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Flexible and LEAN Ads

The IAB New Ad Portfolio emphasizes LEAN (Light, Encrypted, AdChoices supported, and Non-invasive) ad experience and flexible size ad specifications.

LEAN ad experience for digital advertising is based on the following principles:

1. Respect: A consumer's primary objective is consuming publisher content
2. Control: A consumer has control over his/her advertising experience
3. Choice: A consumer decides what content he/she wants to experience and for how long

Accordingly, the LEAN guidance addresses the following:

1. Lightweight user experience to maximize initial page load performance
2. Non-disruptive ad experiences

Flexible Size Ad Specifications are based on the consumer device landscape, operational efficiency for publishers, and the need for creative fidelity:

1. Devices are proliferating in different sizes and with multiple resolutions, especially for mobile devices
2. Publisher content needs to be delivered to multiple screen sizes and requires ads that can respond to multiple sizes
3. Creative design needs to scale to different sizes without losing its original message and impact

Accordingly, flexible size ad specifications define aspect ratio based ad units that maintain their aspect ratio, adjust to the screen size, and can be integrated in responsive website designs.

Every ad in the new ad portfolio is a LEAN ad. Any ad unit can deploy any ad experience as long as it complies with initial and subload file weights, number of file requests and subload start guidance.

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Flexible Size Ad Specifications

Ad Type	Ad unit Name	Transition Fixed Size Ad unit (px)*	Aspect Ratio (width:height)	Ad Size**	Size Range		Max. K-Weight (kB)		Static Image Size (dp)
					Min. Size Width x height (dp***)	Max. Size Width x height (dp***)	Initial Load	Subload	
Horizontal	**2x1**	Half Page	2:1	X Large	900x450	1800x900	**250**	**500**	1800x900
	2x1	N/A	2:1	Small	300x150	450x225	**100**	**200**	
	4x1	Billboard **970x250**	4:1	X Large	900x225	1800x450	**250**	**500**	1800x450
	6x1	Smartphone Banner **300x50, 320x50**	6:1	X Small	300x50	450x75	**50**	**100**	450x75
	8x1	Leaderboard **728x90**	8:1	Medium	600x75	1200x150	**150**	**300**	1200x150
	10x1	Super Leaderboard/ Pushdown **970x90**	10:1	Large	900x90	1800x180	**200**	**400**	1800x180
Vertical	**1x2**	**300x600**	1:2	Large	300x600	450x900	**200**	**400**	450x900
	1x3	Portrait **300x1050**	1:3	X Large	300x900	450x1350	**250**	**500**	450x1350
	1x4	Skyscraper **160x600**	1:4	Medium	160x640	240x960	**150**	**300**	240x960
Tiles	**1x1**	Medium Rectangle **300x250**	1:1	Medium	300x300	450x450	**150**	**300**	450x450
	2x1	120x60 Financial	2:1	X Small	200x100	300x150	**50**	**100**	300x150
	9x16	N/A	9:16	Large	300x540	450x800	**200**	**400**	450x800

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Full Page Portrait			9:16	X Large	600x1067	900x1600	**300**	**600**	900x1600
	10x16	N/A	10:16	X Large	800x1280	1200x1920	**300**	**600**	1200x1920
	2x3	N/A	2:3	Large	300x450	450x675	**200**	**400**	450x675
	3x4	N/A	3:4	X Large	600x800	900x1200	**300**	**600**	900x1200
Full Page Landscape	**16x9**	N/A	16:9	Large	540x300	800x450	**200**	**400**	800x450
			16:9	X Large	1067x600	1600x900	**300**	**600**	1600x900
	16x10	N/A	16:10	X Large	1280x800	1920x1200	**300**	**600**	1920x1200
	3x2	N/A	3:2	Large	450x300	675x450	**200**	**400**	675x450
	4x3	N/A	4:3	X Large	800x600	1200x900	**300**	**600**	1200x900
Feature Phone Sizes	**120x20**	Small Banner	N/A	N/A	N/A	120x20	**5**	**N/A**	N/A
	168x28	Medium Banner	N/A	N/A	N/A	168x28	**5**	**N/A**	N/A
	216x36	Large Banner	N/A	N/A	N/A	216x36	**5**	**N/A**	N/A

* **Transition Fixed Size Ad Units:** These are old fixed size ad units closest in size to the new ad units. Suggested for planning transition to new ad units

** **Ad size:** Ad size is based on how big or small an ad unit is with reference to 1:1 ad unit (Xsmall =0-25%, Small = 25%-75%, Medium = 75%-125%, Large 125%-200%, X Large 200% +)

