# Guidelines for Emergency free Wi-Fi for the Large-Scale Disaster Relief

To support life

00000JAPAN

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Wireless LAN Business Promotion Association

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These guidelines are targeted for the occurrence of a large-scale disaster in Japan and may need to be adapted according to individual countries’ situations and specificities. The Wireless LAN Business Promotion Association is not responsible for any damage caused by the use of these guidelines.

Contents

# 1. Introduction

## 1.1. Background and objective of the guidelines

Japan has learned, from the Great East Japan Earthquake hitting Japan in March 2011, the great importance of ensuring the communication means in various situations. Such situations include rescue of disaster victims, evacuation guidance, operation of shelters, and support for restoration of disaster-stricken areas.

It is highly recognized that wireless LAN served as a practical communication means for the activities to support the restoration of the affected areas, at shelters, etc., thanks to the widespread use of mobile terminals with wireless LAN capability, especially smart phones and tablets. This recognition has produced expectations for future efforts to promote the use of wireless LAN on the outbreak of a large-scale disaster.

At the time of the Great East Japan Earthquake, operators voluntarily allowed people to use their wireless LAN (hereafter referred to as Wi-Fi) services freely whether they were their users or not. Launching Emergency free Wi-Fi services and making the best use of them are very helpful in a situation of difficulties with the mobile network connections; however, voluntary actions after the outbreak of a large-scale disaster are completely up to individual operators.

There are a variety of large-scale disasters and many operators, etc., do not have clear trigger criteria of disaster for launching the Emergency free Wi-Fi services.

Moreover, operators, etc., should consider and prepare for certain things in case of the outbreak of a large-scale disaster. These include: how to inform people when measures responding to the disaster are being taken, access points (APs) operation procedure when launching Emergency free Wi-Fi services, definition of a standard time lag between the outbreak of a disaster and the beginning of the actions responding to it.

These guidelines were prepared by the Wireless LAN Business Promotion Association (hereafter referred to as the Association) based on the proposals in the “Wireless LAN Business Guidelines” published by the Ministry of Internal Affairs and Communications in June 2014. In these guidelines, the Association identifies points of concern, desirable matters, etc., that individual operators, etc., providing Wi-Fi services, should consider when examining and preparing for actions to respond to a potential outbreak of a large-scale disaster.

Especially, the promotion of the Unified Emergency SSID “00000JAPAN” not only helps the nation’s disaster prevention and disaster risk reduction but also ensures the convenience and safety of foreign visitors in the event of disasters. Thus, it is desirable to work on achieving its early application.

The target readers of these guidelines are operators, etc., that provide Wi-Fi services,

including those who provide free Wi-Fi services and those who provide wireless LAN services as an option to their main businesses.

The guidelines were prepared on the basis of the issues mentioned above. They are intended to be used by individual operators, etc., as a reference when they examine and prepare in advance for these matters. They do not intend to impose the content nor require the introduction of new systems.

### 1.2. Terminologies

| | |
|---|---|
| SSID | Service Set Identifier<br>String to be used to identify a wireless LAN access point |
| Emergency Unified SSID | SSID that is commonly used by operators, etc. to launch Emergency free Wi-Fi services in case of outbreak of large-scale disasters. As it is used across different operators, it does not enforce user authentication or encryption. |
| Free SSID | Operator, etc.-specific SSID that is used to provide a free Wi-Fi service without user authentication. |
| Wi-Fi service | Public wireless LAN service that offers Internet access. This includes a case where a service operator owns only the wireless LAN access point only. |
| Emergency free Wi-Fi service | Wi-Fi service that is provided free of charge in the event of a disaster. It uses the Emergency Unified SSID. |
| operator(s) | Those who provide Wi-Fi services as part of their telecommunications business. |
| operator(s), etc. | Operators (as defined above) and other entities that provide Wi-Fi services free of charge and ones that provide Wi-Fi services as an option to their other core businesses. |

### 1.3. Updates to the guidelines

These guidelines were created according to the wireless LAN business environment at the moment. The content of these guidelines may be updated anytime based on the potential changes in the wireless LAN business models, the progress of disaster contingency planning by local governments, etc., or any other changes.

## 2. Scope of target large-scale disasters for launching Emergency free Wi-Fi

services

## 2.1. Disaster scale and damage scale

It is difficult to determine a single reference value of a disaster scale for triggering actions responding to a large-scale disaster, as there are different kinds of disasters such as earthquakes, flood damage caused by typhoons, etc. Instead, a damage scale shall be used to decide whether actions should be taken or not. In other words, actions should be taken in a situation where there is benefit from the use of Wi-Fi services.

In the case of the Great East Japan Earthquake, mobile phones could not be used in the disaster-stricken areas. It is a challenge to secure communication means in times of disaster. Thus, it is appropriate to launch Emergency free Wi-Fi services when the use of Wi-Fi services is favored, that is, "in a situation where mobile phones and smart phones may not be able to be used due to the damage to the mobile network infrastructure in a wide area."

At the same time, local governments, etc., may determine the needs for Emergency free Wi-Fi services, regardless of the damage level of the mobile network infrastructure, and request the operators to launch the services. In such cases, operators and local governments should coordinate with each other to make a decision on the launch of Emergency free Wi-Fi services.

An alternative trigger for launching Emergency free Wi-Fi services may be when the government designates a disaster as a "disaster of extreme severity." However, the designation is made only some time after the outbreak of the disaster. Thus, it may not be adequate for the purpose of utilizing Wi-Fi services for the ascertainment of people's safety and the life-saving activity in the initial response phase to a disaster.

In the meantime, the mobile network operators have been putting efforts on the improvement of the mobile networks to build disaster-tolerant networks. One example is the installation of "large-zone base stations" that cover broader areas with the aim of ensuring communications even in the case of the failure of multiple base stations. In any case, individual mobile network operators should take into account the damage situation of their own mobile network infrastructure and the expectation of its restoration when making the final decision on the launch of Emergency free Wi-Fi services.

