HTML5 Features on Tizen

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TIZEN™

Open Technet

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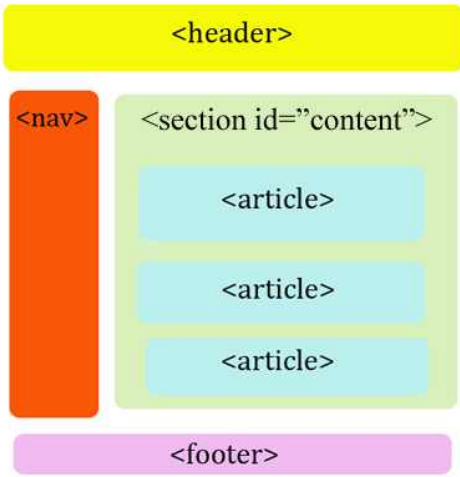
- Introducing Tizen Web Framework
- New HTML5 Features on Tizen

Overview of HTML5

What is HTML5?

Structure and Semantic

APIs



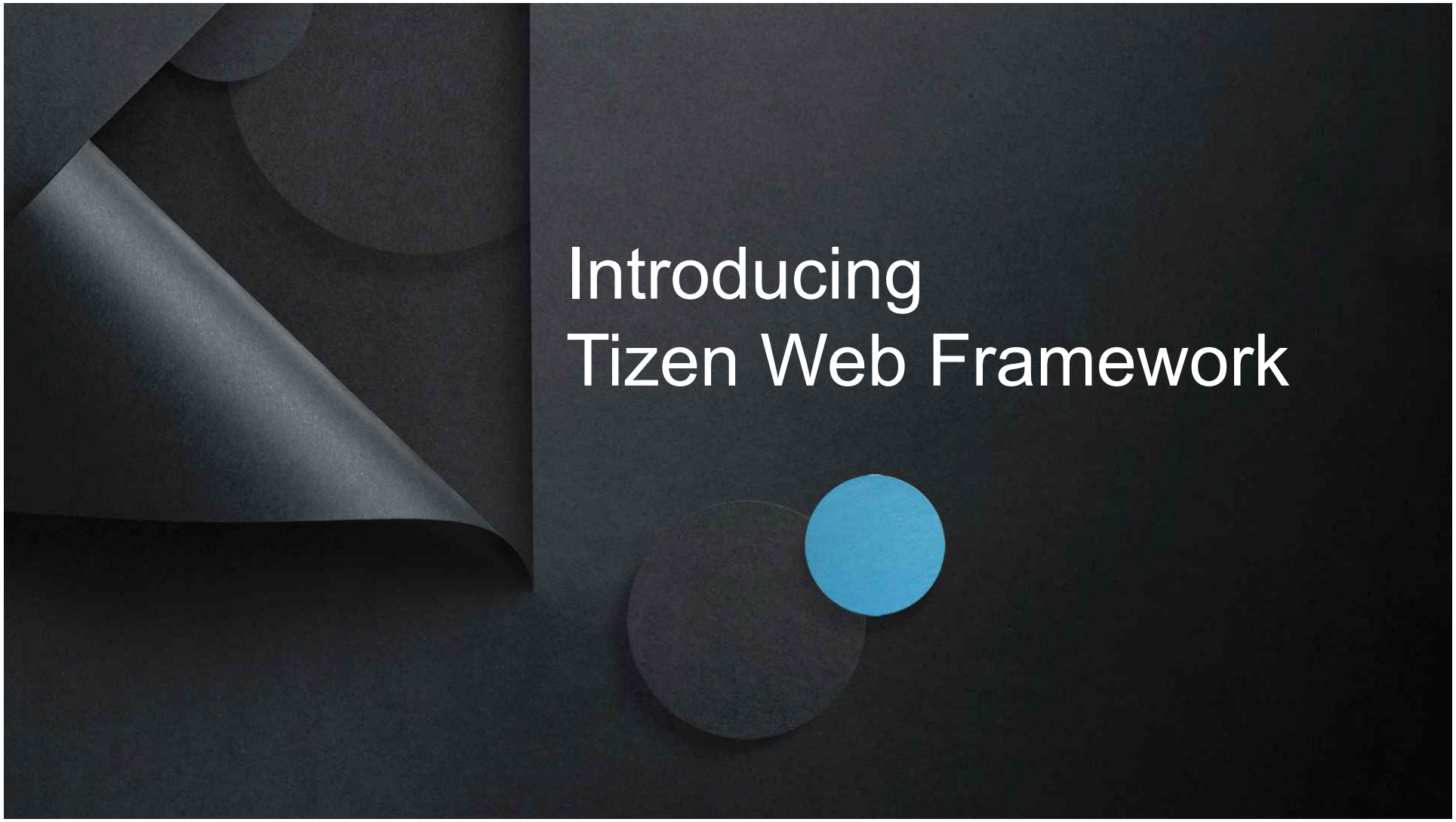
Goal of HTML5: Standards for Web applications

New Elements in HTML5

- **New markup elements – for better structure**
  - `<article>, <aside>, <command>, <details>, <summary>, <figure>, <figcaption>, <footer>, <header>, <mark>, <meter>, <nav>, <progress>, <ruby>, <rt>, <rp>, <section>, <time>`
- **New media elements – for media content**
  - `<audio>, <video>, <source>, <embed>`
- **Canvas element – for drawing**
  - `<canvas>`
- **New form elements and input type attribute values**
  - `<datalist>, <keygen>, <output>`
  - New input type attribute values: `email, url, number, range, date, month, week, time, datetime, datetime-local, search, color,` and so on

