



# streamcore

## SG4412 DEPLOYMENTGUIDE



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# 1 Introduction

StreamGroomer SG4410 series have been designed and optimized to leverage the Streamcore Suite of network performance management applications to ensure good user experience of your business applications at medium-sized sites.

As part of the SG4410 series, the StreamGroomer SG4412 appliance monitors, controls and accelerates application flows across the WAN. Deep Packet Inspection (DPI) and a library of well-known application protocols classify application flows for measurement, control and WAN optimization.

This document is intended to describe the possible deployment cases of the StreamGroomer SG4412 and supported network architectures.

This document also describes the initial configuration steps to register the appliance to the SGM and a list of elements to check in case of connectivity issues.

It is recommended to read this document before proceeding with the installation of the SG4412.

It is highly recommended to refer to the following Streamcore documentation:

- **StreamView User Guide:** for Site and StreamGroomer provisioning and configuration,
- **SGM User Guide (SGMConf):** for securing the communication between the SGM and the StreamGroomer

## 2 Preparing the deployment of the SG4412

Installing the appliance inline on the network consists in a list of simple tasks. A preparation phase is required for a successful deployment.

### 2.1 TASK 1 - UNPACK THE SG4412

The appliance is delivered in a carton box. The serial number of the appliance is available on the bottom of the box.

### 2.2 TASK 2 – GATHER INFORMATION AND RESOURCES

A computer running a terminal emulator and a USB storage device will be used to setup the StreamGroomer. You may need a DB9 to USB converter cable as well.

Before deploying the appliance, a preparation task consists in gathering the following information:

- IP address, mask and gateway of the SGM. The gateway is required if the SGM and the SG are not located in the same subnetwork.
- If a backup SGM exists, the IP address of the backup SGM is also required.
- IP address, mask of the SG4412 also called Administrative IP address. If two SG4412 are deployed in Dual or Tandem mode, an IP address and mask must be assigned to each SG.
- DNS server IP address (used for manual requests from the boot menu such as ping...)
- Number of WAN links to monitor
- Method to insert the SG4412 in the network: as a single appliance, in DUAL mode or in Tandem mode.
- Security level of the communication between the StreamGroomer and the SGM: RSH, weak configuration or strong configuration. Check the SGM configuration (passphrase).
- Line mode of administration port (speed, duplex).
- Method to set the configuration of the SG: with a USB stick or with the command line

### 2.3 TASK 3 – CONFIGURE THE APPLIANCE

Then the appliance can be configured with the console cable connected to a PC. It is also possible to configure the SG with a file generated by the SGM.

Refer to chapter *Configuring Boot Parameters* for the details to configure the appliance.

## 2.4 TASK 3 – CHECK THE CONNECTIVITY

Refer to chapter *Check Connectivity* for this activity.

# 3 Description of the SG4412

## 3.1 UNPACKING THE SG4412

The SG4412 carton contains the appliance and some accessories:

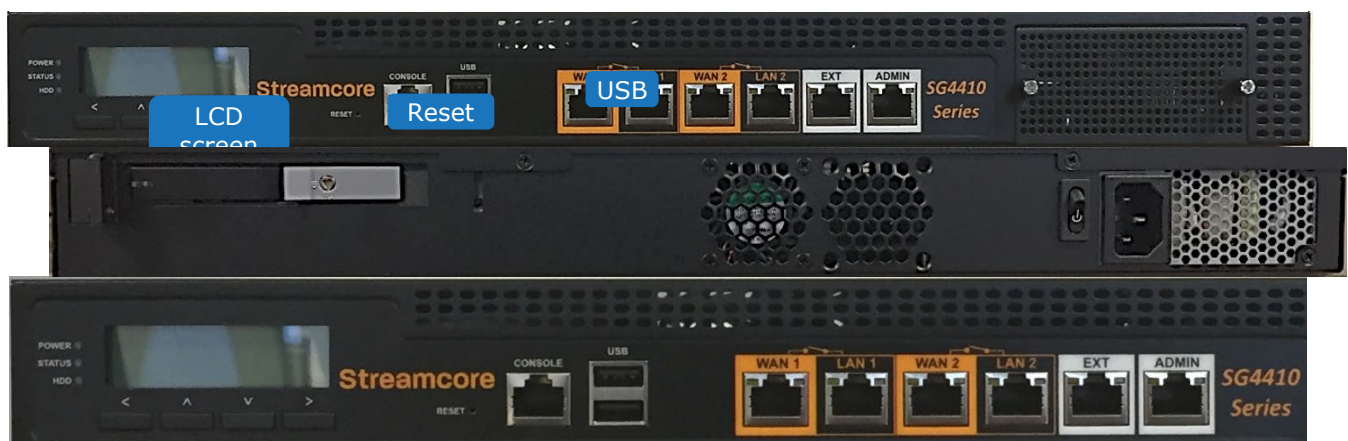
- 1 StreamGroomer SG4412
- 1 power supply cord and the power supply adapter
- 1 RJ45 console cable
- 3 gray straight cables
- 2 red crossover cables
- Rackmount ears

## 3.2 FRONT PANEL FEATURES

Figure 1 Front side

The front panel contains all the interfaces of the SG4412 described here from left to right:

Figure 2 - Rear side



Console

- Status LEDs:

Status of the appliance	
Power	If the LED is on it indicates that the system is powered on. If it is off, it indicates that the system is powered off.
Status	If the LED is green, it indicates that the system's operational state is normal. If it is red, it indicates that the system is malfunctioning.
HDD	If the LED blinks, it indicates data access activities; otherwise, it remains off.

- A LCD screen indicating that the model is StreamGroomer SG4412. The push buttons are not operational.
- A Reset button can be used to reboot the StreamGroomer without turning off the power. (software reboot)
- Interfaces for configuration:

Console and USB	
Console	By using suitable rollover cable or RJ-45 to DB-9 console cable, you can connect to a computer terminal for diagnostic or configuration purpose. Terminal Configuration Parameters: 115200 baud, 8 data bits, no parity, 1 stop bit, no flow control.
USB	The USB 2.0 ports are used to allow the SG to retrieve a configuration file from a storage device. The configuration file is generated with the SGM.

- Interfaces for monitored WAN access links

WAN access links	
LAN1 WAN1	LAN1 and WAN1 are associated with a LAN bypass.
LAN2 WAN2	LAN2 and WAN2 are associated with a LAN bypass.

- Interfaces for management

Management ports	
ADMIN	This interface is a GigaEthernet port. The ADMIN interface is used as port to manage the SG4412 with the SGM. An IP address will be assigned to this interface for that purpose.
EXT	This interface is a GigaEthernet port. The EXT interface is used to connect a second SG4412 to the appliance in order build the DUAL and TANDEM configurations.

The following table describes the meaning of the colours for the Ethernet ports:



Ethernet ports		
SPEED	Amber	The connection speed is 1000Mbps.
	Green	The connection speed is 100Mbps.
	Off	The connection speed is 10Mbps.
LINK/ACT	On/Flashing	The port is linking and active in data transmission.
	Off	The port is not linking.

### 3.3 REAR PANEL

The figure below represents the rear panel of the SG4412.



