

**2D &
3D &
MULTIMEDIA &
WEB**

MEDIA FOR THE WEB

TEXTS / DOCUMENTS

IMAGES

Raster, vector

AUDIO

Sound effects, music

VIDEO

INTERACTIVE CONTENT

Games, virtual worlds



TODAY'S OUTLINE

USAGE OF VARIOUS MEDIA

DESIGN ISSUES

TECHNICAL ASPECTS

RESOURCES

PERCEPTION ISSUES

USABILITY

FORMATS

IMAGES

IMAGE USAGE

PHOTOGRAPHS, ADS, LOGOS
BACKGROUND, ICONS
DECORATIONS

THE ATTENTION COMPETITION

Images attract attention & win the game over text

A PICTURE IS WORTH A THOUSAND WORDS

A well chosen image can replace several sentences

IMAGES AND TEXTS TOGETHER

MARGIN, ALIGNMENT, TEXT FLOW, CAPTIONS

Microsoft investigating 'screen of death'

By Ina Fried

December 1, 2009 10:56 a.m. EST



A blog suggests the black screen issue can occur on a wide range of Windows machines up through Windows 7.

STORY HIGHLIGHTS

- Microsoft says it is looking into reports of problems with security updates
- Those affected are left with a black desktop and little else on their screen
- British blog says there appear to be many causes of the black-screen issue

(CNET) -- Microsoft said on Monday that it is looking into reports that its latest security updates are causing some serious problems for certain users.

The problem has been dubbed the "black screen of death" because those affected are left with a black desktop and little else on their screen.

"Microsoft is investigating reports that its latest release of security updates is resulting

in system issues for some customers," the software maker said in a statement. "Once we complete our investigation, we will provide detailed guidance on how to prevent or address these issues."

The issue was noted by British security firm Prevx on its blog on Friday, with that company also offering a suggested fix for the problem.

"The symptoms are very distinctive and troublesome," Prevx said. "After logging on there is no desktop, task bar, system tray or



DISCOVERIES

Ground-Breaking Science: Very Old Papers Awesome, Hilarious

3 hours ago



DISCOVERIES

Loneliness May Be Contagious

7 hours ago



GAMING REVIEWS

Skateboard-Controlled Tony Hawk: Ride Wipes Out

19 hours ago



GAMING

Avatar Points Way to Future of Movie Games

8 hours ago

Well played! :

www.cnn.com

www.wired.com

BITMAP VS. VECTOR GRAPHICS

BITMAPS

Ugly scaling

Perfect for realistic pictures

SHAPES

Perfect scaling

Perfect for symbols, logos

Bad with realistic pictures

Parametric = editable

Small size for simple objects



IMAGE FILE FORMATS

GIF

8bit, lossless, **animation**, transparency

Obsolete, obscure licensing policy before 2004

JPEG

24bit, lossy, **photographs**

PNG

8 / 24 / 32bit, **lossless**, **transparency**

WEBP (GOOGLE, LOSSY/LOSSLESS, FREE)

SVG (VECTOR GRAPHICS, XML-BASED)

Out of this world: BMP, TIFF, IMG, ...

TECHNICAL ASPECTS

IMAGE SIZE - LOADING TIME

Image compression

Image resolution

- Thumbnails, web size, print size

COMPRESSION

Lossy/lossless

Symbols, large uniform areas - PNG

Photographs, smooth graphics - JPEG

IMAGE SOURCES

STOCK PHOTO

Also vector illustrations, videos
iStockphoto, sxc.hu, Shutterstock
Getty Images, Corbis,
Profimedia (.sk), ...

INDIVIDUAL AUTHORS

Flickr, deviantart, ...

BE CAREFUL ABOUT LICENSING



SVG

SVG IS ...

SCALABLE VECTOR GRAPHICS

2D GRAPHICS & ANIMATIONS IN XML

OPEN, FREE

NICE FOR DYNAMIC VISUALIZATIONS

DEVELOPED AND MAINTAINED BY W3C
[HTTP://WWW.W3.ORG/GRAPHICS/SVG/](http://www.w3.org/Graphics/SVG/)

