

TIZEN™

Tizen Web Runtime Core Specification 3.0

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Conventions

The keywords "MUST", "MUST NOT", "REQUIRED", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC2119.

The term "Web Application" refers to an application that is implemented with the use of Web technologies like (but not limited to) HTML, JavaScript, and CSS, and runs in a Web-browser-like environment called "Web Runtime" (abbreviated to "WRT"). The term "widget" refers to a package containing Web Application resources that can be downloaded, installed, and managed as a whole.

References

W3C Widget Packaging and XML Configuration (<http://www.w3.org/TR/widgets/>)

W3C Widget Access Request Policy (WARP) (<http://www.w3.org/TR/widgets-access/>)

W3C Widget Interface (<http://www.w3.org/TR/widgets-apis/>)

W3C 'view-mode' Media Feature (<http://www.w3.org/TR/view-mode/>)

W3C XML Digital Signatures for Widgets (<http://www.w3.org/TR/widgets-digsig/>)

W3C Content Security Policy 1.0 (<http://www.w3.org/TR/CSP/>)

1. Web Application Package Management

1.1. Web Application Types

Web Runtime(WRT) MUST support 2 types of Web Applications:

0010. Packaged Web Application:

- Web Application is packaged according to W3C Widget Packaging and XML Configuration and Tizen Configuration Extensions.

Since: 2.0

0020. Hosted Web Application:

- Web Application is packaged according to W3C Widget Packaging and XML Configuration and Tizen Configuration Extensions, except having an externally hosted document as the start page.

Since: 2.0

1.2. Web Application Installation

Web Application installation process should conform to the following requirements:

0050. WRT MUST be able to install the [Tizen-signed Web Applications](#).

Since: 2.3

0051. Web Applications packaged according to the format specified in the W3C Widget Packaging and XML Configuration MUST be processed according to the rules specified in the “[Steps for Processing a Widget Package](#)” chapter of that document. Additionally, configuration extensions defined in the “[Tizen Configuration Extensions](#)” section MUST be recognized and supported. The <feature> element SHOULD be ignored in this installation process.

Since: 2.0

0060. If the host device supports the registration of content type handlers by file extension, WRT MUST be registered as the handler for the files with the extension of “.wgt”.

Since: 2.0

0070. WRT SHOULD inform the user the result of Web Application installation.

Since: 2.0

0080. If the Tizen Web API version is lower than the minimum version required by the Web Application, WRT MUST abort the installation.

Since: 2.0

0090. WRT SHOULD register Web Application on the device idle screen (application menu). For that, WRT MUST use the icon and widget name derived according to the rules specified in the “[Steps for Processing a Widget Package](#)” chapter of the W3C Widget Packaging and XML Configuration document.

Since: 2.0

0100. If WRT fails to install the Web Application due to a power failure, it MUST recover to its original state prior to the installation.

Since: 2.0

0104. If the Web Application configuration is "CSP([Contents Security Policy](#))-compatible configuration", WRT MUST be set to "CSP-based security mode". Otherwise, WRT MUST be set to "WARP([Widget Access Request Policy](#))-based security mode".

Since: 2.2

1.3. Web Application Update

0110. WRT MUST support updating the [Tizen-signed Web Applications](#).

Since: 2.0

0120. WRT SHOULD support updating the side-loaded Web Applications.

Since: 2.0

0130. If updating the Web Applications is supported, the following rules MUST be obeyed:

- If the Web Application that is being updated has a Tizen AppID (as described in [Tizen Configuration Extensions](#)), it MUST NOT be updated unless the new Web Application also has the exact same Tizen AppID.
- If the Web Application that is being updated has an author signature, it MUST NOT be updated unless the new Web Application also has been signed by the same author.
- If the Web Application that is being updated has NO author signature, it MUST NOT be updated unless the new Web Application also has NO author signature.
- The update procedure SHOULD follow the procedures defined in [Web Application Installation](#).
- The Web Application data (cookies, and local storage) MUST be preserved across updates. It is up to Web Application whether the old data is preserved and ensured after the update.
- If the install-location is changed when the web application is updated, the web application data, such as cookies, local storage, and other data application keeps inside data directory, is moved to the indicated location.

Since: 2.0

1.4. Web Application Uninstallation

0150. WRT MUST support Web Application uninstallation.

Since: 2.0

0160. During the uninstallation, Web Application's private resources and private data (application configuration, application data, widget preferences, cookies, and local storage) MUST be erased.

Since: 2.0

2. Tizen Configuration Extensions

Tizen-specific widget configuration extension elements are defined in the following namespace: `http://tizen.org/ns/widgets`. To avoid confusion, this section denotes the extension elements as though the following namespace declaration was in effect: `xmlns:tizen="http://tizen.org/ns/widgets"`.

0200. WRT MUST only support Web Applications with the `xmlns:tizen="http://tizen.org/ns/widgets"` namespace declared in the configuration file.

