Accessible Portable Item Protocol™ (APIP™) Frequently Asked Questions

IMS Accessible Portable Item Protocol (APIP) is a technology standard that specifies data formats for accessible test content (tests and items [questions]) and test takers’ accessibility needs, in order to enable accessible test delivery. APIP is intended to meet the access needs of test takers with disabilities, non-native language status, and many others. APIP defines a standard format for assessment content with a standard format for a student’s personal needs and preferences, allowing an accessible assessment experience.

The following are a collection of the most commonly asked questions. If you have another question that is not addressed here, be sure to submit it to the APIP public forum here: http://www.imsglobal.org/community/forum/categories.cfm?catid=110 and we will update the FAQ with new questions and answers.

Q: What are the major parts of APIP?

It is useful to think of APIP as involving three major parts:

- Content: The accessible content, which has supporting information for different kinds of accessibility needs
- Personal needs: The user Personal Needs and Preferences profile (PNP), which documents the access needs of test takers
- Delivery: The delivery system, which combines the PNP information with the accessible content to enable accessible delivery to the student.

Q. Why is APIP important?

Standards exist for many applications and types of information stored and transferred between computers, a common method for coding, storing, transferring and presenting computer-based test items is also imperative for the K-12 assessment industry. Vendors often rely on their own proprietary
methods for coding test items, using Hypertext Markup Language (HTML), Extensible Markup Language (XML), Flash, or other non-standard methods. The need for a common way of coding computer-based items is imperative so assessment items and tests can be viewed, repurposed, and transferred between all test delivery systems and item banks. By standardizing the formatting of information about accessible content, efficiencies in authoring, registration, and delivery of accessible tests are possible.

**Q. Who publishes and maintains the APIP standard?**

APIP is published and maintained by the IMS Global Learning Consortium of the IMS Global Learning Consortium (http://www.imsglobal.org/). IMS is a non-profit, member organization that supports the growth and impact of learning technology worldwide. IMS’s APIP Workgroup includes several state and testing industry members, including Measured Progress, Pearson, ETS, CTB-McGraw Hill, ACT, Pacific Metrics, Data Recognition Corporation, and others. See the full list of IMS member organizations at http://www.imsglobal.org/membersandaffiliates.html

**Q: How did APIP originate?**

Recent technological advances and the growing importance of—and unique demands inherent in—assessment drove efforts to increase the accessibility of test content for all students, illustrated for example by the requirements for the U.S. Federal Department of Education’s (USED) Race to the Top Assessment Program. To develop an industry standard for accessibility and interoperability of test items, USED helped fund the “Accessible Portable Item Profile” project. The Minnesota Department of Education led the effort, which included the states: New Hampshire, Vermont, Utah, Montana, Florida, South Carolina, and Maryland as participants and Michigan, Massachusetts, and North Carolina as observers. National interoperability and accessibility experts provided technical support. In December 2010 the team released the APIP standard as a public draft. The IMS Global Learning Consortium formed a working group to further develop and refine the standard. They also changed the name of the standard to “Accessible Portable Item Protocol” and released the candidate final version in 2012. Version 1.0 of the IMS APIP standard is expected to be published as an IMS standard in the near future.

**Q: Who can use the APIP standard?**

All IMS Global standards are free to download and free to use. To claim conformance to an IMS standard an implementing organization must complete the certification process indicated and join the relevant IMS Alliance community, additional information about conformance is included below.
Q: Are consortia like Smarter Balanced Assessment Consortia and PARCC involved with APIP?

Smarter Balanced and PARCC committed to interoperability in their RttTA applications. Some of the states involved in the development of APIP are members of the RttTA consortia and some are independent. In addition, many of the vendors selected by Smarter Balanced and PARCC are active participants in IMS Global and APIP.

Q. What accessibility needs does APIP support?

The APIP standard accessibility supports focus on the needs of students, rather than assuming that a particular learning issue prescribes the solution. It enables educators to make decisions that support the specific needs of individual students.