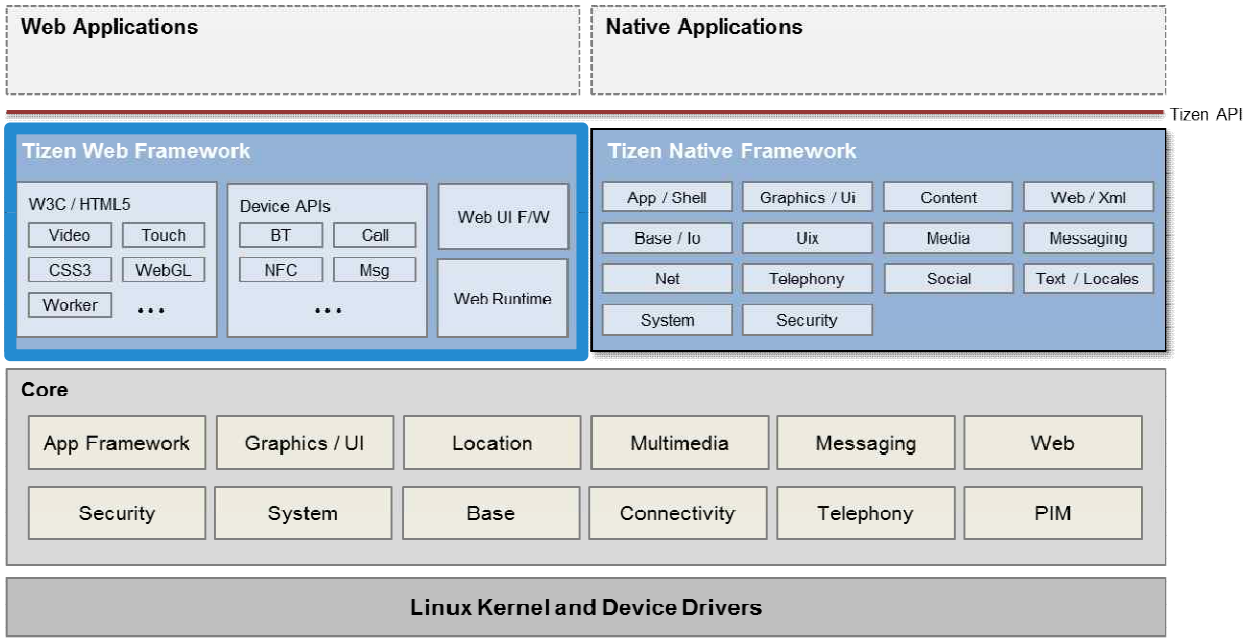
New APIs in HTML5

- **Graphics**
  - 2D Canvas API, Timing control for script-based animations API
- **Media**
  - Media Capture API, Web Real-Time Communication APIs, Web Audio API
- **User interaction**
  - Touch Event API, Vibration, Web Notifications
- **Data storage**
  - Web Storage, File Reader API, File Writer API, File System API, Indexed Database API, WebSQL Database
- **Personal information management**
  - Contacts API, Calendar API
- **Sensors and hardware integration**
  - Geolocation API, DeviceOrientation Event, Battery Status Event, System Information API
- **Network**
  - Server-Sent Events, WebSocket API, Network Information API
- **Communication**
  - Messaging API, HTML5 Web Messaging, Web intents
- **Performance and optimization**
  - Navigation Timing, Resource timing, Page visibility API, Web Workers


Introducing
Tizen Web Framework

Tizen Architecture

- Tizen is a Linux-based platform providing both Web and native APIs



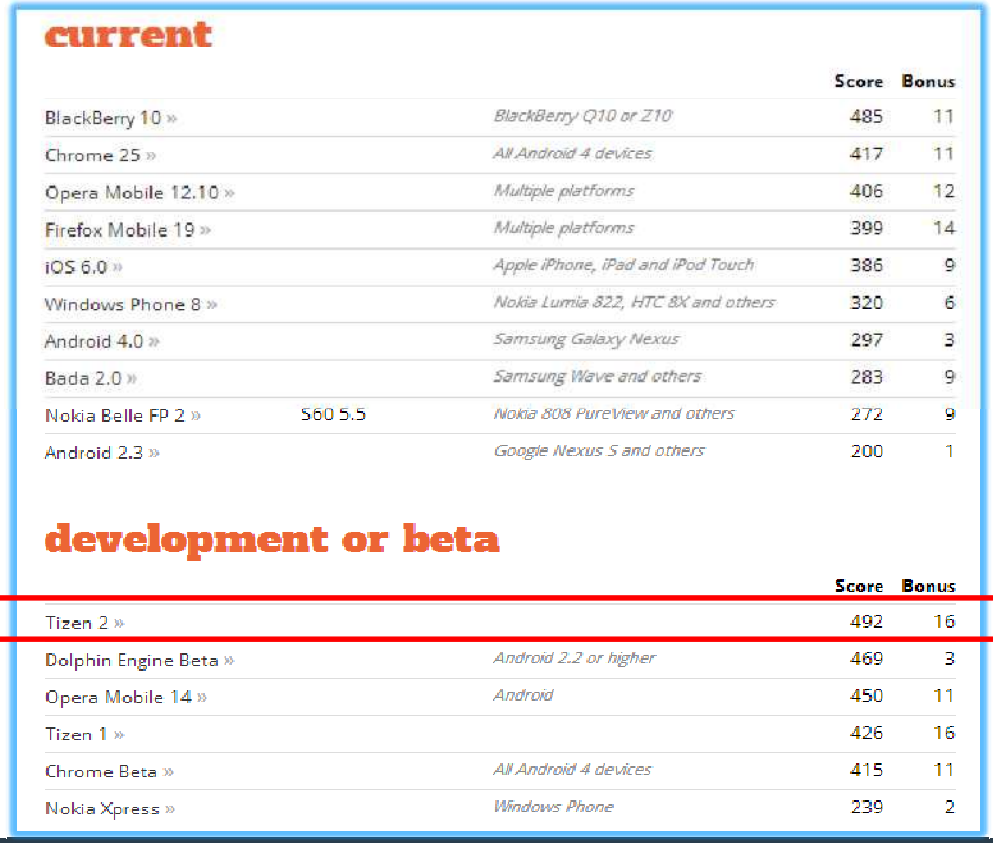
Tizen Architecture

- Web framework provides state-of-the-art HTML5/W3C APIs, Web UI framework, Web Runtime and Tizen device APIs, such as Bluetooth and NFC.
- Native framework supports full-featured native application development and provides a variety of features, such as background applications, IP push, and TTS.
- Tizen core is an underlying layer for both Web and native, and also for HW adaptation.