WRT MUST support the following additional configuration elements that are not included in the W3C Widget Packaging and XML Configuration:

0210. Tizen Application

Element	<code><tizen:application /></code>
Description	This element is used to uniquely identify a Tizen Application.
Context	Child of the <code><widget></code> element
Occurrence	1
Attributes	<ul style="list-style-type: none"> <code>id</code> (mandatory, 10-byte package attribute + '!' + application name; the application name is a 1 to 52-byte set of characters. Once published, an application ID cannot be changed.) <code>package</code> (mandatory, 10-byte set of characters (0~9, a~z, A~Z) randomly generated by the SDK) <code>required_version</code> (mandatory, Tizen API version required for the Web Application to work properly.) <code>launch_mode</code> (optional, available values: <code>group</code>, <code>caller</code>, <code>single</code> (default)) <code>ambient_support</code> (optional, available values: <code>enable</code>, <code>disable</code>, only wearable profile) <p>Since: 2.3.1</p>
Example	<pre><tizen:application id="1234abcDEF.appName" package="1234abcDEF" required_version="1.0" launch_mode="single" ambient_support="enable" /></pre>

Since: 2.1

0211. Tizen Privilege

Element	<code><tizen:privilege /></code>
Description	This element is used to define the API access privilege required by the Web Application.
Context	Child of the <code><widget></code> element
Occurrence	0 or more;
Attributes	<ul style="list-style-type: none"> name (mandatory, URI)
Example	<pre><tizen:privilege name="http://tizen.org/privilege/application.launch" /></pre>

Since: 2.0

0221. Tizen Application Control

Element	<code><tizen:app-control /></code>
Description	This element is used to indicate that the Web Application can handle a specific operation with the specified MIME type and URI. For more information, see the Application Control Guide .
Context	Child of the <code><widget></code> element
Occurrence	0 or more;.

Child Element	Element	<code><tizen:src></code>
	Description	The page that handles requests.
	Occurrence	1
	Attributes	<ul style="list-style-type: none"> name (mandatory, string) reload (optional, string, available values: enable (default), disable)
	Element	<code><tizen:operation></code>
	Description	String that defines the action to be performed.
	Occurrence	1
	Attributes	<ul style="list-style-type: none"> name (mandatory, string)
	Element	<code><tizen:uri></code>
	Description	additional parameters used for resolving the application control requests
	Occurrence	0 or 1
	Attributes	<ul style="list-style-type: none"> name (mandatory, URI)
Element	<code><tizen:mime></code>	
Description	additional parameters used for resolving the application control requests	
Occurrence	0 or 1	
Attributes	<ul style="list-style-type: none"> name (mandatory, MIME) 	

Example	<pre> <tizen:app-control> <tizen:src name="edit.html" reload="enable"/> <tizen:operation name="http://tizen.org/appcontrol/operation/edit"/> <tizen:mime name="image/jpg" /> <tizen:uri name="myapp"/> </tizen:app-control> </pre>
----------------	--

Since: 2.0

0230. Tizen Settings

Element	<code><tizen:setting /></code>
Description	This element defines additional application settings.
Context	Child of the <code><widget></code> element
Occurrence	0 or more; If the same setting is defined more than once, the first one is effective and others are ignored.
Attributes	<ul style="list-style-type: none"> • <code>background-support</code> (optional, available values: <code>enable</code>, <code>disable</code> (default)) <ul style="list-style-type: none"> ○ <code>enable</code>: Web Application execution MUST NOT be suspended when it is put into the background. ○ <code>disable</code>: Web Application execution MUST be suspended when it is put into the background. <p>Since: 2.0</p> <p>Note: Since Tizen 2.4, background process is managed more tightly. Even though <code>background-support</code> is set to “enable”, the web application process which is moved to background can be suspended. To guarantee web application running on the background, background categories which are declared in the system should be added by <code><tizen:background-category></code> tag.</p> <ul style="list-style-type: none"> • <code>context-menu</code> (optional, available values: <code>enable</code> (default), <code>disable</code>)

- `enable`: The context menu SHOULD be displayed when the user long-presses, for example, an image, text, or link.
- `disable`: The context menu SHOULD NOT be displayed when the user long-presses, for example, an image, text, or link.

Since: 2.0

- `encryption` (optional, available values: `enable`, `disable` (default))
 - `enable`: WRT MUST encrypt the Web Application resources (HTML, JS, and CSS files only).
 - `disable`: WRT MUST NOT encrypt the Web Application resources (HTML, JS, and CSS files only).

Since: 2.0

- `screen-orientation` (optional, available values: `portrait` (default), `landscape`, `auto-rotation`)
 - `portrait`: Web Application view-port orientation MUST be locked to `portrait` by default.
 - `landscape`: Web Application view-port orientation MUST be locked to `landscape` by default.

Since: 2.0

- `auto-rotation`: If the system's auto-rotation setting is on, the Web Application view-port orientation MUST be changed according to the device orientation by default.

Since: 2.2

Note: In any configuration, the screen orientation can be changed by the [W3C Screen Orientation API](#).

Note: In case of TV Profile, the default value is `auto-rotation`.

