



## Deploying an Effective Data Centre Alerting System

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White Paper



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## Introduction

The purpose of this short paper is to introduce the issues surrounding implementation of an effective alerting system for data centres and IT rooms in order to facilitate alarm management and remedial action.

Monitoring environmental conditions and facilities in data centres is crucial to system continuity. With heat and power becoming the two most significant issues affecting data centre layout and design, the need for efficient monitoring has never been more prevalent.

Many systems now exist to carry out the monitoring function. These systems are capable of monitoring multiple sensors for temperature, humidity, water leaks, smoke, etc., as well as on-site facilities such as fire alarm systems, security systems, UPS and air-conditioning units.

Critical to the successful implementation of a monitoring system though, is the capacity to efficiently transmit and deliver early-warning alerts to match the specific requirements of the business or organisation that uses it.

## Alerting Options

A variety of automated alerting options are available, the most common of these being email and SNMP. Both provide an effective means of providing early notification of impending problems, but only in circumstances where email and network management systems are manned continually, 24/7.

Emails can now be used to trigger SMS alerts via email to SMS gateways, and these can go some way to accommodating the 24/7 deficiencies of emails alone.

The dilemma remains however – if there is an unmanned data centre or IT room, and an air-conditioning unit fails at 1 a.m. on a Sunday morning, will anyone know? Or will the first indication of a problem be when personnel arrive on the Monday morning? By that time hardware that's incapable of performing an automatic emergency shutdown may well have burnt out leading not only to considerable downtime but also to the inconvenience and expense of procuring and installing replacement components.

SMS alerts may very well be sufficient enough to save-the-day. But again, with personnel fast asleep, will incoming text messages be read or even noticed?

The most effective alerts would appear to be those delivered by voice to landline and mobile phones. There is still some potential for the receiving phones to go unanswered, but a ringing phone is more likely to be answered in the middle of the night than a text message read.

Delivery of messages however, is only part of the problem and two additional issues should also be considered: 1. The delivery mechanism (ie. Network, telephone line, GSM). 2. Call escalation and management.

## **The Delivery Mechanism**

Several options can be considered regarding the delivery of voice alerts to the intended recipients.

### ***(i) Email to Voice***

Emails can be used to initiate the voice messaging process. The call management is handled via a separate server containing all the information relating to personnel phone numbers, etc. and the server recognises a unique identifier to facilitate activation of the correct call sequence to the correct personnel. So, the environmental monitoring system's email alert triggers the voice alerting sequence. Synthesised voice messages detailing the precise nature of the alarm, location of the sensor, etc., can be delivered.

### ***(ii) Voice via Landline***

Voice messages can be sent independently of an internal network and internet, and instead, delivered directly via a PSTN telephone connection. Contact numbers are held locally on the monitoring device. The telephone line can be independent of any internal network communications to provide an additional level of resilience. Voice messages are pre-recorded to identify the specific sensors attached to the monitoring system and provide the recipient with as much information about the alarm as possible.

### ***(iii) Voice via GSM***

Monitoring systems now exist that can not only deliver voice messages via landline telephone connections, but that are also able to deliver messages via GSM, either in the event that the landline goes down, or if no landline is available. Voice messages, once again, are pre-recorded, and the personnel contact list configured on the environmental monitoring device itself.

All of the above delivery methods also accommodate delivery of SMS alerts, giving users options regarding the type of messages they wish to receive (voice and/or text) and by which mechanism.

## **Call Escalation & Management**

The key element of an early-warning system, whatever its nature, is obviously to deliver alerts as soon as possible. But this can quite easily result in multiple contacts receiving the same alarm all at the same time. No-one is then quite sure who might be dealing with the alarm, if someone has dealt with it already, or whether the appropriate remedial action has been taken. The consequence of this typically, is that either everyone will respond generating much duplication of effort, or that time is wasted during the communication process to determine who is going to take action.

The solution to this is to implement an efficient call escalation procedure. A sequential alerting process (where the first named personnel contact receives the alerts, followed by the second if the first fails to acknowledge, followed by the third and so on) will enable any alarm to be handled more efficiently. The alert can also be tracked from the initial alarm stage through to acknowledgement to provide visibility of exactly what happened and when.

Some alerting systems even allow for recipients who failed to respond to an alert to be called back and told that the alarm has been responded to by someone else.

### **Fail-Safe Systems?**

Monitoring and alerting systems now exist that provide voice and text alerts via landline and GSM, as well as alerts via email and SNMP. If the network fails, alerts can still be delivered via telephone landline. If the landline fails, alerts can be delivered via GSM.

### **Summary**

An environmental monitoring system can only be as effective as the alerting mechanisms it employs. Although a variety of mechanisms exist, consideration should be given to the worst-case scenario.....an unmanned data centre, an alarm condition at the weekend in the middle of the night; How will anyone know?

Automated voice alerts delivered to landline and mobile phones are an extremely effective way of ensuring the alarm will be successfully notified and acted upon. Text, emails, SNMP traps, network alerts, etc. can also play a useful role in ensuring alarm notification.

Deployment of automated voice alerts in conjunction with a call escalation and acknowledgement system can provide an efficient long-term solution to data centre alert notification and management.