Mobile Notifications for Computer Network Administration

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Abstract

The network monitoring is a typical task for all kinds of corporative computer networks. The remote monitoring is one of actual functions to make notifications about network faults. One of solutions to support this function is sending special notifications to the administrator's mobile device. The best way to implement the described solution would be pushing notifications to portable devices (mobile phones). This solution isn't new. There are some services and systems that support special functions of notifications about the status of the system [1, 2, 3, 4]. But in most cases they are expensive and complex. The suggested solution is based on the modern network technologies. It uses 3G modems and public mobile telephone network. This means that there is a possibility to send messages and make a call using the provider's network with free delivering. It doesn't need to support quality and reliability of transmitting information. It is supported by provider. We use principle – "don't complicate simple things".

What is proposed? The proposed system is oriented to monitor of computer network component's status and to monitor the special application status. The system sends notifications about network alarms to administrator's mobile device via SMS or voice call.

The system is designed with "agent- manager" functional architecture. The object structure of the manager is presented as Fig. 1. It contains four classes: subject, monitor, festival, USBmodem.

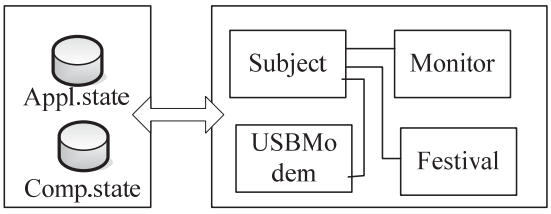

Fig. 1. Object structure

The class "subject" is responsible for the system configuration, receiving reports and monitoring of deviations. The class "monitor" is responsible for the forming of requests, preliminary performing and receiving of reports. The class "festival" is responsible for the transmitting notifications (SMS) to users. The class "USBmodem" is responsible for the message sending via 3G modem. All settings are stored in two database tables (comp.state, appl.state). These tables store information about object ID, names, IP addresses, type of states, text messages.

The system functions could be represented as five components' functions: manager, agent, mobile client, and computer. The system can perform in two modes: the passive and the active one. In passive mode the manager makes inquiry to agent for the network component's status.

In active mode there are two cases: active client and active agent. If the alarm is occurred the agent sends report to the manager (active agent). If the user wants to get information about any component status he sends sms request to the manager (active client).

The sequence diagram for passive mode is shown in Fig.2.

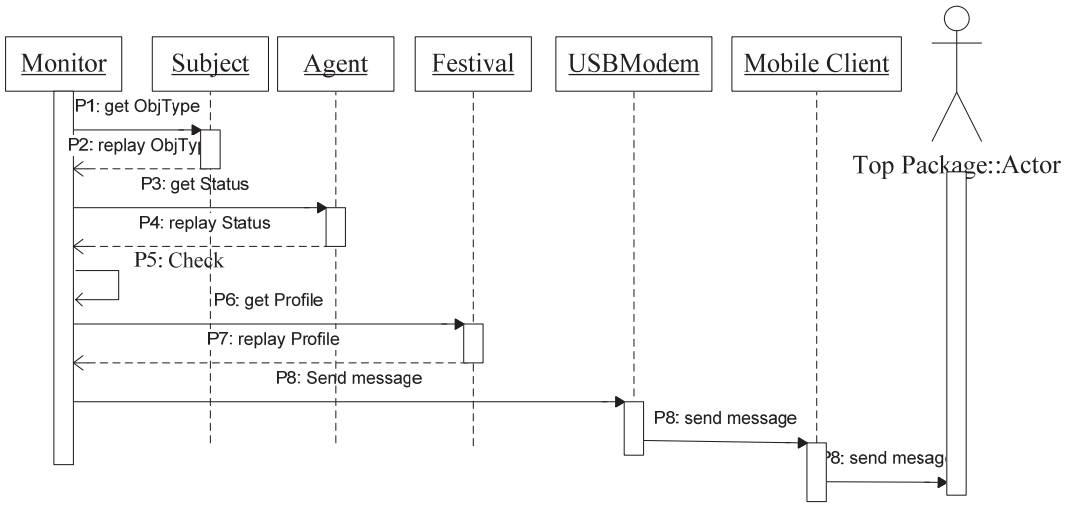

Fig. 2. Sequence diagram for passive mode (alarm is detected)

Passive mode:
P1: Monitor sends request on subject type.
P2: Monitor gets information about subject type.
P3: Monitor sends request on system status.
P4: Monitor gets information about system status.
P5: Monitor checks the status.
P6: If a fault is fixed, the monitor sends request on client's information (profile).
P7: Monitor gets information about client.
P8: Monitor sends request on sending SMS notification or make a call.

Active mode A (active agent):
A1: Agent detects a fault.
A2: Agent sends alarm report to Monitor.
A3: Monitor goes to P6 action (preparing to send notification).

Active mode C (active client):
C1: User prep ears sms.
C2: User sends sms to System (USBModem).
C3: SMS massage as request is sent to Monitor.
C4: Monitor goes to P1 and makes P2 – P4.
C5: Monitor goes to P6.

The system supports two configuration profiles: the profile of system's status and the profile of notifications. The profile of system's status includes descriptions of all managed components. It contains values of the scanning period and IP addresses. The notifications profile includes

information about recipients (users whom the notification will be sending). It is possible to send sms and voice call.

In the normal mode the manager requests the agent in the preferred scanning period. The agent requests operation system to get needed value of managed variables. In the alarm mode the agent generates alarm message (notification) to manger and manager generate notification.

The system supports determined events in real-time on continuous monitoring. The unique rule exists for the each determined event.

Thus, the proposed system helps to the administrator to perform continue monitoring operations by use mobile phone. The system is efficiency but has restrictions. It supports only the determined set of statuses. The increasing number of these statuses increases the complexity of the system.

The systems functions will be extended to make interconnections to SNMP protocol and Netgios protocol in future.

Index Terms: Mobile monitoring, Computer network administering, Network management.

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