Ecma/TC39/2010/032

Overview

The semantics of enumeration in existing editions of ECMA-262 is very loosely specified. This strawman proposes more fully specifying the semantics of property enumeration.

Versioning

The semantics below is incompatible with existing web behavior, and would be enabled only through opting into Harmony. For compatibility, code run in legacy JavaScript versions may need to preserve the previous enumeration behavior.

For-in loops

The semantics of <u>iteration</u> uses the `iterate` proxy trap to drive iteration if it exists, but falls back to using the enumeration behavior of this proposal.

Semantics

The following operation produces an eagerly-computed sequence of the own-properties of an object.

Operation *EnumerateProperties*(obj)

Execution	Error propagation
Let suppress = ∅	
Let props = []	
While (obj != **empty**)	
If *IsTrappingProxy*(obj)	
Let handler = obj.[[Handler]]	
Let enum = handler.[[Get]](″enumerate″)	If *IsError*(enum) Return enum
If !*IsCallable*(enum)	
Return (type=**error**, value=TypeError, target=**empty**)	
Let rest = enum.value.[[Call]](handler, [])	If *IsError*(rest) Return rest
Return [props, …, rest, …]	
Let own = *OwnProperties*(obj)	
For each i in 0 … own.length - 1	
Let P = own[i]	
If P.attributes.enumerable && P ∉ props && P ∉ suppress	
props := [props, …, P.name]	
If !P.attributes.enumerable	
suppress := suppress ∪ { P }	
obj := obj.[[Prototype]]	
Return props	

Operation *OwnProperties*(obj)

We could specify this in a number of different ways. Conceptually, this operation should produce a sequence of property descriptors, in the following order:

properties with values that can be converted to numbers via *ToUInt32*
all other properties, in the order in which they were created

Several specification approaches:

- all objects have two sequential property tables:
  - properties with uint32 names, kept in integer order
  - all other properties, kept in creation order

- objects have one sequential property table, kept in creation order; *OwnProperties* then filters out uint32 properties
- properties in property tables include an internal creation-order attribute

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