Tizen Web Framework

- **W3C standard Web APIs** – W3C/HTML5 Markup, CSS, and JavaScript APIs
- **Supplementary APIs** – De-facto APIs (for example, Khronos and Mozilla)
- **Web Runtime** – Allowing Web applications to run outside the browser
- **Tizen device APIs** – Advanced access to the device's platform capabilities
- **UI framework** – Tools, such as widgets, events, effects, and animations

HTML5TEST.COM Score for Tizen



current

			Score	Bonus
BlackBerry 10 »		*BlackBerry Q10 or Z10*	485	11
Chrome 25 »		*All Android 4 devices*	417	11
Opera Mobile 12.10 »		*Multiple platforms*	406	12
Firefox Mobile 19 »		*Multiple platforms*	399	14
iOS 6.0 »		*Apple iPhone, iPad and iPod Touch*	386	9
Windows Phone 8 »		*Nokia Lumia 822, HTC 8X and others*	320	6
Android 4.0 »		*Samsung Galaxy Nexus*	297	3
Bada 2.0 »		*Samsung Wave and others*	283	9
Nokia Belle FP 2 »	S60 5.5	*Nokia 808 PureView and others*	272	9
Android 2.3 »		*Google Nexus S and others*	200	1

development or beta

		Score	Bonus
Tizen 2 »		492	16
Dolphin Engine Beta »	*Android 2.2 or higher*	469	3
Opera Mobile 14 »	*Android*	450	11
Tizen 1 »		426	16
Chrome Beta »	*All Android 4 devices*	415	11
Nokia Xpress »	*Windows Phone*	239	2

New HTML5 Features on Tizen

HTML5 Feature Set

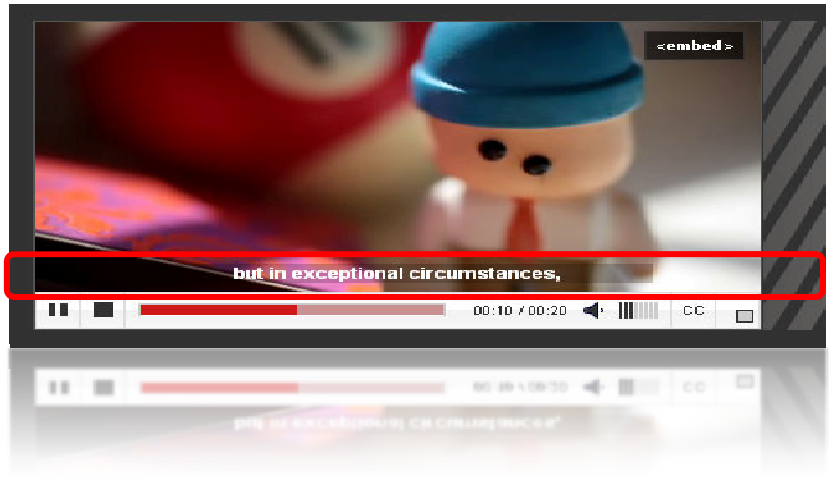
	Specifications	Description
DOM, Forms and Styles	**HTML5 Forms**, Selectors API, Media Queries, CSS Transforms, CSS Animations, CSS Transitions, CSS Color, CSS Background and Borders, CSS Flexible Box Layout, CSS Text, CSS Basic User Interface, CSS Fonts, WOFF File Format 1.0, DOM	Support for fundamental Web document structure and styles
Device	Touch Events, Device Orientation, **Battery Status API**, Vibration API, Browser Online State, **Screen Orientation API**, **Network Information API**	Support for device capabilities, such as sensors and network connectivity information
Graphics	Canvas 2D, SVG	Support for canvas graphics and SVG
Media	Video/Audio Element, getUserMedia, **Web Audio API**, **HTML Media Capture**	Support for HTML video and audio capabilities
Communication	Web Socket API, XMLHttpRequest Level2, Session History, Server-Sent Events, Web messaging	Support for fetching remote resources, communication between client and server, and remote event dispatching
Storage	Web Storage, File API, File API: Writer, File API: Directories and System, Application caches, Indexed DB, Web SQL Database	Support for device storage capabilities

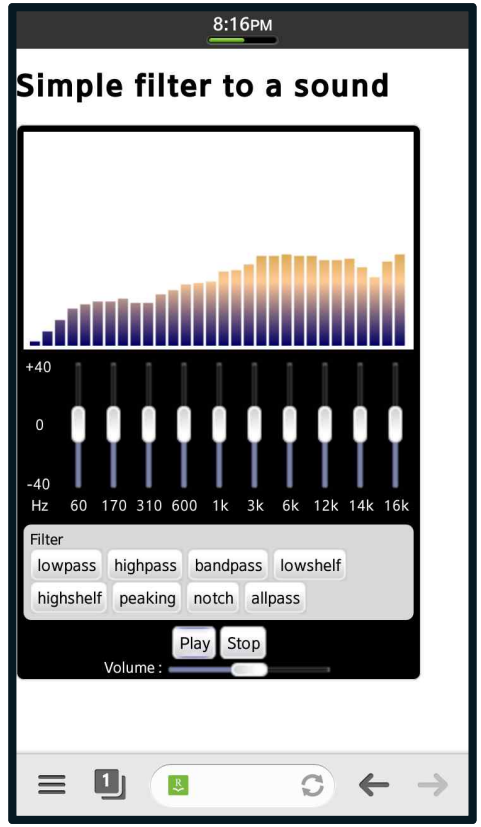
HTML5 Feature Set

	Specifications	Description
Security	Cross-Origin Resource Sharing, iframe sandboxing, **Content Security Policy**	Support for secure mechanism for origin protection and content isolation
UI	**Clipboard API and Events, Drag and Drop**	Support for rich user experience
Performance and Optimization	Web Workers, Page Visibility, Animation Timing Control, **Navigation Timing**	Support for parallel execution and performance optimization methods
Location	Geolocation API	Support for location watch capabilities

Media

- Web Audio API
- HTML5 Video `<track>`
- HTML Media Capture





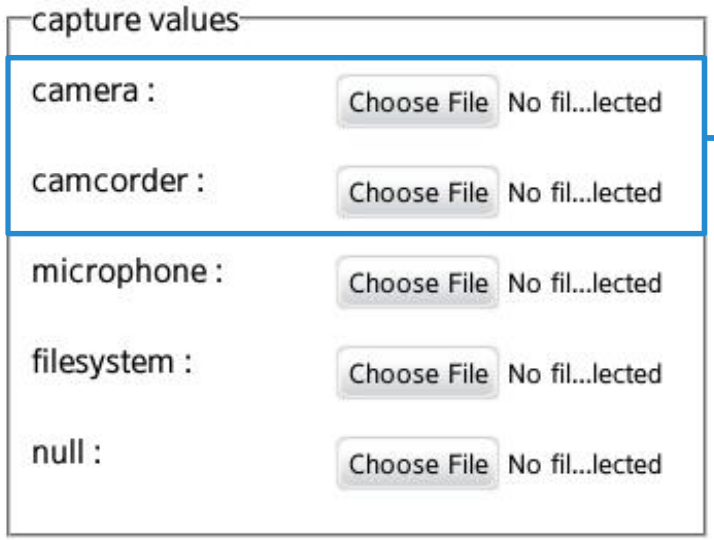
HTML Media Capture (1/2)

