Empowered by Innovation NEC

Introduction to Comprehensive Disaster Management Solutions and lessons learned from the Great East Japan Earthquake

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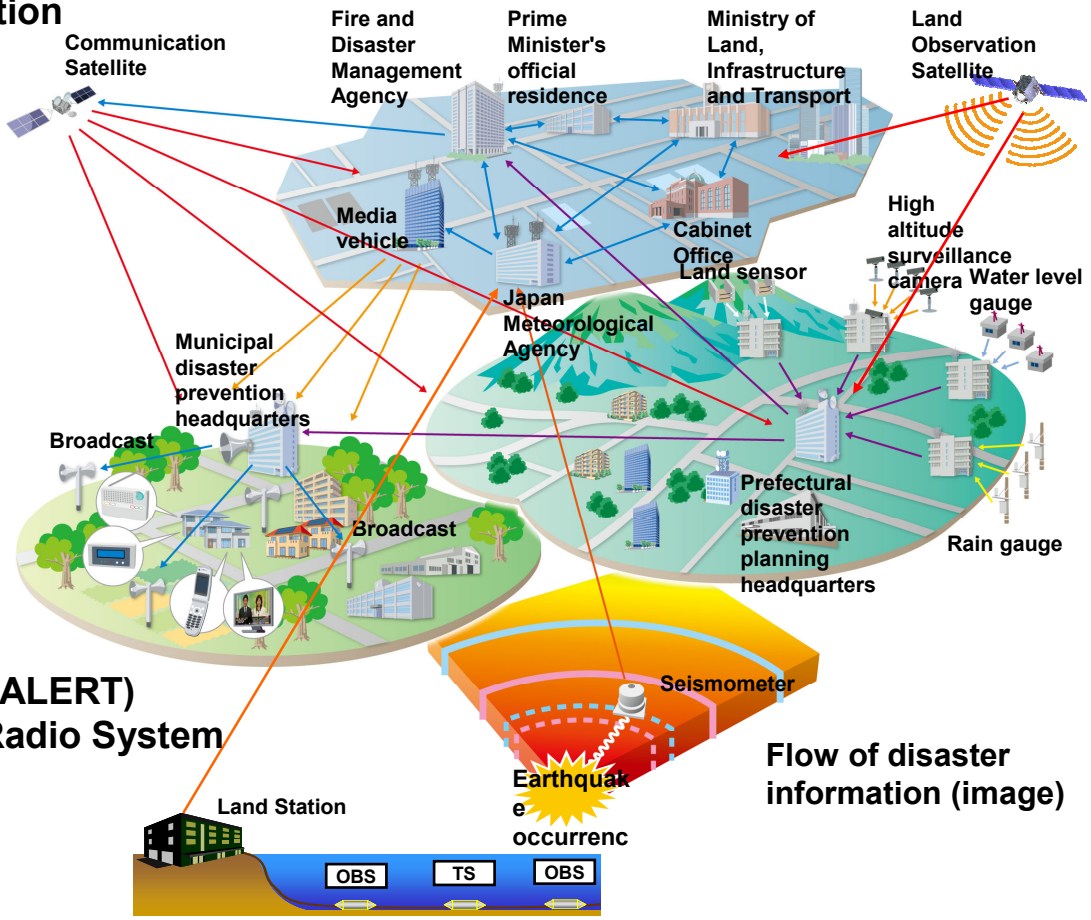
Flow of Disaster information

NEC Solution for Disaster Prevention
◇ Observation
◇ Information gathering
◇ Data analysis & Decision-making
◇ Announcement

NEC can supply and integrate of whole disaster prevention system and network.

- ✓ **Observation**
  - ✓ Ocean Bottom Observation Systems
  - ✓ Earthquake Observation Systems
  - ✓ Land (River, Coast, Dam) Observation Systems
  - ✓ Land Observing Satellite Systems
  - ✓ Global navigation satellite system (quasi-zenith satellites)
- ✓ **Information gathering**
  - ✓ Satellite communication system
  - ✓ Terrestrial Radio system
  - ✓ Optical transmission system
- ✓ **Data analysis & Decision-making**
  - ✓ Earthquake Early Warning system
  - ✓ Disaster Information System
  - ✓ Disaster Emergency Response Center System
- ✓ **Announcement**
  - ✓ National Early Warning System (J-ALERT)
  - ✓ Municipality Disaster Prevention Radio System
  - ✓ Cell Broadcast Service System



Flow of disaster information (image)

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Video Presentation

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System activated upon the Great East Japan Earthquake occurrence