- `install-location` (optional, available values: `auto` (default), `internal-only`, `prefer-external`)

	<ul style="list-style-type: none"> ○ auto: The install location MUST be the system-defined install location. ○ internal-only: The install location MUST be the device internal storage. ○ prefer-external: The install location MUST be an external storage, if an external storage (such as MMC card) is available. <p>Since: 2.0</p> <ul style="list-style-type: none"> • hwkey-event (optional, available values: enable (default), disable) <ul style="list-style-type: none"> ○ enable: A hardware key event MUST be sent to the Web Application when the user presses the hardware key. ○ disable: A hardware key event MUST NOT be sent to the Web Application when the user presses the hardware key. <p>Since: 2.2</p> <ul style="list-style-type: none"> • background-vibration (optional, available values: enable, disable (default)) <ul style="list-style-type: none"> ○ enable: W3C vibration API MUST work when it is put into the background. ○ disable: W3C vibration API MUST NOT work when it is put into the background.. <p>Since: 2.3</p>
Example	<pre> <tizen:setting background-support="enable" /> <tizen:setting context-menu="disable" /> <tizen:setting encryption="enable" /> <tizen:setting screen-orientation="landscape" /> <tizen:setting install-location="internal-only" /> <tizen:setting hwkey-event="enable" /> <tizen:setting background-vibration="enable" /> </pre>

0240. Tizen Hosted Web Application

Element	<code><tizen:content /></code>
Description	In the W3C Widget Packaging and XML Configuration, the Web Application start page is a document contained inside the widget package itself. Tizen WRT allows the start page to be hosted on an external server. The <code><tizen:content /></code> element is used to point to the relevant document. If both <code><content></code> and <code><tizen:content></code> elements are specified, only the <code><tizen:content></code> element is considered.
Context	Child of the <code><widget></code> element
Occurrence	0 or more; if more than 1, then the first occurrence MUST be considered (and all others ignored).
Attributes	<ul style="list-style-type: none"> <code>src</code> (mandatory, URI of an external start page)
Example	<code><tizen:content src="https://www.tizen.org/" /></code>

Since: 2.0

0241. Tizen Content Security Policy

Element	<code><tizen:content-security-policy></code>
Description	This element defines an additional Content Security Policy for a packaged or hosted application.
Context	Child of the <code><widget></code> element
Occurrence	0 or more; if more than 1, the first occurrence MUST be considered (and all others ignored).
Attributes	None
Value	Policy string according to Content Security Policy 1.0 .
Example	<pre><tizen:content-security-policy> script-src 'self' </tizen:content-security-policy></pre>

Since: 2.2

0242. Tizen Content Security Policy Report Only

Element	<code><tizen:content-security-policy-report-only></code>
Description	This element defines an additional Content Security Policy for a packaged or hosted application (for monitoring purposes only).
Context	Child of the <code><widget></code> element
Occurrence	0 or more; if more than 1, the first occurrence MUST be considered (and all others ignored).
Attributes	None
Value	Policy string according to Content Security Policy 1.0 .
Example	<pre><tizen:content-security-policy-report-only> script-src 'self'; report-uri="http://example.com/report.cgi" </tizen:content-security-policy-report-only></pre>

Since: 2.2

0260. Tizen Navigation Policy

Element	<code><tizen:allow-navigation/></code>
Description	This element defines a list of URL domains that are allowed to be navigated in the Web Application window.
Context	Child of the <code><widget></code> element
Occurrence	0 or more; if more than 1, the first occurrence MUST be considered (and all others ignored).
Attributes	None
Value	A list of URL domains separated by white spaces (wild card "*" can be used).
Example	<pre><tizen:allow-navigation> tizen.org *.tizen.org <tizen:allow-navigation/></pre>

Since: 2.2

0270. Tizen Metadata

Element	<code><tizen:metadata/></code>
Description	This element supports metadata information shared with other Web Applications. The defined metadata can be accessed (read-only) through the Tizen Application API.
Context	Child of the <code><widget></code> element
Occurrence	0 or more; if duplicate then the first occurrence MUST be considered (and all others ignored).
Attributes	<ul style="list-style-type: none"> <code>key</code> (mandatory, key must a unique string) The maximum length MAY be limited to 80 byte. In this case, leftover bytes is ignored. <code>value</code> (optional, string) The maximum length MAY be limited to 8192 byte. In this case, leftover bytes is ignored.
Example	<code><tizen:metadata key="key1"/></code>

	<tizen:metadata key="key2" value="value"/>
--	--

Since: 2.20280. Tizen ime

0290. Tizen category

Element	<tizen:category />
Description	This element is used to indicate the categories that the app belongs to.
Context	Child of the <widget> element
Occurrence	0 or more (If omitted, the widget defaults to the watch widget type.)
Attributes	<ul style="list-style-type: none"> name (mandatory, string)
Example	<tizen:category name="http://tizen.org/category/wearable_clock" />

Since: 2.30291. The maximum length of attribute and element (except tizen:metadata, W3C preference element – preference length MAY be limited same as tizen:metadata element) MAY be limited to 2048-byte. In this case, leftover bytes are ignored.

