

# **Elite Gateway\***

## **Quick Installation Guide**

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## **Revision**

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## 1. ABOUT THIS GUIDE

This Guide contains the following information:

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

**Network Configuration:** You will learn how to set up IP address for your ITG in various environment such as static IP address, dynamic IP address, and NAT environment.

**Dial Plan Setup:** We will provide necessary procedure and commands to guide you step by step for a typical dial plan set up.

**Configuration Example:** This chapter shows you how to use the default settings to start up your first call. Examples will be given to show you how an ITG may be working with telephony devices such as PBXs and phone sets.

### 1.1 Before Start up

Before setting up your ITG the first time, you are required to have the following:

- A PC that may run a terminal program such as Hyper Terminal, NetTerm, etc.
- A console cable, where you may find it in the ITG package.

And later on, you are required to get familiar with your environment, your TCP/IP network and your phone systems.

Telnet may also be used for the set up. If you are familiar with the console command, you may also use Telnet to manage the ITG as well. The commands are all the same as that associated with the console interface.

---

## 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  |
|-------------------|--|
| <b>boldface</b>   | Commands and keywords are in <b>boldface</b> .   |
| <b>Bold Arial</b> | User input (anything you are expected to type in) is set in <b>bold Arial</b> .  |
| <i>italic</i>     | 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 for the Internet Telephony Gateway (ITG) set up for your network and/or Internet. 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. Here, we use Hyper Terminal 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!



```
Console>|
```



#### 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 "192.0.0.x" IP domain, say, "**192.0.0.2**" with mask "255.255.255.0"
- 2) Start up the browser. In the address field, key in the address **http://192.0.0.1**. The pop-up screen should appear and prompt for user name and password. The default values are:

User name: "**eitg**" or "**adm**" (all lower case)

Password: **123**

Now you are ready to perform the Network configuration set up described in the next chapter.

### 3. NETWORK CONFIGURATION

We will show you the basic steps for a typical ITG connection in various environment. It includes static IP address environment, dynamic IP address environment, and NAT environment.

#### 3.1 Static IP Address Environment

There are several typical static IP address environment where the following procedure may apply, such as popular broadband application with ADSL or Cable network.

Under the console prompt, you may key in “**net**”. Your ITG will show you the available commands and information associated with the commands.

```
Console>net
net: invalid command, check:
Command                Description
-----
net reset               ; Reset system
net set ip <ip_addr>   ; Set IP address
net set gateway <ip_addr> ; Set default gateway address
net set mask <ip_mask> ; Set IP sub net mask
net set ip_preced <p> <d> <t> <f> ; Set IP precedence
net set speed <auto|10|100> ; Set LAN speed
net set user_pw <pw> <pw> ; Set user password
net set http <on|off>  ; Turn HTTP server on/off
net set pppoe          ; Set PPPoE parameters
net set dyndns         ; Set DynDNS parameters
net set dhcp <on|off>  ; Turn DHCP client on/off
net set telnet <on|off> ; Turn Telnet server on/off
net show               ; Show network settings
net show hwestat       ; Display hardware status
net show pppoe         ; Show PPPoE parameters
net show dyndns        ; Show DynDNS parameters
net show dhcp          ; Show DHCP parameters
```

The command we will use are:

- 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>** (This is an option)

---

6) Console> **config store**

7) **Restart your 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, you may type the command as below and press the <enter> key:

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

The ITG will prompt this change and you ought to restart the system to take effect the change. Press “Y” to change right away, and “N” to continue the set up. This will be effective at next system restart (or power off / on).

- 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.

```
Console>net set mask 255.255.255.0 <enter>
```

```
Console>net set gateway 211.20.96.1 <enter>
```



**Warning**

Incorrect IP address, Mask, and Gateway will result in the ITG not being able to find the remote H.323 devices to make calls. Please make sure that the settings for this ITG are correct.

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

|  |                    |                             |
|--|--------------------|-----------------------------|
| <br><b>Hint</b> | IP address:        | 211.20.96.2                 |
|  | Net mask:          | 255.255.255.0               |
|  | Gateway:           | 211.20.96.1                 |
|  | User password:     | 123                         |
|  | HTTP Server state: | On                          |
|  | Connection         | 10/100Mbps Auto-negotiation |

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

```
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.  
(Note: At this moment the console screen may display "please reboot...". you may ignore it.)

