[MS-INDEXDB]:
Microsoft Edge / Internet Explorer Indexed Database API Standards Support Document

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## Revision Summary

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<td>7/7/2015</td>
<td>1.0</td>
<td>New</td>
<td>Released new document.</td>
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<tr>
<td>11/2/2015</td>
<td>1.1</td>
<td>Minor</td>
<td>Clarified the meaning of the technical content.</td>
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<tr>
<td>12/7/2015</td>
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<td>Minor</td>
<td>Clarified the meaning of the technical content.</td>
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1 Introduction

This document describes the level of support provided by Microsoft web browsers for the W3C Indexed Database API specification [W3C-INDEXDB], published 08 January 2015. The [W3C-INDEXDB] specification defines APIs for a database of records holding simple values and hierarchical objects.

1.1 Glossary

MAY, SHOULD, MUST, SHOULD NOT, MUST NOT: These terms (in all caps) are used as defined in [RFC2119]. All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

1.2 References

Links to a document in the Microsoft Open Specifications library point to the correct section in the most recently published version of the referenced document. However, because individual documents in the library are not updated at the same time, the section numbers in the documents may not match. You can confirm the correct section numbering by checking the Errata.

1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information.


1.2.2 Informative References

None.

1.3 Microsoft Implementations

The following Microsoft web browser versions implement some portion of the [W3C-INDEXDB] specification:

- Windows Internet Explorer 10
- Internet Explorer 11
- Internet Explorer 11 for Windows 10
- Microsoft Edge

Each browser version may implement multiple document rendering modes. The modes vary from one to another in support of the standard. The following table lists the document modes supported by each browser version.

<table>
<thead>
<tr>
<th>Browser Version</th>
<th>Document Modes Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Explorer 10</td>
<td>Quirks Mode</td>
</tr>
<tr>
<td></td>
<td>IE7 Mode</td>
</tr>
</tbody>
</table>
For each variation presented in this document there is a list of the document modes and browser versions that exhibit the behavior described by the variation. All combinations of modes and versions that are not listed conform to the specification. For example, the following list for a variation indicates that the variation exists in three document modes in all browser versions that support these modes:

**Quirks Mode, IE7 Mode, and IE8 Mode (All Versions)**

### 1.4 Standards Support Requirements

To conform to [W3C-INDEXDB], a user agent must implement all required portions of the specification. Any optional portions that have been implemented must also be implemented as described by the specification. Normative language is usually used to define both required and optional portions. (For more information, see [RFC2119].)

The following table lists the sections of [W3C-INDEXDB] and whether they are considered normative or informative.

<table>
<thead>
<tr>
<th>Sections</th>
<th>Normative/Informative</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Informative</td>
</tr>
<tr>
<td>2,3</td>
<td>Normative</td>
</tr>
<tr>
<td>4,5</td>
<td>Informative</td>
</tr>
</tbody>
</table>

### 1.5 Notation

The following notations are used in this document to differentiate between notes of clarification, variation from the specification, and points of extensibility.
<table>
<thead>
<tr>
<th>Notation</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>C####</td>
<td>This identifies a clarification of ambiguity in the target specification. This includes imprecise statements, omitted information, discrepancies, and errata. This does not include data formatting clarifications.</td>
</tr>
<tr>
<td>V####</td>
<td>This identifies an intended point of variability in the target specification such as the use of MAY, SHOULD, or RECOMMENDED. (See [RFC2119].) This does not include extensibility points.</td>
</tr>
<tr>
<td>E####</td>
<td>Because the use of extensibility points (such as optional implementation-specific data) can impair interoperability, this profile identifies such points in the target specification.</td>
</tr>
</tbody>
</table>

For document mode and browser version notation, see also section 1.3.
2 Standards Support Statements

This section contains all variations and clarifications for the Microsoft implementation of [W3C-INDEXDB].