0291. Tizen background category

Element	<tizen:background-category />									
Description	<p>This element is used to represents the categories of the app running on the background.</p> <p>Since Tizen 2.4, the web application is not allowed to run on the background except when it is explicitly declared to do so. The following table lists the background categories that allow the application to run on the background. Note: Even though below background-category is declared, to run web application on the background, <tizen:setting background-support> MUST be set to enable.</p>									
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Background category</th> <th style="text-align: left;">Description</th> <th style="text-align: left;">Related APIs</th> <th style="text-align: left;">Element value</th> </tr> </thead> <tbody> <tr> <td>Media</td> <td>Playing audio,</td> <td>Multimedia API</td> <td>media</td> </tr> </tbody> </table>	Background category	Description	Related APIs	Element value	Media	Playing audio,	Multimedia API	media	
Background category	Description	Related APIs	Element value							
Media	Playing audio,	Multimedia API	media							

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		recording, and outputting streaming video on the background		
	Download	Downloading data with the Tizen Download-manager API	Download API	download
	Background network	Processing general network operations on the background (such as sync-manager, IM, and VOIP)	Sync Manager , Socket , and Curl API	background-network
	Location	Processing location data on the background	Location API	location
	Sensor (context)	Processing context data from the sensors, such as gesture	Sensor API	sensor
	IoT Communication/Connectivity	Communicating between external devices on the background (such as Wi-Fi and Bluetooth)	Wi-Fi and Bluetooth API	iot-communication
Context	Child of the <widget> element			
Occurrence	0 or more (If omitted, the widget defaults to the watch widget type.)			
Attributes	<ul style="list-style-type: none"> value (mandatory, string) 			
Example	<tizen:background-category value="media" />			

Since: 2.4

0292. Tizen Splash Screen

Element	<code><tizen:launch_screen /></code>
Description	This element is used to indicate the splash screen
Context	Child of the <code><widget></code> element
Occurrence	0 or 1
Attributes	<ul style="list-style-type: none"> • <code>ready_when</code> (mandatory, string, values: <code>first-paint</code>, <code>complete</code>, <code>custom</code>) <ul style="list-style-type: none"> ○ <code>first-paint</code>: hide splash screen when “frame,rendred” callback is called ○ <code>complete</code>: hide splash screen when “load,complete” callback is called ○ <code>custom</code>: hide splash screen when <code>window.screen.show()</code> method was called

Child Element	Element	<code><tizen:ls_default></code>
	Description	This element is used to indicate the default of the splash screen
	Occurrence	1
	Attributes	<ul style="list-style-type: none"> background_image (mandatory, string) background_color(mandatory, string) image(mandatory, string) image_border(mandatory, string)
	Element	<code><tizen:ls_landscape ></code>
	Description	This element is used to indicate the landscape of the splash screen
	Occurrence	0 or 1
	Attributes	<ul style="list-style-type: none"> background_image (mandatory, string) background_color (mandatory, string) image(mandatory, string) image_border(mandatory, string)
	Element	<code><tizen:ls_portrait></code>
	Description	This element is used to indicate the portrait of the splash screen
	Occurrence	0 or 1
	Attributes	<ul style="list-style-type: none"> background_image (mandatory, string) background_color (mandatory, string) image(mandatory, string) image_border(mandatory, string)

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Example

```
<tizen:launch_screen ready_when="custom">

  <tizen:ls_default background_image="bg.png" background_color="#ff0000"
  image="icon.png" image_border="0px stretch"/>

  <tizen:ls_landscape background_image="bg.png" background_color="#00ff00"
  image="icon.png" image_border="0px stretch"/>

  <tizen:ls_portrait background_image="bg.png" background_color="#0000ff"
  image="icon.png" image_border="0px stretch"/>

</tizen:launch_screen>
```

Since: 3.0

3. Web Application Runtime

3.1. Web Application Life-cycle

0310. WRT MUST support and properly generate W3C DOM events:

- WRT MUST support W3C DOM events, such as load, unload, and [page visibility](#) events, for all pages of the Web Application.

Since: 2.0

0320. WRT MUST suspend JavaScript execution and rendering (including CSS animations) when the Web Application enters an invisible state, unless the Web Application has been explicitly declared to support the background support mode in its configuration file.

Since: 2.0

0330. For an application whose execution is suspended, WRT MUST resume JavaScript execution and rendering (including CSS animations) when the Web Application enters a visible state.

Since: 2.0

0340. WRT MUST NOT suspend the Web Application execution if the Web Application has been explicitly declared to support the background support mode in its configuration file.

Since: 2.0

3.2. Web API Support

The main functionality of Tizen WRT is to provide the Tizen Web API to Web Applications. As such:

0350. WRT MUST support the Tizen W3C API. For more information, see the [Tizen W3C API Reference](#).

Since: 2.0

0360. WRT MUST support the Tizen Device API. For more information, see the [Tizen Device API Reference](#).

Since: 2.0

0370. WRT MUST support the Tizen Web API in both top-level browsing context (main document window) and nested browsing contexts (iframes).

Since: 2.0

0380. WRT MUST NOT allow an external Web page to access the Tizen Device API.

Note: In case of TV Profile, only if the privilege level of the Web Application is “Public”, WRT MUST NOT allow an external Web page to access the Tizen Device API.

Since: 2.0

0390. WRT MUST support API by Crosswalk Extension. For more information, see [Crosswalk Extension Guide](#)

Since: 3.0

3.3. Debug Support

0390. WRT MUST support the “web inspector” interface for Web Application debugging. For more information, see [Debugging a Web Application](#).