In the case of fixed-line operators, however, it is not straightforward to know the damage level of a mobile network infrastructure. Thus, individual operators shall make their own spontaneous decisions on making their Wi-Fi services free.

Local governments, etc., that operate portals for large-scale disasters may take two actions. The first action is a "disaster response page" that is made available via wireless LAN when difficulties with the mobile network connections are experienced. This page

aims to provide information and services responding to the disaster, such as damage level information and disaster emergency message board services. The second action is making their Wi-Fi services freely available to everybody (i.e., providing Emergency free Wi-Fi services), which require prior registration in a normal situation.

Fukuoka City, for example, has designated triggers to take these disaster response actions, taking into account the potential difficulty of gathering the information about the damage at the time of a disaster. The first trigger is the issue of an Earthquake Early Warnings (Kinkyu Jishin Sokuho) or a Tsunami Warning by the Japan Meteorological Agency. The second trigger is the outbreak of a disaster with a seismic intensity[1] of five or more. As for the second trigger, it is preferable that local governments could also follow these guidelines. In this case, the collaboration between operators and local governments is important.

Also, some Wi-Fi services are owned by facilities such as airports and railways. Operators and those owners should have a prior agreement on the launch of Emergency free Wi-Fi services.

### 2.2. Target areas

As mentioned earlier, the target areas for Emergency free Wi-Fi services, in general, are areas where mobile phones and smart phones cannot be connected to the network for a long period. When the services are requested by the local governments, etc., the target areas are defined by the disaster management headquarters of the relevant municipalities. However, depending on how a Wi-Fi service is operated by each operator, it may be technically difficult to launch a free Wi-Fi service per municipality. The actual target areas should be designated according to how the service is operated.

It should be noted that providing an Emergency free service in a wide area for a long period of time may allow malicious use that exploits security vulnerabilities. The target areas and the period of Emergency free Wi-Fi services shall be determined deliberately.

## 3. Actions responding to a large-scale disaster

### 3.1. Launching Emergency free Wi-Fi services

#### 3.1.1. Emergency Unified SSID

The usage pattern of an Emergency free Wi-Fi service launched at the time of a large-scale disaster will be different from general patterns. For example, users who never use Wi-Fi may use a Wi-Fi service, as it may be the only available communication means at the time. In order to ensure equal opportunity for use and to quickly install temporary Wi-Fi APs, it is convenient to introduce “Emergency Unified SSID” in addition to SSIDs for ordinary usage.

[1] This is according to the Japan Meteorological Agency Seismic Intensity Scale.

The Emergency Unified SSID shall be presented at the top of search results for SSID. Through the field trial performed in Kamaishi City by the Association (see appendix), it was noticed that many mobile terminals showed the search results in character code order. It was also noticed that there was already an existing SSID with the name starting with 0000, which was shown at the top of search results for SSID. Therefore, the Emergency Unified SSID shall start with 00000 to ensure that it is presented at the highest top of search results for SSID so that it can be more recognizable.

Moreover, the string that follows 00000 shall be understandable by users from inside and outside Japan, as it will also be used by rescuers from overseas. The Association proposes the use of JAPAN as such a string, which was used at the field trial mentioned above. Thus, the Association defines the Emergency Unified SSID as follows:

**00000JAPAN**

In order to keep a good visibility of "00000JAPAN," operators, etc., shall not introduce new SSIDs for normal usage that can be presented above the "00000JAPAN."

In ordinary situations, different operators use different SSIDs for their services. The use of a common SSID in an emergency situation may cause two problematic situations.

The first case is a black hole problem that may occur when the upper level network of one of those APs get disconnected, while multiple APs attached to different networks are broadcasting the same SSID. The handover between that AP and other APs will not be performed, which will then cause a communication failure.

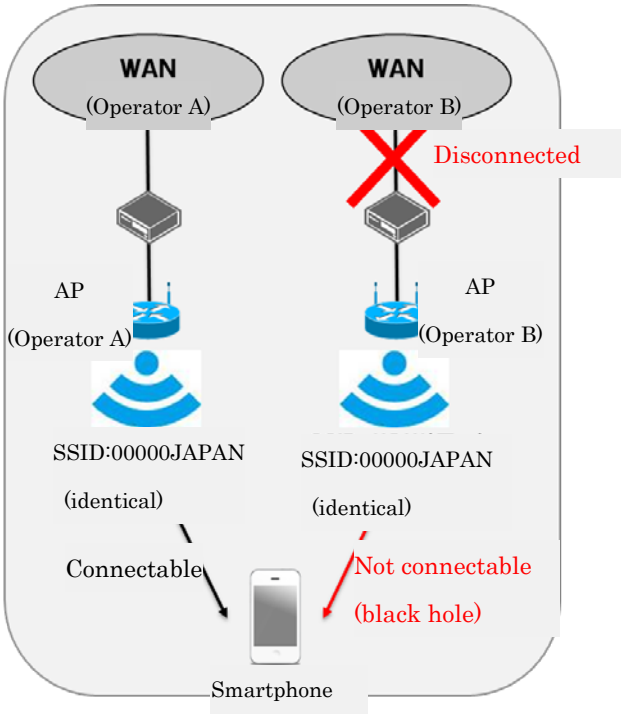



**Figure 3-1 black hole problem**

This may not have a big impact, as most of the APs adopted by Wi-Fi service operators have the capability to automatically stop Wi-Fi services when their upper level networks are disconnected. For APs without such capability, however, it should be considered to have operational rules to avoid the problem, e.g., disallowing the broadcast of the Emergency Unified SSID from such APs.

The second case is about the acquisition of an IP address; When a handover takes place between multiple APs that use the same SSID but belong to different networks, a new IP address may not be assigned from the newly connected network after the handover during a lease period (2 to 5 minutes in general) of the IP address assigned by the DHCP server. This will also cause a communication failure.

