

# Step into the Future: HTML5 and its Impact on SSL VPNs

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# What this is all about....

- All about HTML5
  - 3 useful components of HTML5
- All about VPNs
- SSL VPN or App?
- How to use HTML 5 to maximize the potential of your VPN



# All about HTML5



# All about HTML...

- HTML - the standard markup language that lets you consistently format, structure and present text and more as visual/audible web pages
- HTML allows images and objects to be embedded within web pages
- HTML can be used to create interactive forms



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# More about HTML...

- HTML consists of HTML elements - tags
- A web browser reads HTML documents and composes them into visible or audible web pages
- The browser uses HTML tags to interpret the content of the page but does not display them
- It can embed scripts in languages such as JavaScript



# What is HTML5?

- HTML5 is an expansion to HTML
- HTML5 is a standard for web browsers, not a language
  - Fundamental technologies behind HTML5:
    - DOM5 HTML
    - HTML MIME type (text/html)
    - XML MIME type (application/xhtml+xml)

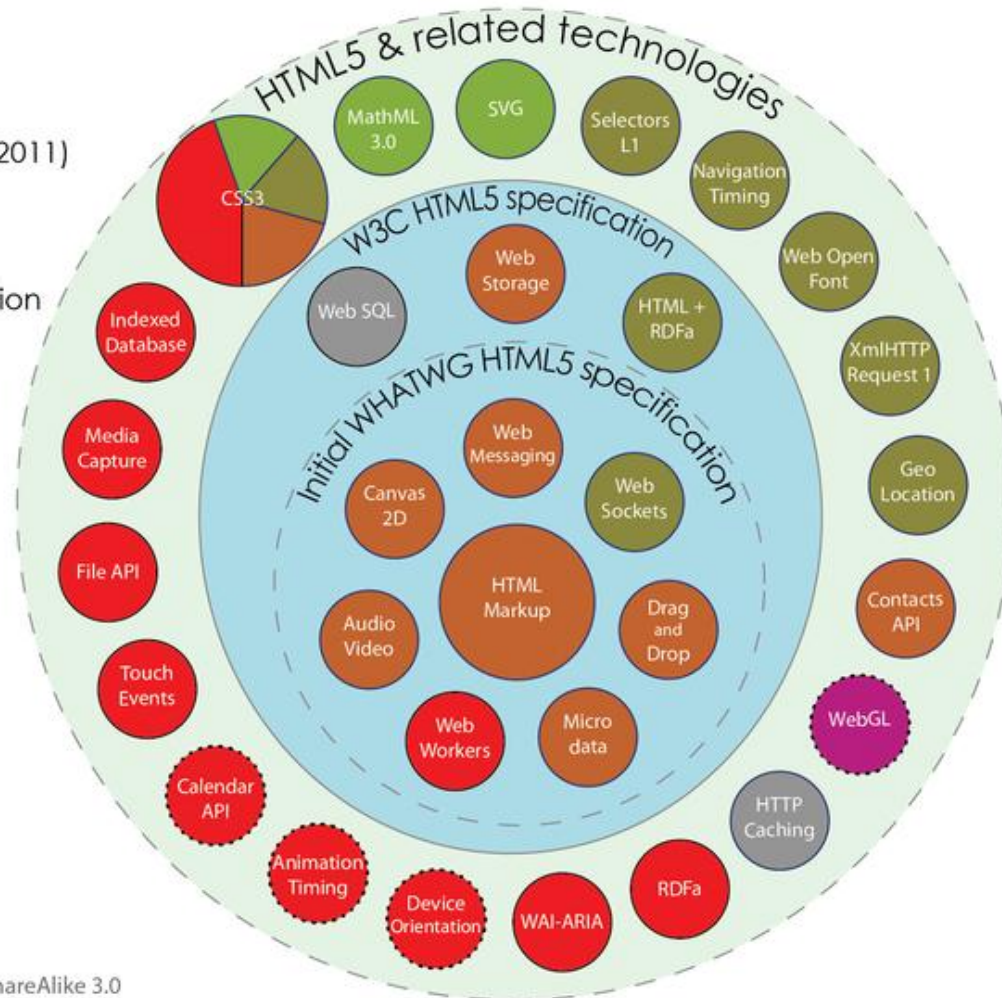


# How Wikipedia illustrates this.....

## HTML5

Taxonomy & Status (December 2011)

- W3C Recommendation
- Candidate Recommendation
- Last Call
- Working Draft
- Non-W3C Specifications
- Deprecated W3C APIs



