

## Development of Network Board for the Web

### 1. Introduction

The demand for power supplies that suit the ubiquitous digital society of today is increasing. Under such conditions, the Software Design Group in the Power Supply Div. of Yutaka Electric Mfg. developed a network interface board - SNMP Web Board ("network board") - that can be built in an uninterruptible power supply ("UPS").

By installing the network board in a UPS, the UPS is functionally upgraded to become a freestanding one, as it is computerized.

#### • Conventional UPS system

UPS is a device installed between a commercial power supply and a computer. If the commercial power supply fails, the battery in the UPS supplies the rated power to the computer for a certain time. However, since the battery has a limited capacity, if the commercial power supply is not restored within a certain period of time, it is necessary to shut down the computer and then stop the power supply before the UPS battery is completely exhausted. In conventional UPS systems, which use a serial circuit (RS232-C) to communicate with the computer, software to monitor the UPS is run on the computer to detect any power failure and shut down the computer as required.

However, conventional UPS systems suffer the following handicaps.

- (1) The UPS output cannot be stopped during a hang-up of a computer on which the UPS monitoring software is operating.
- (2) Such UPS monitoring software is unavailable for special or unsupported operating systems.
- (3) If the OS shutdown time exceeds the computer shutdown time that has been set to stop the UPS output, the hardware will be damaged.

### 2. Characteristics

The above problems with the conventional UPS system have been resolved as follows.

- (1) A Linux-compatible OS is employed for the UPS to perform the functions of the UPS monitoring software, and the system configuration is modified so that the UPS plays the central part in the system.
- (2) If a power failure or any other problem besets the system, the computer is logged in and shut down by means of telnet, ssh (encoding) based on a pre-registered script. As long as the computer can be shut down in this way, the UPS monitoring software is unnecessary and computer shutdown is possible regardless of the OS type and version.
- (3) Until completion of the OS shutdown script, ping monitoring continues to prevent the current operation from shifting to the next one. In addition, a timeout function is added to prevent con-

tinuation of the monitor status due to a computer hang-up.

The other salient features of the network board are as follows.

- (1) Since the network board is equipped with SSL-compatible http server functions, it can be set and operated by the host browser.
- (2) It is possible to notify a power failure or any other problem afflicting the UPS system to the computer via the Mail or Windows Message functions.
- (3) The network board incorporates an NTP-adjustable clock, which allows for scheduled operations.
- (4) It is possible to search for identical boards on the network and centrally control the UPS statuses associated with them.
- (5) The network board is equipped with a redundancy function. By using two UPS units, it is possible to make the system compatible with a redundancy server (see Fig. 1).
- (6) By adopting a Linux-compatible OS so that open source software - which is completely free - can be utilized, it is possible to build difficult-to-develop network applications quickly.
- (7) The OS can be started in a second.

The principal specifications of the network board are shown in Table 1.

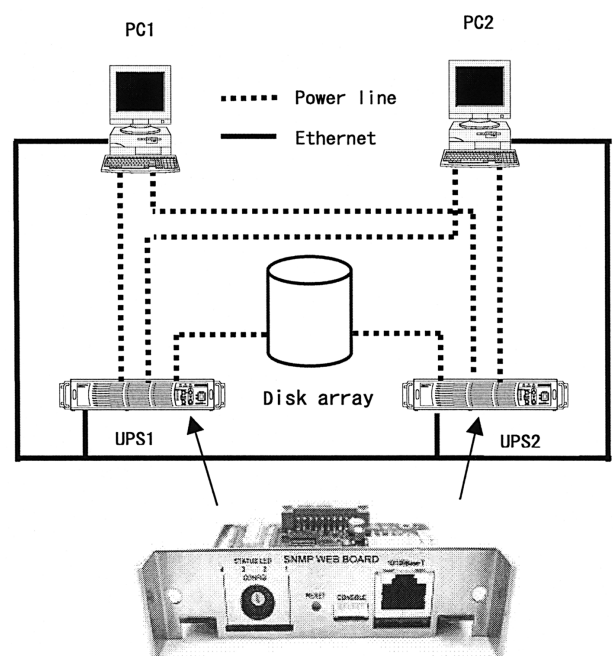


Fig. 1 An example of redundancy

**Table 1 Specifications**

|              |                                               |
|--------------|-----------------------------------------------|
| CPU          | SH7618 (32bit) 50MHz                          |
| OS           | Linux like (base on POSIX)                    |
| Flash ROM    | 8Mbyte                                        |
| SDRAM        | 64Mbyte                                       |
| RTC          | Accuracy: $\pm 50$ ppm, life: 10 years (25°C) |
| Ethernet     | 100BASE-TX / 10BASE-T                         |
| Console port | 38400bps, 8bit, nonparity, 1 stop bit         |
| RS232C       | 2400bps, 8bit, even parity, 1 stop bit        |
| Extend bus   | Address, data, IO, control                    |
| Size         | 80mm (W) $\times$ 90mm (D)                    |
| Condition    | 0 - 50°C / 10 - 80% RH (no dew)               |
| Power        | +5V $\pm$ 10%, max 500mA                      |

### 3. Future plans

In the future, in addition to the redundancy system that has already been implemented, we plan to add the capability to interlock multiple UPS units. Further, we have plans to come up with effective solutions to power supplies for server systems, such as a remote-controllable power supply system combining UPS and an ordinary power supply, a remote-controllable power outlet box, etc.

For further information, contact  
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