Since: 2.0

3.4. Other Support

0410. WRT MUST support the W3C Widget Access Request Policy. For more information, see the [Widget Access Request Policy](#).

Since: 2.0

0420. WRT MAY support the following URI schemes: `sms://`, `mmsto://`, and `mailto://`.

Since: 2.0

0430. For each supported URI scheme above, WRT MUST launch the platform handler for that scheme with appropriate parameters.

Since: 2.0

0440. WRT MUST support localization as defined in the W3C Widget Packaging and XML Configuration.

Since: 2.0

0460. WRT MUST support the W3C Widget Interface.

Since: 2.0

0470. WRT MUST support the [W3C Content Security Policy 1.0](#).

Since: 2.2

0480. WRT MUST send the "tizenhwkey" custom event to the Web Application if the `<tizen:setting hwkey="disable"/>` element is not specified.

- o **tizenhwkey object:**

```
[NoInterfaceObject] interface tizenhwkey
{
  readonly attribute DOMString keyName;
};
```
- o **keyName attribute:**

```
readonly DOMString keyName
```

Defines the selected device hardware key name. The values are `menu` and `back`.

For example:

```
<script>
  $( document ).on("tizenhwkey", function(ev)
  {
    if (ev.originalEvent.keyName === "back")
    {
      // Call the browser back feature if you want back behavior
      window.history.back();
      // Add a script if you need to add another behavior
      // on the hardware back key press
    }
  }
</script>
```

Since: 2.2

0481. WRT MUST send the "rotarydetent" custom event to the Web Application if a device (or emulator) supports rotary event and a rotary device detects a detent point.

- o rotarydetent object:


```
[NoInterfaceObject] interface rotarydetent
{
  readonly attribute Detail detail;
};
```
- o Detail object:


```
[NoInterfaceObject] interface Detail
{
  readonly attribute DOMString direction;
};
```

Defines the direction of rotary device. The values are "CW" for clockwise and "CCW" for counter-clockwise

For example:

```
<script>
  $( document ).on("rotarydetent", function(ev)
  {
    if (ev.detail.direction === "CW")
    {
      // Do action for clockwise rotation
    }
  }
</script>
```

Since: 2.3.1 (wearable profile only)

0482. WRT MUST send the "appcontrol" custom event to the Web Application if current loaded page is selected again for the application control request, and "reload" attribute of service description is set to disable.

- o appcontrol object:


```
[NoInterfaceObject] interface appcontrol
{
};
```

For example:

```
<script>
Window.addEventListener('appcontrol', function onAppControl()
{
    var reqAppControl =
tizen.application.getCurrentApplication().getRequestedAppControl();

    If (reqAppControl)
    {
        // handle application control request
    }
});
</script>
```

Since: 2.4

4. Web Application Runtime UI

4.1. View Mode

0510. WRT MUST support 2 view modes of the W3C 'view-mode' Media Feature: “maximized” and “fullscreen”.

Since: 2.0

4.2. Multiple Browsing Context Support

0520. WRT MUST support the creation of multiple browsing contexts within 1 Web Application. For example, through the `window.open()` method or hyperlink navigation.

Since: 2.0

0530. WRT MUST NOT allow navigation to an external URL if WRT is in the WARP-based security mode and if the URL is NOT specified in the `<access>` element in the configuration file. WRT MAY open up the external URL in a browser.

Since: 2.2

0540. WRT MUST NOT allow navigation to an external URL if WRT is in the CSP-based security mode and if the URL is NOT specified in the `<tizen:allow-navigation>` element in the configuration file. WRT MAY open up the external URL in a browser.

Since: 2.2

4.3. Notification Level Window Support

0550. WRT MUST support notification level window to launch web application on lock-screen. If “always_on_top” is included in appcontrol data for launch request, web application is re-launched with notification level window.

- Requirement
Category : http://tizen.org/category/always_on_top
Privilege Level : Partner

Since: 3.0

5. Web Application Security and Privacy

5.1. Widget Signature

0610. WRT MUST support widget signature processing as defined in the W3C XML Digital Signatures for Widgets.

Since: 2.0

0620. If the Web Application is signed with a valid Tizen distributor signature (such as `signature1.xml`), WRT MUST install it as a trusted Web Application. The first distributor signature (`signature1.xml`) determines the privilege level of the Web Application, which is "Public", "Partner", or "Platform".

Since: 2.0

0630. If the Web Application is signed with an invalid signature (author or distributor), WRT MUST not allow it to be installed.

Since: 2.0

0640. If a Web Application package does not contain a valid Tizen distributor signature (such as `signature1.xml`), WRT MUST install it as an untrusted Web Application.

Note: The application can be untrusted, if it:

- Is not signed.
- Includes only a valid author signature (`author-signature.xml`).
- Includes a valid author signature and a valid non-Tizen distributor signature (`signature1.xml`).

Since: 2.0

5.2. Web Application Protection

0650. For Web Applications that explicitly turn on encryption through the `<tizen:setting />` element in the configuration file, WRT MUST provide the following measures to protect Web Application resources:

- WRT MUST encrypt the HTML, JS, and CSS file resources of the Web Application stored by the device.
- When the Web Application is being run, WRT MUST decrypt the encrypted resources (HTML, JS, and CSS) in a manner transparent to the application itself.