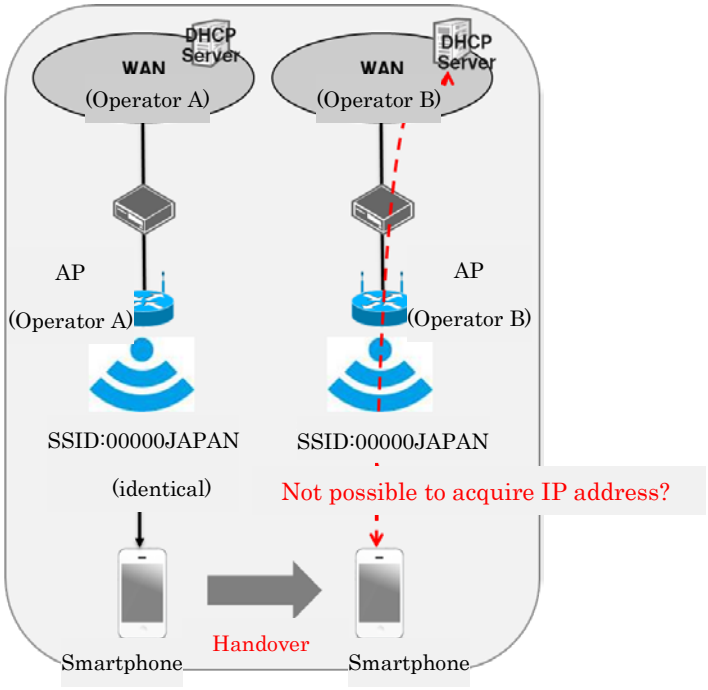



**Figure 3-2 Problem in the acquisition of IP address**

This may become a problem when a terminal simultaneously receives radio signals from multiple APs provided by different operators and experiences frequent handovers. However, the impact may be small as most smart phones are designed to proactively retrieve an IP address by sending a DHCP Discover message or an ARP request when the MAC address of the connected AP has changed.

While introducing the Emergency Unified SSID may cause these situations, it reduces the cost for informing residents and simplifies the setup procedure of user terminals. It can be considered that these benefits outweigh those downsides. Thus, it is adequate to adopt the Emergency Unified SSID.

In addition to the technical challenges mentioned above, there will also be operational challenges such as “use for commercial purposes” and “malicious use in normal times” when applying the Emergency Unified SSID. Thus, it is appropriate to define certain requirements for the participation.

For the operational matters, the Association will study on further details and publish the outcomes as part of its activities.

### 3.1.2. Proprietary Free SSIDs

Local governments that operate free Wi-Fi services for pre-registered users using Free SSIDs normally provide disaster prevention information as part of its content. Their users can conveniently use the same Free SSID in the event of disasters. Besides, there are many free Wi-Fi services for pre-registered users, operated by institutions other than

local governments, with the aim to attract new users. When those free Wi-Fi services are made accessible to non-registered users, their proprietary SSIDs can take the same role as an Emergency Unified SSID.

Especially local governments that operate free Wi-Fi services shall prepare for the launch of Emergency free Wi-Fi services for non-registered users in the event of disasters with the objective of ensuring the security of their residents and regions.

### 3.2. Large-scale Disaster Emergency Portal

Some local governments, shopping districts, etc., that operate Wi-Fi services also provide portal sites for registered users. At the time of a large-scale disaster, it is expected to utilize those portal sites as “Large-scale Disaster Emergency Portal sites” to provide information relevant to the disaster.

A Large-scale Disaster Emergency Portal provides the information closely related to the residents, such as a shelter location. Typically, it will be operated by local governments of municipalities. Still, many issues need to be addressed so that Wi-Fi operators with nation-wide coverage can provide automatic connection to a portal site based on the location of the AP being used. Therefore, for the time being, only local governments, etc., that operate services using proprietary Free SSIDs may provide such portals.

A portal can be redundant for the users who are familiar with the Internet. Thus, it may be useful to allow changing the configuration so that a Large-scale Disaster Emergency Portal will not be used as an initial page.

## 4. Operational guidelines for response actions to a large-scale disaster

### 4.1. Operational guidelines on Emergency free Wi-Fi services

#### 4.1.1. Standard time lag until taking an action

The earlier the countermeasures are taken, the more effective they are. It is important to investigate in advance a standard time lag to the enforcement of an action.

At the same time, it is difficult to define a single reference time because it takes different periods of time to make individual services freely usable, depending on the size of business, how the Wi-Fi service is operated, as well as the size of a disaster. Moreover, the operator may also be affected by a disaster.

On the other hand, a reference time for the initial disaster response is regarded as the first 72 hours after a disaster, taking into account the drastic drop in survival rates of people who are seriously injured, e.g., under the ruins of a building, after those 72 hours. In order to provide rescuers and aid men, from inside and outside Japan, with communication means via Wi-Fi, it is desired to launch an Emergency free Wi-Fi service within the initial response time period.

Also, individual operators shall determine whether they should continue or stop their Emergency free Wi-Fi services according to the progress of restoration of the mobile network infrastructure, taking into account the risk of malicious use described later in section 4.4.

When an Emergency free Wi-Fi service is launched according to the request from local governments, etc., the disaster management headquarters of operators and local governments shall discuss to decide about these matters.

#### 4.1.2. Emergency Unified SSID

##### 4.1.2.1. Operators' perspective

After the outbreak of a disaster, operators need to change their APs to broadcast the Emergency Unified SSID and omit user authentication or encryption from them. It is not practical to configure these settings at every location where an AP is installed. Thus, it is recommended to have a system architecture that allows the remote configuration per unit area, such as per prefecture.

When APs are supplied by a carrier-of-carriers, the partners should agree in advance on the following issues:

(1) Who takes the initiative of the decision on starting the broadcast of the Emergency Unified SSID, the supplier (carrier-of-carriers) or the acquirer?

(2) Through which route should data traffic over the Emergency Unified SSID network be connected to the Internet, in the case where the supplier (carrier-of-carriers) is providing multiple acquirers with different SSIDs for a single AP?