- Section 2.1 describes normative variations from the MUST requirements of the specification.
- Section 2.2 describes clarifications of the MAY and SHOULD requirements.
- Section 2.3 considers error handling aspects of the implementation.
- Section 2.4 considers security aspects of the implementation.

2.1 Normative Variations

The following subsections describe normative variations from the MUST requirements of [W3C-INDEXDB].

2.1.1 [W3C-INDEXDB] Section 3.1.3 Keys

V0003: Invalid keys are incorrectly considered valid

The specification states:

> 3.1.3 Keys
>
> In order to efficiently retrieve records stored in an indexed database, each record is organized according to its key. A value is said to be a valid key if it is one of the following ECMAScript [ECMA-262] types: Number primitive value, String primitive value, Date object, or Array object. An Array is only a valid key if every item in the array is defined and is a valid key (i.e. sparse arrays can not be valid keys) and if the Array doesn't directly or indirectly contain itself. Any non-numeric properties on an Array are ignored, and thus do not affect whether the Array is a valid key. If the value is of type Number, it is only a valid key if it is not NaN. If the value is of type Date it is only a valid key if its [[PrimitiveValue]] internal property, as defined by [ECMA-262], is not NaN. Conforming user agents MUST support all valid keys as keys.

IE11 Mode and EdgeHTML Mode (All versions)

The following keys are incorrectly considered valid and do not throw errors: new String(), new Number(), new Date(NaN), new Date(Infinity), /foo/, and new RegExp().

V0001: An Array cannot be used as a key.

The specification states:

> 3.1.3 Keys
>
> An Array is only a valid key if every item in the array is defined and is a valid key (i.e. sparse arrays can not be valid keys) and if the Array doesn't directly or indirectly contain itself. Any non-numeric properties on an Array are ignored, and thus do not affect whether the Array is a valid key. ...

IE11 Mode and EdgeHTML Mode (All versions)

An Array cannot be used as a key.
V0002: Invalid keys do not throw the correct exception

The specification states:

3.1.3 Keys

If the value is of type Number, it is only a valid key if it is not NaN. If the value is of type Date it is only a valid key if its [[PrimitiveValue]] internal property, as defined by [ECMA-262], is not NaN. Conforming user agents MUST support all valid keys as keys.

IE11 Mode and EdgeHTML Mode (All versions)

A key defined as null, function()[], window, {length:0,constructor:Array}, Array object, or String object throws incorrect errors (DataCloneError).

2.1.2 [W3C-INDEXDB] Section 3.1.5 Key Path

V0004: A sequence<DOMString> key path is not supported and will not behave correctly

The specification states:

... Key Path

A key path is a [DOMString or sequence<DOMString>/string or list of strings] that defines how to extract a key from a value. A valid key path is one of:

...  
• A non-empty [sequence<DOMString> containing only DOMStrings/list containing only strings] conforming to the above requirements.

IE11 Mode and EdgeHTML Mode (All versions)

A sequence<DOMString> key path is not supported and will not behave correctly.

V0005: An empty array used as a key path throws an error

The specification states:

... Key Path

A key path is a [DOMString or sequence<DOMString>/string or list of strings] that defines how to extract a key from a value. A valid key path is one of:

• An empty DOMString.
• An identifier, which is a [DOMString/string] matching the IdentifierName production from the ECMAScript Language Specification [ECMA-262].
• A [DOMString/string] consisting of two or more identifiers separated by periods (ASCII character code 46/U+002E FULL STOP).  
• A non-empty [sequence<DOMString> containing only DOMStrings/list containing only strings] conforming to the above requirements.
**IE11 Mode and EdgeHTML Mode (All versions)**

An **InvalidAccessError** is thrown when an empty string or an empty array is used for the key path.