From left to right, the rear side is composed of:

- A tray for additional storage 2'5 SSD or HDD. Additional storage is reserved for future implementations.
- A fan to control the temperature of the CPU of the StreamGroomer
- A Power On/Off switch to turn on or off the appliance
- The power supply connector: the system uses AC 150W power supply.

## 4 Configuring Boot Parameters

### 4.1

### 4.2 OVERVIEW

To configure the StreamGroomer, a computer equipped with a serial DB9 connector or USB connectors is recommended.

If the computer has no serial connector, it is possible to use a USB to DB9 serial adapter cable that will be connected to the USB port of the computer on one side and on the other side to the console cable provided with the StreamGroomer. In this case, it can be necessary to install the specific software to use the z on the computer.

There are two methods to configure the boot IP parameters of a StreamGroomer:

- With a computer connected to the StreamGroomer with the asynchronous cable on the console port (and optionally the DB9 to USB converter): access to the boot menu of the SG
- With a USB key: reboot the SG on a USB key containing a configuration file prepared with the StreamView application. This method does not require a computer to configure the StreamGroomer.

Both methods are explained hereafter.

### 4.3 CONFIGURE STREAMGROOMER BOOT PARAMETERS WITH THE CONSOLE

#### 4.3.1 Connect the computer to the SG4412

You have to connect a computer to on the console port of the StreamGroomer with the DB9 asynchronous cable (and the additional DB9 to USB adapter cable). The asynchronous cable is provided with the SG4412. The asynchronous cable has a RJ45 connector and a DB9 connector.

#### 4.3.2 Configure the connection

To access the BOOT menu, you have to connect to the StreamGroomer through the asynchronous port via a DB9 asynchronous cable. The most well-known utilities are HyperTerminal, PuTTY or Teraterm for Windows. The configuration has to be done manually by entering the asynchronous port settings as follows:

- Speed **115200** bit/s,
- Parity: NO,
- Flow control: NO
- 1 stop bit,
- 8 bits of data.



Press Enter key. The following screen appears:

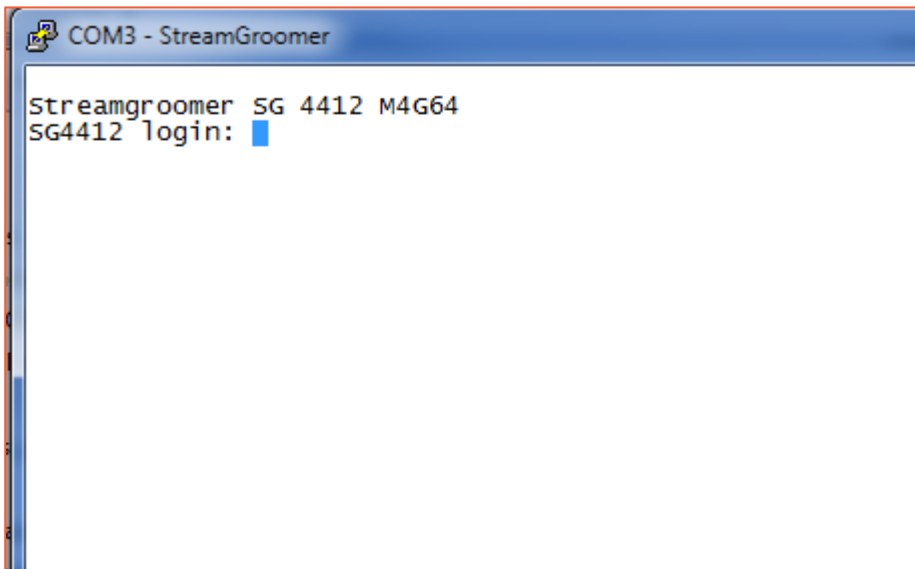


Figure 3 - Initial login as boot user

Log on with the user **boot** and the password **boot**.

Once entered in the boot menu, two modes are available:

**Maintenance mode:** This is the default mode. Type `help` to display the list of commands available in this menu.

**Configuration mode.** To enter the configuration mode, type the keyword `configure` (`config` is also recognized).

You can exit any menu with the `exit` command. Command completion is possible with the `TAB` key.

```
Streamgroomer SG 4412 M4G64
SG4412 login: boot
Password:
Last login: Wed Jan  4 15:14:32 UTC 2017 on ttyS0
Welcome to Streamcore maintenance tool
[SG4412 > maintenance] help

Documented commands (type help <topic>):
=====
configure      exit  reset_configuration  show
drivers_rescue ping  restart              traceroute

Undocumented commands:
=====
EOF  help

[SG4412 > maintenance]
```

Figure 4 - Available commands in Maintenance

It is also possible to connect as user `boot` to the StreamGroomer with the boot menu by Telnet, RSH or SSH from the SGM. Only one user can be connected on the boot menu at a time.

### 4.3.3 Maintenance Menu

The following table lists the commands available in **Maintenance** menu:

Commands	Description
configure	Enters configuration mode
exit	Leaves the current mode. If changes are pending, a confirmation is requested
ping [IP_add]	Sends ICMP ECHO_REQUEST to a network host. Specify an IP address as destination.
reset_configuration	All the operational software and configurations are thus deleted, the name of the StreamGroomer and the parameters of the interface providing access to the SGM are set on the default value attributed at the factory. This option requires certain precautions.
restart [A/B/U]	Restarts the SG in the chosen version (OPE A, B or Boot)
show [...]	Displays various information about the SG and the admin network. See the table hereafter.
traceroute [IP_add]	Traces path to a network host. Specify an IP address as destination.
help	Lists the available commands

The following table lists the parameters of the show command:

Show command details	Description
show arp	Lists the entries of the ARP table
show changes	Presents the changes between the current configuration and the pending changes
show conf	Presents the current configuration
show date	Shows the system date and the last time update (every day at midnight)
show interface	Gives the active status of the interface with its IP Address, MAC Address, MTU and transmitted volume
show iprouting	Presents the admin routing table of the SG
show version	Presents the type of the SG, its serial number, the installed and activated version of the SG

#### 4.3.4 Examples

The following examples show the outputs of the **show** commands:

Example 1: Display the software versions installed on the SG:

```
[SG4412 > maintenance] show version
Running OS      : BOOT StreamCore-USINE-M4G64-S40-308fabf1bb81
SG flash type   : M4G64
SG type        : SG4412
Serial number   : X12L1234

Installed versions
Partition S     : StreamCore-USINE-M4G64-S40-308fabf1bb81
Partition A    : StreamCore-OPE-M4G64-6.2.08-2868f3829bd1
Partition B    : StreamCore-OPE-M4G64-6.4.05-e77e407888a8
[SG4412 > maintenance]
```

Example2: Display the status of the ADMIN interface: The command displays DOWN when the SG is not connected to the network with the ADMIN interface. It cannot be managed by the SGM.

```
[SG4412 > maintenance] show interface
status : DOWN
```