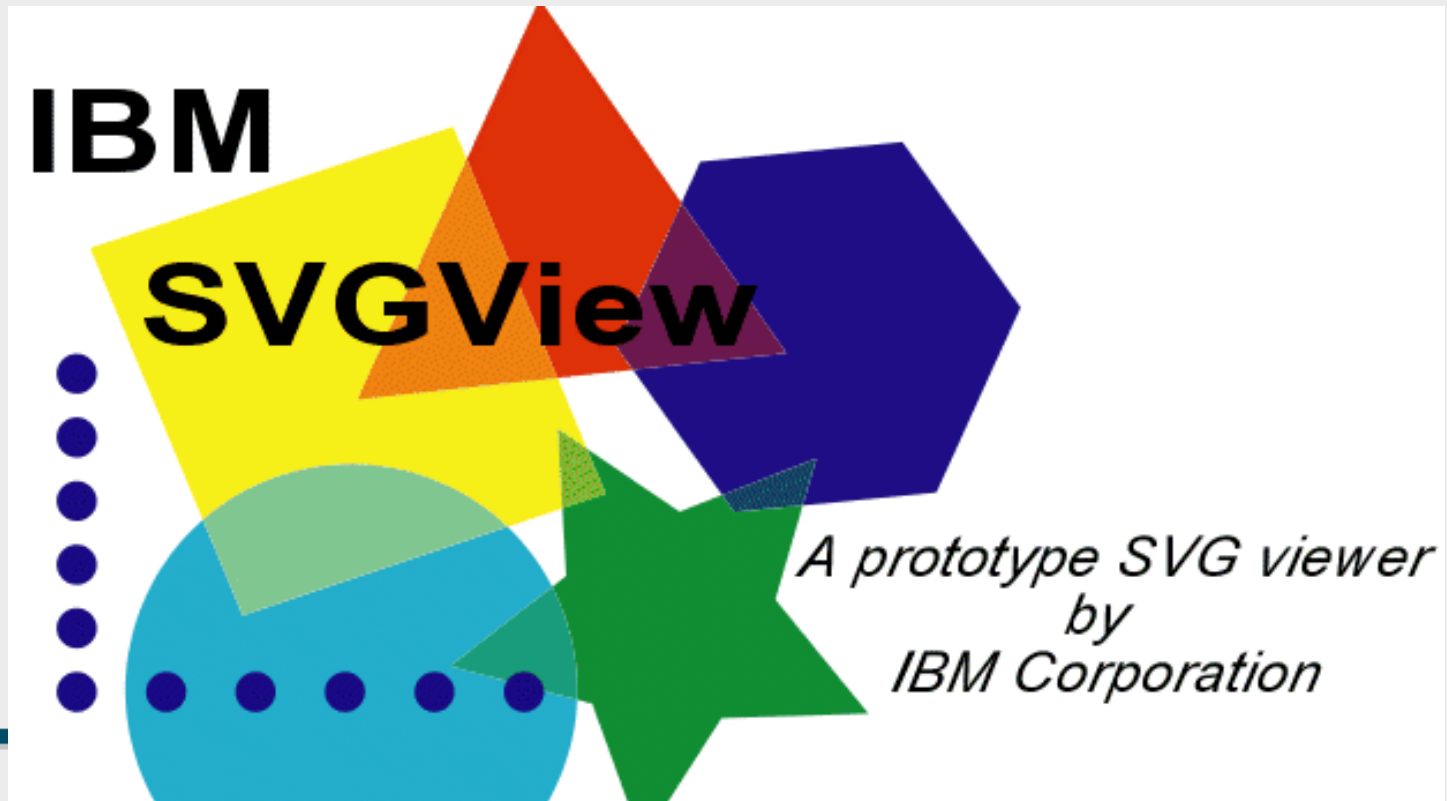
BASIC OBJECTS

SHAPES

Curves, lines, polygons

IMAGES

TEXT



SHAPES AND TEXTS

SHAPES

Fill

Stroke

Markers

TEXT

Glyphs (font)

Unicode text



BASIC DATA TYPES:

NO UNITS:

INTEGER, NUMBER

WITH UNIT:

LENGTH, ANGLE, COORDINATE, TIME

LIST

(SEQUENCE OF VALUES)

COLOR

(DIFFERENT FORMATS)

PAINT

(FILL + STROKE PROPERTIES)

SHAPE ELEMENTS

RECT

CIRCLE

ELLIPSE

LINE

POLYGON

POLYLINE

PATH

- WIDTH, HEIGHT, [X, Y]

- RADIUS, [CX, CY]

- RX, RY, [CX, CY]

- X1, Y1, X2, Y2

- X1, Y1, X2, Y2, ... XN,YN

- SAME SA ABOVE

- COMMANDS + VALUES

e.g move to,
 line to,
 curve to,
 close path...

EXAMPLE ELEMENTS – POLYGON

```
<POLYGON
```

```
FILL="LIME" STROKE="BLUE"
```

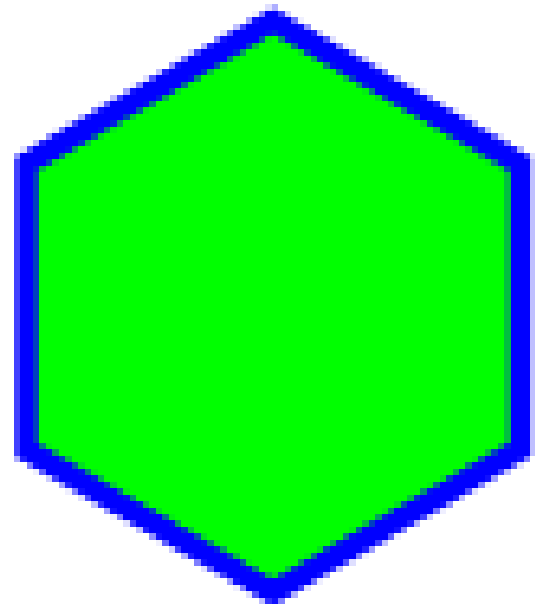
```
STROKE-WIDTH="10"
```

```
POINTS="850,75 958,137.5
```

```
958,262.5 850,325
```

```
742,262.6 742,137.5"
```

```
/>
```



