

Tizen® 3.0 Compliance Specification for IVI Profile

Version 3.0

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Revision History

Revision	Date	Author	Reason for Changes
v0.1	11 Nov. 2013	Tizen TSG	Initial version
v0.2	11 Aug. 2014	Tizen TSG	Prepare for release
v0.3 / v0.4	Oct 2014	Intel IVI team	Internal review
v0.5	Nov 2014	Intel IVI team	Incorporate IVI team feedback
v0.6	Dec 5, 2014	Intel IVI team	Remove requirements not applicable to IVI
v0.8	Dec 10, 2014	Intel IVI team	New addition of spec docs with API spec
v3.0	Jan 5, 2014	Intel IVI team	Updated version to align with IVI 3.0 release

Glossary

Term	Definition
ABI	Application Binary Interface, the runtime interface between a binary software program and the underlying operating system.
API	Application Programming Interface, the interface between software components, including methods, data structures, and processes.
Compliance	Certified for full conformance, which was verified by testing.
Conformance	How well the implementation follows a specification.
CSS	Cascading Style Sheets, a simple mechanism for adding style (for example fonts, colors, and spacing) to web documents.
DOM	Document Object Model, a platform- and language-neutral interface that will allow programs and scripts to dynamically access and update the content, structure, and style of documents.
DTV	Digital Television, a target of the TV Profile.
HU	IVI Head Unit. The main console in a vehicle, located in the front. The head unit is the main interface and controls other devices in the car.
IOMMU	Input/Output Memory Management Unit.
IPTV	Internet Protocol Television, a target of the TV Profile.
IVI	In-Vehicle-Infotainment, a target of the IVI Profile. System used for entertainment, such as music, video, and games, along with information, such as navigation and web. A platform target for Tizen.
jQuery	Portable client-side JavaScript library.
LTE	Long Term Evolution, a telephone and mobile broadband communication standard.
Mobile	Portable, connected devices, such as phones and tablets. A platform target for Tizen.
NFC	Near Field Communication, a form of contactless communication between devices containing an NFC tag, such as smartphones , tablets, smart signs, kiosks

Term	Definition
	etc.
REST	Representational State Transfer, design model used by the World Wide Web based on a client/server architecture where the client requests information and the server processes the request and returns information.
SDB	Smart Development Bridge, a device management tool in the Tizen SDK.
STB	Television set-top box, a target of the TV Profile.
Side loading	Installing applications or components other than from a certified application installer package.
Smack	Simplified Mandatory Access Control Kernel, an access control technology used by Tizen to protect data and prevent malicious programs from causing harm.
UI	User Interface, the widgets, theme, and layout of software components displayed on the device screen through which the user interacts with the device. Usually refers to the visual software elements but may also include hardware buttons or controls.
UX	User experience, the effect that the design of a system (both software and hardware) has on the user of the system.
Tizen Web API	Collection of Tizen web programming interfaces for applications. Includes approved specifications generically known as HTML5, as well as additional interfaces such as Tizen Web Device API and Tizen Web UI FW.
WPS	Wi-Fi based Positioning System.

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1. Overview

This specification defines the operating environment of the Tizen platform. It is intended to be used by both In-Vehicle-Infotainment (IVI) Head Unit (HU) device implementers and application developers to enable the development of portable application software.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" used in this document are to be interpreted as described in [ref. 3].

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1.1. Why Compliance?

Tizen Compliance is designed to ensure IVI device implementations and applications work together.

1.2. Target Audience

This specification is intended to be used by:

- **Application developers:** know how to create compatible applications that work across multiple devices, and how Tizen IVI HUs will behave.
- **IVI HU implementers:** know how to implement device hardware, security configurations, services, APIs, etc.
- **Tier 1 Automotive Suppliers:** know how to customize and enhance an IVI HU, while remaining within compliance guidelines.

1.3. Tizen Compliance Model

To become Tizen compliant, a device **MUST** obtain Tizen Compliance certification from the Tizen Association for at least one Tizen Profile by satisfying the requirements of the Tizen Compliance Specification and passing all of the Tizen Compliance Tests for that profile

A Tizen Profile describes the requirements for a category of Tizen devices that have a common application execution environment. Applications are created for a specific target profile and can run on devices compliant to that profile.