```
Console>config store <enter>
```

- 6) Restart your ITG.

### 3.1.1 After the Network setup

After restarting your ITG, it is recommended to 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>
```

```
Console>ping 211.20.96.1
ping (211.20.96.1): 56 data bytes
211.20.96.1 is alive
Console>
```

- 2) Ping any Internet host with host name www.yahoo.com

```
Console>ping www.yahoo.com <enter>
```

```
Console>ping www.yahoo.com
ping (66.218.71.87): 56 data bytes
www.yahoo.com is alive
Console>█
```

---

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 well connected to the network and also to the Internet.

## **3.2 Dynamic IP Address Environment**

In this section we will show you 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, it is required to apply for a DDNS host name from <http://www.dyndns.org> for the ITG. (For example, the name you may obtain is *mary01.dyndns.org* for the ITG.)

[mary01.dyndns.org](http://www.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 such as [www.dyndns.org](http://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](http://www.dyndns.org)
- 2) Click “Sign Up Now”
- 3) Click “Agree” on Acceptable User Policy.
- 4) Create NIC User Account

Example:

User Name: Mary

Email Address: [mary01@Yahoo.com](mailto:mary01@Yahoo.com)

Password: hbear

Click "Create Account"

- 5) Wait for DYNDNS email for confirmation of your account.
- 6) Go to the [www.dyndns.org](http://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: mary01.dyndns.org
- 11) Click "Add Host" if another host name is needed and go to Step 10, otherwise the host name application is done.

### 3.2.2 Dynamic IP address set up

Here we'd like to introduce commands used in the dynamic IP address environment.

#### 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](mailto:xxxx@hinet.net) and for some other ISP 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 is an option 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 (May be applied for the cable connection)**

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

**C) DDNS service**

- 1) **net set dyndns on**: turn on the DDNS client
- 2) **set dyndns add** *serv\_name host\_name user\_name password*

add the DDNS name applied from dyndns.org

(Note: You should only fill in the DNS server name in *serv\_name* and we only support [www.dyndns.org](http://www.dyndns.org) at this moment so fill in "dyndns". Also, Please fill in the host name before dyndns.org. For example, fill in mary01, if your full host name is mary01.dyndns.org. *user\_name* and *password* are those that you have registered with your DNS server.)

Follow the example in Section 3.2.1.

**Set dyndns add** dyndns mary01 mary hbear

- 3) **net show dyndns**: display status of DDNS service
- 4) **config store**
- 5) **Restart you ITG.**

At this time the following message should appear on your console screen 'Account <host name> (example: mary01).dyndns.org updates successfully'. You are ready to go to the next section. Otherwise check your set up procedure for Step 1) to 5) above.

### **3.3 NAT environment**

In this section we will provide a basic procedure for your ITG which is connected with a NAT Router and 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](http://www.dyndns.org), say. Your Host Name is  
mary01.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 connect status to make sure it is valid by 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. (option)

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. Now you are advised to follow the IP address set up for you ITG the same as that in Section 3.1, for the static IP address environment.

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

1) **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)

2) **net set mask** *net\_mask* <enter>

3) **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.)

