

## Bynet HCS Operating Procedures

### Setting Faxes Devices over VG over SCCP

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<b>Document Version:</b>	1
<b>Latest revision date and revised by:</b>	01/02/2016 Slavik Bialik



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# **1. Overview**

## **1.1. Document Scope**

This document describe how to set faxes on VG devices over SCCP protocol.

The benefit for using VG over SCCP, is that the Cisco Call Manager can configure and manage most of the settings by itself and push them to the VG.

In that case, you don't need to manage configuration from both places, VG & CUCM, you'll configure all the ports and lines from CUCM.

Of course, there are only initial configuration that must to be done on the VG in order for the analog phones / faxes to work properly.

This procedure is based on using VG310 for that case, and using pass-through mode for the faxes (as it's the method that actually worked, and T38 didn't).

## **2. Configuring the VG**

### **2.1. VG Section Overview**

As described before, for this procedure I used the VG310 device. There are quite a few other Cisco gateway devices that you can run FXS ports on, but as they all run Cisco OS platform, the configuration will be quite the same.

### **2.2. Configuration on the VG**

First, connect to your VG via SSH / Telnet.

If not configure yet, configure the IP interface for this VG that will be connected to a voice VLAN, probably, of your client.

#### **2.2.1. Configuring the management / data interface**

While connected to your VG CLI, do the following:

- configure terminal
- interface GigabitEthernet0/0 (**or any other port you must use**)
  - ip address <ip-address> <subnet-mask>

Now you'll have access via IP to your VG. This IP is not only the management port, it's the signaling and data port either.

#### **2.2.2. Configuring SCCP over VG**

First, we must enable SCCP on the VG.

We'll do it by setting the following command in the VG CLI:

```
sccp
```

Afterwards, we must assign the SCCP protocol to an existing Ethernet port. As we are using in our example in GigabitEthernet0/0, we'll do the following in the CLI:

```
sccp local GigabitEthernet0/0
```

That way, we told the VG with which port it can use & register against a Cisco Call Manager.

#### **2.2.3. Configuring the Available Cisco Call Managers on the VG**

After we enabled SCCP on the VG, we must set the Cisco Call Managers that the VG will try to register to.

So first, we need to know how many CUCMs we have in order to prioritize correctly the registration. If for example you have a subscriber that is installed on customer's premises, we will prefer of course to prioritize the CUCM Subscriber first.

So in my case, I have 2 CUCMs, and I'll set the following in the CLI:

```
sccp ccm <CCM1 IP> identifier 1 version 7.0
```

```
sccp ccm <CCM2 IP> identifier 2 version 7.0
```

Just for you to understand, the *'identifier'* attribute is not the one that handles the priorities between the CUCMs. It's only an index, that we'll use it later.

Now, we'll create a group and associate the CUCMs we created above to this group. And now, this is the part that we're prioritizing the order of the registration of the CUCMs. We're using the indexes of the ``ccm`` we created above and putting a priority for every each one of them.

And for whoever asked if they need to create this ccm group if they have only one CUCM, the answer is **yes**, because after we'll create the group itself, the next section is to associate this group to an object, and we cannot associate a single ``ccm`` to this object. So just create a group that'll contain a single ``ccm``.

Do the following:

- **sccp ccm group 1** (*while '1' is the index of the group*)
  - **associate ccm 1 priority 1**
  - **associate ccm 2 priority 2**

#### 2.2.4. Enabling SCCP Telephony Control Application

In order for our Cisco Communication Manager to be able to manage our FXS ports from its own management, we must enable on the VG itself first the STCAPP (SCCP Telephony Control Application).

From VG's CLI do the following:

- **stcapp**
- **stcapp ccm-group 1**

So, first we enabled STCAPP feature on the VG, and afterwards we configured the Cisco Call Managers to be able to use the STCAPP feature.

#### 2.2.5. Configure Voice Ports

So, first we must need to know which module of FXS ports we have in our VG / VGW. We can check it out by doing the following command in the CLI:

**show inventory**

You'll get a list of all the physical cards that you device have on it. Review it, and understand which module is the module that can run FXS ports.

In my example, I had this:

```
NAME: "onboard 24 FXS voice interface on Slot 0 SubSlot 0", DESCR: "onboard 24 FXS voice interface"
```

```
PID: VG310 , VID: V01 , SN: FOC19362K3Z
```

So my FXS module is sitting on slot 0, sub-slot 0. Means, it's sitting on 0/0. And every FXS port that is under this module will be described like: 0/0/0, 0/0/1... 0/0/23

So you first must understand the structure of your FXS ports.

Now, we'll configure the voice ports.

