Configuration Guide – Email notification on SNMP service alert

WebCCTV

Let's make things safer

Contents

WebCCTV is all about peace of mind for the customer. It is the core of a security system to make the user feel secure. A part of that is keeping the uptime of the system as high as possible. The less time is needed to notice, diagnose and fix an issue, the higher the uptime of the system will be.

WebCCTV includes a whole range of functionality to help with that. In this paper we will build a basic, but fully operational notification system. **When a camera goes down, System Health Service will send an SNMP message to an SNMP management software (Trap Receiver), who then notifies the user by email.** This setup takes less than 10 minutes to perform, but can save days of downtime later on.

Quadrox advises you to use a similar setup in each of your installations to ensure a minimal response time as a service to your customers.

1 Introduction

A video surveillance system is an important element in the protection of the assets and people that are secured by it. It is logical that the user expects it to be up and running 24/7, 365 days per year, so that when something happens, the system has it on disk.
Unfortunately, like with any IT system or even any machine in general, 100% uptime is not a reasonable expectation. Things *will* go wrong. There can be hardware failures (a camera falling out, a hard disk problem), bugs in the software or even something stupid like a power cut.

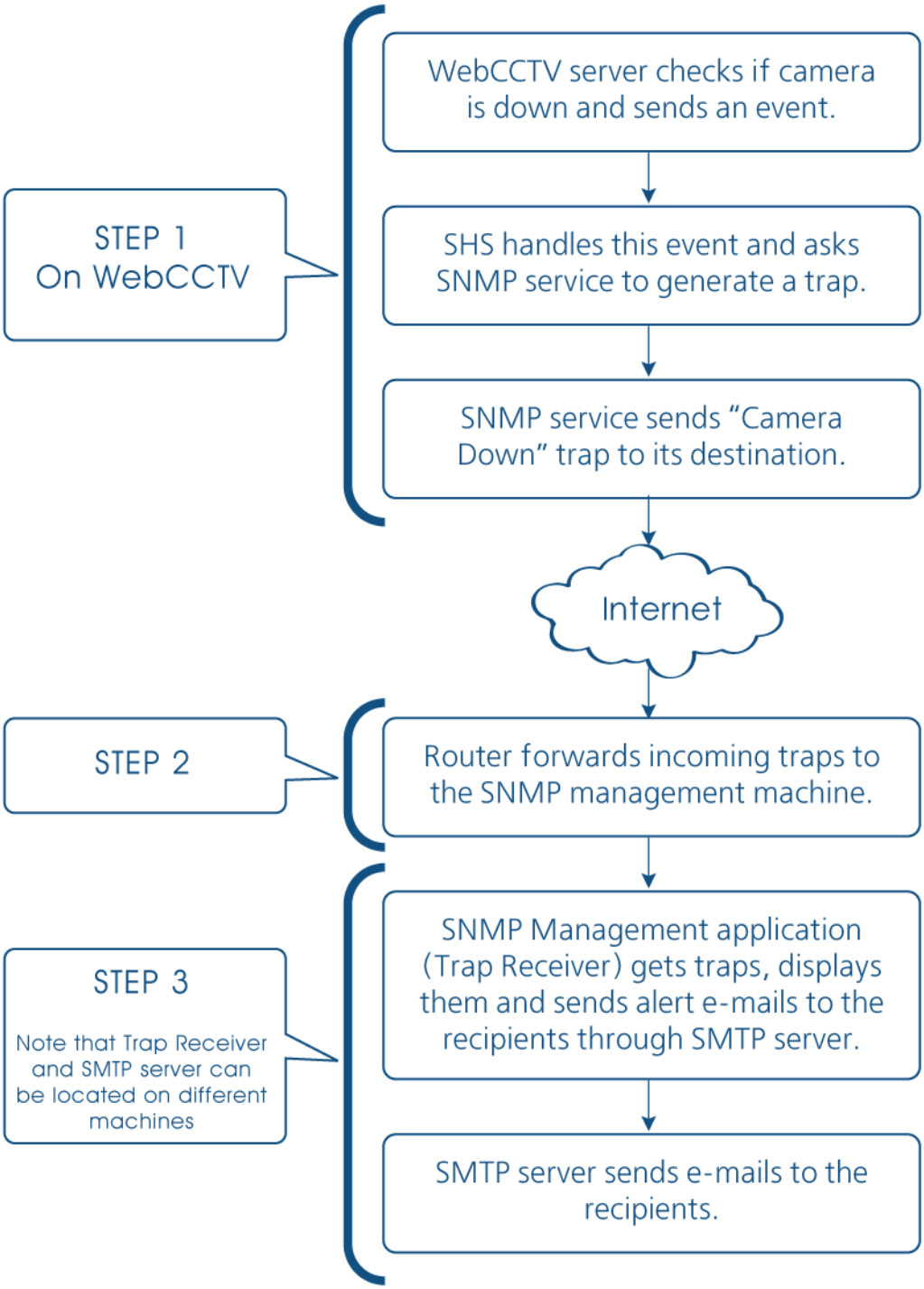
WebCCTV is all about peace of mind for the customer. It is the core of a security system to make the user feel secure. A part of that is keeping the uptime of the system as high as possible. WebCCTV includes a whole range of functionality to help with that. The less time is needed to notice, diagnose and fix an issue, the higher the uptime of the system will be.
All service events and user actions are logged in an event log, which can be consulted from the Windows OS (with the Event Viewer tool) as well as via the web application. This is an excellent tool for troubleshooting and tracing a problem. Our network diagnostics page (in Video Manager) allows you to determine with one click if your cameras are online and if there is a proper connection between the NVR and the client machine. This helps you to find out whether a lack of streaming is a camera, a network or a software problem.
This technical note is about using another helpful component – System Health Service – and the SNMP protocol to send notifications about problems through email. The sooner you, the installer, the end user, the manager or Quadrox get notified about a problem, the sooner it can be fixed.

