



**Synway AST Series**

## **Elastix 2.0.3 Installation Manual**

**Synway Information Engineering Co., Ltd**

**[www.synway.net](http://www.synway.net)**

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## Preface

When you use the Synway AST series boards to set up an Elastix system, this file provides the help for software installation and configuration.

Chapter 1 tells what to prepare before installing Elastix.

Chapter 2 introduces how to install the Elastix 2.0.3 system.

Chapter 3 unfolds how to compile and install the Dahdi and SynAST drivers.

Chapter 4 shows how to configure and use the Elastix system.

Appendix A gives the contact way of technical support and sales department in Synway.

Although Synway has scrupulously checked through this manual, but cannot guarantee the absence of errors and omissions. We sincerely apologize for any consequent inconvenience brought to you and will be very grateful if you kindly give your advice regarding amendments to this book.

## Chapter 1 Preparation

### 1.1 Hardware

First you shall prepare the following items: A PC with an empty HD (what we use herein is SAMSUNG, ATA/133 HDD 80GB), a Synway TEJ200P/PCI board and a Synway FXM3201P board with a trunk module (CH1 and CH2) and a station module (CH3 and CH4).

You can install the Synway AST series boards either before or after the installation of the Elastix system. Here we install the AST boards first and then install the Elastix system.

All hardware manuals for the AST series boards can be downloaded from the following page.

<http://www.synway.net/Support/Resources.aspx>

### 1.2 Software

Make sure you have these software: Elastix 2.0.3, dahdi-linux-complete-2.3.0.1+2.3.0 and SynAst-1.7.0.0.

Elastix 2.0.3, about 682MB in size, can be downloaded from:

<http://downloads.sourceforge.net/project/elastix/Elastix%20PBX%20Appliance%20Software/2.0.3/Elastix-2.0.3-i386-bin-15Nov2010.iso>

Then burn the downloaded driver into a CD.

dahdi-linux-complete-2.3.0.1+2.3.0, about 1.9MB in size, can be downloaded from:

<http://downloads.asterisk.org/pub/telephony/dahdi-linux-complete/releases/dahdi-linux-complete-2.3.0.1+2.3.0.tar.gz>

SynAst-1.7.0.0, about 16.5MB in size, can be downloaded from:

[http://www.synway.net/Download/Driver/Asterisk/AST1700/SynAST-1.7.0.0\\_en.tar.gz](http://www.synway.net/Download/Driver/Asterisk/AST1700/SynAST-1.7.0.0_en.tar.gz)

## Chapter 2 Installation of Elastix 2.0.3 System

### 2.1 Brief Introduction to Elastix System

The Elastix system is an integrated system which includes the operating system CentOS and other software like Asterisk, Dahdi, FreePBX. All necessary software can be installed well at one time, not requiring independent operation for any one of them. Then Asterisk and relative services will be automatically started up upon installation.

For detailed information about Elastix, please go to the official website of Elastix:

<http://www.elastix.org>.

### 2.2 Installation of Elastix System

#### Step1: Set the guide mode

Set BIOS to boot from CD-ROM. Put the CD of Elastix system burned already into CD-ROM and start the PC.

#### Step2: Install Elastix

1. The system will go into the CD guide after the PC being started. Then the following interface will be shown on the screen. See Figure 1. Press Enter directly to go into the default installation mode.



```
- To install or upgrade in graphical mode, press the <ENTER> key.  
- To install or upgrade in text mode, type: linux text <ENTER>.  
- Use the function keys listed below for more information.  
[F1-Main] [F2-Options] [F3-General] [F4-Kernel] [F5-Rescue]  
boot: _
```

Figure 1

**Note:** When all the installations are booted from CD-ROM, there may pop up the prompt 'Error downloading kickstart file' on the screen. Now you should select OK, but not Cancel; otherwise it may result in abnormal running of the system due to uninstallation of some packages.

2. Next, choose the language for installation. Here select 'English' (Figure 2).

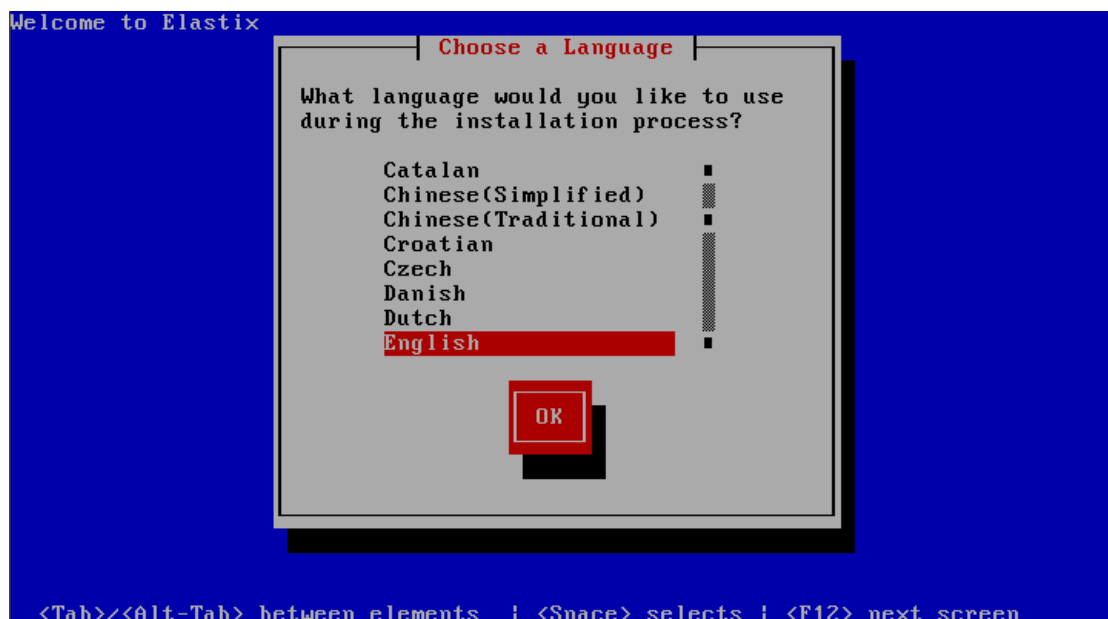


Figure 2

3. Next, choose a keyboard type according to your requirement. Usually we choose 'us' (Figure



3).



Figure 3

- Next is the partitioning operation. You have four options to select. For a brand new HD, select the default setting 'Use free space on selected drivers and create default layout'. For an HD with some data already, if you want to discard it, use the option 'Remove all partitions on selected drivers and create default layout'; if you want to keep the old data, select the option 'Create custom layout' to do partitioning. What we use here is a new HD. Select the default setting and click on 'OK' (Figure 4).

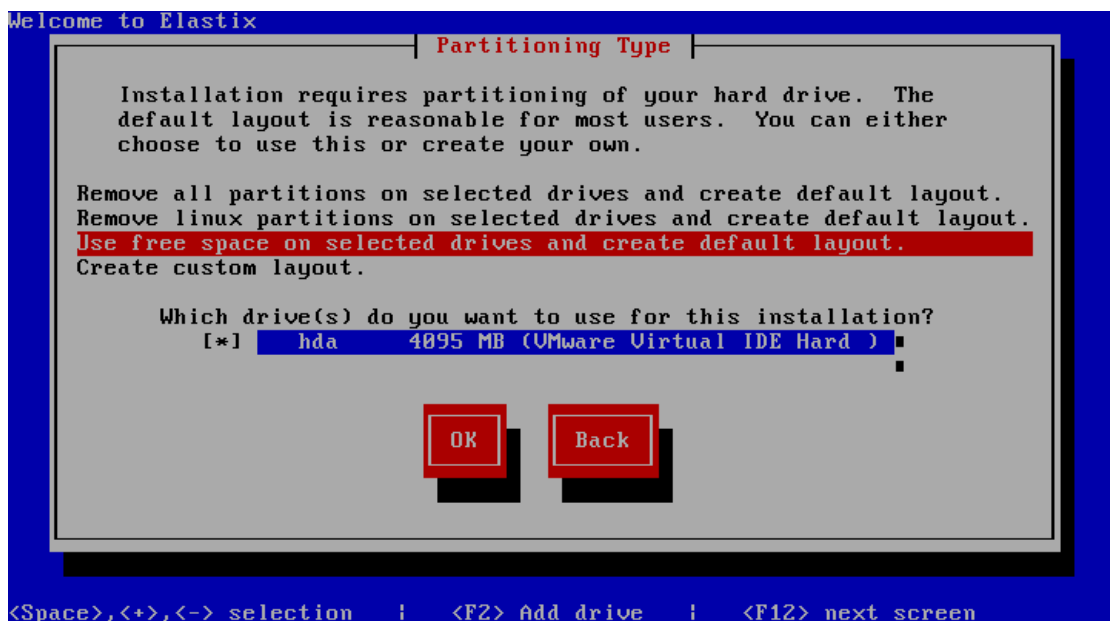


Figure 4

- Next, the following prompt 'Review and modify partitioning layout?' pops up. Select 'No' here (Figure 5).