The first and current version of APIP describes support for the following accessibility needs:

1. Spoken (or Read Aloud), supporting a variety of different audiences, including:
   - Text Only
   - Text and Graphics
   - Non-Visual
   - Graphics Only
   - Directions Only
   - Spoken User Preferences (speech rate, link indication, etc.)
2. Braille information for a refreshable Braille display, including user preferences
3. References to Tactile manipulatives
4. Sign Language:
   - American Sign Language (ASL)
   - Signed English
5. Translation of the entire content into a different language
6. Translation of specific words, phrases, or object descriptions into a different language
7. Translation of the entire content into another version of the item that uses simpler language
8. Providing an alternate representation of any piece of information in the question
9. Magnification, and magnification amount preferences
10. Reversing the color values of the entire test
11. Alternate text and background colors
12. Color Tint Overlay over the content
13. Masking certain parts of the test interface or question
14. Masking the answer choices when the item is first encountered
15. Playing music or sounds in the background
16. Allowing for additional testing time
17. Allowing for breaks during the test
18. Emphasizing key words that need special attention
19. Providing a line-by-line reading ruler
20. Providing extra information to English Language Learners (ELL) to clarify some information
21. Providing extra information for some users who need additional guidance during testing or for something specific within an item (Cognitive Guidance)

Q: Why is this the list of accommodations supported? Can there be others?

The list of accessibility features in the current version of APIP were created by an initial end user group made up of 10 U.S. states, and then discussed and ratified for inclusion in APIP version 1 by the APIP Workgroup, a technical working group made up of representatives from a number of different assessment vendors. The APIP Workgroup also designated each access features as ‘required,’ ‘elective,’ or not applicable for the authoring systems (content), PNP systems, delivery systems at the Entry and Core Profile levels. Access features designated as required were deemed to be vital to assessment accessibility and interoperability at the respective certification levels, and the vendor community believes they can reasonably support these features. Other features can be added in future versions of APIP by bringing the feature requirements to either the APIP Workgroup or APIP End User Group’s attention.

Q: To what extent does APIP specify how assessment content should be delivered?

APIP specifies what the content should contain and provides some guidance about how that content should be delivered, but does not specify delivery details. Future versions of APIP may specify additional best practices for delivery systems.

Q: Does APIP compliance of delivery systems imply complete consistency of assessment delivery?

The conformance categories include a differentiation between the ability to import and export APIP Content or PNP files. Since APIP is primarily a transfer format, it will not certify how systems manage or modify data within the system itself. Delivery Systems are expected to combine the information provided by APIP content packages and PNP files. Although they do not need to natively use the APIP format during delivery, certified delivery systems must make use of the data/information supplied by APIP. Contracts with vendors who are providing compliant APIP Delivery Systems may include additional delivery specific requirements, including specifications around the presentation of default content, or how certain accessibility information should be presented. Bear in mind that some specific delivery-system implementation features may be the intellectual property of specific vendors, and may not be universally available. For example, a vendor may have developed a specific software tool for magnifying the content and navigating through that magnified content. The APIP concept of magnification is a required feature that compliant delivery systems must support, but a specific vendor’s implementation
Q. What does it mean to be APIP conformant?

APIP Conformance describes two tiers of accessibility features within APIP, namely Required (R) and Elective (e) features (see the conformance matrix in the diagram below). Required accessibility features are features that implementing systems are expected to support as a base level, or minimal feature set, of an APIP conformant system. This minimal feature set is called the Entry APIP “conformance profile”. At present there are two officially recognized conformance certification levels: Entry Level and Core Level. The Core Level adds additional accessibility features that must be supported by implementing systems. In addition to accessibility features, there will be requirements set for the minimum QTI features (as defined within the APIP QTI 2.1 profile) for Content and Delivery Systems. QTI features include assessment interoperability features such as item types, scoring, and feedback features. Depending upon which feature set is demonstrated by the implementing system, the system will receive either APIPv1 Entry or Core Certification. The specific required features for each level of certification are outlined in the table below. Elective access features are those additional features beyond the
Entry or Core sets that would be optionally supported by systems, at the request of customers. These elective features would be individually certified, and certified systems that include them will list the specific APIP elective access features they support, using the conformance identifiers defined within the conformance documentation.