System Health Service (SHS) is a separate software process that runs on the WebCCTV NVR. It's main task is monitoring the video server software and other machine parameters like memory usage or temperature, to detect if something is going wrong. If it does, it tried to heal the system, e.g. by restarting the video software or even the entire PC, and it tries to notify the user about the problems that occur. It can beep (audio notification), write extra information in the event log, and send SNMP alerts, called "traps".

The **Simple Network Management Protocol (SNMP)** is as its name suggests a networking protocol designed to send service messages about network components to a management software. Many software packages exist to handle SNMP alerts: from very extensive and pricy tools like IBM Tivoli and HP Openview, over full-functionality open-source tools like Hyperic HQ, down to very simple freeware tools like Trap Receiver. We will use the latter in our case study, to demonstrate the concept and reach a working notification system.
It's important to know that SNMP software can receive events that were sent by a network component itself, as well as poll such components to see if they are still alive. I.e. if you centralise your SNMP handling, you can even detect that an NVR has gone offline completely.

The figure on the next page explains the setup of a basic, but fully operational notification system that we will build in this paper. **When a camera goes down, SHS will send an SNMP message to an SNMP management software (Trap Receiver), who then notifies the user by email.** This setup takes less than 10 minutes to perform, but can save days of downtime later on.

Quadrox advises you to use a similar setup in each of your installations to ensure a minimal response time as a service to your customers.



E-mail Alert Schema

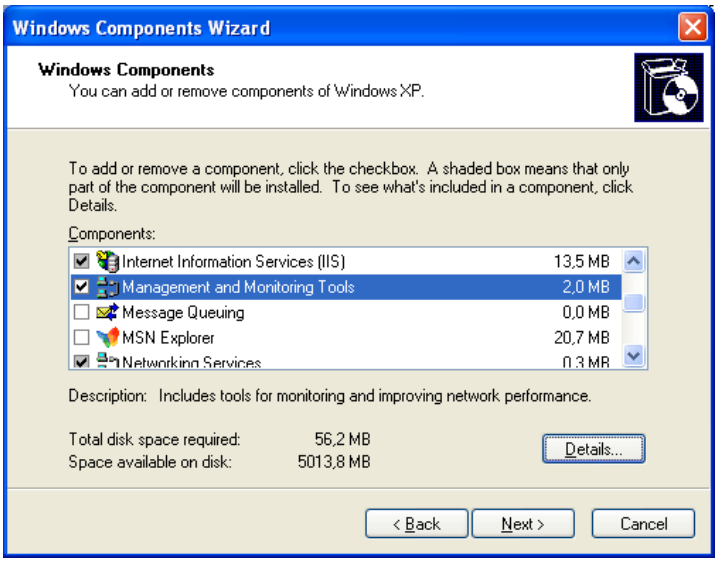
2 WebCCTV Configuration (STEP 1)

The first configuration part is performed on the WebCCTV itself. You have to do this on all WebCCTV(s) you want to receive camera down information from.