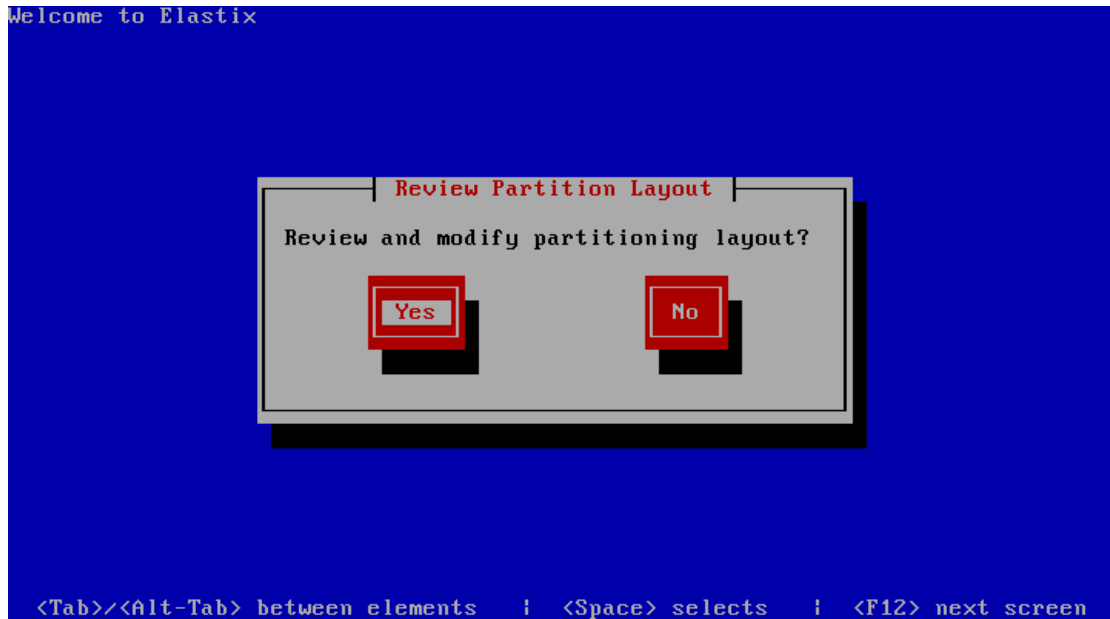


Figure 5

- Next, the following prompt 'Would you like to configure the eth0 network interface in your system?' pops up. Select 'Yes' here (Figure 6).

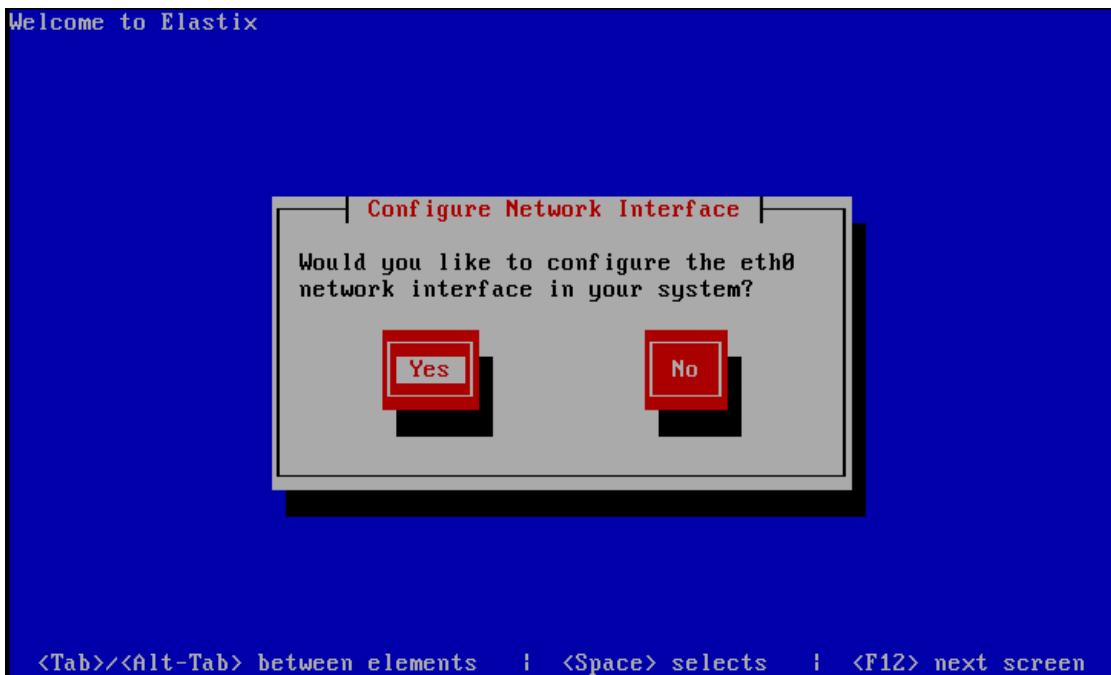


Figure 6

- Next, choose to configure IPv4 or IPv6. Here we select 'Activate on boot' and 'Enable IPv4 support', and then click 'OK' (Figure 7).

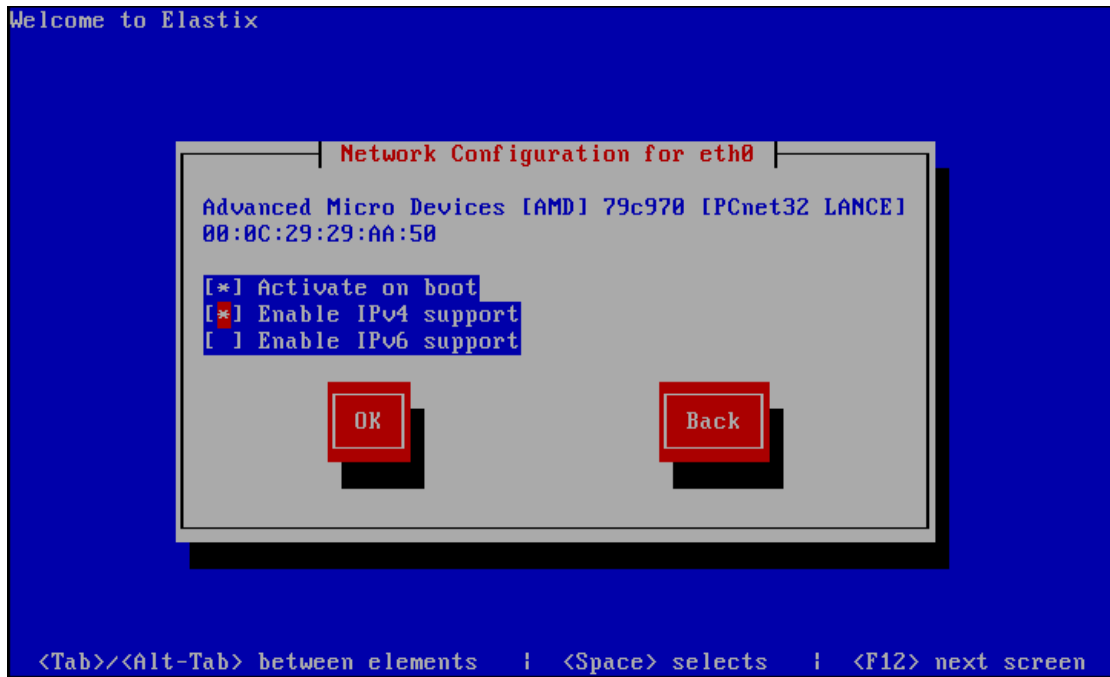


Figure 7

- Next, choose to manually or dynamically configure IP address. Here we select 'Manual address configuration', enter the IP address and the subnet mask below, and then click 'OK' (Figure 8).