- **IVI HU implementations:** if implemented to a profile, a HU will provide applications with consistent behavior defined by that profile, as well as a consistent user experience.

- **Applications:** if built to a profile, applications will run on HUs that are compliant to the profile.

The Tizen Compliance Tests for a profile will measure conformance to the Tizen Compliance Specification for that profile.

Note: This specification describes only the compliance requirements for the Tizen IVI Profile. Other supported profiles have their own related specifications.

1.4. Revision Policy

There will be a distinct release of the specification, as well as matching compliance tests, for each distinct release (version) of the Tizen platform. Updates may be issued between releases, if deemed necessary. All compliance requirements for the IVI Profile specification must be approved by the Tizen Technical Steering Group (TSG) and may change from time to time, only by approval of the Tizen Technical Steering Group.

1.5. Tizen Source Code Modification Policy

All Tizen implementations MUST provide the full behavior of the Tizen API and application execution environment as defined by the Tizen Profile for its device category. The best way to accomplish this is by using the source code for the Tizen reference implementation. If modifications or replacements to the source code must be made, the implementer is responsible for making sure that there is no impact on compliant applications. The Tizen Compliance Tests may be used to measure the correctness of the implementation, but in case of ambiguities, errors, or incompleteness of this specification or of the Tizen Compliance Tests, the final arbiter of compatibility is the behavior of the Tizen reference implementation.

1.6. References

The following external specifications and other documents are referenced by this specification.

Normative References

1. [N] Tizen Web Runtime Core Specification 2.3:
<https://source.tizen.org/sites/default/files/page/tizen-2.3-wrt-core-spec.pdf>
2. [N] Tizen 3.0 Crosswalk APIs for IVI
3. [N] IETF RFC 2119 "Key words for use in RFCs to Indicate Requirement Levels":
<http://www.ietf.org/rfc/rfc2119.txt>
4. [N] ISO 18092 "Near Field Communication – Interface and Protocol (NFCIP-1)":
[http://standards.iso.org/ittf/PubliclyAvailableStandards/c038578_ISO_IEC_18092_2004\(E\).zip](http://standards.iso.org/ittf/PubliclyAvailableStandards/c038578_ISO_IEC_18092_2004(E).zip)

5. [N] W3C Widget Access Request Policy (W3C Recommendation 7 February 2012 version): <http://www.w3.org/TR/widgets-access/>
6. [N] W3C Vehicle Web API:
 - a. Information Access API: https://rawgit.com/w3c/automotive-bg/master/vehicle_spec.html
 - b. Data API: http://rawgit.com/tripzero/automotive-bg/master/data_spec.html

Informative References

7. [I] NFC Specifications: <http://www.nfc-forum.org/specs/>
8. [I] Smart Development Bridge: https://developer.tizen.org/documentation/dev-guide/2.3.0?redirect=org.tizen.gettingstarted/html/dev_env/smart_development_bridge.htm
9. [I] Tizen Privilege Guide: https://developer.tizen.org/documentation/dev-guide/2.3.0?redirect=org.tizen.gettingstarted/html/tizen_overview/security.htm
10. [I] Tizen Application Filtering: https://developer.tizen.org/documentation/dev-guide/2.3.0?redirect=org.tizen.gettingstarted/html/tizen_overview/application_filtering.htm
11. Application Controls for Tizen web applications: https://developer.tizen.org/documentation/dev-guide/2.3.0?redirect=org.tizen.mobile.web.appprogramming/html/guide/app_guide/application_service.htm
12. [I] Tizen Web Application Security and Privacy: https://developer.tizen.org/documentation/dev-guide/2.3.0?redirect=org.tizen.mobile.web.appprogramming/html/basics_tizen_programming/web_security_privacy.htm
13. [I] Tizen Web Application Package Manager: https://developer.tizen.org/documentation/dev-guide/2.3.0?redirect=org.tizen.mobile.web.appprogramming/html/basics_tizen_programming/application_package_manager.htm
14. [I] Document Object Model (DOM) Level 3 Events Specification: <http://www.w3.org/TR/DOM-Level-3-Events-key/>

2. IVI Profile Software Compliance

This chapter describes the software requirements that implementers MUST meet to create a compliant Tizen IVI device.