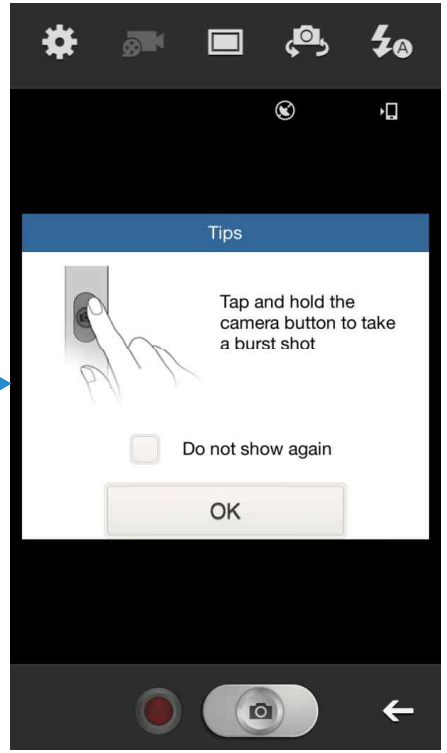
- Media Capture refers to the `capture` attribute added to the `<input>` element.
- The `capture` attribute enables content authors to give hints of preferred means to capture local media such as image, video, and sound.
- It works by overloading the `<input type="file">` and adding new values for the `accept` attribute.

```
<input type="file" accept="image/*" capture="camera">
```

HTML Media Capture (2/2)

```
<input type="file" accept="image/*" capture="camera">
<input type="file" accept="video/*" capture="camcorder">
```





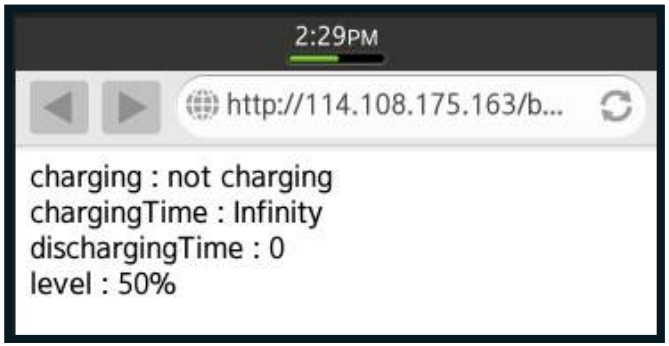
Device

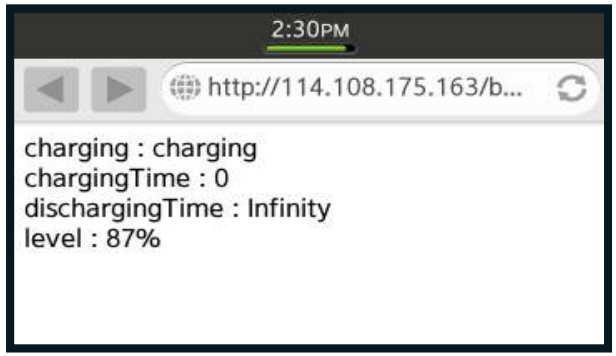
- Battery Status API
- Network Info API
- Screen Orientation API

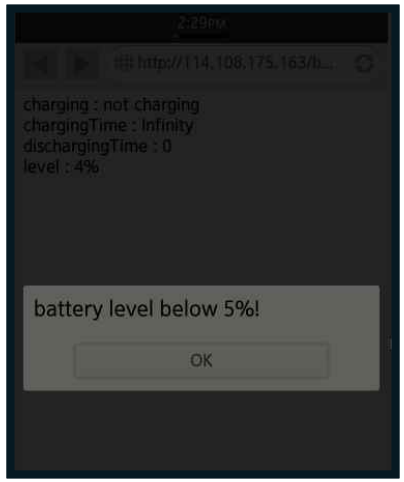
Battery Status API (1/3)

- The Battery Status API specification defines a means for Web developers to programmatically determine the battery status of the hosting device.
- The Battery Status API can be used to defer or scale back work when the device is not charging in or is low on battery.
  - An archetype of an advanced Web application, a Web-based email client, can check the server for new email every few seconds if the device is charging, but do so less frequently if the device is not charging or is low on battery.
  - Another example is a Web-based word processor, which can monitor the battery level and save changes before the battery runs out to prevent data loss.

Battery Status API (2/3)








```
<div>charging: <span id="charging"></span></div>
<div>chargingTime: <span id="chargingTime"></span></div>
<div>dischargingTime: <span id="dischargingTime"></span></div>
<div>level: <span id="level"></span></div>
```

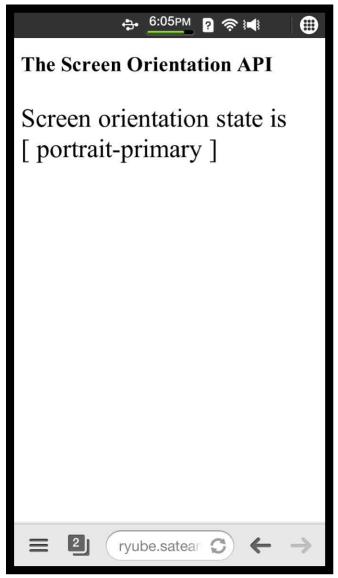
```
<script>
    // As Tizen is WebKit-based, the webkit prefix must be used
    var battery = navigator.battery || navigator.webkitBattery;
</script>
```

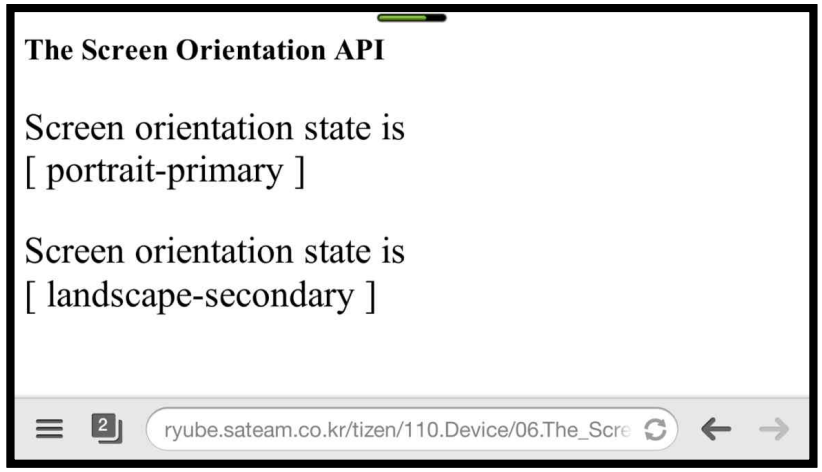
Battery Status API (3/3)

```
<script>
     window.addEventListener('load', function (e)
     {
        // battery.charging: true or false
        document.querySelector('#charging').textContent =
                                        battery.charging ? 'charging' : 'not charging';

        // battery.chargingTime: second (ex: 3600) or infinite
        document.querySelector('#chargingTime').textContent = battery.chargingTime / 60;

        // battery.dischargingTime: second (ex: 3600) or infinite
        document.querySelector('#dischargingTime').textContent = battery.dischargingTime / 60;

        // battery.level: between 0 and 1 (ex: 0.50)
        document.querySelector('#level').textContent = Math.floor(battery.level * 100) + '%';
    },
      false);
</script>
```

Screen Orientation API (1/2)

- The Screen Orientation API provides an interface for Web applications to access and lock the device screen orientation state.





