Internet Telephony Gateway

Distributor Installation & Configuration Guide

V1.01

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Trademarks

FCC Warning

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the Instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense.

CE-mark Warning

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

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ABOUT THIS GUIDE

This Guide contains the following information:

Start up Preparation: This chapter illustrates how to prepare for the Internet Telephony Gateway (ITG) set up through console interface or network interface.

Network Configuration: Describes how to set up an IP address for your ITG in various environments such as static IP address, dynamic IP address, and NAT.

Dial Plan Setup: A step guide to the procedures and commands necessary to define a typical dial plan set up.

Configuration Example: How to use the default settings to start up your first call. Examples are provided to show how an ITG may be configured with telephony devices such as PBXs and phone sets.

1.1 Before Start Up

To set up the ITG for the first time, you will require the following items:

- A PC that can run a terminal program such as Hyper Terminal, NetTerm etc.
- An RS232 console cable. (Alternatively, since the ITG comes with a default IP address Telnet can be used for management and configuration of the ITG. The commands are the same as those associated with the console interface.)
- To complete the configuration of a specific customer you will need to be familiar with the customers' basic ISP and TCP/IP network settings plus their phone systems.

1.2 Notation Conventions

This document uses the following conventions:

- Examples that contain system prompts denote interactive sessions, indicating that the user enters commands at the prompt.
- Different type styles and characters are used. These serve a variety of purposes as described below:

Convention Description

boldface Commands and keywords are in **boldface.**

Bold Arial User input (anything you are expected to type in) is set in **bold Arial**.

italic Arguments for which you supply values.

[ ] Elements in square brackets are optional.

{ x | y | z } Alternative but required elements are grouped in braces ({ }) and separated by vertical bars (|).

[x | y | z] Optional alternative keywords are grouped in brackets ([ ]) and separated by vertical bars (|).

"string" A non-quoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

<key> A key on the VT-100 terminal or terminal emulator. For example <Enter> denotes the Enter key.

2. START UP PREPARATION

This chapter shows you how to prepare the ITG for your network and/or Internet connection. We divide this chapter into two sections, console interface and network Interface.

2.1 Console Interface

1) Connect your PC's COM port to the console port of the ITG using an RS-232 cable.

2) Start up your terminal program. Hyper Terminal is used here as an example.

3) Set up the parameters as below for your COM port:

Baud rate:	**19200 bps**
Data bit:	**8**
Parity Check:	**None**
Stop bit:	**1**
Flow Control:	**None**

4) Power off and on the ITG, the terminal will prompt "Console>" to show it is ready.

Hint

If you cannot get any response from the terminal program after striking "enter" key several times, check and make sure the hardware COM-port you are connecting to is correct, i.e. COM1 or COM2. Then check the above parameters again. It is recommended to quit Hyper Terminal and re-start again if this has occurred.

2.2 Network Interface

Since the ITG comes with a default IP address, you may use any PC to connect to either a hub or LAN segment where the ITG is, then follow the steps below:

1) Set up the PC with the IP address in the "192.168.0.x" IP domain, say, "**192.168.0.2**" with mask "255.255.255.0"

2) Start up the browser. In the address field, type in the address **http://192.168.0.1**.
The pop-up screen should appear and prompt for user name and password. The default values are:

User name:	**eitg**	(all lower case)
Password:	**123**	

You are now ready to perform the Network configuration set up described in the next chapter.

3. NETWORK CONFIGURATION

The following are the basic steps for a typical ITG connection in various environments, including static IP address environment, dynamic IP address environment, and NAT environment.

3.1 Static IP Address Environment

There are several typical static IP address environments where the following procedure may apply, such as popular broadband application with ADSL or Cable network.
Under the console prompt, key in "**net**". Your ITG will show you the available commands and information associated with the commands.

To complete the configuration the following commands will be used:

1) Console>**net set ip**

2) Console>**net set gateway**

3) Console>**net set mask**

4) Console>**net show**

5) Console>**set h323 dns_ip <IP address>** (optional)

6) Console> **config store**

7) **Restart the ITG**

1) The command "net set ip" is used to set the IP address for the ITG. If you would like to set up the IP address to "211.20.96.2", for example, type the command as below and press the <enter> key:

Console>**net set ip 211.20.96.2**<enter>

The ITG will prompt to confirm this change – either press "**Y**" to change right away or "**N**" to continue the set up (at this point it is most efficient to continue with the set up changes and only restart the ITG once complete).

2) Use the "**net set**" command for gateway and mask parameters. You will need to consult with your network administrator for the appropriate value of these two parameters. Examples follow:

Console>**net set mask 255.255.255.0** <enter>
Console>**net set gateway 211.20.96.1** <enter>

Warning
Incorrect IP address, Mask or Gateway will result in the ITG not being able to find the remote H.323 devices to make calls. It is important to ensure that the settings for this particular ITG are correct.