You must configure a voice port for every FXS port you have on your module. Means that if I have 24 FXS port on my module, I'll configure 24 voice ports.

So, I'll show you only how to configure one. Those are the settings for one voice port:

```
voice-port 0/0/0
```

```
  cptone IL
```

```
  caller-id enable
```

And so on, till 0/0/23, if you have 24 ports as I do.

The ``cptone`` attribute is setting the tones for this voice port to be suitable to Israeli tones. And ``caller-id`` is enabling the voice port to support the caller ID feature.

### 2.2.6. Configuring Dial Peers

Our final step on the VG, is to configure dial peers for every voice port we have. Yes, it's kind of a stupid process, but we need to configure a separate dial peer for every voice port we has, means that in my case, I need to configure 24 new dial peers.

The configurations are very easy, this is an example for one dial peer of many:

```
dial-peer voice 10 pots
```

```
  service stcapp
```

```
  port 0/0/0
```

So, every dial-peer is using the STCAPP service and every dial-peer assigned to its own voice port.

### 3. Configuring the Cisco Communication Manager

After we finished configuring the VG and all of its ports & dial-peers, we'll now configure the VG on the CUCM.

#### 3.1.1. Getting the MAC address of VG's interface

First, we must get the MAC address of the physical IP interface on the VG that we assigned to use SCCP in order to "talk" with the CUCM.

Login back to your VG, and do:

**show interfaces**

You'll see an output like this one:

```
GigabitEthernet0/0 is up, line protocol is up
Hardware is CN Gigabit Ethernet, address is 5c83.8ffe.c660 (bia 5c83.8ffe.c660)
Internet address is 172.16.68.4/24
MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
  reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Full Duplex, 1Gbps, media type is RJ45
output flow-control is XON, input flow-control is XON
ARP type: ARPA, ARP Timeout 04:00:00
Last input 00:00:00, output 00:00:00, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
 129933 packets input, 22896897 bytes, 0 no buffer
  Received 21188 broadcasts (0 IP multicasts)
   0 runts, 0 giants, 0 throttles
   0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
   0 watchdog, 20834 multicast, 0 pause input
 306832 packets output, 28559200 bytes, 0 underruns
   0 output errors, 0 collisions, 1 interface resets
 300 unknown protocol drops
   0 babbles, 0 late collision, 0 deferred
   1 lost carrier, 0 no carrier, 0 pause output
   0 output buffer failures, 0 output buffers swapped out
```

As you can see, I marked down the area that the MAC address of this interface is showing. Take this MAC address and store it aside in order to use it next.

#### 3.1.2. Configuring the VG as a Gateway

Login to the CUCM.



In the top menu navigate to **Device** → **Gateway**.

Click '**Add New**'.

Now, in the Gateway Type, choose your device. For me, it's the **Cisco VG310**. Choose it, and click **Next**.

Now, in the **Protocol** field, choose '**SCCP**' and click **Next**.

You'll get the following window:

**Gateway Details**

Product	VG310
Gateway	New
Protocol	SCCP
⚠ Device is not trusted	
Mac Address (Last 10 Characters)*	<input type="text"/>
Description	<input type="text"/>
Cisco Unified Communications Manager Group*	-- Not Selected --

---

**Configured Slots, VICs and Endpoints**

Module in Slot 0

*Figure 1: Adding new Gateway in Cisco Communication Manager*

For the previous step, we took the MAC address of the VG's interface. So take it, remove all the dots from it and leave only the letters and numbers in it.

My MAC address is, for example is: 5C838FFEC660

And what they ask us, is to take only the last 10 characters from our MAC address, so in my case it's only: **838FFEC660**.


Put your 10 last characters of you MAC address in the '**MAC Address**' field.

Fill the description, and choose Communication Manager Group that is set on your system.

Leave the rest of the configuration as they are (not showed in the picture above).

In the 'Module in Slot 0' that you can see, I chose my only module that this gateway can recognize, and it's: **VG-2VWIC-MBRD**.

Here's the final configurations for example:

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**Gateway Details**

Product: VG310  
 Gateway: New  
 Protocol: SCCP

⚠ Device is not trusted

Mac Address (Last 10 Characters)\*: 838FFEC660

Description: VG310 Gateway

Cisco Unified Communications Manager Group\*: BYASHKELONC-CUCM-Group ▼

---

**Configured Slots, VICs and Endpoints**

Module in Slot 0: VG-2VWIC-MBRD ▼

*Figure 2: Example of configurations while adding new Gateway*

Now click 'Save'.

After you clicked 'Save', and the object is created, it'll now recognize the sub slots that are available for use.

So I tracked my sub-slot for FXS ports and used it. In my case, it's sitting on 0/0, so I have a unit called '24FXS-SCCP'.

