

# Navy Assessment Profile

*Requirements and Guidelines for Implementing xAPI in Assessments*



Document Version: 1.1

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# Revision History

Version	Release Date	Notes
0.9	5/6/2021	Draft of the profile. Internal Navy review only.
1.0	6/7/2021	All edits and feedback incorporated. First full version of the profile released.
1.1	8/30/2022	<ol style="list-style-type: none"><li>1. Updated core assessment profile to be more extensible for other profiles and types of assessment (i.e., performance assessment)</li><li>2. Added the ability to distinguish between assessment types.</li><li>3. Added an Activity Profile section for relating assessment questions to learning objectives and relating assessments to competency frameworks.</li></ol>

Table 1: Navy Assessment Profile Revision History

# 1. Overview

## 1.1. How to Read this Document

This document is provided as an auxiliary resource to the formal xAPI Specification (version 1.0.3) and addresses the Navy-specific requirements for implementing xAPI in assessments. If an object or property is listed as “optional” in the xAPI Specification, but that same object or property is listed as a requirement herein, then this document takes precedence. The requirements in this document provide content developers with the mandatory Learning Record Provider (LRP) obligations for implementing xAPI Statements in assessments. The following common syntactic and typographic conventions are used in this document:

- Footnotes appear at the bottom of pages where there is a need to provide additional information or references.
- Words or concepts will use *Italics* or “double quotations” when there is a need to draw special attention to them.
- Title Case is used to identify concepts and terminology from the xAPI Specification.
- A Courier font such as this is used to represent data objects or properties associated with the xAPI Statement Data Model. A Courier font is also used to distinguish between technical terminology or concepts originating from the xAPI Specification or an xAPI Profile. A Courier font is also used to represent unique identifiers such as IRIs or IDs.
- xAPI Statement examples represented as JavaScript Object Notation (JSON) data snippets and other types of syntax examples are provided inside of light blue background box area like the one below:

```
"data-object":{  
    "property1": "value",  
    "property2": "value"  
}
```

### 1.1.1. Conformance Requirements

These xAPI conformance requirements are intended to be reused as part of the contract requirements in a Data Item Description (DID) deliverable or Contract Data Requirements List (CDRL). The use of “SHOULD” and “MAY” was avoided since these types of contract documents normally contain only mandatory instructions. Complete definitions are provided below. Not following these recommendations could risk interoperability and/or lead to xAPI deliverables not being accepted by the Navy.

1. SHALL OR SHALL NOT. If a product fails to implement a SHALL or SHALL NOT requirement, the product is non-conformant to Navy’s requirements.

## 1.1.2. Optional Requirements

Some attributes or values are labeled as optional. This is based on the understanding that not all information may be available to the application recording the learner's interactions with the content. Thus, when those optional attributes are unknown, it is permitted to omit them. However, if the attribute or value is known, it is required to record that information.

## 1.2. When to Use this Profile

The purpose of this document is to provide content developers with best practices, technical guidance, and standard requirements for implementing xAPI in assessments. This document is intended to serve as Navy's official technical and baseline requirements for any assessment contractually required to support xAPI. The different use cases for using xAPI to collect data for assessments are provided below in Section 1.4.

## 1.3. How to Use this Profile

This document is intended to be used in addition to the xAPI Specification and the Navy Core xAPI Profile. Please see these documents for the general data and content integration requirements. This document assumes an understanding of the xAPI Specification<sup>1</sup> and the underlying concepts explained therein. All communication and data formats SHALL follow the general requirements in the xAPI specification. The guidance provided in this document is meant to provide additional information and requirements specific to structuring assessment data with xAPI.

## 1.4. Navy Assessment Use Cases

Assessments are instruments designed to measure and evaluate specific elements of learning, such as whether the learner can recall or acquire specific knowledge, or demonstrate specific skills as a result of learning or training. Assessment is paramount to the Navy's training effectiveness evaluation strategy, which uses the Kirkpatrick Model (KM) as the foundational approach. The scope of assessment in this profile is focused on collecting data for formative and summative assessments. In this context, formative assessment involves using surveys or low stakes practice tests/quizzes as the instruments to collect the data and provide feedback. Summative assessment involves using high stakes tests or comprehensive tests to collect the data. Summative assessment results are expected to be compared against some standard measure or benchmark (criterion-referenced), or against how other learners performed (norm-referenced). Examples of these types of assessments represented by specific Navy use cases are described below:

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<sup>1</sup> The xAPI Specification, <https://github.com/adlnet/xAPI-Spec>

## 1.4.1. Formative Assessment

1. ***KM Level 1 Assessment*** - This type of assessment is a survey that provides the learner's feedback and perception of the quality and effectiveness of the instructor, content, and environment.
2. ***KM Level 2 Practice Assessment*** - This type of assessment is a knowledge check or quiz that measures and assesses the learner's progress immediately after an enabling learning objective, topic, or lesson in a course and provides corrective feedback to the learner to improve learning outcomes in real time.
3. ***KM Level 2 Observational Assessment*** - This type of assessment is a performance assessment involving the instructor and learner where the instructor observes the learner demonstrating specific knowledge or skills in a classroom lab exercise, drill, or hands-on skill activity (based on one or more learning objectives or competencies).
4. ***KM Level 2 Knowledge Assessment*** - This type of assessment (i.e., pretest/entry test/diagnostic test) measures and assesses the learner's ability to satisfy the learning objectives associated with a course or lesson prior to instruction in order to identify gaps or improve understanding before the training and summative assessment.

## 1.4.2. Summative Assessment

1. ***KM Level 2 Knowledge Assessment*** - This type of assessment (i.e., posttest/comprehensive test/summative test) measures and assesses the learner's knowledge and ability to satisfy the learning objectives associated with a course after the instruction.

## 1.4.3. Performance Assessment

Performance assessment can be used for formative or summative assessments. It measures whether Sailors can demonstrate what they learned by applying knowledge or skills through various performance tasks (simulated or real). The Navy Performance Assessment Profile specifies several additional assessment use cases based on performance, such as scenario-based performance assessments in a simulated virtual environment. Refer to the Navy Performance Assessment Profile for those specific use cases, requirements, and examples.

# 2. Navy Assessment Profile

## 2.1. Overview

The Navy Assessment Profile provides guidance on recording learner activity during an assessment, whether that is as a stand-alone entity or as part of a larger lesson.



## 2.2 Assessment Profile Concepts

The following tables provide a list of the xAPI vocabulary Concepts specifically used in this Profile. Concepts defined in other Profiles can also be used in or with the Navy Assessment Profile. If additional assessment use cases are identified and new Concepts are added, then an updated version of this Profile will be issued.

### 2.2.1. Verbs

Concept	Description	IRI	Applicable Activity
initialized	Indicates that the Actor successfully started an attempt on an Activity.	<a href="http://adlnet.gov/expapi/verbs/initialized">http://adlnet.gov/expapi/verbs/initialized</a>	assessment
responded	Indicates an Actor responded to an assessment question.	<a href="http://adlnet.gov/expapi/verbs/responded">http://adlnet.gov/expapi/verbs/responded</a>	cmi.interaction
resumed	Indicates that the Actor continued or reopened a suspended attempt on an Activity.	<a href="http://adlnet.gov/expapi/verbs/resumed">http://adlnet.gov/expapi/verbs/resumed</a>	assessment
suspended	Indicates that the Actor suspended an attempt on an Activity with the intent to return at a later time.	<a href="http://adlnet.gov/expapi/verbs/suspended">http://adlnet.gov/expapi/verbs/suspended</a>	assessment
terminated	Indicates that the Actor successfully ended an attempt on an Activity.	<a href="http://adlnet.gov/expapi/verbs/terminated">http://adlnet.gov/expapi/verbs/terminated</a>	assessment

