Navy Simulation Base Profile

Requirements and Guidelines for Implementing xAPI in Simulation Content

Document Version: 1.3

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Revision History

Version	Release Date	Notes
0.5	5/05/2020	Initial draft of the profile. Authors review only.
0.9	6/29/2020	Second draft of the profile. Internal Navy review only.
1.0	7/31/2020	All edits and feedback incorporated. First full version of the profile released.
1.1	3/12/2021	Specification of new context extensions in the profile's concepts section.
1.2	7/20/2021	Global update from "NETC" to "Navy."
1.3	7/01/2022	Global update from "Navy Common Reference Profile and xAPI Implementation Guidelines" to "Navy Core xAPI Profile". Clarification of requirements and supporting text.

Table 1: Navy Simulation Base Profile Revision History

1. Overview

1.1. How to Read this Document

This document is best read with the document outline / navigation pane enabled. To display the navigation pane in Adobe Acrobat, click "View > Show/Hide > Navigation Panes > Bookmarks." 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 Simulation content. 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 & Examples Sections of this document provide content developers with the mandatory Learning Record Provider (LRP) obligations for implementing xAPI Statements in Simulation content. 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.
- 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 JSON 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 the Navy's requirements.

1.2. When to Use this Profile

The purpose of this document is to provide content developers with best practices, technical guidance, and requirements for implementing xAPI in simulation content. This document is intended to serve as the Navy's official technical requirements for any simulation content contractually required to support xAPI. The scope of this document is limited to only xAPI content and does not address other learning technology standards.

1.2.1. Simulation Use Cases

Navy simulations focus on recreating hardware components, systems, and/or other situations for the purpose of training individuals and teams on these components. Simulations include, but are not limited to, web-based simulations, desktop simulations, full-scale simulators, part-task trainers, maintenance trainers, and production systems that support a simulation mode. These simulation types can all benefit from xAPI data and LRS integration.

Simulation content spans several modalities and covers a wide range of topics. As a result, it is difficult to create an xAPI Profile that completely covers the data tracking requirements for every use case. Instead, this Profile describes the basic xAPI requirements for all simulation content and provides best practices for extending this Profile for more specific simulation data tracking requirements.

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[1] 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 supporting simulation communications and data with xAPI. This Profile's requirements are principally organized in the following sections:

- Profile Overview
- Profile Concepts
- xAPI Statement Requirements & Examples
- Custom Extension Best Practices

[1] The xAPI Specification, https://github.com/adlnet/xAPI-Spec

2. Simulation Base Profile

2.1. Overview

2.1.1. Terminology

The terminology in this xAPI Profile assumes an understanding of the xAPI and simulation content.

2.2. Simulation Base Profile Concepts

The following tables provide a list of available Concepts for use in the xAPI Simulation Base Profile. If additional simulation use cases are identified and new Concepts are added, then a new version of the Profile will be issued.

2.2.1. Verbs

Concept	Definition	IRI
initialized	Indicates that the Actor successfully started an attempt on an Activity.	http://adlnet.gov/expapi/verbs/initialized
terminated	Indicates that the Actor successfully ended an attempt on an Activity.	http://adlnet.gov/expapi/verbs/terminated

Table 2: Verbs in the Simulation Base Profile

2.2.2. Activity Types

Concept	Definition	IRI
simulation	A simulation is an attempted task or series of tasks in an artificial context that mimics reality. Tasks would likely take on the form of interactions, or the simulation could be self-contained content.	http://adlnet.gov/expapi/activities/simulation

Table 3: Activities in the Simulation Base Profile

2.2.3. Activity Extensions

The following table provides a list of the Activity Extensions used in the Navy Simulation Base Profile.