3) Key in the “net show” command to confirm the configuration

Hint

IP address:	211.20.96.2
Net mask:	255.255.255.0
Gateway:	211.20.96.1
User password:	123
HTTP Server state:	Enable
Connection	10/100Mbps Auto-negotiation

4) If the remote ITG that you will make a connection to has a host name, you should execute the following command in order to locate it on the network. Example:

Console>**set h323 dns_ip 168.95.1.1** <enter>
(Note: In this example we type in Hinet primary DNS Server IP address 168.95.1.1.)

5) Type the following command to store the above settings.

Console>**config store** <enter>

6) Restart the ITG.

3.1.1 After the Network setup

After restarting your ITG, perform a simple test by pinging the network devices.

1) Ping your gateway. The command is shown in the following example.

Console>**ping 211.20.96.1** <enter>

2) Ping any Internet host (i.e. host name www.ewholdings.co.uk)

Console>**ping www.ewholdings.co.uk** <enter>

(Note: In order to ping a host name successfully, you should perform the “**set h323 dns_ip** *IP_address*” command shown above.)

If the above test message contains “xxx.xxx.xxx.xxx is alive”, it means the ITG is connected to the network and the Internet.

3.2 Dynamic IP Address Environment

This section shows how to obtain a valid host name in the dynamic IP environment first, followed by the way to set up a typical ITG connection in the dynamic IP address environment via built-in PPPoE, DHCP, and DDNS clients.

3.2.1 Applying for a host name in the dynamic IP environment

First, you must apply for a DDNS host name from http://www.dyndns.org for the ITG. (For example, the name you may obtain is *ewc01.dyndns.org* for the ITG.)

ewc01.dyndns.org is applied for the ITG.

If you have already obtained a valid host name with your user name and password from the dynamic DNS server (www.dyndns.org), you may skip the following and go to Section 3.2.2 directly.

1) Go to the dyndns web page

    www.dyndns.org

2) Click “Sign Up Now”

3) Click “Agree” on Acceptable User Policy.

4) Create NIC User Account. Example:

    User Name: EWC
    Email Address: EWC@ewholdings.co.uk
    Password: ITG
    Click “Create Account”

5) Wait for DYNDNS email for confirmation of your account.

6) Go to the www.dyndns.org web page again

7) Click “login”

8) Type in your user name and password

9) Click “Dynamic DNS” and “Add New Host”

10) Type in ‘New Host Name’ and select ‘dyndns.org’

    For example: *ewc01.dyndns.org*

11) Repeat steps 9 & 10 if another host name is required, otherwise the host name application is complete.

3.2.2 Dynamic IP address set up

A) PPPoE (for the ADSL connection)

1) **net set pppoe on**: turn on PPPoE service.

2) **net set pppoe user_name** *my_name*

insert user name provided by ISP

(Note: Please consult with your ISP for the correct user name. For example you should type in xxxx@hinet.net (for some ISP's you may not need to type in the information after "@".)

3) **net set pppoe pw** *password*

insert password provided by ISP

4) **net set pppoe fix_ip** *ip_address*

(Note: This command optional and may be used where you are assigned a fixed IP address by your ISP, even in the dynamic IP address environment.)

insert the static IP address provided by your ISP

5) **net show pppoe**: display PPPoE status

B) DHCP

1) **net set dhcp on**: turn on DHCP service

C) DDNS service

1) **net set dyndns on**: turn on the DDNS client

2) **net show dyndns**: display DDNS client setting

3) **set dyndns add** *serv_name host_name user_name password*

add the DDNS name applied from dyndns.org

(Note: You should fill in the DNS server name in *serv_name. O*nly www.dyndns.org is supported at this moment. Also, please fill in the host name before dyndns.org. For example, fill in ewc01, if your full host name is ewc01.dyndns.org.)
user_name and *password* are those that you have registered with your DNS server.

Following the example in Section 3.2.1.

set dyndns add dyndns EWC01 EWC ITG

4) **net show dyndns**: display DDNS configuration

5) **config store**

6) **Restart the ITG.**

At this time the following message should appear on your console screen 'Account <host name> (example: ewc01.dyndns.org) updates successfully'. You are ready to go to the next section. Otherwise check your set up procedure for Steps 1 to 5 above.

3.3 NAT environment

This section provides a basic procedure for an ITG, which is connected via a NAT Router in the private IP address environment. In the following set up we assume that your NAT router supports both PPPoE and Dynamic DNS service.

1. Follow you NAT router set up procedure and enable PPPoE by entering User Name, Password, and Host Name that you have applied from www.dyndns.org, say. Your Host Name is ewc01.dyndns.org.

2. Turn on the advanced setting for you NAT router. Enable Connect on Demand, Set Idle Time Out to 0 minute, then click "Save All".

3. Set up DDNS service for you NAT router.

Enter DDNS User Name and Password.

Enter DDNS Server Name and Host Name.

Then click "Save".

4. At this time you should check your NAT router WAN connection status to make sure it is available by using the ping command, for example.

C:\> **ping 168.95.1.1** (for Hinet connection)
(Note: This command is executed under MS-DOS prompt)

5. Set the DMZ

(Note: If you can't find this feature in your NAT router, you should go to the next step to set up your virtual server.)

Enter the DMZ setting as the following:
Enable IP address 192.168.0.5 as the DMZ IP address

6. Set up the Virtual Server and Web Server. (Option)

Set the virtual server for Web Server and Telnet.
Set the IP to 192.168.0.5 (for an example).