2.1 Management and Monitoring Tools (SNMP service)

In order to be able to send SNMP messages, the WebCCTV machine must have the SNMP service installed:

- Check if **Management and Monitoring Tools** is installed at **Start → Settings → Control Panel → Add/Remove Programs → Add/Remove Windows Components**.
- If the **Management and Monitoring Tools** are not installed *during* the WebCCTV/GuardDVR/GuardNVR installation[1], SNMP reporting will not work and an (extra) manual configuration is needed. In this case, call Quadrox support. Our support engineers will be happy to assist you in the process.



Management and Monitoring Tools

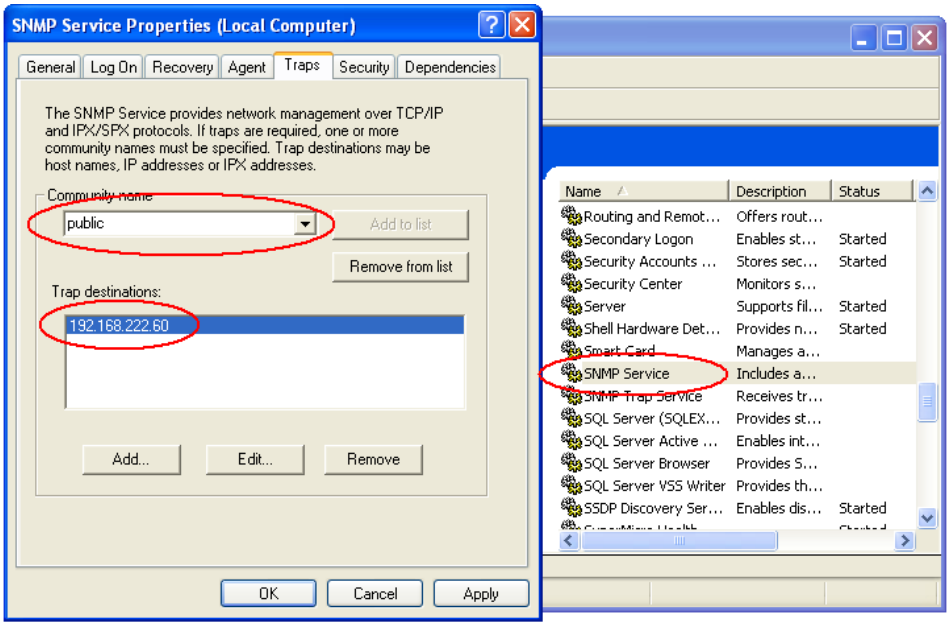
[1] Starting from version 3.8.2.0, WebCCTV/GuardDVR/GuardNVR is pre-configured to send SNMP messages right after installation.

2.2 SNMP Service Configuration

We need to setup the IP address of the machine that hosts the SNMP Management Application (Trap Receiver), so called Trap destinations:

- Select **SNMP Service** at **Start → Settings → Control Panel → Administrative Tools → Services,** right click, select **Properties** and go to the **Traps** tab.
- Type **public** as community name and click **Add to list**.
- Click **Add…** and type the trap destination address and click **Add**. It can be an IP address or a DNS name. See **STEP** 3 below to find out which IP address you need.
- Restart the SNMP service. Right click **SNMP Service** and select **restart**.

The configuration of the WebCCTV is finished.



SNMP Service configuration

3 Router Configuration (STEP 2)

If the WebCCTV(s) and the SNMP Management Console application are connected through the Internet (i.e. they are not in the same LAN), you must configure your border router/firewall to allow traps to be sent to the SNMP Management Console machine.
If all WebCCTV(s) and the SNMP Management Console machine are in the same LAN, this step can be omitted.