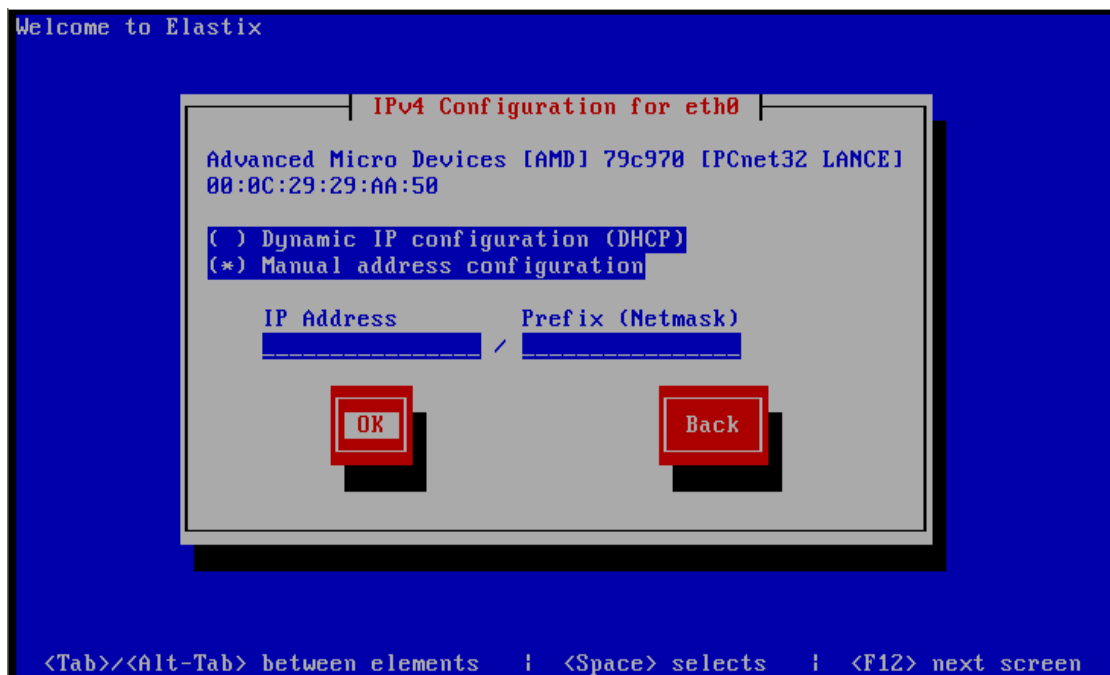


Figure 8

**Note:** During the following installation process, the system will automatically link to Internet to download some relative files. Therefore, if the network has not been well configured, all subsequent operations will fail. However, for some networks that have DHCP servers to automatically allocate IP and gateway addresses, such network

**configuration is not required.**

9. Next, enter the gateway address, the primary DNS address and the secondary DNS address, and then click 'OK' (Figure 9).

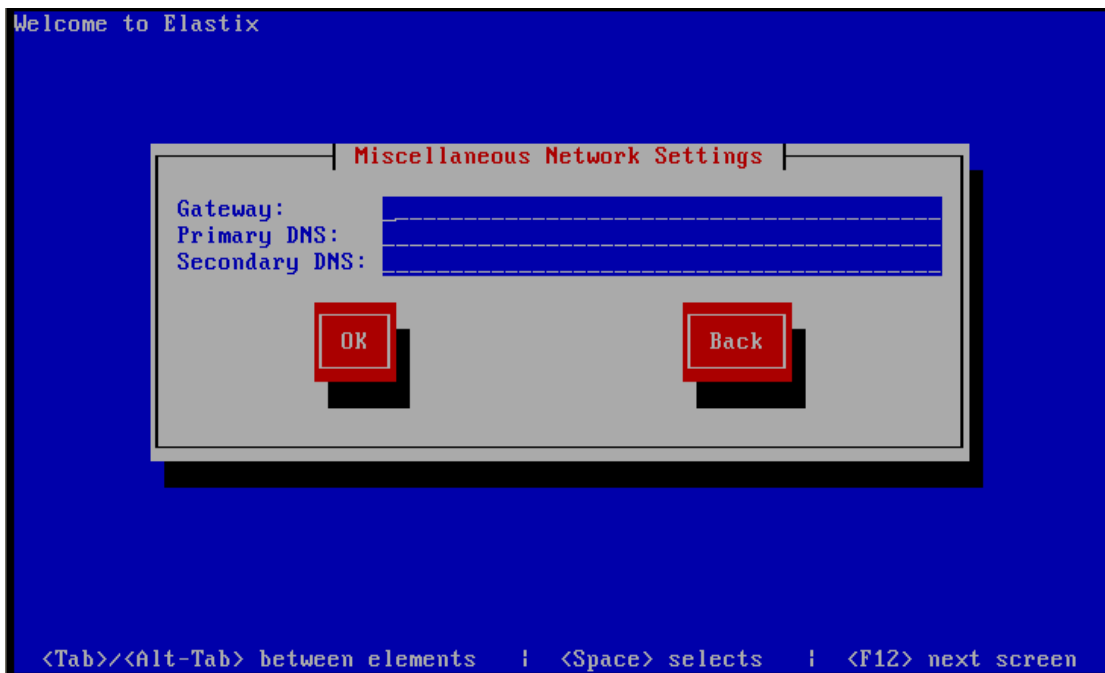


Figure 9

10. Next, determine how to get the hostname, assigned automatically via DHCP or entered manually. Here we select 'manually' and enter a hostname such as 'Synway' on the dotted line (Figure 10).