V0006: Some types of key paths are considered valid values and do not throw exceptions

The specification states:

```plaintext
... Key Path

A key path is a [DOMString or sequence<DOMString>]/string or list of strings] that defines how to extract a key from a value. A valid key path is one of:

- An empty DOMString.
- An identifier, which is a [DOMString/string] matching the IdentifierName production from the ECMAScript Language Specification [ECMA-262].
- A [DOMString/string] consisting of two or more identifiers separated by periods ([ASCII character code 46/U+002E FULL STOP]).
- A non-empty [sequence<DOMString> containing only DOMStrings/list containing only strings] conforming to the above requirements.
```

**IE11 Mode and EdgeHTML Mode (All versions)**

The following types of key paths are considered valid values and do not throw exceptions:

- strings containing non-valid identifier characters (e.g., (,) comma, (*) asterisks, (") quotation mark, (%) percent sign, (/) solidus, (&) ampersand, (!) exclamation mark, (^) circumflex accent)
- identifiers starting with a number

### 2.1.3 [W3C-INDEXDB] Section 3.1.6 Index

V0007: The multiEntry flag is not supported

The specification states:

```plaintext
Each index also has a |multiEntry flag.
```

**IE11 Mode and EdgeHTML Mode (All versions)**

The **multiEntry** flag is not supported.

### 2.1.4 [W3C-INDEXDB] Section 3.1.9 Key Range

V0008: The bound function throws an "Invalid argument" exception, not a DataError exception

The specification states:

```plaintext
3.1.9 Key Range
```
Records can be retrieved from object stores and indexes using either keys or key ranges. A key range is a continuous interval over some data type used for keys.

The IDBKeyRange interface defines a key range.

```javascript
interface IDBKeyRange {
  static IDBKeyRange bound (any lower, any upper, optional boolean lowerOpen = false, optional boolean upperOpen = false);
};

bound, static
...
If either the lower parameter or upper parameter is not valid key, or the lower key is greater than the upper key, or the lower key and upper key match and either of the bounds are open, the implementation MUST throw a DOMException of type DataError.
```

**IE11 Mode and EdgeHTML Mode (All versions)**

The `bound` function throws an "Invalid argument" exception, not a `DataError` exception.

### 2.1.5 [W3C-INDEXDB] Section 3.1.12 Options Object

**V0009:** The `multiEntry` parameter is not supported

The specification states:

```
multiEntry of type boolean, defaulting to false.
```

**IE11 Mode and EdgeHTML Mode (All versions)**

The `multiEntry` parameter is not supported.

### 2.1.6 [W3C-INDEXDB] Section 3.1.13 Key Generators

**V0011:** Key generators specified as arrays throw a `DataError`

The specification states:

```
3.1.13 Key Generators

When a object store is created it can be specified to use a key generator. ...
Implementations MUST use the following rules for generating numbers when a key generator is used.
...
... Only specified keys values which are Number values affect the current number of the key generator. Dates and Arrays which contain Numbers do not affect the current number of the key generator. Nor do DOMString values which could be parsed as numbers. Negative Numbers do not affect the current number since they are always lower than the current number.
```

**IE11 Mode and EdgeHTML Mode (All versions)**
Key generators specified as arrays throw a DataError.

V0011: Key generators specified as arrays throw a DataError

The specification states:

2.11. Key Generators

When a object store is created it can be specified to use a key generator. A key generator is used to generate keys for records inserted into an object store if not otherwise specified.

Only specified keys of type number can affect the current number of the key generator. Keys of type date, array (regardless of the other keys they contain), binary, or string (regardless of whether they could be parsed as numbers) have no effect on the current number of the key generator. Keys of type number with value less than 1 do not affect the current number since they are always lower than the current number.

IE11 Mode and EdgeHTML Mode (All versions)

Key generators specified as arrays throw a DataError.

V0010: An InvalidAccessError, not a ConstraintError, is thrown when the key generator reaches the maximum value

The specification states:

3.1.13 Key Generators

When a object store is created it can be specified to use a key generator. Implementations MUST use the following rules for generating numbers when a key generator is used.