- Open port **UDP 162** for incoming requests and redirect it to the SNMP Management Console host machine **SNMP Trap**.

4 SNMP Application Machine Configuration (STEP 3)

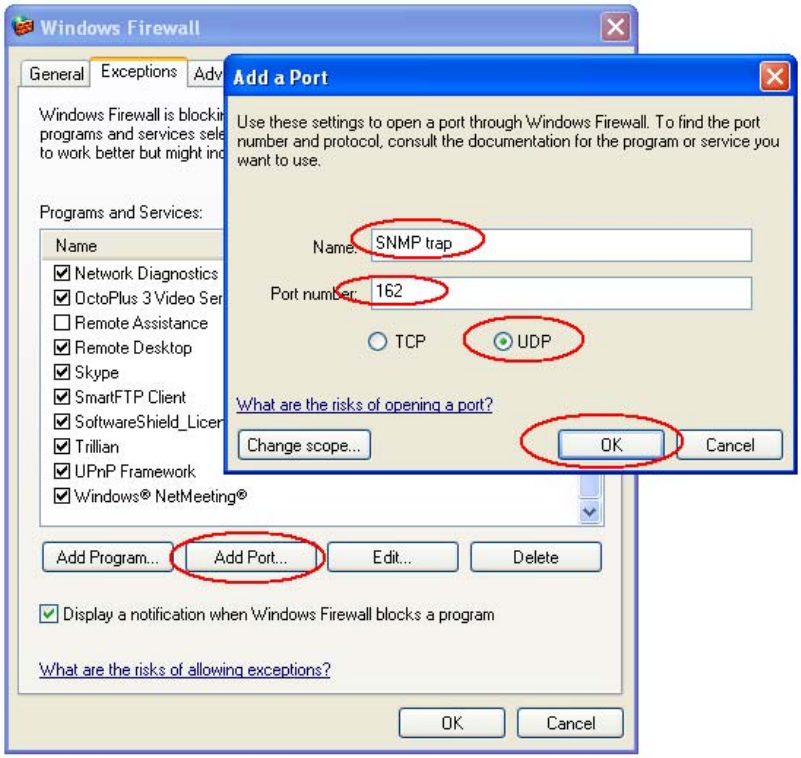
Select the machine that will host the SNMP Management application. It can be a dedicated machine, one of the WebCCTV units, a client machine or an already existing SNMP Management application.

For this simple setup, we recommend installing the application on your WebCCTV itself for simplicity. As an IP address in **STEP 1**, you can select **localhost** or **127.0.0.1**.

4.1 Windows Firewall Configuration

If the Windows Firewall is enabled on this machine, you need to open the SNMP trap port on the firewall:

- Right click **My Network Places** icon (on your desktop), select **Properties**.
- Right click **Local Area Connection**[2], select **Properties** and select **Advanced** tab.
- Click **Settings**, select **Exceptions** tab and click **Add port…**
- Enter **name** (Example: SNMP trap), enter **Port number 162** and choose **UDP**. Click **OK** twice.



Windows Firewall Configuration

If your machine is equipped with other firewall software, please make also there the corresponding changes.

[2] Or any other connection that serves incoming packets.

4.2 Case study: Trap Receiver

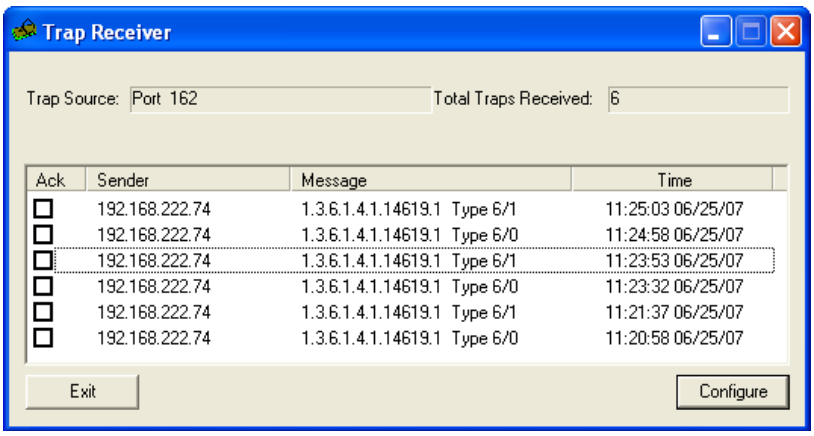
In this manual we use the freeware "Trap Receiver" application (http://www.trapreceiver.com/). Download and install this application on your machine. Note that this machine should correspond to the IP address configured in **2.2 SNMP Service Configuration**.

