Security for Mobile Widgets to access Device API's

Introduction to Widgets

Widgets are small WEB applications, built using standard WEB technologies, which help to enhance the user's mobile web experience and also help increase the Mobile Internet usage for the frequently used or personalized web content. The standard WEB technologies that are used to build widgets are HTML, CSS, JavaScript, XML and AJAX. Widget applications such as Weather Forecasters, News Readers, Currency Converters, Clock, Games etc. can be developed.

Why Mobile Widgets are required?

1. Mobile Widgets are generally single purpose applications, wherein the end-user views the re-formatted and specialized WEB content. Ease of usage is the key element for the Mobile Widgets, whereby the user need not have to type any URL, configure the settings and so on. Mobile Widgets aim at providing better user experience.
2. Bring the services and WEB content available on the Internet to the Mobile, in a more useful format for the user, without having to re-create the same.
3. Using the Mobile Widget, content delivery can be optimized for efficient bandwidth usage and in turn result in cost effectiveness for the end-user.
4. Mobile Widgets shall be tool for developer for deploying any application on the Mobile Device without worrying about the languages that are supported by the Mobile Device (like C, C++ and J2ME).

Importance of Mobile Widgets in Emerging Market

Specifically in the Emerging Market, the only means of access to Internet will be through the mobile phone. For most of them, Mobile Phone will be their first personal gadgets that they are using, other than their TV's and Radio. These users may not go and browse the Internet using the WAP/WEB Browser, but it is very important to provide content that these users are interested on it without complicated user interface using the Mobile Widget.

Widget Application

1. Mobile Device's are personal and the widget application should be personalized to the user needs and requirements.
2. Location of the mobile device is important information that can be used for building the widget application to enhance the user experience and get the required and relevant information. Location based services can be local maps, local offers, local weather report, people tracking.

3. Mobile Commerce (m-commerce) refers to the ability to conduct a commercial transaction over a mobile device. Here the mobile device can be used as a valid authentication tool to conduct the commercial transaction.

Mobile Widget as an Object

Mobile Widget can be embedded within the WEB page. In this case, the user is not going to download the widget and the widget got download as part of the WEB page itself; so more restricted access has to be provided by the widget framework.

Accessing the Mobile Feature using Device API's

In order to develop different kind of application using the Widget Framework, it is not sufficient to develop using the standard JavaScript. The framework should allow accessing the Mobile Features as well so that more innovative mobile application can be developed using the widget framework in short time.

The following are the few mobile features that should be allowed to access:

1. Messaging – Sending of SMS, MMS and E-Mail. It will be added advantage if the widget can register to receive the particular SMS message.
2. Gallery – to access the image, video and sound clips.
3. Persistent Data Storage – this is specifically required for the widget to store its data to the persistent storage
4. Phone Status such as signal strength, battery strength, operator information, sound level and so on.
5. Contact List – should be provision to retrieve and add contacts.
6. Location information to provide the current location of the mobile device.
7. Camera to capture the new image/video.
8. To Do List – should be provisioned to add, edit and delete the To Do List content.
9. Calendar – should be able to add, edit or delete the calendar entries.
10. Integration with the home screen.
11. Communication channel such as Bluetooth or IRDA. This can be used to connect to the printer or other devices.

But providing the mobile features free of access without restriction may be against the user privacy.

Framework Security

The widget configuration should contain list of mobile features that are used by the application. During the installation of the widget, the user confirmation should be obtained for accessing the mobile features. The widget framework should not allow accessing of the mobile features that are not specified in the configuration.

The framework itself should provide certain level of security, where it should asks for the user confirmation before accessing the mobile features. The access information can be stored and re-used for the subsequent access. The user should be able to clear the access information.

The widget framework should visually represent the list of features that are used by the widget. This shall give the Mobile User clear indication on what are all the services that shall be used by the application.

Storage access

Widget framework shall allow the widgets to store the session information on the persistent storage of the mobile device without any additional security. This shall allow the widget to store the session and user preferred information to the persistent data and can be re-used. This persistent data is internally handled by the Widget framework and the Widget shall be able to read and write the data to it.

When the widget is uninstalled the Widget framework shall delete this persistent data as well. When the SIM has been changed, the persistent data needs to be cleared by the Widget framework.

Digital Signature

In order to authenticate the Widget Developer, the widget can be digital signed. This is the traditional method of signing any application to authenticate the source of the application. This should not be mandated for all the widgets and only when specific mobile features are accessed then this can be made mandatory. Even if it is not digital signed, the Widget Framework should allow accessing of this feature with the user confirmation.

Security Grid

Mobile Features	Digital Signature	Framework Security	Comments
Messaging – Sending		√	
Gallery	√	√	
Persistent Data Storage	√	√	
Phone Status			Free Access
Contact List	√	√	
Location Information	√	√	
Camera		√	
To Do List	√	√	
Calendar	√	√	
Integration with Home Screen		√	

Communication Channel such as Bluetooth/IRDA		√	
Session Storage Access			Free Access
Phone Information like IMEI Number, Mobile Number	√	√	