REPORT
11. IVI PAID FOR CONFERENCE PHONE
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:

Inputs Regarding Minutes of Previous Meeting

None expressed

Action Items from Previous Meeting

NONE
Election of Officers and Committee Chairs

<table>
<thead>
<tr>
<th>Office</th>
<th>Serving in 2013</th>
<th>Nominees for 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>President</td>
<td>Joe Mueller</td>
<td>Joe Mueller</td>
</tr>
<tr>
<td>Treasurer</td>
<td>Jon Bellin</td>
<td>Jon Bellin</td>
</tr>
<tr>
<td>Secretary</td>
<td>Jochen Wolle</td>
<td>Jochen Wolle</td>
</tr>
<tr>
<td>Chair Technical Committee</td>
<td>Jon Bellin</td>
<td>Jon Bellin</td>
</tr>
<tr>
<td>Chair Marketing Committee</td>
<td>Adri Kruger</td>
<td>Adri Kruger</td>
</tr>
<tr>
<td>Administrator</td>
<td></td>
<td>Bob Helsel</td>
</tr>
</tbody>
</table>

Note that the role of the Administrator shall be to coordinate the administration of the foundation on behalf of the Board of Directors. This includes taking an active role on the administration of the IVI web forum and IVI web site.

Kirk moves that we retain the same slate of offers for 2014, adding the role of Administrator to be filled by Bob Helsel. Jon Bellin seconded. MSC (6:0:0).

BoD Sub Committees

<table>
<thead>
<tr>
<th>Sub Committees of BoD</th>
<th>Serving in 2013</th>
<th>Nominated for 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal Committee</td>
<td>(not created, BoD as</td>
<td></td>
</tr>
</tbody>
</table>
Kirk Fertitta moves that we retain the same slate of sub committee members identified above for 2014. Teresa Lopes seconded. MSC (6:0:0).

Recommendations from Technical Committee

Resolution (2014-02-07:#1): The technical committee moves that the IVI Foundation approve the minor change to the IVI-3.17 specification to change the IVI.NET installation directories to support side-by-side design-time capabilities.

Resolution (2014-02-07:#2): The technical committee moves that the IVI Foundation approve the new
IVI-6.4 File Format Specification.

MSC 6:0:0

**Membership Report**

Bob Presented the membership roster:

![Membership List IVI 12-16-13.xls](image-url)

**Financial Report**

Bob presented (will be incorporated in minutes later).

![2013 IVI PL_final.xls](image-url)

**IVI Paid for conference phone**

Note our resolution passed Feb 2013 that phone attendees will be charged 50% of meeting fee or $100, whichever is more.

On Wednesday/Thursday we had phone attendees from Agilent (Pete Stone) and NI (Pankaj Adhikari).

Bob Helsel will arrange for bills to be sent to John Harvey and Jon Bellin for 50% of the meeting fee.

**IVI non-profit status**

Bob has been updating the process Bode Enterprises uses as they manage the various consortia. It turns out that the IVI Foundation has not been filing a 990EZ (IRS form for non-profits) (Note that we are a business league in IRS terms). Nominally this should have been filed since the incorporation of the consortium.

Note that we are not currently under any known IRS scrutiny.
Based on external counsel, Bode Enterprises is recommending that we file our form 1024. This was completed by Gesmer/Updegrove when we were formed.

Recommend that we file a 990EZ and 1024 form. Total filing fees of $850. Bob will absorb costs for preparing the filings. An external accountant would probably cost $6k -- $8k on top of the $850 filing fee.

Kirk Fertitta moved that we accept Bob’s recommendation to file these documents and pay the filing fees. Jochen Wolle seconded.

MSC 6:0:0

**Web Forum: especially resolutions regarding expenditures**

Web forum discussion proposed that we consider:

- up to $2K on web forum styling (after financial report) including a graphic for a link members can use on their web pages.
- Annual fee for answer hub (~$3000/yr)
- Annual fee for Bob’s time to administer (based on actuals, not to exceed $3600 based on $75/hr)

(Jochen stepped out at this point)

Kirk moved that we authorize $8600 for 2014 web forum expenses. Teresa seconded.

MSC 6:0:0

**ACTION:** Joe – make finances and plan to attract members/meeting plans a standing BoD agenda item until resolved.

**Opportunity to Collaborate with LXI on reference design**

LXI consortium concluded that to attract members and ensure the longevity of the standard it would be beneficial to develop a reference design and make it available to members. It will be a SW implementation of most of the LXI core and extended functions (for Linux and Win 7). This will include some sort of a simplistic simulated instrument.
LXI will use this to promote the standard and also decrease the cost of implementation for existing and new members.