Note that the Trap Receiver applications works as a service and you don't need to start the **Trap Receiver GUI** to handle traps. After configuration is completed the Trap Receiver handles traps in the background.

As mentioned in the introduction, this application could be replaced by any SNMP-enabled network monitoring tool if such a tool is already available (check with the system administrator) or if you need more advanced functionality.

4.2.1 Start Trap Receiver

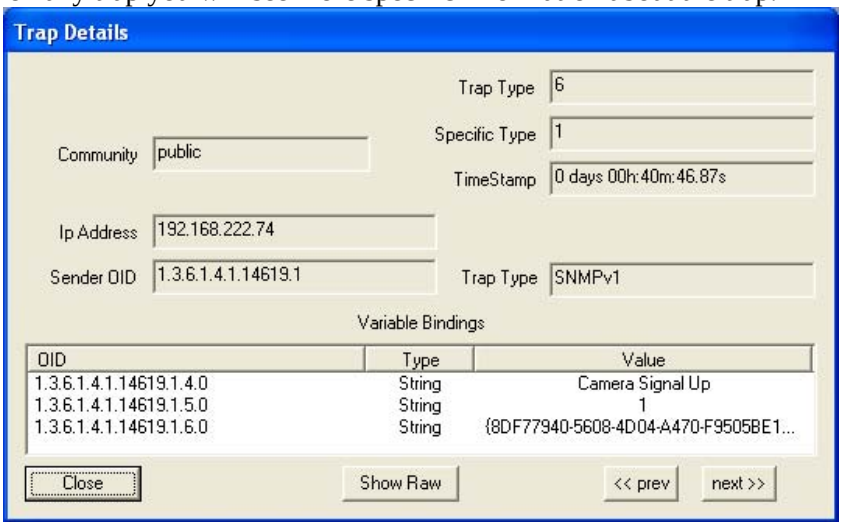
Double click the Trap Receiver shortcut on your desktop.
You should be able to get traps from the WebCCTV(s) now. (Disconnect a camera for example)



Trap Receiver main window

In our example above, you can see traps from the WebCCTV with IP address 192.168.222.74. Type 6/0 means that the camera is down and 6/1 means that the camera is up.

If you double click on any trap you will see more specific information about the trap.

