

Category: IT Solutions

S01: Monitoring a WLAN Site

This IT monitoring solution, IS01, enables remote environmental monitoring and remote control of a WLAN site using centralized monitoring over SNMP or a WWW interface.

Customer's problem

The customer, an Internet Service Provider, experiences equipment outages due to environmental conditions and power failures. Power outages that outlast the capacity of UPS batteries subsequently cause major problems. The solution should encompass the following features:

- Immediate, centralized detection of electricity supply outage to the site.
- Monitoring of external and internal rack temperatures.
- Ability to disconnect certain equipment remotely when running on battery power.
- Monitoring of physical access to the rack, ability to remotely authorize rack access.
- The solution must not depend on existing equipment nor require its replacement.
- Ability to test UPS functions remotely.

Situation

The customer is an Internet Service Provider whose infrastructure includes WLAN sites with multiple radio links. Site locations are difficult to access. The only external input is the electricity connection. Every site is equipped with a back-up power supply (UPS), which can keep the equipment up and running for 30 minutes to several hours, depending on the site.

Some UPS units have a WWW interface that can be monitored, while some older units do not offer remote monitoring capabilities.

Longer-lasting outages of electricity supply lead to equipment failures that could have been prevented. When the electricity supply is interrupted, the site is powered by UPS. After the UPS battery runs out, the entire site goes down.

However, if the outage is detected before the batteries run out, it is often possible to prevent subsequent failures by turning off all non-critical equipment or by dispatching service personnel to the site in order to secure an alternative power supply.

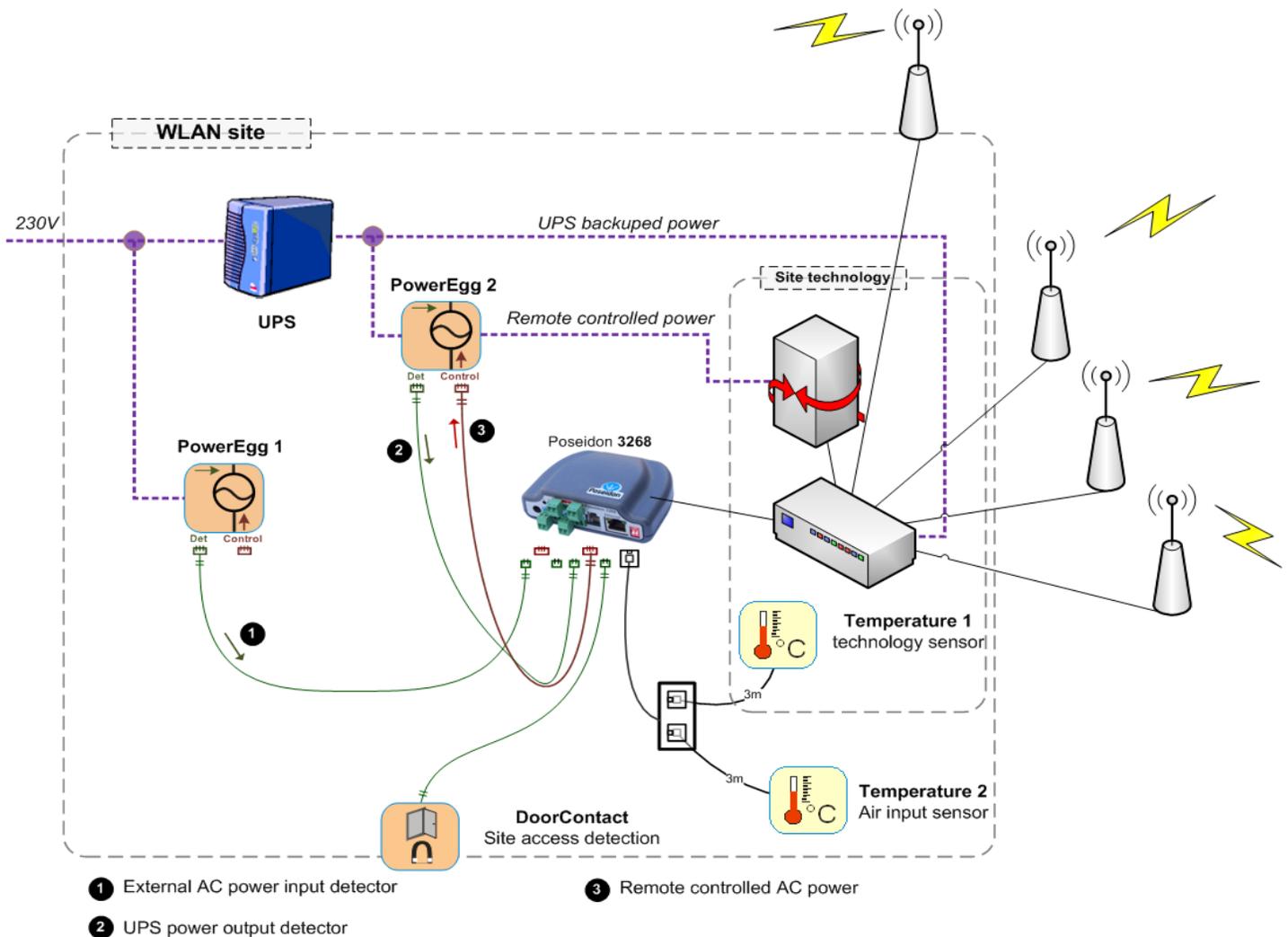
In addition, several system outages were caused by overheating in the summer or by forced manual restart of certain equipment.

