



Fixed Size Ad Specifications

The following fixed size ad units are recommended as part of the new ad portfolio. These have been recommended based on Attitudes and Usage Study to determine which of the ad units, contribute to the majority of revenue and are sufficient to advertise across multiple screen sizes.

Ad unit Name	Fixed Size (px)*	Max. K-Weight (kB)	
		Initial Load	Subload
Billboard	970x250	250	500
Smartphone Banner	300x50 or 320x50	50	100
Leaderboard	728x90	150	300
Super Leaderboard/ Pushdown	970x90	200	400
Portrait	300x1050	250	500
Skyscraper	160x600	150	300
Medium Rectangle	300x250	150	300
20x60	120x60	50	100
Mobile Phone Interstitial	640x1136 or 750x1334 or 1080x1920	300	600
Feature Phone Small Banner	120x20	5	N/A
Feature Phone Medium Banner	168x28	5	N/A
Feature Phone Large Banner	216x36	5	N/A



General Ad Requirements (apply to all ads)

- **Interest-Based Advertising (IBA):** Include IBA self-regulation controls for ads using behavioral targeting (5kB max file size).
- **Audio:** Audio in ads should be muted. To allow for audio initiation in ads, a control may be included for the user to initiate audio. See the LEAN user experience and ad content guidance for more on audio in ads.
- **Defining ad space:** Ad unit content must be clearly distinguishable from publisher or unpaid content on the page (for example an ad unit may have clearly defined borders so it is not confused with normal page content).
- **CPU Load:** Ads should be developed to perform smoothly and not interfere with site or app performance. 30% CPU load max (based on the average CPU of the user base) per active ad. Please review the LEAN guidance for more details on CPU load.
- **Maximum number of host-initiated file requests:** Ad must not exceed ten file requests during initial file load. Additional files can be loaded as necessary during host initiated subload and user initiated loads.

General Notes

- **Initial file load:** Includes all assets and files necessary for completing first visual display of the ad and requested before `load` event dispatched by the `window` object.
- **Host-initiated subload (subload):** This is the additional file weight an ad can load in addition to initial load. Ad file subload may begin after the `load` event has been dispatched by the `window` object. The ad should listen for the `load` event dispatched by the window object of the host page. When communication with the host page is not possible, then it is acceptable to listen for the `load` event dispatched by the window object of the ad iframe.
- **File weight calculation:** For calculating ad file weight, all files for the ad, including those shared libraries not exempt by the publisher or ad server, must be included as part of the maximum file weight calculation. File weights are calculated after files have been compressed into gzip format.
Initial Load K-Weight= All ad files + Non-exempt shared libraries + max 50 kB for all exempt Shared Libraries
Subload K-Weight = All ad files + all non-exempt shared libraries

See the LEAN user experience and load performance guidance for details on initial load, subload, and shared libraries



- **User-initiated file size:** Unlimited file size load is allowed after user-initiated interaction. Ad should be responsible for bandwidth and device capabilities while doing so. User initiation is the willful act of a user to engage with an ad. User interaction is the discrete user action with the ad or its elements, e.g. click or tap or other complete and discrete gesture.

- **Static file weight and static image size:** Use Initial Max K-Weight guidance for static image only ads or backup file requirements.

- **Slow internet connection:** For 3G (1.5 Mbps download speeds) or slower connections, the file weights should be 30% less than recommended.

File sizes in this specification are defined for the creative assets and files required for creative rendering and management of the ad. Ad server files or other non-creative services files like measurement or verification must not be counted against ad K-weight.

Flexible Ad Sizing Grid

The sizing grid is a LEAN standard based range of k-weights for an ad of given pixel size. This will allow self-determination of ad specification for innovative and custom ad formats that may not be part of IAB Ad Portfolio.

Size Group (x1000 pixels)	Example of Previous IAB Fixed Sizes	Max Initial K-weight (kB)	Max subload K-weight (kB)	Static Image (e.g. .jpg .png or .gif) kB
Less than 180	320x50, 300x50	50	100	50
120-180	N/A	75	150	75
180-300	728x90	100	200	100
300 - 500	970x90, 160x600, 300x250	150	300	150
500-700	Full Page (Small Phones <4.5" screen)	200	400	200
700-900	300x600, 970x250	250	500	250
700-1m	Full Page (Large phones > 4.5" screen)	300	600	300
1m +	Full page (Large devices > 7" screen)	350	700	350

Sizes for fixed size ad units are calculated based on double density (or 2x) resolution.

*E.g. 728x90 size will be 728*90*4= 262080 pixels.*

*For flexible size ad units, the sizes are calculated using midpoint of the size height and width at 2x resolution. E.g. 8:1 ad unit recommended size is 900*112.5*4 pixels which is in the 300k- 500k pixel range.*

Transition fixed size ad units in the flexible size specification grid will follow the size determined by the corresponding aspect ratio ad unit



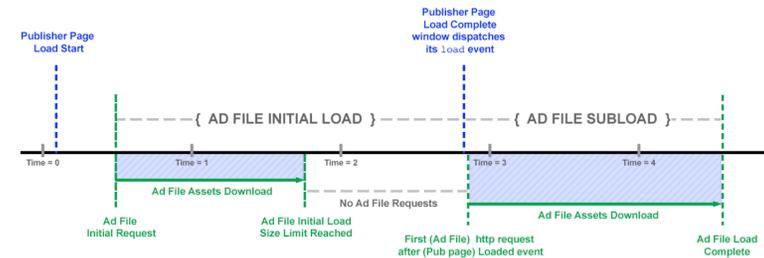
LEAN: User Experience and Load Performance

