# A compiler providing incremental scalability for web application

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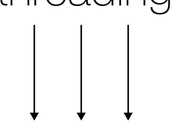
To develop a **web application**, one have to **choose**

**features** scalability

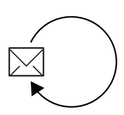
**Monolithic** models

threading



Java

event-loop

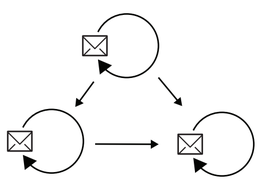


node.js

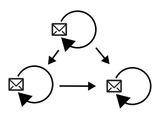
or

**performance** scalability

**Distributed** models

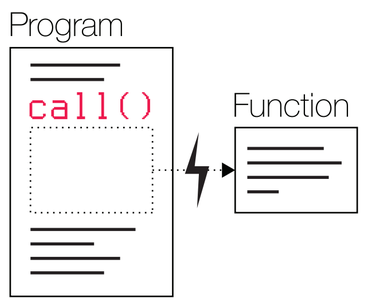


**SEDA**, **System S**, **Storm**

We want to **compile**  into 

The compiler extracts **autonomous parts** by searching for **rupture points** marking them out

## A **Rupture point** is a call of a loosely coupled function




In node.js, an **asynchronous call** is a **rupture point**.

I/O Operation like `fs` and `express`.

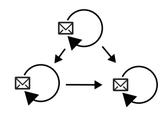
```
var app = require('express')();
app.get('/', function handler(req, res){
  //...
});
```

**Application parts** are enveloped into **fluxions**.

A **fluxion** is an autonomous  with :

+ a unique **name**,
+ a persisted **memory**,
+ and a **function**
+ which outputs **streams**

```
flx handler-1000 {fs}
-> null
  function handler(req, res) {
    //...
  }
```

**source**  compilation **target** 

```
var app = require('express')(),
    fs = require('fs'),
    count = 0;

app.get('/', function handler(req, res){
  fs.readFile(__filename, function reply(err, data){
    count += 1;
    var code = ('' + data)
                    .replace(/\n/g, '<br>')
                    .replace(/ /g, ' ');
    res.send(err
            || 'downloaded ' + count +
               ' times<br><br><code>' +
               code + '</code>');
  });
});

app.listen(8080);
console.log('>> listening 8080');
```

```
flx source.js {}
>> handler-1000 [res]
  var app = require('express')(),
      fs = require('fs'),
      count = 0;
  app.get('/', >> handler-1000);
  app.listen(8080);
  console.log('>> listening 8080');
```

req
res

```
flx handler-1000 {fs}
-> reply-1001 [res]
  function handler(req, res) {
    fs.readFile(__filename, -> reply-1001);
  }
```

res
err
data

```
flx reply-1001 {count}
-> null
  function reply(err, data) {
    count += 1;
    var code = ('' + data)
                    .replace(/\n/g, '<br>')
                    .replace(/ /g, ' ');
    res.send(err
            || 'downloaded ' + count +
               ' times<br><br><code>' +
               code + '</code>');
  }
```

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