

# Resilient Network Platform and Rural IoT Platform **NerveNet**

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Ethernet (10/100/1000base-T PoE+)

**NerveNet NPS-108AC**  
(HIRAKAWA HEWTECH)



**Raspberry Pi 3**  
(RS Components)

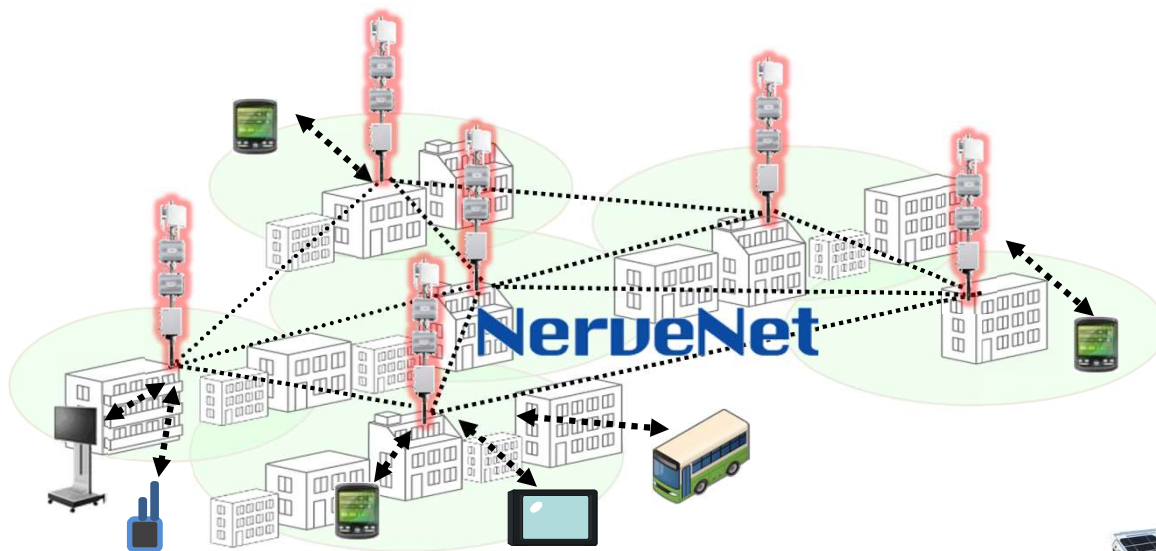


**Antennas**  
**Wi-fi**  
**Transceivers**  
**Base station**

**NerveNet is a solution for providing both daily and emergency info-com services to a local area in resilient and secure way.**

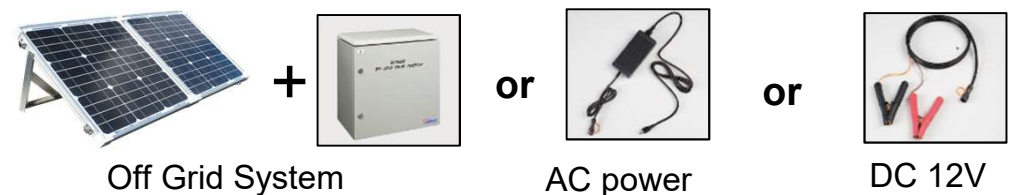
## System Overview

- In-network distributed “data processing” and “resilient communication” functions
- Enables resilient information sharing and communications including IoT devices
- Composed of base stations interconnected by Ethernet-based wired and wireless systems
- Forms line, star, tree, or mesh topology network



