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Position Paper for the WoT workshop

An autonomous communication system based on NSD and WebRTC relay.

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1. Introduction - device to device collaboration in public wifi environment -

Currently, lots of public wifi services are can be seen. If we can provide device-to-device collaboration services there, people can easily share their local interests. For example, someone send the beautiful picture near there from the smartphone to the digital signage screen located at the wifi spot, such a pictures are really helpful for the tourists. Other than that, if residents can send the direction to the nice restaurant from his smartphone to tourist's tablet, it'll be nice. Furthermore, such a service will become a powerful tool in emergency situations. Since people needs to have lots of local information from near by guys.

For above usecases, web platform is powrful solution, because it doesn't require any application installation process and people can easily use it.

2. Needs to traffic limitations

Especially, in emergency situations, there tends to happen traffic limitation requirement, due to the damage of the backbone network facilities etc. To address such an issue, we think it'll be better to keep local traffic near the local area. To realize above requirements, we think it'll be valuable to consider to setup web server systems for each area.

3. Needs for the discovery service.

We can see that local web server solution will make sense for decreasing backbone traffic, however one problem remains, how to obtain those local web server's url. That is why we're interested in NSD (Network Service Discovery) api. If those local server supports discovery mechanism, such as UPnP or mDNS, people can easily obtain those urls and make use of communication services.

4. A restrictions for generic public Wifi services.

However, there is a issue for discovery senario in public Wifi environment. Generic public wifi service doesn't permit IP multicast packet and direct connection to each devices for security reasons. Therefore, it's hard to use discovery senario because those are based on IP multicast technology and direct access to each devices in above environment.

5. Solution

To address above issues, we propose the hybrid solution with NSD and WebRTC api. Typical sequences are shown below:

- (1) Each local web servers regist their url to public registration server.
- (2) Clients try to discover local web server via NSD api
- (2)' If discover succeeds, people can make use of the service.
- (3) If failed, clients connect to registration server and discover server url.
- (4) people access to the server and make use of the service.

With above solution, we can provide an autonomous communication services for each network environment. Automatically detect the network restrictions and provide services in appropriate way.

At the workshop, I'll present the details and field test result about it.