

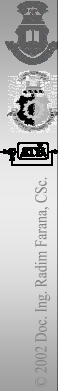
Browser Scripts

(VBScript, JavaScript)



Content

- VBScript, JavaScript
- The SCRIPT tag
- Syntax
- Browser Objects Model
- Events
- Examples



Sources

Cornell G. *Microsoft Visual Basic Scripting. Příručka programátora.* 1. vyd. Brno : Computer Press, 1999. 278 s. ISBN 80-7226-144-4.
<http://home.netscape.com/eng/mozilla/3.0/handbook/javascript/index.html>
<http://www.javascript.sk/>



The SCRIPT Tag

```
<SCRIPT LANGUAGE="JavaScriptVersion">
<!-- Begin to hide script contents from old browsers.

    // comment

    JavaScript statements...

// End the hiding here. -->
</SCRIPT>
<NOSCRIPT>
  <B>This page uses JavaScript, so you need to get
  Netscape Navigator 2.0 or later!<BR>
  If you are using Navigator 2.0 or later, and you see
  this message, you should enable JavaScript by choosing
  Network Preferences from the Options menu.
</NOSCRIPT>
```



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Functions

```
<SCRIPT LANGUAGE="JavaScript">
function fun1() {
    ...
}
function fun2() {
    ... return condition;
}
</SCRIPT>
<FORM NAME="myForm">
<INPUT TYPE="button" NAME="myButton"
  onClick="fun1()">
</FORM>
<SCRIPT>
document.myForm.myButton.onclick=fun2
</SCRIPT>
```



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Literals

- 42
- 3.14159
- -3.1E12
- .1e12
- "To be or not to be!"
- 'This is a question.'

Special characters:
\\b - backspace
\\f - form feed
\\n - new line character (LF)
\\r - carriage return (CR)
\\t - tab character
\\" - quotes



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Expressions, Conditional Expressions

- **Expressions**

3 + 4

x = 7

- **Conditional Expressions**

(condition) ? value1 : value2

status = (age >= 18) ? "adult" : "minor"



Assignment Operators

- **Shorthand for arithmetic • Bitwise operations operations**

x += y means x = x + y

x -= y means x = x - y

x *= y means x = x * y

x /= y means x = x / y

x %= y means x = x % y

x <<= y means x = x << y

x >>= y means x = x >> y

x >>> y means x = x >>> y

x &= y means x = x & y

x ^= y means x = x ^ y

x |= y means x = x | y



Operators

- **Arithmetic Operators**

+ - addition

- - subtraction

* - multiplication

/ - division

% - modulus var2 % var1

++ - increment var++, ++var

-- - decrement

-- unary negation

- **Bitwise Operators**

& - AND (15 & 9 = 9,

1111 & 1001 = 1001)

| - OR (15 & 9 = 15)

^ - XOR (15 & 9 = 6)

- **Bitwise Shifts**

<<< - left shift

>>> - sign propagating right shift

>>>> - zero-fill right shift

| x | operation | x | y |
|---|-----------|---|---|
| 3 | y=x++ | 4 | 3 |
| 4 | y=++x | 4 | 4 |



Operators

- **Logical Operators**

&& - And
|| - Or
! - Not

- **Comparison Operators**

== - equal
!= - not equal
> - left operand is greater
>= - greater or equal
< - left operand is less
<= - less or equal



Operator Precedence

comma ,
assignment = += -= ...
conditional ? :
logical-or ||
logical-and &&
bitwise-or |
bitwise-xor ^
bitwise-and &

equality == !=
relational < <= > >=
bitwise shift >> << >>> <<<>>>
additional/subtraction + -
multiply/divide * / %
negation/increment
! ~ - ++ --
call, member () []



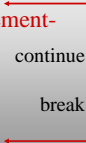
Statements

- **Conditional Statements**

```
if (condition) {statements1}  
  [else {statements2}]
```

- **Loop Statements**

```
for ([initial-expression;] [condition;] [increment-  
  expression])  
  {statements}  
while (condition) {statements}
```



Statements

- **Object Manipulation Statements**

```
for (variable in object ) { statements }  
objectname = new objecttype(parameters)  
this[.property] - current object  
with (object) { statements }
```



Built-in Objects

- **Array**

```
arrayObjectName = new Array([arrayLength])
```

- **Boolean**

```
booleanObjectName = new Boolean(value)
```

- **Date**

```
varname = new Date(parameters)
```

- **Function**

```
functionObjectName = new Function ([arg1, arg2,  
... argn], functionBody)
```

```
var setBGColor = new Function("document.bgColor='antiquewhite'#")
```