Screen Orientation API (2/2)

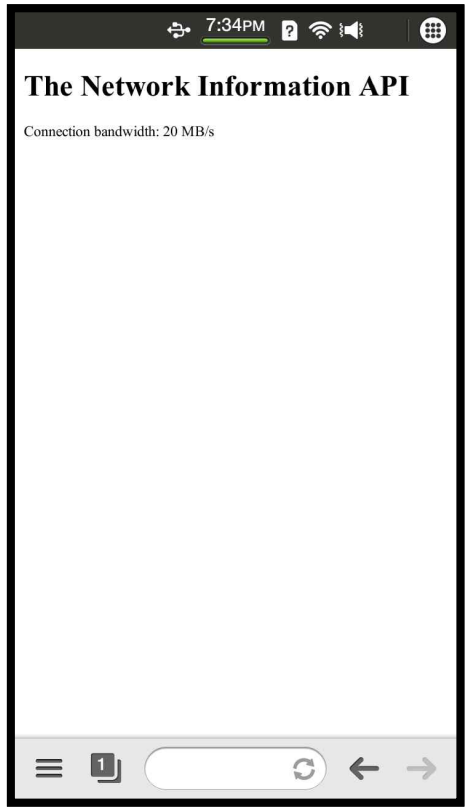
```
<body>
    <h1>The Screen Orientation API</h1>
    <div id="log"></div>
</body>
<script>
    var log = document.getElementById("log");
    function screenState()
    {
        log.innerHTML += ("<p>Screen orientation state is <br /> [ " + screen.orientation +
" ]</p>");
    }
    window.addEventListener("orientationchange", function(e)
    {
        setTimeout(function()
        {
            screenState();
        }, 25);
    },
     false);
    screenState();
</script>
```

Network Info API (1/2)

- Provides the Web application with network information used in the device to through a JavaScript API.
- Supports obtaining the bandwidth of the current network, and checking whether the current network status is paid service.
- This can be used when the user has a low bandwidth or a metered connection, for example:
  - Image viewer showing very low resolution thumbnails
  - Video game loading low textures
  - Email client downloading only headers or asking the user to download headers
  - Any app trying to aggressively cache any downloaded asset

Network Info API (2/2)

```
<body>
    <h1>The Network Information API</h1>
    <div id="log"></div>
</body>
<script>
    var connection = navigator.connection || navigator.webkitConnection;
    var log = document.getElementById("log");
    function connectionStatus() {
        log.innerHTML = "Connection bandwidth: " + connection.bandwidth +
" MB/s";
        if (connection.metered) {
            log.innerHTML = "The connection is metered!";
        }
    }
    connection.addEventListener("change", connectionStatus);
    connectionStatus();
</script>
```



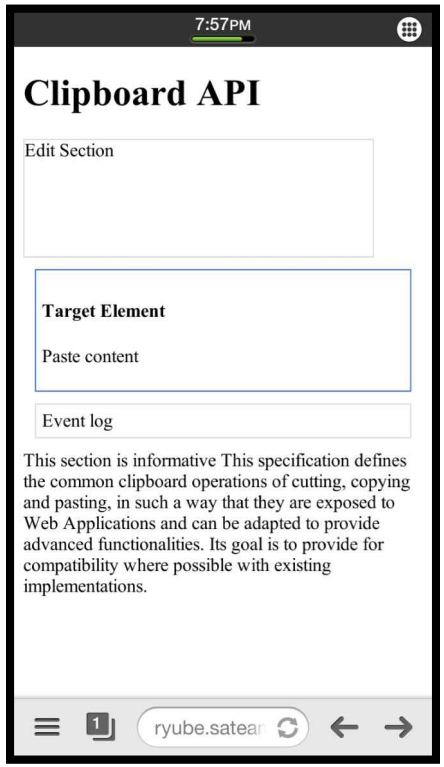
UI

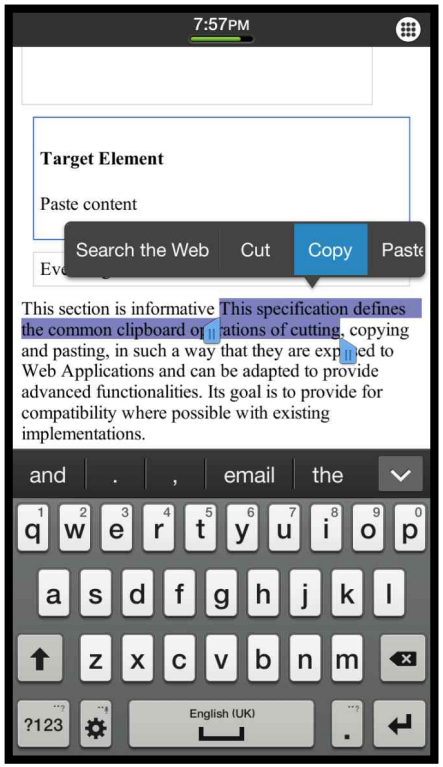
- Clipboard API
- HTML5 Drag and Drop

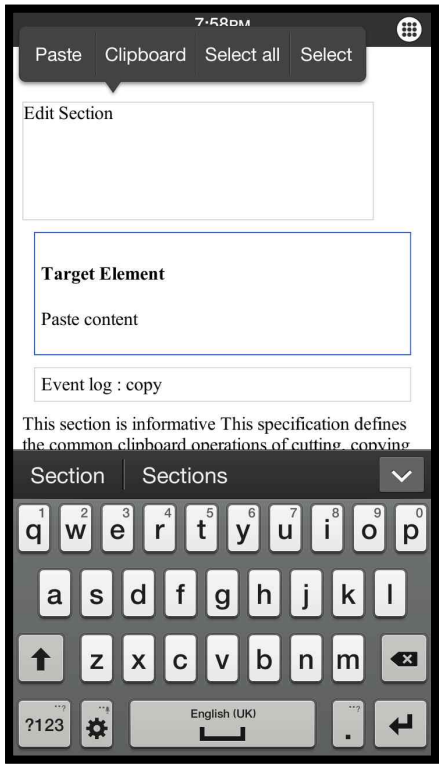
Clipboard API (1/5)