***Density-independent pixels (dp):** Devices can have different resolutions. Resolution is defined by number of pixels per inch. Density independent pixels is a way to consistently measure the size of an image on a device independent of screen resolution. 320 dp is approximately 2 inches wide. dp = (width in pixels * 160) / screen density. E.g. for pixel density of 1 i.e. ~160 pixels per inch (iPhone 3) 320dp is 320px (320dp= (Xpx *160)/160). For pixel density of 2 i.e. 320 pixels (iphone 5) 320dp is 640px (320dp= (Xpx *160)/320)

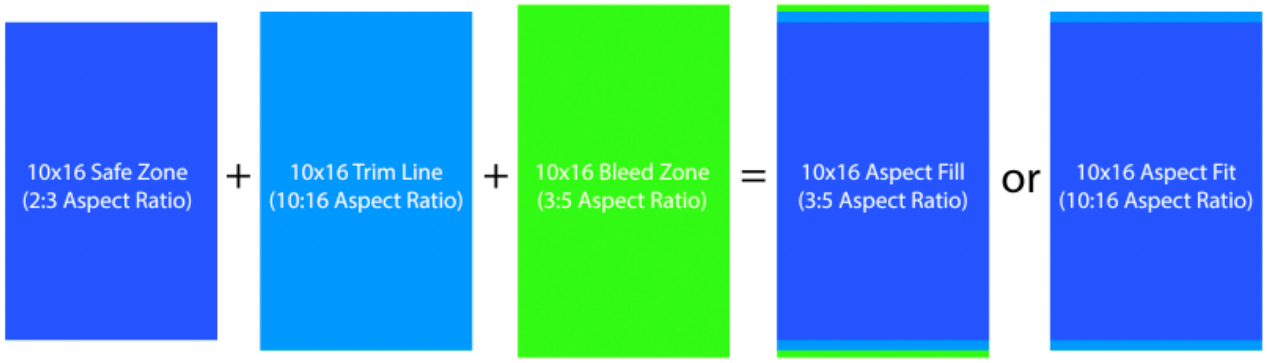
Horizontal ad types are ads with landscape layout i.e. larger width and smaller height aspects. They are expected to fit edge to edge of screen width or margin to margin of content layout width. Typical placements are top or bottom of the screen and sometimes in middle of page sections

Vertical ad types are ads with portrait layout i.e. larger height and smaller width aspects. They are expected to fit edge to edge from top to bottom or margin to margin vertically between page layout elements. Typical placements are on the right or left edges of the screen or page layout

Tiles are usually rectangles or squares with very closely measured height and width aspects. Typical placements are tiles in grid layouts. Usually they are small to medium sized ad units

Full page ads cover full device screen and are defined based on popular device screen height and width aspects. Typical placements are on mobile phones, tablets, and other devices for interstitials and expanded experience of rich media ads. Although full page ads are defined by the device aspect ratios, full screen may not be always available for display or the device may not be exact aspect ratio. To address this, print industry practices can be followed to ensure the main creative is always viewable on the screen

Print Industry Best Practice	How the Best Practice Works	Solution for Full Page Design	Recommended Aspect Ratio for each approach for Full Page aspect ratios			
			9:16	10:16	2:3	3:4
Safe Zone	Ensures that all text and graphics within a creative are unobstructed by overlaid UI elements	Aspect ratio safe zones can ensure no critical message of the creative is cut off in the margins	3:5	2:3	3:4	4:5
Trim Line (Aspect Fit)	The main creative to be displayed if the bleed zone is removed	Full Page ads are currently designed to be Aspect Ratio Fit	9:16	10:16	2:3	3:4
Bleed Zone (Aspect Fill)	Enables responsive design to, eliminate letterboxing when container aspect ratio is a non-standard size	Aspect ratio bleed zones can ensure that the creative always fills the full screen, as many devices aren't always perfect aspect ratios	9:17	9:16	10:16	2:3



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

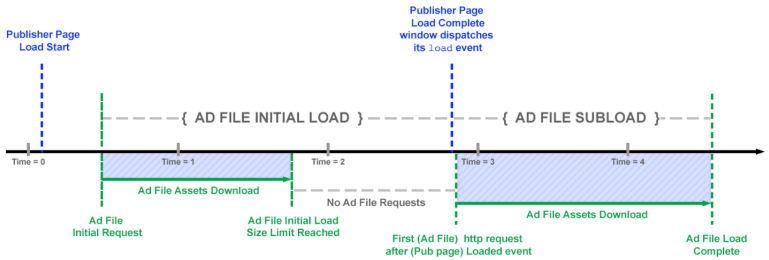
LEAN: User Experience and Load Performance

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.