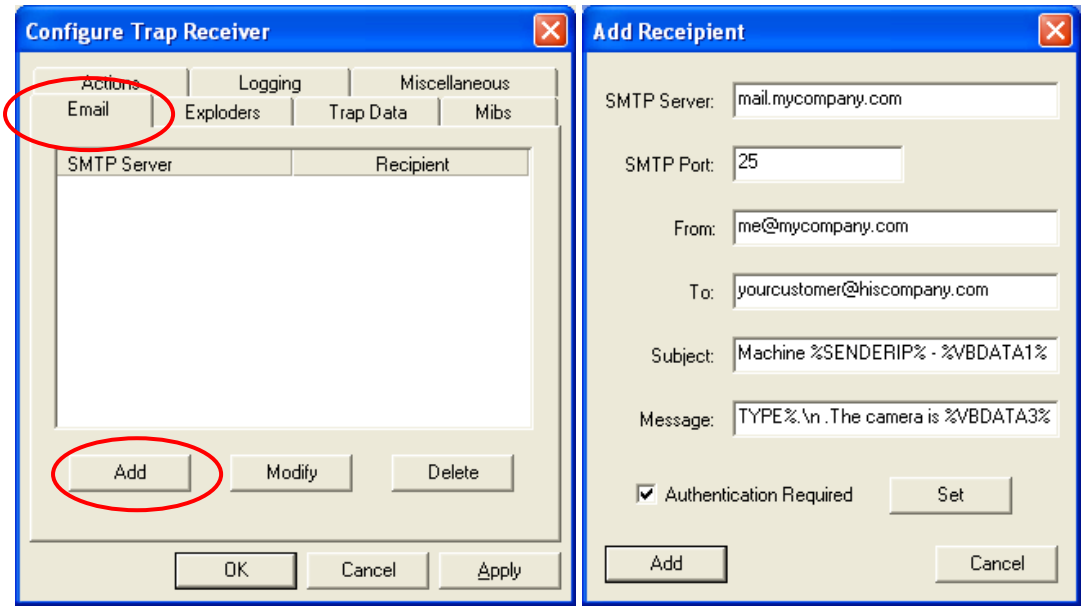


Specific Trap Information

The most important info in this window is the camera GUID which defines the camera that went down.

4.2.2 Trap Receiver E-Mail Configuration

- Click **Configure** in the main window, select **Email** tab.

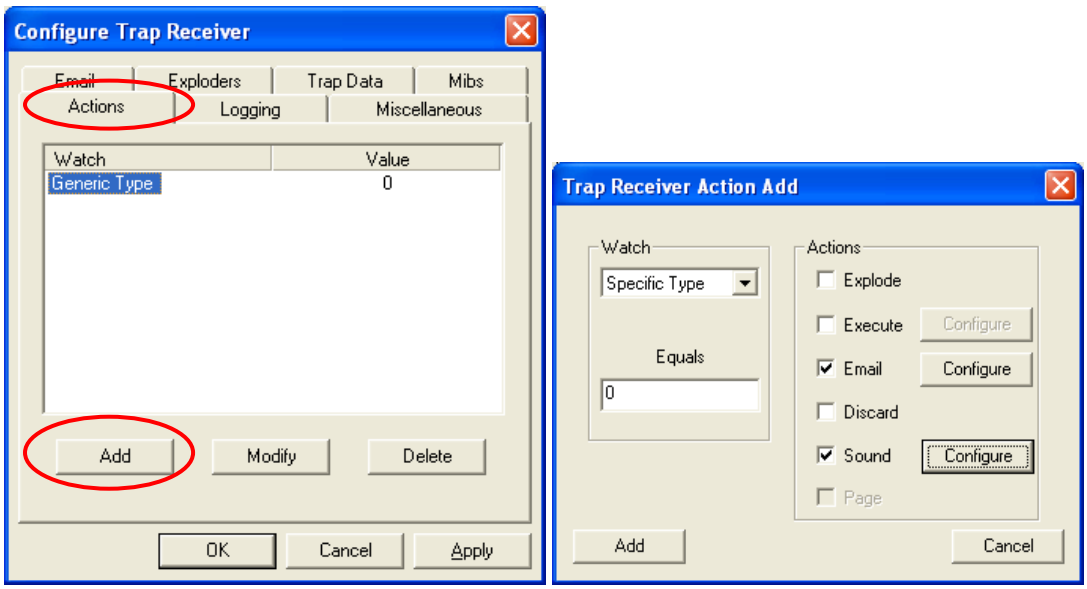


Mail Configuration

- Click **Add** and fill in the following information:
  - **SMTP Server address** (not SNMP!): normally this is your company's SMTP (email) server, but for private clients it can be the provider's SMTP address.
  - **SMTP port**: usually 25.
  - **From** field: From name in the alert e-mail.
  - **To** field: specifies the recipient who receives the E-mails.
  - **Subject** field: specifies the subject of the E-mails. You can use macros that substitute trap information (see more in detail the Trap Receiver manual page at http://www.trapreceiver.com/trapreceivermanual.html). For example:
    - Subject Entry: Machine %SENDERIP% - %VBDATA1%
    - Subject Result: **`Machine 192.168.222.74 – Camera Signal Down.`**
  - **Message** field: specifies the content of the E-mails. You can use macros that substitute trap information (see more in detail the Trap Receiver manual page at http://www.trapreceiver.com/trapreceivermanual.html). For example:
    - Message Entry: Machine %SENDERIP% has received trap %GENERICTYPE%/%SPECIFICTYPE%.\n .The camera is %VBDATA3%.
    - Message Result: **`Machine 192.168.222.74 has received trap 6/0 The camera is {8DF77940-5608-4D04-A470-F9505BE138D4}`**
  - If the SMTP server requires authentication, check **Authentication Required**.
  - Click **Add** to complete the Email configuration.