Built-in Objects

- **Math**

```
Math.PI - property  
Math.sin(1.56) - method
```

- **Number**

```
1.25
```

- **String**

```
"Hello, everybody!"
```



Date Object

- **Properties**
 - none
- **Methods**

| | | |
|------------|-------------|----------------|
| getDate | getTime | getTimeoffset |
| getDay | getFullYear | |
| getHours | parse | toGMTString |
| getMinutes | setDate | toLocaleString |
| getMonth | setHours | UTC |
| getSeconds | setMinutes | |
| getTime | setMonth | |
| | setSeconds | |
| | setTime | |
| | setYear | |



Math Object

- **Properties**
 - E
 - LN2
 - LN10
 - LOG2E
 - LOG10E
 - PI
 - SQRT1_2
 - SQRT2
- **Methods**

| | |
|-------|--------|
| abs | max |
| acos | min |
| asin | pow |
| atan | random |
| ceil | round |
| cos | sin |
| exp | sqrt |
| floor | tan |
| log | |



Number Object

- **Methods**
 - MAX_VALUE - the largest representable number
 - MIN_VALUE - the smallest representable number
 - POSITIVE_INFINITY - returned after overflow
 - NEGATIVE_INFINITY - returned after overflow
 - NaN - not a number



String Object

- **Methods**

- anchor
- big, blink, bold, fixed, italics, small, strike, sub, sup
- charAt
- indexOf, lastIndexOf
- link
- split
- substring
- toLowerCase, toUpperCase

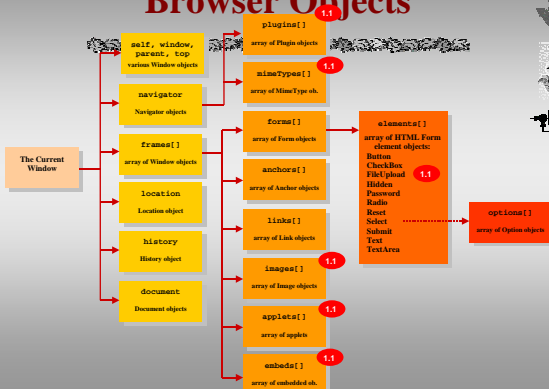


Buil-in Functions

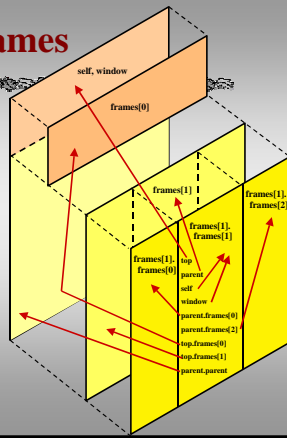
- **isNaN**
isNaN(testValue)
- **eval**
[objectName.]eval(string)
- **parseInt**
parseInt(string [, radix])
- **parseFloat**
parseFloat(string)



Browser Objects



Windows, Frames



Events

| Event | Applies to | Occurs when | Event handle |
|-----------|--|--|--------------|
| abort | images | User aborts the loading of an image (for example by clicking a link or clicking the Stop button) | onAbort |
| blur | windows, frames, and all form elements | User removes input focus from window, frame, or form element | onBlur |
| click | buttons, radio buttons, checkboxes, submit buttons, reset buttons, links | User clicks form element or link | onClick |
| change | text fields, textareas, select lists | User changes value of element | onChange |
| error | images, windows | The loading of a document or image causes an error | onError |
| focus | windows, frames, and all form elements | User gives input focus to window, frame, or form element | onFocus |
| load | document body | User loads the page in the Navigator | onLoad |
| mouseout | areas, links | User moves mouse pointer out of an area (client-side image map) or link | onMouseout |
| mouseover | links | User moves mouse pointer over a link | onMouseOver |
| reset | forms | User resets a form (clicks a Reset button) | onReset |
| select | text fields, textareas | User selects form element's input field | onSelect |
| submit | submit button | User submits a form | onSubmit |
| unload | document body | User exits the page | onUnload |

Navigator Object

`navigator.propertyName`

- Properties**

- appName - browser code name
- appName - browser name
- appVersion - version number
- userAgent - user-agent header

- Methods**

none

- Event handlers**

none

Navigator Plugins

- 1. `navigator.plugins[index].propertyName`
- 2. `navigator.plugins[pluginIndex][mimeTypeIndex].mimeTypePropertyName`

• Properties

description
filename
length
name

Plugins array

- Properties
length

• Methods

eval
toString
valueOf

- Methods
refresh



Navigator MimeTypes

- `navigator.mimeTypes[index].propertyName`

• Properties

description
embedPlugin
type ("video/mpeg", ...)
suffixes ("mpeg, ...")