When the current number of a key generator reaches above the value $2^{53}$ (9007199254740992) any attempts to use the key generator to generate a new key will result in a ConstraintError. It is still possible to insert records into the object store by specifying an explicit key, however the only way to use a key generator again for the object store is to delete the object store and create a new one.

IE11 Mode and EdgeHTML Mode (All versions)

An InvalidAccessError, not a ConstraintError, is thrown when the key generator reaches the maximum value.

2.1.7 [W3C-INDEXDB] Section 3.2.1 The IDBRequest Interface

V0012: The source attribute is incorrectly specified as type any.

The specification states:

```javascript
interface IDBRequest : EventTarget {
```
IE11 Mode (All versions)
The source attribute is incorrectly specified as type any.

V0013: The readyState attribute is defined as type DOMString, not IDBRequestReadyState.

The specification states:

```javascript
interface IDBRequest : EventTarget {
    readonly attribute any result;
    readonly attribute DOMError error;
    readonly attribute (IDBObjectStore or IDBIndex or IDBCursor)? source;
    readonly attribute IDBTransaction transaction;
    readonly attribute DOMString readyState;
    attribute EventHandler onsuccess;
    attribute EventHandler onerror;
};;
```

IE11 Mode (All versions)
The readyState attribute is defined as type DOMString, not IDBRequestReadyState.

2.1.8 [W3C-INdexDB] Section 3.2.3 Opening a database

V0014: The WorkerUtils interface does not implement the IDBEnvironment interface

The specification states:

```
3.2.3 Opening a database

WebIDL
WorkerUtils implements IDBEnvironment;

All instances of the WorkerUtils type are defined to also implement the
IDBEnvironment interface.
```

IE11 Mode and EdgeHTML Mode (All versions)
The WorkerUtils interface does not implement the IDBEnvironment interface. Instead it implements
the indexedDB attribute.

V0015: The cmp function throws an "Invalid argument" exception, not a DataError exception

The specification states:
3.2.3 Opening a database

WebIDL

interface IDBFactory {
  short cmp (any first, any second);
};

cmp
  If either first or second is not a valid key, the implementation MUST throw a
  DOMException of type DataError.

**IE11 Mode and EdgeHTML Mode (All versions)**

The `cmp` function throws an "Invalid argument" exception, not a `DataError` exception.

V0016: The `deleteDatabase` success event is of type `Event`, not `IDBVersionChangeEvent`

The specification states:

3.2.3 Opening a database

deleteDatabase

  If the steps above are successful, the implementation MUST set the result of the
  request to undefined and fire a success event at the request. The event MUST
  implement the `IDBVersionChangeEvent` interface and have `oldVersion` set to database
  version and have the `newVersion` property set to null.

**IE11 Mode and EdgeHTML Mode (All versions)**

The `deleteDatabase` success event is of type `Event`, not `IDBVersionChangeEvent`.

V0017: Invalid values passed to the open function throw an `InvalidAccessError`, not a `TypeError`

The specification states:

3.2.3 Opening a database

WebIDL

interface IDBFactory {
  IDBOpenDBRequest open (DOMString name, [EnforceRange] optional unsigned long
  long version);
  ...
};

open

  If the value of version is 0 (zero), the implementation MUST throw a TypeError.
  ...

  If an error is returned from the steps above, the implementation MUST set the
  error attribute of the request to a DOMError whose name is the same as the error
  returned, and dispatch an event at the request. The event MUST use the Event
  interface and have its [type] set to "error". The event does bubble but is not
  cancelable. The propagation path of the event is just the request.

**IE11 Mode and EdgeHTML Mode (All versions)**
Invalid values passed to the open function throw an InvalidAccessError, not a TypeError.