Concept	Definition	IRI	Values
element-nomenclature	A string value that provides the system or equipment type designation represented in the content.	https://w3id.org/xapi/simulation/extensions/element-nomenclature	Use uppercase format of value from the Type Designation column in the program engineering equipment list. Confirm with PMO[2]. (Ex: AS-4108/SPY)
element-ref-des	A string value of the system or equipment reference designator represented in the content.	https://w3id.org/xapi/simulation/extensions/element-ref-des	Use uppercase format of value from the Ref Des column in the program engineering equipment list. Confirm with PMO. (Ex: T01A1)
s1000d-dmc	A string value that provides the S1000D[3] data module code of the procedural data module that is being used to support the content.	https://w3id.org/xapi/simulation/extensions/s1000d-dmc	Use uppercase format of value from the DMC column in the program technical documentation data module requirements list (DMRL). (Ex: MK16-A-CSA-00-0027-00A-283A-A)
s1000d-sns	A string value that provides the S1000D[4] Standard Numbering System code for the system or equipment that is being used to support the content.	https://w3id.org/xapi/simulation/extensions/s1000d-sns	Use uppercase format of value contained in s1000d-dmc value. Confirm with PMO[5]. May also verify against NAVSEA S1000D DMRL Planner > MICC-SNS tab > Combined column. (Ex. CSA-00)

Table 4: Activity Extensions in the Simulation Base Profile

[2] This may be a contractor's internal company Program Management Office or a Government PMO.

[3] Refer to the AIA/ASD S1000D specification website for more information: https://s1000d.org/

[4] Refer to the AIA/ASD S1000D specification website for more information: https://s1000d.org/

[5] This may be an internal company Program Management Office or Government PMO.

2.2.4. Context Extensions

The following Context Extensions may be used in this Profile (**Table 4**).

If the values can be determined, the Simulation Base Profile requires `launch-location` and `school-center` Context Extensions. These Navy-specific Context Extensions are only required to be set if they are identified in advance or obtained dynamically. Consult the Navy Common Reference Profile for additional guidance on the appropriate values for these Navy Context Extensions.

Concept	Definition	IRI	Values
simulation-mode	A string value used to determine the simulation mode in which the content is experienced.	https://w3id.org/xapi/simulation/extensions/simulation-mode	freeplay[6], graded[7], guided[8], tutorial[9]

Table 4: Context Extensions in the Simulation Base Profile

2.2.5. 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 Simulation Base Profile defines specific Statement requirements for simulation content 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"
   }
}
```

[6]freeplay - This mode allows the student to interact with the simulation without restrictions.

[7]graded - This is an assessment mode that tracks the student's interactions in relation to predefined performance criteria.

[8]guided - This is a facilitated interactive training mode throughout which the student's performance is prompted.

[9]tutorial - This is a self-directed interactive training mode during which the student advances (e.g., clicking a "next" button or some other prompt in the simulation) through a demonstration of the expected performance.

Navy Core xAPI Profile activity

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

Navy Simulation Base Profile activity

2.3. xAPI Statement Requirements & Examples

This section provides the detailed requirements for the most common types of xAPI Statements for simulation activities. Example Statements are also provided for illustrative purposes after the requirements. In some instances, the Navy Core xAPI Profile or the LRS Administrator will need to be consulted to determine the appropriate values.

2.3.2. Simulations

2.3.2.1. Initializing a Simulation

An Initialized Statement is required to be communicated when a simulation is started. A new Context Registration Universally Unique Identifier (UUID) SHALL be included in the Initialized Statement (and associated Terminated Statement for the simulation). There is no requirement that other granular activities use this same UUID within an attempt on the simulation. An attempt includes all the data generated during a learning activity after the Initialized Statement but before the Terminated Statement. All of the xAPI requirements for an Initialized Statement for simulation activities are provided below.

2.3.2.1.1. Initialized Simulation Statement Requirements

The following are the requirements for an xAPI Statement for initializing a simulation:

- 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 simulation 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/simulation`

- 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 Simulation Base Profile activity identified in the Simulation Base Profile Activity section above
- 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 `https://w3id.org/xapi/simulation/extensions/simulation-mode` property SHALL be set to the appropriate simulation mode
- The `timestamp` SHALL be set according to the requirements in the Navy Core xAPI Profile

2.3.2.1.2. Initialized Simulation Statement Example

```
{
  "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/simulations/3e3ff734-07ff-1235-
9ae3-0184bb639fe",
    "definition": {
```