EXAMPLE ELEMENTS – PATH / TRAJECTORY

```
<PATH D="M153 334  
C153 334 151 334 151 334  
C151 339 153 344 156 344  
C164 344 171 339 171 334  
C171 322 164 314 156 314  
C142 314 131 322 131 334  
C131 350 142 364 156 364  
C175 364 191 350 191 334  
C191 311 175 294 156 294  
C131 294 111 311 111 334  
C111 361 131 384 156 384  
C186 384 211 361 211 334  
C211 300 186 274 156 274"  
STYLE="FILL:WHITE;STROKE:RED;STROKE-WIDTH:2"/>
```



ADVANCED OBJECTS

GROUPS

<G>

SYMBOLS

<SYMBOL>

used for animations, re-using

IMAGES

<IMAGE>

A whole external image (png, jpeg)

Also a whole another SVG image

It's rendered independently by browser

RENDERING FEATURES

RENDERING ORDER

Painter's algorithm

No z-index (workarounds necessary)

CLIPPING

Any item to any shape

GROUPS

In-group objects rendered separately

Group displayed afterwards

RE-USING SYMBOLS & ELEMENTS

< USE >

x, y, width, height

transform

URI



TRANSFORMATIONS

TRANSLATE

ROTATE

SCALE

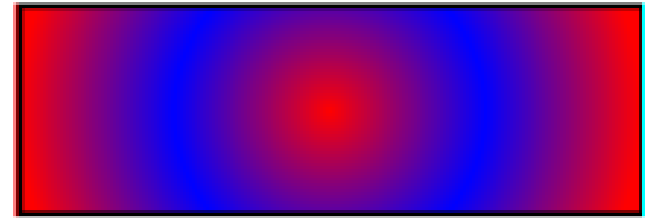
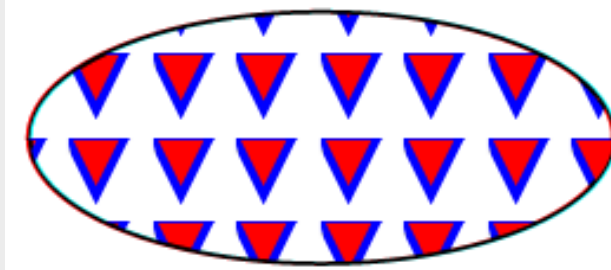
SKEW

ARBITRARY
MATRIX



RASTER EFFECTS

FILLS
PATTERNS
GRADIENTS
FILTERS
MASKS (ALPHA CHANNEL)



STYLING AND TRANSFORMATIONS

SVG IS BASED ON XML

SVG CAN BE TRANSFORMED BY XSLT

```
<xsl:template match="svg:rect">
```

SVG CAN BE STYLED BY CSS:

```
rect
{
    fill           :    red;
    stroke         :    blue;
    stroke-width   :    3
}
```

INTERACTIVITY

HYPERLINKS

CURSOR CHANGES

VIEW ZOOMING / PANNING

EVENTS TRIGGERED BY USER

SCRIPTING (ON DOM-LEVEL)

just like HTML

NATIVE ANIMATION

SMIL

Synchronized Multimedia Integration Language

SET & MODIFY SCALAR ATTRIBUTES

SPECIFY TIMING AND KEY POINTS

START / STOP ANIMATION

STOP / REMOVE MODIFIER DURING ANIMATION

SPLINE MODIFIERS

ANIMATION EXAMPLE

```
<RECT ID="RECTELEMENT"
```

```
X="300" Y="100" WIDTH="300" HEIGHT="100"
```

```
FILL="RGB (255,255,0) ">
```

```
<ANIMATE
```

```
    ATTRIBUTENAME="X"
```

```
    ATTRIBUTETYPE="XML"
```

```
    BEGIN="0S" DUR="9S"
```

```
    FILL="FREEZE"
```

```
    FROM="300" TO="0" />
```

```
</RECT>
```