2.1.9 [W3C-INDEXDB] Section 3.2.4 Database

V0021: The keyPath parameter cannot be specified as an array

The specification states:

```
3.2.4 Database
A database object can be used to manipulate the objects of that database. It is also
the only way to obtain a transaction for that database.

    interface IDBDatabase : EventTarget {
        ...;
        IDBObjectStore createObjectStore (DOMString name, optional
        IDBObjectStoreParameters optionalParameters);
        ...;
        ...;
    createObjectStore
    ...
    If the optionalParameters argument is specified and has a keyPath property which
    is not undefined or null, then set keyPath to the value of this property. ...
```

IE11 Mode and EdgeHTML Mode (All versions)

The keyPath parameter cannot be specified as an array.

V0019: The onversionchange event is not supported

The specification states:

```
... ...
    interface IDBDatabase : EventTarget {
        ...
        attribute EventHandler onversionchange;
    };
```

IE11 Mode and EdgeHTML Mode (All versions)

The onversionchange event is not supported.

V0022: The transaction function throws an InvalidAccessError, not a TypeError

The specification states:

```
3.2.4 Database
A database object can be used to manipulate the objects of that database. It is also
the only way to obtain a transaction for that database.

    interface IDBDatabase : EventTarget {
        ...
        IDBTransaction transaction ((DOMString or sequence<DOMString>) storeNames, optional IDBTransactionMode mode = "readonly");
```
... transaction
...
    If the value for the mode parameter is not "readonly" or "readwrite", the implementation MUST throw a TypeError.

**IE11 Mode and EdgeHTML Mode (All versions)**

The transaction function throws an `InvalidAccessError`, not a `TypeError`.

V0018: The version attribute returns a DOMString

The specification states:

```javascript
... ...
    interface IDBDatabase : EventTarget {
        ... readonly attribute unsigned long long version;
    }
... ...
```

**IE11 Mode (All versions)**

The `version` attribute returns a DOMString:

```javascript
    readonly attribute DOMString version;
```

V0020: A DOMException of type `InvalidAccessError`, not `SyntaxError`, is thrown.

The specification states:

If the optionalParameters argument is specified and has a keyPath property which is not undefined or null, then set keyPath to the value of this property. If keyPath is not a valid key path, the implementation MUST throw a DOMException of type `SyntaxError`.

**IE11 Mode and EdgeHTML Mode (All versions)**

A DOMException of type `InvalidAccessError`, not `SyntaxError`, is thrown.

2.1.10 [W3C-INDEXDB] Section 3.2.5 Object Store

V0027: The multiEntry parameter is not supported

The specification states:

```javascript
3.2.5 Object Store

    Object store objects implement the following interface:

        interface IDBObjectStore {
```
... createIndex (DOMString name, (DOMString or sequence<DOMString>) keyPath, optional IDBIndexParameters optionalParameters);
...
);
createIndex

Parameter | … | Description
----------------------------------------------------------------------------------
-------------------------------
optionalParameters | … | The options object whose attributes are optional parameters to this function.
unique specifies whether the index's unique flag is set.
multiEntry specifies whether the index's multiEntry flag is set.

IE11 Mode and EdgeHTML Mode (All versions)

The multiEntry parameter is not supported.

V0026: A key path of type Array is not supported

The specification states:

3.2.5 Object Store

Object store objects implement the following interface:

interface IDBObjectStore {
...
readonly attribute any keyPath;
...
};

d the key path is a sequence<DOMString>, the value will be a new Array, populated by appending Strings equal to each DOMString in the sequence.

IE11 Mode and EdgeHTML Mode (All versions)

A key path of type Array is not supported.

V0026: A key path of type Array is not supported

The specification states:

4.5. The IDBObjectStore interface

The IDBObjectStore interface represents an object store handle.

interface IDBObjectStore {
...
readonly attribute any keyPath;
...
};

... However, if this attribute returns an object (specifically an Array), it returns
the same object instance every time it is inspected. ...

**IE11 Mode and EdgeHTML Mode (All versions)**

A key path of type Array is not supported.