Likewise, the owners of the facilities where APs are installed should be involved in the discussion about the operation of the Emergency Unified SSID at the time of disaster.

Moreover, in large-scale disasters that can cause a cutoff of the mobile network, it will take time to restore the mobile network facilities. One practical solution is to introduce wireless LAN network with a satellite channel for its higher level (backbone) network, which is easy to establish temporally, in order to provide a provisional network quickly. With the Emergency Unified SSID, multiple mobile network operators do not need to install multiple APs at the same place. Instead, they can cooperate to share the installation of APs that broadcast the Emergency Unified SSID so that different mobile network operators cover different areas. This facilitates a prompt availability of provisional communication means. Each mobile network operator should have a window of contact to coordinate these matters with other operators.

##### 4.1.2.2. Users' perspective

Users need to do some extra operations on their terminals in order to use the network with the Emergency Unified SSID, which is different from the SSIDs they normally use.

About half of the participants at the field trial conducted in Kamaishi City could not access to the network using the Emergency Unified SSID. The following actions can be taken to improve the setup success rate of the Emergency Unified SSID network:

(1) Letting people use the Emergency Unified SSID network as part of disaster reduction drills and exercises held on the Disaster Reduction Day (Bosai-no-hi) or on other occasions. This will allow an automatic connection to the network at the time of a disaster.
(2) Preparing connection manuals to put at local governments' shelters etc., where APs may be installed at the time of a disaster.
(3) Developing and distributing an application that allows an automatic connection to the Emergency Unified SSID network.
(4) Presetting the Emergency Unified SSID on terminals.

### 4.1.3. Proprietary Free SSIDs

#### 4.1.3.1. Operators' perspective

Some local governments, etc., operate free Wi-Fi services for pre-registered users by themselves, while others outsource the operation to network operators. In the case of outsourcing, local governments, etc., and network operators should have, in advance, an agreement on the operation at the time of a large-scale disaster, as stated in section 4.1.2.1.

Below is the case where local governments, etc., by themselves operate free Wi-Fi services for pre-registered users.

Free Wi-Fi services for pre-registered users operated by local governments, etc., themselves, in general, have a simple architecture. For example, AP controller may not be equipped and individual APs may function autonomously. In such cases, it is not practical to configure individual APs to remove user authentication and to change the encryption method for the air interface. Thus, it is recommended to discuss in advance the operation of APs with the owners of facilities where APs are installed.

A large-scale disaster may cause damage to a higher level network of APs. It may be necessary to secure a higher level network via satellite channel and establish a proprietary communication line to a main government building in order to provide information using a Large-scale Disaster Emergency Portal, which will be described later. It may also be needed to provide partial information using their proprietary servers. As it is obvious, precautions against potential power outages must also be taken.

The broadcast of the Emergency Unified SSID by other network operators in the area where the proprietary Free SSID is broadcasted should not cause any problem. Thus, there is no need to put constraints with each other on the launch of an Emergency free

Wi-Fi service. However, they can have some prior agreement on the details of the launch of the services.

#### 4.1.3.2. Users' perspective

Users are usually using those services with proprietary Free SSIDs in addition to other SSIDs provided by network operators. Such users do not need to make a special operation on their terminals to use the services at the time of a disaster. The following actions may help further increasing the connection setup success rate:

(1) Letting people use the network with a proprietary Free SSID as part of disaster reduction drills and exercises held on the Disaster Reduction Day (Bosai-no-hi) or on other occasions. This will allow an automatic connection to the network at the time of a disaster.
(2) Preparing connection manuals to put at the locations where APs are installed.
(3) Developing and distributing an application that allows an automatic connection to the network with a proprietary Free SSID.

## 4.2. Guidelines for a Large-scale Disaster Emergency Portal

The analysis of the field trial performed in Kamaishi City by the Association (see Appendix) shows that there are demands for certain kinds of information to be included in the top page. That information will be shown on a terminal immediately after it gets connected to the network of an Emergency free Wi-Fi service at the time of a large-scale disaster. Those are as follows:

(1) Information useful for victims to evacuate and information useful to rescue them, e.g., the details of the damage, and the state of the essential public service utilities.
(2) Internet search engines, e.g., Yahoo! JAPAN and Google.
(3) SNS, e.g., Facebook, Twitter and mixi.

The results of a questionnaire survey from the field trial show that more than 75% of the participants had a positive opinion on the need for the top page with those three kinds of information (the middle screen in Figure 4 in the Appendix), stating "It is useful to have a Large-scale Disaster Emergency Portal, which allows a quick access to the necessary information." (Figure 8 in the Appendix)

Thus, "Information useful for victims to evacuate or information useful to rescue them," including emergency message boards (safety check), disaster relevant information provided by a local government, earthquake and tsunami information, emergency shelter information, road traffic information and power outage information, shall be displayed in the top page of a Large-scale Disaster Emergency Portal so that all victims can easily access to such information.

Users that are familiar with information search on the Internet show a strong demand

for Internet search engines accessible from the top page.

Also, pages shall be designed to provide an easy experience even for users that are not familiar with using a terminal. The top page of a Large-Scale Disaster Emergency Portal shall be easy to understand and shall fit in a screen, i.e., shall not require a scroll operation.

Besides, in order to have it accessible to foreign victims and foreign rescuers, a Large-Scale Disaster Emergency Portal should have versions in other languages.

Taking into account those factors, it is desirable to prepare a Large-Scale Disaster Emergency Portal with some effort to ensure a better usability by improving content organization and visual effect.

### 4.3. AP operation policy

Individual operators, etc., shall deliberate and prepare internal frameworks for operating APs that are used for Emergency free Wi-Fi services. Such frameworks should cover the situation where they need to launch Emergency free Wi-Fi services while they themselves have gotten stricken by a disaster.

#### 4.3.1. Perspective of the preparation for launching an Emergency free Wi-Fi service

At the outbreak of a large-scale disaster, other areas, in addition to the main disaster stricken-areas, can be heavily affected due to traffic and transportation disarray, etc. As such, there is an argument for the need for launching free Wi-Fi services in areas wider than the disaster stricken-areas. As stated in Section 2.2., however, it must be noted that an Emergency free Wi-Fi service in a wide area for a long period of time has the potential risk of malicious usages.