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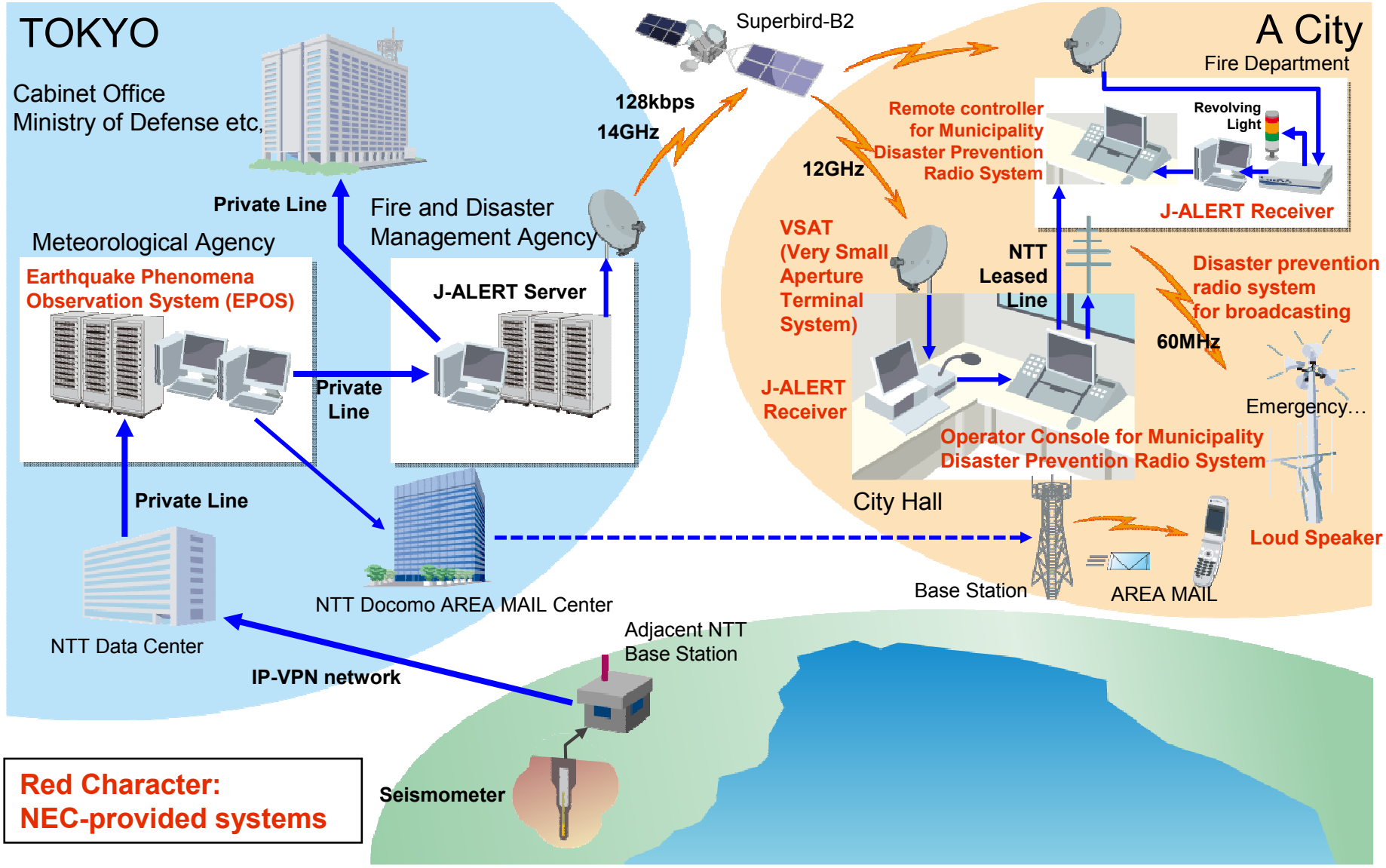
System concept of Earthquake early warning system and Disaster prevention radio system

NEC system under the Great East Japan Earthquake



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Lessons learned from the Great East Japan Earthquake