V0024: The direction argument of the openCursor function is defined as type DOMString, not type IDBCursorDirection

The specification states:

3.2.5 Object Store

Object store objects implement the following interface:

```javascript
interface IDBObjectStore {

  ... // Other methods...

  IDBRequest openCursor (optional any range, optional IDBCursorDirection direction = "next");

  ... // Other methods...

};
```

**IE11 Mode (All versions)**

The direction argument of the openCursor function is defined as type DOMString, not type IDBCursorDirection:

```javascript
IDBRequest openCursor(optional any range = 0, optional DOMString direction = "next");
```

V0029: An index created using an empty string incorrectly return a null index name

The specification states:

3.2.5 Object Store

Object store objects implement the following interface:

```javascript
interface IDBObjectStore {

  ... // Other methods...

  IDBIndex createIndex (DOMString name, (DOMString or sequence<DOMString>) keyPath, optional IDBIndexParameters optionalParameters);

  ... // Other methods...

};
```

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>The name of a new index</td>
</tr>
</tbody>
</table>

**IE11 Mode and EdgeHTML Mode (All versions)**

An index created using an empty string incorrectly returns a null index name.
V0025: The keyPath and optionalParameters arguments of the createIndex function are of the wrong types

The specification states:

```javascript
... Object Store
... ...
    interface IDBObjectStore {
        ... [NewObject] IDBIndex   createIndex (DOMString name,
            (DOMString or sequence<DOMString>) keyPath,
            optional IDBIndexParameters optionalParameters);
        ...
    };
```

**IE11 Mode (All versions)**

The keyPath and optionalParameters arguments of the createIndex function are of the wrong types. They should be (DOMString or sequence<DOMString>) and IDBCursorDirection respectively.

```javascript
IDBIndex createIndex (DOMString name, DOMString keyPath, optional any optionalParameters = 0);
```

V0037: The autoIncrement attribute is not supported

The specification states:

```javascript
interface IDBObjectStore {
    ... readonly attribute boolean        autoIncrement;
    ...
};
```

**IE11 Mode and EdgeHTML Mode (All versions)**

The autoIncrement attribute is not supported.

V0028: An index with an empty key path cannot be created

The specification states:

```javascript
3.2.5 Object Store
Object store objects implement the following interface:
    interface IDBObjectStore {
        ... IDBIndex   createIndex (DOMString name,
            (DOMString or sequence<DOMString>) keyPath,
            optional IDBIndexParameters optionalParameters);
        ...
    };
```
... Otherwise, the implementation MUST create a new index in the object store and return an IDBIndex object representing it. Set the created index's name to name and key path to keyPath. Set the created index's unique and multiEntry flags to the values of the unique and multiEntry properties in the optionalParameters argument.

IE11 Mode and EdgeHTML Mode (All versions)
An index with an empty key path cannot be created.

V0038: The keyPath argument of the createIndex function is Domstring, but should be (DOMString or sequence<DOMString>)
The specification states:

3.2.5 Object Store
Object store objects implement the following interface:

```
interface IDBObjectStore {
...
    IDBIndex createIndex (DOMString name,
                        (DOMString or sequence<DOMString>) keyPath,
                        optional IDBIndexParameters optionalParameters);
...}
```

EdgeHTML Mode (All versions)
The keyPath argument of the createIndex function is Domstring, but should be (DOMString or sequence<DOMString>):

```
IDBIndex createIndex (DOMString name, DOMString keyPath, optional IDBIndexParameters optionalParameters = 0);
```

V0030: The range argument of openCursor does not properly handle the undefined value
The specification states:

3.2.5 Object Store
Object store objects implement the following interface:

```
interface IDBObjectStore {
...
    IDBRequest openCursor (optional any range,
                          optional IDBCursorDirection direction = "next");
...}
```

```
openCursor
```
If the range parameter is a key range then the cursor's range MUST be set to that range. Otherwise, if the range parameter is a valid key then the cursor's range is set to key range containing only that key value. If the range parameter is not specified, the cursor's key range is left as undefined.
**IE11 Mode (All versions)**

The range argument of `openCursor` does not properly handle the undefined value.