Table 2: Verbs in the Navy Assessment Profile

### 2.2.2. Activity Types

Concept	Description	IRI	ContextActivity Relationships
assessment	An assessment is an Activity Type that determines a learner's mastery of a particular subject area. An assessment typically has one or	<a href="http://adlnet.gov/expapi/activities/assessment">http://adlnet.gov/expapi/activities/assessment</a>	N/A

	more questions.		
cmi.interaction	An interaction is typically a part of a larger Activity (such as an assessment, game, or simulation) and refers to a control to which a learner provides input.	<a href="http://adlnet.gov/expapi/activities/cmi.interaction">http://adlnet.gov/expapi/activities/cmi.interaction</a>	assessment (parent)
profile	A Profile defines a set of rules and recommendations for generating xAPI Statements for a particular domain. The inclusion of a Profile Activity in a Statement identifies that Statement as following the rules outlined in the Profile.	<a href="http://adlnet.gov/expapi/activities/profile">http://adlnet.gov/expapi/activities/profile</a>	N/A

Table 3: Activity Types in the Navy Assessment Profile

## 2.2.3. Activity Extensions

Concept	Description	IRI	Value Type	Expected Value(s)	Applicable Activity
assessment type	The value representing the type of assessment.	<a href="http://id.tincanapi.com/extension/assessment-type">http://id.tincanapi.com/extension/assessment-type</a>	string	One of the following in lowercase: - survey - quiz - progress test - pretest - posttest - comprehensive - oral test - essay test - problem sheet	assessment

				- assignment sheet	
extended interaction type	The type of interaction when the <code>interactionType</code> is other but a more specific interaction type that is not an existing <code>interactionType</code> is known.	<a href="https://w3id.org/xapi/netc-assessment/extensions/activity/extended-interaction-type">https://w3id.org/xapi/netc-assessment/extensions/activity/extended-interaction-type</a>	string	upload, *  * or as needed based on implementer requirements	cmi.interaction

Table 4: Activity Extensions in the Navy Assessment Profile

## 2.2.4. Context

### 2.2.4.1. Context Activities Category

The Context Activities Category array is a location in an xAPI Statement reserved for objects used to categorize, or tag, the Statement. This location is used in profiles to indicate that a Statement follows a specific profile or a collection of profiles. This Navy Assessment Profile defines specific Statement requirements for assessments and also references requirements in the Navy Core xAPI Profile. This is represented in xAPI Statements by adding the following two activities to the Context Activities Category array of the Statements.

```
{
  "id": "https://w3id.org/xapi/netc/v1.0",
  "definition": {
    "type": "http://adlnet.gov/expapi/activities/profile"
  }
}
```

Navy Core xAPI Profile activity

```
{
  "id": "https://w3id.org/xapi/netc-assessment/v1.0",
  "definition": {
    "type": "http://adlnet.gov/expapi/activities/profile"
  }
}
```

Navy Assessment Profile activity

If the values can be determined, the Navy Assessment Profile requires that the `launch-location` and `school-center` Context Extensions be included in xAPI Statements. Consult the Navy Common Reference Profile for additional guidance on the appropriate values for these Navy Context Extensions.

## 2.2.5. Result Extensions

Concept	Description	IRI	Value Type	Applicable Activity
response explanation	The learner's response to an interaction which asks the learner to explain why the answer was given. i.e., True or False, and explain why.	<a href="https://w3id.org/xapi/netc-assessment/extensions/result/response-explanation">https://w3id.org/xapi/netc-assessment/extensions/result/response-explanation</a>	string	cmi.interaction

Table 5: Result Extensions in the Navy Assessment Profile

## 2.2.6. Attachment UsageType

Concept	Description	IRI
uploaded response	Identifies the attachment as an interaction response from the learner in the form of an uploaded file.	<a href="https://w3id.org/xapi/netc-assessment/attachments/usage-type/upload">https://w3id.org/xapi/netc-assessment/attachments/usage-type/upload</a>

Table 6: UsageType IRIs in the Navy Assessment Profile

## 2.3. Statement Requirements & Examples

The scope of the xAPI Statement requirements and examples provided below is intended for assessments not packaged together with a SCORM course or other parent activity. Refer to the Navy E-learning for the requirements and specific Statement examples of assessments with the course as a parent or other grouping relationship.

### 2.3.1. Initializing an Assessment

An Initialized Statement is required to be communicated when an attempt on any type of assessment is started. A new Context Registration Universally Unique Identifier (UUID) SHALL be created upon initialization of the assessment and included in all statements reported for this attempt on the assessment. All of the Navy xAPI requirements for an Initialized Statement for assessment activities are provided below.

### 2.3.1.1. Initialized Assessment Statement Requirements

The following are the requirements for an xAPI Statement for initializing an assessment:

- The `actor` property SHALL be set according to the requirements in the Navy Core xAPI Profile
- The `verb.id` SHALL be set to `http://adlnet.gov/expapi/verbs/initialized`
- The `verb.display.en` SHALL be set to `initialized`
- The `object.id` SHALL be set to a unique identifier for the course according to the Activity ID requirements in the Navy Core xAPI Profile
- The `object.definition.type` SHALL be set to `http://adlnet.gov/expapi/activities/assessment`
- If known, the `object.definition.extensions` object SHALL include the `http://id.tincanapi.com/extension/assessment-type` Activity Extension and set to a predefined string value to indicate the type of assessment
- If the assessment is related to another assessment (e.g., pretest/posttest), the `context.contextActivities.grouping` array SHALL include the related assessment Activity
- The `context.contextActivities.category` array SHALL include the Navy Core xAPI Profile Activity identified in the Navy Core xAPI Profile
- The `context.contextActivities.category` array SHALL include the Navy Assessment Profile Activity identified previously in this document
- The `context.registration` SHALL be set to a new attempt UUID
- The `context.platform` SHALL be set to the appropriate string value defined in the Navy Core xAPI Profile
- If known, the following Context Extensions requirements apply:
  - The `https://w3id.org/xapi/netc/extensions/school-center` property SHALL be set to the appropriate predefined value from the Navy Common Reference Profile
  - The `https://w3id.org/xapi/netc/extensions/launch-location` property SHALL be set to the appropriate predefined value from the Navy Common Reference Profile
- The `timestamp` SHALL be set according to the requirements in the Navy Core xAPI Profile

### 2.3.1.2. Initialized Assessment Statement Example

An example of an Initialized Statement for a posttest is provided below.

```
{  
  "actor": {
```

```

    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",
      "name": "0123456789"
    }
  },
  "verb": {
    "id": "http://adlnet.gov/expapi/verbs/initialized",
    "display": {
      "en": "initialized"
    }
  },
  "object": {
    "id": "https://navy.mil/netc/xapi/activities/assessments/17923a7d-afee-22aa-c4ee-3333acac400",
    "definition": {
      "name": {
        "en": "P-8A ICW Advanced Airborne Sensor Posttest"
      },
      "description": {
        "en": "P-8A ICW Advanced Airborne Sensor General Familiarization Posttest"
      },
      "type": "http://adlnet.gov/expapi/activities/assessment",
      "extensions": {
        "http://id.tincanapi.com/extension/assessment-type": "posttest"
      }
    }
  },
  "context": {
    "contextActivities": {
      "category": [
        {
          "id": "https://w3id.org/xapi/netc/v1.0",
          "definition": {

```

```

        "type": "http://adlnet.gov/expapi/activities/profile"
    },
    {
        "id": "https://w3id.org/xapi/netc-assessment/v1.0",
        "definition": {
            "type": "http://adlnet.gov/expapi/activities/profile"
        }
    }
]
},
"registration": "ad8ca9da-51b1-48eb-ae58-a68d4d3ae886",
"platform": "Moodle 3.8.3",
"extensions": {
    "https://w3id.org/xapi/netc/extensions/school-center": "Center for Naval
Aviation Technical Training (CNATT)",
    "https://w3id.org/xapi/netc/extensions/launch-location": "Ashore"
}
},
"timestamp": "2021-04-02T16:00:21.230Z"
}

```

## 2.3.2. Suspending an Assessment

Learners can suspend an assessment with the intent of coming back to it at a later time. Note, suspending and resuming an assessment is not required. These statements are only required if the assessment design provides a way to be suspended and resumed at a later time. A Suspended Statement SHALL be sent when the user suspends an attempt on the assessment. All of the Navy xAPI requirements for a Suspended Statement are provided below.