Example 3: When the SG is connected to the network with the ADMIN interface, the output gives details about the interface:

```
[SG4412 > maintenance] show interface
status      : UP 1000baseT-FD flow-control
address     : 192.168.8.200
HW address  : 00:90:0b:4e:62:0f
MTU         : 1500
TX packets  : 5, errors : 0
RX packets  : 368, errors : 0
TX bytes    : 398 (0.00 MB)
RX bytes    : 22176 (0.02 MB)
```

Example 4: Show the configuration of the SG:

```
[SG4412 > maintenance] show conf
Last save date: Tue Jan 03 21:49:47 UTC 2017
version          : 1.1
name             : SG4412
admin_address    : 192.168.8.200
admin_mask       : 255.255.255.0
admin_gateway    : 192.168.8.1
admin_port_speed : auto
sgm_address      : 192.168.8.180
sgm_address2     : 192.168.8.29
sgm_address3     :
sgm_address4     :
secure_com       : no
dns_server1      :
dns_server2      :
dns_suffix1      :
dns_suffix2      :
ssh_port         : 22
[SG4412 > maintenance]
```

Example 5: Show IP routing information:

```
[SG4412 > maintenance] show iprouting
Destination      Netmask      Gateway      Metric Use
192.168.8.0      255.255.252.0  0.0.0.0      0        0
[SG4412 > maintenance]
```

### 4.3.5 Configuration Menu

This figure details the possible actions to create a configuration and apply the changes. It is also possible to try a configuration with the possibility to commit or cancel the changes.

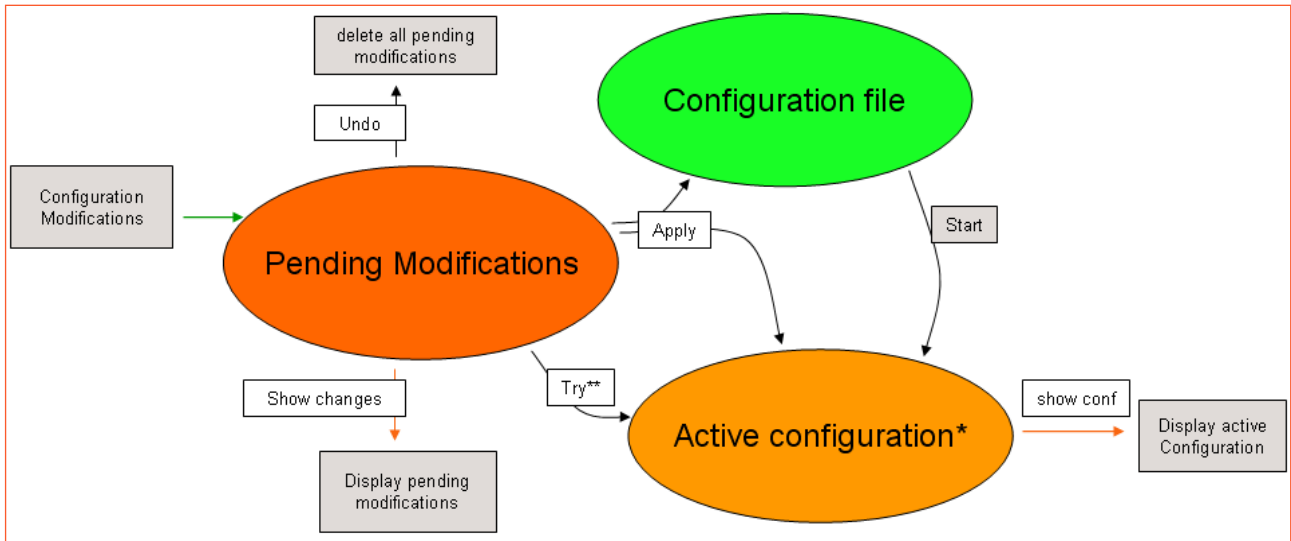


Figure 5 - Configuration diagram

\* Configuration available in boot mode (unless security settings)

\*\* If the `try` sequence is applied, pending configuration are saved (like an "apply"). If the `try` sequence is cancelled, active configuration is rebuilt from the Configuration file; pending configurations are still available.

Enter the **Configuration** menu.

Type the `help` command to get the list of available commands to configure the SG4412 as shown here:

```
[SG4412 > maintenance] configure
[SG4412 > configuration] help

Documented commands (type help <topic>):
=====
apply  boot_pwd  exit  no  secure_com  show  try  undo

Undocumented commands:
=====
EOF      admin_port_speed  dns_suffix2      sgm_address      ssh_port
admin_address  dns_server1      help              sgm_address2
admin_gateway  dns_server2      name              sgm_address3
admin_mask     dns_suffix1      public_key_sgm   sgm_address4

[SG4412 > configuration]
```

Available commands in **Configuration** mode are:

Commands	Description
<code>help</code>	List the available commands
<code>apply</code>	Save and apply pending changes
<code>exit</code>	Leave the current mode
<code>show [...]</code>	Display various information about the SG and the admin network
<code>try</code>	Apply pending changes without saving them. If the <code>try</code> is confirmed with <code>apply</code> , pending configuration are saved (like an "apply"). If the <code>try</code> is cancelled, the active configuration is rebuilt from the Configuration file; pending configurations are still available.
<code>undo [...]</code>	Delete pending changes. You can specify a parameter to cancel.

Commands	Description
	If no parameter is given, all changes will be cancelled.

The following table lists the parameters of the **show** command:

Show command detail	Description
show arp	List the entries of the ARP table
show changes	Present the changes between the current configuration and the pending changes
show conf	Present the current configuration
show date	Show the system date and the last time update (every day at midnight)
show interface	Give the active status of the interface with its IP Address, MAC Address, MTU and transmitted volume
show iprouting	Present the routing table of the SG
show version	Present the type of the SG, its serial number, the installed and activated version of the SG

The commands in the table below set the parameters of the SG:

Configuration Commands	Description
admin_address [IP_add]	Define the IP address at which the StreamGroomer is accessible. SG IP configuration and security configuration are only available in boot mode.
admin_mask [mask]	Define the IP network through which the admin of the StreamGroomer should pass. SG IP configuration and security configuration are only available in boot mode.
admin_gateway [IP_add]	Identify the IP address of the gateway allowing you to contact the SGM from the SG. SG IP configuration and security configuration are only available in boot mode.
admin_port_speed [speed]	Choose the speed of the interface (use the TAB key to list the list of available values): <ul style="list-style-type: none"> <li>• 100M-fd</li> <li>• 100M-hd</li> <li>• 10M-fd</li> <li>• 10M-hd</li> <li>• 1G-fd</li> <li>• auto</li> </ul> SG IP configuration and security configuration are only available in boot mode.
boot_pwd	Change the password of the user boot.
dns_server1 [IP_add]	DNS server used by the SG (for admin purpose). It is needed for the web caching feature.
dns_server2 [IP_add]	Second DNS server used by the SG in case the first one does not answer.
dns_suffix1 [domain_name]	DNS suffix for local DNS query
dns_suffix2 [domain_name]	Second DNS suffix for local DNS query
name [xxx]	Name presented as prompt

Configuration Commands	Description
public_key_sgm [...]	Public key of the SGM used for the secured connection between SGM and SG. SG IP configuration and security configuration are only available in boot mode.
secure_com [yes   no]	Activate/Deactivate secured communication between SGM and SG (SSH)
sgm_address [IP_add]	IP address of the SGM server which administers the SG
sgm_address2 [IP_add]	IP address of the first backup SGM server which administers the SG (optional)
sgm_address3 [IP_add]	IP address of the second backup SGM server which administers the SG (optional)
sgm_address4 [IP_add]	IP address of the third backup SGM server which administers the SG (optional)
ssh_port [port]	TCP port to use with the secured communication between SG and SGM (22 by default). SG IP configuration and security configuration are only available in boot mode.