MISCELLANEOUS

NO INTERNAL SUPPORT FOR:
word wrapping, line breaking

SUPPORT FOR:
compressed .svgz files

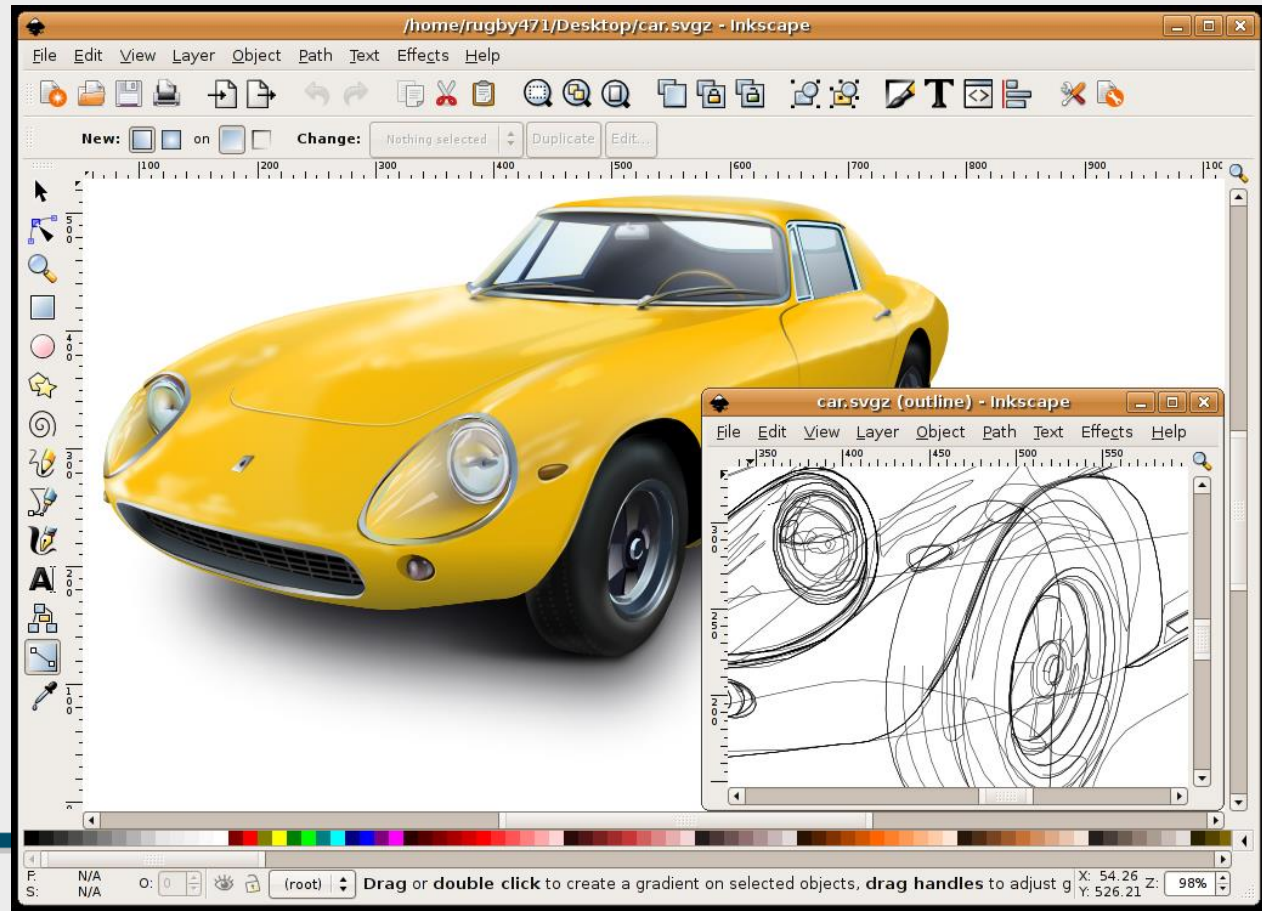
PROFILES:
Tiny, Basic, Full, Print

NATIVE SUPPORT IN BROWSERS

Major browsers (including mobile) support some SVG
Issues may occur with bitmap filters and animations

EDITORS – INKSCAPE

OPEN SOURCE VECTOR GRAPHICS EDITOR
SVG COMPLIANT
MULTI-PLATFORM



ADOBE FLASH

FLASH USED TO BE ...

MACROMEDIA FLASH

Acquired by Adobe in 2005

MAINLY FOR ANIMATED
VECTOR GRAPHICS

SEO KILLER

PROPRIETARY



FLASH NOW ...

INCLUDES POWERFUL OOP AND GUI
LANGUAGE

ActionScript 3.0 + Flex components

INCORPORATES MULTIMEDIA

video, music, inline/online, streaming, webcam...

