Minutes for the:	*11th meeting of Ecma TC39*
to be held in:	*Redmond, WA, USA*
on:	*29 - 30 July 2009*

1   Opening, welcome and roll call

1.1   Opening of the meeting (Mr. Neumann)

The meeting was opened by Mr. Neumann at approximately 10:15 AM on 29th July.

1.2   Introduction of attendees

John Neumann – Ecma

Douglas Crockford – Yahoo

Kwans Yul Seo – Company 100

Erik Arvidsson – Google

Mark Miller – Google

Allen Wirfs-Brock – Microsoft

Arjun Bijanki - Microsoft

Sam Ruby – IBM

Cormac Flanagan – UCSC

Brendan Eich – Mozilla

Rob Sayre – Mozilla

Chris Pine – Opera (Phone)

Istvan Sebestyen – Ecma

1.3   Host facilities, local logistics

Allen Wirfs-Brock described facilities, lunch, and dinner plans for the meeting.

2   Adoption of the agenda (2009/033)

Agenda was adopted with modifications. After agenda point 3 it was decided to include a new agenda point on the Report of the Ecma Secretariat. That agenda point will cover various issues, such as reports from the last GA, presentation of development on the Ecma IPR policies such as Patent, Copyright and Trademark.

It was decided that the technical notes for this meeting will be taken by Erik Arvidsson since Mr. Horwat could not be here for this meeting. The technical notes are attached to this minutes in the Annex.

3   Approval of minutes from March 2009 (2009/031-Rev1)

Minutes approved as presented.

4 Report of the Ecma Secretariat and discussion of various related issues

Several issues were discussed:

4.1 Plans for the 12th TC39 Meeting

In order to move ahead the organization of the joint meetings Mr. Sebestyen has reported that the Ecma Secretariat has contacted the meeting organizers of the Ajax Conference and the W3C Conference respectively. So far no reply from the W3C organizers, but there is still sufficient time left to prepare that joint event. With the Ajax Conference organizers and Hilton Logan Airport the discussions have revealed that the costs for the TC39 meetings there would be too high (at least 350 US$ / day / participants plus the Ecma expenses). It was recognized that a host in the Bay Area the following week would therefore be a better choice for the next meeting. So the idea of linking the next Tc39 meeting with the Ajax Conference was dropped. In order to prepare the venue document for the September meeting it was agreed that member companies - home in that area - would identify during the next days who would host the meeting, where the meeting would take place and also a list of suitable hotels should be provided to the Ecma Secretariat.

4.2 Plans for the 13th TC39 Meeting

That meeting is still planned to be hold together with the W3C Members` conference. See also agenda point 8 below. There are still a couple of issues (both organizational and legal related) to be clarified. It should be discussed first how the joint meetings with W3C should be held. The target is that both all W3C and Ecma TC39 participants should be able to participate provided they are either members of Ecma or W3C (or both).

TC39 is planning to invite Philippe Le Hegaret from the W3C for the September TC39 meeting. Mr. Neumann has requested TC39 to establish a topic list of mutual interest to W3C and TC39 to be discussed in the joint meeting. Erik Arvidsson has agreed to pulling together subjects that TC39 want to discuss in the joint meeting. TC39 will agree to details at the next meeting in September and send to W3C for their consideration.

4.3 Trademark issues

Mr. Sebestyen reported that the GA has been informed about the trademark registration by TC46 and about the draft trademark disclaimer. He explained that the GA requested TC46 to define exactly how they intend to use the OpenXPS trademark (that has been already granted to Ecma). One obvious application is for "defensive purposes" to prevent that someone is using the trademark for something unrelated to the Ecma OpenXPS specification.

TC39 has decided that they also wish that Ecma registers ECMAScript as Wordmark for the very same defensive purposes. They have requested the Ecma Secretariat to identify the countries where such a trademark use would make most sense. These countries would probably include at least the EU, Switzerland, US, and maybe some Asian countries.