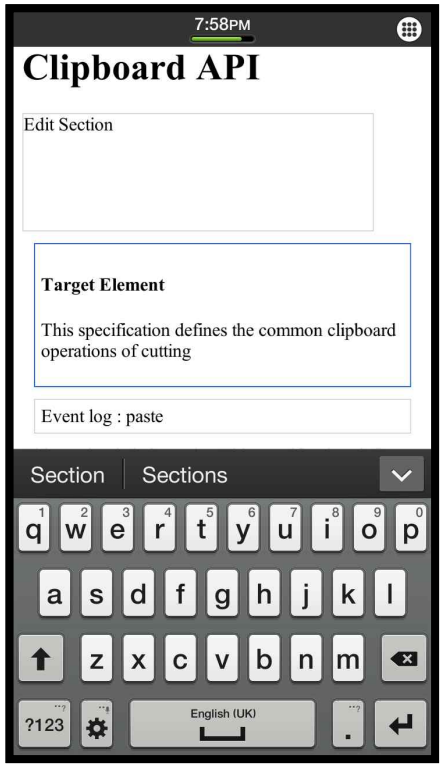
- The common clipboard operations, such as cutting, copying and pasting, so that they are exposed to Web applications and can be adapted to provide advanced functionalities.
- Its goal is to provide for compatibility where possible with existing implementations.
- Rich content editing
  - When copying text which contains hyperlinks or other structure, it is often useful to be able to reformat the content to preserve important information.
- Graphics with built-in semantics
  - In order to make web applications which allow the manipulation of rich text, or of graphic content such as SVG, it is useful to provide a mechanism that allows for copying more than just the rendered content.

Clipboard API (2/5)









Clipboard API (3/5)

```
<style>
    .log {border: 1px solid #d9d9d9; margin: 10px; padding: 5px;}
    .target {border: 1px solid #36c; margin: 10px; padding: 5px;}
</style>
</head>
<body>
 <h1>Clipboard API</h1>
    <div style="width: 300px; height: 100px; border: 1px solid #d9d9d9" contenteditable>Edit Section</div>
    <div  class="target">
        <h4>Target Element</h4>
        <p id="target">Paste content</p>
    </div>
    <div id="ev-log" class="log">Event log</div>
    <div contenteditable>
This section is informative
This specification defines the common clipboard operations of cutting, copying and pasting, in such a way
that they are exposed to Web Applications and can be adapted to provide advanced functionalities. Its goal
is to provide for compatibility where possible with existing implementations.
    </div>
<body>
```

Clipboard API (4/5)

```
<script>
    var pasteTarget = document.getElementById( "target");
    var evLogBox = document.getElementById( "ev-log");

    document.addEventListener( "cut", function(e) {
        cutHandler(e);
    }, false);

    document.addEventListener( "copy", function(e){
        copyHandler(e);
    }, false);

    document.addEventListener( "paste", function(e){
         pasteHandler(e);
    }, false);

    function cutHandler(e) {
        evLogBox.innerHTML = "Event log : cut";
    };
```

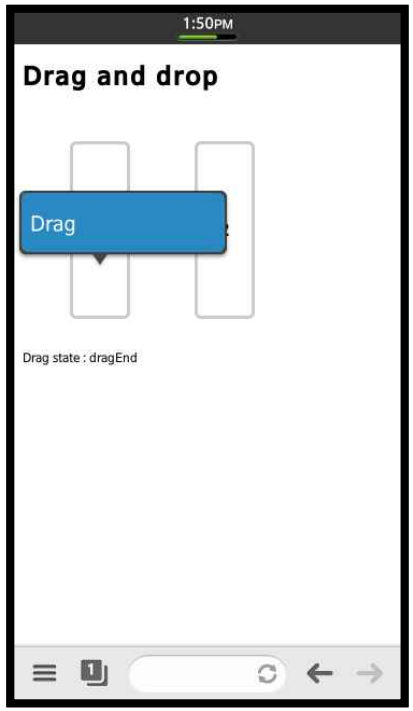
Clipboard API (5/5)

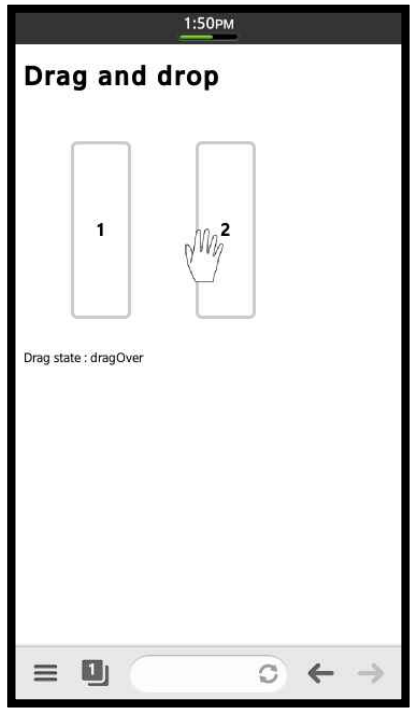
```
    function copyHandler(e) {
        e.preventDefault();
        // Select area
        var range = window.getSelection();
        //store clipboardData
        e.clipboardData.setData("text/plain", range);
        evLogBox.innerHTML = "Event log : copy";
    };
    function pasteHandler(e) {
        e.preventDefault();
        // clipboardData Restore to target
        pasteTarget.innerHTML = e.clipboardData.getData("text/plain");
        evLogBox.innerHTML = "Event log : paste";
    };
</script>
```

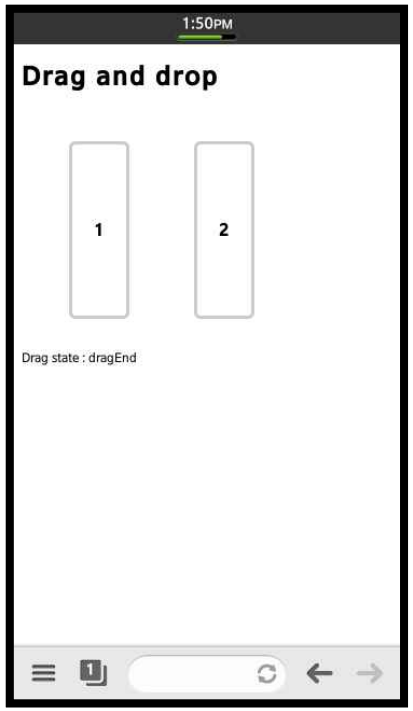
HTML5 Drag and Drop (1/5)