### 2.3.2.1. Suspended Assessment Statement Requirements

The following are the requirements for an xAPI Statement for suspending an assessment:

- The actor SHALL be set according to the requirements in the Navy Core xAPI Profile

- The `verb.id` SHALL be set to `http://adlnet.gov/expapi/verbs/suspended`
- The `verb.display.en` SHALL be set to `suspended`
- The `object.id` SHALL be set to a unique identifier for the assessment according to the Activity ID requirements in the Navy Core xAPI Profile
- The `object.definition.type` SHALL be set to `http://adlnet.gov/expapi/activities/assessment`
- If known, the `object.definition.extensions` object SHALL include the `http://id.tincanapi.com/extension/assessment-type` Activity Extension and set to a predefined string value to indicate the type of assessment
- If the assessment is related to another assessment (e.g., pretest/posttest), the `context.contextActivities.grouping` array SHALL include the related assessment Activity
- The `context.contextActivities.category` array SHALL include the Navy Core xAPI Profile Activity identified in the Navy Core xAPI Profile
- The `context.contextActivities.category` array SHALL include the Navy Assessment Profile Activity identified previously in this document
- The `context.registration` SHALL be set to the same attempt UUID established during the last assessment Initialization
- The `context.platform` SHALL be set to the appropriate string value defined in the Navy Core xAPI Profile
- If known, the following Context Extensions requirements apply:
  - The `https://w3id.org/xapi/netc/extensions/school-center` property SHALL be set to the appropriate predefined value from the Navy Common Reference Profile
  - The `https://w3id.org/xapi/netc/extensions/launch-location` property SHALL be set to the appropriate predefined value from the Navy Common Reference Profile
- The `timestamp` SHALL be set according to the requirements in the Navy Core xAPI Profile

### 2.3.2.2. Suspended Assessment Statement Example

```
{
  "actor": {
    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",
      "name": "0123456789"
    }
  }
}
```



```

    },
    "verb": {
      "id": "http://adlnet.gov/expapi/verbs/suspended",
      "display": {
        "en": "suspended"
      }
    },
    "object": {
      "id": "https://navy.mil/netc/xapi/activities/assessments/17823a7d-afee-22aa-c4ee-3333acac400",
      "definition": {
        "name": {
          "en": "P-8A ICW Advanced Airborne Sensor Quiz"
        },
        "description": {
          "en": "P-8A ICW Advanced Airborne Sensor General Familiarization Quiz"
        },
        "type": "http://adlnet.gov/expapi/activities/assessment",
        "extensions": {
          "http://id.tincanapi.com/extension/assessment-type": "quiz"
        }
      }
    },
    "context": {
      "contextActivities": {
        "category": [
          {
            "id": "https://w3id.org/xapi/netc/v1.0",
            "definition": {
              "type": "http://adlnet.gov/expapi/activities/profile"
            }
          },
          {
            "id": "https://w3id.org/xapi/netc-assessment/v1.0",

```

```

        "definition": {
            "type": "http://adlnet.gov/expapi/activities/profile"
        }
    },
    "registration": "d88ca9da-51b1-48eb-ae58-a68d4d3ae994",
    "platform": "Moodle 3.8.3",
    "extensions": {
        "https://w3id.org/xapi/netc/extensions/school-center": "Center for Naval
        Aviation Technical Training (CNATT)",
        "https://w3id.org/xapi/netc/extensions/launch-location": "Ashore"
    },
    "timestamp": "2021-04-02T16:10:41.520Z"
}

```

## 2.3.3. Resuming an Assessment

After an attempt on an assessment is suspended, it should be able to be resumed by the user. All of the Navy xAPI requirements for a Resumed Statement are provided below. Note, suspending and resuming an assessment is not required. These statements are only required if the assessment provides a way to be suspended and resumed at a later time.

### 2.3.3.1. Resumed Assessment Statement Requirements

The following are the requirements for an xAPI Statement for resuming an assessment:

- The actor SHALL be set according to the requirements in the Navy Core xAPI Profile
- The verb.id SHALL be set to `http://adlnet.gov/expapi/verbs/resumed`
- The verb.display.en SHALL be set to `resumed`
- The object.id SHALL be set to a unique identifier for the assessment according to the Activity ID requirements in the Navy Core xAPI Profile
- The object.definition.type SHALL be set to `http://adlnet.gov/expapi/activities/assessment`

- If known, the `object.definition.extensions` object SHALL include the `http://id.tincanapi.com/extension/assessment-type` Activity Extension and set to a predefined string value to indicate the type of assessment
- If the assessment is related to another assessment (e.g., pretest/posttest), the `context.contextActivities.grouping` array SHALL include the related assessment Activity
- The `context.contextActivities.category` array SHALL include the Navy Core xAPI Profile Activity identified in the Navy Core xAPI Profile
- The `context.contextActivities.category` array SHALL include the Navy Assessment Profile Activity identified previously in this document
- The `context.registration` SHALL be set to the same attempt UUID established during the last assessment Initialization
- The `context.platform` SHALL be set to the appropriate string value defined in the Navy Core xAPI Profile
- If known, the following Context Extensions requirements apply:
  - The `https://w3id.org/xapi/netc/extensions/school-center` property SHALL be set to the appropriate predefined value from the Navy Common Reference Profile
  - The `https://w3id.org/xapi/netc/extensions/launch-location` property SHALL be set to the appropriate predefined value from the Navy Common Reference Profile
- The `timestamp` SHALL be set according to the requirements in the Navy Core xAPI Profile

### 2.3.3.2. Resumed Statement Example

```
{
  "actor": {
    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",
      "name": "1625378"
    }
  },
  "verb": {
    "id": "http://adlnet.gov/expapi/verbs/resumed",
    "display": {
      "en": "resumed"
    }
  }
}
```

```

    },
    "object": {
      "id": "https://navy.mil/netc/xapi/activities/assessments/17823a7d-afee-22aa-
c4ee-3333acac400",
      "definition": {
        "name": {
          "en": "P-8A ICW Advanced Airborne Sensor Quiz"
        },
        "description": {
          "en": "P-8A ICW Advanced Airborne Sensor General Familiarization Quiz"
        },
        "type": "http://adlnet.gov/expapi/activities/assessment",
        "extensions": {
          "http://id.tincanapi.com/extension/assessment-type": "quiz"
        }
      }
    },
    "context": {
      "contextActivities": {
        "category": [
          {
            "id": "https://w3id.org/xapi/netc/v1.0",
            "definition": {
              "type": "http://adlnet.gov/expapi/activities/profile"
            }
          },
          {
            "id": "https://w3id.org/xapi/netc-assessment/v1.0",
            "definition": {
              "type": "http://adlnet.gov/expapi/activities/profile"
            }
          }
        ]
      }
    },

```

```

    "registration": "d88ca9da-51b1-48eb-ae58-a68d4d3ae994",
    "platform": "Moodle 3.8.3",
    "extensions": {
      "https://w3id.org/xapi/netc/extensions/school-center": "Center for Naval
      Aviation Technical Training (CNATT)",
      "https://w3id.org/xapi/netc/extensions/launch-location": "Ashore"
    }
  },
  "timestamp": "2021-04-02T16:15:41.520Z"
}

```

## 2.3.4. Terminating an Assessment

A Terminated Statement is recommended to be communicated when an attempt on an assessment has ended. The `context.registration` used for an assessment initialization and termination SHALL be the same unique ID. The overall assessment results – success, completion, score, duration – SHALL also be conveyed in the Terminated Statement, if known. All of the Navy xAPI requirements for a Terminated Statement for assessments are provided below.

