watchdogBackup

Dynamic watchdog monitoring of a backup interface

1 Introduction

It can be desirable to run a guard watchdog script on a backup interface. This is particularly important where the backup interface is over a 3G link where the 3G connectivity can disappear without the router detecting a problem. The problem with doing this is that it should only be monitored when the primary interface is down.

The watchdogBackup script is designed to do this. It will dynamically enable and disable monitoring of a backup interface. Note that the script assumes that data will be traversing the backup interface within a defined period.

There are two conditions that are a requirement for this script:

- The primary interface must be a PPP interface
- Data must be guaranteed to be traversing the backup interface within a defined configurable period of time.

The watchdogBackup script dynamically calls an existing script embedded in firmware called watchdogOID to monitor the backup interface. WatchdogOID periodically checks a MIB to ensure it is incrementing. Virtual Access recommends that the receive octet count on the backup interface is monitored.

If the OID fails to increment within a defined configurable period then the monitored interface is first reset. If the OID continues to fail to increment then the router is reset.

The script is commonly used in a scenario as below. The primary connection is via an ADSL link using PPP. The backup interface is generally a 3G connection.
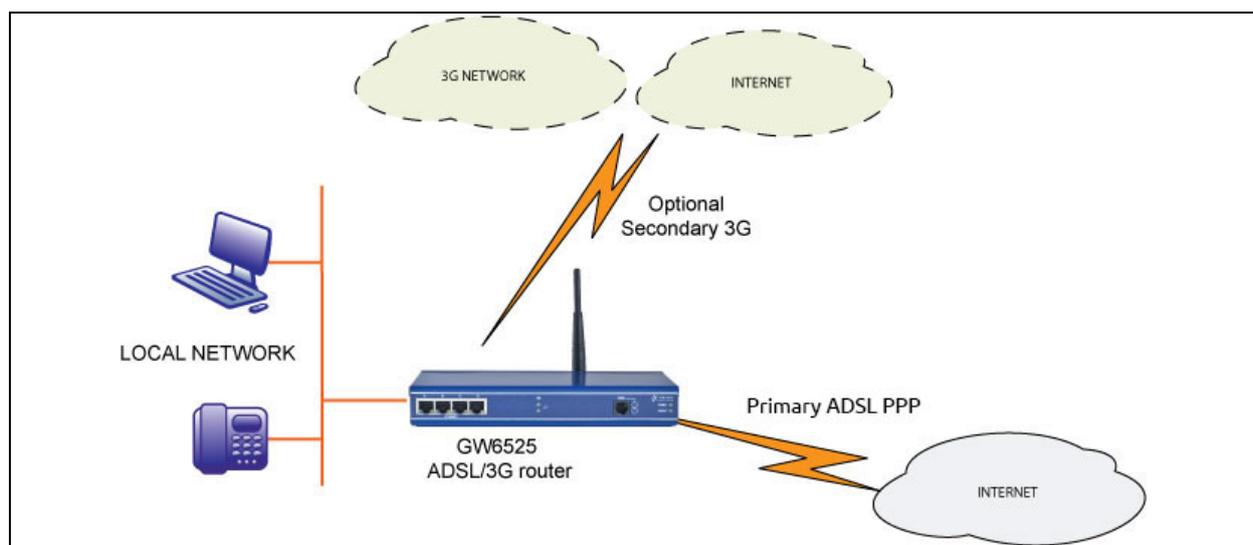
Figure 1: Network architecture

2 Configuring the watchdogBackup script

2.1 Script overview

The script is designed to be run on boot. On boot:

- The script first waits for PPP to establish on the primary link

- If PPP fails to come up on the primary link within a configurable period of time the script will start monitoring the backup interface by periodically checking an OID value (ideally the receive octet count on the backup interface). This must increment with a configurable period of time.

- If PPP comes up as normal the script will wait for PPP to come down.

- On PPP down on the primary link the script will monitor the backup interface by periodically checking the desired OID value (the receive octet count on the interface). This must increment with a configurable period of time.

- If PPP comes back up on the primary link then monitoring of the backup interface is disabled.

- If the backup interface monitored OID does not increment within a configurable time period then the backup interface lower layer is reset.

- If the OID fails to increment after a further period of time then the router is reset.

Note: This script is not embedded in any firmware image. Copy the script from Section5 'WatchdogBackup script' and paste into the script editor in the web GUI.

2.2 Script parameters

The script name is watchdogbackup and it takes in **six** required parameters. These parameters are described in the example and table below.

watchdogBackup **ppp-1, 180, MIB.2.2.1.10.10, modem-1, 180, 120**

Parameter	Description
ppp-1	The PPP interface for the primary link.
180	The time to wait in seconds for primary PPP to come up on boot before starting to monitor the backup interface.
MIB.2.2.1.10.10	The OID to monitor for the backup interface. This example uses the receive octet count for ppp-2.
modem-1	The backup physical interface to reset on first fail if the OID does not

	increment.
180	The initial time to wait in seconds before starting backup interface checks.
120	The time to wait in seconds between OID value checks.

