Natural Disaster

: 
.JP’s Experience and Preparation

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Where’s Japan

earthquakes large enough to feel: 2,000-20,000 times a year

typhoons disastrous to Japanese territory: 5-20 times a year
Natural Disasters in Japan

Earthquake: January, 1995
6,500 dead, 44,000 wounded, 640,000 houses broken

Typhoon: September, 2015
40 dead, 80 wounded, 7,500 houses broken

Earthquake: April, 2016
258 dead, 2,800 wounded, 195,000 houses broken

Heavy rain: July, 2017
41 dead, 21 wounded, 1400 houses broken
the Great East Japan Earthquake and Tsunami in March 2011

area hit by tsunami

earthquake center

Fukushima nuclear power plants

Tokyo (capital of Japan)
What happened

- **Earthquake**
  - Friday, March 11, 2011  14:46 JST
  - magnitude scale 9.0
  - buildings collapsed by quakes, buildings slanted by land liquefaction, roads/railroads severed, lifelines severed, ...

- **Tsunami**
  - height ~9 meters on the sea
  - ran up land slopes to 30-40 meters high
  → nearly 20,000 dead or missing

- **Nuclear power plants disaster**
  - nuclear power plants were intensely hit by earthquake and tsunami
  - plants broken and radiation leaked
  - power shortage
    - no traffic lights even in some parts of Tokyo area
    - planned blackout several hours a day
Difficulties experienced – “people” aspects

- On the day of earthquake
  - some facilities/goods in the office and machine rooms were broken or fell down by the earthquake
    - fortunately, none of our employees injured
  - not easy to spot all employees
    - some were out of office
    - phones (fixed line, mobile, Internet) were heavily congested and lines/waves couldn’t be grabbed by users
    - staff-safety-check service purchased for this kind of emergency didn't work (because of communication congestion!)
  - employees couldn't go back home after earthquake
    - public transportation halted their operation because they had to do thorough safety checkups after an intense earthquake
    - road congestion because many people tried to get home by cars as public transportation systems were not available
    - 30-40 employees stayed overnight with blankets and sleeping bags (over 120,000 people couldn't travel home in Tokyo area)
Difficulties experienced – “people” aspects – cont.

• on the day of earthquake – cont.
  – foods/drinks in market stores or convenience stores were sold out
  – employees couldn’t sleep well in frequent aftershocks
    • To take their minds off the fear, beer, wine, DVDs were of much help even in the office

• for several days after the earthquake
  – not all the public transportation services were back to normal
  – planned blackout was executed, rotating among designated areas
    • employees living in designated areas were directed to work from home
    • employees who need to work in the office were directed to come to the office but back home early during daylight time
  – the ministry directs people to stay home as far as possible in order for them to avoid troubles and save electric power
Difficulties – “service” aspects

• on the day of earthquake
  – all sorts of problem-finding must be done immediately
    • safety in the office
    • continuity of the service
      – DNS, WHOIS, registry system, office system, ...
      – servers in the office, servers in data centers, NOC function, ...
    => fortunately, JP services were not disrupted
    => some office facilities got damages

• during several days after the earthquake
  – decide how domain names should be handled (=relief)
    • people (registrants / registrars) in the disaster-affected area may not be able to renew their domain names
    • such domain names were automatically renewed with no charge
    • announce to the public was not done, only through registrars
      – some registrars could not extend the above relief to their registrants
Preparing ourselves

• Pocket-manual for all employees
  – evacuation, safety check, …
  – whom/what/how you should report
  – how to manually unlock electrically locked doors, to unlock electrically locked safety boxes, ...
  – brief manuals within smartphone & on paper

• Survival kit
  – food/water/gloves/helmet/…for every employee + more
  – sleeping bags/radios/flush lights/… for office stayers

• Basic drills
  – periodical evacuation drills
  – periodical emergency messaging drills
    • Email or SMS addresses are often changed but not reported to the manager
Preparing ourselves – cont.

• For organizational initial decision
  – set basic priorities to
    • functions to survive
    • who are going to do what

• Basic criteria for
  – making employees go home
  – selecting and making employees to come to office
  – treating visitors who happen to be in our office

• Emergency communication tool
  – smartphone + G Suite
  – for all employees, e-mail accounts under a TLD other than .JP
  – for each operation site, a satellite phone
  – …
Preparing ourselves – cont.

• Remote work environment
  – software on PC
  – shared data on the network
  – scheme to manage remote staffs

• Disaster Recovery sites
  – Tokyo and Osaka (500Km away)
  – both systems and staffs
  – periodical drills to switch the active site

• Anycast DNS servers within regional big ISP networks
  – Experimental research

• Crisis Management Committee
  – Planning and handling all the above
3-day survival kit is stored under each employee’s desk

- fully clear to hide my body
- storage with 3-day survival kit

inside the storage

folding helmet

content
Anycast DNS servers within regional big ISP networks

- Joint research effort with 8 domestic ISPs
  - those ISPs are provided by regional electric power companies (or affiliates)
  - their area coverage don’t overlap and collectively cover the whole Japan

- This collaboration will make JP DNS survive even when many parts of Japan are in trouble due to natural disaster
Q & A