MimeTypes array

- Properties
length

• Methods

eval
toString
valueOf



Location Object

- `[windowReference.]location[.propertyName]`
- `[windowReference.]location.methodName(parameters)`

• Properties

hash
host
hostname
href
pathname
port
protocol
search

• Methods

eval
reload
replace
toString
valueOf



History Object

1. `history.propertyName`
2. `history.methodName(parameters)`
3. `[windowReference,]history[index]`

• Properties

current
length
next
previous

• Methods

back
eval
forward
go
toString
valueOf



Document Object

1. `document.propertyName`
2. `document.methodName(parameters)`

• Properties

alinkColor
bgColor
cookie
domain
fgColor
lastModified
linkColor
referrer
title

URL
vlinkColor

• Properties

anchors
applets
embeds array
forms
images
links



Document Object

• Methods

close - closes an output stream to display it
eval - evaluates a string of JavaScript code
open - opens a stream to collect the output
toString - converts object to string (default)
valueOf - primitive value of the object
write - writes HTML expressions to the document
writeln - writes HTML expressions to a document in the specified window and follows them with a newline character



Frame Objects

1. `[windowReference.]frameName.propertyName`
2. `[windowReference.]frames[index].propertyName`
3. `window.propertyName`
4. `self.propertyName`
5. `parent.propertyName`

• Properties

frames - child frames
name
length - number of child frames
parent
self
window property

• Methods

blur
clearTimeout
eval
focus
setTimeout (fnc, msec)
toString
valueOf



Anchor Objects

• Properties

• Methods

eval
toString
valueOf

• Anchors array

• Properties

length

• Methods

eval



Link Objects

• Properties

hash
host
hostname
href
pathname
port
protocol
search
target

1. `document.links[index]`
2. `document.links.length`

• Methods

eval
toString
valueOf

• Event Handlers

onClick
onMouseOut
onMouseOver



Images Objects

1. `imageName.propertyName`
2. `document.images[index].propertyName`
3. `formName.elements[index].propertyName`

```
myImage = new Image()
myImage.src = "seaotter.gif"
...
document.images[0].src = myImage.src
```

1. `imageName.onabort = handlerFunction`
2. `imageName.onerror = handlerFunction`
3. `imageName.onload = handlerFunction`



Images Object

• Properties

border
complete
height
hspace
lowsrc
name
prototype
scr
vspave
width

• Methods

eval
toString
valueOf

• Event Handlers

onAbort
onError
onLoad



Applets Objects

```
<APPLET 1. document.applets[index]
CODE=className 2. document.applets.length
HEIGHT=height
WIDTH=width
MAYSCRIPT
[NAME=appletName]
[CODEBASE=classFileDirectory]
[ALT=alternateText]
[ALIGN="left"|"right"
"top"|"absmiddle"|"absbottom"
"texttop"|"middle"|"baseline"|"bottom"]
[HSPACE=spaceInPixels]
[VSPACE=spaceInPixels]
[<PARAM NAME=parameterName VALUE=parameterValue>]
[ ... <PARAM>]
</APPLET>
```



Applets Objects

- **Properties**

- **Methods**

eval
toString
valueOf

- **Applets array**

- **Properties**

length

- **Methods**



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Embeds Objects

```
<EMBED                                1. document.embeds[index]
SRC=source                            2. document.embeds.length
NAME=embedName
HEIGHT=height
WIDTH=width>
[parameterName=parameterValue]
[ ... parameterName=parameterValue]
</EMBED>
```

The following code includes an audio plug-in in a document.

```
<EMBED SRC="train.au" HEIGHT=50 WIDTH=250>
```



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Forms Objects

- **Properties**

action
encoding
length
name
method
target
elements array

1. `formName.propertyName`
2. `formName.methodName(parameters)`
3. `forms[index].propertyName`
4. `forms[index].methodName(parameters)`

- **Methods**

eval
reset
submit
toString
valueOf



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Elements Array

1. `elementName.propertyName`
2. `elementName.methodName(parameters)`
3. `formName.elements[index].propertyName`
4. `formName.elements[index].methodName(parameters)`