To remove a configuration value, use the `no` command following with the command name. The example shows how to use it in combination with the `undo` command:

```
[SG4412 > configuration] sgm_address2 192.168.8.37
[SG4412 > configuration] show changes
Pending changes:
sgm_address2      = 192.168.8.37
[SG4412 > configuration] undo
Done
[SG4412 > configuration] show changes
No pending changes
```

This sequence shows how to set the SG administration address and the address of the SGM that will manage the SG:

```
Welcome to Streamcore maintenance tool
[SG4412 > maintenance] config
[SG4412 > configuration] sgm_address 192.168.8.180
[SG4412 > configuration] admin_address 192.168.8.181
[SG4412 > configuration] admin_mask 255.255.255.0
[SG4412 > configuration] apply
Pending changes:
admin_address     = 192.168.8.181
admin_mask        = 255.255.255.0
sgm_address       = 192.168.8.180
Apply pending changes? ([y]/n) y
Done
[SG4412 > configuration] exit
[SG4412 > maintenance] show conf
Last save date: Wed Jan 04 15:37:43 UTC 2017
version           : 1.1
name              : SG4412
admin_address     : 192.168.8.181
admin_mask        : 255.255.255.0
admin_gateway     : 192.168.8.1
admin_port_speed  : auto
sgm_address       : 192.168.8.180
sgm_address2     :
sgm_address3     :
sgm_address4     :
secure_com        : no
dns_server1      :
dns_server2      :
dns_suffix1      :
dns_suffix2      :
```

```
ssh_port      : 22
[SG4412 > maintenance]
```

## 4.4 CONFIGURE STREAMGROOMER BOOT IP PARAMETERS WITH A USB KEY

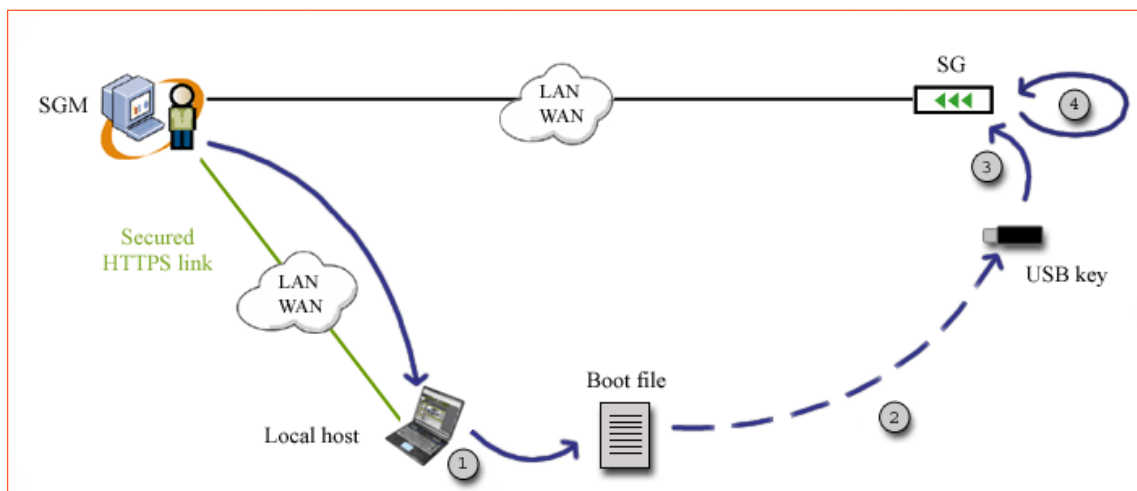
### 4.4.1 Procedure

The StreamGroomer boot IP parameters can also be automatically imported through a USB stick containing a boot configuration file. A boot file contains the login password and the StreamGroomer boot parameters. If the communication link between the SGM and the StreamGroomer is to be secured, it also contains the RSA public key of the SGM.

During the boot phase, the StreamGroomer is able to read its configuration from a file that has been prepared with the SGM.

With a web browser, connect to the SGM and enter in the StreamView application and go to the STREAMGROOMER section, and select the StreamGroomer:

1. Prepare the boot file in StreamView for the selected SG. If the site is supported by a Dual or Tandem configuration, a boot file has to be generated for each SG.
2. Download the boot file on the local desktop and save it on an USB key
3. Plug the USB key on the SG
4. Reboot the SG



**Figure 6: Configure SG Boot**

These steps are detailed below.

### 4.4.2 Prepare the boot file

This section describes how to create the boot file with StreamView.

When the database has been prepared on the SGM, boot files are ready to be downloaded for each StreamGroomer (see "StreamView Configuration Guide"). As a summary the following steps are necessary for each StreamGroomer:

- In the Smart Service Tree, add a new site.
- In the StreamGroomers Tree, add the StreamGroomer and fill all configuration information.

### 4.4.3 Download the boot file on the local host

In order to download a StreamGroomer boot file:

- Select StreamGroomer that has been created
- Select the **Parameters > Boot** file subtab
- Click Download the boot file on the local computer
- Select save to disk, which can be the USB key.
- Click OK and follow path to where the USB key is plugged in.

The boot file is named **sgconfig\_<sgname>.txt**. It can be saved on the USB key:

- In the root directory or
- In a directory called **Streamcore**.



#### About the file **sgconfig\_<sgname>.txt**

There must be **only one file which name starts with sgconfig\_ on the USB device**. If several files match this criteria, the StreamGroomer will ignore them and boot parameters won't be updated.

You also have access to the boot menu by Telnet, RSH or SSH to the SG from the SGM (use the boot user). Only one person can be connected on the boot menu at a time.

### 4.4.4 Load the SG configuration from the USB key

#### 1 STEPS TO LOAD THE SG CONFIGURATION FILE

In order to download boot parameters into a StreamGroomer from the USB key, follow the steps:

1. Set the StreamGroomer in Boot mode.
2. Insert the USB key into the StreamGroomer with the file **sgconfig\_<sgname>.txt**.
3. Power down and up. The SG must reboot.
4. Wait for a few minutes until the StreamGroomer has booted entirely.
5. Unplug the USB key and check the **sgstatus\_<sgname>.txt** file.



#### Set the SG in boot mode

The StreamGroomer must be restarted in **Boot mode** in order to process the file **sgconfig\_<sgname>.txt**. If StreamGroomer is not in Boot mode, the file on the USB device will be ignored and the parameters of the configuration file won't be applied.