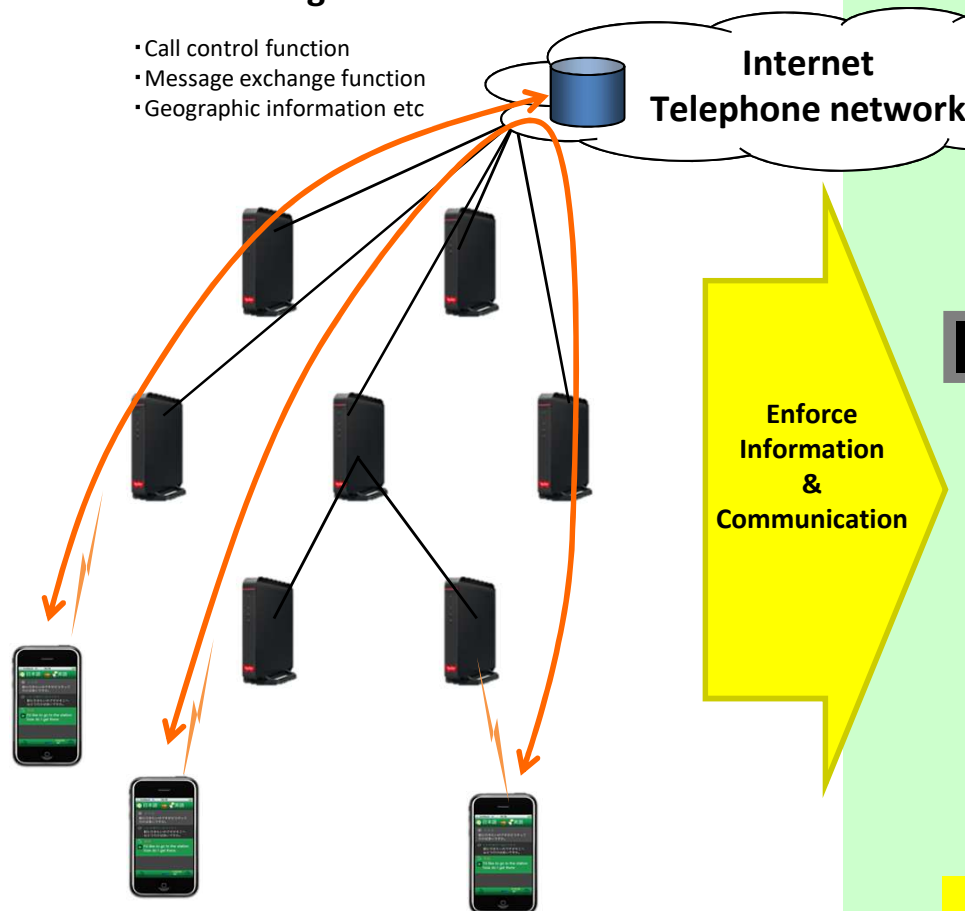
NerveNet Base Station

↑  
Power sources



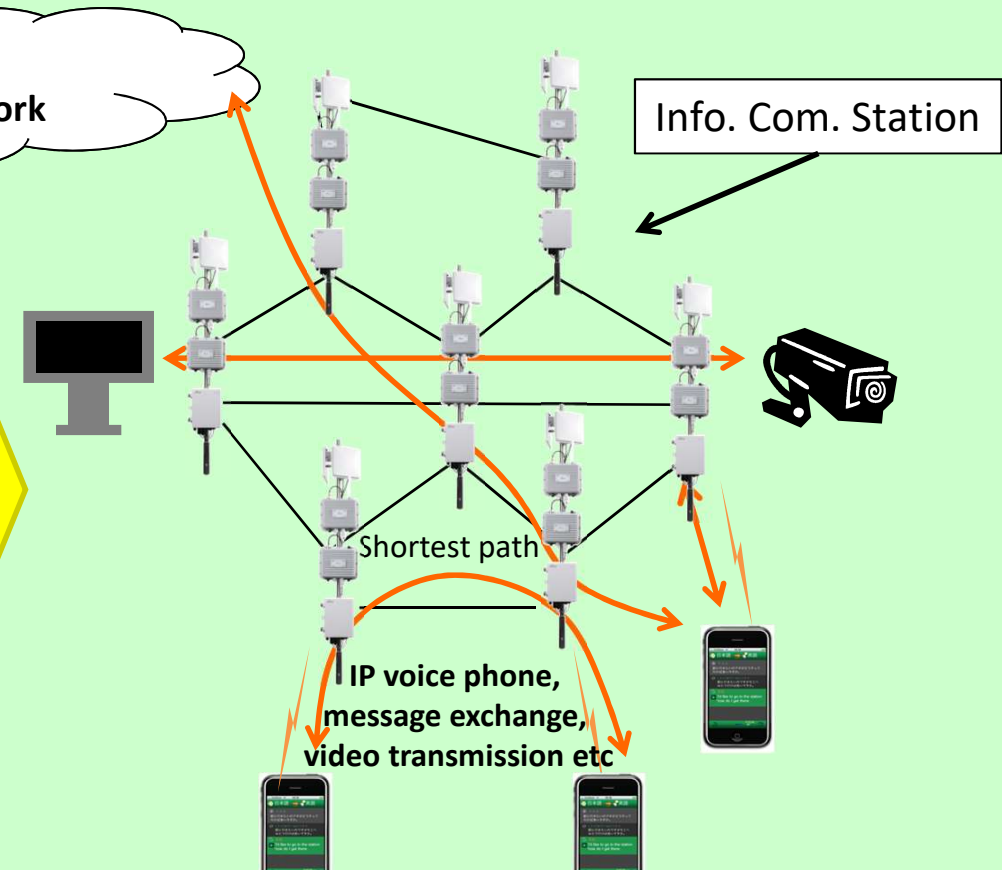
## Mobile network, telephone network, public wireless LAN network