2.1. General Principles

IVI device implementations MUST include support for the Tizen Web API.

- The IVI device implementation MUST accurately report the presence or absence of optional hardware and software features (see section 2.5) as platform attributes.

- If an IVI device implementation reports that it supports a particular optional hardware or software feature, it **MUST** implement the entire corresponding API.
- Whether an IVI device implementation supports or does not support a particular optional hardware or software feature, the compliance tests **MUST** be passed. If the feature is not supported, the corresponding API **MUST** return the unsupported return value, as described in sections 2.2.4 for Web API.

2.2. Tizen Web APIs

2.2.1. Namespace

IVI device implementations **MUST NOT** modify the API namespace listed in the Tizen Web Device API Reference [ref. 3], including `tizen.*`.

2.2.2. Tizen Web API Categories

The specific API versions and cross referenced links are available in [ref. 2], except where noted below.

- **W3C/HTML5 APIs:** include the standard APIs defined by W3C, such as HTML5, CSS3, and Widget Specification.
- **Supplementary APIs:** non-W3C specifications, such as WebGL, Typed Array, FullScreen API, and viewport Meta Tag.
- **Web Device API:** defined by the Tizen project to facilitate the development of web applications by accessing various device features not fully covered by W3C APIs. The APIs enable interacting with device features, such as alarm, Bluetooth, content, file system, and system information.
- **W3C Vehicle Information API:** an Open Web Platform standard for HTML5/JavaScript application developers enabling Web connectivity through in-vehicle infotainment systems and vehicle data access protocols. See reference [ref. 6]

2.2.3. Preliminary Web APIs

The Tizen Web API includes some preliminary Web API specifications which are in an early stage in the development cycle. Preliminary revisions are referred to as Editor's Draft (ED), Working Draft (WD), and Last Call Working Draft (LCWD). Application developers are cautioned that APIs in these specifications could be modified in a future version of Tizen to align with the developing progress of specifications. Note that some Crosswalk API implementations may differ from Tizen 2.x web runtime implementations. The full list of preliminary Web APIs supported by Crosswalk for IVI are indicated in the *Tizen 3.0 Crosswalk APIs for IVI* document which includes links to the W3C/HTML5 specification. See [ref 1] and [ref. 2].

IVI device implementations MUST support all Tizen Web APIs listed in the normative references area, including those indicated as preliminary.

2.2.4. Behavior of Unsupported APIs

IVI device implementations MUST NOT omit any web API listed in the Tizen Web API specification, except those specified as optional in section 2.5.1 and not supported on the device. Optional APIs are dependent on particular hardware or software availability.

If an optional API is not supported on the device, it MUST return “undefined” when a whole module is not supported. For example, an attempt to access `tizen.bluetooth` MUST return “undefined” if the bluetooth module is not supported on the device. In case APIs in a module depend on a certain optional feature, those APIs MUST report `NotSupportedError` if the feature is not present. For example, if MMS is not supported on the device, an attempt to call `tizen.messaging.getMessageServices("messaging.mms", successCallback)` MUST report `NotSupportedError`.

2.3. Application Control

The application control interface (`AppControl`) in the Tizen Web API enables launching an application directly using an app ID or invoking specific application functionality remotely through IPC.

A Tizen application may register itself as an `AppControl` provider. The available `AppControl` values can be queried and invoked by another Tizen application.

IVI device implementations MUST provide the `AppControl` to be registered by Tizen applications. There is no mandatory platform `AppControl` in this profile.

Further details on Application Controls are provided in the developer documentation. (See [ref. **Error! Reference source not found.**])

2.4. Platform Attributes

HU implementations MUST provide accurate platform attributes through the System Information API for the Tizen Web API.

