

*the*  
**NODE FIRM**

Copyright© 2013 The Node Firm. All Rights Reserved.

# **ERROR HANDLING**

## LIFE BEFORE DOMAINS

## OCCASIONAL ERRORS

### 01\_server\_throws.js:

```
var server = require('http').createServer();
server.on('request', function(req, res) {
  a.abc();
  res.end('Thank you for using our service!');
});
server.listen(8000);
```

## GLOBAL ERROR CATCHALL

Prevent node from going down

**02\_uncaught\_exception\_handler.js:**

```
process.on('uncaughtException', function(err) {  
  console.log('uncaught exception here', err);  
});  
  
var server = require('http').createServer();  
server.on('request', function(req, res) {  
  a.abc();  
  res.end('Thank you for using our service!');  
});  
server.listen(8000);
```

# EVENT EMITTERS AND ERRORS

the error event is special

## 03\_event\_emitter\_error.js

```
var EventEmitter = require('events').EventEmitter;

var server = require('http').createServer();
server.on('request', function(req, res) {
  ee = new EventEmitter();
  ee.emit('example', 1, 2, 3);
  ee.emit('error', new Error('something terrible has happened'));
  res.end('Thank you for using our service!');
});
server.listen(8000);
```

# WITHOUT DOMAINS

## 04\_event\_emitter\_handle\_error.js:

```
var EventEmitter = require('events').EventEmitter;

var server = require('http').createServer();
server.on('request', function(req, res) {
  ee = new EventEmitter();

  ee.on('error', function(err) {
    res.writeHead(500);
    res.end(err.message);
  });

  ee.emit('example', 1, 2, 3);
  ee.emit('error', new Error('something terrible has happened'));
  res.end('Thank you for using our service!');
});

server.listen(8000);
```

## **DOMAINS**

Domains provide a mechanism for catching unhandled errors emitted from arbitrary groups of IO.



## DOMAINS: EVENTEMITTER

### 05\_domains.js:

```
var EventEmitter = require('events').EventEmitter;
var domain = require('domain');

var server = require('http').createServer();
server.on('request', function(req, res) {

    var d = domain.create();

    d.once('error', function(err) {
        res.writeHead(500);
        res.end(err.message);
    });

    d.run(function() {
        ee = new EventEmitter();

        ee.emit('example', 1, 2, 3);
        ee.emit('error', new Error('something terrible has happened'));
        res.end('Thank you for using our service!');
    });

});

server.listen(8000);
```

## DOMAINS: EXCEPTIONS

domain.run also catches exceptions

### 06\_domains\_throw.js:

```
var EventEmitter = require('events').EventEmitter;
var domain = require('domain');

var a;

var server = require('http').createServer();
server.on('request', function(req, res) {

  var d = domain.create();

  d.on('error', function(err) {
    res.writeHead(500);
    res.end(err.message); // respond with the error
  });

  d.run(function() {
    a.abc();
    res.end('Thank you for using our service!');
  });

});
server.listen(8000);
```

This also works if the error is thrown asynchronously:

#### 07\_domains\_throw\_async.js:

```
var EventEmitter = require('events').EventEmitter;
var domain = require('domain');

var server = require('http').createServer(function(req, res) {

    var d = domain.create();

    d.on('error', function(err) {
        res.writeHead(500);
        res.end(err.message);
    });

    d.run(function() {
        setTimeout(function() {
            a.abc();
        }, 500);
    });

}).listen(8000);
```

# RESOURCE LEAKS

Domains are not a cure all

**08\_leak\_example.js:**

```
var domain = require('domain');
var net = require('net')
var connections = 0;
var server = require('http').createServer(function(req, res) {
  var d = domain.create();

  d.on('error', function(err) {
    console.log('caught error, continuing');
    res.writeHead(500);
    res.end('ERROR: ' + err.message + '. ' + connections + ' hanging client');
  });

  d.run(function() {
    var conn = net.connect('http://google.com');
    connections++;

    throw new Error('simulated explosion');

    conn.end("GET / \r\n\r\n");
  });
});

server.listen(8000);
```

**Rule of thumb:** Default to restarting the node process, unless you are absolutely sure there are no leaking resources.

## EXPLICITLY ADDING EVENT EMITTERS

### 09\_domains\_add.js:

```
var EventEmitter = require('events').EventEmitter;
var domain = require('domain');

var server = require('http').createServer();
server.on('request', function(req, res) {
  var d = domain.create();
  d.add(req);
  d.add(res);

  d.on('error', function(err) {
    res.writeHead(500);
    res.end(err.message);
  });

  res.emit('error', new Error('halp!'));
});
server.listen(8000);
```

# INTERCEPTING CALLBACKS

Intercepting errors in callbacks

**10\_domains\_intercept.js:**

```
var domain = require('domain');
var fs = require('fs');

var server = require('http').createServer();
server.on('request', function(req, res) {

    var d = domain.create();

    d.on('error', function(err) {
        res.writeHead(500);
        res.end(err.message);
    });

    fs.readFile('non-existant-file', d.intercept(function(contents) {
        res.end(contents);
    }));

});
server.listen(8000);
```

## SUMMARY

- Use domains to handle errors
- When errors occur, seriously consider exiting the process
- add event emitters to domains: `domain.add(emitter)`
- remove event emitters from domains: `domain.remove(emitter)`
- intercept errors in callbacks: `domain.intercept(function(result) {})`
- catch errors thrown in a callback `domain.bind(function(err, result) {})`