4) **net show** <enter>

5) **set h323 dns\_ip** *ip\_address* <enter>

9. Perform 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>
```

```
Console>net show
***** Net Parameters *****
Configured IP address = 192.168.0.5.
Configured IP subnet mask = 255.255.255.0.
Default gateway IP address = 192.168.0.1.
Current active IP address = 192.168.0.5.
Current active subnet mask = 255.255.255.0.
IP precedence = 0 0 0 0
Ethernet MAC address = 00-50-2d-00-1c-fb
Ethernet speed setting = 10/100 Mbps auto-negotiation
USER password = eitg
HTTP server state = off
*****
```

---

12. Restart your 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 should be the same for those if you use telnet to set up the ITG.

### 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 at the labels of the RJ-11 ports.



#### Hint

Ear and Mouth (E&M) module is also available for 8-port ITG model. Please consult with your local dealer, if you are interested in the E&M module. In this guide, we will focus on FXO and FXS only.

#### FXO port

The FXO port allows the connection with a device that is associated with a phone number and can generate a ring signal; say 316, or 408-1234. So the only connections for FXO port will be to your local PSTN Line or one of the analog extension line 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.

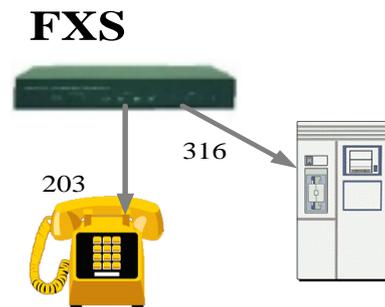
---

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 the 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 your local phone service provider that can generate and provide 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 handset is off-hook.

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

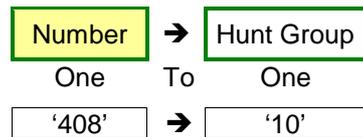
### 4.1.2 The dial plan

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

- Phone number
- Hunt Group ID
- Destination ID
- Destination

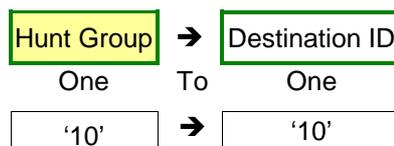
#### 1) Phone Number

The “Phone number” associated with the ITG is a set of digits. You may look at that as an area code associated with your phone number. This number will only map to one Hunt Group in this example. You may reference to Section 5 for 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.



|   |   |
|---|---|
|  | In this guide, we will only set up <b>one</b> Hunt Group to <b>one</b> Destination. |
| Hint  | This will be convenient for you to trace the relations.                             |

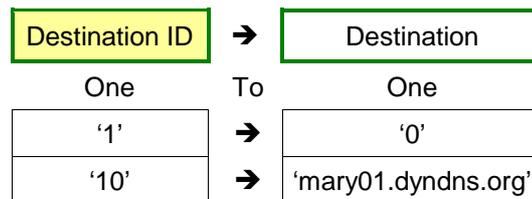
---

### 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.



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

#### Hint

| Number | Hunt Group | Dest. ID | Destination       |
|--------|------------|----------|-------------------|
| 201    | 1          | 1        | 0                 |
| 408    | 10         | 10       | mary01.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 quick reference.



**Warning**

After power 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 to it, you are required to restore new records from memory back to the flash memory so you do not loss it when power on occurs.

#### 4.2.1 ‘atpm’ command

For setting up your ITG the first time, you may 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 key 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 digits 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 already starts up the process.



**Hint**

Some times, limit the maximum digits will speed up the call process by the ITG.

Also, if you would like to control the long distance calls through your FXO port, say Internet call through your PBX to make an International call with phone number “011-886-3-5679728”. You set the max. digits to cut the dial.

**Prefix Strip/ Address:** As 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 is to strip out dial. The preset number of digits for you, the prefix Address is to add the predefined number of digits to the number for you.

For example: Prefix Strip 4 digits

☎ 886-3-5679728 ⇒ ITG ⇒ 5679728⇒Remote ITG

In this example your ITG will stripe ‘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, you may want to check if you've stripped out or addressed more digits to your number incorrectly.

### 2) **atpm hlist**

Now, let's 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 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   | mary01.dyndns.org |

Now, let's add some phone numbers to the ITG. The commands we will use are:

- 4) **atpm req** : request for database update
- 5) **atpm aadd** : add a new phone number
- 6) **atpm hadd** : add a new Hunt Group
- 7) **atpm dadd** : add a new Destination
- 8) **atpm done** : close the database
- 9) **atpm store** : save the changes from memory to the flash memory.

#### 4) **atpm req**

Accompany with the command '**atpm done**' both commands are used to inform the ITG that we are going to make changes to the phone system or complete the changes.



#### **Hint**

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



#### **Warning**

During the 'atpm req' set up period, all the connection and dial process will be torn down. It is strongly recommended that you do not connect your ITG to the network before executing this command!

#### 5) **atpm aadd**

With this command you may add a new phone number to the ITG. For example, add a number '408' to the ITG where hunt group is 10 and we want to strip '408' 3 digit.

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

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

#### 6) **atpm hadd**

When adding a phone number, hadd is used to add a new Hunt Groups. For example, let's add a new Hunt Group 10 and its destination to 10, the command is:

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

The number 2 here is the hunt type. We suggest that you use this default number.

#### 7) **atpm dadd**

Here we intend to add a physical port or a physical H.323 gateway. For example, let's add a new destination to the IP address '211.20.96.5' to Destination ID, 10.

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

The parameter H323 here is to tell 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 mary01.dyndns.org  
<enter>
```

#### 8) **atpm done**

This command is used to inform your ITG to close the Dial Plan database.

---

### 9) **atpm store**

This command is used to store all your settings from memory to the flash memory. Without this command, all the settings will disappear if you power off the ITG.