It must also be noted that the cost of installing and operating APs are on their installers, e.g., their owners. Furthermore, systems that are used for Emergency free Wi-Fi services may experience an excessive load.

Taking these factors into consideration, individual operators, etc., shall determine the target area for an Emergency free service according to how their Wi-Fi services are operated, and deliberate and prepare for Emergency free Wi-Fi services based on their own situations.

### 4.4. Security considerations

When launching an Emergency free Wi-Fi service, the normal authentication procedure is often omitted. That is, the information security mechanisms are disabled, raising a risk of malicious uses such as information theft.

In a normal situation, measures such as authentication and encryption of data transmitted are taken to prevent malicious usages. Anti-abuse measures that can trace an abuse when an incident happens are also taken. When determining the target areas

and the period of an Emergency free Wi-Fi service, it must be taken into account that those security measures possibly do not work effectively for Emergency free Wi-Fi services.

If restoring mobile network infrastructure takes time and people are forced to live in evacuation centers for a long time, an Emergency free Wi-Fi service launched for the support of evacuation and rescue will become the means of daily communication. In such a situation, more attention to security must be paid; for example, people should understand the risk on entering a credit card number. It is recommended to promote better awareness, among users, of the potential security risks that may be imposed by a free Wi-Fi service.

In general, it is considered that security measures and users' convenience contradict with each other. It is important to continue to examine security measures that can be taken at the time of a large-scale disaster, while ensuring users' convenience from the perspective of providing as many people as possible with communication means and disaster relevant information. For the detail on the information security relevant to wireless LAN networks, please refer to "Secure Introduction and Operation of Wireless LAN for Companies" prepared by the Ministry of Internal Affairs and Communications (MIC) in 2012.

## 5. How to inform people of measures responding to a large-scale disaster

### 5.1 Announcement in normal times

At the outbreak of the Great East Japan Earthquake, it was difficult to inform victims about the launch of free Wi-Fi services due to the extremely limited communication means. This experience tells that it is rational to make announcements or requests relevant to the launch of Emergency free Wi-Fi services in normal times to the relevant parties. The relevant parties are entities that will be in charge of the rescue and aid and of the restoration in the event of a disaster, including local government staffs responsible for disaster risk reduction, police and fire departments, medical experts and volunteer organizations, as well as the general users.

The Association conducted a field trial on the launch of an Emergency free service in September 2013. The Association is now aiming to raise awareness of Emergency free Wi-Fi services among general users and to educate them by providing information on the website, advertizing via mass media such as news papers and magazines, giving seminars to promote awareness, etc.

Operators, etc., which provide Wi-Fi services, are expected to conduct trials on launching an Emergency free Wi-Fi service at disaster reduction drills organized by local governments, in addition to providing information on their websites. The aim of such

trials is to raise the awareness of local government staffs responsible for disaster risk reduction, police and fire departments, medical experts, volunteer organizations, etc.

### 5.2. Announcement in the initial response phase right after the outbreak of a disaster

During the outage of mobile network services in the disaster-stricken areas in the initial response phase right after the outbreak of a disaster, the users of Wi-Fi services will be rescuers such as staffs responsible for disaster risk reduction, police and fire departments, and medical experts. As communication means are limited, administrative radio systems for disaster use and posters will be used to inform those rescuers of the launch of Emergency free Wi-Fi services. Therefore, the collaboration between operators, etc., which provide Wi-Fi services, and local governments is essential. It is important to establish a bilateral liaison mechanism by sharing the information regularly at disaster reduction drills, etc., and by discussing, in advance, concrete ways to inform people.

In order to inform rescuers from foreign countries, it is necessary to provide English leaflets and connection setup manuals at airports and at the sites in disaster-stricken areas where those rescuers are received.

Moreover, operators themselves can be stricken by a large-scale disaster and may not be able to make preparations for raising awareness after the occurrence of a disaster. Therefore, it is recommended to prepare in advance the means for informing people. Such means include leaflets and connection setup manuals, both in Japanese and English, as well as signboards that are to be set up at airports, stations, and Wi-Fi facilities in disaster-stricken areas.

Furthermore, it is useful that progress reports on the restoration of critical infrastructures, which are submitted to local governments by operators, also contain information relevant to the Emergency free Wi-Fi service in addition to the information on the restoration of the network infrastructures.

### 5.3. Announcement in the recovery phase of disaster

In the recovery phase of a disaster, in addition to rescuers, victims may be informed of an Emergency free Wi-Fi service. In such a case, additional efforts must be taken to provide adequate information to as many people as possible. Announcements can be made using posters at locations where free Wi-Fi services are provided, such as evacuation centers and convenience stores. Besides that, announcements can be made using public announcement vehicles and disaster emergency message services, as well as with the collaboration with media such as TVs, radios and news papers.

## 6. Proposal for sharing information at the time of a large-scale disaster

### 6.1. Purpose of sharing information about the launch of an Emergency free Wi-Fi service

In the event of large-scale disasters, multiple organizations such as operators and local

governments, etc., will launch Emergency free Wi-Fi services using “Emergency Unified SSID.” Operators and local governments, etc., that provide Emergency free Wi-Fi services (hereafter referred to as operating entities) will notify users of information about Emergency free Wi-Fi services (e.g., period, location, SSID, etc.) at their websites, etc. In order to promptly respond to inquiries from users, operating entities shall put further efforts to share information and to coordinate the period and locations of the services.

### 6.2. Information sharing functions

Operating entities may need to discuss the details of Emergency free Wi-Fi services (e.g., period and locations) right after the outbreak of a large-scale disaster. A communication means that can facilitate such discussions may be the one with the capability of exchanging opinions in real time and with the capability of reviewing the discussion details afterward.

