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TRUSTWORTHY WIDGET SHARING

WIDGET SHARING

Widgets are small applications for mobile devices. They have access to sensitive resources, such as the user's data, camera and microphone, and to capabilities, such as making phone calls, sending SMS messages, or connecting to the Internet.

Access eg. to
- **Address book**
- **User Data**
- **Location Data**
- **Making calls**
- **Internet**
- **Microphone**
- **Camera**

A *widget sharing system* provides support for discovering widgets from multiple developers, comparing them on different aspects such as functionality, operating requirements and trustworthiness, and installing chosen widgets.

In the past, widget platforms were closed, and the limited group of developers were accredited. Malware was non-existent. As widget development has become open to everyone and their capabilities grown, malicious widgets are a genuine concern.

TRUST VS. RISK

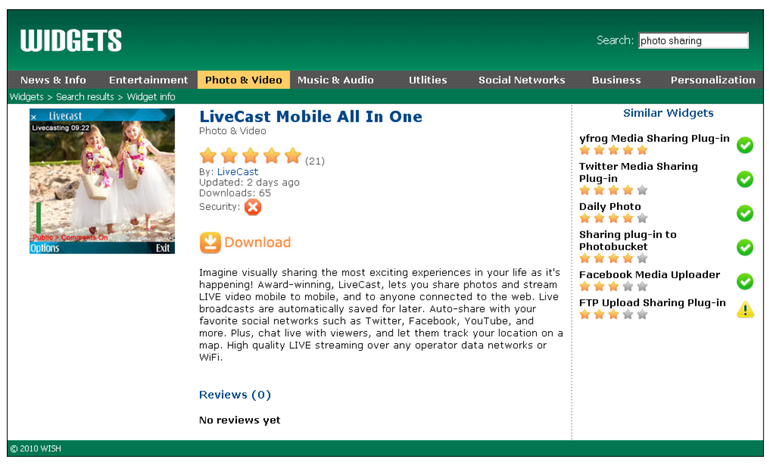
Trust is the willingness to rely on another, considering the risks and incentives involved. *Risks* from running a malicious widget range from loss of money (e.g. via unauthorized outbound phone calls) to violations of privacy (e.g. eavesdropping the user through the phone's microphone or camera, or sending out the user's address book without permission).

Users must trust a widget to install and run it, and they need the support of the widget sharing platform for evaluating the risk they take in installing a given widget. At the same time, the widget sharing system also creates incentives for the user to install specific widgets, by providing recommendations of widgets the user might find interesting.

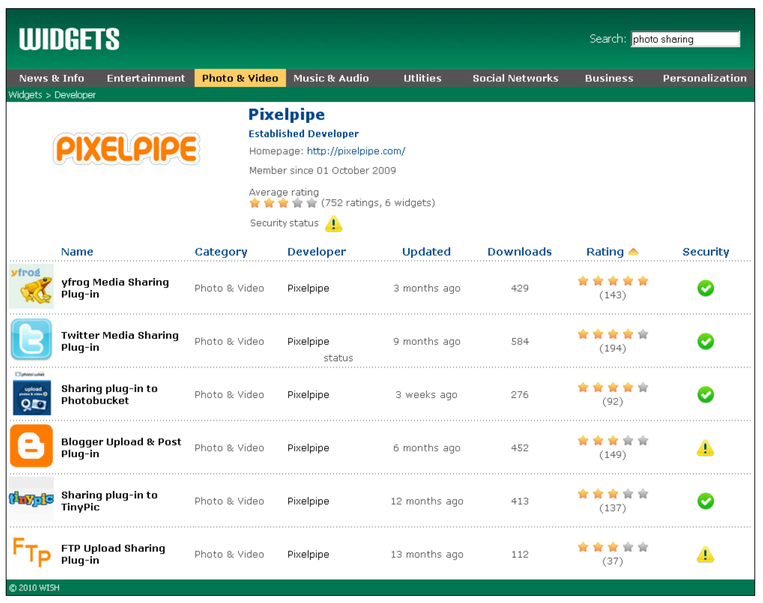
TRUST ELEMENTS

The user interface of the widget sharing system contains both recommendation elements, to encourage the user to choose a widget, and risk evaluation elements, to support the user's trust decision.

Recommendation elements include information about the widget's capabilities (description, screenshot), its popularity (downloads, ratings), and as suggestions of other, related widgets. Risk evaluation elements include feedback from other users (reviews), the security status of the widget, and the access requirements the widget has in order to operate (not shown in the figure).



The security status of the widget is based on users reporting issues, such as bugs in the widget, through a separate issue tracker system. These issues can be categorized as minor (e.g. glitches) or major (e.g. sends out credit card information unencrypted) from a security perspective, and the existence of such issues is shown in the widget sharing system.

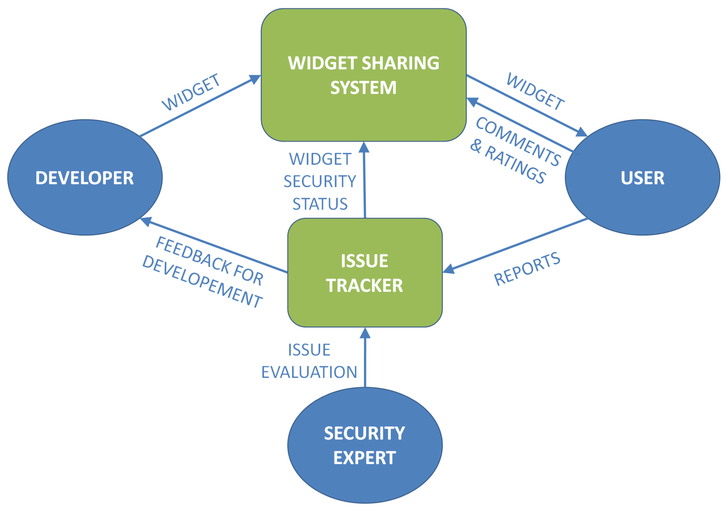


The system collects reputation information on each developer. This information is aggregated from the risk and recommendation data on each of the developer's widgets.

In addition to summaries, the system interprets the information to produce descriptive characterizations, such as "established developer", or "newbie developer", based on public criteria. This step helps the users interpret the reputation information.

ARCHITECTURE

There are three types of actors in the widget sharing system architecture: developers, users and security



Developers produce new widgets to be shared through the system, and may publish new versions of the widgets as bugs are found and fixed, or new features added. Users download widgets, give feedback through ratings and reviews, and submit bug reports to the issue tracking system. Security experts act as moderators for the issue tracker, overseeing that security relevant bugs are correctly categorized. They can be expert users; their main role is to ensure that developers cannot selectively skew the security status of their own widgets.

EVALUATION

The widget sharing system has been implemented as a prototype. Its usability has been evaluated through user experiments, consisting of a combination of web questionnaire and semi-structured interviews.

Initial results from the user experiments show that newbie users have trouble selecting relevant information for evaluating the risk of installing a widget. They are in particular need of information that has been analyzed and interpreted for them. Expert users, in contrast, are more capable of interpreting information themselves, and selecting the relevant information for their decisions.