The IMS conformance process allows for additional profiles to be created based on regional or community-specific requirements. For example, the RttTA consortia (PARCC, Smarter Balanced) may determine that the APIP Core or Entry profiles do not fully meet their community’s specific requirements and a new conformance profile could be developed to which vendors would develop content and systems for certification.

Q: Does an access feature that is required (‘R’) in an authoring product mean that all items must have that accommodation or accessibility tool?

If an item is expected to be delivered to an audience requiring the accessibility content, then the Content Authoring System should be providing the accessibility content within the item. If an item is specifically deemed inappropriate for a specific audience, and the item will not be delivered to that audience, then those exceptional pieces of content do not need the accessibility information. For example, if you have created an item that you know would be impossible for a blind person to respond to correctly, that item would not include Braille content, a Braille inclusion order, nor would it include a Spoken NonVisual inclusion order. It should be noted too that IMS conformance is relevant to the technical inclusion of the information, not the accuracy or appropriateness of the information.

Q: If a system provides an Elective (‘e’) access feature, must that feature be included when seeking APIP certification?

Elective access features are those features that could be supported by systems, but are not required for conformance. Elective features will be individually certified, and systems that use elective features must list the specific APIP Elective access features they support. Either Entry or Core certified systems are eligible to be certified in any elective feature. There is no Elective certification without Entry or Core certification. If a vendor is contracted to deliver or receive Elective information, that vendor would be “required by contract” to support the Elective feature. The contract may or may not require that the vendor seek IMS certification for the specific Elective features specified in that contract.

Q. What does it mean to be APIP certified?

IMS stands behind the certification marks it issues to products and content that prove conformance to a specific profile of the standard by passing a set of tests prescribed by the IMS community. When APIP systems and content pass certification, they will be listed at www.imscert.org and will receive an IMS
Conformance Registration Number and be able to display the official certified logo. IMS only certifies specific named products and specific versions of those products. IMS certification adds value to the marketplace because it means that the supplier is committed to working with the IMS community to actively resolve issues that may arise.

The www.imscert.org web page is the only official listing of products that have received IMS certification. Many more suppliers around the world use IMS standards, but achieving the IMS certification mark indicates that a product has gone through and passed testing prescribed by the IMS members in an ongoing community process.

**Q: Does APIP conformance for delivery systems imply complete consistency related to assessment delivery?**

The conformance categories include a differentiation between the ability to import and export APIP Content or PNP files. Since APIP is primarily a transfer format, it will not certify how systems manage or modify data within the system itself. Delivery Systems are expected to combine the information provided by APIP content packages and PNP files. Although they do not need to natively use the APIP format during delivery, certified delivery systems must make use of the data/information supplied by APIP. Contracts with vendors who are providing compliant APIP Delivery Systems may include additional delivery specific requirements, including specifications around the presentation of default content, or how certain accessibility information should be presented. Bear in mind that some specific delivery-system implementation features may be the intellectual property of specific vendors, and may not be universally available. For example, a vendor may have developed a specific software tool for magnifying the content and navigating through that magnified content. The APIP concept of magnification is a required feature that compliant delivery systems must support, but a specific vendor’s implementation of that feature may be limited to that specific vendor.