```
      "name": {
        "en": "P-8A Poseidon Simulator"
      },
      "description": {
        "en": "An flight simulator on the Navy's P-8A aircraft."
      },
      "type": "http://adlnet.gov/expapi/activities/simulation"
    }
  },
  "context": {
    "contextActivities": {
      "category": [
        {
          "id": "https://w3id.org/xapi/netc/v1.0",
          "definition": {
            "type": "http://adlnet.gov/expapi/activities/profile"
          }
        },
        {
          "id": "https://w3id.org/xapi/simulation/v1.0",
          "definition": {
            "type": "http://adlnet.gov/expapi/activities/profile"
          }
        }
      ]
    },
    "registration": "ad8ca9da-51b1-48eb-ae58-a68d4d3ae886",
    "platform": "P-8A Poseidon Simulator 1.0",
    "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",
      "https://w3id.org/xapi/simulation/extensions/simulation-mode": "freeplay"
    }
```

```
  },
  "timestamp": "2020-04-29T16:00:21.230Z"
}
```

2.3.2.2. Terminating a Simulation

A Terminated Statement is recommended to be communicated when an attempt on a simulation is ended. The Context Registration ID used for a simulation initialization and termination SHALL be the same unique ID during an attempt. There is no requirement that other granular activities use this same UUID within an attempt on the simulation but it is recommended if possible. The overall simulation results can be conveyed in the Terminated Statement. The instructional design of the simulation will help determine what the content developer should set, if anything, for the overall simulation results in Result Success, Result Completion, and Result Score Scaled. All of the xAPI requirements for a Terminated Statement for simulation activities are provided below.

2.3.2.2.1. Terminated Simulation Statement Requirements

The following are the requirements for an xAPI Statement for terminating a simulation:

- 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/terminated`
- The `verb.display.en` SHALL be set to terminated
- The `object.id` SHALL be set to a unique identifier for the simulation 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/simulation`
- 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 Simulation Base Profile activity identified in the Simulation Base Profile Activity section above
- 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
    - The `https://w3id.org/xapi/simulation/extensions/simulation-mode` property SHALL be set to the appropriate simulation mode
- If known, set the following Result Object properties to the overall result values for the simulation using the requirements below:
    - The `result.duration` SHALL be set to an ISO 8601 formatted duration value representing the total time spent in the simulation
    - The `result.success` SHALL be set to `true` if the simulation was passed
    - The `result.success` SHALL be set to `false` if the simulation was failed
    - The `result.completion` SHALL be set to `true` if the simulation was completed
    - The `result.completion` SHALL be set to `false` if the simulation was not completed
    - The `result.score.scaled` SHALL be set to a decimal number between `0` and `1` if there is an overall score associated with the simulation
- The `timestamp` SHALL be set according to the requirements in the Navy Core xAPI Profile

2.3.2.2.2. Terminated Simulation Statement Example

```
{
  "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/simulations/3e3ff734-07ff-1235-
9ae3-0184bb639fe",
    "definition": {
```

```
      "name": {
        "en": "P-8A Poseidon Simulator"
      },
      "description": {
        "en": "An flight simulator on the Navy's P-8A aircraft."
      },
      "type": "http://adlnet.gov/expapi/activities/simulation"
    }
  },
  "context": {
    "contextActivities": {
      "category": [
        {
          "id": "https://w3id.org/xapi/netc/v1.0",
          "definition": {
            "type": "http://adlnet.gov/expapi/activities/profile"
          }
        },
        {
          "id": "https://w3id.org/xapi/simulation/v1.0",
          "definition": {
            "type": "http://adlnet.gov/expapi/activities/profile"
          }
        }
      ]
    },
    "registration": "ad8ca9da-51b1-48eb-ae58-a68d4d3ae886",
    "platform": "P-8A Poseidon Simulator 1.0",
    "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",
      "https://w3id.org/xapi/simulation/extensions/simulation-mode": "freeplay"
    }
```

```
  },
  "result": {
    "duration": "PT1H10M5S",
    "success": true,
    "completion": true,
    "score": {
      "scaled": 0.95
    }
  },
  "timestamp": "2020-04-29T17:00:00.130Z"
}
```

2.4. Extending the Simulation Base Profile

This Simulation Base Profile is meant to be extended for specific types of simulations. The following sections describe the best practices for extending this Profile.

2.4.1. Using Context Activities

xAPI `contextActivities` can be used to provide additional information about the learning event. This can include how the Activity acted upon is nested in or grouped with other Activities. For example, a learner may interact with a toggle button that is part of a control panel and the control panel is part of the overall simulation. First and foremost, developers should reuse Concepts and Statements from other Navy Profiles (e.g. Navy E-Learning Profile) if they apply before creating new Concepts.

2.4.1.1. Context Activities Requirements

The following are the requirements for an xAPI Statement when extending this Profile with Context Activities:

- The `contextActivities.parent` property SHALL be used when there is one or more parent Activities for the object. Additional guidelines and examples can be found in the other Navy Profiles
- The `contextActivities.grouping` property SHALL be used when there is a need to group Statements together. Additional guidelines and examples can be found in the other Navy Profiles

2.4.1.2. Context Activities Example