4.4 Patent issues

Mr. Sebestyen has reported that the GA is still working on the new Ecma patent policy. He has distributed for information the latest draft Patent Policy that was distributed to the GA. That version is neither final nor approved yet.

TC39 discussed what patent licensing strategy they would like to implement to allow ECMAScript Edition 5 to have best chances for speedy and high level market penetration. TC39 agreed that the application space (Web) of ECMAScript and its acceptability in W3C would require that potential essential patents of the specification should be available free of royalties on a worldwide basis. It was pointed out that since the default Ecma patent policy requires RAND commitment only, patent holding TC39 members should submit official patent statements to the Secretary General of Ecma (by the September 2009). Mr. Sebestyen pointed out that for the time being Ecma does not have approved forms for

such statements. However, the patent licensing template that has been distributed in GA/2009/076 is a good starting point, and members may use it if they wish. It was pointed out that the list of patents in the form (page 2) is voluntary, and in case of a RF statement its information content is actually not that important. It was also mentioned by Mr. Sebestyen that since the template is not approved yet by the Ecma GA TC39 members are free to use it or not, or to modify it as they feel. Also patent statements written in "prose" are acceptable. It was pointed out by some TC39 members that the use of a formalized template would (such as in GA/2009/076) would have a better optics in the market place.

Mr. Sebestyen also explained that the received statements would be put up on the Ecma website next to the download of ECMAScript Edition 5. Ecma does not have a separate patent database at present.

4.5   Copyright issues

The copyright issues around the TC39 standards and other deliverables were discussed in details.

Mr. Sebestyen has reported that the GA has approved at the last GA a general copyright disclaimer for draft Ecma and approved Ecma deliverables (GA/2009/070). Ecma does not make differences between copyright on text and software. TC39 has looked at the general disclaimer and concluded that in the application space of the ECMAScript standard it does not fully satisfies all requirements, because TC39 also wants to encourage derivative works that do not fully comply with the ECMAScript standard (such as partial implementation, or implementations of the standard with modifications). In all cases would TC39 like to see an acknowledgement of the original Ecma Source in such implementations, and in addition they also want to see that the Ecma copyright remains valid in all such implementations. On the other hand a not-compliant implementation may not call itself as ECMAScript implementation. It was also felt by TC39 that an Ecma trademark on the ECMAScript term would serve a very useful purpose to achieve that goal. It was also agreed that both text and possible software components of TC39 deliverables would carry the Ecma copyright.

It was agreed that to fulfil the above TC39 needs a different copyright disclaimer and license would be needed. Members of TC39 promised to provide examples of suitable licenses.

The above principles have been adopted by TC39. It is planned to complete the TC39 copyright disclaimer and license at the September 2009 meeting of TC39.

4.6   Visibility: TC39 Web Pages on the Ecma public website, Liaisons

It was pointed out that most comprehensive information about the ECMAScript standardization is being provided on the ECMAScript Wiki page. Therefore it should be checked by Patrick Charollais if there is a link from the TC39 public Ecma webpage to the ECMAScript wiki, and if not, such a link should be established.

Mr. Sebestyen mentioned that ECMA-262 is the most popular Ecma standard in terms of number of downloads, which is about 3,000 free downloads per month.

On liaison he mentioned that the ISO/IEC JTC1 Directives will be changed in about a year time. It can be expected that the new rules will make JTC1 Fast Tracks more difficult (also for Ecma). Also for this reason it is important to approve the ECMAScript 5 Edition in December 2009, because until approval of the new rules the old rules are in force.

It was also decided that the next edition of the draft should be sent by the Ecma Secretariat to JTC1 SC22 for information. SC22 is a candidate place for Fast Track submission.

5   Review of project candidate draft testing, including outstanding issues

Latest draft on the WIKI and is week newer than 2009/036. There was a discussion of several issues that have come up over the past week. Review of errata by several results in "looks good to me" type of comments.