Then click "Save".

7. Set the Customer Definable Virtual Server. (Optional)

Enter the Virtual Server settings as the following:

Enable IP address 192.168.0.5

TCP Internal port range from 1000 to 5000

External port range from 1000 to 5000

Click “Add”

Enable IP address 192.168.0.5

UDP Internal port range from 30000 to 31000

External port range from 30000 to 31000

Click “Add”

8. You should now follow the IP address set up for your ITG as per the instructions in Section 3.1, for the static IP address environment.

Note: The fixed IP address you will key in should be identical to that which you set for the IP address in the DMZ in your NAT router above, say “192.168.0.5”

a) **net set ip** *ip_address* <enter> (Note: This *ip_address* should be the same as that set for the DMZ, say 192.168.0.5)

b) **net set mask** *net_mask* <enter>

c) **net set gateway** *ip_address* <enter> (Note: The *ip_address* for the “gateway” here should be identical to that for the LAN port associated with the NAT router.)

d) net show <enter>

e) **set h323 dns_ip** *ip_address* <enter>

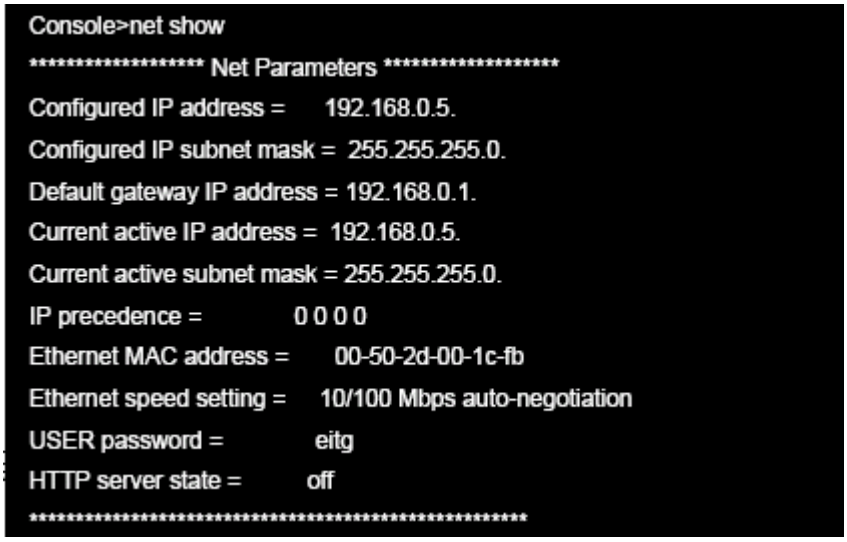
9. Enter the following command on your remote ITG.

set h323 nat_call on <enter>

10. **config store** <enter>

11. Now perform the following command on your local ITG to make sure your DMZ settings are correct.

Console> **net show** <enter>



12. Restart the ITG.

13. Type the following command to make sure the WAN connection for your ITG is working normally.

Console> **ping 168.95.1.1** <enter>
(Note: This ping command is executed on the console screen.)

14. You are ready to perform the Dial Plan Set Up described in the next chapter.

4. DIAL PLAN SET UP

This chapter shows you the basic concept and commands to help you configure your ITG through the console port. It includes ITG voice port, Dial Plan, and console commands. All the commands used through the console port are the same as those used via Telnet.

4.1 Concepts

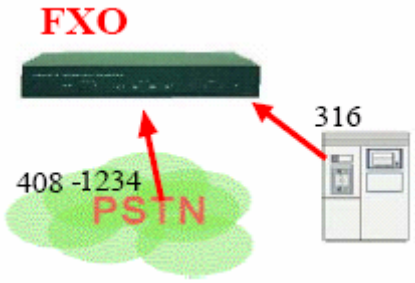
4.1.1 The Voice Port

There are two types of voice port, **FXO** (Foreign eXchange Office) and **FXS** (Foreign eXchange Station). You should locate them on the back of the ITG as labelled RJ-11 ports.

In this guide, we will focus on FXO and FXS only.

FXO port

The FXO port allows a connection with a device that is associated with a phone number and can generate a ring signal; say 316, or 408-1234. Therefore, the only connections for FXO ports will be to your local PSTN Line or one of the analog extension lines associated with your PBX system. When your FXO port connects to a PSTN Line, the VoIP call can be made to the local number (408-1234). Or, vice versa, you may make a VoIP call through the phone number 408-1234.



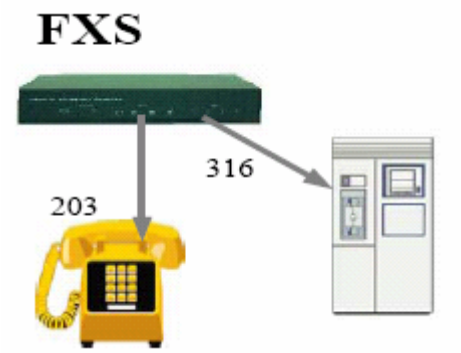
The same is applied to a PBX system. You are required to know which extension number will be assigned to the FXO port. Your PBX users will need to know this number to make a VoIP call.