Platform attributes include the following:

- Device capabilities (see section 2.5)
- Information about data storage devices
- Display information
- Information about the device orientation
- Locale information
- Network information

2.5. Optional APIs

The Tizen API may depend on available hardware capabilities and, in some cases, on software capabilities. Optional software features may be capabilities not part of the publicly available stack, or may require hardware capability that is beyond the minimum HU requirement (such as higher processing power/memory) (See section 3.1 for minimum hardware requirements).

HU implementations MUST NOT omit any API listed in the API specification, except those specified as optional in this section. Optional APIs are dependent on particular hardware or software availability.

- Optional hardware: Hardware is optional, but if present its corresponding API MUST be supported or the API MUST return “undefined” as described in section Behavior of Unsupported APIs.
 - Web: Bluetooth, telephony, MMS, NFC, camera, microphone, sensors, Location (GPS), Wi-Fi.

For more detail, see the optional Tizen Web APIs [ref. 2].

HU implementations MUST support the System Information APIs to report device capabilities. Capability information can be used by application stores to check the capabilities of a given device and to select applications that will run with full capabilities on the device.

2.5.1. Tizen Web API

The Tizen Web APIs specified as optional in [ref. 2] will not be implemented if a HU implementation does not include those features. These features can be used to filter out applications by using the SystemInfo API. The HU implementation MUST accurately report the availability of these features through the Tizen Web API `SystemInfo` API.

2.6. Privilege

Certain APIs have access to privacy-sensitive information or have security or stability implications. If an application uses such APIs, then appropriate privileges MUST be declared in the configuration document for the application.

Privilege is affected by the privilege levels described below. In addition to declaring the privilege, the application MUST have access to the required privilege level:

- Public: for all Tizen developers
- Partner: for trusted application developers (for using security-sensitive API)
- Platform: for OEMs/Tier 1 automotive suppliers (for development of preloaded applications)

See the Tizen Privilege Guide [ref. **Error! Reference source not found.**] for detailed information of the privilege level.

If an application declares a privilege that requires a level higher than public, and the application is not signed with a certificate granting it access to that level, then the implementation MUST block installation and execution of the application.

2.6.1. Tizen Web API

If a web application does not declare a required privilege in the *config.xml* file, access to the corresponding API MUST throw `SecurityError` as specified in the Tizen Web Device API Reference [ref. 2]. HU implementations MUST support this mechanism.

HU implementations MUST NOT change the semantics of permissions as documented in the Tizen Web Application Security and Privacy [ref. **Error! Reference source not found.**] for applications using the Tizen Web API.

2.7. Multi User Support

Tizen IVI systems must support multiple user accounts and appropriate security access control privileges, and relative paths. Specifically:

- All common paths must be derived from TZ-Platform-config (see multi user Meta data: https://wiki.tizen.org/wiki/Multi-user_Platform_Metadata)
- The shared media directory MUST be defined as multiuser Meta data (called platform config). Directories must not be hardwired.

2.8. Application Packaging Compatibility

Tizen defines a mandatory application packaging format. HU implementations MUST correctly process packages in this format. They MUST NOT extend this packaging format in a way that would prevent packages generated on the implementation from running on other conforming HU implementations.

Nothing in this section precludes HU implementations from supporting additional packaging formats outside the requirements of this specification.

2.8.1. Web App Package Support

HU implementations MUST be able to install, remove, list, and update Web application packages in the *.wgt* format as described in the Tizen Web Runtime Core Specification [ref. 1].

2.9. Web Runtime

2.9.1. Tizen Crosswalk

HU implementations MUST support all mandatory requirements in the Tizen Crosswalk Runtime Core Specification. See [ref. 1], [ref. 2], and [ref. **Error! Reference source not found.**].

The Web Runtime implementation on HU implementations MUST be based on Tizen Crosswalk. Any customizations made by device implementations MUST NOT alter the original web exposed behavior, based on version 10 of Crosswalk or higher.

2.10. Security

The following are security requirements for Tizen platforms.