### 2.3.4.1. Terminated Assessment Statement Requirements

The following are the requirements for an xAPI Statement for terminating an assessment:

- The `actor` SHALL be set according to the requirements in the Navy Core xAPI Profile
- The `verb.id` SHALL be set to `http://adlnet.gov/expapi/verbs/terminated`
- The `verb.display.en` SHALL be set to `terminated`
- The `object.id` SHALL be set to a unique identifier for the course according to the Activity ID requirements in the Navy Core xAPI Profile
- The `object.definition.type` SHALL be set to `http://adlnet.gov/expapi/activities/assessment`
- If known, the `object.definition.extensions` object SHALL include the `http://id.tincanapi.com/extension/assessment-type` Activity Extension and set to a predefined string value to indicate the type of assessment

- If the assessment is related to another assessment (e.g., pretest/posttest), the `context.contextActivities.grouping` array SHALL include the related assessment Activity
- The `context.contextActivities.category` array SHALL include the Navy Core xAPI Profile Activity identified in the Navy Core xAPI Profile
- The `context.contextActivities.category` array SHALL include the Navy Assessment Profile Activity identified previously in this document
- The `context.registration` SHALL be set to the same attempt UUID established during the last Initialization
- The `context.platform` SHALL be set to the appropriate string value defined in the Navy Core xAPI Profile
- If known, the following Context Extensions requirements apply:
  - The `https://w3id.org/xapi/netc/extensions/school-center` property SHALL be set to the appropriate predefined value from the Navy Common Reference Profile
  - The `https://w3id.org/xapi/netc/extensions/launch-location` property SHALL be set to the appropriate predefined value from the Navy Common Reference Profile
- If the assessment has a result/outcome, set the following Result Object properties to the overall result values for the assessment Activity using the requirements below:
  - The `result.duration` SHALL be set to an ISO 8601 formatted duration value representing the total time spent in the assessment
  - The `result.success` SHALL be set to `true` if the assessment was passed
  - The `result.success` SHALL be set to `false` if the assessment was failed
  - The `result.completion` SHALL be set to `true` if the survey was completed
  - The `result.completion` SHALL be set to `false` if the survey was not completed
  - The `result.score.scaled` SHALL be set to a decimal number between -1 and 1
  - The `result.score.raw` SHALL be set to a number representing the learner's performance on the assessment between the min and max values
  - The `result.score.min` SHALL be set to a number representing the minimum score on the assessment
  - The `result.score.max` SHALL be set to a number representing the maximum score on the assessment
- The `timestamp` SHALL be set according to the requirements in the Navy Core xAPI Profile

#### 2.3.4.2. Terminated Assessment Statement Example

An example of a Terminated Statement for a posttest is provided below.

```

{
  "actor": {
    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",
      "name": "0123456789"
    }
  },
  "verb": {
    "id": "http://adlnet.gov/expapi/verbs/terminated",
    "display": {
      "en": "terminated"
    }
  },
  "object": {
    "id": "https://navy.mil/netc/xapi/activities/assessments/17923a7d-afee-22aa-c4ee-3333acac400",
    "definition": {
      "name": {
        "en": "P-8A ICW Advanced Airborne Sensor Posttest"
      },
      "description": {
        "en": "P-8A ICW Advanced Airborne Sensor General Familiarization Posttest"
      },
      "type": "http://adlnet.gov/expapi/activities/assessment",
      "extensions": {
        "http://id.tincanapi.com/extension/assessment-type": "posttest"
      }
    }
  },
  "result": {
    "duration": "PT2H24M0S",
    "success": true,
    "completion": true,
  }
}

```

```

    "score": {
      "scaled": 0.85,
      "raw": 85,
      "min": 0,
      "max": 100
    }
  },
  "context": {
    "contextActivities": {
      "grouping": [
        {
          "id": "https://navy.mil/netc/xapi/activities/assessments/48223a7d-afee-22aa-c4ee-3333acac401",
          "definition": {
            "name": {
              "en": "P-8A ICW Advanced Airborne Sensor Poseidon Pretest"
            },
            "description": {
              "en": "A pretest on the P-8A ICW Advanced Airborne Sensor."
            },
            "type": "http://adlnet.gov/expapi/activities/assessment",
            "extensions": {
              "http://id.tincanapi.com/extension/assessment-type": "pretest"
            }
          }
        }
      ],
      "category": [
        {
          "id": "https://w3id.org/xapi/netc/v1.0",
          "definition": {
            "type": "http://adlnet.gov/expapi/activities/profile"
          }
        }
      ]
    }
  }
}

```



```

    {
      "id": "https://w3id.org/xapi/netc-assessment/v1.0",
      "definition": {
        "type": "http://adlnet.gov/expapi/activities/profile"
      }
    }
  ],
  "registration": "ad8ca9da-51b1-48eb-ae58-a68d4d3ae886",
  "platform": "Moodle 3.8.3",
  "extensions": {
    "https://w3id.org/xapi/netc/extensions/school-center": "Center for Naval
    Aviation Technical Training (CNATT)",
    "https://w3id.org/xapi/netc/extensions/launch-location": "Ashore"
  }
},
"timestamp": "2021-04-02T17:00:00.130Z"
}

```

## 2.3.5. Assessment Question Interactions

### 2.3.5.1. Responding to an Assessment Question

The xAPI specification provides a standard way to track assessment data with built-in object definitions for computer managed instruction (CMI) interactions. These question types were inherited from SCORM and are intended to provide a familiar utility for capturing assessment interaction data. The questions are the children of an assessment, and therefore SHALL include the assessment Activity as the parent Context Activity. Each assessment question has a specific type (defined as the `interactionType`). Some of the `interactionTypes` may not be applicable to all assessment types. A list of the `interactionTypes`, the valid response format, and the applicable assessment types are provided in the table below.

interaction Type	Description	Response Format
true-false	An interaction with two possible responses: true or false.	Either true or false

choice	An interaction with multiple choices from which the learner can select. This includes interactions in which the learner can select only one answer from the list (multiple choice) and also those where the learner can select multiple items as the answer (multiple select).	A list of item ids delimited by [,.]. If the response contains only one item, the delimiter SHALL not be used.
fill-in	An interaction which requires the learner to supply a short text response. Typically, the correct response consists of part of a word, one word or a few words. "Short" means that the correct responses pattern and learner response strings will normally be 250 characters or less.	A list of responses delimited by [,.]. If the response contains only one item, the delimiter SHALL not be used.
long-fill-in	An interaction which requires the learner to supply a response in the form of a long string of characters. "Long" means that the correct responses pattern and learner response strings will normally be more than 250 characters.	A list of responses delimited by [,.]. If the response contains only one item, the delimiter SHALL not be used.
matching	An interaction where the learner is asked to match items in one set (the source set) to items in another set (the target set). Items do not have to pair off exactly and it is possible for multiple or zero source items to be matched to a given target and vice versa.	A list of matching pairs, where each pair consists of a source item id followed by a target item id. Items can appear in multiple (or zero) pairs. Items within a pair are delimited by [,.]. Pairs are delimited by [,.].
performance	An interaction that requires the learner to perform a task that requires multiple steps, or that contains multiple interactions for a single question.	A list of steps containing a step ids and the response to that step. Step ids are separated from responses by [,.]. Steps are delimited by [,.]. The response can be a string as in a fill-in interaction or a number range as in a numeric interaction.
sequencing	An interaction where the learner is asked to order items in a set.	An ordered list of item ids delimited by [,.].
likert	An interaction which asks the learner to select from a discrete set of choices on a scale.	A single item id
numeric	Any interaction which requires a numeric response from the learner.	A range of numbers represented by a minimum and a maximum delimited by [:]. Where the range does not have a maximum or does not have a minimum, that number is omitted but the delimiter is still used. E.g. [:]4

		indicates a maximum for 4 and no minimum. Where the correct response or learner's response is a single number rather than a range, the single number with no delimiter can be used.
other	Another type of interaction that does not fit into those defined above. If "other" is used, refer to the Extended Interaction Type defined in Section in 2.3.	Any format is valid within this string as appropriate for the type of interaction.