- **Button**
- **Checkbox**
- **FileUpload**
- **Hidden**
- **Password**
- **Radio**
- **Reset**
- **Select**
- **Submit**
- **Text**
- **Textarea**



Button

- **Properties**
 - form
 - name
 - type
 - value
- **Event handlers**
 - onBlur
 - onClick
 - onFocus
- **Methods**
 - blur
 - click
 - eval
 - focus
 - toString
 - valueOf

```
<INPUT TYPE="button" VALUE="Calculate" NAME="calcButton"
onClick="calcFunction(this.form)">
```



Checkbox

- **Properties**
 - checked
 - defaultChecked
 - form
 - name
 - type
 - value
- **Methods**
 - blur
 - click
 - eval
 - focus
 - toString
 - valueOf
- **Event handlers**
 - onBlur
 - onClick
 - onFocus



FileUpload

- **Properties**

form
name
type
value

- **Event handlers**

onBlur
onClick
onFocus

- **Methods**

blur
click
eval
focus
toString
valueOf



Hidden

- **Properties**

form
name
type
value

- **Methods**

eval
toString
valueOf

- **Event handlers**

onBlur
onClick
onFocus



Password

- **Properties**

defaultValue
form
name
type
value

- **Methods**

blur
eval
focus
select
toString
valueOf

- **Event handlers**

onBlur
onFocus



Radio

- **Properties**
- **Methods**
- **Event handlers**

| | | |
|----------------|----------|---------|
| checked | blur | onBlur |
| defaultChecked | click | onClick |
| form | eval | onFocus |
| length | focus | |
| name | toString | |
| type | valueOf | |
| value | | |



Reset

- **Properties**
- **Methods**

| | |
|-------|----------|
| form | blur |
| name | click |
| type | eval |
| value | focus |
| | toString |
| | valueOf |

- **Event handlers**

onBlur
onClick
onFocus

```
<INPUT TYPE="button" VALUE="Calculate" NAME="calcButton"  
onClick="calcFunction(this.form)">
```



Select

- **Properties**
- **Methods**

| | |
|---------------|----------|
| form | blur |
| length | eval |
| name | focus |
| options | toString |
| selectedIndex | valueOf |
| type | |

- **Event handlers**

onBlur
onClick
onFocus



Options

Options Array

• Properties

length
selectedIndex

• Option object

• Properties

defaultSelected
index
selected
text
value

Adding new option:

1. using constructor `Option()`
2. refresh page by using `history.go(0)`



Submit

• Properties

form
name
type
value

• Methods

blur
click
eval
focus
toString
valueOf

• Event handlers

onBlur
onClick
onFocus



Text

• Properties

default
form
name
type
value

• Methods

blur
eval
focus
select
toString
valueOf

• Event handlers

onBlur
onChange
onFocus
onSelect



Textarea

- **Properties**
 - default
 - form
 - name
 - type
 - value
- **Methods**
 - blur
 - eval
 - focus
 - select
 - toString
 - valueOf
- **Event handlers**
 - onBlur
 - onChange
 - onFocus
 - onSelect



Examples

- **Easy scripts**
- **Last modification of document**
- **Clock**
- **Menu**
- **Scrolling text**
- **Picture rotator**



Examples

- **Close window on click at picture**

```
<A HREF="javascript:window.close()">  
picture </A>
```
- **Goto previous page on click at hyperlink**

```
<A HREF="javascript:history.back(-1)">  
hyperlink</A>
```



Last modification

```
<script language="JavaScript">
<!-- // to hide script contents in old browsers
dnes=new Date()
msden=24*60*60*1000;
datakt = document.lastModified
akt=new Date(datakt)
odakt=(dnes.getTime()-akt.getTime())/msden
odakt=Math.round(odakt)
var tisk = "<P ALIGN=center>Date of last modification:
"+akt+". "
document.write(tisk)
document.writeln("Number of days since: "+odakt+".")
// end hiding contents from old browsers
// -->
</script>
```



Clock - 1

```
<BODY text="#000000" bgcolor="#FFFFFF" link="#0000EE"
vlink="#551A8B" alink="#FF0000" background="bcgrnd.gif"
ONLOAD="clock()">
```

```
<SCRIPT LANGUAGE="JavaScript">
<!-- hide for old browsers
var timeStr, dateStr;
function clock()
{
now= new Date();
hours= now.getHours();
minutes= now.getMinutes();
seconds= now.getSeconds();
timeStr= "" + hours;
timeStr+= ((minutes < 10) ? ":0" : ":") + minutes;
timeStr+= ((seconds < 10) ? ":0" : ":") + seconds;
document.clock.time.value = timeStr;
}
```