**Q: What is the certification process like?**

For system or platform certification: the process is likely to take PNP systems the least amount of time, Content Systems will take a little longer, and Delivery Systems are likely to take the longest. Content certification is dependent on the volume (size and/or number of items) of what’s being tested, but in general will likely take less time than system certification. IMS provides developers with materials, through the QTI/APIP Alliance, to facilitate the certification process. Systems that meet the requirements without alteration will go through the process much faster than systems requiring modification after reviewing the certification requirements.

**Q. What standards is APIP based on?**
APIP is based on three existing interoperability standards:

- QTI: The IMS Question & Test Interoperability Specification provides standard XML language for describing questions and tests. The specification has been produced to allow the interoperability of content within assessment systems. QTI is well-established and has been used internationally for over a decade. APIP uses the newer 2.1 version of QTI.
- Access for All: The IMS Access for All Personal Needs and Preferences (PNP) standard defines a common way for describing a student’s needs and preferences in a digital environment. PNP allows an inclusive user experience by enabling the matching of the characteristics of learning resources to the needs and preferences of individual students.
- Content Packaging: IMS Content Packaging (CP) is used to structure the QTI and accessibility information in a convenient exchange format (the package is exchanged as a zip file).

Q: What are the differences between APIP and QTI?

QTI v2.1 and APIP are the same except that APIP includes support for a range of access features (accommodations or access tools) needed for students with disabilities taking assessments in an electronic setting - see the "Access Features" section in the conformance table above. APIP is a higher bar to implement because it requires additional features in either an authoring tool (to author items, quizzes, tests) or test delivery platform to implement the accessibility features.

If a vendor implements APIP then they are also implementing QTI v2.1. An APIP item or test that has accessibility features set to 'none' in an actual test or item is using QTI v2.1. If a vendor implements QTI v2.1 they are a long way towards getting to APIP, but are not there yet.

Q: What is the Common Education Data Standards (CEDS) and how is it related to APIP?

The Common Education Data Standards (CEDS) project is housed within the National Center for Education Statistics (NCES) and develops common data standards education data elements. Part of this project includes the development of the Assessment Interoperability Framework (AIF). AIF is a collaborative effort between the Race to the Top Assessment Consortia (PARCC, Smarter Balanced) and two leading education standards organizations (SIF Association and IMS Global). One goal of AIF is to develop an architecture plan, detailing how system components and interoperability standards interact to support next generation assessments. SIF and APIP are the two standards that comprise the AIF architecture and have been adopted as vocabularies in CEDS to support assessment.

Q: My school uses a student information system to manage student level data, how is APIP related to these kinds of systems?
Many schools use student information systems for managing student and school level data. SIF and other organizations have well-established standards for managing student information. APIP will not replace these standards, but will generally need to interact with them. For example, in order to create Personal Needs and Preferences profiles (PNPs), student information may need to be retrieved from the student information system. These interactions are part of what is being defined by the Assessment Interoperability Framework (AIF).

Q: Why is there a need for accessibility in assessments?

Assessment at all levels—classroom, school, district, and state—is essential for tracking student success, guiding instruction, and for learning how we can improve our school systems. This has been demonstrated by extensive research in the U.S. and abroad. However, under state and federal laws, all students must be able to perceive, interact with, and respond to the full range of assessments in order for us to obtain valid and meaningful information about learning that teachers and parents need and can use to foster student growth. When a student can perceive, interact with, and respond to instruction and assessment we say that student has achieved meaningful “access” to education. This means that it is possible to use assessments to help us collect valid information about what that student really knows, understands, and can do. Conversely, if a student cannot access instruction or assessment, it is not possible for us to gain meaningful information about what the student knows or might be able to learn. Without meaningful access, we have no way to inform or guide instruction because we have no way to communicate effectively with the student regarding his or her understanding of academic concepts.