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# Aims of HTML5

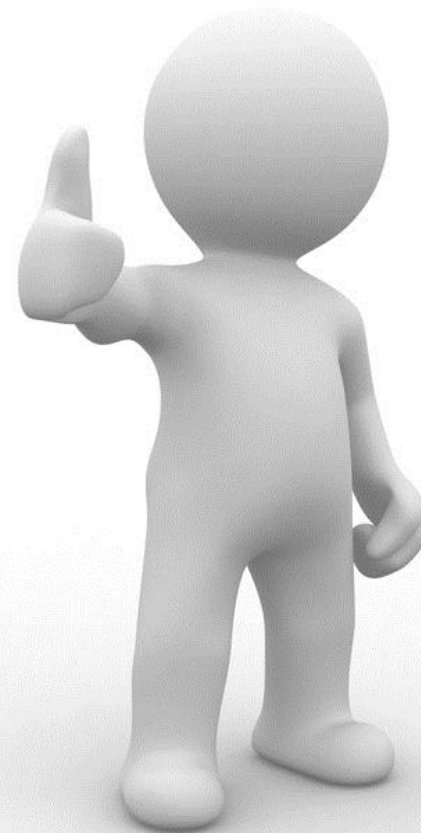
- HTML5 aims to provide interoperability among browsers so Web applications and documents behave the same way no matter which (HTML5 compliant) browser is used to access them
- HTML5 is intended to allow the Web browser to become a development platform
- HTML5 introduces markup and application programming interfaces (APIs) for complex web applications





# What HTML5 can be used for...

- Video
- Audio
- Vector graphics & animation
- Drag & drop
- Editable page content
- Storage within the browser



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# Useful Component No.1 - WebSockets

- Web protocol providing for a bi-directional, full-duplex, single socket communication channel over a single TCP connection with a remote host
- A stream of messages unlike TCP, which functions with a stream of bytes
- Accounts for network hazards such as proxies and firewalls (uses TCP Port 80), making streaming possible over any connection
  - Detects the proxy server and sets up a tunnel to automatically pass through the proxy



# Benefits of WebSockets

- No separate up and downstream connections, all communications are over a single connection
- Reduces the load on servers, allowing more concurrent connections
- Eliminates request and response headers, framing data with just 2 bytes
  - Text frames: starts with a 0x00 byte, ends with a 0xFF byte, UTF-8 data in between
  - Binary frames: uses a length prefix
- Reduces latency



# Useful Component No.2 - Canvas

- Canvas lets you identify a section of a Web page, draw content within it and make it fully interactive, using a combination of HTML and JavaScript code
  - Use the `<canvas>` tag create a new canvas window
  - Create the JavaScript that draws the content into the canvas window
  - Call the JavaScript function from the HTML code
  - Interactive pictures, charts & graphs, game components and other imaginations can be drawn directly by programming code and user interaction — Adobe Flash or other plug-ins are not required



# Useful Component No.3 - Web Workers

- A Web Worker is a JavaScript script that runs in the background, executed from an HTML page
  - Independent of other scripts executed from the same HTML page
- Web workers perform computationally expensive tasks without affecting the user interface
- Web workers allow web pages to remain responsive while computing heavy-load tasks in the background



# More about Web Workers

- Web workers allow the simultaneous execution of browser threads with JavaScript threads running in the background
  - Single thread browsers have to wait for JavaScript programs to finish executing before proceeding
- Web workers communicate with the document by message passing



# More things you can do with HTML5

- HTML5 elements <video>, <audio> and <canvas> make it easier to handle multimedia and graphical content on the web
- No longer need to download plug-ins:
  - Java, Adobe Flash, Quicktime, Real Player, Windows Media Player
- HTML5 defines processing for invalid documents
  - Syntax errors are consistently treated by all conforming browsers and other user agents



# Who supports HTML5?





# What next?

- Many features of HTML5 have been designed to run on low-powered devices - smartphones and tablets
- In December 2011 research firm Strategy Analytics forecast sales of HTML5 compatible phones will top 1 billion units in 2013



