Network impact of Web access to device APIs

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Background

In our work for the Internet Society (ISOC) we are focused on the continued operation of the global Internet, taking a holistic approach to identify issues and opportunities in technology development and deployment for open networking. Many network growth opportunities and issues cross boundaries and cut into competing interests.

Our purposes are to:
- Identify and help elaborate such cross-boundary network issues.
- Promote resolution of cross boundary network issues through open dialog and collaboration of involved entities, in appropriate fora.
- Promote and validate the open collaborative Internet development model.

We are also concerned with identifying forces towards islands of networking and multiple networked realities. We aim to drive the development and acceptance of a modern understanding and consistent implementation of the end-to-end principle[1] of the Internet. Furthermore, we aim to support development and deployment of key technologies for ensuring a stable and secure Internet infrastructure.[2]

These core aims and objectives lead us to have interest in the nascent work to extend the functionality of the web to encompass access to device APIs, and this interest arises in three main areas, detailed below.

Network impact

We are interested in understanding how extending the web to encompass access to device APIs might impact the network layer and whether there are other potential effects on network usage arising from this direction in web development. Today, a considerable proportion of unwanted traffic on the network has its origin in poorly secured hosts running vulnerable releases of software. In a sense, web applications may improve security, as hosts using these applications are more likely to be running the latest code. However, exposing device APIs to the web may increase the potential for remote exploits leading to new generations of network worms and bots.

Impact on the network may also arise as a result of web applications driving new patterns of network usage. IP networks are typically dimensioned based on assumptions about end-host behaviour that are increasingly invalid. As more traffic is machine-to-machine and as more bulk transfers take place in the

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[1] The Rise of the Middle and the Future of End-to-End (RFC3724), Section 2, A Brief History of the End-to-End Principle, http://www.ietf.org/rfc/rfc3724.txt
[2] ISOC's position is more fully elaborated on the ISOC website, http://isoc.org/

background to other online activities, new pressures are placed on network operators as they attempt to manage their networks cost effectively and fairly for all their customers. While we do not think of the network as a static entity nor consider that these impacts are necessarily negative, we are keen to explore the potential for increasingly sophisticated web applications to drive similar, or other equally disruptive, patterns of network usage.

Open interfaces

Where architectural choices arise we are keen to assert the pre-eminence of open interfaces. The gross functionality of the network should not depend on use of proprietary equipment. Open interfaces also serve to maximise the potential for the development of innovative new uses for the network, which increases the value of the network to all.

Layering

Finally, we are motivated to emphasise the distinction between network capabilities and the functionality of the web, to minimize undesirable interactions between these layers of the stack and to maximize the desirable property of being able to make changes to either layer without reference to other layers.

We are in a position to provide a neutral place for these impacts to be further discussed and understood if that is deemed necessary and/or useful.