The next version of the ES5 standard will be prepared and sent to the Ecma Secretariat in a week time by Mr. Wirfs-Brock. Patrick Charollais will start to work on the editing of the standard in order that the editing work can be finished by the September 2009 TC39 meeting (Deadline: September 14, 2009).

Patrick will have to convert to Ecma/ISO style and work with Allen Wirfs-Brock to complete before September and members will help review technical content as he finishes. Discussion occurred about how to capture the tests under Ecma label and resolution of issues related to doing this.

6   Discussion of ES harmony and SES and their relationship

ES-Harmony:

The following requirements, goals, and means help to inform and guide development of proposed extensions and improvements to ES5 for ES-Harmony.

Straw-man proposals live in strawman until approved by TC39, at which point they move into the harmony namespace, linked from the proposals page.

Requirements

1. New features require concrete demonstrations.
2. Keep the language pleasant for casual developers.
3. Preserve the "start small and iteratively prototype" nature of the language.

Goals

1. Be a better language for writing:
    1. complex applications;
    2. libraries (possibly including the DOM) shared by those applications;
    3. code generators targeting the new edition.
2. Switch to a testable specification, ideally a definitional interpreter hosted mostly in ES5.
3. Improve interoperation, adopting de facto standards where possible.
4. Keep versioning as simple and linear as possible.
5. Support a statically verifiable, object-capability secure subset.

Means

1. Minimize the additional semantic state needed beyond ES5.
2. Provide syntactic conveniences for:
    1. good abstraction patterns;
    2. high integrity patterns;
    3. defined by desugaring into kernel semantics.
3. Remove (via opt-in versioning or pragmas) confusing or troublesome constructs.
    1. Consider making Harmony build on ES5 strict mode.
4. Support virtualizability, allowing for host object emulation."

7   Next steps

1. Allen Wirfs-Brock will complete update of final doc and send to Patrick Charollais for formatting

2. Allen Wirfs-Brock with get help to review for technical correctness

3. Final doc to be sent by Patrick Charollais to TC39 by 9/14

4. Final doc approval by TC39 at September meeting and sent to CC and GA for approval.

5. If testing reveals errors that need correcting they will be sent to ISO/IEC as part of Ecma comments during FT Ballot in JTC 1.

Future work

1. Continued evolution of thinking on ES Harmony.

2. Allen Wirfs-Brock will give workshop on interpreter that will be used to rewrite the ES 5 draft into a formal language specification to eliminate ambiguities and facilitate implementations. Either in the September of the November meeting.

3. Track changes for ES 5

4. Technical report on tests for ES 5

8   Date and place of the next meeting(s)

- September [23-24] (Bay Area) @ 10 AM

  TC39 decided to drop the original plan to meet at same hotel as AJAX in Boston. The reasons were the too high costs for such an event, and that no major benefit - except some convenience gain - was expected from such arrangement. Clarification is needed for the new host and list of appropriate hotels. Responsible: companies located in the area.

- November [5-6] (Santa Clara, California) @ 10 AM [Ecma – co located with W3C]

  TC39 will meet on Thurs/Fri at same hotel (Santa Clara Marriott). Groups we want to avoid overlap with include HTML5 and DOM. Reminder: TC39 members who want to attend W3C meeting must be company members of that group and be identified by their W3C member as delegates to the meeting.

  - Ecma GA December 3-4 San Jose

9   Closure

The meeting closed at approximately 4:30 on 30th July.

Annex: Technical notes taken by Erik Arvidsson

Wednesday 2009-07-29

Istvan covers the minutes of the ECMA general assembly

…

2000-4000 downloads per month for ES3 doc at ECMA (e4x is also popular)

Should we trademark ECMAScript? Yes, unless someone brings up reason not to. ECMA will do it.

AI: Istvan to register ECMAScript as a trademark.