V0023: The keyPath attribute is defined as type DOMString, not as any

The specification states:

```javascript
interface IDBObjectStore {
    ... 
    readonly attribute any keyPath;
    ... 
};
```

**IE11 Mode and EdgeHTML Mode (All versions)**

The keyPath attribute is defined as type DOMString, not as any:

```javascript
readonly attribute DOMString keyPath;
```

### 2.1.11 [W3C-INDEXDB] Section 3.2.6 Index

V0031: The multiEntry attribute is not supported

The specification states:

```javascript
3.2.6 Index

Index objects implement the following interface:

```javascript
interface IDBIndex {
    ... 
    readonly attribute boolean multiEntry;
    ... 
};
```

**IE11 Mode and EdgeHTML Mode (All versions)**

The multiEntry attribute is not supported.

V0032: The range arguments of `openCursor` and `openKeyCursor` do not properly handle the undefined value

The specification states:

```javascript
3.2.6 Index

Index objects implement the following interface:

```javascript
interface IDBIndex {
    ... 
    IDBRequest openCursor (optional any range, optional IDBCursorDirection direction = "next");
    IDBRequest openKeyCursor (optional any range, optional IDBCursorDirection direction = "next");
    ... 
};
```
IE11 Mode (All versions)
The range arguments of openCursor and openKeyCursor do not properly handle the undefined value.

2.1.12 [W3C-INDEXDB] Section 3.2.7 Cursor
V0036: Passing an invalid argument to advance throws an InvalidAccessError
The specification states:

```javascript
advance
  If the value for count is 0 (zero), the implementation MUST throw a TypeError.
```

IE11 Mode and EdgeHTML Mode (All versions)
Passing an invalid argument to advance throws an InlineCode|InvalidAccessError], not a [InlineCode|TypeError].

V0034: The direction attribute is defined as type DOMString, not as IDBCursorDirection
The specification states:

```javascript
interface IDBCursor {
  readonly attribute (IDBObjectStore or IDBIndex) source;
  readonly attribute IDBCursorDirection direction;
  readonly attribute any key;
  readonly attribute any primaryKey;
  IDBRequest update (any value);
  void advance ([EnforceRange] unsigned long count);
  void continue (optional any key);
  IDBRequest delete ();
};
```

IE11 Mode (All versions)
The direction attribute is defined as type DOMString, not as IDBCursorDirection.

V0033: The source attribute is defined as the wrong type
The specification states:

```javascript
interface IDBCursor {
  readonly attribute (IDBObjectStore or IDBIndex) source;
  readonly attribute IDBCursorDirection direction;
  readonly attribute any key;
  readonly attribute any primaryKey;
  IDBRequest update (any value);
  void advance ([EnforceRange] unsigned long count);
  void continue (optional any key);
};
```
```javascript
IDBRequest delete ();
);

IE11 Mode (All versions)
The `source` attribute is defined as type `any`, not as `(IDBObjectStore or IDBIndex)`. V0035: The count argument of `advance` is not the correct type
The specification states:
```javascript
interface IDBCursor {
    readonly attribute (IDBObjectStore or IDBIndex) source;
    readonly attribute IDBCursorDirection direction;
    readonly attribute any key;
    readonly attribute any primaryKey;
    IDBRequest update (any value);
    void advance (long count);
    void continue (optional any key);
    IDBRequest delete ();
};
``` IE11 Mode (All versions) The count argument of the `advance` function is of type `long`, not `unsigned long`, and the `[EnforceRange]` flag is not set.
```javascript
void advance(long count);
```

### 2.2 Clarifications
There are no clarifications of the MAY and SHOULD requirements of `W3C-INDEXDB`.

### 2.3 Error Handling
There are no additional error handling considerations.

### 2.4 Security
There are no additional security considerations.
3 Change Tracking

No table of changes is available. The document is either new or has had no changes since its last release.
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