The new guidance creates a positive user experience of advertising by way of maximizing page load performance. The ad must:

1. Use light weight file loads during initial load of the page
2. Eliminate or minimize render blocking scripts like CSS, JavaScripts during initial load
3. Use subload for rendering ad experiences that require heavy file weights
4. Minimize number of files requested during initial load
5. Make user initiation required for ad functionality that needs large file downloads

Initial vs. Subload vs. User Initiated Load

For the purpose of defining initial load and subload, the `load` event dispatched by the publisher page's `window` object is considered as the event to separate the initial load from the subload of the ad content. Subload must not start prior to this `load` event is dispatched. When an ad is nested in an `iframe` that does not allow the ad document to capture the `load` event of the publisher page, then it can use the `load` event of the ad document's `iframe`.



Initial Load is defined as all files requested by the ad to render the creative when the page starts loading. It includes all files sent by the ad server to the page (image, HTML5, JS, CSS, Sprite sheets, Video files) and any other files requested by the ad for creative rendering and management before the `load` event is dispatched by the `window` object.

Subload is defined as all files requested by the ad after the `load` event is dispatched by the `window` object. It includes all files requested by the ad (auto initiated without any user interaction) to the page (image, HTML5, JS, CSS, Sprite sheets, Video files) for the purpose of creative rendering and management.

Subload must start after the `load` event has been dispatched by the `window` object of the page or the ad `iframe`.

User Initiated Load is the file weight of all assets loaded when a user initiates interaction with the ad. Unlimited gzipped file load is allowed for any creative assets loaded after user-initiated ad interaction, like expansion or clicks.



While no limit has been placed on user initiated load, ad developers should consider user experience and load performance as part of their ad design.

The assets for user initiated ads should be optimized for load performance, and only necessary assets should be loaded.

File Requests

The maximum number of Initial Load **file requests allowed is 10**.

HTML5 ads are like mini web pages and the number of requests made to fetch files has a big impact on load performance of the ad as well as on the page.

This file request limit only applies to the initial load. No file request limit has been placed on subsequent file loads.

HTTP2 standard allows multiple requests per connection. This will negate the need for this standard in the future when HTTP2 adoption is at acceptable levels. Currently, most browsers support it (<http://caniuse.com/#search=http2>), but content and ad server adoption is low at ~10%. More information on HTTP2 is available here: <https://http2.github.io/faq/>. And more data on adoption is available here: <https://w3techs.com/technologies/details/ce-http2/all/all>

Managing CPU Load

High CPU load generated by uninitiated functions should be minimized. CPU load generated by animation should stop once animation is complete. Higher CPU load is allowed for user-initiated functions (animation, interactivity, etc.) as long as the page or app continues to function smoothly.

Poor performance of an ad in an isolated instance can indicate that it will negatively affect performance of a site or app when the ad is loaded into a live environment.

Optimize those features that generate high CPU load. For example, if high CPU load is exhibited during animation, try to optimize animation by reducing the number of elements animated at one time.

Avoid using `setTimeout` and `setInterval` in animation scripts, etc. Animation scripts should not be executed when the ad is not in view.

In-page banners must delay initiating animation until the `load` event is dispatched by the `window` object

What is gzip?

All assets for HTML5 ads must be packaged together for delivery. To optimize the file size for delivery to a browser, all assets should be delivered in compressed format. The common method for compressing files in transition over the Internet is the gzip utility, which is free to use and supported by all modern browsers. Ad servers compress ad files they serve as part of their general process.



Shared Libraries and Resources

Browser caching capabilities benefit all parties by eliminating the need to download previously requested resources that already exist on the user's device. Advertisers (Creative developers) are encouraged to take advantage of browser caching functionality by linking to shared libraries hosted on the Ad Serving party's (Publisher ad server or third-party ad server) domain that are used across campaigns.

Please refer to the IAB HTML5 Resources wiki (https://wiki.iab.com/index.php/HTML5_for_Digital_Advertising_Resources) for commonly used shared libraries and check with the ad serving party for the ones that are hosted.

Publishers and first-party ad servers should specify the shared library name(s) and originating CDN url(s) that are exempt and can be excluded from file weight calculations in their ad specifications and guidance to advertisers. They must provide reasonable notice for the advertiser to update creative.

Shared libraries that are exempt are allowed a combined maximum of 50 kB file weight (gzipped) as part of initial load. No limit is imposed during subload. Any shared library and CDN NOT specified in publisher or ad server guidance must be counted in file weight calculations submitted by advertisers.

Other shared resources for which the publishers and ad servers are encouraged to take advantage of browser caching functionality are Web Fonts, DAA provided AdChoices insertion, and CSS packages

Render Blocking Elements

JavaScript is a render blocking script that blocks the DOM construction and delays page content rendering.

It is recommended that all JavaScript be executed as asynchronous and executed inside a sandboxed i-frame. CSS also blocks rendering. Styles to HTML5 elements can be implemented in three ways:

1. External CSS: These are CSS files external to the ad HTML and are referred to by the ad when it wants to apply a style.
2. Internal CSS: These are CSS definitions that are inside the ad HTML document
3. Inline Style: In this method, the ad does not call a CSS element from another file, but each element has its style defined in the element definition itself

Inline style method is the most efficient of the above methods and it is recommended to use inline style method to minimize load time. Embedded styles may also be used. Since ads are usually not multi-page websites, using external CSS for ads does not offer the typical advantages of external CSS and may add file weight and number of files to the ad load.