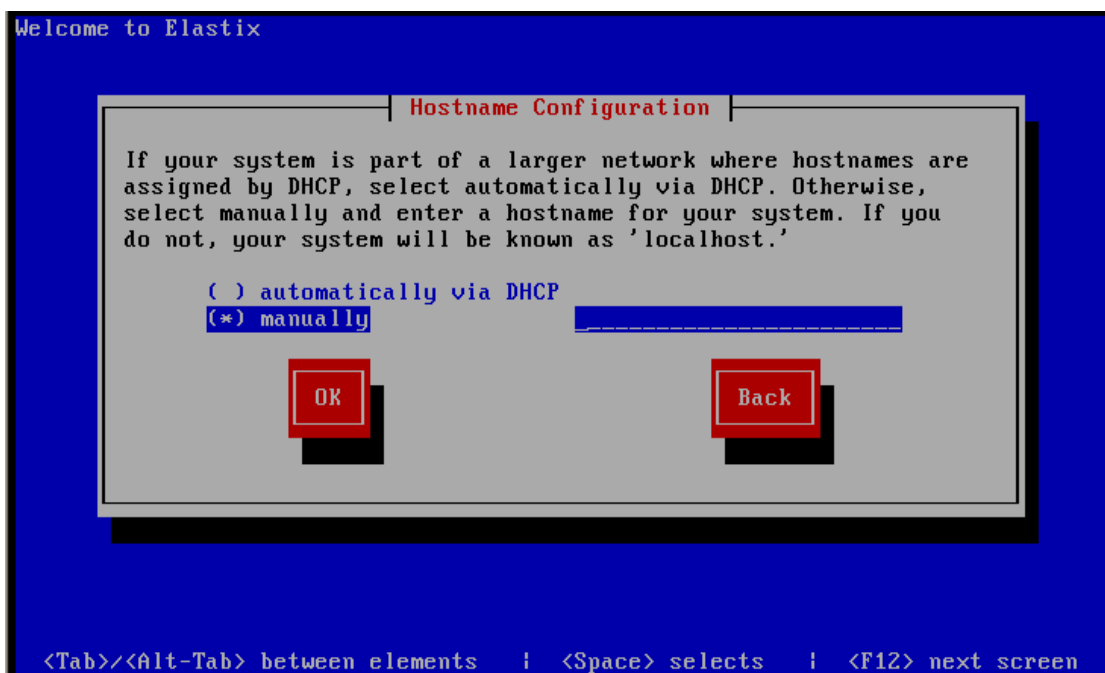


Figure 10

11. Next, select a time zone according to the real situation. Here we select 'America/New\_York' (Figure 11).

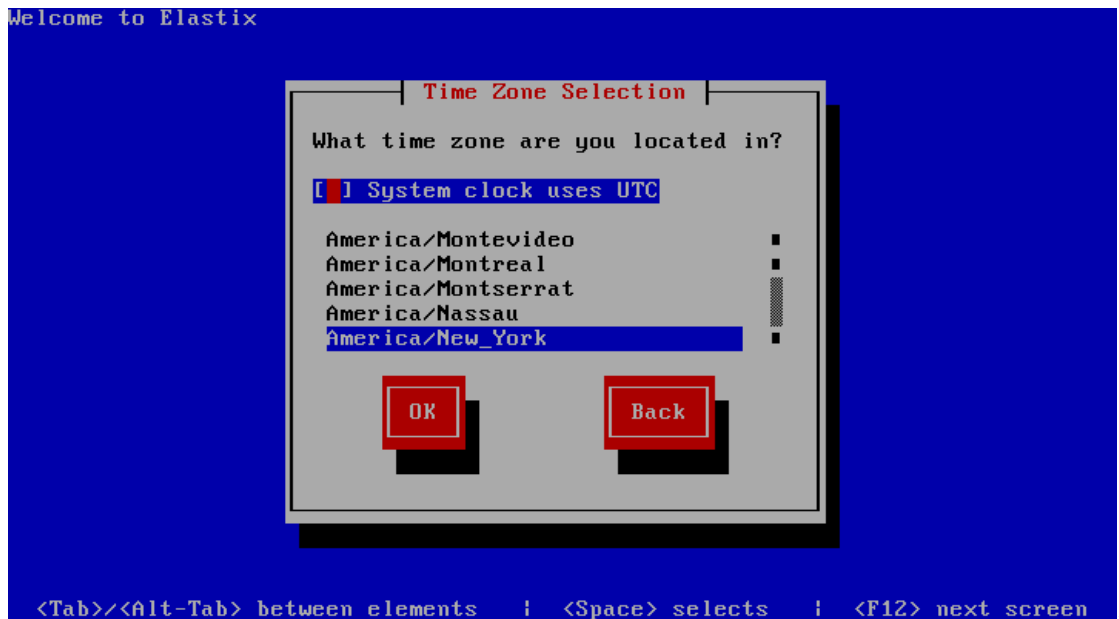


Figure 11

12. Next, enter the system administrator password (Figure 12).

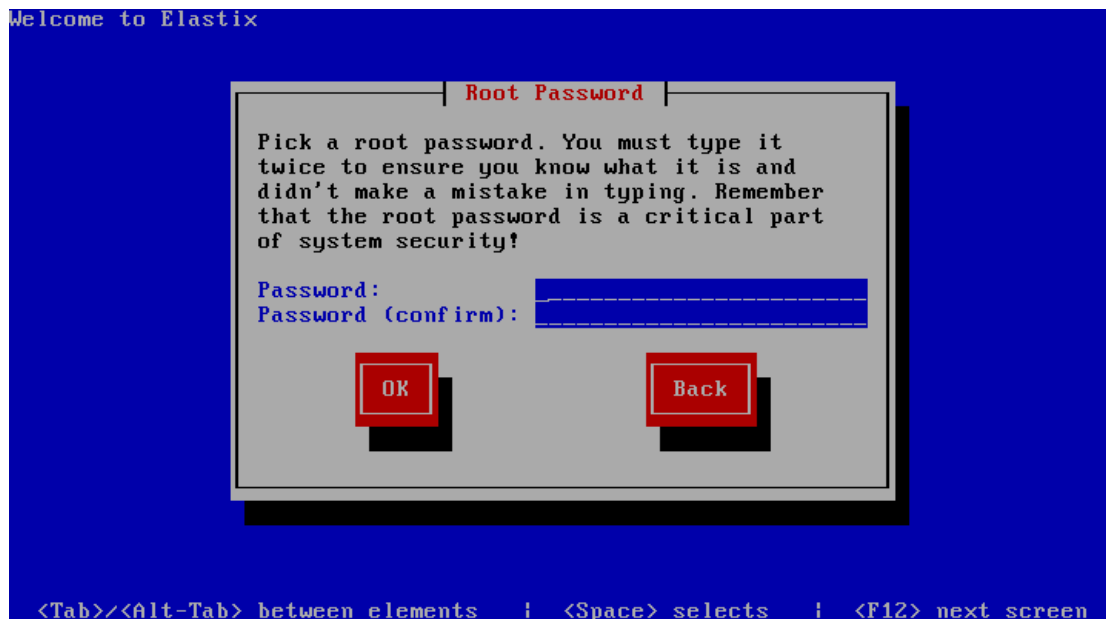


Figure 12

13. Next, the partitioning and formatting of the HD begins. After that, the system installation starts. Upon all files being installed successfully, the PC will be restarted automatically (Figure 13).

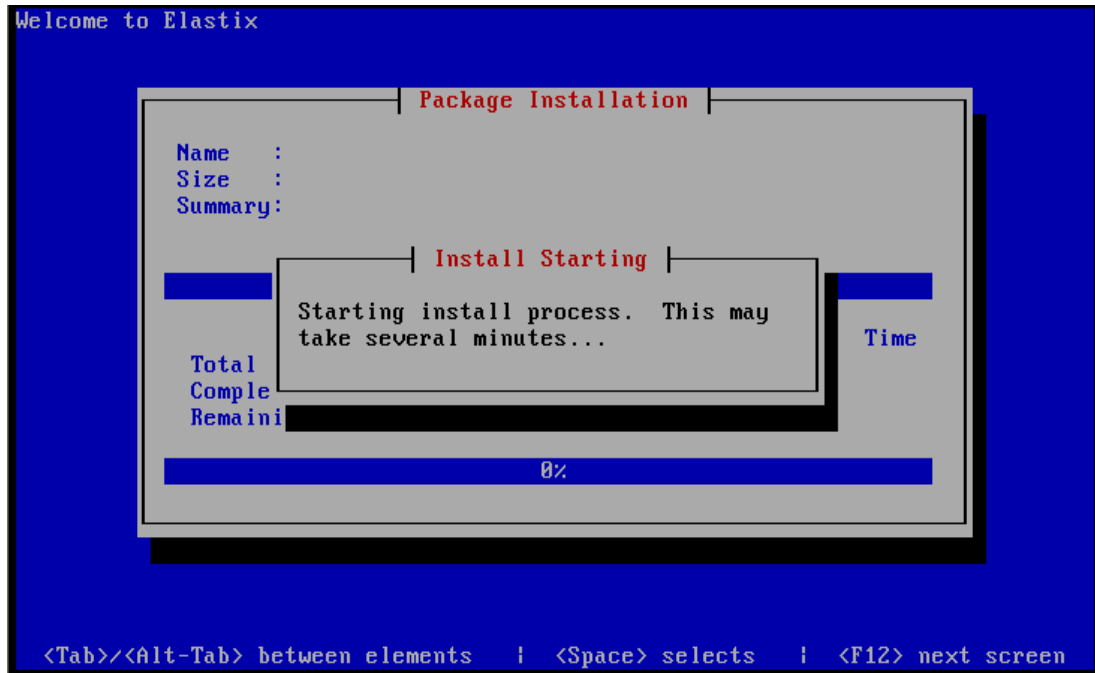


Figure 13

**Note: You must take out the Elastix CD before the PC restart; or the system will go into the installation guide interface again.**

14. After the PC restart, the system goes into the startup interface (Figure 14).

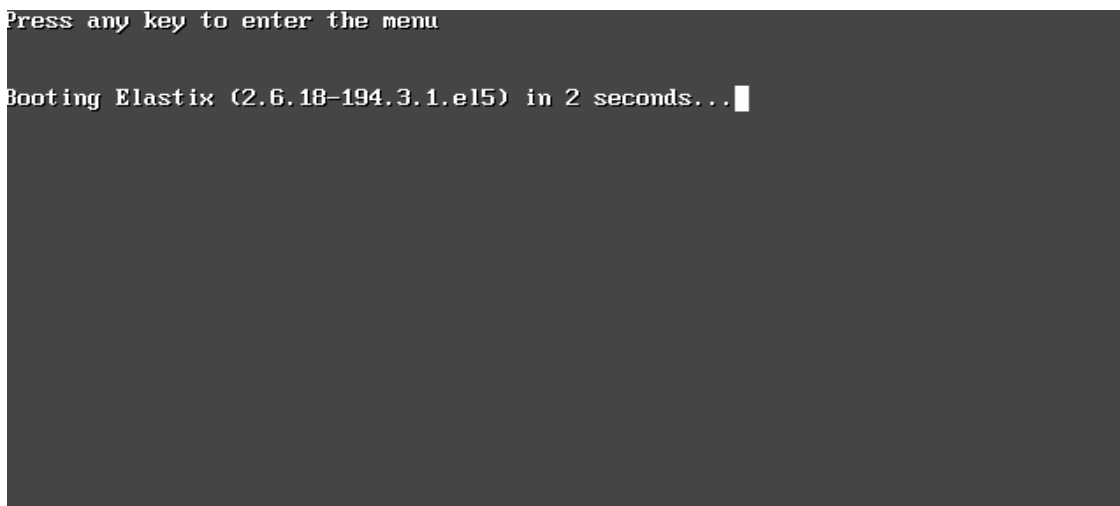


Figure 14

15. During the startup process, the following prompt will pop up to ask for a new MySQL root

password. Here we can set any password as we want (Figure 15).