Q. What is an Inclusion Order?

One important aspect of APIP is the concept of Inclusion Orders. With APIP, you can specify the order that information is supplied to different kinds of audiences. So, content can be read differently depending on the type of read aloud support (“spoken” in APIP terms) required by the student. Specifically, only text might be read for some users, only descriptions of graphics provided for other users, both text and graphics read for still other users, and more detailed descriptions of graphics provided for users who have visual needs. For each category of user, both the information and the order in which information is presented to them are specified by an inclusion order. Think of inclusion orders as a specific audience’s content presentation order. In addition, there are inclusion orders for the sign language audiences (ASL and Signed English) and for Braille users.

Also, for the different kinds of users, you can specify which content could be read automatically, and which content can be read at the request of the user. APIP refers to those as the Default Order and the On Demand Order, respectively.
Q: Does APIP support of Braille include the Nemeth codes needed for symbolic/mathematical representation?

Version 1 of APIP does not support Nemeth codes because it doesn't actually support the attachment of BRF files (or any other Braille encoded format) to the content. It has been proposed that BRF files beattachable in APIP v1.1. This would allow the encoding of content using Nemeth codes, though the inclusion of Nemeth codes becomes more of a policy decision.

Q: There are needs for different types of calculators, including a “spoken” calculator, is this an explicit type?

APIP doesn't specifically mention the accessibility features of the calculators, though it does differentiate between the functions a calculator should have. It is implied that the delivery engine would provide the accessibility supports required by students who need a spoken support. This requirement could be more explicit in future conformance documentation, if desired.

Q: Does APIP support increased whitespace?

Increased whitespace was originally part of the APIP specification, but has been profiled out because (at the time) states felt more research needed to be done on the effects of the various kinds of whitespace that could be added (line spacing, word spacing, letter spacing, and combinations of all three). If needed, and explicit requirements were provided, it could easily be added to an upcoming version.

Q: Can objects be tagged as 3-D and then not shown if a student doesn’t do well with 3-D objects? Does APIP support this?

We currently do not have a way of tagging certain content for a particular cognitive mismatch (where the content’s presentation does not match the capabilities of the user). Is that a desired feature? The workgroup could discuss the possible technical solutions to address this need and include it in a future version of APIP. It would likely involve all 3 aspects of APIP (content, PNP, and delivery).

Q: Can APIP separate delivery versus input requirements? That is, the student taking the test may not be able to use a computer and may need to provide input to another human being or other type of input?

No, APIP does not address this use case at this time. This could theoretically be easily solved through new variables added to the PNP specification, and included in version 1.1 or later.
Q: Does APIP support scaffolding?

Scaffolding was another feature that was in the original list of access features for APIP, and is currently profiled out of version 1.0. The states felt more research was needed before some standardized requirements could be given. If specific requirements were supplied, it could easily be added into a future version.

Q: Does APIP support graphic type alternate representations?

APIP version 1.0 does not support graphic alternate representations. Similar to previous questions about supported features, it is currently profiled out. More research was thought needed in order to determine what we mean by graphic representations. Did we mean specific graphical representations like bar charts, or line graphs, or is it just generically ‘graphic’? This could very easily be added to a future version.

Q: Does APIP support text-to-speech rate and pitch preferences for each individual?

Yes, APIP supports users providing their preferred reading rate and pitch. It is an elective compliance feature though, so would need to be specifically requested/contracted.

Q: Does APIP allow the ability to print out the stimuli, or print out an entire item?

In general, APIP leaves security details to the contracting parties, and is then left to the delivery system to address. If needed, a PNP variable could be added to indicate the student is allowed to print out testing materials. Another point is that APIP does allow you to reference physical materials that should be given to the user in conjunction with the item (for example, a 3-D model or a book).

Q: Does APIP cover the use of companion materials (periodic table, formula sheet, etc.)?

Companion Materials are supported in APIP, and are described in section 2.2.13 on the Best Practices document. All companion materials can (should) themselves have accessibility information added to them (they can be APIP content).