## 5.CONFIGURAITON EXAMPLES

### 5.1 The default dial-plans

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

Network:

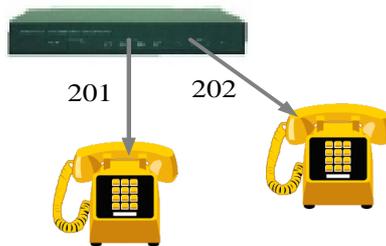
IP : 192.0.0.1  
Mask : 255.255.255.0  
Gateway : 0.0.0.0

Dial Plan:

| No. | Hunt Group | Dest. | Dest. ID          |
|-----|------------|-------|-------------------|
| 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)

### FXS



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.

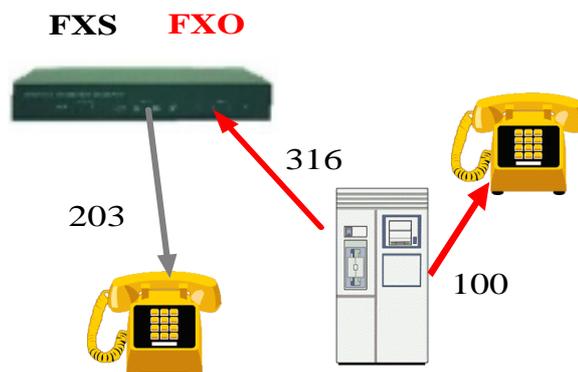
☎ 202 ⇒ ITG ⇒ local port #2 ⇒ ☎)))



**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.

Now let's test your ITG that is equipped with FXO interface. Assume you have one extension line with your PBX system, say, 316 as the extension number, we 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 your PBX. For an ITG with FXO port, you should find a Guide for setting the appropriate line impedance in your package. Please set it up accordingly to adjust your FXO port.

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. 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 shows you how to test your ITG without modifying any settings. This section will show you how to connect two ITGs together and make VoIP calls.

Assume that we have a second ITG, say ITG B, with the default setting as well. Now, let's set up the IP address to, e.g. '192.0.0.2' and connect it to ITG A with the following three steps.

Step 1.

**ITG B:**

```
Console>net set ip 192.0.0.2 <enter> and restart. ITG  
B
```

Step2.

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

Step3.

**ITG A:**

```
Console>ping 192.0.0.2 <enter> ; ping ITG B  
Ping (192.0.0.2) 56 data byte  
192.0.0.2 is alive
```

---

**ITG B:**

```
Console>ping 192.0.0.1 <enter> ; ping ITG A
Ping (192.0.0.1) 56 data byte
192.0.0.1 is alive
```

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

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

**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 192.0.0.2 <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 192.0.0.1 <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       | 192.0.0.2 |

**ITG B:**

| No. | Hunt Group | Dest. ID | Dest.     |
|-----|------------|----------|-----------|
| 01  | 10         | 10       | 192.0.0.1 |

Now, once ITG A gets a dialed number "02" it will direct the call to ITG B. The same is to ITG B, '01' will map to ITG A without a doubt.



Assume both ITGs have a FXS port on port#3 with a phone set connected. To call each others.

**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 assign to each ITG with 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 to the next ITG with, 03, 04, etc.

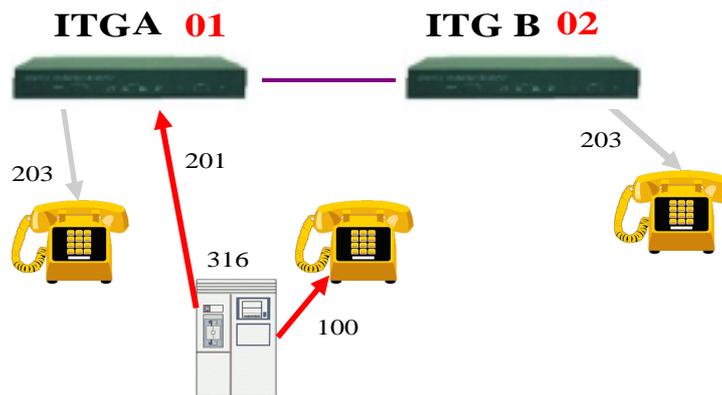


**Hint**

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

- 1) Both ITG can ping each other
- 2) You are connected to a correct port. 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) Make sure you've 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 wants 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

Imagine how we use the PBX with our extension handset. We pick up the handset and dial any extension number directly to your co-workers, and dial '0' or '9' to make a call to 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 as an extension of the PBX.

After all of above, your ITG should perform normally. 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 will not block the IP port.