Since: 2.0

5.3. Private Storage (HTML5 Local Storage and Cookie) Support

0660. WRT MUST provide own local storage space per Web Application:

- The local storage space MUST not be accessible to other applications, be they native or Web Applications.

Since: 2.0

0670. WRT MUST provide own cookie database per Web Application:

- The cookie database MUST NOT be accessible to other applications, be they native or Web Applications.

Since: 2.0

5.4. Device API Security Policy

0690. WRT MUST support the identification of the sensitive API privileges.

Since: 2.0

0691. WRT MUST support the mapping between each Tizen Device API and the corresponding privilege which is defined in the API definitions in [Tizen Device API Reference](#).

Since: 2.3

0700. WRT MUST NOT allow any Web Application access to sensitive API features before consulting the security policy.

Since: 2.0

0710. WRT MUST NOT include any mechanism disabling the security policy checks.

Since: 2.0

0720. WRT MUST NOT allow the user to elevate permissions set by the security policy.

Since: 2.0

Note: The following table summarizes the "distributor signature type" to "privilege level" behavior mapping.

Table 1: Distributor signature type to privilege level mapping

Privilege level	Distributor signature type			Untrusted
	Platform	Partner	Public	
Platform	Allowed	Security error for runtime use (direct API call without the config.xml file declaration) Installation failure for the config.xml file use	Security error for runtime use (direct API call without the config.xml file declaration) Installation failure for the config.xml file use	Security error for runtime use (direct API call without the config.xml file declaration)
Partner	Allowed	Allowed	Installation failure for the config.xml file use	Installation failure for the

Privilege level	Distributor signature type			Untrusted
	Platform	Partner	Public	
Public	Allowed	Allowed	Allowed	config.xml file use

Since: 2.1

5.5. Content Security Policy

0741. In the CSP-based security mode, WRT MUST consider the CSP policies delivered from the following sources:

- Default policy (enforced by WRT)
- config.xml: <tizen:content-security-policy>, <tizen:content-security-policy-report-only>, elements (if any)
- HTTP header: Content-Security-Policy and Content-Security-Policy-Report-Only (if any)

Since: 2.2

0742. The default CSP policy enforced by WRT is "default-src *; script-src 'self'; style-src 'self'; object-src 'none';". Note that this default CSP policy MAY be subject to change in the future Tizen platform releases.

Since: 2.2

0743. The CSP policy combination algorithm is as follows:

- If the CSP policy is present in the config.xml file, the configuration-based CSP policy is enforced and the default CSP policy is ignored.
 - If the CSP policy is present in the HTTP header, the most restrictive policy in the configuration-based CSP policy and HTTP-based CSP policy SHOULD be applied.
- If the CSP policy is not present in the config.xml file, the default CSP policy is enforced.
 - If the CSP policy is present in the HTTP header, the most restrictive policy in the default CSP policy and HTTP-based CSP policy SHOULD be applied.

Since: 2.2

5.6. Internet Access Security Policy

0745. WRT MUST support the internet access control using <http://tizen.org/privilege/internet> privilege.

Local Domain: N/A.

Remote Domain: Grant permission if defined, otherwise block execution.

Since: 2.3

5.7. HTML5 API Security Policy

0750. Web Runtime MUST support HTML5 APIs.

Since: 2.3

0751. Web Runtime MUST supports below privileges along with HTML5 APIs that request user permission.

API	Privilege	Behavior
Geolocation	http://tizen.org/privilege/location	<u>Local Domain:</u> Grant permission if defined, otherwise block execution.
Getusermedia	http://tizen.org/privilege/mediacapture	<u>Remote Domain:</u> Popup user prompt if defined, otherwise block execution.
Audio Recording	http://tizen.org/privilege/audiorecorder	<u>Local Domain:</u> Grant permission if defined, otherwise block execution.
Video Recording	http://tizen.org/privilege/camera	<u>Remote Domain:</u> block execution.
Web Notifications	http://tizen.org/privilege/notification	<u>Local Domain:</u> Grant permission if defined, otherwise Popup user prompt.
Storage ¹⁾	http://tizen.org/privilege/unlimitedstorage	<u>Remote Domain:</u> Popup user prompt.
FullScreen	http://tizen.org/privilege/fullscreen	If defined then launch in fullscreen mode. If not defined

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		then launch fullscreen mode as per user input (which depends upon content)..
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1) IndexedDB, FileSystem capacity, quota exceeding WebDatabase

Since: 2.3

5.8. Web Application Default Privilege Policy

0755. The Web Application has the following default privileges. Therefore, it is possible to operate on the privilege even if it is not described in config.xml. WRT can have a default privilege depending on the system.