Discussing whether we want to put setTimeout etc into ECMAScript? There is a clearly a gap between ES and HTML5. How can we close the gap? Execution model needs to be standardized.

Brendan: I want to focus on hot language issues first

Meet with W3C in September. We'll invite Phillipe (from w3c).

1. Global object vs this
2. Execution model
3. setTimeout
4. Event handlers
5. Multiple globals

Open Issues:

Allen: I have no open issues. Last issue was with configurability with eval:ed vars. var - non configurable, eval var - configurable. [[Global]].foo is configurable (the standard behavior). Eval in function that creates vars are deletable (and were in ES1). Hopefully there are not other issues that are this serious lurking in the draft ;-)

Mark: xhr+eval is not the same as createElement('script')

Allen: Another issue that came up was the RegExp issue regarding idents. Applied David Sarah's fix.

Another issue that was fixed as an UTF-8 issue. Made it explicit. Would not decode invalid UTF-8.

Doug: Would that break existing implementations?

Allen: Depends on existing implementations but it should not.

Brendan: There is a regexp bug in IE and SpiderMonkey with turkish-i

```
"iI\u0130".replace(/[\u0130]/gi, "#")
IE:   "###"
FF:   "#I#"
others: "iI#"

upper(i) =>I
upper(I) => I
upper(turkish-i) => turkish-i
```

B: What was the utf-8 resolution

A: throw an exception (URIError) if the decoded value is not valid utf-8

Doug: There was the language thing with strict code unit. We use "code unit" in the text where it should not be used since we should only use "code unit" in regards to Unicode.

A: The main work task is now to reformat the spec to match the ECMA style (typography etc)

A: We have to have the final document at the next meeting (Sept)

B: Is there anything we should double check?
A: Chapter 10 is significant. All the array and string algorithms were rewritten.
A: My sense: There must be bugs in this document. No worse than in ES3

Test suites:

Mark: Sputnik and MS ES5 tests test the specs. The moz tests tests mozilla implementation. Should reflect the spec and the structure of the spec
Rob: Our concern is that the spec does not match the implementation.
Mark: Sputnik tests extensions as well
Rob: Mozilla is willing to contribute their tests.
Rob: Doing development as an open source project with code reviews etc.
Brendan: It doesn't matter where it is hosted
Rob: At one point we hope to have enough tests to publish it as a technical report. The project is not an official ECMA project but a future report will be an ECMA branded report.

CodePlex should be fine. Mark to ask Christian what his objections are.

Implementation testing and break the web testing. Mark believes that Microsoft are coming to a closure on the implementation front. Allen, and others, have been using their prototype for weeks without noticing anything. That doesn't prove anything but it is something.

What can we do if we do find a compat issue?

John Neumann: We cannot change it after September. Which goes to fast track to ISO. 6 months. Comments can be made during that time. And we can do revisions which will use the same edition number.

At next meeting we will approve the spec.

```

Istvan: 2 meetings. Sept (in the bay area, most likely Google), Nov (with w3c).

Mark: Wants to distinguish ES6 and Harmony. ES6 is the next concrete
spec and Harmony is the general direction.

Don't call it ES6.

What are the goals for Harmony?

1-9. The ES3.1 9 goals are still applicable (on the wiki)
10. To provide syntactic conveniences for good abstraction patterns.
11. To provide syntactic conveniences for high integrity patterns.
12. To minimize the additional semantic state needed beyond that provided by ES5
13. Reference implementation? Testable spec.

Brendan to move the ES3.1 list over to the harmony namespace in the
wiki. http://wiki.ecmascript.org/doku.php?id=harmony:harmony

Cormac: Should an ESH implementation also run ES5? How do they interact?
Mark: Suggests ESH runs ES5strict but not necessarily ES5
Mark: use strict puts you in harmony

Make sure the language remains approachable by casual scripters.

Discussion about int and other number types that are wanted by code generating

Allen: First and foremost it is a language for humans

const f() {} is syntactic sugar for frozen functions.

It would be good if the ES5 object model is good enough for ES3, ES5 and ESH

Cormac: Harmony spec needs to spec compat mode with ES5 and strict mode


opt in?

mark:

```
 if (function() { "use strict"; return this; }()) {

  // < ES5

 } else {

  // >= ES5

 }
```


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Thursday 2009-07-30

Allen: Possible time frames for harmony
Doug: Gating thing would be implementation, feature wrangling.
Testable implementation and test suites and the synchronize that with

```
the ecma calendar
Cormac: 2 which ends up being 3
Cormac: There is the whole issue of formalism
Allen: We could probably identify some smaller sub problems.
Milestone would be to create a reference implementation for ES5


starts with a strawman. then moves to proposals, then specification as a patch
Doug: What language. He likes the work Allen has been doing and
suggests ES5 as the implementation language.
Cormac: Spec ES5 in ES5 (the English prose)
Mark: We could say that the interpreter is written in the common
subsets of ES5 strict and ES3.


Spec. Formalism
        Use ES3/5s "interpreter" based on Allen Wirf-Brock's work
        Rewrite ES5 spec using above
            (1) replace pseudo code with ES code
            (2) Reorg as appropriate
            (3) Parser/grammar?
        Use new "ES5" spec as baseline for Harmony spec


Work flow
    straw man - vague feature/functionality/sketch
    proposal - "complete" informal spec
    spec patch - formal spec
    (Tech Report)
    Integrated into Harmony spec


Brendan: We already have hg.ecmascript.org setup.



Catchalls

Brendan: We should really get feedback from V8 and Apple and other VM people.
Mark: There is another approach to catchalls similar to how it is done in E
Allen: Catchalls should be cachable. Catchalls on prototype needs extra care
Erik: There is also index getter/setter

Brendan:

set
setMissing
----------------
setIndexed
getIndexed

Mark: ES4 had List/Vector. Maciej also wanted Set

set covers the use case. It requires more work than setMissing
(setIndexed/getIndexed) but it might be better to start simple.

a = []
a[(1 << 32) - 2] = 42;
a[(1 << 32)] = 43;
print(a[0]) => undefined
a.length => (1 << 32) -1
```

Return to label

Mark: Still useful even without lambdas.
Cormac: What does it give us that exceptions cannot achieve
Codify a pattern and make sure that no one catches the exception

Hashes/Map

Allen: hashCode. Sure it introduces another source of non determinism
Mark wants hash tables
Mark: It introduces a covert channel
Ephemeron

weak pointer. has 2 methods. registerExecutor/registerObserver which
gets notified when the pointer is null

ephemeron table can be used to assign unique ids to objects. Chasing our tail.
Mark: The ephemeron table is local so if you don't have a reference to
it you cannot get the id
Mark: We can introduce a new primitive. A number generator that
returns a unique number for object that it is passed in

Messages to null - No, it is too late

Mark: Can we add modules to strawman or proposal. Yes, add to strawman first

ByteArray/Blob

Nitro has it
Canvas wants clamping and rounding
Maybe we need bit blip on a new value type
Mark: Could byte array be written in the language?
Brendan: Yes, with catchalls
Mark: Then it is not introducing new semantic state?
Allen's concern is that we add a specialized object.
Mark: Blob implies immutable, buffer, array implies mutable
Allen: Why bytes and not bits?
Mark: then we get to the endian issue :-)

Math.random()

Rob: What about an improved random?
Mark: What about crypto?
Brendan: We (moz) are planning to use their crypto libraries for
Math.random(). If we provide something else people will still use
Math.random which
Doug: We still need a fast random generator.
Mark: From a security point the issue is that there is a shared state.

More Math functions?
hypot? log10?

Mark: How about a standardized debugging API. Not as part of

ECMAScript but something the TC might be interested in.
Brendan: There is some work going on in the open web between V8,
Spidermonkey and Nitro. It seems like this will happen.

Spread

Mark: We should also allow spread to be used in object literals to expand

```
let a = {a: 0}
let b = {b: 1, ...a} // {b:1, a: 0}
let c = {...a, b: 1} // {a: 0, b:1}
```

Array like objects should work. Use same logic as for apply to determine length

Mark:
```
{
  x: x,
  y: y,
  ...stuff
}
```

enumerable own properties

Allen: It is a different semantics with the same operator.
Brendan: Call it spread-map
Allen: This is syntactic sugar to the object literal

Mark: Is the following syntactic sugar conflict free?