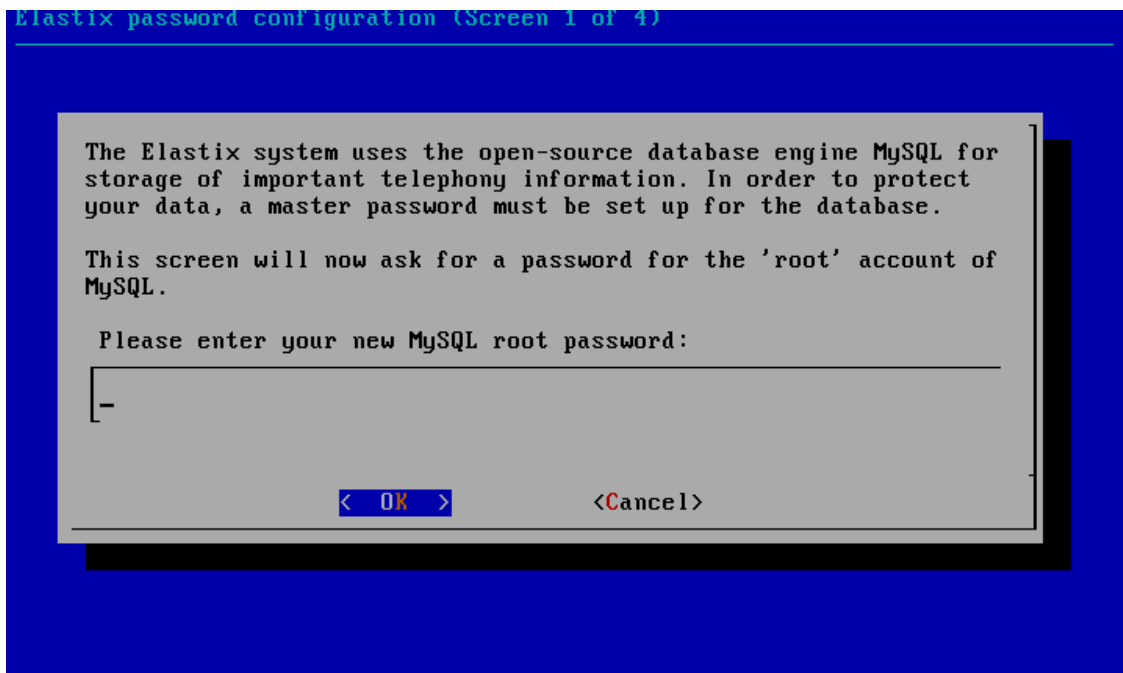


Figure 15

16. Also in the startup process, the following prompt will pop up to ask for a web login password. Here we can set any password as we want, such as 'admin' (Figure 16).

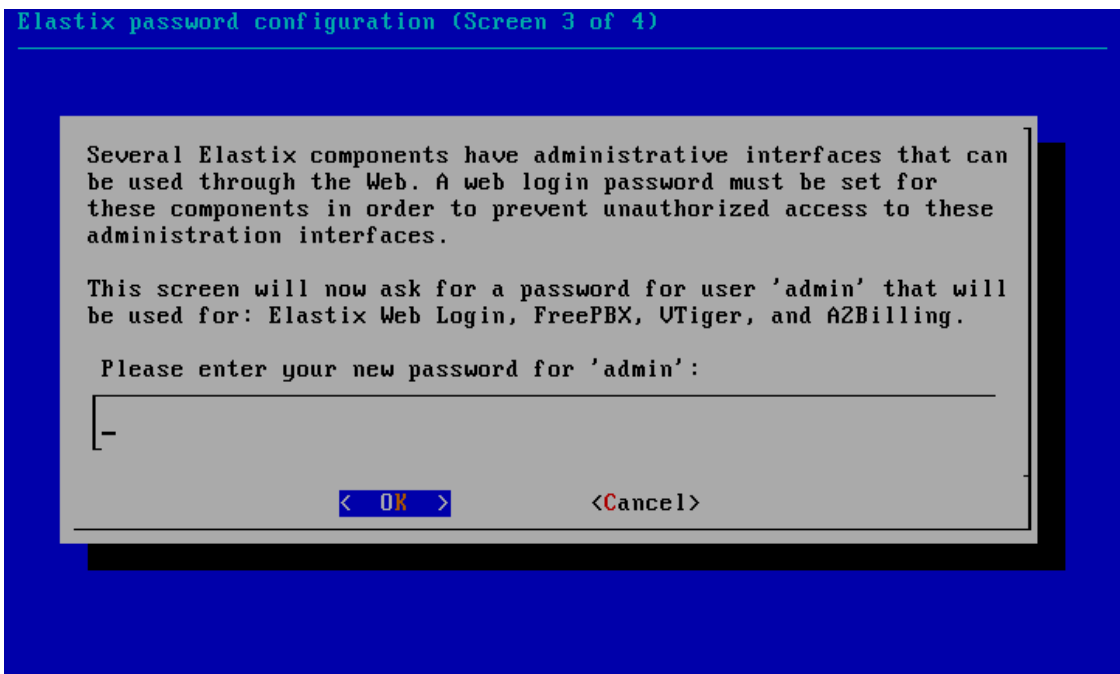


Figure 16

### Step3: Log on the system

There pops up the login prompt after the system startup. Please use the root username to log in,

and the password is just the one set during the installation process.

**Step4: When all the above steps are finished, the Elastix operating system has been installed successfully.**



## Chapter 3 Compilation and Installation of Dahdi and SynAST

To support the Synway AST series boards, you should install the SynAST driver based on the Elastix system. Here take the Synway TEJ200P and FXM3201P boards as an example. As recompilation is required for driver installation, you should first install the compiling environment.

### 3.1 Driver Installation

#### Step1: Stop relative services

```
# amportal stop # Stop Asterisk services
```

Note: amportal commands include stop, start, restart and some other operations. See the command description for details.

**Note: When the board driver is being installed, the Dahdi driver needs to be recompiled before the configuration of Asterisk system. Asterisk services will be automatically started once the Elastix system is successfully installed, and the driver installation will fail if it is performed while Asterisk services are running. In such situation, you should manually stop Asterisk services first.**

#### Step2: Install the SynAST driver

Put the prepared files under the /opt directory. Enter this directory and decompress relative installation packages.

```
# cd /opt
# tar -zxvf SynAST-1.7.0.0_en.tar.gz
# tar -zxvf dahdi-linux-complete-2.3.0.1+2.3.0.tar.gz
```

Enter SynAST-1.7.0.0\_en to start auto installation:

```
# cd SynAST-1.7.0.0_en
# cd for_dahdi
# Modify the Setup file, find the line 'echo > /etc/dahdi/modules' and change it to be:
if [ ! -f /etc/dahdi/modules ]; then
    echo > /etc/dahdi/modules
fi
# ./Setup install
```

Prompts on Screen:

```
Install SynAST AST package now!
```

```
Would you like to install SynAST AST package now? (y/n) Enter 'y'.
```

```
Please enter working dahdi directory [q](exit install) : Enter the directory to dahdi. Here please enter: /opt/dahdi-linux-complete-2.3.0.1+2.3.0
```

Would you like to open hardware echocan on boards? (y/n) Enter 'y'.

If there are TEJ boards installed on your machine, the following prompts will pop up on the screen.

Select tej21 mode [t, e, j] : Select the TEJ board trunk working mode. Here select **e** which indicates working in E1 mode;

select [75, 120]ohm : Select the trunk impedance in E1 mode. Here input **120** which indicates working in Twisted Pair, 120Ω mode.

Select OK to start installing. During the installation, the system will link to the network to download some relative files. When finished, the prompt **Install Driver Completed** appears.

If you have multiple boards of a same model, follow the section Configure Boards Order in the file *SynAST\_UserManual.pdf* to handle.

Now both Dahdi and SynAST drivers are already installed.

In the above step, these options 'Select tej21 mode [t, e, j]', 'select [75, 120]ohm' will appear only when the system is installed with TEJ series boards. In other words, they will not appear if the system is installed only with FXM series boards.

**Note: The system will automatically compile and install the Dahdi driver while installing the SynAST driver. Therefore, it is not necessary to compile and install the Dahdi driver separately.**

### Step3: Configure board information

```
#>dahdi_genconf
```

**Note: If there are TEJ series boards installed, you need to modify '/usr/lib/perl5/site\_perl/5.8.8/Dahdi/Span.pm' – add a line 'TEJ', to the end of the variable @pri\_strings.**

### Step4: Check if the driver module has been loaded

Input the command:

```
# lsmod | grep fxm
```

If properly installed, the first several lines of FXM information will display on the screen. If they include the **fxm32** line, it means the **fxm32.ko** module has been well loaded.

To check TEJ boards, just replace 'FXM' in the above command with 'TEJ'.

### Step5: Start Asterisk

```
# amportal start           # Start Asterisk Services
```

Now the SynAST driver installation is finished. All the operations performed under the character interface are completed. Next, you are required to use the client (another PC) to log in the WEB interface to do configurations.

## Chapter 4 Configuration and Management of Elastix

In the address bar of the browser, enter the IP address of the Elastix system to go into the initial interface of Elastix (see Figure 17). Enter the administrator username **admin** and the password **admin** (refer to the password shown in Figure 16) to reach the configuration and management interface.



Figure 17

On the upward side of the main interface of Elastix is the menu bar (Figure 18).