- The device MUST follow the Linux standard security model, including:
 - Applications MUST run under a non-root user ID.
 - An application MUST be allowed to read and write files in its home directory and shared media directory as defined by the TZ_USER_CONTENT variable in the Multi-user Platform Metadata.
- Smack-based access control and process isolation:
 - The device MUST have a Linux kernel including all Smack features from Linux kernel version 3.5 or later, and the Smack features MUST be enabled.
 - All applications SHOULD run with Smack labels different from the predefined Smack labels.
- Secure execution environment:
 - All applications shall be launched by the application FW (native and HTML5) which will launch the application in the right user isolated and secured environment.
- Smack supported modules:
 - The device MUST contain coreutils, d-bus, udev, and Xorg with Smack capability enabled by Tizen. If coreutils is not included the device MUST provide an equivalent package (e.g. busybox or toybox) that provides support of the Smack option in their base command.
 - If the device supports RPM packages, the device MUST contain the Tizen RPM security plugin.
- Privileged information:
 - The device MUST NOT allow any other privilege than the permissions described in the application's manifest file.

2.11. Multimedia

The following media formats/codecs MAY be supported by HU implementations.

Please note that the Tizen Technical Steering Group makes no representation that these codecs are unencumbered by patents. Implementation of these codecs MAY require patent licenses from the relevant patent holders.

Format	Codec
Audio codec (Decoder)	AAC LC
	AAC+
	Enhanced AAC+
	AMR-NB
	AMR-WB
	MP3
	Vorbis
	PCM (raw PCM)
Audio codec (Encoder)	AAC LC
	AMR-NB
	Raw PCM
Video codec (Decoder)	H.263
	H.264 HP
	MPEG-4 part 2
Video codec (Encoder)	H.263
	H.264 HP
	MPEG-4 part 2
Image codec (Decoder)	BMP
	GIF
	JPEG
	PNG
Image codec (Encoder)	JPEG
	PNG
	BMP

Type	File Type/Container Format
Audio	MPEG-4 (.mp4, .m4a)
	AMR (.amr)
	MP3 (.mp3)
	Ogg (.ogg)
	WAV (.wav)
Video	3GPP (.3gp)
	MPEG-4 (.mp4)
Image	BMP (.bmp)
	GIF (.gif)
	JPEG (.jpg)
	PNG (.png)

2.12. Developer Tools

HU implementations MAY include services that enable communication with the Tizen SDK, enabling the following development tasks:

- Smart Development Bridge [ref. **Error! Reference source not found.**].
SHOULD support all SDB functions to interact with the Tizen SDK. The sdbd (SDB daemon) SHOULD support all commands documented in the SDB Commands section of the SDB reference.
- Log View [ref. 2].
SHOULD support the function to retrieve the dlog (Tizen platform log).

If a HU implementation is unrecognized by the SDB, HU implementers SHOULD provide suitable device drivers, allowing developers to connect the device using the SDB.

The implementation MAY permit side loading through SDB, for development purposes, of applications not signed with a distributor signature.

2.13. Tizen Compliance Tests

The Tizen Compliance Tests (TCT) for IVI verify conformance to the requirements of this specification. Platforms MUST pass the TCT to be considered Tizen compliant.

3. IVI Profile Hardware Compliance

This chapter describes mandatory and optional hardware components. If a HU includes an optional hardware component that has a corresponding API, the implementation MUST implement that API as described in this specification.

3.1. Mandatory Hardware Requirements

These minimum hardware features MUST be provided by a compliant HU implementation.

3.1.1. Memory Storage

A Tizen HU MUST have at least 1GB of RAM and at least 4 GB of internal storage.

HU implementations MUST allow a host computer to access files in the folder defined by the TZ_USER_CONTENT variable in the Multi-user Platform Metadata, and all subdirectories of that folder. The precise method is unspecified. Two optional methods are USB mass storage (UMS) and Media Transfer Protocol (MTP).

3.1.2. Sound

HU implementations MUST support at least one audio output.

3.1.3. Connectivity / Networking

HU implementations SHOULD support at least one form of data networking capable of accessing the Internet. Examples of acceptable data networking technologies include Wi-Fi, LTE, HSPA, etc. Implementations MAY omit any individual mechanism, as long as at least one method is supported.

3.1.4. Display

HU implementations SHOULD provide a minimum screen resolution of 320x480(HVGA). However, it is strongly recommended to use a display resolution of 480x800 (WVGA) or 720x1280 (HD) for a HU implementation. The Tizen reference implementation has only been validated with these two display resolutions.