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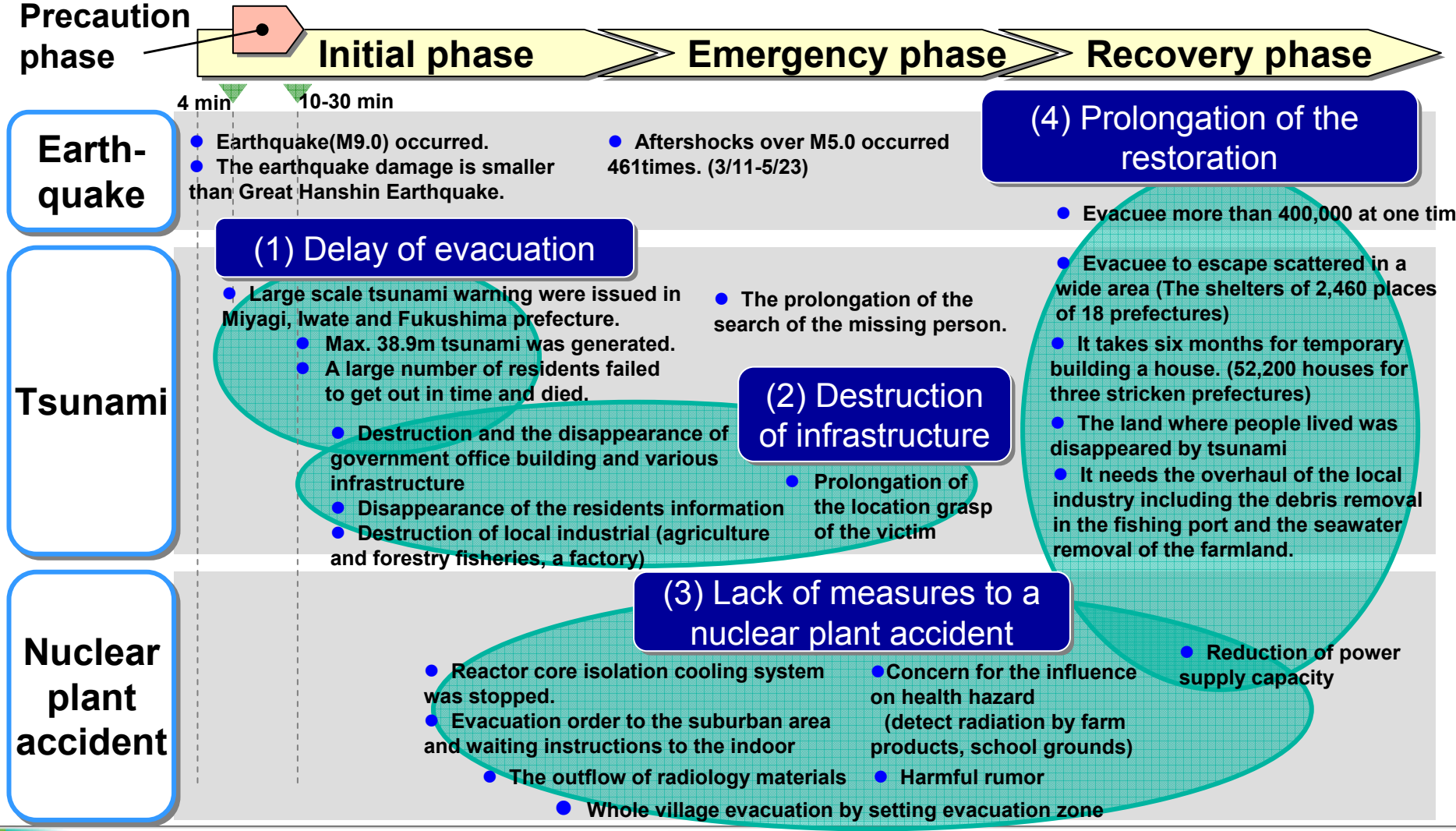
Feature of the Great East Japan Earthquake

Lessons learned from the Great East Japan Earthquake

Three features of the Great East Japan Earthquake are shown in a time scale.



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Learning from the Great East Japan Earthquake
<Lessons for strong information communication in disasters>

- **Support for unexpected situation like infrastructural damages**
  - ・Communication functionality is maintained by rearranging routes flexibly
  - ・Securing data integrity

- **Support for wide areas beyond administrative districts**
  - ・Securing of agency services such as wide area assistance for distant staff members
  - ・Securing ways to communicate with wide area evacuees

- **Prompt and accurate understanding of whole situation**
  - ・Central consolidation of diversified data that lies scattered in every place and organization
  - ・Arranging events in chronological order and grasping the situation accurately based on data

- **Transmission of accurate information to disaster site**
  - ・Transmission of accurate information to the staff working on disaster site
  - ・Transmission of information to citizens for appropriate actions