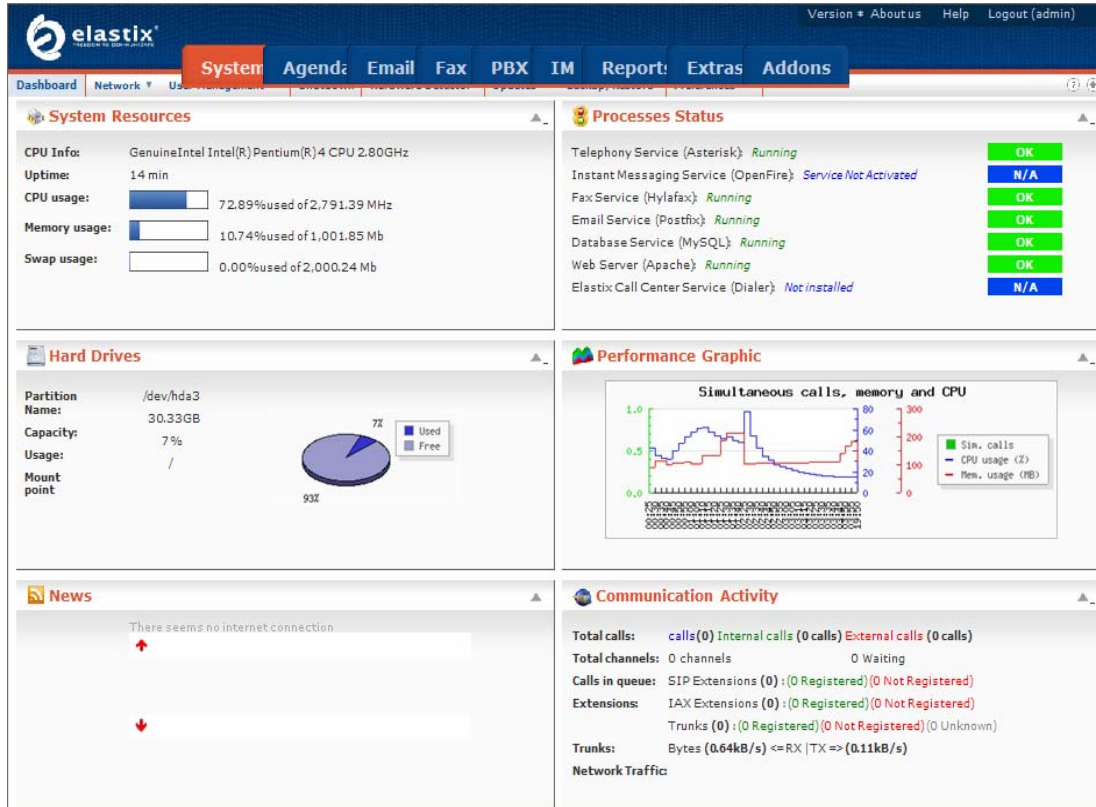


Figure 18

First of all, click on 'Hardware Detector' in SYSTEM menu to detect the installed hardware. In the displayed page (Figure 19), select 'Advanced' and tick the option 'Replace File chan\_dahdi.conf'. Then click the button 'Detect New Hardware'.

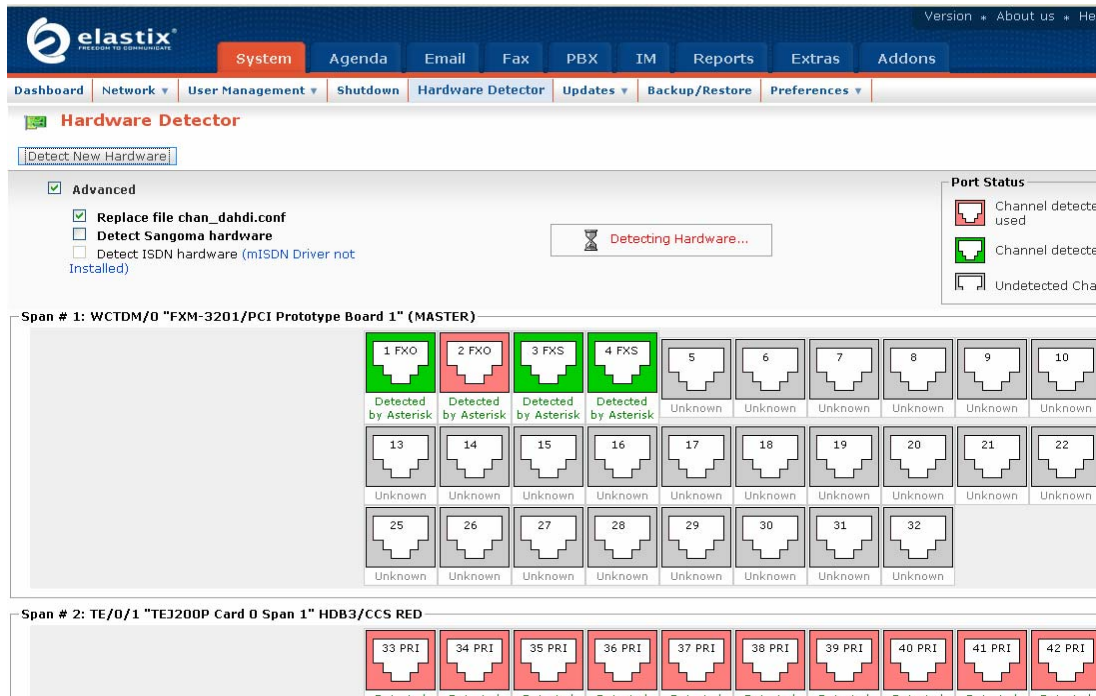


Figure 19

Then you can configure the PBX according to Elastix explanation.

Here we use an actual example to explain how to configure.

Take the FXM3201P board as an example. Install an FXM3201P motherboard with an FXO module and an FXS module. Channel 1 and Channel 2 on the board are FXO (trunk) while Channel 3 and Channel 4 are FXS (station). You can see from the above figure that the corresponding trunks in the Elastix system are zap channel 1 and channel 2, the corresponding stations are zap channel 3 and channel 4. If there are multiple boards in the system, the channels are arranged by board number.

Now we demonstrate such functions as making a call from extension to extension, a call from extension to trunk, and a call from trunk to extension.

First, click on 'PBX' in the menu bar to go by default into the Extensions setting, or click on the menu 'PBX Configuration' and then click the item 'Extensions' in the left navigation bar (Figure 20).