Next steps: we will put together a conference call with:

- Vesna Jadric
- Kirk Fertitta
- Steve Schink
- Joe Mueller
- Vinod Cherian
- John Harvey
- John Ryland

Joe to schedule in the next few weeks.

*Motion to Adjourn: Kirk Fertitta, Teresa Lopes seconded MSC 6:0:0*
10. Annual Membership Meeting
Feb 7, 2014

Called to order: 9:43 Pacific

Review voting members in attendance, introductions

Voting Members in Attendance (establish quorum and voting representatives in attendance):

<table>
<thead>
<tr>
<th>Company</th>
<th>Representative</th>
<th>Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeroflex Corporation</td>
<td>Marv Rozner</td>
<td></td>
</tr>
<tr>
<td>Bustec</td>
<td>Fred Bloennigen</td>
<td></td>
</tr>
<tr>
<td>EADS NA Test &amp; Services</td>
<td>Dan Masters</td>
<td></td>
</tr>
<tr>
<td>Keithley Instruments</td>
<td>John Ryland</td>
<td>X</td>
</tr>
<tr>
<td>MathWorks</td>
<td>Vinod Cherian</td>
<td>X</td>
</tr>
<tr>
<td>Pacific MindWorks, Inc.</td>
<td>Kirk Fertitta</td>
<td>X</td>
</tr>
<tr>
<td>Rockwell Collins</td>
<td>Jason Schares</td>
<td></td>
</tr>
<tr>
<td>Tektronix</td>
<td>Santanu Pradham</td>
<td></td>
</tr>
<tr>
<td>Teradyne</td>
<td>Teresa Lopes</td>
<td>X</td>
</tr>
<tr>
<td>VTI Instruments</td>
<td>Tom Sarfi</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Company</th>
<th>Representative</th>
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</tr>
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<td>National Instruments</td>
<td>Jon Bellin</td>
<td>X</td>
</tr>
<tr>
<td>Rohde &amp; Schwarz</td>
<td>Jochen Wolle</td>
<td>X</td>
</tr>
</tbody>
</table>
Note: Quorum is 25% of voting membership or 2, whichever is greater (By-Laws section 3.6). Based on 14 voting members, a quorum is 4.

7/14 Present 2014-02-07 satisfies quorum.

Review Agenda

ANNUAL MEMBERSHIP MEETING ___________________________________________ 82
1. REVIEW VOTING MEMBERS IN ATTENDANCE, INTRODUCTIONS ___________ 82
2. REVIEW AGENDA ___________________________________________________ 83
3. REVIEW MINUTES OF PREVIOUS MEETING ___________________________ 83
4. CIRCULATE MEMBERSHIP ROSTER TO BE CORRECTED BY MEMBERSERROR! BOOKMARK NOT DEFINED.
5. CREATE SLATE OF GENERAL DIRECTORS REPRESENTING GENERAL MEMBERSHIP........83
6. IDENTIFY SPONSOR DIRECTORS AS ELECTED BY SPONSOR MEMBERS _______ 85
7. NEW BUSINESS____________________________________________________ 85

Review minutes of previous meeting
No concerns expressed

Create slate of general directors representing general membership
There are 10 General-level members in the IVI Foundation, Inc., of whom, 4 are in attendance. Being more than 25% of the total membership that class, this constitutes a quorum.

NOTE FROM BY-LAWS 4.3c: “… Notwithstanding anything in these By-laws to the contrary, at the discretion of the Board, no Member shall be eligible to nominate or elect a Director if such Member’s representative to the Board of Directors failed to attend a majority of the meetings of the Board in the previous year....”
10 total general members. As a class, General Members are permitted to nominate up to 5 directors.

Motion: Kirk Fertitta moved that we take all general members present as voting members. Seconded by Teresa Lopes.

Resolution passes: Vote amongst attending general members, passes unanimously
Identify Sponsor Directors as elected by Sponsor Members

The following directors were elected by their representative companies.

<table>
<thead>
<tr>
<th>Company</th>
<th>Representative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agilent Technologies</td>
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</tr>
<tr>
<td>Rohde &amp; Schwarz</td>
<td>Jochen Wolle</td>
</tr>
</tbody>
</table>

New Business
None

MSC to adjourn (unanimous)  9:48 Pacific