After clicking 'Save' again, the list of the ports will appear to you near the sub-slot you chose to use. It looks like that:

**Configured Slots, VICs and Endpoints**

Module in Slot 0: VG-2VWIC-MBRD ▼

Subunit 0: 24FXS-SCCP ▼

0/0/ 6	0/0/ 7	0/0/ 8	0/0/ 9	0/0/10	0/0/11	0/0/ 3	0/0/ 4	0/0/ 5
0/0/12	0/0/13	0/0/14	0/0/15	0/0/16	0/0/17			
0/0/18	0/0/19	0/0/20	0/0/21	0/0/22	0/0/23			

Subunit 1: < None > ▼

Subunit 2: < None > ▼

*Figure 3: Example of a sub-slot that is containing FXS ports*

From now on, you can click on the ports in the Gateway section, and it'll take you directly to the analog device for you to configure.

If you'll click on one of them, it'll take you to the device configuration window, and you'll see a device name that is looking like this: AN838FFEC660001.

Let's break this device name into parts in order to understand it's structure, so in the future you can just use a template of all of the 24 devices to configure at once instead of configuring one by one in the 'Gateway' view.

Device name structure is this:

- **ANA** – Prefix of the analog devices.
- **838FFEC660** – The last 10 characters of the MAC address we used to configure the VG.
- **0** – The slot number.
- **0** – The sub-slot number.
- **1** – The port on this module.

Let's for the example, click on one of the ports that showed in the port list near the sub-slot. It'll take us to the configuration of the analog device, should look like that:

<b>Phone Type</b>	
<b>Product Type:</b>	<b>Analog Phone</b>
<b>Device Protocol:</b>	<b>SCCP</b>
<b>Real-time Device Status</b>	
<b>Registration:</b>	Registered with Cisco Unified Communications Manager BYASHKELONC-CUCM-S
<b>IPv4 Address:</b>	172.16.68.4
<b>Device Information</b>	
<input checked="" type="checkbox"/>	Device is Active
Device Trust Mode*	Not Trusted
MAC Address*	838FFEC660000
Description	
Device Pool*	AshkelonCollegeDP <a href="#">View Details</a>
Common Device Configuration	DefaultCommonProfile <a href="#">View Details</a>
Phone Button Template*	Standard Analog
Common Phone Profile*	Standard Common Phone Profile <a href="#">View Details</a>
Calling Search Space	CSS_Internal
AAR Calling Search Space	< None >
Media Resource Group List	< None >
Location*	Hub_None
AAR Group	< None >
User Locale	< None >
Network Locale	< None >

**Figure 4: Creating new analog device**

Simply configure it as you already know, there are now special configurations that must to be done. Just configure it, assign a Directory Number to it, and you are ready to go.

The only thing, you must notice after saving the device is that it's registering successfully to the CUCM. You can look in the top header of the device configuration window, after saving (and you can refresh it, it can took a few second till successful registration), you should finally see it like that:

<b>Phone Type</b>	
<b>Product Type:</b>	<b>Analog Phone</b>
<b>Device Protocol:</b>	<b>SCCP</b>
<b>Real-time Device Status</b>	
<b>Registration:</b>	Registered with Cisco Unified Communications Manager BYASHKELONC-CUCM-S
<b>IPv4 Address:</b>	172.16.68.4

**Figure 5: Successful registration**

As you can see, mine registered to my Communication Manager, and the IP that is showed in the *IPv4 Address* is the IP address of the VG.

You're finally done configuring the analog phones / faxes on the Call Manager side.

## 4. Setting Pass-through Mode on VGW

If you have a SIP trunk to your PSTN, you can skip this section, and you're done.

If not, this one is indeed needed for you. If your access to your PSTN and backwards to your CUCM, which the VG is registered to, is via Cisco Voice Gateway, with PRIs for example, you must follow this section.

I must mention, this document doesn't describe how to configure a VGW and all of its dial-peers, you must already know the structure of your VGW configurations.

Find the **VOIP** dial-peer that is used both as inbound / outbound to the CUCM, or whether you have a few separated, you must configure it on all of them.

Here's an example of my dial-peer:

```
dial-peer voice 150 voip
destination-pattern 6789...
voice-class codec 2
session target ipv4:10.8.254.240
incoming called-number .
dtmf-relay h245-alphanumeric
fax protocol pass-through g711ulaw
no vad
```

As I added to mine, add this line of configuration to your dial-peers:

**fax protocol pass-through g711ulaw**

That way, we enable on this dial-peer the fax protocol to work in pass-through mode, in g711 ulaw codec.

Now, try to send your fax out to the PSTN.

Good luck!