Hint

The FXO port cannot connect to a device such as telephone or fax machine since they do not provide any phone number / extension and cannot generate any ring signal. If you connect those to the FXO port, you may hear nothing once you pick up the handset.

FXS port

The FXS port allows connection to a device such as telephone, fax machine, or trunk line of a PBX system (For 4-port and 8-port model only).
The FXS port is like the local phone service provider that generates and provides a ring signal. It is easy to tell if you have connected a device to the FXS port and you may hear the dial tone provided by the FXS port once the hand set is off-hook.



Warning

The FXS port is with voltage and current. **DO NOT** connect this port to any PBX extension line or PSTN line. This may cause FXS port or your PBX extension port malfunction.

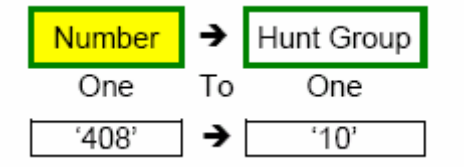
4.1.2 The dial plan

Before you start setting up the dial plan for the ITG, it is required to know the following basic concepts associated with the ITG.

1. Phone number
2. Hunt Group ID
3. Destination ID
4. Destination

1) Phone Number

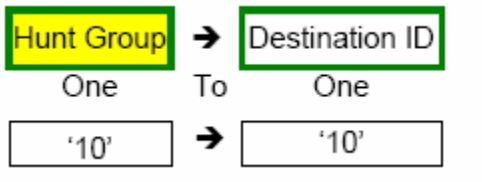
The “Phone number” associated with the ITG is a set of digits. You may look at this as an area code associated with your phone number. In the following example this number will only map to one Hunt Group.



Section 5 contains more details regarding configuration and Dial Plan examples.

2) Hunt Group ID

The “Hunt Group ID” here is an interpreter between phone number and Destination ID. The ITG phone table will be based on the number you dial to find the related hunt group. So, different numbers may map to the same hunt group. A Hunt group consists of at least one Destination ID. It means that when a call is placed the first available Line Destination ID will be connected.



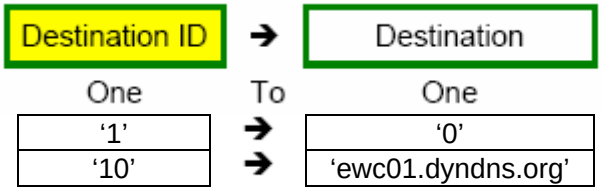
Hint

In this guide, we will only set up **one** Hunt Group to **one** Destination.

3) Destination ID and Destination

The “Destination ID” here is an interpreter between Hunt Group and physical Destination. Hunt Groups may map to the same destination ID. The destination is either a physical port or a remote IP address that ITG should make a call to. Each Destination ID maps to a physical destination. There are two types of physical destination.

- A physical port on the ITG, i.e. the FXO/FXS port
- A H.323 VoIP gateway with a fixed IP address or a host name.



Hint

In this guide, we will use a dial plan table as below for illustration purpose.

Number	Hunt Group	Destination ID	Destination
201	1	1	0
408	10	10	ewc01.dyndns.org

‘201’ is a default number, ‘408’ is a new number we will add onto the table.

4.2 Console Configuration & Commands

To start up the console management, we will show you some often used console commands first. The major command for the dial plan set up is “**atpm**”. The following will show you how to set up your dial plan using the command “**atpm**”.

Hint

Key in ‘atpm’ command without any parameters first and it will prompt the available parameters for your reference.

Warning
After powering on the ITG, all the information such as dial plan, port settings in the flash memory will be copied to the memory. If you have made any changes, you are required to store these changes to flash memory so you do not lose them when power off / on occurs.

4.2.1 'atpm' command

Use the following command lists to check all your current tables.

1) **atpm alist** ; show you the phone number or address table

2) **atpm hlist** ; show you the hunt group table

3) **atpm dlist** ; show you the destination table

1) **atpm alist**

After keying in the command '**atpm alist**' you will find the default table as below: (Note: For a 2-port ITG model)

Address Entry	Hunt Group ID	Min Digits	Max Digits	Prefix Strip	Prefix Address
201	1	0	3	3	None
202	2	0	3	3	None

Min Digits/Max Digits: Once the handset is off hook and you start to dial, the ITG will wait for the number of digits specified before it looks up the Hunt Group. For example, if the Maximum Digits are 2 and you dial "201", before you press "1" the ITG starts up the process.

Hint
Some times, limiting the maximum digits will speed up the call process by the ITG. Also, if you would like to control long distance calls through your FXO port you can set the max. digits to cut the dial after a normal local call string has been entered.

Prefix Strip/ Address: As with any phone system, your phone number is set according to "country code- area code- local number", for example '886-3-5679728'. In a local area, you don't need to receive the number '886-3', the Prefix Strip here can be set to strip out a preset number of digits. The prefix Address is used to add predetermined digits to the number.