Also, individual operating entities may need to display and update the details of Emergency free Wi-Fi services (e.g., period and locations) or need to view their details. Information infrastructure that leverages the bulletin board system accessible via Internet may serve for this purpose, for example. However, the maintenance of such information infrastructure and its operation rules must be further examined.

The Association will continue to investigate on the role of such information sharing and its implementation method.

## References

1. “Wireless LAN Business Guidelines,” Telecommunications Bureau, Ministry of Internal Affairs and Communications, 2013
2. “Secure Introduction and Operation of Wireless LAN for Companies,” Information and Communications Bureau, Ministry of Internal Affairs and Communications, 2012

## Contacts

Please contact the Wireless LAN Business Promotion Association (e-mail: guide-saigai@wlan-business.org) for inquiry about these guidelines.

# Appendix: Field trial on the launch of an Emergency free Wi-Fi service responding to a large-scale disaster

## 1. Field trial on the launch of an Emergency free Wi-Fi service

The Wireless LAN Business Promotion Association conducted a field trial in Kamaishi City of Iwate Prefecture in 2013 in order to examine ideal ways of launching free Wi-Fi services when a large-scale disaster occurs. In the field trial, the technical verification of "Emergency Unified SSID" was carried out for the first time in the country. The country's major network operators participated in this. Also, a user acceptance survey of "Disaster Emergency Portal" and the examination of the way of linking up with local governments were performed. In this appendix, the background of the field trial jointly conducted with Kamaishi City and the future plans of the Association will be also described.

## 2. Field trial overview

To bring Emergency free Wi-Fi services to as many people as possible when a large-scale disaster occurs, both tangible and intangible aspects must be implemented. The tangible aspects include the improvement of Wi-Fi infrastructure itself and the process of launching Emergency free Wi-Fi services. The intangible aspects include the approach to actually making people use a service.

The Association conducted the field trial in order to identify the challenges relevant to both aspects. As for the way to launch a free Wi-Fi service, it focused on the verification of two points: "Emergency Unified SSID" and "Disaster Emergency Portal" which are provided via wireless LAN service by local governments or private companies.

### 2.1. Emergency Unified SSID

At the time of the Great East Japan Earthquake, network operators independently made their Wi-Fi services freely available with their own SSIDs. However, it is believed that many people could not use those services as they were not aware of the SSIDs and their usage. By using a common SSID among different operators, the notification to users can be standardized. Besides, it allows a single access point (hereafter referred to as AP) to be used by all users. This will make it possible to install APs at more evacuation centers and temporary housing. At the field trial, major national mobile network operators, including NTT DOCOMO, KDDI (au) and Softbank, installed APs and provided services using an Emergency Unified SSID. It was verified that participants could connect their smart phones to APs from other operators and use services, while in normal situations they could connect only to APs from operators with which they have contracts. "JAPAN" was adopted as an Emergency Unified SSID to ensure that rescuers from inside and outside Japan would be able to identify it easily.

On the other hand, it was revealed that 40% of participants could not use the

“Emergency Unified SSD” unless some explanation was given.


**Figure 1 Exhibition of access points from individual operators**



**Figure 2 Explanation panel about Emergency free Wi-Fi services**


**Figure 3 Emergency Unified SSID "JAPAN"**

## 2.2. Disaster Emergency Portal at the field trial

To examine the way to provide useful information via Disaster Emergency Portal, the Association conducted a questionnaire survey. The target of the survey was people from the affected areas by the Great East Japan Earthquake. The subject was the user acceptance in terms of the easy-to-understand top page that can be used by everybody at the time of a disaster, the page structure that allows the victims to access to necessary information easily, and the linkage with (providing links to) other Disaster Emergency Portals. With the support from LAWSON, Inc., the survey was conducted at 38 LAWSON convenience stores in Aoba-ku, Sendai City and at one LAWSON convenience store in Kamaishi City.

The procedure of questionnaire survey was as follows:

A participant

(1) turns on the wireless LAN connection of his/her smart phone at one of the trial stores,

(2) taps on the Emergency Unified SSID "JAPAN,"

(3) starts an Internet browser,

(4) taps on "Connect to free Internet" on the specialized page shown (the left side of Figure 4)

(5) freely explores the Disaster Emergency Portal, and

(6) answers the questionnaire (the right side of Figure 4, five questions, requires around one minute) after the trial experience.

The top page of the Disaster Emergency Portal (the middle of Figure 4) showed Disaster Emergency Message Board for Safety Confirmation, Information from Local Governments, Earthquake and tsunami information, Evacuation Shelters Information, Road Traffic Information, Railroad information, and Power Outage Information, as well as links to search engines, “Google search” and “Yahoo Japan,” and links to “mixi,” “Twitter” and “Facebook.”