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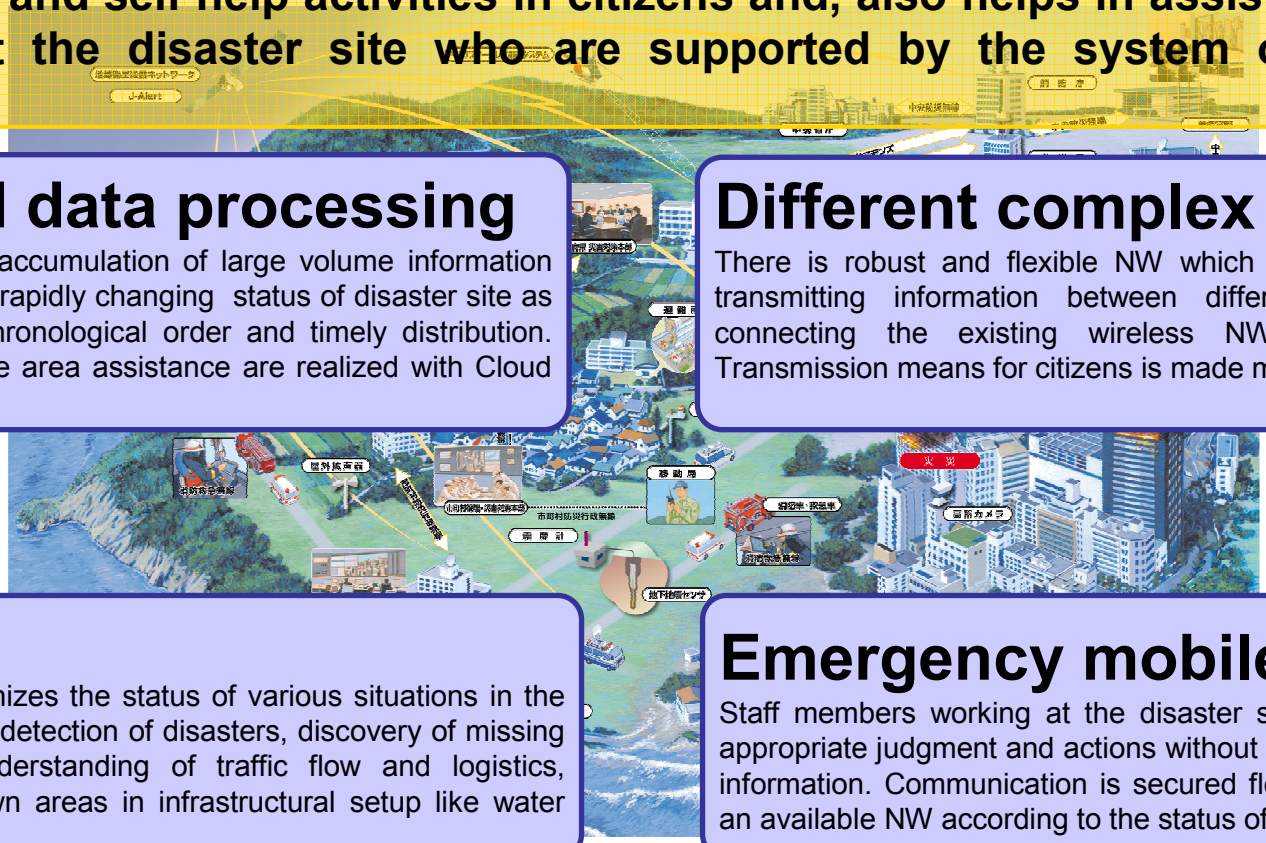
Concept of New Disaster information communication system
<Resilient Disaster information communication system model>

When there is an unexpected situation, timely and accurate information as well as a network which is flexible to connect, helps in reinforcement of cooperation and self help activities in citizens and, also helps in assistance of staff members at the disaster site who are supported by the system of wide area assistance



Advanced data processing

It facilitates real time accumulation of large volume information which is scattered like rapidly changing status of disaster site as well as analysis in chronological order and timely distribution. Data integrity and wide area assistance are realized with Cloud technology.

Different complex NW

There is robust and flexible NW which enables receiving and transmitting information between different organizations by connecting the existing wireless NW in disaster mode. Transmission means for citizens is made multilayered.

- M2M

It automatically recognizes the status of various situations in the real world like prompt detection of disasters, discovery of missing people, complete understanding of traffic flow and logistics, detection of breakdown areas in infrastructural setup like water supply etc.

