In Case of Emergency...

An ETSI Summit on Critical Communications

20 November 2014

PUBLIC WARNING SYSTEM IN JAPAN

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What would you do in case of earthquake?

- **Save life**
  - Hide under the table
  - Open the door to secure an escape route
  - Go away from something dangerous (e.g. Knife, Folk)
  - Turn off the fire

- **Secondary disaster is more terrible**

- **What we can do?**
  Notify what happen via cellular NW in a very short time to minimize the disaster
What would you do in case of earthquake?

After feeling big shake, what people do?

- They would contact many people
- Emergency
- Your family, Friends....

Traffic congestion occurs!
What should Operators do?

Under the emergency situation... 
Following two are keys

- **PWS**
  - notify what happens

- **Access Control**
  - Keep the NW for communication way
Procedure of PWS(ETWS)

1. Detection earthquake (P-wave) by Government
2. Government delivers the information to Mobile operator
3. Mobile operator broadcast the information to users in target area

Earthquake Early Warning System

Public Warning System

Sensor

Earthquake

S-wave

P-wave

Detection at more than two points
Earthquake early warning information (epicentre, scale)
Safety measures against S-wave

P-wave: Body wave that is the first wave to arrive to the seismograph
S-wave: Waves of energy that travel through the Earth's layers

How shortly notify the information is key!
How soon ETWS shall be delivered?

Japanese requirement
Example of PWS (1)

緊急地震速報
福島県で地震発生。強い揺れに備えてください（気象庁）

Emergency earthquake breaking report
Earthquakes occurrence in FUKUSHIMA, Prepare for the destructive shaking
(The Meteorological Agency)

Rapport de rupture du tremblement de terre en cas d'urgence
Les tremblements de terre survenue à Fukushima, se préparer à la secousse destructrice (L'Agence météorologique)
Example of PWS (2)

landslide or flood due to heavy rain by Typhoon

Prepare for escape
This is Yokohama city
Oct. 13, 19:30, Yokohama city issued a warning the damage from a landslide is the following area…

...
Why Access Control is needed?

- Prioritize Emergency Call/High priority Call
- Minimizing NW congestion to improve of data/call success rate

![Graph showing successful call rates over time](image-url)

Number of MO-CS call
Number of MO-PS Call
MO-CS Call Successful Rate
MO-PS Call Successful Rate

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Why separate access control for Voice and Data?

Access control for voice and data **separately** is essential to mitigate any traffic case.  **(DSAC in 3G, SCM(Rel.12) in LTE)**

- Is past, protect PS domain (mail, Chat) from huge amount of CS call.
- Now, protect voice call from PS (keep-alive, etc)

Traffic Trace taken around the midnight of the new year (2005) eve

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Summary

For disaster,
“悲観的に準備し、楽観的に行行動せよ”

“Prepare Pessimistically, Action optimistically”

In PWS, there is no “too much”