For example: Prefix Strip 4 digits

- ☎ 886-3-5679728 ⇨ ITG ⇨ 5679728 ⇨ Remote ITG

(In this example the ITG will strip '886 3' before sending the number '5679728' to the remote ITG.)

To add prefix number 5679 to the digits,

- ☎ 728 ⇨ ITG ⇨ 5679-728 ⇨ Remote ITG

(In this example the local ITG will add '5679' then send '5679728' to the remote ITG)

Warning

If you think your dial plan is correct but couldn't reach the destination, check if you've stripped out or addressed more digits incorrectly.

2) **atpm hlist**

Use the command "**atpm hlist**" to display the Hunt Group table.

Console>**atpm hlist** <enter>

Hunt Group	Type	# of Dest. ID	Dest. ID
1	2	1	1
2	2	1	2

Type 1 is to hunt for the next available port and Type 2 is for the first available one. The default value is "2", and "# of Dest. ID" is the amount of Destination ID in this hunt group.

Hunt Group	Type	# of Dest. ID	Dest. ID
10	2	1	10
11	2	2	11 1

This example shows that Hunt Group 11 has two destinations.

3) **atpm dlist**

The command "**atpm dlist**" is used to display the Destinations

Console>**atpm dlist** <enter>

Dest. ID	Mode	Destination
1	Local	0
2	Local	1

It has two types of Mode, **Local** and **Remote**. Local is the physical ports on your ITG. If your ITG is a 2-port model, it will display as above. Remote means that the target is a H.323 device.

Dest ID	Mode	Destination
10	H.323	211.20.96.5
11	dns	ewc01.dyndns.org

Now, let's add some phone numbers to the ITG. The commands that will be used are:

a) **atpm req** : request for database update

b) **atpm aadd** : add a new phone number

c) **atpm hadd** : add a new Hunt Group

d) **atpm dadd** : add a new Destination

e) **atpm done** : close the database

f) **atpm store** : save the changes from memory to the flash memory.

4) **atpm req**

This is the mandatory command used to inform the ITG that you are going to make changes to the phone system.

Hint

Without this request command, the following three commands will fail.

Warning

During the 'atpm req' set up period, all the connection and dial processes will be torn down. If you are modifying a previously installed and working ITG it is strongly recommended that you request the customer complete all ITG calls before executing this command!

5) **atpm aadd**

This command is used to add a new phone number to the ITG. For example, to add a number '408' to the ITG where hunt group is 10 and 3 digits (408) are to be stripped.

Console>**atpm aadd 408 3 6 10 3** <enter>

The number 3 and 6 are the minimum digits and maximum digits. (The range is between 0 and 16)

6) **atpm hadd**

When adding a phone number, hadd is used to add new Hunt Groups. For example, to add a new Hunt Group 10 with a destination of 10, the command is:

Console>**atpm hadd 10 2 10** <enter>

The number 2 here is the hunt type, which is typically to be used as default.

7) **atpm dadd**

Command is used to add a physical port or a physical H.323 gateway. For example, to add a new destination to IP address '211.20.96.5' to Destination ID, 10.

Console>**atpm dadd 10 h323 211.20.96.5** <enter>

The parameter H323 here tells the ITG the destination is a H.323 gateway. If you know its host name, you may do the following:

Console>**atpm dadd 11 dns** ewc01.dyndns.org <enter>

8) **atpm done**

This command is used to inform the ITG to close the Dial Plan database after all the changes have been made. This command is mandatory to ensure the ITG is returned to a normal state.

9) **atpm store**
This command is used to store the new settings from memory to flash memory. Without this command, any changes will disappear if the ITG is powered off.

5. CONFIGURAITON EXAMPLES

5.1 The default dial-plans

Before any configuration set up, your ITG should have the following basic information.

Network:

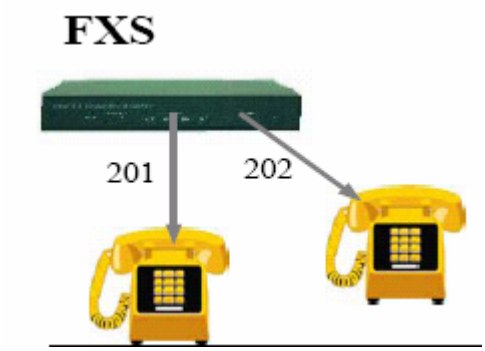
IP :	192.168.0.1
Mask: :	255.255.255.0
Gateway :	0.0.0.0

Dial Plan:

No.	Hunt Group	Dest. ID	Dest.
201	1	1	0 (local port #1)
202	2	2	1 (local port #2)
203	3	3	2
204	4	4	3
20X	X	X	(x-1)

(X is from 1 to 8, and it varies depending on your ITG model)

If your ITG's two FXS ports are connected to two telephones, say port 1 and port 2 respectively, just pick up phone 1 and dial '202', phone 2 should ring.