Emergency mobile NW

Staff members working at the disaster site use information for appropriate judgment and actions without isolating any part of the information. Communication is secured flexibly by connecting to an available NW according to the status of the disaster site.

- Support for contingencies like infrastructural damages
- Wide area support for extended regions
- Prompt and accurate understanding of whole situation
- Transmission of accurate information to disaster site

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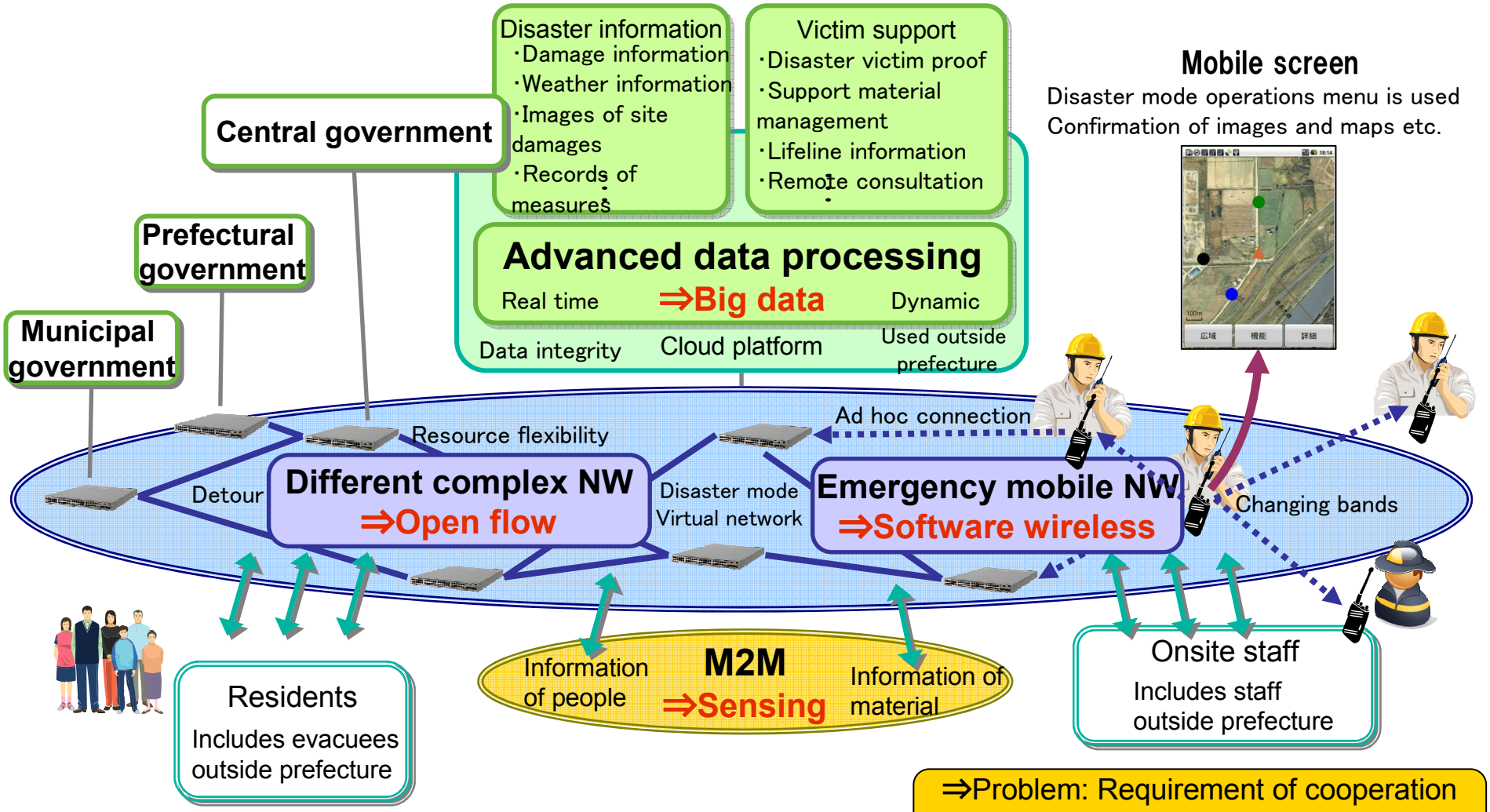
Concept of New Disaster Information Communication System Model

Strong Disaster information communication system model for disasters

The new model has latest technology and it effectively uses the complete set up of system. This results in providing the means of receiving and transmitting concrete information in which configuration can be changed flexibly, and also helps in making judgment.