SUPPORTS ADVANCED CODE FEATURES

remoting, XML, serialization

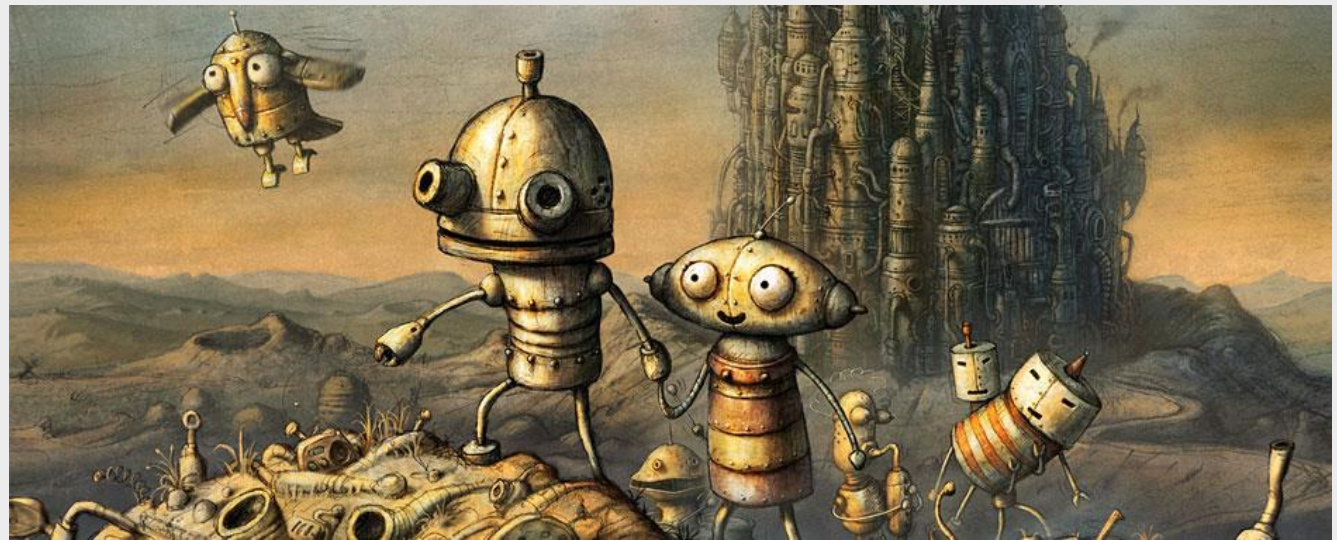
USES AN OPEN FORMAT

SLOWLY RECEDES FROM WEB

FLASH/FLEX IN FUTURE ...

WILL PROBABLY VANISH AS A MEDIUM CARRIER

MIGHT REMAIN AS AN AUTHORING PLATFORM



Machinarium: Flash based game.
Originally in-browser powered by Flash Player.
Later ported to iOS to become #1 selling iPad application

INTERACTIVE TECHNOLOGIES

JAVASCRIPT/AJAX,

JAVA, FLASH, SILVERLIGHT, SHOCKWAVE, SVG

PROPRIETARY PLUGINS / BINARIES

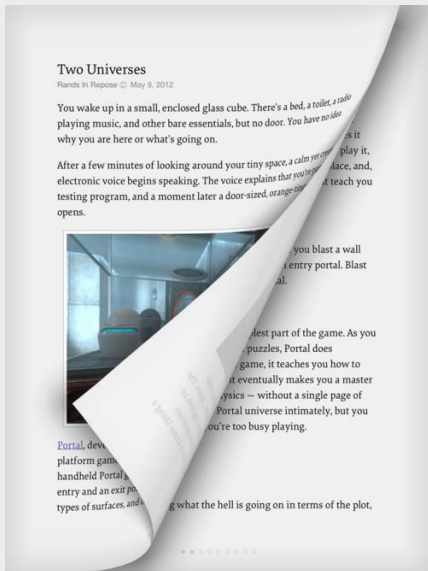
OPEN STANDARDS



**VIDEO /
ANIMATION**

USAGE

INTERNET TV, VIDEO ON DEMAND
VIDEO CALLS
ANIMATIONS, DECORATIONS
AVATARS / WEB ACTORS



CURRENT SITUATION

TV AND WEB COME CLOSER

HTPCs, media centers, smart TVs

WEB 2.0 VIDEO BOOM

Video blogs, citizen journalism, indymedia

HD / TV / VIDEO ON DEMAND

The Vimeo logo, featuring the word "vimeo" in a blue, lowercase, sans-serif font.The Hulu logo, featuring the word "hulu" in a green, lowercase, sans-serif font, with a small "TM" trademark symbol to the right.The YouTube logo, featuring the word "You" in black and "Tube" in white inside a red rounded rectangle.The Netflix logo, featuring the word "NETFLIX" in a black, uppercase, sans-serif font.

FORMATS AND TECHNICAL STUFF

MPEG, AVI, JAVA

Obsolete, no streaming support

APPLE QUICKTIME, ADOBE FLASH

STREAMING, BITRATE

PLUGINS VS. NATIVE SUPPORT

HTML5 => <VIDEO> ELEMENT, NO PLUGINS

Ogg Theora (Mozilla, Opera) vs. H.264 (Apple, Google),

WebM (Mozilla, Opera, Adobe, Google)

Microsoft planned to ignore <video> at all

VIDEO USAGE GUIDELINES

VIDEO IS NOT A REPLACEMENT FOR TEXT

Video is sequential, webpage is not

People can't skim video

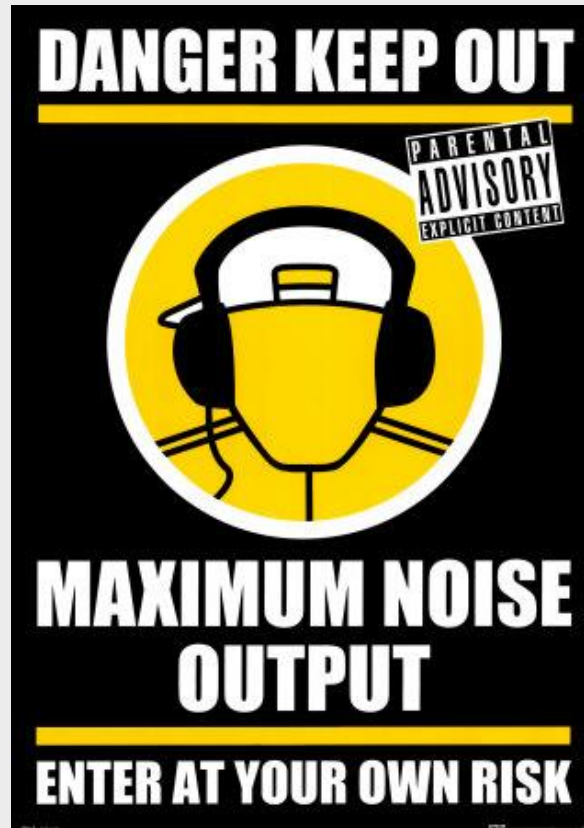
→ must wait until something interesting happens