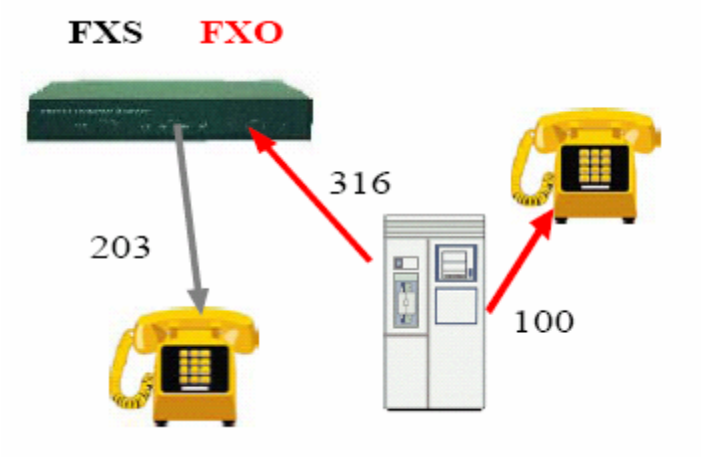
☎ 202 ⇨ ITG ⇨ local port #2 ☎

Hint

You may also check the LED indicators on the ITG. When it rings, the related LED should flash. After you pick up the handset, it should remain on and off when the phone is on hook.

To test an ITG that is equipped with FXO interface. Assume you have one extension line with your PBX system, say, 316 as the extension number. Connect this line to ITG's port 1 (FXO port), then connect a telephone phone set to port 3 (for example) of the ITG.

Pick up your extension handset, for example, 100 and dial '316'. After one ring, you should hear a dial tone. Now press '203' then the telephone connected to the ITG's FXS port should ring.



Hint

If you do not hear the dial tone, please check the line impedance of the PBX.

Now let's make a call to your extension. Pick up the handset connected to the FXS port and dial '**201**', you should hear a dial tone (This means that ITG picks up the line connected to your PBX). Then dial **'100**', your extension handset should ring right away.

Hint

This guide only uses the default values. Once you are familiar with the dial plan set up, you may design your own. For example you may set it up with only one digit, '**1**' and '**100**' rings.

5.2 ITG to ITG in the Static IP Address Environment

The previous section showed how to test the ITG without modifying any settings. This section shows how to connect two ITGs together and make VoIP calls. Assume that we have a second ITG, say ITG B, which is using the default setting. Now, let's set up the IP address to, e.g. '192.168.0.2' and connect it to ITG A with the following three steps.

Step 1.

ITG B:
Console>**net set ip 192.168.0.2** <enter> and restart. ITG B

Step2.

Connect ITG A and ITG B to the same Ethernet switch or hub.

Step3.

ITG A:
Console>**ping 192.168.0.2** <enter> ; ping ITG B
(Ping (192.168.0.2) 56 data byte 192.168.0.2 is alive)

ITG B:
Console>**ping 192.168.0.1** <enter> ; ping ITG A
(Ping (192.168.0.1) 56 data byte 192.168.0.1 is alive)

After these three steps, both ITGs should find each other on the same network.

Now let's set up the remote H.323 gateway for each ITG.

ITG A:

Console>**atpm req** <enter>

Console>**atpm aadd 02 2 5 10 2** <enter>

Console>**atpm hadd 10 2 10** <enter>

Console>**atpm dadd 10 h323 192.168.0.2** <enter>

Console>**atpm done** <enter>

Console>**atpm store** <enter>

ITG B:

Console>**atpm req** <enter>

Console>**atpm aadd 01 2 5 10 2** <enter>

Console>**atpm hadd 10 2 10** <enter>

Console>**atpm dadd 10 h323 192.168.0.1** <enter>

Console>**atpm done** <enter>

Console>**atpm store** <enter>

The dial plan for these two ITGs should add a new record after the above commands.

ITG A:

No.	Hunt Group	Dest. ID	Dest.
02	10	10	192.168.0.2

ITG B:

No.	Hunt Group	Dest. ID	Dest.
01	10	10	192.168.0.1

Now, once ITG A gets a dialled number, “02”, it will direct the call to ITG B. The same applies to ITG B, ‘01’, which will map to ITG A.

(Assume both ITGs have a FXS port on port #3 with a phone set connected.)

ITG A:

Pick up handset and dial “02203”, where ‘02’ points to ITG B and ‘203’ for port 3 of ITG B. The phone attached to ITG B should ring.

ITG B:

Pick up the handset and dial “01203”, where ‘01’ points to ITG A and ‘203’ is designated for port 3 of ITG A. The phone attached to ITG A should ring.

Hint

In this example, we assigned to each ITG a unique number. You may treat that number as an area code. Each ITG represents a different area. ITG A is with area code 01 and ITG B is with code 02. So. If you have more, you may assign the next and subsequent ITGs 03, 04, etc.