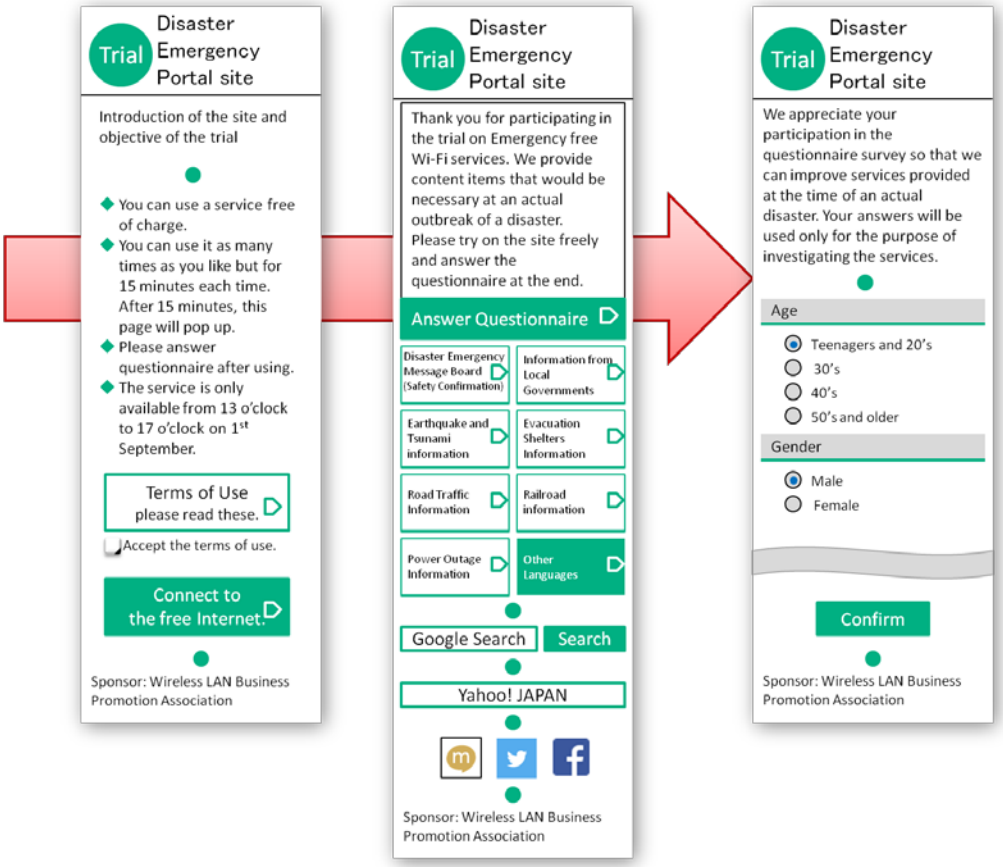
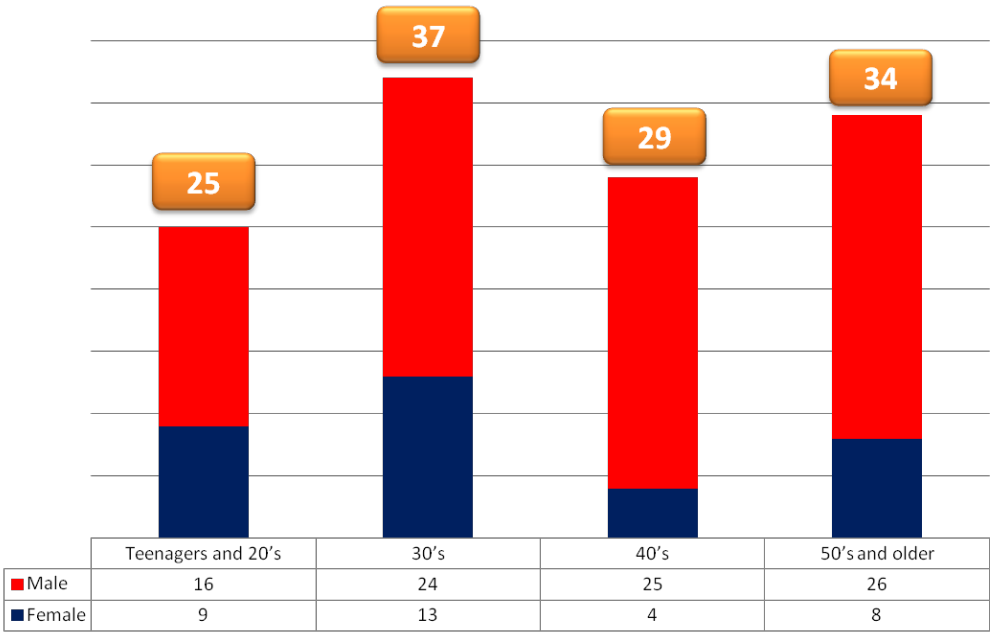



**Figure 4 Disaster Emergency Portal Pages**

### 2.2.1. Survey results

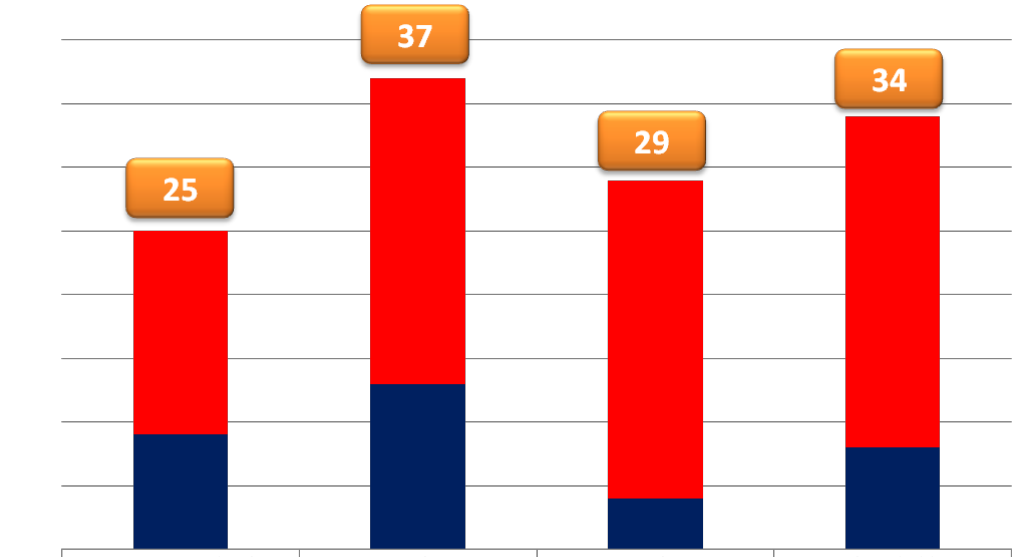
125 participants responded to the questionnaire. Around 30 participants from each generation responded, well-spread among different generations. (Figure 5)




| | Teenagers and 20's | 30's | 40's | 50's and older |
|---|---|---|---|---|
| Male | 16 | 24 | 25 | 26 |
| Female | 9 | 13 | 4 | 8 |