VIDEO DECORATIONS ARE ANNOYING

page flipping, zooming, fade in/out

don't turn your web into PowerPoint

WHEN INSERTING AUDIO/VIDEO



DISABLE SOUND
BY DEFAULT

3D ON WEB

MOTIVATION

COMPUTER GAMES VIRTUAL REALITY APPLICATIONS

Virtual towns, 3d maps
Shops, museums

OBJECT DEMONSTRATION

Commercial projects
Cultural heritage

RICH INTERNET APPLICATIONS



HISTORY – VRML (1994)

TEXT-BASED FILE FORMAT

3D MODELS AND ANIMATION

BROWSER PLUG-IN NECESSARY

Cortona, Octaga, Flux, Cosmo Player

Browsers not 100% compatible



WHY IS VRML EVIL?



Error. Click for details

```
Cortona Console
Can not load definition of EXTERNPROTO Particles
File: http://www.mission-base.com/vrml/characters/charityCloud.wrl
Can not load definition of EXTERNPROTO Particles
File: http://www.mission-base.com/vrml/characters/angelHeadCloud1b.wrl
```

```
Exception: java.lang.NoClassDefFoundError: vrml/eai/event/VrmlEventListener
java.lang.NoClassDefFoundError: vrml/eai/event/VrmlEventListener
    at java.lang.ClassLoader.defineClass1(Native Method)
    at java.lang.ClassLoader.defineClass(Unknown Source)
    at java.security.SecureClassLoader.defineClass(Unknown Source)
    at java.net.URLClassLoader.defineClass(Unknown Source)
```

PLEASE NOTE that your VRML plugin is only partially supported.

The virtual machine in your web browser is not supported by your VRML plugin: Java does not talk to VRML. VRSpace bypasses this limitation, but some of objects may not display, namely, VRML EAI-specific code will not work.

This usually happens if you install java **after** you have installed the VRML plugin.
If that is the case, simply uninstall VRML plugin and install it again.

```
at java.lang.ClassLoader.loadClass(Unknown Source)
at sun.plugin2.applet.Plugin2ClassLoader.loadCode(Unknown Source)
at sun.plugin2.applet.Plugin2Manager.createApplet(Unknown Source)
at sun.plugin2.applet.Plugin2Manager$AppletExecutionRunnable.run(Unknown Source)
at java.lang.Thread.run(Unknown Source)
```

EVOLUTION – CUSTOM BINARY PLUGINS

ACTIVEX, MOZILLA OBJECT

PROPRIETARY SOLUTIONS

E.g. EPUD, FMFI UK

Multimediálna historická
Bratislava



EVOLUTION – SHOCKWAVE 3D

BASED ON MACROMEDIA SHOCKWAVE
GPU ACCELERATION,
ADVANCED GRAPHICS

Texture filtering,
transparency, fog

PROPRIETARY
TECHNOLOGY

ONLINE (CASUAL) GAMES



EVOLUTION – X3D FEATURES

ALL VRML PLUS:

XML-BASED

NURBS

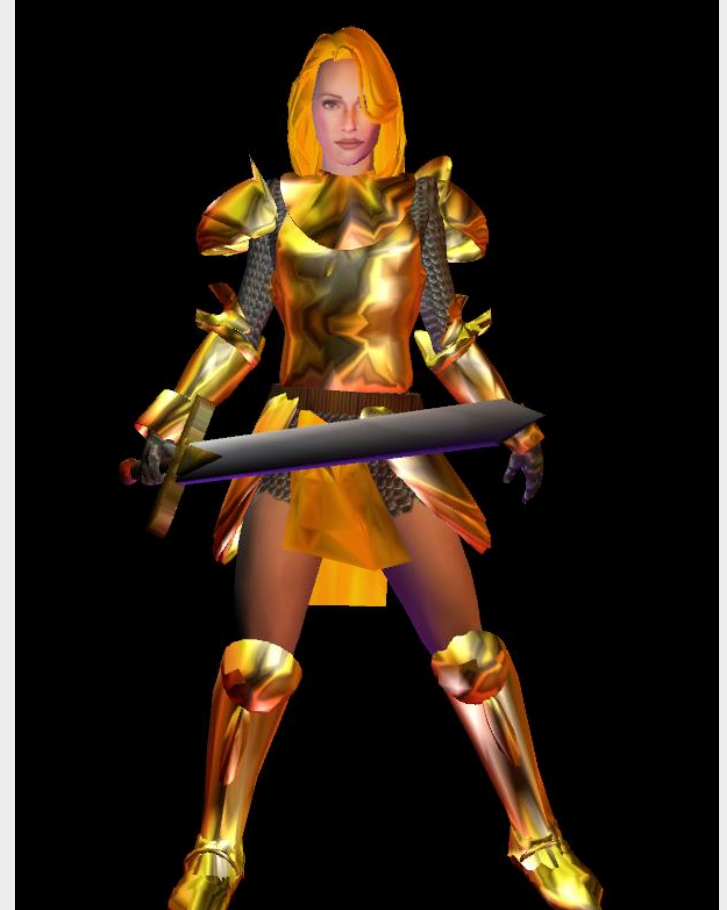
MULTITEXTURING

SHADERS

HUMANOID ANIMATION

COLLISION DETECTION

...