Hint

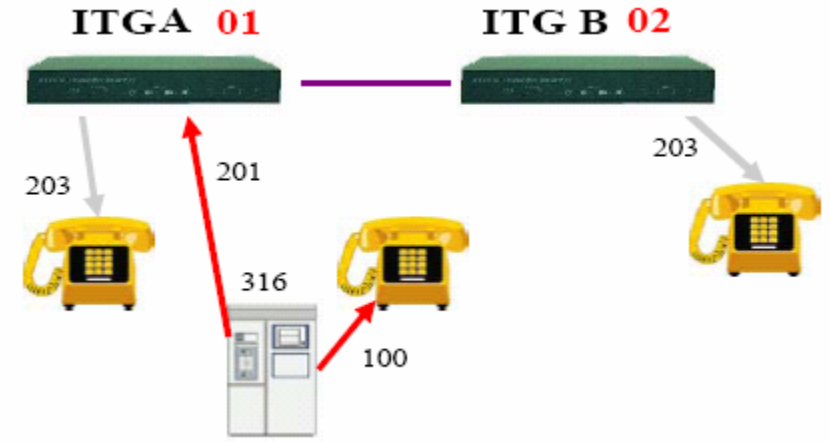
If you can not hear the ring signal, please do make sure of the following:

1) Both ITGs can ping each other

2) You are connected to the correct ports. In this example, it should be the FXS port. Also the phone number will be “20X” where X corresponds to the location of the port.

3) Ensure you have stripped the number in the command “atpm aadd” correctly.

We may continue to use the configuration mentioned in Section 4.1 for PBX connections.



ITG A:

The users at ext. 100 want to make a call to ITG B, 203. What we need to do is to pick up the handset with extension ‘100’ and dial ‘316’. After you hear the dial tone again, dial ’02-203’. Then, the phone attached to ITG B should ring.

ITG B:

If users at ITG B want to make a call to ext 100 through ITG A, one should dial, ’01-201’ where the PBX line is connect to port 1. After hearing the dial tone, just dial the extension number ‘100’.

Hint

This is conceptually the same design as how we use a PBX with an extension handset. We pick up the handset and dial any extension number directly to your co-workers, or dial ‘0’ or ‘9’ to make a call to the PSTN network. The same is with ITG B, after you dial “01-201”, you can do the same thing because “01201” connects you to the extension handset 316. In this scenario the handset with extension 203 connected to ITG B may also be looked at as an extension of the PBX.

After completing all of the above, your ITG should be performing normally. Now let’s do the following two things:

A) Convert the IP address, Mask, and Gateway to your network that can access the Internet. Do the same thing to your second and third ITG so they may connect to the Internet as well.

B) Check the bandwidth, and the router. Normally, if you can ping each other, it means that they should talk to each other via VoIP calls.

Warning
Please make sure your router does not block the IP port. The port used for an ITG with the default settings are:

TCP: **1024 ~5000**
UDP: **30000 ~31000**

Warning
The average bandwidth for each channel is from 12kbps to 16kbps by default. In a heavy traffic network, the available bandwidth between two nodes may affect the voice quality.

5.3 ITG to ITG in the Dynamic IP Address Environment

The previous section showed the steps regarding how to set up a typical ITG-to-ITG connection in a static IP address environment without modifying any settings. This section will illustrate how to connect two ITGs in a dynamic IP address environment via built-in PPPoE, DHCP, and DDNS clients, assuming there is a second ITG, (ITG B), located on site B with default settings.

First of all, it is required to apply for a DDNS host name from http://www.dyndns.org for ITGs on site A and site B. (For example, the names are *ewc01.dyndns.org* for ITG on site A, and *ewc02.dyndns.org* for ITG on site B.)

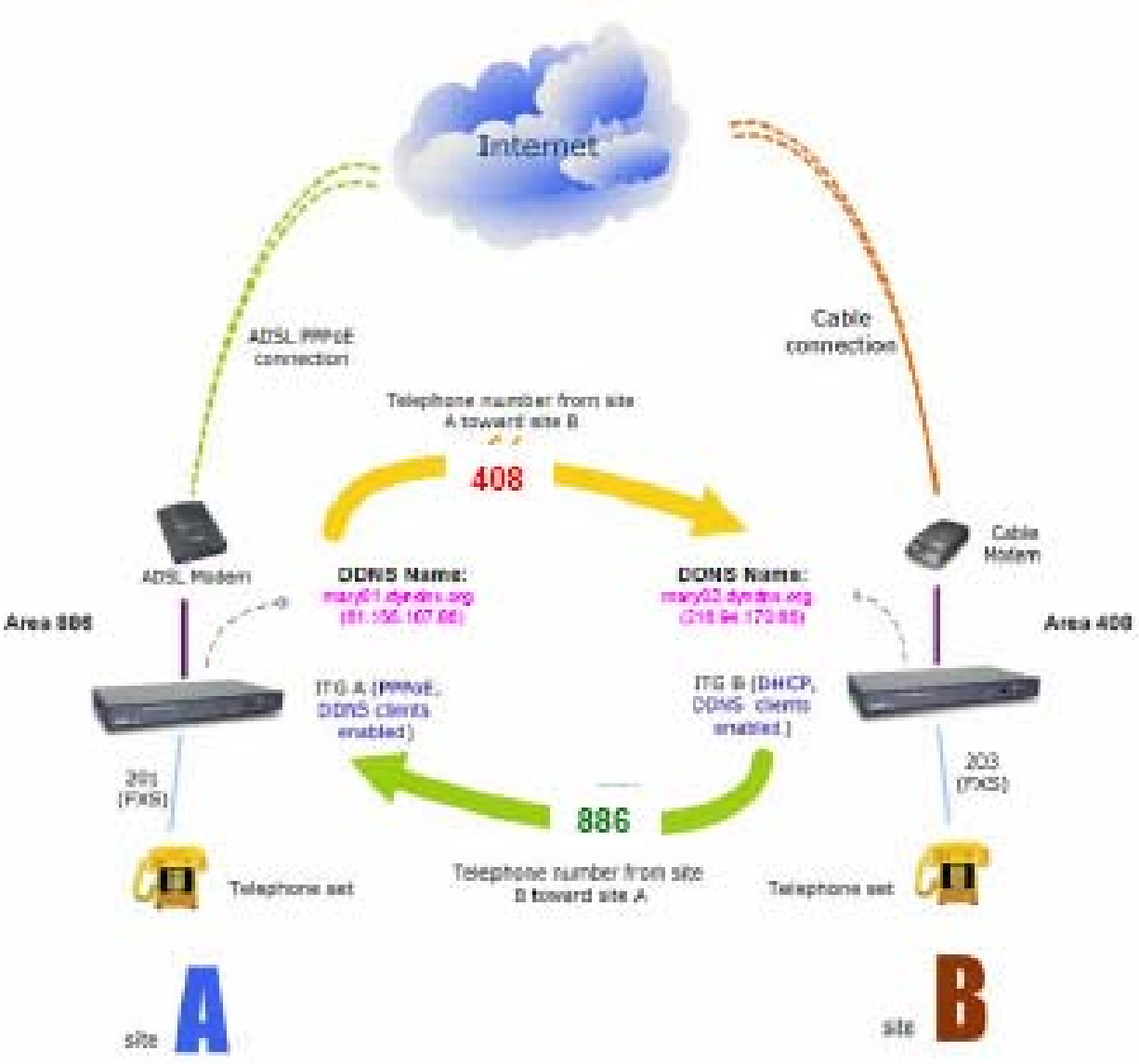
ewc01.dyndns.org is applied for ITG on site A,