When a USB key is plugged in a StreamGroomer and it is rebooted, the following operations are automatically performed by the SG:

1. The SG detects the USB key and checks that it can write on the device.
2. The SG search on the device for a file named **sgconfig\_<sgname>.txt**
3. It check and imports the security parameters (password, optional strong SSH authentication...)
4. The SG imports the other parameters.
5. Finally, the SG generates a status of the procedure in the file named **sgstatus\_<sgname>.txt** on the USB key.

#### 2 STATUS OF THE PROCEDURE

A StreamGroomer will produce different kinds of beeps at the end of these operations:



Beep	Event
Double short high-pitched beep and then deep beep	The 5 steps described above have been successful. A status file summarizing the configuration has been pushed on the USB key.
Several short high-pitched beeps	A strong SSH authentication has been required and the StreamGroomer is generating its pair of public/private RSA keys during step 4.
Several long deep beeps	Step 1 has failed (USB key mount)
Single long deep beep	Step 2, 3 or 4 have failed. If step 2 has failed, then a <b>sgstatus_ERROR.txt</b> file is pushed on the key. A typical reason can be for instance if the StreamGroomer has found several files starting with sgconfig). If step 3 or 4 has failed, then a <b>sgstatus_&lt;sgname&gt;.txt</b> is pushed on the key and contains a message explaining the failure.

#### 4.4.5 Case of strong SSH authentication

In case of strong SSH authentication, the **sgstatus\_<sgname>.txt** file contains the RSA public key of the StreamGroomer. This file must be imported to the SGM to complete the setup of the secured communication link between the SGM and the StreamGroomer.

To import the RSA public key into the SGM, connect to the SGM. With StreamView, go to the STREAMGROOMERS section and select the StreamGroomer in the tree menu. In the Parameters tab, click on the button **Import**. Browse to search the **sgstatus\_<sgname>.txt** and select the file.

Refer to the StreamView User Guide for further details on how to secure the link between the SGM and the StreamGroomer.

## 5 Installing the SG4412 on the network

When the equipment is turned on for the first time, the bypasses of the pairs LAN1/WAN1 and LAN2/WAN2 are enabled. This means that SG acts as a straight cable: the network packets go directly from one LAN port to the WAN port of a pair (and the other way around) without being processed by the SG. No statistics are produced by the SG in Boot mode.

### 5.1 CONNECTING THE SG4412

The SG4412 manages 1 or 2 WAN access links.

#### 5.1.1 Simple configuration – 2 WAN links

The figure below shows how the SG is connected to the switches and the routers of a company.

If only one link is to be managed, use the LAN1 and WAN1 interfaces and do not connect any cable on the LAN2 and WAN2 interfaces.

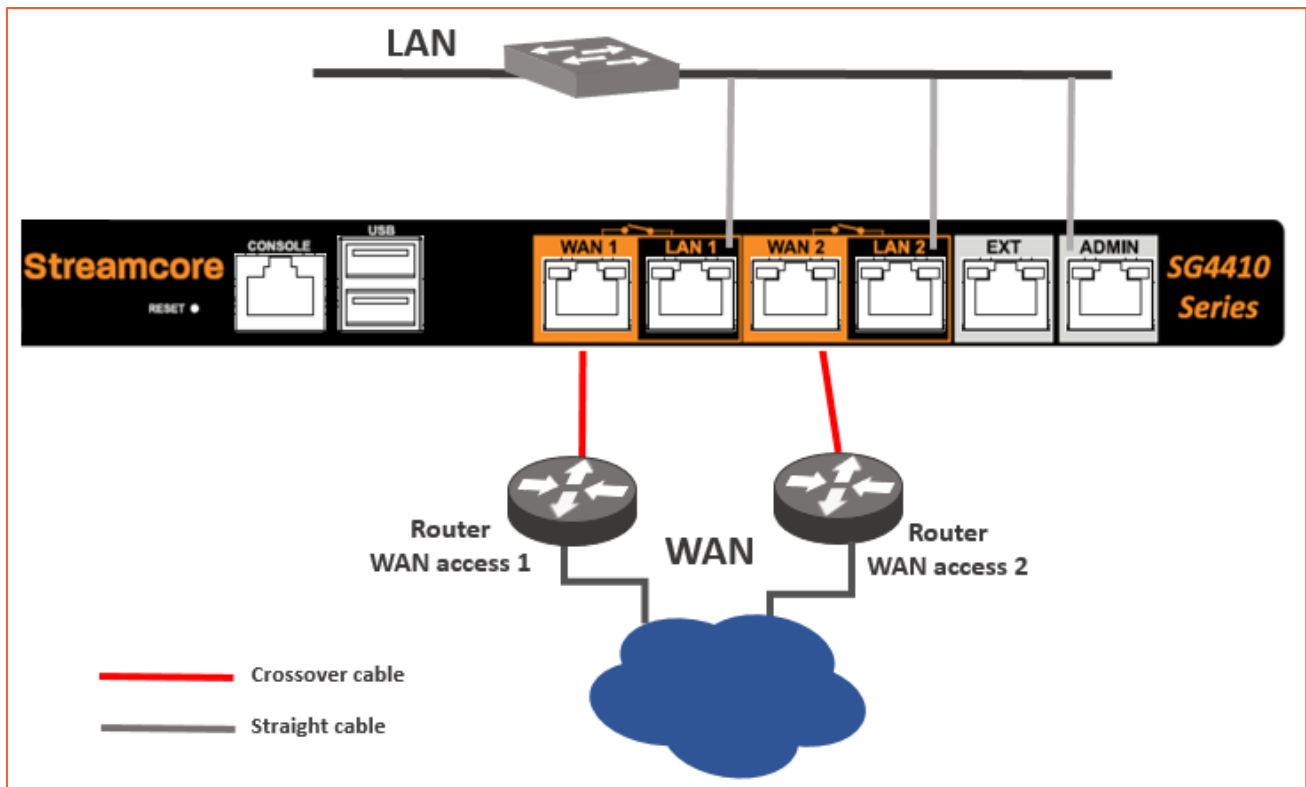


Figure 7 – Deployment to manage 2 WAN links

### 5.1.2 DUAL configuration

The figure hereafter shows how to connect 2 SG4412 to create a DUAL configuration.



#### Case of Dual

Note that only LAN1 and WAN1 interfaces are used in Dual mode. LAN2 and WAN2 ports are ignored by the Streamcore software in this configuration. It is not necessary to connect them to the network. Refer to StreamView User Guide for further details.

The StreamGroomers are connected with the interface EXT. Refer to the StreamView documentation for further details to declare a site supported by a pair of StreamGroomer configured and connected in Dual mode.

Note: The StreamGroomers are connected with the EXT link. They should belong to the same subnet to keep the communication as fast as possible between the 2 StreamGroomers.