Table 7: Assessment Question Interaction Types

### 2.3.5.2. Responded Statement Requirements

The following are the requirements for an xAPI Statement for responding to an interaction in an assessment:

- The `actor` SHALL be set according to the requirements in the Navy Core xAPI Profile
- The `verb.id` SHALL be set to `http://adlnet.gov/expapi/verbs/responded`
- The `verb.display.en` SHALL be set to `responded`
- The `object.id` SHALL be set to a unique identifier for the interaction according to the Activity ID requirements in the Navy Core xAPI Profile
- If known, the `object.definition.name.en` SHALL be set to a short description of the interaction
- The `object.definition.description.en` SHALL be set to the question text of the interaction
- The `object.definition.type` SHALL be set to `http://adlnet.gov/expapi/activities/cmi.interaction`
- The `object.definition.interactionType` SHALL be set to a predefined string value for the type of interaction.
- The additional values for each `interactionType` property's supported interaction component list(s) SHALL be set according to the rules defined in the xAPI Specification.
  - All ID values SHALL be distinct for Interaction component lists
  - All ID values for Interaction component lists SHALL NOT include any whitespace
- The `context.contextActivities.parent` array SHALL include the assessment Activity
- The `context.contextActivities.category` array SHALL include the Navy Core xAPI Profile Activity identified in the Navy Core xAPI Profile
- The `context.contextActivities.category` array SHALL include the Navy Assessment Profile Activity identified previously in this document

- The `context.registration` SHALL be set to the same attempt UUID established during the last assessment Initialization
- The `context.platform` SHALL be set to the appropriate string value defined in the Navy Core xAPI Profile
- If known, set the following Result Object properties using the requirements below:
  - The `result.success` SHALL be set to `true` if the answer to the interaction was correct
  - The `result.success` SHALL be set to `false` if the answer to the interaction was incorrect
  - The `result.completion` SHALL be set to `true` if the interaction was completed
  - The `result.completion` SHALL be set to `false` if the interaction was not completed
  - The `result.score.scaled` SHALL be set to a decimal number between 0 and 1 representing the grade of the answer
  - The `result.score.raw` SHALL be set to a number representing the learner's raw score on the question between the min and max values
  - The `result.score.min` SHALL be set to a number representing the minimum score on the question
  - The `result.score.max` SHALL be set to a number representing the maximum score on the question
- The `result.response` SHALL be set to a string value representing the response provided by the learner. See the Assessment InteractionType Table in the Assessment Question Interactions Section of this document for the acceptable response format requirements.
- If the question also asks for an explanation for their response, the `result.extensions` object SHALL include the `https://w3id.org/xapi/netc-assessment/extensions/result/response-explanation` Result Extension and set the value to the learner's explanation.
- The `timestamp` SHALL be set to the time of the response using the Timestamp requirements in the Navy Core xAPI Profile

#### 2.3.5.2.1. Other `cmi.interactions` Types

The following are assessment interaction types that are not represented by one of the `cmi.interaction` types defined above. Using the type `other` allows for compatibility with Learning Record Consumers and Analytics that support `cmi.interaction` types, while adding structure to an otherwise free-form type. The following types inherit the Responded Statement Requirements guidance and add rules to support the new type. Where requirements conflict with the Responded Statement Requirements Section above, use these requirements.

##### 2.3.5.2.1.1. Upload Type Statement Requirements

An Upload type interaction is one where the learner is asked to upload some digital artifact for grading or evaluation by an instructor, such as a PDF term paper, essay, or other assignment.

An xAPI Statement for responding to an Upload type interaction in an assessment SHALL include the Responded Statement Requirements above and the following requirements:

- The `object.definition.interactionType` SHALL be set to `other`
- The `result.response` SHALL be set to the string “File uploaded” and the name of the file, or some other description of the upload, if known
- The `object.definition.extensions` object SHALL include the property `https://w3id.org/xapi/netc-assessment/extensions/activity/extended-interaction-type` and the value SHALL be set to `upload`
- If known, the files uploaded can be referenced or included as Statement attachments. Follow the xAPI Spec requirements on including attachments to Statements<sup>2</sup>

### 2.3.5.3. Responded Statement Examples

The following list of Responded Statement examples illustrate the correct way to store responses to assessment questions (`cmi.interactions`). Only the first example (True-False) below provides a full xAPI Statement example with the Context Object. For the sake of brevity, the other Responded Statement examples only include the minimum xAPI Statement data related to each `interactionType`.

#### 2.3.5.3.1. True-False

```
{
  "actor": {
    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",
      "name": "0123456789"
    }
  },
  "verb": {
    "id": "http://adlnet.gov/expapi/verbs/responded",
    "display": {
      "en": "responded"
    }
  },
}
```

<sup>2</sup> Experience API (xAPI) Specification, Section 2.4.11, <https://github.com/adlnet/xAPI-Spec/blob/dev/xAPI-Data.md#attachments>

```

"object": {
  "id": "https://navy.mil/netc/xapi/activities/cmi.interactions/47213bb2-b1f7-420e-9042-952bde6fe72b",
  "definition": {
    "name": {
      "en": "true-false: Blue Angels home base"
    },
    "description": {
      "en": "The Blue Angels' home base has been located at Naval Air Station Pensacola, Florida since 1954."
    },
    "type": "http://adlnet.gov/expapi/activities/cmi.interaction",
    "interactionType": "true-false"
  },
  "context": {
    "contextActivities": {
      "parent": [
        {
          "id": "https://navy.mil/netc/xapi/activities/assessments/c66edc28-aa6b-11ea-bb37-0242ac130002",
          "definition": {
            "name": {
              "en": "Naval Aviation Quiz"
            },
            "description": {
              "en": "This is a quiz on Naval aviation history."
            },
            "type": "http://adlnet.gov/expapi/activities/assessment",
            "extensions": {
              "http://id.tincanapi.com/extension/assessment-type": "quiz"
            }
          }
        }
      ]
    }
  }
},

```

```

    "category": [
      {
        "id": "https://w3id.org/xapi/netc/v1.0",
        "definition": {
          "type": "http://adlnet.gov/expapi/activities/profile"
        }
      },
      {
        "id": "https://w3id.org/xapi/netc-assessment/v1.0",
        "definition": {
          "type": "http://adlnet.gov/expapi/activities/profile"
        }
      }
    ],
    "registration": "d88ca9da-51b1-48eb-ae58-a68d4d3ae994",
    "platform": "Moodle 3.8.3"
  },
  "result": {
    "response": "true",
    "duration": "PT12S",
    "success": true,
    "completion": true
  },
  "timestamp": "2021-04-02T16:12:41.520Z"
}

```

#### 2.3.5.3.2. Choice

```

{
  "actor": {
    "name": "John Doe",
    "account": {

```

```

    "homePage": "https://edipi.navy.mil",
    "name": "0123456789"
  }
},
"verb": {
  "id": "http://adlnet.gov/expapi/verbs/responded",
  "display": {
    "en": "responded"
  }
},
"object": {
  "id": "https://navy.mil/netc/xapi/activities/cmi.interactions/09ee623e-72f4-471b-9b4c-94933bbb51e9",
  "definition": {
    "name": {
      "en": "choice: Blue Angels home base"
    },
    "description": {
      "en": "The Blue Angels' home base has been located at which Naval Air Station since 1954."
    },
    "type": "http://adlnet.gov/expapi/activities/cmi.interaction",
    "interactionType": "choice",
    "choices": [
      {
        "id": "choice01-pensacola",
        "description": {
          "en": "Pensacola"
        }
      },
      {
        "id": "choice02-norfolk",
        "description": {
          "en": "Norfolk"
        }
      }
    ]
  }
}

```



```

        },
        {
            "id": "choice03-jacksonville",
            "description": {
                "en": "Jacksonville"
            }
        },
        {
            "id": "choice04-sandiego",
            "description": {
                "en": "San Diego"
            }
        }
    ]
}
},
"context": { ... truncated for brevity ...},
"result": {
    "response": "choice01-pensacola",
    "duration": "PT10S",
    "success": true,
    "completion": true
},
"timestamp": "2021-04-02T16:12:41.520Z"
}