- Tree topology ("Communication" vulnerability)
- All information and functions are concentrated in the Internet (Vulnerability due to Information exists remotely and concentrate 1 stations)
- Communication between neighborhoods also via remote



## NerveNet

- Information communication station with communication function and information processing function can be configured by connecting wired and wirelessly
- Mesh topology ("Communication" Robustness)
- Provide services such as IP voice phone, message exchange, video transmission etc without Internet (Enforce "information")

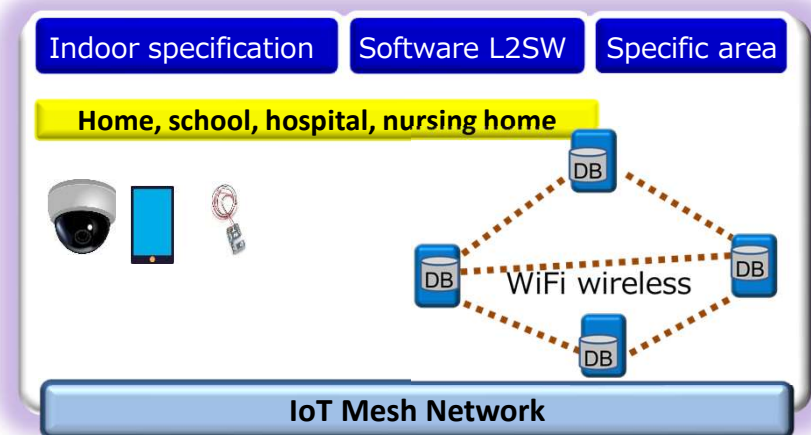
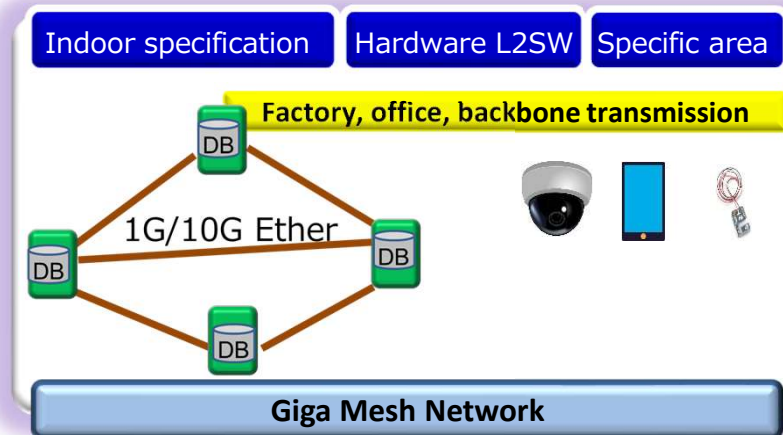
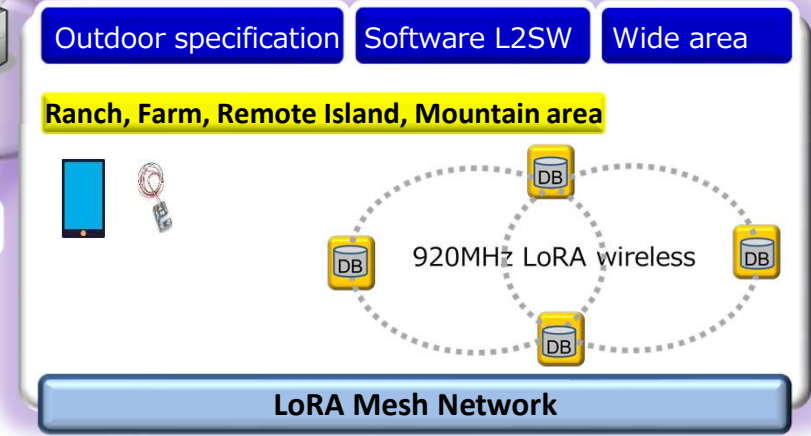
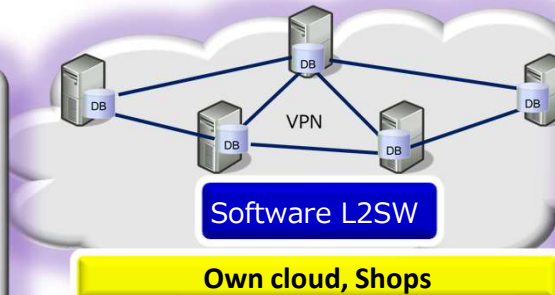
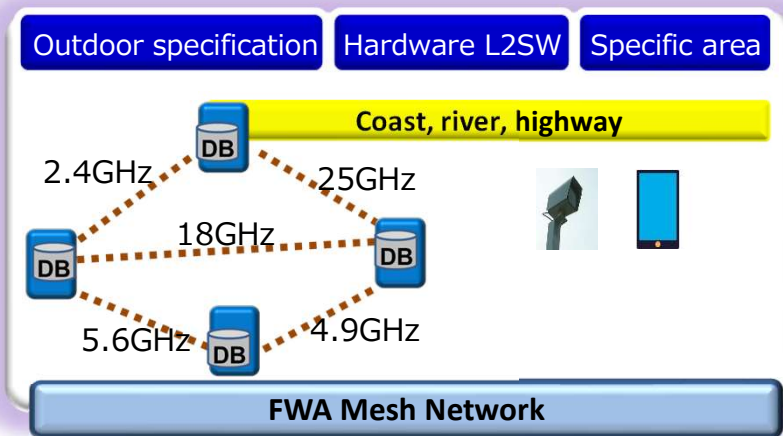