4.2.3 Trap Receiver Action Configuration

- Select **Actions** tab. We will create (for this example) two actions to have different sound alerts for camera up and down traps).



Action Configuration

- Click **Add** and fill in the following info:
  - **Watch** drop-down list: Select **Specific Type**.
  - **Equals** field: Type **0** for the camera down trap and **1** for the camera up trap.
  - **Actions:**
    - Check **Email** box and select previously configured Email option
    - Check **Sound** box and select one of the appropriate WAV files (usually C:\Windows\Media contains some of them).
  - Click **Add** to add the action.

Remark: Windows XP sends also other traps during startup. The configuration above catches those traps too and recognizes them as a Camera Down signal. To avoid such behavior there are two possible solutions:

1. **Change Actions** so that it reacts only on to the WebCCTV Camera Up/Down traps. To do so please delete all Action previously created and add a new **Action**:
   a. **Watch** drop-down list: Select **Sender OID**.
   b. **Equals** field: Type **1.3.6.1.4.1.14619.1** to catch only Camera Up/Down traps.
   c. Actions:
      i. Check **Email** box and select a previously configured Email option.
      ii. Check **Sound** box and select one of the appropriate WAV files (usually C:\Windows\Media contains some of them).
   d. Click **Add** to add the action.
2. **Add an action** that blocks other traps than Camera Up/Down:
   a. **Watch** drop-down list: Select **Sender OID**.
   b. **Equals** field: Type **1.3.6.1.4.1.311.1.1.3.1.1** to catch non-relevant traps.
   c. Actions:
      i. Check **Discard** box.
   d. Click **Add** to add the action.

Now only WebCCTV's Camera Up/Down traps will be processed.
You have configured now everything receive E-mail alerts if a camera goes down.

5 Troubleshooting

Question: The Trap receiver application doesn't receive any traps
Answer:

- Check that your system has the SNMP service installed (see **2.1 Management and Monitoring Tools (SNMP service)**. If not – install the SNMP service.
- Check that your system has the System Health Service installed. In the **Service**s the **WebCCTV System Health Service** should be installed and running. If not, repeat WebCCTV (GuardDVR/NVR) installation and make sure that "System Health Service" and "SNMP support" options are enabled.
- Check that your WebCCTV is configured to send SNMP traps when camera goes down:
    - Open the Registry Editor (regedit.exe) and check that the HKEY_LOCAL_MACHINE\SOFTWARE\Quadrox\OctoPlus3\Filters\{F9924237-56F5-4d8d-BFA8-73BB74572381}\SignalControlPrecision value is set to 0x00001388 (5000).
    - Open the Registry Editor (regedit.exe) and check that the HKEY_LOCAL_MACHINE\SOFTWARE\Quadrox\SHSSRV\XMLConfigFile value is set ends with "…SNMP.xml". So, the C:\Program Files\Quadrox\GuardDVR\SHS\ SHSOPServer-SNMP.xml is correct.
- Check that SNMP service was restarted. Restart your machine to make sure it has restarted properly.
- Check that your border router/firewall is configured according to **3 Router Configuration (STEP 2**).
- Check that the SNMP Console machine (with the Trap Receiver application) has Windows Firewall also properly configured.
- Try to setup the Trap Receiver application on the WebCCTV itself, change the trap destination address for the SNMP service to 127.0.0.1 (see **2.2 SNMP Service Configuration)**
- Restart the SNMP service and try to disconnect camera again. Note that to avoid false alarms the WebCCTV recognizes camera down state after 5-10 seconds. If the local Trap Receiver gets the traps – then the WebCCTV is configured properly and problem is in the router / client PC. If not – check the WebCCTV configuration one more time.

Question: Customer doesn't receive any e-mails
Answer:

- Check that you've entered a proper name/IP address for the SMTP server. Check that you can reach this SMTP server from the Trap Receiver machine.
- Check if your SMTP server requires authentication and provide valid credentials if necessary.
- Check that you've entered a proper Recipient address and From address.
- Enable Logging and Debug on the Configuration page of the Trap Receiver application. This will help to check the SMTP errors.
- Check if that anti-spam software didn't reject mails from the Trap Receiver application.