- To realize the previous Drag and Drop, a JavaScript library was used.
- Drag and Drop can be used by using JavaScript API and the added markup attribute
- Drag and Drop requires a source, target, and data, and can be used through events
- The related events are `dragstart`, `drag`, `dragleave`, `dragenter`, `dragover`, `drop`, and `dragend`; the `dragstart` and `drop` events send data through a `DataTransfer` object

HTML5 Drag and Drop (2/5)







HTML5 Drag and Drop (3/5)

```
<body>
<h1>Drag and drop</h1>
<div class="example_body">
    <div id="drag-list">
        <div class="drag-row" draggable="true">1</div>
        <div class="drag-row" draggable="true">2</div>
    </div>
    <div>Drag state : <span id="log"></span></div>
</div>
</body>
```

HTML5 Drag and Drop (4/5)

```
<script>
    var cols = document.querySelectorAll('#drag-list .drag-row');
    var colsLength = cols.length;
    var log = document.getElementById('log');

    //Set Event Listener in the drag element
    for (var i = 0; i < colsLength; i++ ) {
        cols[i].addEventListener('dragstart', dragStart, false);
        cols[i].addEventListener('drag', dragIng, false);
        cols[i].addEventListener('dragstart', dragStart, false);
        cols[i].addEventListener('dragenter', dragEnter, false);
        cols[i].addEventListener('dragover', dragOver, false);
        cols[i].addEventListener('dragleave', dragLeave, false);
        cols[i].addEventListener('drop', dragDrop, false);
        cols[i].addEventListener('dragend', dragEnd, false);
    };
</script>
```

HTML5 Drag and Drop (5/5)

```
<script>
    // Confirm each drag point as log
    function dragStart(e) { log.innerHTML = 'dragStart'};
    function dragIng(e) { log.innerHTML = 'drag' };
    function dragOver(e) {
        e.preventDefault();
        log.innerHTML = 'dragOver'
    };
    function dragEnter(e) { log.innerHTML = 'dragEnter' };
    function dragLeave(e) { log.innerHTML = 'dragLeave' };
    function dragDrop(e) {
        e.stopPropagation();
        log.innerHTML = 'dragDrop'

    };
    function dragEnd(e) {
        log.innerHTML = 'dragEnd'
    };
</script>
```

Performance and Optimization

- `requestAnimationFrame`
- Navigation Timing

`requestAnimationFrame` (1/3)

- **The animation effect in a Web browser is realized using CSS3 animation with JavaScript `setTimeout()`, and `setInterval()` methods**
- **This kind of animation has the following limitations:**
  - Many resources are used to handle complex works such as WebGL, Canvas and so on, so situations occur where the browser stops working
  - As it is impossible to operate accurately to the display frequency of the browser, animation movement sometimes stops midway
  - It is operated in an inactive state of the Web page, wasting resources

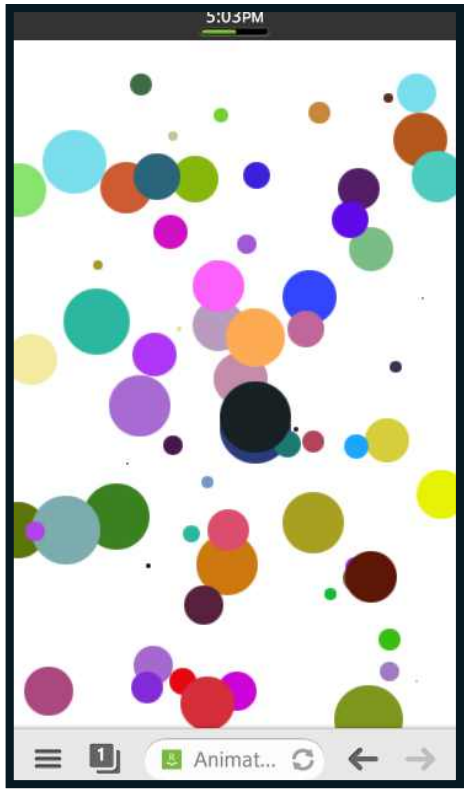
`requestAnimationFrame` (2/3)

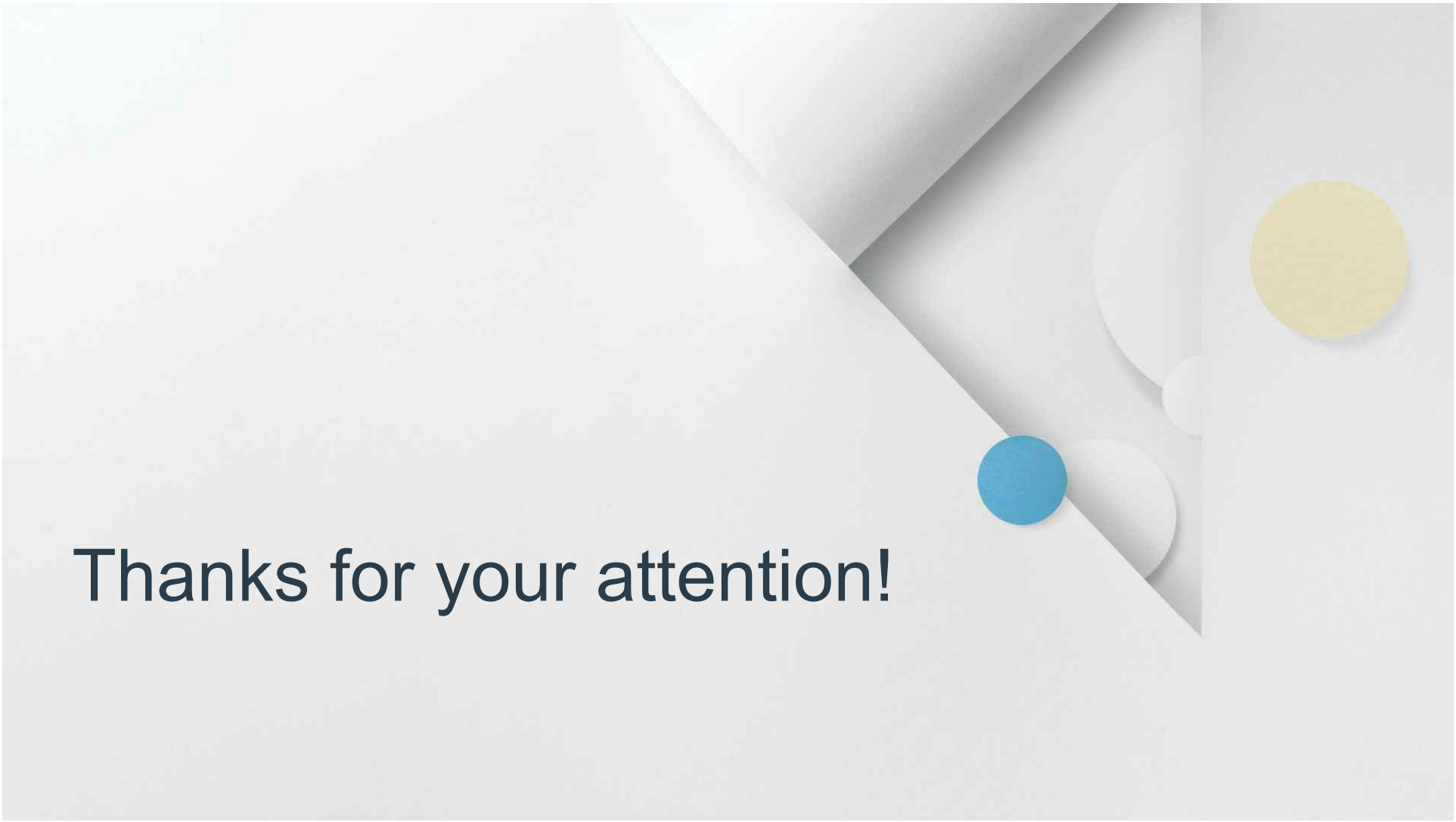
- **The `requestAnimationFrame()` method is a JavaScript API created to resolve such problems**
  - The `requestAnimationFrame()` method is called when the browser updates the page display
  - Animation frame and browser display frequency match accurately, reducing the waste of resources