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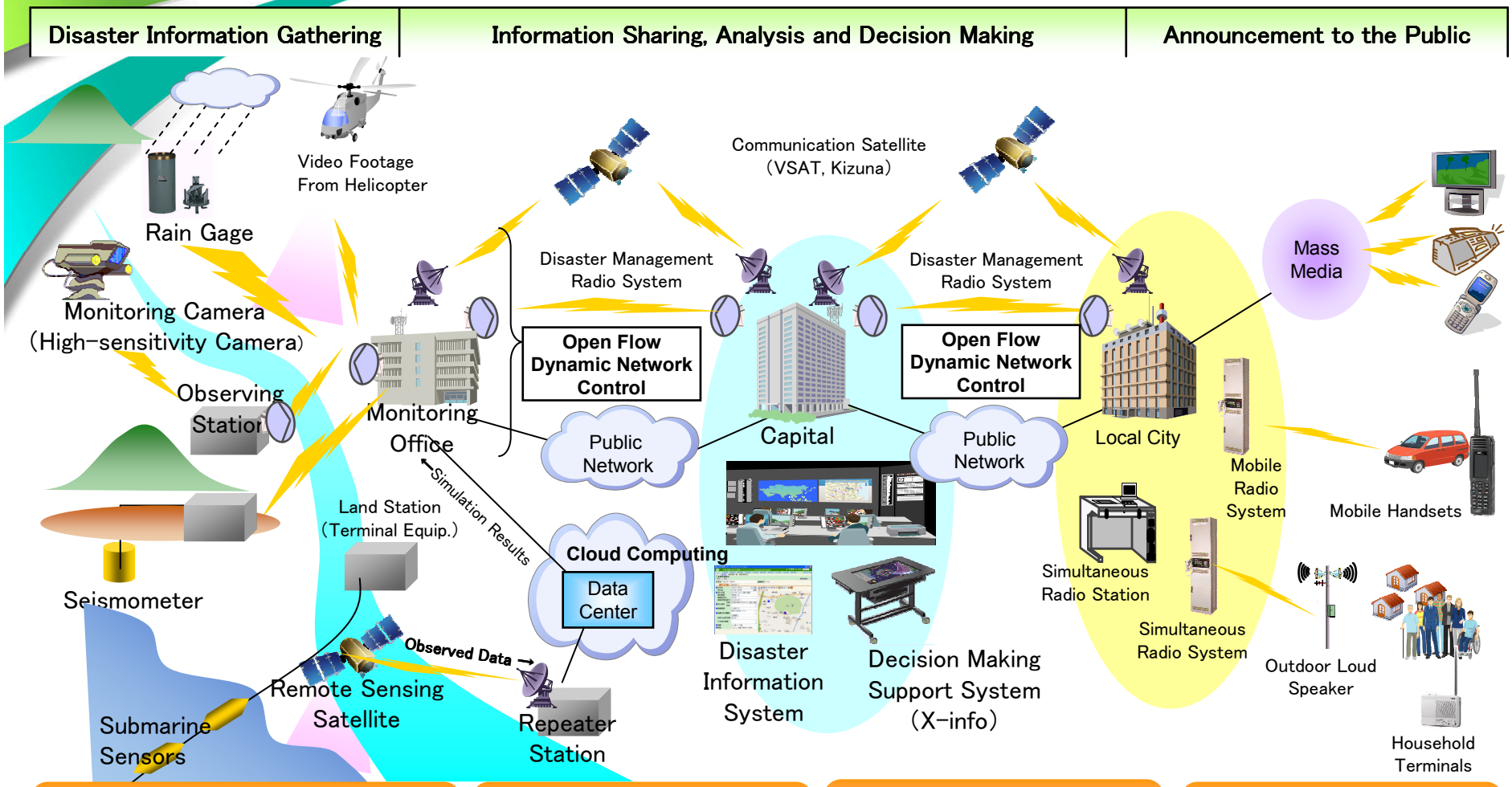
Cloud-computing Based Comprehensive Disaster Management System



Remote Sensing Satellite
Ocean Bottom Observations System
Helicopter Video Footage System
High-sensitivity Camera. Infrared Camera

Real-time Simulation System
Earthquake Early Warning System

Disaster Information System
Decision Making Support System
(X-info)

Information Transfer System
(Public Commons)

M2M [CONNEXIVE]

Communication Satellite[VSAT]/ Disaster Management Radio System[Pasolink]
Dynamic Network Control System [Open Flow]

Mobile Radio System
Simultaneous Radio System

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