ADOBE FLASH PLAYER 10 & 11

SUPPORT FOR 3D CONTENT
MATRIX TRANSFORMATIONS
TEXTURE MAPPING
2D VERTEX -> 3D VERTEX
SOFTWARE RENDERING FP10
GPU ACCELERATION FP11



CUSTOM 3D ENGINES

Papervision
Away3D
Alternativa



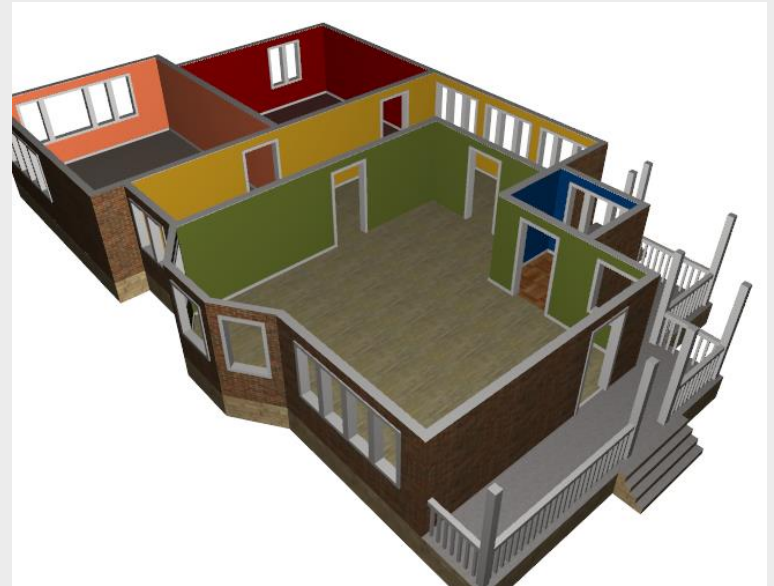
GOOGLE 03D

NICE HW ACCELERATION

SPECIAL EFFECTS

Shaders
Shadows

OPEN SOURCE
JAVASCRIPT-ABLE
PLUG-IN



CANVAS 3D

CAME WITH HTML5

ARBITRARY PIXELS

i.e. custom rendering

JAVASCRIPT-ABLE

OPERA CANVAS 3D

MOZILLA CANVAS 3D



<http://gyu.que.jp/jscloth>

WEBGL

WEBGL

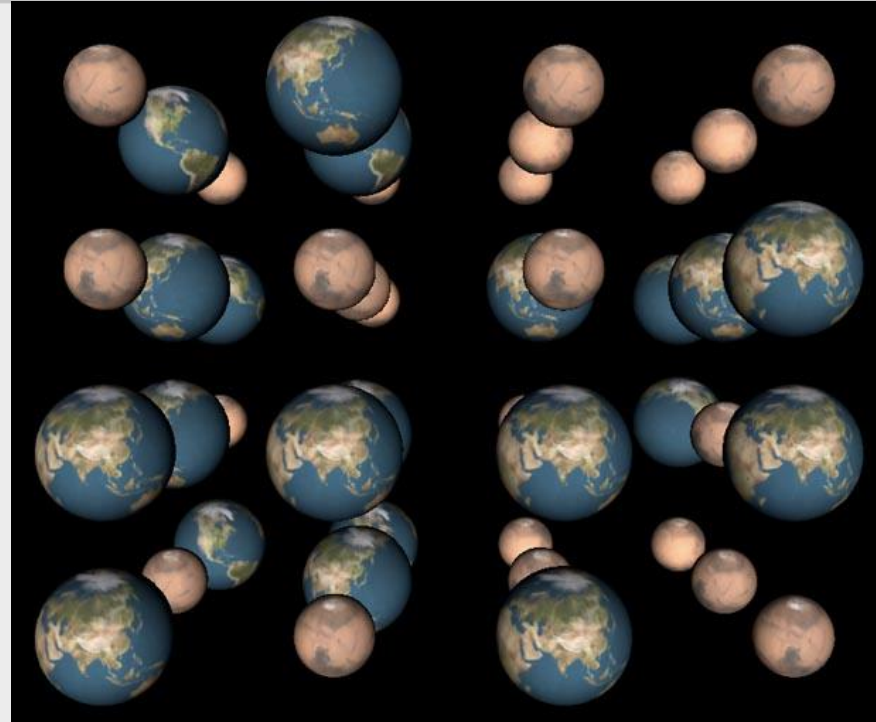
BASED ON OPENGL
(OPENGL ES)

PART OF HTML5

BROWSER SUPPORT

JAVASCRIPT - CPU INTENSIVE

GPU, SHADERS, DOM, SCRIPTING...



WHAT'S NEXT?

FULLY HW ACCELERATED <CANVAS>

UNIFIED PLATFORM? WEBGL ?

UNIFIED DATA FORMAT? COLLADA (.DAE) ?

Supported by Google

XML-based

DATA / CODE PROTECTION ?