Table 1: Six required parameters and their descriptions

2.3 Configuring the script

The script is currently not embedded in any firmware image. To use the script first paste the script from Section5 'WatchdogBackup script' into the script editor and then use the scheduler to run the script at boot up.

From the start page, click **Advanced** to open the Expert View menu.

2.3.1 Pasting the script into the script editor

If you are using 9.09.xx firmware, in the Expert View menu, click **system > scripts > script editor**. The Script Editor page appears

If you are using 10.00.xx firmware, in the Expert View menu, click **system > management > scripts > script editor.** The Script Editor page appears.
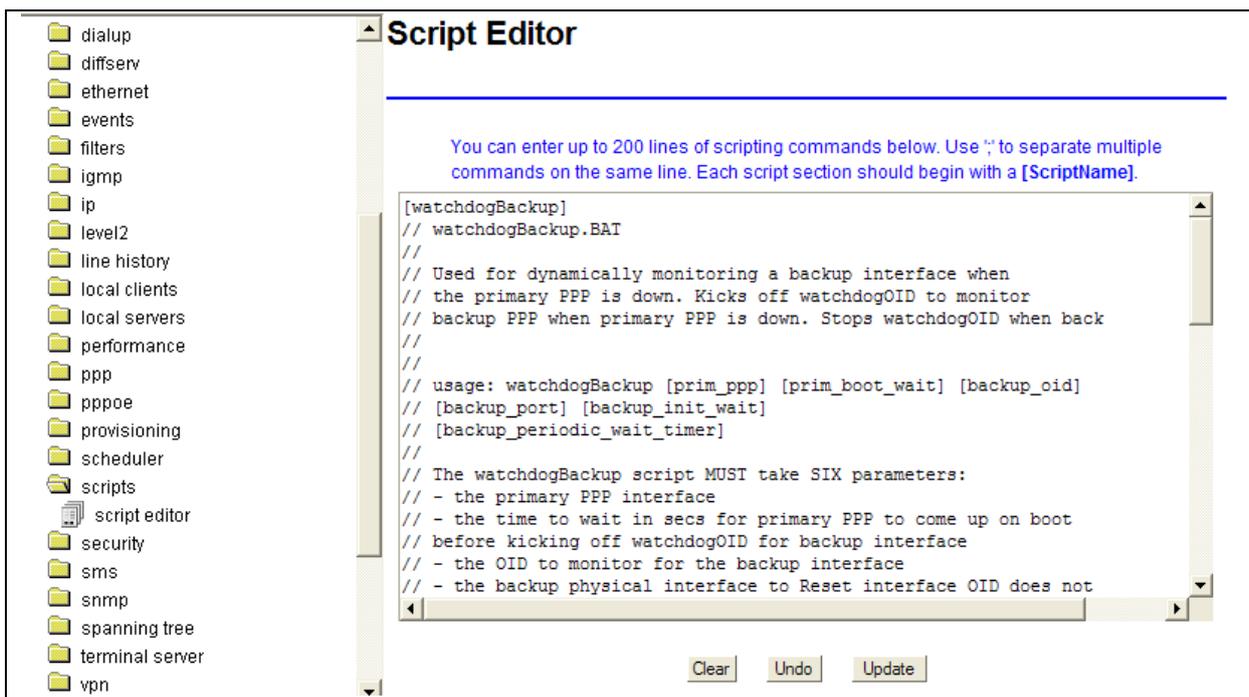
Figure 2: The script editor page in version 9.09.xx

Paste in the script from Section5 'WatchdogBackup script' from this document. The first line of the script should begin with the script name in square brackets, [watchdogBackup]. This name will be used to call the script using the scheduler.

You can omit any line beginning with **//** (denotes a comment tag) if the number of script lines needs to be reduced. Also multiple script lines can be entered onto

the same script editor line separated by '**;**' (semi colon). When you have completed the script, click **Update**.

2.3.2   Scheduling the script to run on boot

If you are using 9.09.xx firmware, in the Expert View menu, click **system > scheduler > scheduler tasks**. The Scheduler Task Entry page appears.

Click **add** in the Operation column of the list. The Scheduler Task form appears.

If you are using 10.00.xx firmware, in the Expert View Menu, click **system, management > scheduler > scheduler tasks**. The Scheduler Task Entry page appears.

Click **add** in the Operation column of the list. The Scheduler Task form appears.