Clock - 2

```
date= now.getDate();
month= now.getMonth()+1;
year= now.getYear();
dateStr= "" + month;
dateStr+= ((date < 10) ? "0" : "/") + date;
dateStr+= "/" + year;
document.clock.date.value = dateStr;
Timer= setTimeout("clock()",1000);
}
// -->
</SCRIPT>
```

```
<FORM NAME="clock">
<INPUT TYPE="text" NAME="time" SIZE="6" VALUE="">
<INPUT TYPE="text" NAME="date" SIZE="9" VALUE="">
</FORM>
```



Menu - Table (1)

```
<TABLE WIDTH="170" CELLS=1 CELSPACING=0 CELLSPACING=5
ALIGN=LEFT BORDER=0 onMouseover="changeto('white')"
onMouseout="changeback('none!')">
<TR><TD><A href="source.htm" TARGET="S2">Title</a>
</TD>
</TR>
<script language="JavaScript">
function changeto(highlightcolor)
{
source=event.srcElement
if (source.tagName=="TR" || source.tagName=="TABLE")
return
while(source.tagName!="TD")
source=source.parentElement
if (source.style.backgroundColor!=highlightcolor
&& source.id!="ignore")
source.style.backgroundColor=highlightcolor;
}
```



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Menu - Table (2)

```
function changeback(originalcolor)
{
if (event.fromElement.contains(event.toElement)
|| source.contains(event.toElement)
|| source.id=="ignore")
return
if (event.toElement!=source&&originalcolor=="none")
source.style.backgroundColor=""
else
source.style.backgroundColor=originalcolor
}
</script>
```



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Menu - Pictures

```
<script language="JavaScript">
<!--
var version;
version = false;
if (((navigator.appName == "Netscape") &&
(parseInt(navigator.appVersion.substring(0,1)) >= 3))
|| ((navigator.appName == "Microsoft Internet Explorer")
&& (parseInt(navigator.appVersion.substring(0,1)) >= 4)))
{version = true;}
function change(name, img)
{if (version)
{document[name].src = img;}
}
// -->
</script>
<A href="Info.htm" OnMouseOver="change('T0', 'SH.jpg')]"
OnMouseOut="change('T0', 'H.jpg')"></A>
```



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Scrolling text (1)

```
<body background="bg.gif" onload="wiper()" noscrolling>
<SCRIPT LANGUAGE="JavaScript">
<!--
timeID = 5;
stcnt = 11;
msg = "Hello girls and boys!";
wmsg = new Array(32);
wmsg[0]=msg;
  blnk = "
  for (i=1; i<32; i++)
  {
    b = blnk.substring(0,i);
    wmsg[i]="";
    for (j=0; j<msg.length; j++)
      wmsg[i]=wmsg[i]+msg.charAt(j)+b;
  }
-->
```



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Scrolling text (2)

```
function wiper()
{
  if (stcnt > -1) str = wmsg[stcnt]; else str = wmsg[0];
  if (stcnt-- < -40) stcnt=31;
  status = str;
  clearTimeout(timeID);
  timeID = setTimeout("wiper()",10);
}
// End -->
</SCRIPT>
```



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Picture Rotator (1)

```
<SCRIPT>
delay = 100
imageNum = 1

// Preload animation images
theImages = new Array()
for(i = 1; i < 11; i++) {
  theImages[i] = new Image()
  theImages[i].src = "image" + i + ".gif"
}

function animate() {
  document.animation.src = theImages[imageNum].src
  imageNum++
  if (imageNum > 10) {
    imageNum = 1
  }
}
-->
```



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Picture Rotator (2)

```
function slower() {
  delay+=10
  if(delay > 4000) delay = 4000
}
function faster() {
  delay-=10
  if(delay < 0) delay = 0
}
</SCRIPT>
<BODY BGCOLOR="white">
<IMG NAME="animation" SRC="image1.gif" ALT="[Animation]"
  onLoad="setTimeout('animate()', delay)">
<FORM>
  <INPUT TYPE="button" Value="Slower" onClick="slower()">
  <INPUT TYPE="button" Value="Faster" onClick="faster()">
</FORM>
</BODY>
```





... to be continued