```

#### 2.3.5.3.3. Choice with Multiple Responses

```

{
  "actor": {
    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",

```

```

    "name": "0123456789"
  }
},
"verb": {
  "id": "http://adlnet.gov/expapi/verbs/responded",
  "display": {
    "en": "responded"
  }
},
"object": {
  "id": "https://navy.mil/netc/xapi/activities/cmi.interactions/09ee623e-72f4-471b-9b4c-94933bbb51e0",
  "definition": {
    "name": {
      "en": "choice: first three officer admirals"
    },
    "description": {
      "en": "Who were the first three officers to hold the rank of Admiral?"
    },
    "type": "http://adlnet.gov/expapi/activities/cmi.interaction",
    "interactionType": "choice",
    "choices": [
      {
        "id": "choice01-porter",
        "description": {
          "en": "ADM David D Porter"
        }
      },
      {
        "id": "choice02-fletcher",
        "description": {
          "en": "ADM Frank F Fletcher"
        }
      }
    ]
  }
},

```

```

        {
            "id": "choice03-farragut",
            "description": {
                "en": "ADM David G Farragut"
            }
        },
        {
            "id": "choice04-dewey",
            "description": {
                "en": "ADM George Dewey"
            }
        }
    ]
}
},
"context": { ... truncated for brevity ...},
"result": {
    "response": "choice01-porter[,]choice03-farragut[,]choice04-dewey",
    "duration": "PT15S",
    "success": true,
    "completion": true
},
"timestamp": "2021-04-02T16:12:41.520Z"
}

```

#### 2.3.5.3.4. Fill-In

```

{
  "actor": {
    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",
      "name": "0123456789"
    }
  }
}

```

```

    }
  },
  "verb": {
    "id": "http://adlnet.gov/expapi/verbs/responded",
    "display": {
      "en": "responded"
    }
  },
  "object": {
    "id": "https://navy.mil/netc/xapi/activities/cmi.interactions/0023b4ea-bfa6-42d0-8bb6-clfffa827ec3",
    "definition": {
      "name": {
        "en": "fill-in: Blue Angels home base "
      },
      "description": {
        "en": "The Blue Angels' home base has been located at Naval Air Station  

        _____ since 1954."
      },
      "type": "http://adlnet.gov/expapi/activities/cmi.interaction",
      "interactionType": "fill-in"
    }
  },
  "context": { ... truncated for brevity ... },
  "result": {
    "response": "Pensacola",
    "duration": "PT8S",
    "success": true,
    "completion": true
  },
  "timestamp": "2021-04-02T16:12:41.520Z"
}

```

### 2.3.5.3.5. Long Fill-In

```
{
  "actor": {
    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",
      "name": "0123456789"
    }
  },
  "verb": {
    "id": "http://adlnet.gov/expapi/verbs/responded",
    "display": {
      "en": "responded"
    }
  },
  "object": {
    "id": "https://navy.mil/netc/xapi/activities/cmi.interactions/636d0f18-9632-4878-8910-044b959cb37e",
    "definition": {
      "name": {
        "en": "long-fill-in: P-8 origins"
      },
      "description": {
        "en": "What aircraft does the P-8 replace and what are the origins?"
      },
      "type": "http://adlnet.gov/expapi/activities/cmi.interaction",
      "interactionType": "long-fill-in"
    }
  },
  "context": { ... truncated for brevity ... },
  "result": {
    "response": "The P-3 Orion has been in service with the Navy since 1962. The P-8 is a replacement for the P-3.",
    "duration": "PT45S",
    "completion": true
  }
}
```

```
    },  
    "timestamp": "2021-04-02T16:12:41.520Z"  
  }  
}
```

#### 2.3.5.3.6. Matching

```
{  
  "actor": {  
    "name": "John Doe",  
    "account": {  
      "homePage": "https://edipi.navy.mil",  
      "name": "0123456789"  
    }  
  },  
  "verb": {  
    "id": "http://adlnet.gov/expapi/verbs/responded",  
    "display": {  
      "en": "responded"  
    }  
  },  
  "object": {  
    "id": "https://navy.mil/netc/xapi/activities/cmi.interactions/ea39a83e-d3d3-4e26-b6d6-70b7c989e2d9",  
    "definition": {  
      "name": {  
        "en": "matching: aircraft types and purpose"  
      },  
      "description": {  
        "en": "Match the following types of current aircraft to their primary purpose."  
      },  
      "type": "http://adlnet.gov/expapi/activities/cmi.interaction",  
      "interactionType": "matching",  
      "source": [  

```

```

    {
      "id": "source01-F-35",
      "description": {
        "en": "F-35 Lightning"
      }
    },
    {
      "id": "source02-E-2",
      "description": {
        "en": "E-2 Hawkeye"
      }
    },
    {
      "id": "source03-P-3",
      "description": {
        "en": "P-3 Orion"
      }
    },
    {
      "id": "source04-E-6",
      "description": {
        "en": "E-6 Mercury"
      }
    }
  ],
  "target": [
    {
      "id": "target01-combat",
      "description": {
        "en": "Combat"
      }
    },
    {
      "id": "target02-awacs",

```

```

        "description": {
            "en": "Airborne Early Warning and Control"
        }
    },
    {
        "id": "target03-maritime-patrol",
        "description": {
            "en": "Maritime Patrol"
        }
    },
    {
        "id": "target04-electronic-warfare",
        "description": {
            "en": "Electronic Warfare"
        }
    }
]
}
},
"context": { ... truncated for brevity ...},
"result": {
    "response": "source01-F-35[.]target01-combat[, ]source02-E-2[.]target02-awacs[, ]source03-P-3[.]target03-maritime-patrol[, ]source04-E-6[.]target04-electronic-warfare",
    "duration": "PT55S",
    "success": true,
    "completion": true
},
"timestamp": "2021-04-02T16:12:41.520Z"
}

```

#### 2.3.5.3.7. Performance

```
{
```



```
"actor":{
  "name":"John Doe",
  "account":{
    "homePage":"https://edipi.navy.mil",
    "name":"0123456789"
  }
},
"verb":{
  "id":"http://adlnet.gov/expapi/verbs/responded",
  "display":{
    "en":"responded"
  }
},
"object":{
  "id":"https://navy.mil/netc/xapi/activities/cmi.interactions/f2047000-ea6d-4844-95c5-6a72e6c22a3e",
  "definition":{
    "name":{
      "en":"performance: walk-around steps"
    },
    "description":{
      "en":"Perform the steps for a walk-around in the simulated environment. Your performance will be measured in terms of successfully completing each step."
    },
    "type":"http://adlnet.gov/expapi/activities/cmi.interaction",
    "interactionType":"performance",
    "steps":[
      {
        "id":"step01-damage",
        "description":{
          "en":"Step 1: Check aircraft exterior and engines for damage."
        }
      },
      {
        "id":"step02-leakage",
```

```

        "description":{
            "en":"Step 2: Check aircraft exterior and engines for leakage."
        }
    },
    {
        "id":"step03-brake-wear",
        "description":{
            "en":"Step 3: Check aircraft for brake wear."
        }
    },
    {
        "id":"step04-tire-wear",
        "description":{
            "en":"Step 4: Check aircraft for tire wear."
        }
    }
]
},
"context": { ... truncated for brevity ...},
"result":{
    "response":"step01-damage[.]checked[, ]step02-leakage[.]checked[, ]step03-brake-
wear[.]checked[, ]step04-tire-wear[.]not-checked",
    "duration":"PT55S",
    "success":true,
    "completion":true,
    "score":{
        "scaled":0.8,
        "raw":8,
        "min":0,
        "max":10
    }
},
"timestamp":"2021-04-02T16:12:41.520Z"