# All about VPNs

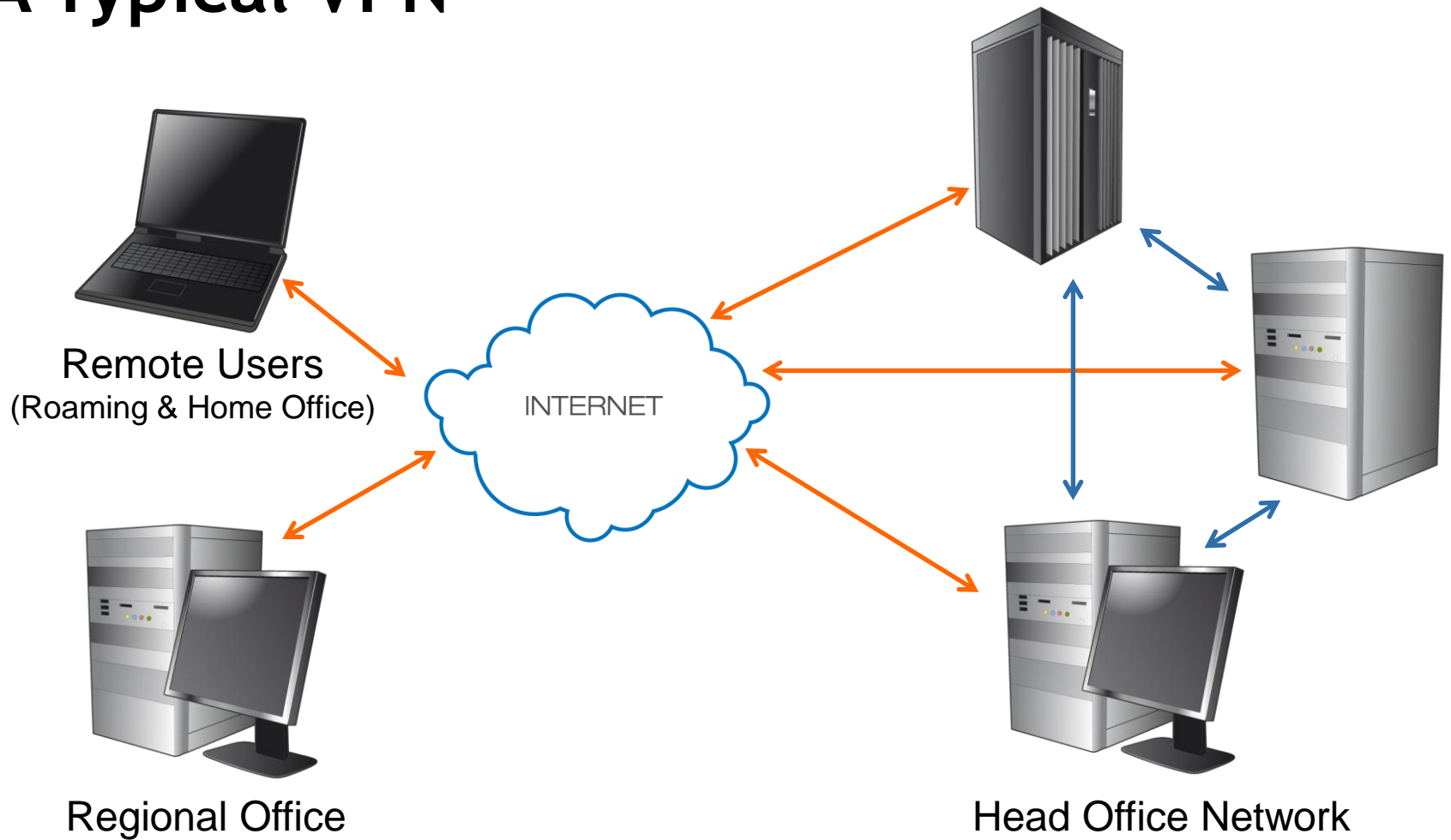


# All about VPNs...

- VPN (virtual private network)
  - A secure private network that uses public telecommunications (Internet) to provide offices or travelling users access to a central organisational network
- Mobile (Remote Access) VPN
  - A VPN client is not fixed to a single IP address, but roams across different networks (data networks from cellular carriers, multiple Wi-Fi access points)



# A Typical VPN



# Why we use VPNs....

- All company resources can be connected
- Extends intranets beyond the company walls
- Not reliant on leased lines
- More scalable than leased lines
  - Size of network more flexible
- More remote employees possible
  - Savings for remote employees
  - Increased productivity for remote employees
- Additional SSL or IPsec protocols - increased security
  - Standard VPNs send data via Tunnels



# SSL or IPsec VPN?

- IPsec VPN - enables encryption on any application by installing separate client software on every remote device requiring VPN access
  - IPsec is used more for site-to-site VPNs
- SSL VPN - needs no client software and works with any standard HTTP web browser
  - SSL is more suitable for remote client access VPNs





# SSL VPN or App?

# What an App is all about....

- An **Application** is software designed to help the user to perform specific tasks
- A **mobile app** is an app designed to run on smartphones, tablet computers and other mobile devices
- A comScore study (May 2012) revealed that during the first quarter of 2012, more mobile subscribers used apps than browsed the web on their devices: 51.1% vs. 49.8%





# Disadvantages of Apps

- Software must be installed on the device
- Must be tailored to the operating system
- Must be updated over time
- It can be corrupted by software/malware/viruses
- Maintenance & administration costs



# Maximise the potential of your VPN with HTML5



# Best possible scenario

- A secure VPN with full SSL encryption
- No need to install software on the client
  - BYOD is not an issue
- Central administration
  - No update on client side – only on the server
- Central security checking
- No operating system dependencies



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# What HTML5 brings to the mix

Applying HTML5 to your VPN brings you:

- Mutuality
  - Embed multiple elements without plug-ins
  - Functionality is built into the browser
  - E.g. Canvas, Websockets, many different versions of audio & video usable
- Needs of web applications fulfilled
  - Easier application with wikis, front ends, drag & drop APIs...



# More nice things..

- Consistency of webpage construction
- Cleaner and more standardised code
  - Semantic HTML5 elements developed
  - E.g. <header>, <nav>, <footer> tags can show much more than <div> tags
- Geolocation
  - HTML5 geolocation APIs make your location directly available to any HTML5 compatible browser based application



# And even more nice things

- Offline application cache
  - Refresh specified pages even when offline, faster loading, reduced load on server
  - Deliver webpages from cache when offline
- Temporary data store replacing cookies
  - HTML5 storage elements for local and session data
  - Database managed by the browser
  - Store data without an internet connection, synchronize when online



Thank you very much for your attention

Any questions?