The screen orientation MAY be fixed or dynamically rotatable at 90 degree angles.

HU implementations SHOULD support a 32-bit frame buffer.

3.1.5. USB

HU implementations MAY provide USB host functionality.

The implementation MUST support:

- USB 2.0 or later
- the Smart Development Bridge (SDB)

3.1.6. Input Devices

HU implementations MUST provide applications a means of receiving keyboard input from users.

- A soft keyboard MUST be implemented.
- A soft keyboard or an input method setup MUST be able to support entry of all keys found on a QWERTY keyboard. For example, a 12 key number pad can allow a user to enter alphabetical letters through multiple presses of a numeric key.

HU implementations SHOULD include a touchscreen capable of single touch. Multi-touch capability is recommended, if possible.

3.2. Optional Hardware Requirements

If a HU includes an optional hardware component that has a corresponding API, the implementation **MUST** implement that API, as described in this specification.

HU implementations **MUST** accurately report the presence of optional hardware components in:

- the Tizen Web API `SystemInfo` API

3.2.1. Graphics

A HU implementation **MAY** omit 3D Graphics hardware acceleration. However, it is strongly recommended that it include hardware acceleration, to provide the best possible user experience on the device.

3.2.2. Sensors

A HU implementation **MAY** omit any and all sensors listed in this specification. If an implementation provides any sensor from this specification, it **SHOULD** meet the specific requirements for that sensor type.

HU implementations **MUST** accurately report the presence or absence of sensors.

3.2.3. Telephony

A HU implementation **MAY** support cellular connectivity to provide telephony features through cell phones. If an implementation includes telephony hardware, it **MUST** support voice calls and the messaging API (SMS) using cellular technologies.

HU implementations **MUST** accurately report the presence or absence of telephony.

If Telephony is supported, the implementation **MUST** provide hands-free support via Bluetooth.

3.2.4. Bluetooth

A HU implementation **MUST** have Bluetooth capability and **MUST** support the Bluetooth API.

HU implementations **SHOULD** implement the Audio/Video Remote Control Profile (AVRCP) and the Object Exchange (OBEX) protocol.

3.2.5. Wi-Fi

A HU implementation MAY omit Wi-Fi capability. If an implementation includes Wi-Fi hardware features, it MUST support the Wi-Fi API.

HU implementations MUST accurately report the presence or absence of Wi-Fi.

3.2.6. NFC

A HU implementation MAY omit NFC capability. If an implementation includes NFC hardware, it MUST support the NFC API.

HU implementation MAY omit NFC reserved push even if NFC hardware is included in the implementation.

HU implementations SHOULD read/write NFC Data Exchange Format (NDEF) messages in NFC standard formats, such as NFC Forum Tag Types 1, 2, 3, and 4.

A Tizen HU SHOULD support sending and receiving data using the following standards [ref. 7]:

- NFCIP-1 (ISO 18092)
- LLCP 1.0
- SNEP 1.0

HU implementations MUST accurately report the presence or absence of NFC.

3.2.7. Input Devices

A HU implementation MUST have a microphone for voice activation, specifically to support hands-free calling. HU implementations MUST accurately report the presence of a microphone.

4. IVI Profile Application Compliance

This chapter provides information for application developers to aid them in creating applications that will run on Tizen IVI compliant devices.

4.1. API Use

Applications **MUST** use only the APIs defined in the Tizen Web API specification when making calls external to the application. Compliant web applications **MAY** also use any RESTful web APIs implemented using HTTP and the principles of REST (Representational State Transfer).

Web applications **MAY** also use RESTful APIs provided by other open services, as well as JavaScript libraries included in the resources of the application, subject to the condition that the web application's configuration specifies the REST API domain in the `<access>` tag, according to the W3C Widget Access Request Policy [ref. 5].

4.2. Application Packaging

Applications **MUST** follow the packaging guidelines, as defined for the platform. See [ref. **Error! Reference source not found.** and ref. 1].

4.3. Namespace

Applications **SHOULD** include a namespace, such as: `<company>.<application>`. Applications **MUST NOT** overwrite the Tizen API namespaces.