**Figure 5 Responders to the questionnaire by age and gender**

Among these 125 responders, 91 responders, more than 70% of them, were regular users of Wi-Fi services. (Figure 6)




| | Teenagers and 20's | 30's | 40's | 50's and older |
|---|---|---|---|---|
| Yes | 16 | 24 | 25 | 26 |
| No | 9 | 13 | 4 | 8 |

**Figure 6 Do you usually use a wireless LAN service at a hotspot?**

Among the different items of the content, “Disaster Emergency Message Board for Safety Confirmation” and “Earthquake and Tsunami Information” were the most used, while most of other items were also accessed. (Figure 7)

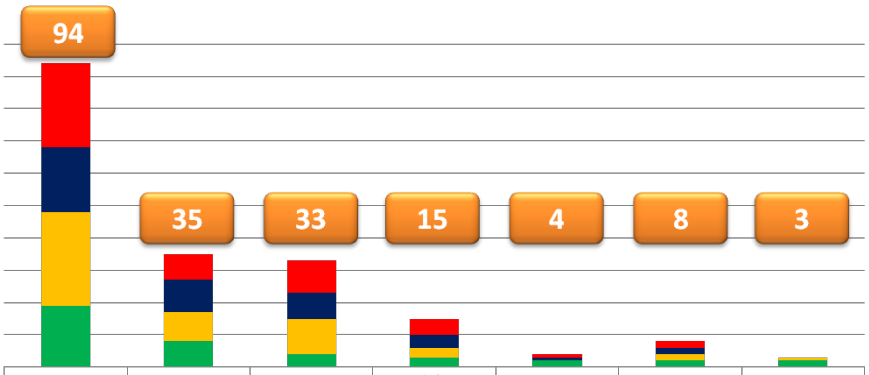
| | |
|---|---|
| Disaster emergency message board (safety confirmation) 53 | Information from local governments 37 |
| Earthquake and tsunami information 40 | Evacuation shelters information 36 |
| Road traffic information 28 | Railroad information 20 |
| Power outage information 19 | English 15 |

| | |
|---|---|
| Google search 0 | Yahoo! Japan 6 |

| | | |
|---|---|---|
| mixi 1 | Twitter 1 | Facebook 1 |

**Figure 7 the usage of individual items of the content (number of people that use it)**

As for the top page, more than half of the participants expressed the opinion that “It is necessary to quickly access the essential information,” which proves some benefit of the top page. However, some challenges on improving ease of operation and use were identified; such opinions are “Felt puzzled until it got connected,” “The procedure to reach the necessary information is tedious,” “Linked pages (corresponding to PCs) are difficult to read.” (Figure 8)




| | It is necessary to quickly access the essential information. | It is convenient for unfamiliar user. | Get confused as it is different from normal procedure. | It is inconvenient as it cannot be directly accessed from Yahoo! app., etc. | It is not needed other than the Internet connection itself. | Linked pages are difficult to read. | Others. |
|---|---|---|---|---|---|---|---|
| 50's and older | 26 | 8 | 10 | 5 | 1 | 2 | 0 |
| 40's | 20 | 10 | 8 | 4 | 1 | 2 | 0 |
| 30's | 29 | 9 | 11 | 3 | 0 | 2 | 1 |
| Teenagers and 20's | 19 | 8 | 4 | 3 | 2 | 2 | 2 |

**Figure 8 Response on the survey on the top page of the Disaster Emergency Portal (Multiple Answers Allowed)**

### 2.2.2. Consideration on future improvements

A certain appreciation was noted for the usefulness of each content item of the Disaster Emergency Portal.

Content items for further consideration for future improvements will be information that is useful according to the user's situation and location. Examples are information about the nearest evacuation shelter using map and location services, the interface with SNSs from local governments and BBSs such as 2ch, the information about planned power outage, the information about stores and gas stations that are open in the area, etc.

When providing these content items, the visual elements, such as how those items are organized (hierarchy and nested structure), are important to improve user's usability.

In spite of all the effort to simplify the connection setup procedure, some participants from all generations still expressed confusion, not knowing how to proceed, as they were not familiar with such things. It is necessary for people from all generations to have an experience with the Disaster Emergency Portal through disaster reduction drills, etc., in normal times so that they can use it without trouble at an actual disaster.

## 3. Importance of linking up with local governments

Kamaishi City was devastated by the Great East Japan Earthquake. All communication means were disrupted. The city was completely isolated and even

communication among its citizens was not possible, let alone with central and prefecture governments. More than two years have passed now. We could learn from Kamaishi City, which experienced the disaster, and convey a lesson to local governments across the country. Even before the disaster happened, Kamaishi City had recognized the importance of the use of ICT, especially because of its aging society, and had been carrying out the installation of optical fiber network in the entire area of Kamaishi City. After the earthquake, the first Major Tsunami Warning (3m) was issued. At this point, however, "the administrative radio systems for disaster use" of the coastal area got disrupted due to the power outage, and the subsequent Major Tsunami Warning (10m) could not be issued. Tsunami waves higher than predicted cut not only the optical fiber network of the coastal area but also the interior one. The disaster caused 888 deaths and 152 missing people in Kamaishi City.

Wi-Fi systems are not equipped with emergency batteries like the base stations of mobile networks, and they may not be considered as disaster-resilient networks. At the same time, they are convenient, because they can be easily installed and can be used by anybody. Kamaishi City municipal officers stated, "it is of course better to have Wi-Fi systems equipped at all evacuation centers, but it is more important to inform citizens on a daily basis of the locations where they will be available, even if they are limited to several places," because it is not even possible to notify the locations where they can be used when the communication networks to their citizens are disrupted by a disaster. Also, taking into account that more than half of deaths in Kamaishi City were elderly citizens of more than 65 year old, several challenges are identified: information must be conveyed in a language that can be understood by elderly citizens, and technologies that can be easily used by anybody should be introduced.

Revision History of the original document (Japanese version)

| | | |
|---|---|---|
| April 21, 2014 | Version 1.0 | Initial document published |
| March 2, 2015 | Version 2.0 | Updated: Added the descriptions on actions according to the request from local governments, etc. |