Platform of information & communication for community

## < Distinctive Function 1 >

### Provide Software in All in One

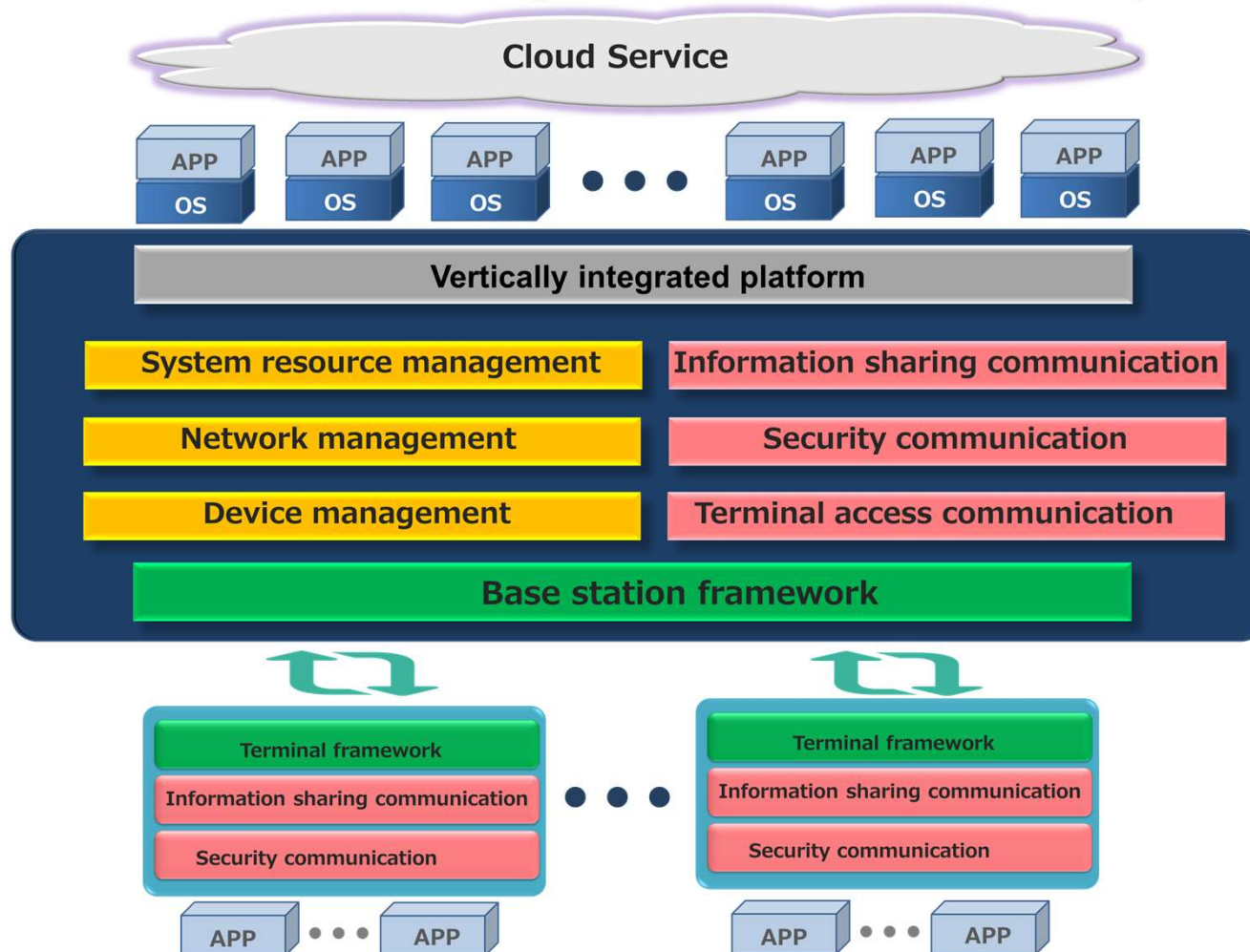
- Communication network resistant to disasters and obstacles that are not limited to wired / wireless
- Multipurpose available IoT / M2M service platform
- Intelligent network system with Installation environment, Bandwidth characteristics, Service-adapted