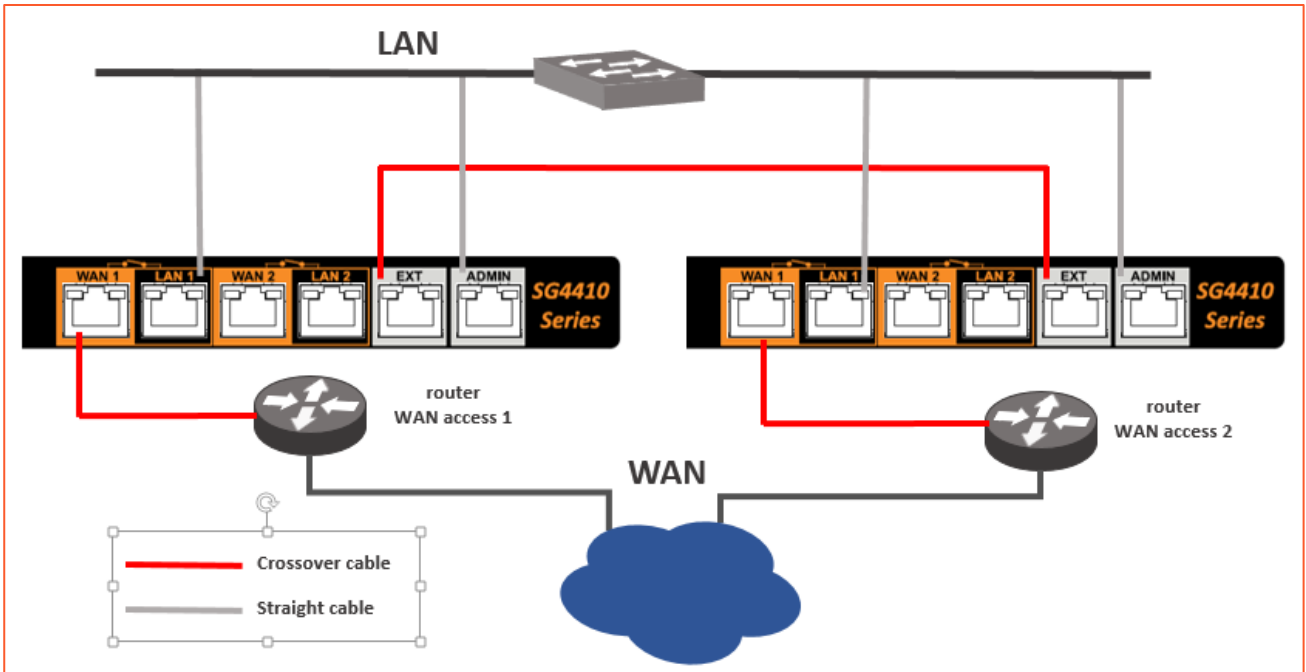


Figure 8 - DUAL configuration

### 5.1.3 Tandem configuration

The figure below explains the wiring to create a tandem configuration.

Refer to the StreamView documentation for further details to declare a site supported by a pair of StreamGroomers configured and connected in Tandem mode.

Note: The StreamGroomers are connected with the EXT link. They should belong to the same subnet to keep the communication as fast as possible between the 2 StreamGroomers.

## 5.2 DEPLOYING THE SG4412

This section describes where and how to connect the SG4412 to network equipments to comply with the network requirements.

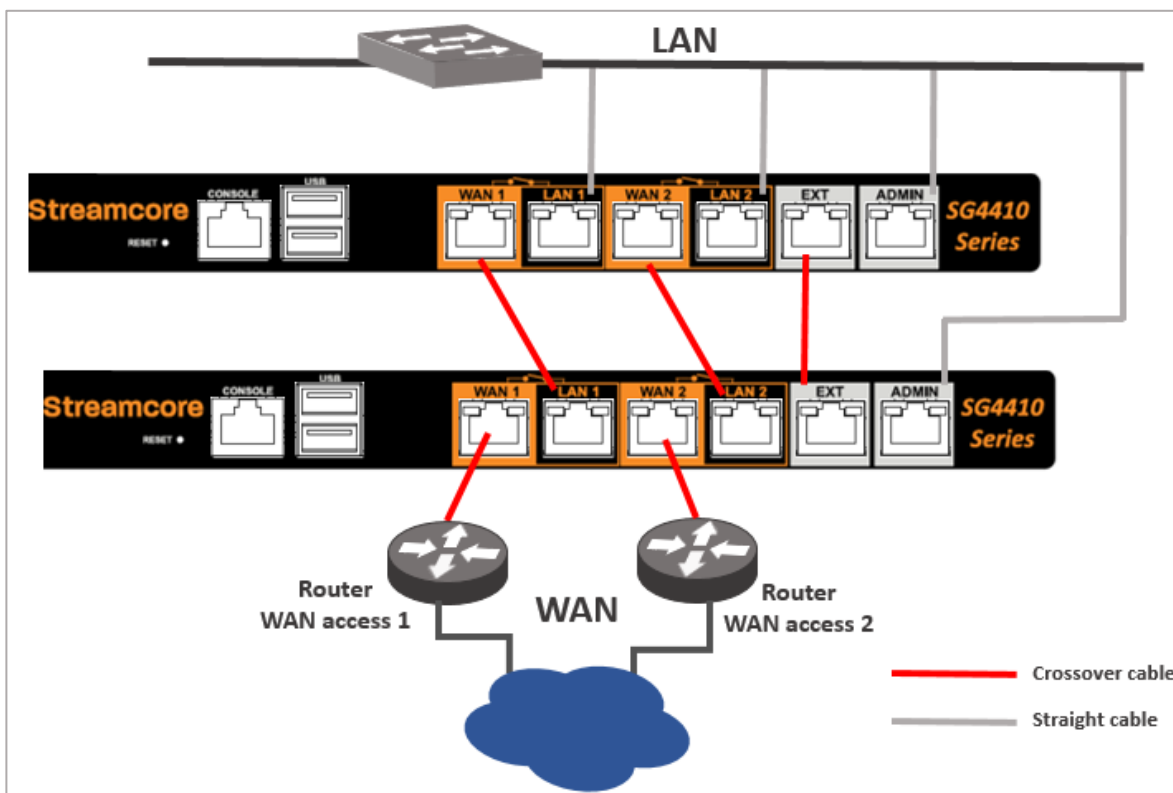
It also describes the 4 configurations supported by Streamcore Software Suite, whatever the SG model.

### 5.2.1 Supported Network architectures

This sections lists the possible locations to install the SG in the network.

#### 3 BETWEEN THE ROUTER AND THE LAN

Figure 9 - Tandem mode configuration (2 links)



A StreamGroomer is usually placed in an inline position **between the router and the LAN**:

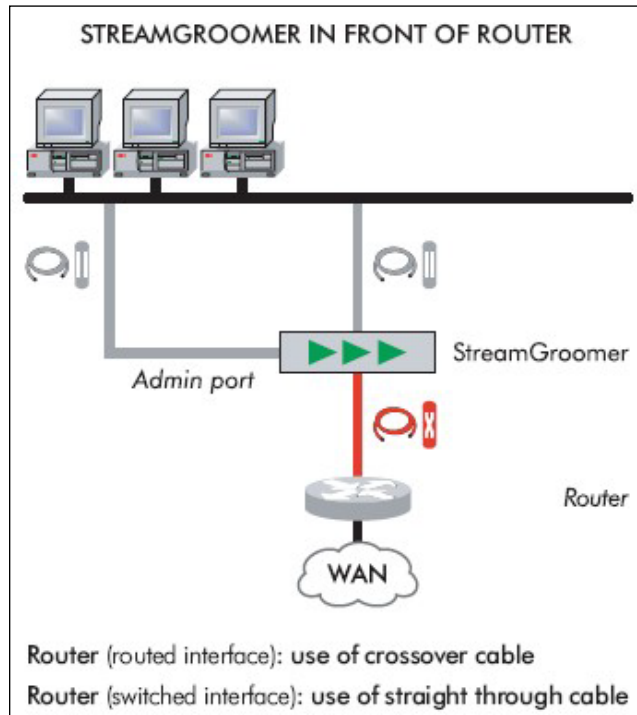


Figure 10 - SG between the LAN and a router

#### 4 BETWEEN THE LAN AND THE SWITCH

A SG can be transparently inserted **in the LAN, in front of the switch**:

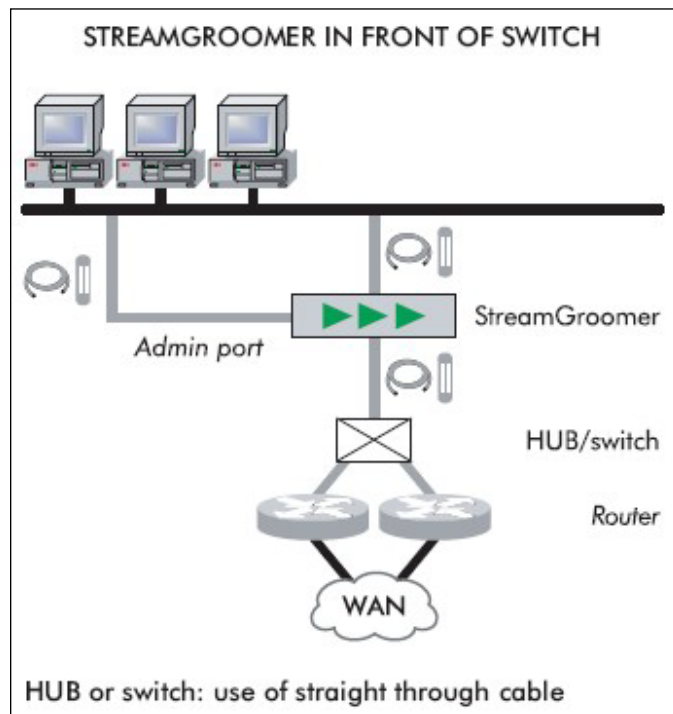


Figure 11 - SG in front of a switch, in the LAN



### Case of Dual and Tandem

If a Dual or Tandem is deployed in this network architecture, both SG must be aware that their LAN and WAN interfaces are connected to switches. A parameter of the SG named **Switch WAN side** is used for that purpose. It must be set to **Yes** for the two SG of the Dual or Tandem. Refer to StreamView User Guide for further details.

## 5 BETWEEN THE ROUTER AND A FIREWALL

A SG can be transparently inserted **between the router and a firewall**:

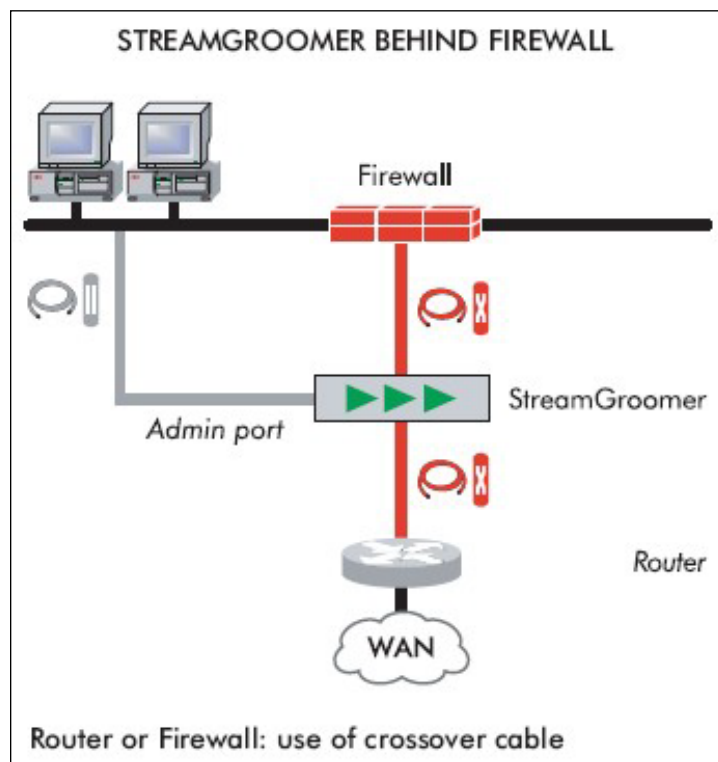


Figure 12 - SG between a router and a firewall

If there is a switch between the StreamGroomer and the router accessing the WAN, the crossover cable should be replaced with a straight-through cable. If the StreamGroomer is connected between two routers, or between a router and a firewall, 2 crossover cables should be used.

### 5.2.2 Manage a single WAN access link

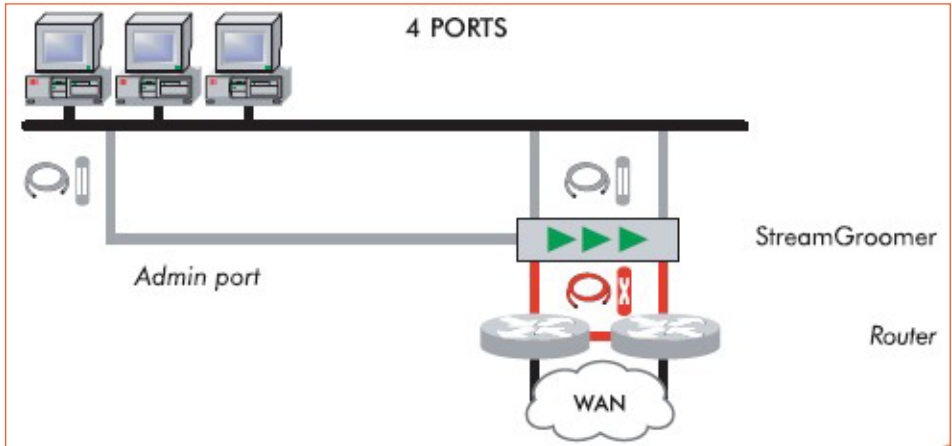
In this section, one SG 4412 is installed to support a site with a WAN access link. This configuration is also called 2 ports. The pair of interfaces LAN1/WAN1 is used. LAN2 and WAN2 interfaces are not used.

Refer to the paragraph 5.1.1 Simple configuration – 2 WAN links to know how to connect the SG to the switch and router.

### 5.2.3 Manage 2 WAN access links

The SG 4412 can also be installed to support a site with 2 WAN access links. This configuration is also called *4 ports*. Both pairs LAN1/WAN1 and LAN2/WAN2 are used.