4.4. Application Features and Privileges

A Tizen application **MUST** declare the features and privileges that it uses in the configuration `config.xml` file included in the application package. Further details on how to implement this requirement are provided in the developer documentation. See [ref. **Error! Reference source not found.** and ref. **Error! Reference source not found.**].

The application **SHALL** be granted privileges only for the listed APIs. In some circumstances, user consent **MAY** be required before a privilege is granted. User consent may be requested at install time or at access time.

The Tizen Web API configuration document (`config.xml`) uses syntax as shown in these examples:

```
<feature name="http://tizen.org/feature/network.bluetooth"/>
<tizen:privilege name="http://tizen.org/privilege/application.launch"/>
```

4.5. Profile Declaration

A Tizen application MUST declare the Tizen profile it is capable of running on. If this declaration is omitted, application stores MAY not correctly select the application for installation. For the Tizen IVI profile, the following declarations style is used.

In the Tizen Web API configuration document (*config.xml*):

```
<widget xmlns="http://www.w3.org/ns/widgets"
  xmlns:tizen="http://tizen.org/ns/widgets" ...>
  <tizen:profile name="IVI"/>
```

Appendix A. Additional Information

This chapter contains tables of information providing further details for API aspects referenced elsewhere in this specification.

A.1. Tizen Application Control

Browse a webpage		
1	operation	http://tizen.org/appcontrol/operation/view
	uri	http://[PATH]
2	operation	http://tizen.org/appcontrol/operation/view
	uri	https://[PATH]
Display an image		
3	operation	http://tizen.org/appcontrol/operation/view
	uri	file://[PATH]
	mime	image/bmp
4	operation	http://tizen.org/appcontrol/operation/view
	uri	file://[PATH]
	mime	image/jpeg
5	operation	http://tizen.org/appcontrol/operation/view
	uri	file://[PATH]
	mime	image/gif
6	operation	http://tizen.org/appcontrol/operation/view
	uri	file://[PATH]
	mime	image/png
Play a sound		
7	operation	http://tizen.org/appcontrol/operation/view
	uri	file://[PATH]

	mime	audio/aac
8	operation	http://tizen.org/appcontrol/operation/view
	uri	file://[PATH]
	mime	audio/amr
9	operation	http://tizen.org/appcontrol/operation/view
	uri	file://[PATH]
	mime	audio/mp3
10	operation	http://tizen.org/appcontrol/operation/view
	uri	file://[PATH]
	mime	audio/wav
Play a video		
11	operation	http://tizen.org/appcontrol/operation/view
	uri	file://[PATH]
	mime	video/mp4
12	operation	http://tizen.org/appcontrol/operation/view
	uri	file://[PATH]
	mime	video/3gpp
Select a file		
13	operation	http://tizen.org/appcontrol/operation/pick
	mime	*/*
14	operation	http://tizen.org/appcontrol/operation/pick
	mime	image/*
15	operation	http://tizen.org/appcontrol/operation/pick
	mime	video/*
16	operation	http://tizen.org/appcontrol/operation/pick
	mime	audio/*

Appendix B. Web Runtime 2.3 Spec Waiver

This document references *[N]* *Tizen Web Runtime Core Specification 2.3*: <https://source.tizen.org/sites/default/files/page/tizen-2.3-wrt-core-spec.pdf> used by Tizen 2.3 compliance profiles. It describes the Tizen 2.3 webkit-based runtime. Many of these features are the same for the Tizen 3.0 Crosswalk-based runtime but there are exceptions. This section highlights these exceptions. This appendix will be removed in the future when a full *Tizen 3.0 Web Runtime Core Specification* based on Crosswalk is created.

The table below includes the section from the 2.3 specification and whether it is supported and required for Tizen 3.0 for IVI compliance.

Section Number	Section Title	Notes	Supported and Required
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1	Web Application Package Management		Yes
2	Tizen Configuration Extensions		Yes
3	Web Application Runtime		Yes
4	Web Application Runtime UI		Yes
5	Web Application Security and Privacy		Yes
6	Web Dynamic Box		No
7	Web Service Application		No