```
{
  "actor": {
    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",
      "name": "0123456789"
    }
  },
  "verb": {
    "id": "https://w3id.org/xapi/simulation/verbs/toggled",
    "display": {
      "en": "toggled"
    }
  },
  "object": {
    "id": "https://navy.mil/netc/xapi/activities/simulations/563ff734-37ea-7643-
9ff3-7365afecc333",
    "definition": {
      "name": {
        "en": "P-8A Poseidon Simulator Master Battery Switch"
      },
      "description": {
        "en": "Simulated Master Battery Switch for the P-8A Poseidon."
      },
      "type": "https://w3id.org/xapi/simulation/activity-types/toggle-switch"
    }
  },
  "context": {
    "contextActivities": {
      "parent": [
        {
          "id": "https://navy.mil/netc/xapi/activities/simulations/36652637-fe34-
12aa-cc39-ffffac8740aa",
```

```
          "definition": {
            "name": {
              "en": "P-8A Control Panel Simulator"
            },
            "description": {
              "en": "Physical Simulation of P-8A Toggle Control Panel."
            },
            "type": "https://w3id.org/xapi/simulation/activity-types/control-panel"
          }
        }
      ],
      "grouping": [
        {
          "id": "https://navy.mil/netc/xapi/activities/simulations/3e3ff734-07ff-
1235-9ae3-0184bb639fe",
         "definition": {
           "name": {
             "en": "P-8A Poseidon Simulator"
           },
           "description": {
             "en": "An flight simulator on the Navy's P-8A aircraft."
             },
           "type": "http://adlnet.gov/expapi/activities/simulation"
           }
         }
      ],
      "category": [
        {
          "id": "https://w3id.org/xapi/netc/v1.0",
          "definition": {
            "type": "http://adlnet.gov/expapi/activities/profile"
          }
        },
        {
```

```
          "id": "https://w3id.org/xapi/simulation/v1.0",
          "definition": {
            "type": "http://adlnet.gov/expapi/activities/profile"
          }
        }
      ]
    },
    "registration": "ad8ca9da-51b1-48eb-ae58-a68d4d3ae886",
    "platform": "P-8A Poseidon Simulator 1.0",
    "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": "2020-04-29T17:00:00.130Z"
}
```


2.4.2. Using Extensions

The xAPI specification defines locations within an xAPI Statement where developers can extend the base data model to provide additional properties and values. Extensions can be applied to Activity Definitions, Results or Context properties. The properties and values are determined by the developer, profiles, or Communities of Practice. Refer to the Navy Profiles for available extension properties and values. Developers can include additional extensions by following the requirements listed below.

2.4.2.1. Extension Requirements

The following are the requirements for extending this Profile:

- Extensions SHALL only be used when there is no existing xAPI data element, or existing extension defined in a Navy profile, that can be appropriately used for the tracked information
- The `object.definition.extensions` SHALL include additional information about the activity (object)
- The `result.extensions` SHALL include outcomes associated with the learner's attempt on the simulation, other than completion, success, score and duration
- The `context.extensions` SHALL include additional contextual information about the Statement

2.4.2.2. Extension Example


```
{
  "actor": {
    "name": "John Doe",
    "account": {
      "homePage": "https://edipi.navy.mil",
      "name": "0123456789"
    }
  },
  "verb": {
    "id": "https://w3id.org/xapi/simulation/verbs/toggled",
    "display": {
      "en": "toggled"
    }
  },
  "object": {
    "id": "https://navy.mil/netc/xapi/activities/simulations/563ff734-37ea-7643-
9ff3-7365afecc333",
    "definition": {
      "name": {
        "en": "P-8A Poseidon Simulator Master Battery Switch"
      },
      "description": {
        "en": "Simulated Master Battery Switch for the P-8A Poseidon."
      },
      "type": "https://w3id.org/xapi/simulation/activity-types/toggle-switch",
      "extensions": {
        "http://navy.mil/ext/objcode": "15822"
      }
    }
  },
  "context": {
    "contextActivities": {
      "parent": [
```