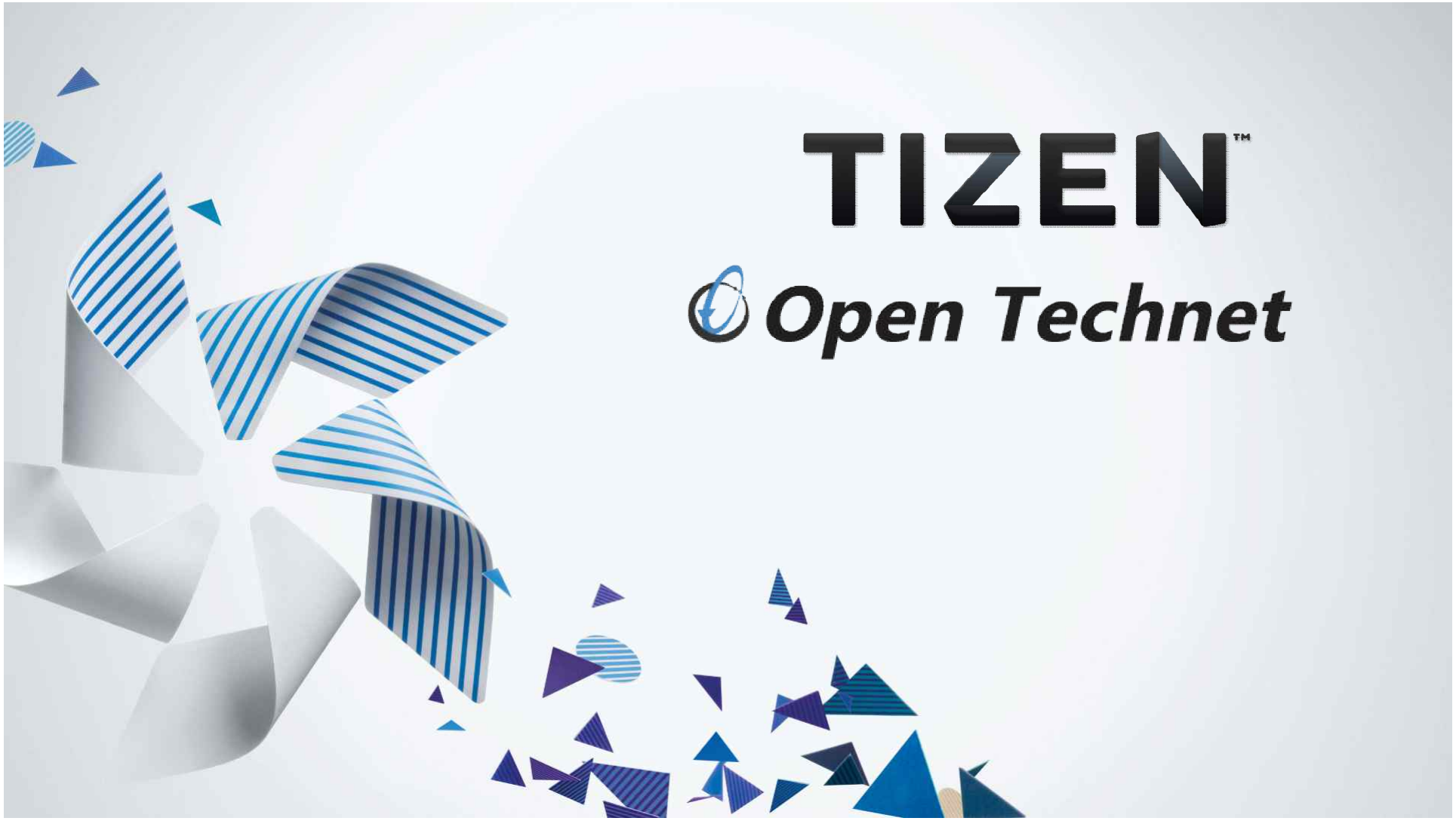
requestAnimationFrame (3/3)

- Browser display uses 60Hz, which is the same scanning rate of a general monitor

```
function animate() {
    //Randomly creates coordinate, radius, color
    var x = Math.floor(Math.random() * canvas.width);
    var y = Math.floor(Math.random() * canvas.height);
    var r = Math.floor((Math.random() * 30) + 1);
    var c = "#"+((1 << 24) * Math.random()|0).toString(16);
    //Creates a circle in random locations
    context.beginPath();
    context.arc(x, y, r, 0, Math.PI * 2, true);
    context.fillStyle = c;
    context.fill();
    webkitRequestAnimationFrame(animate);
}
```




Thanks for your attention!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