```

```
}
```

### 2.3.5.3.8. Sequencing

```
{
  "actor": {
    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",
      "name": "0123456789"
    }
  },
  "verb": {
    "id": "http://adlnet.gov/expapi/verbs/responded",
    "display": {
      "en": "responded"
    }
  },
  "object": {
    "id": "https://navy.mil/netc/xapi/activities/cmi.interactions/5e4e1a69-04be-4217-b8d5-c3c3f9be033f",
    "definition": {
      "name": {
        "en": "sequencing: maintenance check steps"
      },
      "description": {
        "en": "Put the maintenance check steps in order from the first to the last step."
      },
      "type": "http://adlnet.gov/expapi/activities/cmi.interaction",
      "interactionType": "sequencing",
      "choices": [
        {
```

```

        "id": "damage",
        "description": {
            "en": "Check aircraft exterior and engines for damage."
        }
    },
    {
        "id": "leakage",
        "description": {
            "en": "Check aircraft exterior and engines for leakage."
        }
    },
    {
        "id": "brake-wear",
        "description": {
            "en": "Check aircraft for brake wear."
        }
    },
    {
        "id": "tire-wear",
        "description": {
            "en": "Check aircraft for tire wear."
        }
    }
]
},
"context": { ... truncated for brevity ...},
"result": {
    "response": "damage[, ]leakage[, ]brake-wear[, ]tire-wear",
    "duration": "PT35S",
    "success": true,
    "completion": true
},
"timestamp": "2021-04-02T16:12:41.520Z"

```

```
}
```

### 2.3.5.3.9. Likert

```
{
  "actor":{
    "name":"John Doe",
    "account":{
      "homePage":"https://edipi.navy.mil",
      "name":"0123456789"
    }
  },
  "verb":{
    "id":"http://adlnet.gov/expapi/verbs/responded",
    "display":{
      "en":"responded"
    }
  },
  "object":{
    "id":"https://navy.mil/netc/xapi/activities/cmi.interactions/0a865058-bbdf-4c04-926a-e8f494400c50",
    "definition":{
      "name":{
        "en":"likert: instructor explanation"
      },
      "description":{
        "en":"The instructor clearly explained the training objectives."
      },
      "type":"http://adlnet.gov/expapi/activities/cmi.interaction",
      "interactionType":"likert",
      "scale":[
        {
          "id":"likert_1",
```

```

        "description":{
            "en":"Strongly Disagree"
        }
    },
    {
        "id":"likert_2",
        "description":{
            "en":"Disagree"
        }
    },
    {
        "id":"likert_3",
        "description":{
            "en":"Neither agree nor disagree"
        }
    },
    {
        "id":"likert_4",
        "description":{
            "en":"Agree"
        }
    },
    {
        "id":"likert_5",
        "description":{
            "en":"Strongly agree"
        }
    }
]
}
},
"context":{
    "contextActivities":{
        "parent":[

```

```

    {
      "id": "https://navy.mil/netc/xapi/activities/surveys/77723a7d-afec-22aa-
c4ee-3333acac400",
      "definition": {
        "name": {
          "en": "P-8A ICW Advanced Airborne Sensor Survey"
        },
        "description": {
          "en": "A Level 1 survey on the P-8A ICW Advanced Airborne Sensor
Course."
        },
        "type": "http://adlnet.gov/expapi/activities/assessment",
        "extensions": {
          "http://id.tincanapi.com/extension/assessment-type": "survey"
        }
      }
    },
    "category": [
      {
        "id": "https://w3id.org/xapi/netc/v1.0",
        "definition": {
          "type": "http://adlnet.gov/expapi/activities/profile"
        }
      },
      {
        "id": "https://w3id.org/xapi/netc-assessment/v1.0",
        "definition": {
          "type": "http://adlnet.gov/expapi/activities/profile"
        }
      }
    ],
    "registration": "d88ca9da-51b1-48eb-ae58-a68d4d3ae994",
    "platform": "Moodle 3.8.3"

```

```

    },
    "result":{
        "response":"likert_3",
        "completion":true
    },
    "timestamp":"2021-04-02T16:12:41.520Z"
}

```

### 2.3.5.3.10. Numeric

```

{
  "actor": {
    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",
      "name": "0123456789"
    }
  },
  "verb": {
    "id": "http://adlnet.gov/expapi/verbs/responded",
    "display": {
      "en": "responded"
    }
  },
  "object": {
    "id": "https://navy.mil/netc/xapi/activities/cmi.interactions/de125a65-dc61-48e8-8cba-32b3a09471c8",
    "definition": {
      "name": {
        "en": "numeric: number of P-8 aircraft in service"
      },
      "description": {

```



```

        "en": "How many total P-8 Poseidon are currently in service?"
    },
    "type": "http://adlnet.gov/expapi/activities/cmi.interaction",
    "interactionType": "numeric"
}
},
"context": { ... truncated for brevity ...},
"result": {
    "response": "91",
    "duration": "PT15S",
    "success": true,
    "completion": true
},
"timestamp": "2021-04-02T16:12:41.520Z"
}

```

#### 2.3.5.3.11. Other

```

{
  "actor": {
    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",
      "name": "0123456789"
    }
  },
  "verb": {
    "id": "http://adlnet.gov/expapi/verbs/responded",
    "display": {
      "en": "responded"
    }
  },
  "object": {

```

```

    "id": "https://navy.mil/netc/xapi/activities/cmi.interactions/dbcd346a-b828-4c20-9d84-3a817f6b5048",
    "definition": {
      "name": {
        "en": "other: longitude and latitude interaction"
      },
      "description": {
        "en": "What are the latitude and longitude coordinates for NAS Pensacola in decimal degrees?"
      },
      "type": "http://adlnet.gov/expapi/activities/cmi.interaction",
      "interactionType": "other"
    },
    "context": { ... truncated for brevity ... },
    "result": {
      "response": "30.3572925, -87.3064915",
      "duration": "PT15S",
      "success": true,
      "completion": true
    },
    "timestamp": "2021-04-02T16:12:41.520Z"
  }

```

#### 2.3.5.3.12. Other - Upload

```

{
  "actor": {
    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",
      "name": "0123456789"
    }
  },

```

```

"verb": {
  "id": "http://adlnet.gov/expapi/verbs/responded",
  "display": {
    "en": "responded"
  }
},
"object": {
  "id": "https://navy.mil/netc/xapi/activities/cmi.interactions/dbcd346a-b828-4c20-9d84-3a817f6b6048",
  "definition": {
    "name": {
      "en": "other: upload essay"
    },
    "description": {
      "en": "Please upload your PDF or Word doc essay"
    },
    "type": "http://adlnet.gov/expapi/activities/cmi.interaction",
    "interactionType": "other",
    "extensions": {
      "https://w3id.org/xapi/netc-assessment/extensions/activity/extended-interaction-type": "upload"
    }
  },
  "context": { ... truncated for brevity ... },
  "result": {
    "response": "File uploaded: MyEssay.docx",
    "completion": true
  },
  "timestamp": "2021-04-02T16:12:45.520Z"
}

```

### 2.3.5.3.13. Other – Upload with Attachment (fileUrl)

```
{
  "actor": {
    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",
      "name": "0123456789"
    }
  },
  "verb": {
    "id": "http://adlnet.gov/expapi/verbs/responded",
    "display": {
      "en": "responded"
    }
  },
  "object": {
    "id": "https://navy.mil/netc/xapi/activities/cmi.interactions/dbcd346a-b828-4c20-9d84-3a817f6b6048",
    "definition": {
      "name": {
        "en": "other: upload essay with attachment"
      },
      "description": {
        "en": "Please upload your PDF or Word doc essay"
      },
      "type": "http://adlnet.gov/expapi/activities/cmi.interaction",
      "interactionType": "other",
      "extensions": {
        "https://w3id.org/xapi/netc-assessment/extensions/activity/extended-interaction-type": "fileURL"
      }
    }
  },
  "context": { ... truncated for brevity ... },
  "result": {
```

```

    "response": "File uploaded: MyEssay.docx",
    "completion": true
  },
  "attachments": [
    {
      "usageType": "https://w3id.org/xapi/netc-assessment/attachments/usage-
type/upload",
      "display": { "en-US": "MyEssay" },
      "description": { "en-US": "Uploaded response to Question 11" },
      "contentType": "application/vnd.openxmlformats-
officedocument.wordprocessingml.document",
      "length": 2747,
      "sha2": "495395e777cd98da653df9615d09c0fd6bb2f8d4788394cd53c56a3bfdcd929a",
      "fileUrl": "https://navy.mil/documents/MyEssay.docx"
    }
  ],
  "timestamp": "2021-04-02T16:12:50.520Z"
}

```

### 3. Activity Profile Resource Metadata

The xAPI Specification provides an Activity Profile Resource to store additional data related to an Activity. The Activity Profile Resource stores a document of additional Activity metadata information which is accessible through a unique combination of attribute values. These attributes are the `activityID` (which represents a unique identifier of an Activity from an xAPI Statement) and the `profileId` (which represents a unique identifier of a metadata profile with semantics about the available properties in that profile). See the Activity Profile Resource Section of the xAPI Specification<sup>3</sup> for general information and implementation details for storing and retrieving data in an Activity Profile Resource document.