Q. What role does U.S. federal legislation play in accessibility?

Over the last century, several major federal laws have been enacted for the purpose of protecting the rights of each and every citizen, regardless of the presence of a disability, to have equal access to all
publicly funded education, training, and employment preparation programs. Examples of these laws include: The Smith Fess Act (1920), The Rehabilitation Act of 1973 (reauthorized across the decades and contains Section 504 and Section 508, which are commonly recognized civil rights legislation); The Elementary and Secondary Education Act of 1965 (still active and currently known as No Child Left Behind); The Education of All Handicapped Children’s Act of 1975 (now known as IDEA); and The Americans with Disabilities Act, enacted 1990 (and still active). All these laws and many others have evolved across the decades as our understanding of the diverse and resilient nature of human capabilities has grown and deepened.

The Individuals with Disabilities Education Act of 1997 (IDEA ‘97) raised the importance of providing all students with access to instructional materials. NCLB 2001 included a more exacting mandate: all students had to be tested for their achievement of state standards. This legislation drove the application of Universal Design principles to instructional materials and then assessments. As the publishing industry began to develop digital content, the National Instructional Materials Accessibility Standards (NIMAS) were developed and included in IDEA ‘04, a major step forward for many students.

Q: How does the Measured Progress U.S. patent #8,303,309 affect the APIP standard?

All IMS standards development occurs under the auspices of an Intellectual Property Rights (IPR) Policy (http://www.imsglobal.org/ipr/imsipr_policyFinal.pdf) that accounts for the possibility of patents and provides a framework for participants to work together on identifying, discussing, and resolving IP issues. Measured Progress disclosed their United States patent early in the process of developing APIP and signed an intent to offer a RAND (Reasonable, And Non-Discriminatory) Zero-cost license specifically for the "field of" implementation of APIP Delivery Systems. Measured Progress does not feel the patent applies to APIP PNP or Content Systems. IMS is neutral with respect to any patent claims, meaning that IMS does not provide a legal opinion on patent claims. Therefore, implementers of APIP should review the Measured Progress License http://www.measuredprogress.org/ipr-apiip and make their own decision as to whether they wish to avail themselves of the license offered by Measured Progress.

Q: Does my organization have to agree that the Measured Progress patent claims are valid and/or have to partake in the Measured Progress license to implement or become certified to APIP?

No. From the perspective of IMS, an implementing organization that does not believe the Measured Progress claims are valid or does not wish to avail themselves of the Measured Progress license can still implement APIP Delivery System(s). There is no inference that just because an organization has implemented APIP or achieved APIP certification through IMS that such organization agrees with the patent claims or has invoked the Measured Progress license.
Q: How is APIP conformance certification related to the Measured Progress patent and license?

IMS does not connect conformance certification to the Measured Progress license. When a product becomes APIP certified, in the view of IMS, it carries no automatic acceptance or rejection of the Measured Progress license, it represents a long-term, active commitment by suppliers that IMS fully supports. Measured Progress has chosen the IMS certification process as a neutral way to identify the scope of an APIP implementation; in addition, their license language seems to allow for some other methodology or process to be defined.

Q: How does this Measured Progress patent affect the QTI standard?

The Measured Progress patent and license has no impact on the QTI standard. APIP uses a subset of QTI and the two are distinct specifications with separate profiles for conformance. The IMS IPR Policy is only concerned about patents that are necessarily infringed by implementation, and Measured Progress believes that their patent has valid claims relating to an accessibility enabled assessment delivery system as described here: http://www.measuredprogress.org/ipr-apip.

Q: Does the Measured Progress patent cover all categories of assessment systems or is it limited to only delivery systems?

IMS does not provide legal opinion on patent claims and calls attention to the patent and license as required by the IMS IPR Policy (http://www.imsglobal.org/ipr/imsipr PolicyFinal.pdf). The license details published on the Measured Progress website http://www.measuredprogress.org/ipr-apip indicate that the patent is related to an accessible assessment delivery system; other assessment related systems may fall outside of the scope of the patent.