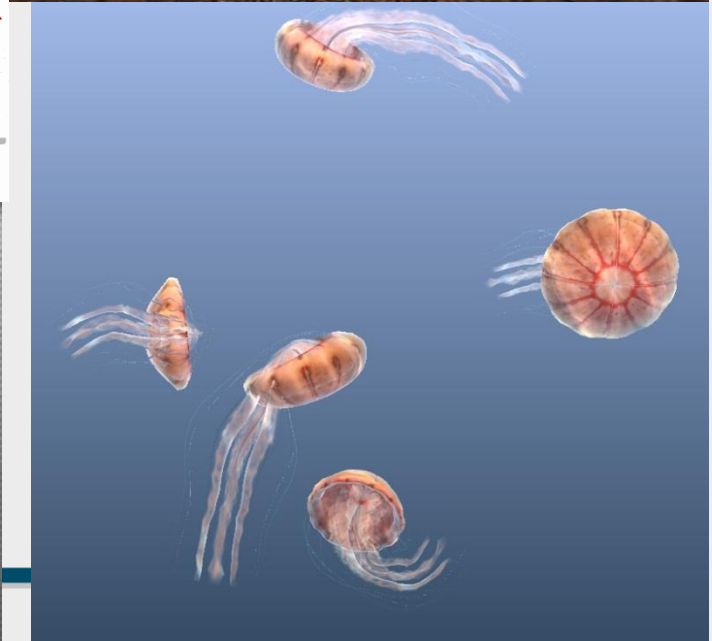
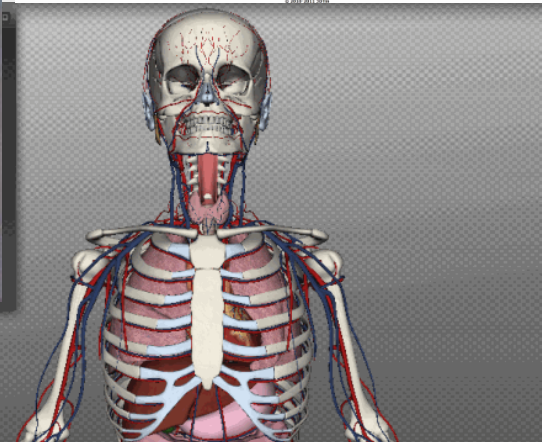
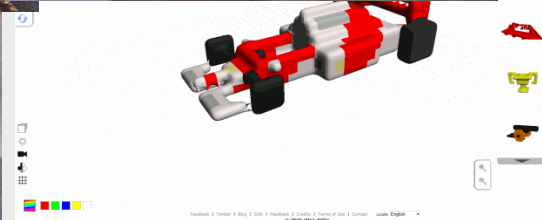
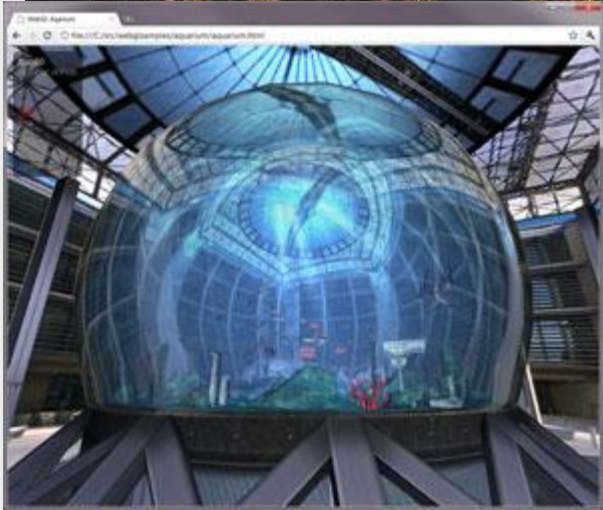
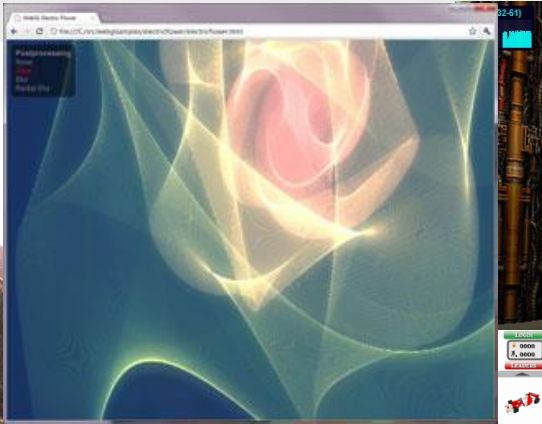
WebGL's JavaScript is exposed. Native code?

GOOGLE V. ADOBE V. MICROSOFT V. APPLE ...

WEBGL: SEE FOR YOURSELF

[HTTP://WWW.CREATIVEBLOQ.COM/3D/25-AMAZING-EXAMPLES-WEBGL-ACTION-12132954](http://www.creativebloq.com/3d/25-amazing-examples-webgl-action-12132954)

[HTTP://CODE.GOOGLE.COM/P/WEBGLSAMPLES/](http://code.google.com/p/webglsamples/)



**SO LONG
AND THANKS
FOR ALL THE FISH**