Figure 3: The scheduler task entry page in version 9.00.xx

Field	Description
Enabled	Enables or disables a particular schedule. Set to **Yes**.
Name	The name associated with the schedule. Enter a descriptive name
Date	The date the script initiates. This field is ignored when frequency is set to start up. Leave at **default**
Time	The time the script initiates. This field is ignored when frequency is set to start up. Leave at **default**
Frequency	Sets the frequency the script executes. Set to **startup**.
Window	This parameter sets how long the system will wait if it is busy before executing the script. For example if the script is set to execute at 10:00 and the window is set to 30 seconds, the system will try executing the script within this window only. Set to **30**.

Script	The name of the script to be executed.
	Enter the script name, followed by the relevant parameters as shown in the above image. Separate the parameters by commas.
	Example: watchdogBackup ppp-1, 180, MIB.2.2.1.10.10, modem-1, 180, 120

Table 2: The scheduler task fields and their descriptions

3 Debugging commands

Useful debug commands via command line are described in the table below.

Diagnostic Command	Description
Show tasks	Displays all running tasks.
Show task <tasknum>	Displays running task. Also indicates position task is currently at.
Show task vars <tasknum>	Displays variables and variable values associated with task.
Show ip route	Displays routing table.
Show events	Displays event log.
Show change log	Displays recent configuration changes.
Dir scripts	Displays all scripts embedded in the firmware.
Show config script ALL	Displays all scripts in the script editor.
Show config script <scriptname>	Displays the <scriptname> script as configured in script editor. Includes line numbers.
Show config script –n <scriptname>	Displays the <scriptname> script as configured in the script editor. Does not include line numbers.
Show oid <oid_num>	Displays an OID value
Show oid all	Displays all supported OIDs

Table 3: Debug command lines and their descriptions

Useful trace commands via the command line are described in the table below.

Trace command	Description
++All 6	Traces all INFO events
++ip	Traces IP traffic
++script	Traces script events
--script	Stops script event tracing
--	Stops all event tracing
Trace on <script_name>	Traces each line in a script as it executes
Trace off <script_name>	Turns off tracing for script

Table 4: Trace command lines and their descriptions

4 Script events

Severity	Class	Subclass	Text
INFO	49	40	watchdogBackup running primary <primary_ppp> backup <OID> <backup_interface_to_reset>
INFO	49	40	watchdogBackup detected primary down starting monitoring backup
INFO	49	40	watchdogBackup detected primary up stopping monitoring backup
INFO	49	40	watchdogoid <OID> not incrementing - resetting <backup_interface_to_reset>
INFO	49	40	watchdogoid $oid not incrementing after <backup_interface_to_reset> reset - rebooting

Table 5: Script events

5 WatchdogBackup script

```
[watchdogBackup]

// watchdogBackup.BAT

//

// Used for dynamically monitoring a backup interface when

// the primary PPP is down. Kicks off watchdogOID to monitor

// backup PPP when primary PPP is down. Stops watchdogOID when back

//

// Usage: watchdogBackup [prim_ppp] [prim_boot_wait] [backup_oid]

//                        [backup_port] [backup_init_wait]

//                        [backup_periodic_wait_timer]

//

// The watchdogBackup script MUST take SIX parameters:

//     -  the primary PPP interface

//     -  the time to wait in secs for primary PPP to come up on boot

//        before kicking off watchdogOID for backup interface

//     -  the OID to monitor for the backup interface

//     -  the backup physical interface to reset if OID does not increment

//     -  the initial time to wait in secs before starting backup interface

//        checks (to avoid continuous reboot)

//     -  the time to wait in secs between backup interfafce checks

//

// NOTE: Care should be taken to avoid continuous reloads in the event

// the backup interface not coming up. The prim_boot_wait and

// backup_init_wait should be used to allow plenty of time for remote

// access to diagnose.


!echo off


!arg prim_ppp, prim_boot_wait, sec_oid, sec_phy_port, sec_init_wait, sec_wait_timer


!log watchdogBackup running primary $prim_ppp backup $sec_oid $sec_phy_port


$z = `sh state ppp $prim_ppp`
```

```
!if $z[2] = Up

  !goto WDSEC_PRIMARY_UP

!endif


!waitevent ppp.12:$prim_ppp $sec_init_wait

  !label WDSEC_PRIMARY_UP

  !while 1

    !waitevent ppp.13:$prim_ppp

    !endevent

    !label WDSEC_PRIMARY_DOWN

    !log watchdogBackup detected primary $prim_port down starting monitoring backup

    $z = `watchdogOID $sec_oid, $sec_phy_port, $sec_init_wait, $sec_wait_timer`

    !waitevent ppp.12:$prim_ppp

    !endevent


    !log watchdogBackup detected primary $prim_port up stopping monitoring backup

    $z = `kill watchdogOID`


  !endwhile

!endevent


//PPP not up on boot after initial wait

!label WDSEC_PRIMARY_DOWN_ON_BOOT

!goto WDSEC_PRIMARY_DOWN
```