<sup>3</sup> Activity Profile Resource Section of the xAPI Specification, <https://github.com/adlnet/xAPI-Spec/blob/master/xAPI-Communication.md#27-activity-profile-resource>

## 3.1. Relating an Assessment to a Competency

This section of the Navy Assessment Profile leverages Activity Profile Resource for storing and retrieving optional metadata about an assessment, specifically when relating an assessment to a competency.

### 3.1.1. Relating an Assessment to a Competency Requirements

To relate an assessment Activity to a competency, construct an HTTP POST Request (to store) or an HTTP GET Request (to retrieve) Activity Profile data using the Activity Profile Resource IRL provided by the Navy LRS (e.g., <https://lrs.navy.mil/xapi/activities/state>). The the following query parameters are required when using the Activity Profile Resource:

- The `activityId` parameter SHALL use the assessment Activity's IRI as the value
- The `profileID` parameter SHALL use the `educationalAlignment` property from the LRMI specification<sup>4</sup> as the value.

A description of the `educationalAlignment` property and its subproperties are provided in the table below.

Property	Description	Applicable Activity
<code>educationalAlignment</code>	An alignment of the assessment to an established competency framework and course-level competency. When this property is used as result extension in xAPI, the following subproperties are required: <ul style="list-style-type: none"><li>- <code>alignmentType</code></li><li>- <code>educationalFramework</code></li><li>- <code>targetName</code></li><li>- <code>targetDescription</code></li><li>- <code>targetURL</code></li></ul>	assessment
<code>alignmentType</code>	The item being described is intended to assess the competency or learning outcome defined by the referenced term. The value for <code>alignmentType</code> when used for this purpose will always be "assesses."	assessment
<code>educationalFramework</code>	The framework to which the resource being described is aligned.	assessment
<code>targetName</code>	The name of a node in an established educational framework.	assessment

<sup>4</sup> LRMI Specification, <https://www.dublincore.org/specifications/lrmi/>

targetDescription	The description of a node in an established educational framework.	assessment
targetURL	The URL of a node in an established educational framework.	assessment

Table 8: educationalAlignment Properties

### 3.1.2. Storing an Assessment to a Competency Relationship Example

POST/PUT

https://lrs.adlnet.gov/xapi/activities/profile

?activityId=https://navy.mil/netc/xapi/activities/assessments/17923a7d-afee-22aa-c4ee-3333acac400

&profileID=http://purl.org/dcx/lrmi-terms/educationalAlignment

Content Body

```
{
  "http://purl.org/dcx/lrmi-terms/educationalAlignment":
    {
      "@type": "AlignmentObject",
      "alignmentType": "assesses",
      "educationalFramework":
        "https://cass.asid.eduworks.com/api/data/schema.cassproject.org.0.4.Framework/LADRI
        MP_IMP_71b632c1-d0cb-3a58-8491-fcb698535ff2_1600101558252",
      "targetName": "Identify actionable sensor data to support precision targeting
        against threats at sea and on land.",
      "targetUrl":
        "https://cass.asid.eduworks.com/api/data/schema.cassproject.org.0.4.Competency/LADR
        IMP_5ab8f68a-814c-3c79-bbad-aa0a295d9c77"
    }
}
```

### 3.1.3. Retrieving an Assessment to a Competency Relationship Example

GET

```
https://lrs.adlnet.gov/xapi/activities/profile
?activityId=https://navy.mil/netc/xapi/activities/assessments/17923a7d-afee-22aa-
c4ee-3333acac400
&profileID=http://purl.org/dcxlrmi-terms/educationalAlignment
```

Response

```
{
  "http://purl.org/dcxlrmi-terms/educationalAlignment":
    {
      "@type": "AlignmentObject",
      "alignmentType": "assesses",
      "educationalFramework":
        "https://cass.asid.eduworks.com/api/data/schema.cassproject.org.0.4.Framework/LADRI
        MP_IMP_71b632c1-d0cb-3a58-8491-fcb698535ff2_1600101558252",
      "targetName": "Identify actionable sensor data to support precision targeting
        against threats at sea and on land.",
      "targetUrl":
        "https://cass.asid.eduworks.com/api/data/schema.cassproject.org.0.4.Competency/LADR
        IMP_5ab8f68a-814c-3c79-bbad-aa0a295d9c77"
    }
}
```

## 3.2. Relating an Assessment Question to a Learning Objective or Competency

This section of the Navy Assessment Profile leverages Activity Profile Resource for storing and retrieving optional metadata about an assessment question, specifically when relating an assessment question to a learning objective or a competency.



### 3.2.1. Relating an Assessment Question to a Learning Objective Requirements

To relate an assessment question to a learning objective, construct an HTTP POST Request (to store) or an HTTP GET Request (to retrieve) Activity Profile data using the Activity Profile Resource IRL provided by the Navy LRS (e.g., <https://lrs.adlnet.gov/xapi/activities/profile>). The the following query parameters are required when using the Activity Profile Resource:

- The `activityId` parameter SHALL use the Activity’s IRI Activity as the value
- The `profileID` parameter SHALL use the `assesses` property from the LRMI specification<sup>5</sup> as the value. A description of the `assesses` property is provided in the table below

Concept	Description	IRI	Value	Applicable Activity
assesses	The item being described is intended to assess the learning outcome defined by the referenced term.	<a href="http://purl.org/dcx/lrmi-terms/assesses">http://purl.org/dcx/lrmi-terms/assesses</a>	string or array of strings	assessment question (cmi.interaction)

Table 9: Assesses Property

### 3.2.2. Storing an Assessment Question to Learning Objective Relationship Example

```
POST/PUT
https://lrs.adlnet.gov/xapi/activities/profile
?activityId=https://navy.mil/netc/xapi/activities/cmi.interactions/ea39a83e-d3d3-4e26-b6d6-70b7c989e2d9
&profileID=http://purl.org/dcx/lrmi-terms/assesses

Content Body
{  "http://purl.org/dcx/lrmi-terms/assesses": "https://cass.asid.eduworks.com/api/data/schema.cassproject.org.0.4.Competency/LADRIMP_25aa93b6-8508-353b-9ce3-da0d1bab1c73"
}
```

<sup>5</sup> LRMI Specification, <https://www.dublincore.org/specifications/lrmi/>

## 3.2.2. Retrieving an Assessment Question to Learning Objective Relationship Example

GET

`https://lrs.adlnet.gov/xapi/activities/profile`

`?activityId=https://navy.mil/netc/xapi/activities/cmi.interactions/ea39a83e-d3d3-4e26-b6d6-70b7c989e2d9`

`&profileID=http://purl.org/dcx/lrmi-terms/assesses`

Response

```
{  "http://purl.org/dcx/lrmi-terms/assesses": "https://cass.asid.eduworks.com/api/data/schema.cassproject.org.0.4.Competency/LADRIMP_25aa93b6-8508-353b-9ce3-da0d1bab1c73"
}
```