```
        {
          "id": "https://navy.mil/netc/xapi/activities/simulations/36652637-fe34-
12aa-cc39-ffffac8740aa",
          "definition": {
            "name": {
              "en": "P-8A Control Panel Simulator"
            },
            "description": {
              "en": "Physical Simulation of P-8A Toggle Control Panel."
            },
            "type": "https://w3id.org/xapi/simulation/activity-types/control-panel"
          }
        }
      ],
      "grouping": [
        {
          "id": "https://navy.mil/netc/xapi/activities/simulations/3e3ff734-07ff-
1235-9ae3-0184bb639fe",
         "definition": {
           "name": {
             "en": "P-8A Poseidon Simulator"
           },
           "description": {
             "en": "An flight simulator on the Navy's P-8A aircraft."
             },
           "type": "http://adlnet.gov/expapi/activities/simulation"
           }
         }
      ],
      "category": [
        {
          "id": "https://w3id.org/xapi/netc/v1.0",
          "definition": {
            "type": "http://adlnet.gov/expapi/activities/profile"
          }
```

```
        },
        {
          "id": "https://w3id.org/xapi/simulation/v1.0",
          "definition": {
            "type": "http://adlnet.gov/expapi/activities/profile"
          }
        }
      ]
    },
    "registration": "ad8ca9da-51b1-48eb-ae58-a68d4d3ae886",
    "platform": "P-8A Poseidon Simulator 1.0",
    "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",
      "https://w3id.org/xapi/netc/extensions/user-agent": "Mozilla/5.0 (X11; Linux
x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.103 Safari/537.36"
    }
  },
  "result": {
    "extensions": {
      "https://w3id.org/xapi/netc/extensions/toggle-state": "on"
    }
  },
  "timestamp": "2020-04-29T17:00:00.130Z"
}
```


2.4.3. Using Document Resources

xAPI allows developers to set and retrieve arbitrary data. These Resources should be used to store educationally relevant information that does not fit into an xAPI Statement. xAPI Document Resources can be used to store and access stateful metadata associated with an Activity, Agent, or both.

2.4.3.1. Document Resource Requirements

The following are the requirements when extending this Profile using Document Resources:

- Document Resources SHALL NOT be used for the purpose of real-time simulation client synchronization
- Document Resources SHALL be used to store educationally relevant data about Activities, Agents, or both. Specifically,
    - The Activity State Resource SHALL be used to persist and access educationally relevant state data about the Activity and the Agent (e.g. Metadata about an Agents attempt of a simulation Activity)
    - The Agent Profile Resource SHALL be used to persist and access data about an Agent (e.g. Metadata about the xAPI Actor used in Statements)
    - The Activity Profile Resource SHALL be used to persist and access data about an Activity (e.g. Metadata about the xAPI simulation Activity used in Statements)

2.4.3.2. Document Resource Example

```
POST/PUT
https://lrs.netc.gov/xapi/activities/state
?activityId=https://navy.mil/netc/xapi/activities/simulations/3e3ff734-07ff-1235-9ae3-0184bb639fe
&agent={"account": {
            "homePage": "http://my.navy.mil/",
            "name": "0123456789"}}
&stateId=https://w3id.org/xapi/simulation/activity-state/control-panel-state
&registrationID=ad8ca9da-51b1-48eb-ae58-a68d4d3ae886

Content Body
{
    "error": 0,
    "configuration": "1044,ae,566ffe,43",
    "back-light”: "on"
}
```

2.4.4. Documenting the Profile

The following are the requirements for extending this Profile:

- A Profile document SHALL be created using a Profile Template (preferably created in Microsoft Word) including
    - Purpose of the Profile
    - Contact information for the creators and users of the Profile
    - xAPI Statement requirements and examples
    - Document resource requirement and examples
    - Any other best practices
- If machine interpretation of the Profile is required, a JSON-LD document SHALL be created that describes the Profile. See the API Profile Specification at https://github.com/adlnet/xapi-profiles for more information on creating an xAPI Profile JSON-LD document
- The Profile document creator SHALL work with the Navy Learning Stack Administrator to publish the Profile documentation