- Is it possible to expand from a specific area to a wide area using Wi-Fi, FWA, wired (Gbit), LPWA etc.
- Integrated operation management from system, network and terminal



## < Distinctive Function 2 >

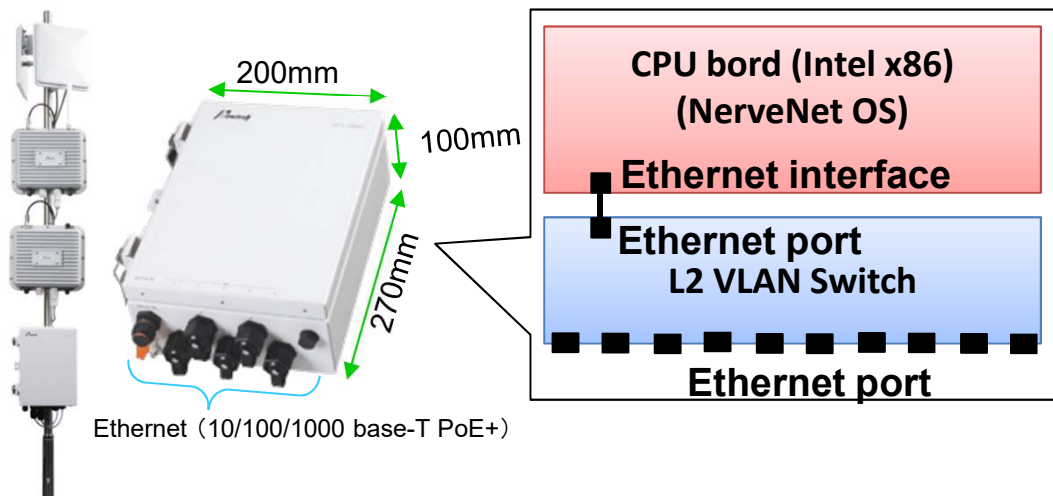
Vertically integrated platform that can cooperate with a wide variety of IoT / M2M services