API	Privilege	Behavior
AppManager	http://tizen.org/privilege/appmanager.launch	Allows the application to open other applications using the application ID or application control.
Haptic	http://tizen.org/privilege/haptic	Allows the application to control the vibration feedback.
Network	http://tizen.org/privilege/network.get	Allows the application to retrieve network information, such as the status of each network, its type, and detailed network profile information.
Notification	http://tizen.org/privilege/notification	Allows the application to show and hide its own notifications and badges.
PackageManager	http://tizen.org/privilege/package manager.info	Allows the application to retrieve detailed application package information.
MediaStorage	http://tizen.org/privilege/mediastorage	Allows the application to read and write files in media folders.
ExtenalStorage	http://tizen.org/privilege/externalstorage	Allows the application to read and write files that are saved to an external storage, such as SD cards.

Since: 3.0

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5.9. Web Runtime Directory Policy

0760. WRT MUST supports directory policy likes below:

- Support Shared directory
When installing the Web Application, if api_version of the Web Application is less than 3.0, it creates shared directory, and if it is greater than or equal to 3.0, it moves res/wgt/shared/res content to shared/res directory and make a symlink from shared/res to res/wgt/shared/res.

Since: 3.0

6. Web Widget

The web widget is only supported by the WRT of the wearable profile.

6.1. Web Widget Package Management (Install and Uninstall)

0900. WRT SHOULD install the Web Widget at the time when its Web Application is installed because Web Application and Web Widget share resources in the same package.

Since: 2.3.2

0910. WRT SHOULD support Web Widget uninstallation. WRT SHOULD uninstall the Web Widget at the time when its Web Application is uninstalled and resources for Web Widget are all removed together.

Since: 2.3.2

0920. When the Web Application is uninstalled, all instances of its Web Widget in the Widget Viewer SHOULD be terminated.

Since: 2.3.2

6.2. Web Widget Configuration Extensions

The following configuration extensions SHOULD be supported if WRT supports Web Widget.

0940. Tizen Web Widget

Element	<code><tizen:app-widget></code>
Description	Used to define the basic information about a Web widget.
Context	Child of the <code><widget></code> element
Occurrence	0 or more

Attributes	<ul style="list-style-type: none"> <code>id</code> (required; Unique ID of the Web widget in the <code>< TIZEN_APPLICATION_ID >.< STRING ></code> format, where <code>< STRING ></code> comprises 1 or more characters (0~9, a~z, A~Z). <code>primary</code> (required; Defines a primary Web widget among Web widgets in a Web app. Expected Value: true false). <code>max-instance</code> (optional; Limits the number of widget instances concurrently executable for a Web app. When omitted or its value is 0, unlimited number of widget instances are supported. Expected Value: integer)
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Since: 2.3.2

0950. Tizen Widget Label

Element	<code><tizen:widget-label></code>
Description	Used to define the name of the Web widget.
Context	Child of the <code><tizen:app-widget></code> element
Occurrence	1 or more;
Attributes	<ul style="list-style-type: none"> <code>xml:lang</code> (optional; specifies the language of the box label (for available values, see the IANA Language Subtag)) <p>Since: 2.13.2</p>

Since: 2.3.2

0970. Tizen Widget Content

Element	<code><tizen:widget-content></code>
Description	Used to define the starting page of the Web widget.
Context	Child of the <code><tizen:app-widget></code> element
Occurrence	1

Attributes	<ul style="list-style-type: none"> <code>src</code> (required; local file path, relative to the source web app directory, of the widget starting page.)
-------------------	--

Since: 2.3.2

0980. Tizen Widget Size

Element	<code><tizen:widget-size></code>
Description	Used to define the size of the Web widget.
Context	Child of the <code><tizen:widget-content></code> element
Occurrence	1
Attributes	<ul style="list-style-type: none"> <code>preview</code> (required; Image file path, relative to the source Web app directory, of the box content displayed in the Widget viewer.) <p>Since: 2.3.2</p>
Value	2x2

Since: 2.3.2

0985. Tizen Widget Metadata

Element	<code><tizen:widget-metadata></code>
Description	It defines a (key, value) pair that can be read by a Web widget via <code>widget_service</code> API. Its main use is to allow developers to define a constant to be read by a Web widget.
Context	Child of the <code><tizen:app-widget></code> element
Occurrence	0 or more
Attributes	<ul style="list-style-type: none"> <code>key</code> (required; expected value: string.) <code>value</code> (required; expected value: string.)

Since: 2.3.2

7. Web Service Application

Support of [Web Service Application](#) is optional in WRT.

Web Service Application requires Partner Level Certification.

7.1. Web Service Application Package Management (Install and Uninstall)

1700. WRT SHOULD install the Web Service Application at the time when its Web Application is installed. This means that the Web Dynamic Box resources are packaged with its Web Application.

Since: 2.3

1710. WRT SHOULD support Web Service Application uninstallation.

WRT SHOULD uninstall the Web Service Application at the time when its Web Application is uninstalled. The Web Service Application resource are all removed with its Web Application.

Since: 2.3

1720. When the Web Application is uninstalled, all instances of its Web Service Application SHOULD be removed.

Since: 2.3

7.2. Web Service Application Configuration Extensions

The following configuration extensions SHOULD be supported if WRT supports Web Service Application.