The figure below show a typical insertion of the SG4412:



**Figure 13 - Manage a site with 2 WAN links**

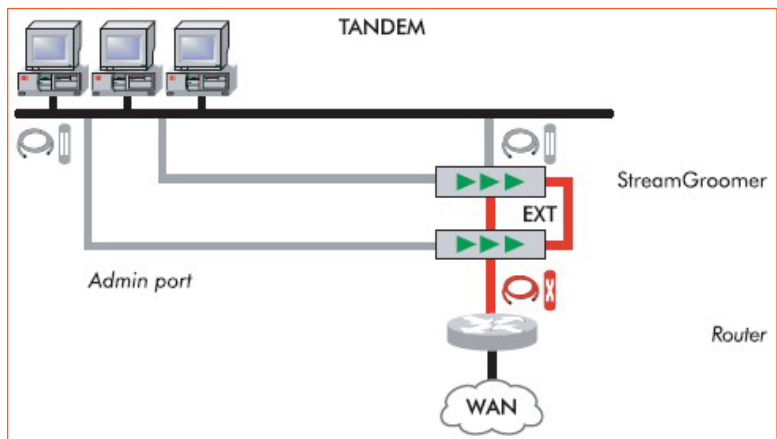
Refer to the paragraph 5.1.1 Simple configuration – 2 WAN links to know how to connect the SG to the switch and router.

### 5.2.4 Implement High Availability (Tandem)

Tandem mode is an interesting feature to ensure that network monitoring, QoS and WAN acceleration features are always available. If the main SG fails, the secondary becomes active and continues operating on the network.

To implement high availability with the SG4412, two appliances SG4412 must be installed on the network. The figure below shows that the appliances are connected with the EXT interface. Use crossover cables between the 2 SG.

Refer to the paragraph 5.1.3 Tandem configuration to know how to connect the SG to each other and also to the switch and router. Refer to the paragraph for further details on the interconnection with the EXT ports. Refer to the StreamView user guide for further details on this insertion mode.



**Figure 14 - Tandem configuration with 2 StreamGroomers**

### 5.2.5 Implement Dual mode

This mode is interesting when a site manages 2 links that are physically far from each other. As for Tandem mode, the two SG4412 appliances are connected with the EXT interface.

Refer to the paragraph 5.1.2 DUAL configuration to know how to connect the SG to each other and also to the switch and routers.

**Warning:** Refer to the paragraph below for further details on the interconnection with the EXT ports.

Refer to the StreamView User Guide for further details on this insertion mode.

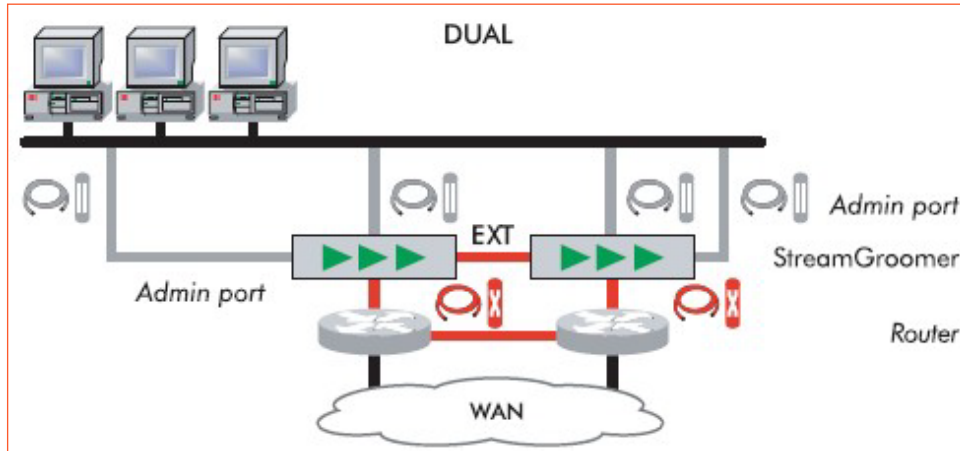


Figure 15 - DUAL configuration

## 5.2.6 Using the EXT interface

Please read carefully this paragraph if the StreamGroomers must be connected with the EXT interfaces.

This management link allows the primary SG to be monitored by the secondary SG in order to ensure high availability or monitor for the same site 2 WAN access links that are not close to each other.

When the SG executes the Streamcore software version 6.2 and earlier versions, the management link between the SG on the EXT interface uses a layer 3 protocol. Although not recommended, the StreamGroomers can be connected through a router.

From release 6.3, the SG communicate with a layer 2 protocol. This means that the StreamGroomers must belong to the same LAN.

# 6 Check Connectivity

## 6.1 CHECK CONNECTIVITY WITH STREAMVIEW

The SG must be declared in the SGM and configured with StreamView. The ADMIN address of the SG has to be defined. In StreamView, select the SG.

Go to the **Read status** tab or **Release Management** tab.

If the message **Cannot read statistics for this object** is displayed, the SGM cannot connect with the SG.

Possible reasons are:

- The IP address, mask and gateway of the SG configured in the SGM are not correct.
- The IP address of the SGM configured in the SG is not correct. The SG replies only to the SGM which IP address is specified by one of the parameters **sgm\_address**, **sgm\_address2**, **sgm\_address3** or **sgm\_address4**.
- The ADMIN port of the SG is not connected to the LAN.
- The SG is powered off.
- Check with the network and security administrators if the configured parameters are correct and if the communication is not blocked by a firewall.



## 6.2 CHECK CONNECTIVITY WITH PING

It is possible to check the availability of a StreamGroomer with a ping from any host.

It is also possible to check that the SG can communicate with the SGM and the backup SGM. Connect on the SG with the console port as **boot** user. Execute the commands in the Maintenance mode to check that the SGL is reachable from the SG.

```
ping <SGM address> OR ping <backup_SGM_address>
```

Check with the network and security administrators if the configured parameters are correct and if the communication is not blocked by a firewall.

## 6.3 TROUBLESHOOTING

This procedure describes how to force the SG to return to BOOT mode.

It is useful when the SG is running in operational mode but is not reachable from the SGM and the technician cannot log on the appliance (forgotten password).

If a technician is present on site, he can execute the following steps respecting this order to force the SG to return to the BOOT mode:

1. Turn off the StreamGroomer using the on/off switch or unplug the power cable
2. Turn on the StreamGroomer using the on/off switch or plug the power cable
3. Wait for the operational software reboot and the opening of the bypass
4. Turn off the StreamGroomer
5. Turn on the StreamGroomer

The equipment will then automatically restart in boot software.

# 7 Technical Specifications

The characteristics of the SG4412 are listed in the following table:

Model	SG4412
Height	4.4 cm (1U)
Width	43,1 cm
Depth	30,5 cm
Weight	4 kg (8.8 lbs)
Power and type	150W Power AC adapter, 100-240V 50-60Hz
Operating Temperature	0 to 40°C
Relative humidity	5% to 90%
MTBF	> 45,000 hours
Network interfaces (to LAN/WAN)	4 x 10/100/1000 Base-T 2 pairs with bypass integrated
EXT	10/100/1000 Base-T
Administration interface	10/100/1000 Base-T
Console interface	RJ45
USB port	2 x USB 2.0
Compliances	CE Class A FCC Class A

	RoHS EMC
Miscellaneous	LITHIUM METAL BATTERY The SG4412 uses a lithium metal battery.