- Realizing edge computing by providing virtualization infrastructure in cooperation with cloud services
- Provide security functions using terminal-to-terminal VPN (patent pending at NICT & NSC)
- Provide terminal framework for smartphone and sensor GW
- Provide base station framework for using base station distributed DB (clustering function)



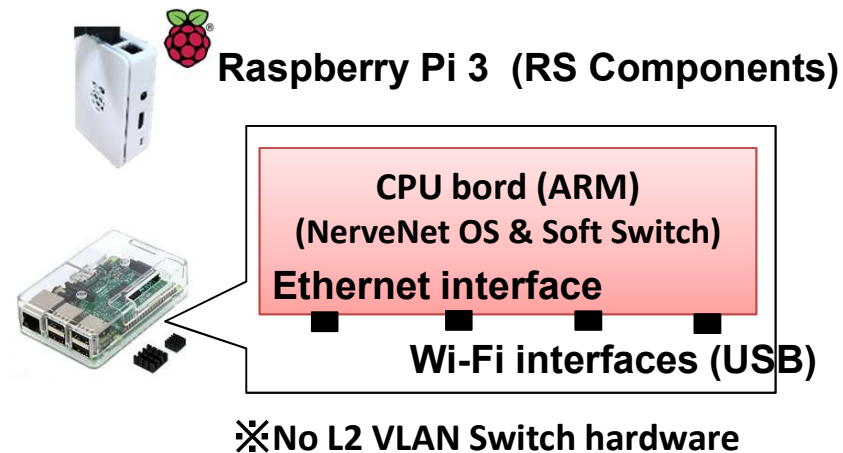
## High-Performance Outdoor Type

### NerveNet NPS-108AC (Hirakawa Hewtech)



Type	NPS-108AC
Network Interface	IEEE 802.3at(PoE+) Ethernet (10/100/1000 base-T) 5 ports
Operation Temp./Humidity	-10 ~ 50°C / 20 ~ 85%
Power input/consumption	DC12V / 25W average (100W max)
Protection class	IP65
Weight	5.5kg
Other interfaces	Serial ATA, PCI-E, USB, SD, Serial
Storage	2.5 inch SSD 8GB (default)
OS	Debian Linux 8 (NerveNet OS)
RAM	4GB
CPU	Intel Atom

## All-Software Type



Type	Raspberry Pi 3 model B
Network Interface	Ethernet (10/100/1000 base-T) 1 port, Embedded Wi-Fi (11gn)
Operation Temp.	0 ~ 70°C
Power input/consumption	DC5V / 6.5W average (12.5W max)
Weight	120g
Other interfaces	USB2.0 x4 , micro SD, GPIO
Storage	2.5 inch SSD 8GB (default)
OS	Debian Linux 8 (NerveNet OS)
RAM	1GB
CPU Broadcom BCM2837	Quad Core 1.2GHz

## Example 1: Early warning system of heavy rain disaster

**In some countries and regions in ASEAN, hundreds of people have been hurt due to floods and landslides caused by heavy rain. One factor is lacking early warning systems.**

**Utilizing terrestrial digital broadcasting and NerveNet etc. which are technologies originating from Japan, we expect to help solving those problems.**

**We are planning to investigate the feasibility of an early warning system using NerveNet. We are looking for partners to do research with us about application of this technology.**



## Example 2: Infrastructure system to observe the care recipient

In some ASEAN countries, rapid declining birth rate and aging population are proceeding like Japan. There is a need for a mechanism to safely and efficiently capture the care recipients in a hospital, home, and surrounding areas.

A Japanese company has plan to demonstrate such a system for care recipient in collaboration with multiple hospitals in Thailand, where NerveNet will be used.

Care in each hospital room  
in the hospital

Area to care at home