```
const { ... }
```

Allen:

```
{[...],
  x: x,
}
```

in ES4 {const x: ...}

Brendan:

```
let o = {x: 0, y: 1} const;
```

Allen:

```
var o = {
  method f() {}
};
```

it would do binding.

SES

function objects are frozen
function have name property
frozen functions do not have prototypes
object literals inherits from null

```
% becomes the modulo operator
remove ==, remove !=
remove semicolon insertions
remove with
changes to eval
change the status to ps and ls
What to do with this? Probably leave it as ES5 strict


class Observable() {
  const listeners = [];

  public addListener(listener) {
    listeners.push(listener);
  }

  public notify() {
    for (let i = 0; i < listeners.length; i++) {
      listeners[i](...);
    }
  }
}

if a listeners references this it gets access to the listeners

(1, listeners[i])(...) gets around it. apply etc also gets around it
```


I will send these out to the es-discuss list as well later today
incase people find any obvious errors in my notes.

--
erik

Email note by Brendan Eich from Aug. 3, 2009:

Cc'ing tc39 since this was a topic at last week's meeting:

http://groups.google.com/group/webdebugprotocol?hl=en

/be

On Aug 3, 2009, at 4:10 PM, Allen Wirfs-Brock wrote:

Last week you mentioned that there is some discussion going on somewhere about a "standardized" JavaScript debugger API or some such. Did you find a link to it?

Thanks,

Allen

Email note by Brendan Eich from Aug. 2, 2009:

On Aug 2, 2009, at 11:33 AM, Mark S. Miller wrote:

> On Fri, Jul 31, 2009 at 9:33 AM, Erik Arvidsson<arv@google.com> wrote:
>> Brendan: We already have hg.ecmascript.org setup.
>
> How can we start trying to use this?

I'll have to get back to you on this, later today or tomorrow.

> Is it mercurial only?

Yes.

> Any reason why mercurial was chosen?

http://weblogs.mozillazine.org/preed/2006/11/version_control_system_shootou.html
http://weblogs.mozillazine.org/preed/2007/04/version_control_system_shootou_1.html

That was then. We could reevaluate but the main values in the modern distributed version control systems are the distributed part and the graph of changesets instead of file-wise atomicity.

At this point hg.mozilla.org is a sunk cost. If it's a bad sunk cost we can revisit. Do you have specific objections?

> Should we merge the test suites there?

Who is going to do that work?

/be

Email note by Mark Miller from July. 31, 2009:

On Fri, Jul 31, 2009 at 9:33 AM, Erik Arvidsson <arv@google.com> wrote:

Brendan: We already have hg.ecmascript.org setup.

We also discussed whether we should host the merge test suites there.

SES

function objects are frozen
function have name property
frozen functions do not have prototypes
object literals inherits from null
% becomes the modulo operator
remove ==, remove !=
remove semicolon insertions
remove with
changes to eval
change the status to ps and ls
What to do with this? Probably leave it as ES5 strict

Important to note that this was read from an earlier list. Now that we seek to make SES a statically verifiable subset of ESH, many of these may no longer be relevant. Most important change that remains relevant: be able to execute code without the global object at the bottom of the scope chain. (This may be included within the "changes to eval" above but is worth calling out.)

Since the module proposal needs this restriction as well, perhaps these get tied together?

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  Cheers,
  --MarkM