Solution

One Poseidon 3268 unit with two temperature sensors, one door contact and two PowerEgg modules is added to the site.

- **PowerEgg1** functions as a voltage detector only. When the UPS input fails, contact (1) connected to the Poseidon input opens.
- **PowerEgg2** monitors the voltage at the UPS output. When the contact (2) opens, the Poseidon unit still manages to send a SNMP Trap before all equipment goes down.
- The 110/230V output of **PowerEgg2** powers non-critical equipment. This equipment can be disconnected by closing the output 2 of the Poseidon unit (3).

The entire system can be controlled over a web interface, or integrated to the customer's NMS monitoring system.



Bill of materials:

- Poseidon model 3268 connected to the Ethernet to send alerts by e-mail and SNMP.
- T-Box2 hub to connect two sensors.
- Temperature sensor 1 to be placed at the heatsink of the equipment. The sensor measures the maximum temperature inside the rack. Cable 3m long, indoor version.
- Temperature sensor 2 located near the inlet of outside air into the rack. Cable 3m long, indoor version.
- Two PowerEgg units to detect and control 230V mains voltage.
- Door contact to detect the opening and closing of the rack door.

1x	600254	Poseidon 3268
1x	600280	Poseidon T-Box2
2x	600005	Temp-1Wire 3m
1x	600119	Door Contact
2x	600237	PowerEgg

Using the system

- To analyze the data, any SNMP software can be used. In this case, the client uses **The Dude**, which is also used to monitor the network infrastructure.
- For security reasons, it is recommended to control the power output of PowerEgg2 using the password-protected Poseidon web interface or the command-line PosDamIO utility (invoked by clicking a desktop icon). The outputs can be controlled over SNMP; however, this may introduce a security weakness.

Possible functionality that exceeds requirements

- Simple notification of alarm situations (e.g. battery failure) is sent to a central NMS. The alert notification is e-mailed as well, in case the central system is not accessible. This e-mail can be forwarded to a mobile phone (SMS).
- The **PD Trigger** software can be used for further processing of alarm events (e.g. to disconnect an output).
- Excessive temperature 1 (air intake) can indicate the need to increase cooling capacity or to replace air filters, before the equipment actually overheats.
- The 230V output can be disconnected automatically using output control conditions that can be configured in the Poseidon 3268 unit. The PowerEgg2 power output can be therefore disconnected, for instance, when the electricity supply to the UPS fails or when the temperature is too high, even if the network is down.

Evaluation of the solution

- 1) **Requirement:** *Immediate, centralized detection of electricity supply outage to the site.*
Satisfied, integrated with the existing NMS (The Dude).
- 2) **Requirement:** *Monitoring of external and internal rack temperatures.*
Satisfied, connected to NMS.
- 3) **Requirement:** *Ability to disconnect certain equipment remotely when running on battery power.*
Satisfied, connected to NMS. Secure control is possible.
- 4) **Requirement:** *Monitoring of physical access to the rack, ability to remotely authorize rack access.*
Satisfied, connected to NMS.
- 5) **Requirement:** *The solution must not depend on existing equipment nor require its replacement.*
Satisfied, UPS monitored via its input and output voltages.
- 6) **Requirement:** *Ability to test UPS functions remotely.*
Not implemented for security reasons. However, the solution can satisfy this need as well if the UPS is connected to the 230V power output of PowerEgg1.

Conclusion

Deployment of the solution has reduced the number of failures at primary sites, thanks to early warnings and better infrastructure monitoring.
The service provider has increased the quality of its services and solved problems at certain sites.