Figure 20

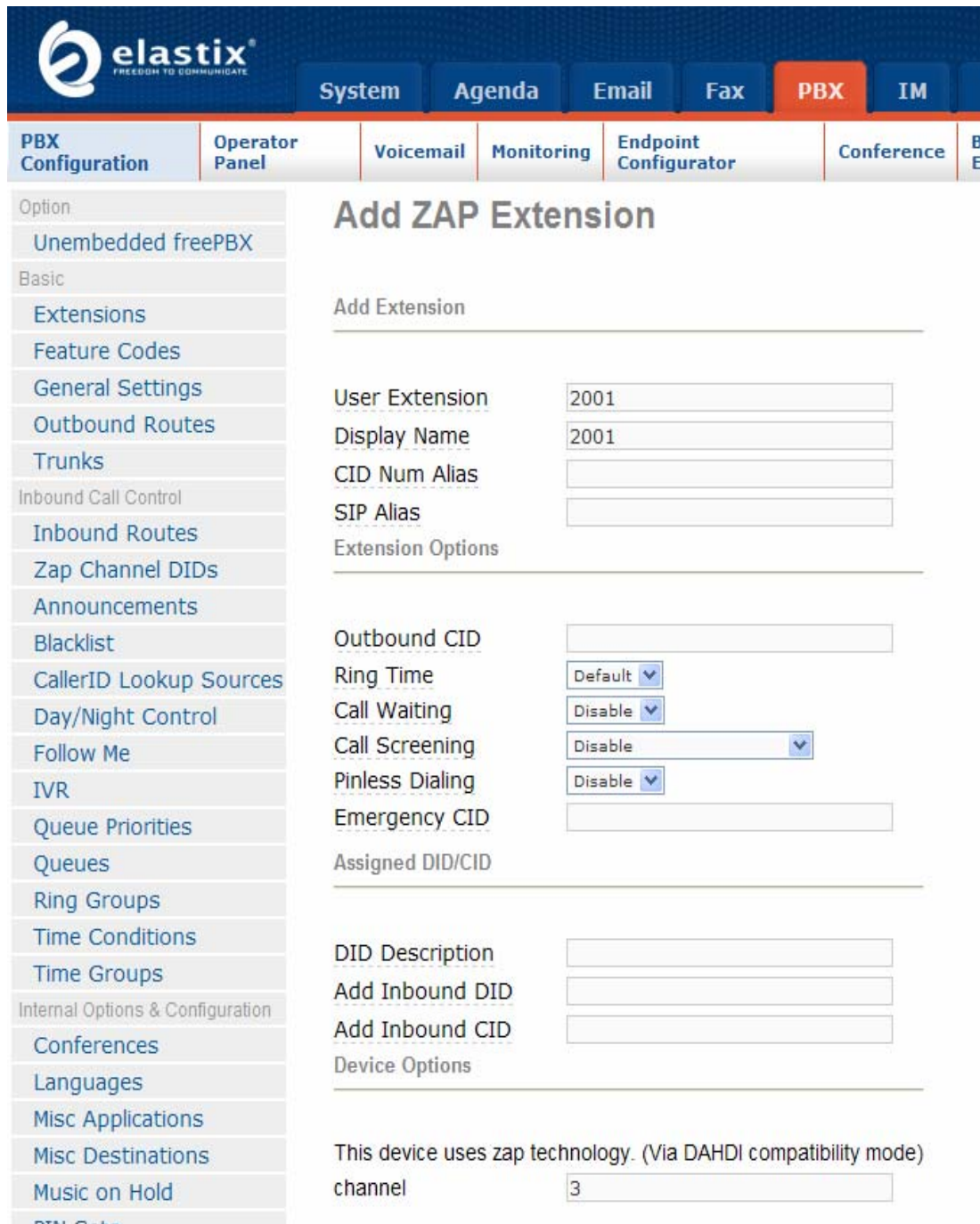
### Step1: Configure extensions

In this situation, there are two station channels on the FXM board respectively corresponding to zap channel 3 and zap channel 4. We need to add two Extensions whose numbers are supposed to be 2001 and 2002.

To add the information about the first extension 2001, choose Generic ZAP Device in the pull-down box for Device and press the Submit button to submit (see Figure 20). Then fill in some relative information on the page shown afterwards. Fill in 2001 for both options 'User Extension' and 'Display Name'. Find the sentence 'This device use technology. (Via DAHDI compatibility mode)' (see Figure 21) and fill in 3 for the following option 'channel'. This indicates Extension 2001



uses zap channel 3. Press Submit and the configuration of Extension 2001 is finished. Meanwhile, the configuration file `/etc/asterisk/chan_dahdi_additional.conf` is generated.



The screenshot shows the Elastix web interface for configuring a PBX extension. The main navigation bar includes 'System', 'Agenda', 'Email', 'Fax', 'PBX', and 'IM'. The 'PBX' tab is active, and the 'PBX Configuration' sub-tab is selected. The left sidebar contains a list of configuration options, with 'Zap Channel DIDs' highlighted. The main content area is titled 'Add ZAP Extension' and contains the following form fields:

- Add Extension**
  - User Extension:
  - Display Name:
  - CID Num Alias:
  - SIP Alias:
- Extension Options**
  - Outbound CID:
  - Ring Time:
  - Call Waiting:
  - Call Screening:
  - Pinless Dialing:
  - Emergency CID:
- Assigned DID/CID**
  - DID Description:
  - Add Inbound DID:
  - Add Inbound CID:
- Device Options**
  - This device uses zap technology. (Via DAHDI compatibility mode)
  - channel:

Figure 21

After that, return to the top 'Add Extension' to add Extension 2002. Configure it to use zap channel 4. Then both extensions are well configured.

When the modified configuration is submitted, there appears a prompt in red 'Apply Configuration Changes Here' on the top right corner of this page (see Figure 22). Click it to apply the modified configuration. Now we can make calls from extension to extension. Dial 2002 on the first extension to call the second extension.

Apply Configuration Changes Here

### Add an Extension

Please select your Device below then click Submit

Device

---

Device

Figure 22

## Step2: Configure trunks

Now there are two trunk channels on the FXM board respectively corresponding to zap channel 1 and zap channel 2.

Click the item Trunks in the left navigation bar. You can see from the right side of this page (see Figure 23) that the default setting has included a trunk. Click 'Trunk ZAP/g0' and you will see the default value of 'Zap Identifier (trunk name)' is g0. Modify it to 1 which indicates this trunk uses zap channel 1 and leave other parameters unchanged. Save the change and the configuration of the first trunk is finished (see Figure 24).

System	Agenda	Email	Fax	PBX	IM	Reports	Extras	Addons		
Voicemail	Monitoring	Endpoint Configurator	Conference	Batch of Extensions	Tools	Flash Operator Panel	VoIP Provider	My Extension	?	+

### Add a Trunk

- Add Zap Trunk (DAHDI compatibility mode)
- Add SIP Trunk
- Add IAX2 Trunk
- Add ENUM Trunk
- Add DUNDI Trunk
- Add Custom Trunk

Figure 23

The screenshot displays the Elastix PBX configuration interface. The top navigation bar includes 'System', 'Agenda', 'Email', 'Fax', 'PBX', 'IM', and 'Reports'. The 'PBX' tab is active, showing sub-menus for 'PBX Configuration', 'Operator Panel', 'Voicemail', 'Monitoring', 'Endpoint Configurator', 'Conference', and 'Batch of Extensions'. The left sidebar lists various configuration options under categories like 'PBX Configuration', 'Basic', 'Inbound Call Control', and 'Internal Options & Configuration'. The main content area is titled 'Edit ZAP Trunk (DAHDI compatibility Mode)'. It features a 'Delete Trunk ZAP Channel g1' button, a status indicator 'In use by 1 route', and several configuration sections: 'General Settings' (Trunk Description: ZAP Channel 1, Outbound Caller ID, CID Options: Allow Any CID, Maximum Channels, Disable Trunk: Disable, Monitor Trunk Failures: Enable), 'Outgoing Dial Rules' (Dial Rules, Dial Rules Wizards: (pick one), Outbound Dial Prefix), and 'Outgoing Settings' (Zap Identifier (trunk name): 1). A 'Submit Changes' button is located at the bottom.

Figure 24

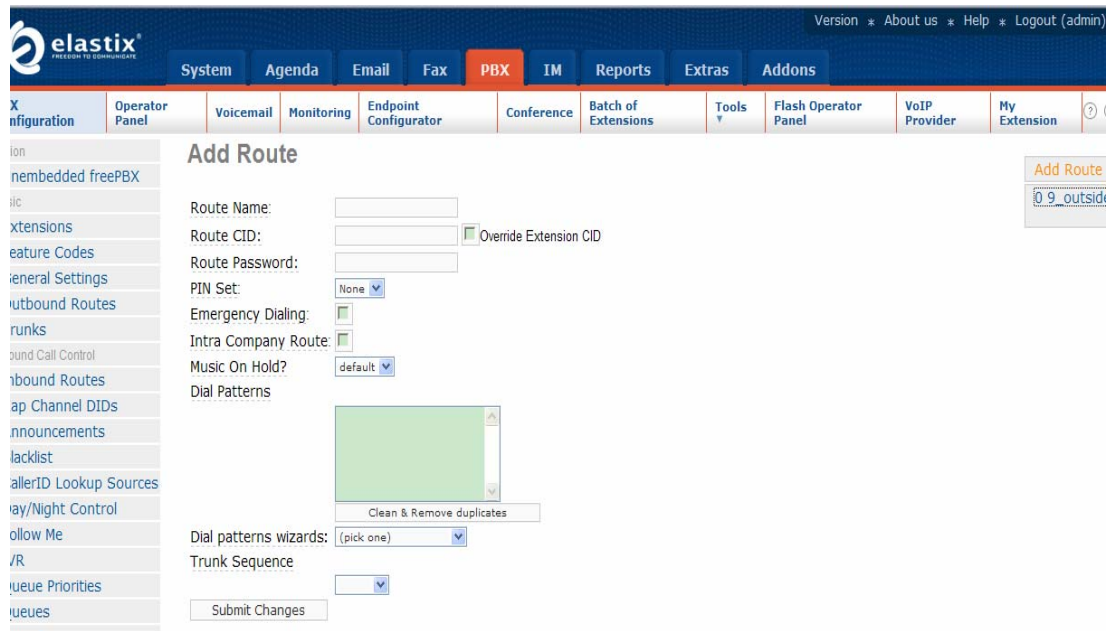
Then add the second trunk. Click 'Add a Trunk' on the right and press 'Add Zap Trunk (DAHDI compatibility mode)' (see Figure 23). Fill in 2 for 'Zap Identifier (trunk name)' which indicates this trunk uses zap channel 2. Click the Submit button to submit. Now both trunks are properly configured.

Next, we shall manage to perform the call from extension to trunk.