The port used for 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 shows the steps regarding how to set up a typical ITG-to-ITG connection in the static IP address environment without modifying any settings. This section we will show you 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, say 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 [mary01.dyndns.org](http://mary01.dyndns.org) for ITG on site A, and [mary02.dyndns.org](http://mary02.dyndns.org) for ITG on site B.)

[mary01.dyndns.org](http://mary01.dyndns.org) is applied for ITG on site A,

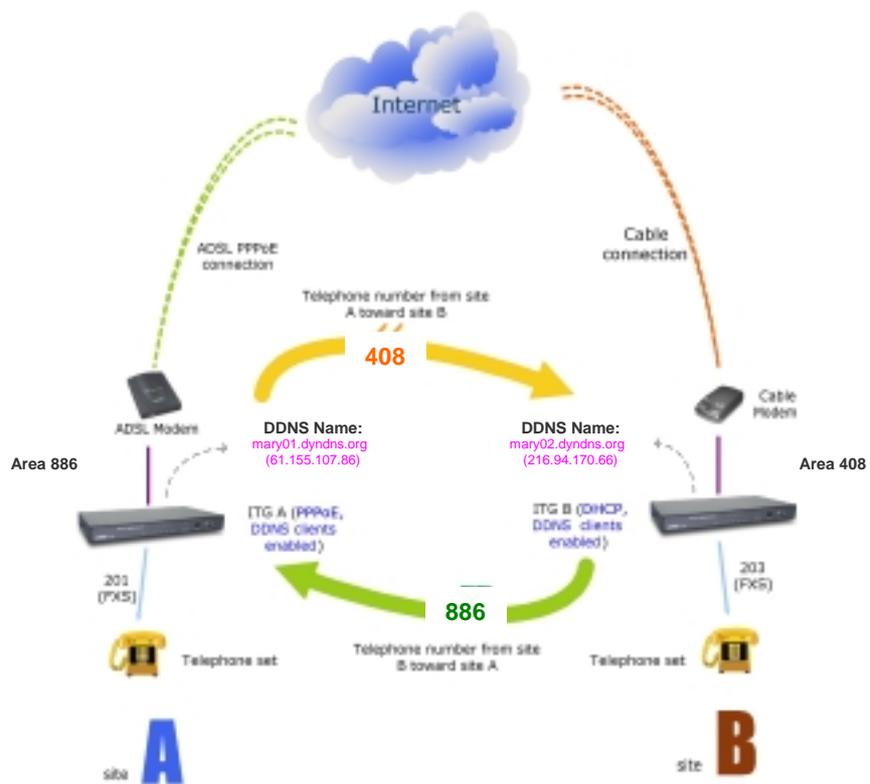
[mary02.dyndns.org](http://mary02.dyndns.org) is applied for ITG on site B.

#### **Other parameters on this topology :**

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

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

Network topology can be shown as follows:



**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/p  
 assword  
 obtained  
 from ISP.

---

DDNS client section:

```
set dyndns add dyndns mary01 my_name my_password <enter>
config store <enter>
net reset <enter>
```

Dialplan settings:

```
atpm req <enter>
atpm dadd 408 dns mary02.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 rebooting

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 mary02 username 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 mary01.dyndns.org  
<enter>
```

```
atpm hadd 886 2 886 <enter>
```

```
atpm aadd 886 2 8 886 3 <enter>
```

```
atpm done <enter>
```

```
atpm store <enter>
```

Create an  
address  
entry for  
ITG on site  
A

After these modifications, users on site A are able to dial “408 + telephone number” to call users on site B to have voice conversation. Users on site B are able to have voice communication by dialing number “886 + telephone number” toward users on site A. (Please note that there is a Max digits (8) limitation of dial string in this case, users may modify this parameter to meet different needs.)



If calls can not 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 PBX related issues**

There are some issues related to PBX system. There are: 1) CP (Call Progress) Tone detection, and 2) Call Security

### **5.4.1 CP Tone Detection**

You may encounter a problem when your call goes to PBX via a VoIP connection, the caller may already hang up the phone but the PBX port is still active.

The cause of this problem may be due to the CP tone mismatch. The ITG can not understand the Tone from PBX. So it still considers the line is on and never hangs up.

Once this happened, you may find a technical document provided by your vendor to fix this problem.

### **5.4.2 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 any time once it connects to the Internet.

If the ITG is only equipped with FXS port, that should be okay, but once it is connected with PBX or PSTN, you are opening a phone line for any Internet users 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 dialing to certain numbers. Or ask the PSTN provider to limit the line usage as well.

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

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