1730. Tizen Service Application

Element	<code><tizen:service></code>
Description	This element is used to indicate the basic information of the Web Service Application.
Context	Child of the <code><widget></code> element
Occurrence	0 or more

Attributes	<ul style="list-style-type: none"> • <code>id</code> (mandatory; unique ID of the Service Application in the <code><TIZEN_APPLICATION_ID></code> format (see <code><tizen:application></code> description in section "Tizen Configuration Extensions") • <code>auto-restart</code> (optional; Indicates whether or not this application is re-launched automatically when it is terminated. (available values: <code>true</code>, <code>false</code> (default))) • <code>on-boot</code> (optional; Indicates whether or not this application is launched automatically on device booting time. This attribute requires Partner level certificate. (available values: <code>true</code>, <code>false</code> (default)))
Example	<pre><tizen:service id="webService.application" auto-restart="true" on-boot="true"></pre>

Since: 2.3

Note: Service does not support encryption. Therefore, `encryption="enable"` in `<tizen:setting>` will cause fail during the package installation.

1740. Tizen Service Name

Element	<code><tizen:name></code>
Description	<p>This element is used to indicate the name of the Web Service Application.</p> <p>Note: <code>&amp;</code>, <code>&lt;</code>, and <code>&gt;</code> are used to express <code>&</code>, <code><</code>, and <code>></code> as the name of the Web Service Application in <code>config.xml</code> code.</p>
Context	Child of the <code><tizen:service></code> element
Occurrence	1 or more
Attributes	<ul style="list-style-type: none"> • <code>xml:lang</code> (optional; specifies the language of the service name (for available values, see the IANA Language Subtag))
Example	<pre><tizen:name>WebService</tizen:name> <tizen:name xml:lang="ko-kr">WebService</tizen:name></pre>

Since: 2.3

1750. Tizen Service Icon

Element	<code><tizen:icon></code>
Description	This element is used to indicate the icon of the Web Service Application.
Context	Child of the <code><tizen:service></code> element
Occurrence	0 or 1
Attributes	<ul style="list-style-type: none"> <code>src</code> (mandatory, file path of Web Service Application icon (path relative to the Web Application directory))
Example	<code><tizen:icon src="service-icon.png"/></code>

Since: 2.3

1760. Tizen Service Content

Element	<code><tizen:content></code>
Description	This element is used to indicate the start page of the Web Service Application.
Context	Child of the <code><tizen:service></code> element
Occurrence	1
Attributes	<ul style="list-style-type: none"> <code>src</code> (mandatory, start javascript file path of the Web Service Application (path relative to the Web Application directory))
Example	<code><tizen:content src="service/service.js" /></code>

Since: 2.3

1770. Tizen Service Description

Element	<code><tizen:description></code>
Description	This element is used to indicate the description of the Web Service Application.

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Context	Child of the <code><tizen:service></code> element
Occurrence	0 or 1
Attributes	None
Example	<code><tizen:description>Web Service Application</tizen:description></code>

Since: 2.3

1780. Tizen Service Metadata

Element	<code><tizen:metadata></code>
Description	This element supports metadata information shared with other Web Applications. The defined metadata can be accessed (read-only) through the Tizen Application API.
Context	Child of the <code><tizen:service></code> element
Occurrence	0 or more
Attributes	<ul style="list-style-type: none"> • <code>key</code> (mandatory, key must a unique string) • <code>value</code> (optional, string)
Example	<pre><tizen:metadata key="key1"/> <tizen:metadata key="key2" value="value"/></pre>

Since: 2.3

1790. Tizen Service Category

Element	<code><tizen:category></code>
Description	This element is used to indicate the categories that the app belongs to.
Context	Child of the <code><tizen:service></code> element

Occurrence	0 or more
Attributes	<ul style="list-style-type: none"> • name (mandatory)
Example	<tizen:category name="http://tizen.org/category/service" />

Since: 2.3

7.3. Web Service Application Runtime

1780. The Web Service Application Runtime SHOULD be able to execute ECMAScript 3rd edition.

Since: 2.3

1790. The Web Service Application Runtime SHOULD be able to execute “module” specification of the Common JS.

Since: 2.3

1800. The Web Service Application Runtime SHOULD be able to receive application events and invoke designated user callbacks.

- **onStart:** A callback for the service application that the service has begun.
- **onExit:** A callback for the service application that the service is going to stop.
- **onRequest:** A callback for the service application that the service has a request from another application

Since: 2.3

1810. The Web Service Application Runtime SHOULD load a user script that is set with <tizen:content> tag under <tizen:service> tag in the configuration.

Since: 2.3

1820. The Web Service Application Runtime SHOULD NOT provide a user interface by itself.

Since: 2.3

1830. The Web Service Application Runtime SHOULD be able to be launched by Application Control with an explicit application id.

Since: 2.3

1840. The Web Service Application Runtime SHOULD be able to handle Application Control with an explicit application id.

Since: 2.3

1850. The Web Service Application Runtime SHOULD keep running even if the launching application is terminated.

Since: 2.3

1860. The Web Service Application Runtime SHOULD be launched as an independent process.

Since: 2.3

1870. The Web Service Application Runtime SHOULD provide MessagePort API as a means of inter-process communication between applications.

Since: 2.3

7.4. Web Service Application Security and Privacy

1900. Web Service Application SHOULD support [Device API Security Policy](#)

Since: 2.3