### Step3: Configure the outbound route for calls from extension to trunk

Find the option Basic in the left navigation bar and click Outbound Routes. You can see from the right side of this page that the default setting has included a route with the name of 0\_9\_outside which indicates the rule to dial 9 before the phone number (see Figure 25). The outbound call is routed on ZAP/1. Actually, dial 9+phone number on the extension and the call will be routed out through zap channel 1. You can modify the configuration and apply it to make calls from extension to trunks.





The screenshot shows the Elastix PBX configuration interface. The top navigation bar includes 'System', 'Agenda', 'Email', 'Fax', 'PBX', 'IM', 'Reports', 'Extras', and 'Addons'. The 'PBX' tab is active. Below the navigation bar, there are several sub-tabs: 'Configuration', 'Operator Panel', 'Voicemail', 'Monitoring', 'Endpoint Configurator', 'Conference', 'Batch of Extensions', 'Tools', 'Flash Operator Panel', 'VoIP Provider', and 'My Extension'. The 'Configuration' sub-tab is selected, and the 'Add Route' form is displayed. The form includes the following fields and options:

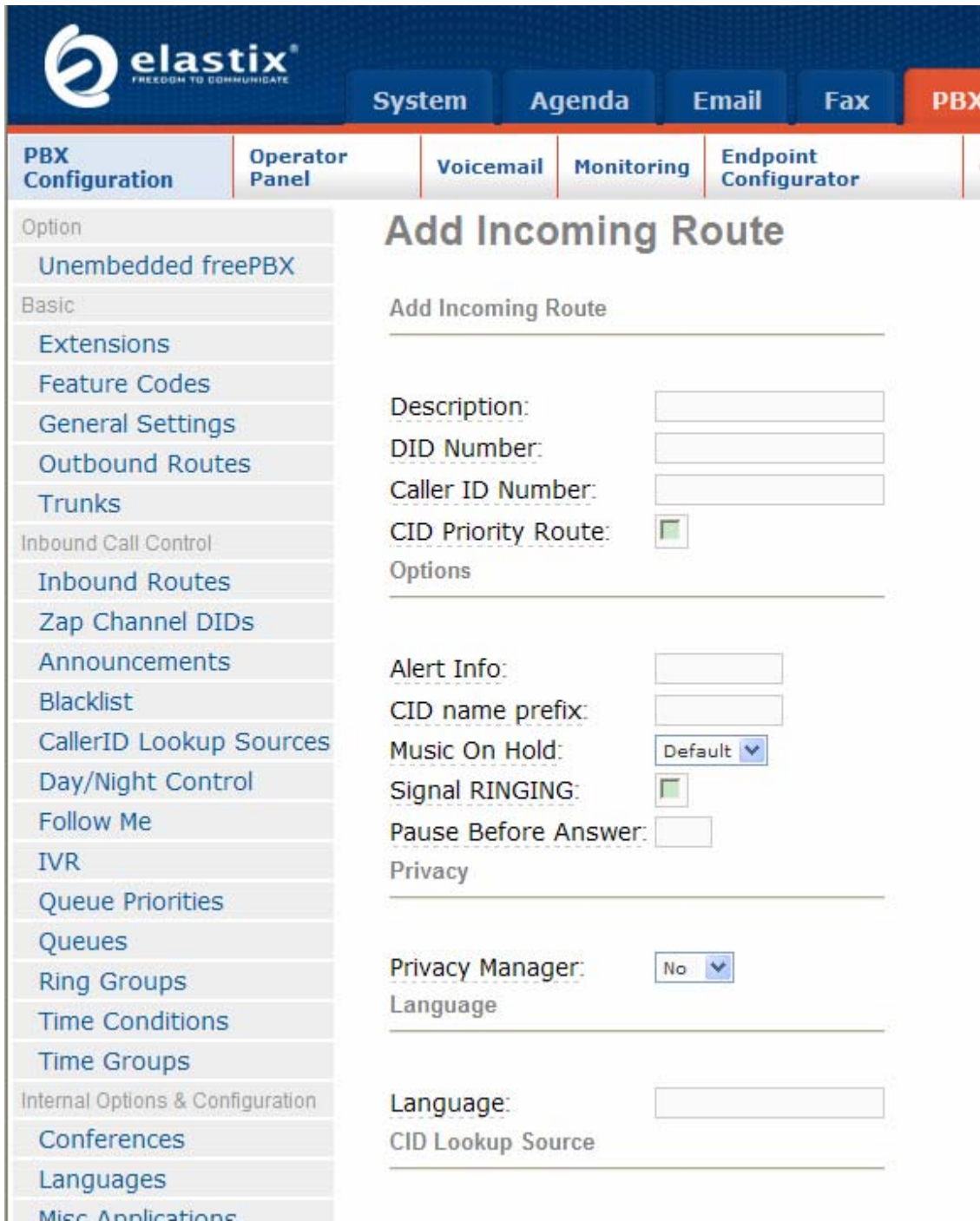
- Route Name:
- Route CID:   Override Extension CID
- Route Password:
- PIN Set:
- Emergency Dialing:
- Intra Company Route:
- Music On Hold?:
- Dial Patterns:
- Dial patterns wizards:
- Trunk Sequence:
- 

On the right side of the form, there is an 'Add Route' button and a text input field containing '09\_outside'.

Figure 25

#### Step4: Make calls from trunk to extension

To make calls from trunk to extension, you need to configure 'Inbound Routes'. Find the option Inbound Call Control and select Inbound Routes. Go to the bottom of the displayed page to find Set Destination (see Figure 26). Select Extensions and designate some extension (see Figure 27). Thus, when a call comes in from a trunk, the specified extension rings directly. Just pick up the call and talk. Also you can set other inbound routes like IVR to complete corresponding flows. However, the IVR must be set beforehand.



The screenshot shows the Elastix PBX configuration interface. At the top, there is a navigation bar with tabs for System, Agenda, Email, Fax, and PBX. Below this is a secondary navigation bar with tabs for PBX Configuration, Operator Panel, Voicemail, Monitoring, and Endpoint Configurator. The main content area is titled 'Add Incoming Route' and contains several form fields:

- Description:** Text input field
- DID Number:** Text input field
- Caller ID Number:** Text input field
- CID Priority Route:** Check box (checked)
- Options:** Section header
- Alert Info:** Text input field
- CID name prefix:** Text input field
- Music On Hold:** Dropdown menu (Default)
- Signal RINGING:** Check box (checked)
- Pause Before Answer:** Text input field
- Privacy:** Section header
- Privacy Manager:** Dropdown menu (No)
- Language:** Text input field
- CID Lookup Source:** Text input field

On the left side, there is a sidebar menu with categories like Option, Basic, Inbound Call Control, and Internal Options & Configuration, each containing several sub-items.

Figure 26

Inbound Call Control	CID Priority Route: <input type="checkbox"/>
Inbound Routes	Options
Zap Channel DIDs	
Announcements	Alert Info: <input type="text"/>
Blacklist	CID name prefix: <input type="text"/>
CallerID Lookup Sources	Music On Hold: <input type="text" value="Default"/>
Day/Night Control	Signal RINGING: <input type="checkbox"/>
Follow Me	Pause Before Answer: <input type="text"/>
IVR	Privacy
Queue Priorities	
Queues	Privacy Manager: <input type="text" value="No"/>
Ring Groups	Language
Time Conditions	
Time Groups	Language: <input type="text"/>
Internal Options & Configuration	CID Lookup Source
Conferences	
Languages	Source: <input type="text" value="None"/>
Misc Applications	Fax Detect
Misc Destinations	
Music on Hold	Detect Faxes: <input type="checkbox"/> No <input type="checkbox"/> Yes
PIN Sets	Set Destination
Paging and Intercom	
Parking Lot	<input type="checkbox"/> Phonebook Directory: <input type="text" value="Phonebook Directory"/>
System Recordings	<input type="checkbox"/> IVR: <input type="text" value="Unnamed"/>
VoiceMail Blasting	<input type="checkbox"/> Terminate Call: <input type="text" value="Hangup"/>
Remote Access	<input type="checkbox"/> Extensions: <input type="text" value="&lt;2001&gt; 2001"/>
Callback	<input type="button" value="Submit"/> <input type="button" value="Clear Destination &amp; Submit"/>
DISA	

Figure 27

At last don't forget to click 'Apply Configuration Changes Here' to make modified configurations effective; otherwise, no modification works. Then you can perform call tests based on the above configurations.

Now you are allowed to use the Synway FXM3201P board in the Elastix system to make simple calls. To achieve other more complicated functions, go to <http://www.elastix.org/> to refer to relative documents.

## Appendix A Technical/Sales Support

Thank you for choosing Synway. Please contact us should you have any inquiry regarding our products. We shall do our best to help you. However, our technicians and salesmen are mainly responsible for maintaining our boards and providing relative technical support. If there are problems about Asterisk, please keep touch with Digium Inc. for help.

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