ewc02.dyndns.org is applied for ITG on site B.

Other parameters in this topology :

ITG on site A has **PPPoE**, and **DDNS** clients enabled
ITG on site B has **DHCP**, and **DDNS** clients enabled.

Network topology is illustrated in the following diagram:



ITG configuration (ADSL PPPoE connection) on site A:

PPPoE section:

net set pppoe on <enter>
net set pppoe user_name *my_name* **<enter>**
net set pppoe pw *my_password* **<enter>**

Please fill in username/ Password obtained from ISP.

DDNS client section:

Set dyndns add dyndns ewc01 my_name my_password <enter>

Config store <enter>

Net reset <enter>

Dialplan settings:

atpm req <enter>

atpm dadd 408 dns *ewc02.dyndns.org* <enter>

atpm hadd 408 2 408 <enter>

atpm aadd 408 2 8 408 3 <enter>

atpm done <enter>

atpm store <enter>

Create an address entry for ITG on site B

ITG configuration (cable connection) on site B:

DHCP section:

net set dhcp on <enter>

then press ”y” or use command **net reset** to reboot

DNS server section:

set h323 dns_ip 168.95.1.1 <enter>

config activate <enter>

config store <enter>

DNS server settings will not take effect till system reboot.

DDNS client section:

set dyndns add dyndns ewc02 *my_name my_password* <enter>

config store <enter>

net reset <enter>

Please fill in *username* and *password* obtained from ISP.

Dialplan section:

atpm req <enter>

atpm dadd 886 dns ewc01.dyndns.org <enter>

atpm hadd 886 2 886 <enter>

atpm aadd 886 2 8 886 3 <enter>

atpm done <enter>

Create an address entry for ITG on site A

atpm store <enter>

After these modifications, users on site A are able to dial “408 + telephone number” to call users on site B. Users on site B are able to talk to site A by dialling number “886 + telephone number. (Please note that there is an 8 digit maximum limitation of a dial string - users may modify this parameter to meet different needs.)

Warning
If calls cannot be made, please check:

a) Connectivity between ITGs is correct. (This may be checked via *ping* command in ITG.)

b) DDNS name is correctly updated.

5.4 Call Security

The ITG is a standard H.323 VoIP gateway that will allow any standard H.323 device to make a VoIP call to it. That means no matter where you are, once you have a H.323 device such as another ITG, or a software package such as Microsoft NetMeeting, you may make a call to this ITG at any time once it is connected to the Internet.

If the ITG is only equipped with FXS port, that should be okay for secure operation. However, once it is connected to a PBX or PSTN service, you are effectively opening a phone line for any Internet user to make a call. For example, you may have an International call to Europe though an ITG in Singapore even you are in Hong Kong. To prevent this from happening, you are required to do the following:

1) **Restrict the line’s right to use**. For example, if the line goes to an extension line, ask the PBX manager to restrict this line from dialling to certain numbers. Or ask the PSTN provider to limit the line usage as well.

2) **Re-check the dial table.** Check that the dial plan table only allows certain numbers to make calls. That is, remove the unnecessary numbers and restrict the maximum digits or prefix the allowed number inside the ITG instead of allowing users to dial the number themselves.

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