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SIP Trunking using the EdgeMarc Network Services Gateway and the Cisco UC320.

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Overview

The purpose of this knowledgebase solution is to describe the steps needed to configure the Cisco UC320 for proper operation in a SIP trunking application. Please note that this solution documents the basic configuration needed in the PBX and that the requirements of your specific SIP trunking environment may require modifications to the configuration steps provided in this document.

Prerequisites

SIP trunking information provided by the VoIP service provider:

- SIP proxy server IP address or DNS name.
- Trunking Direct Inward Dial (DID) phone numbers
 - Calls to the trunking DID(s) are forwarded from the service provider to the wide area network (WAN) IP address of the EdgeMarc. There may be a single “Pilot” phone number used for all inbound calls and/or multiple DIDs depending on the service ordered.
- SIP authentication credentials (optional)
 - Some SIP trunking service providers require a unique username and password to be supplied for IP PBX registrations and/or SIP signaling using P-Asserted-Identity (RFC 3325). This knowledgebase solution provides the configuration steps for both PBX registration and static or non-registration modes of PBX operation.
- UC320 SW Version 2.2.2.

Network Topology



The PBX in the above network topology represents the Cisco UC320 PBX that is connected via its LAN port to the LAN port of the EdgeMarc Network Services gateway. The PBX used in our lab comprises of the following:

- Cisco UC320
- 3 Cisco SPA IP phones
- 2 analog phones

Description of Basic Operation and Call Flows

Basic Call Flow:

All phones connect to the Cisco UC320 PBX. The Cisco UC320 PBX will interface with the service provider using a SIP trunk.

Internal calls:

- Calls between phones on the LAN
- LAN phone → Cisco UC320 PBX → LAN phone

Outbound calls:

- Call is initiated by a LAN phone to a WAN phone.
- LAN phone → Cisco UC320 PBX <SIP trunk> → EM → SIP trunk service provider → WAN phone

Inbound call:

- Call is initiated by a WAN phone to a LAN phone.
- WAN phone → SIP trunk service provider → EM → <SIP trunk> Cisco UC320 PBX → LAN phone

Configuration:

1. Plug PC into LAN side of PBX. By default a 192.168.10.x IP should be configured on your PC. And access the UC3xx PBX using it's default IP 192.168.10.1 through any browser.

By default the user name a password will be uc320.

2. The first screen that should pop up is the site summary. Here we can use tabbed pages to configure each module on the UC3XX.

Small Business
Cisco UC320W Configuration Utility

Status Configuration

Ports and Trunks
Line (FXO) Ports
FXS Ports
SIP/BRI Trunks
Outbound Trunks

Users/Phones
Users
Hot Phones
Assign Phones

Extension Buttons
Shared FXO Lines
Shared Extensions
Additional Extensions

Call Routing
Call Paging
Hunt Groups
Auto Attendant
Inbound Calls

User/Group Features
Call Forwarding
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Voicemail
Phone Buttons
Phone Button Labels
Directory

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Topology
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LAN
Wireless
Port Forwarding

Apply Changes
Site Summary
Apply Configuration

Site Summary

Use the tabbed pages to enter information about the site and to review the settings from each module of the configuration utility.

Support Info Site Telephony Ports and Trunks Users/Phones Extension Buttons Call Routing

This system is supported by:

Company

Name

Phone

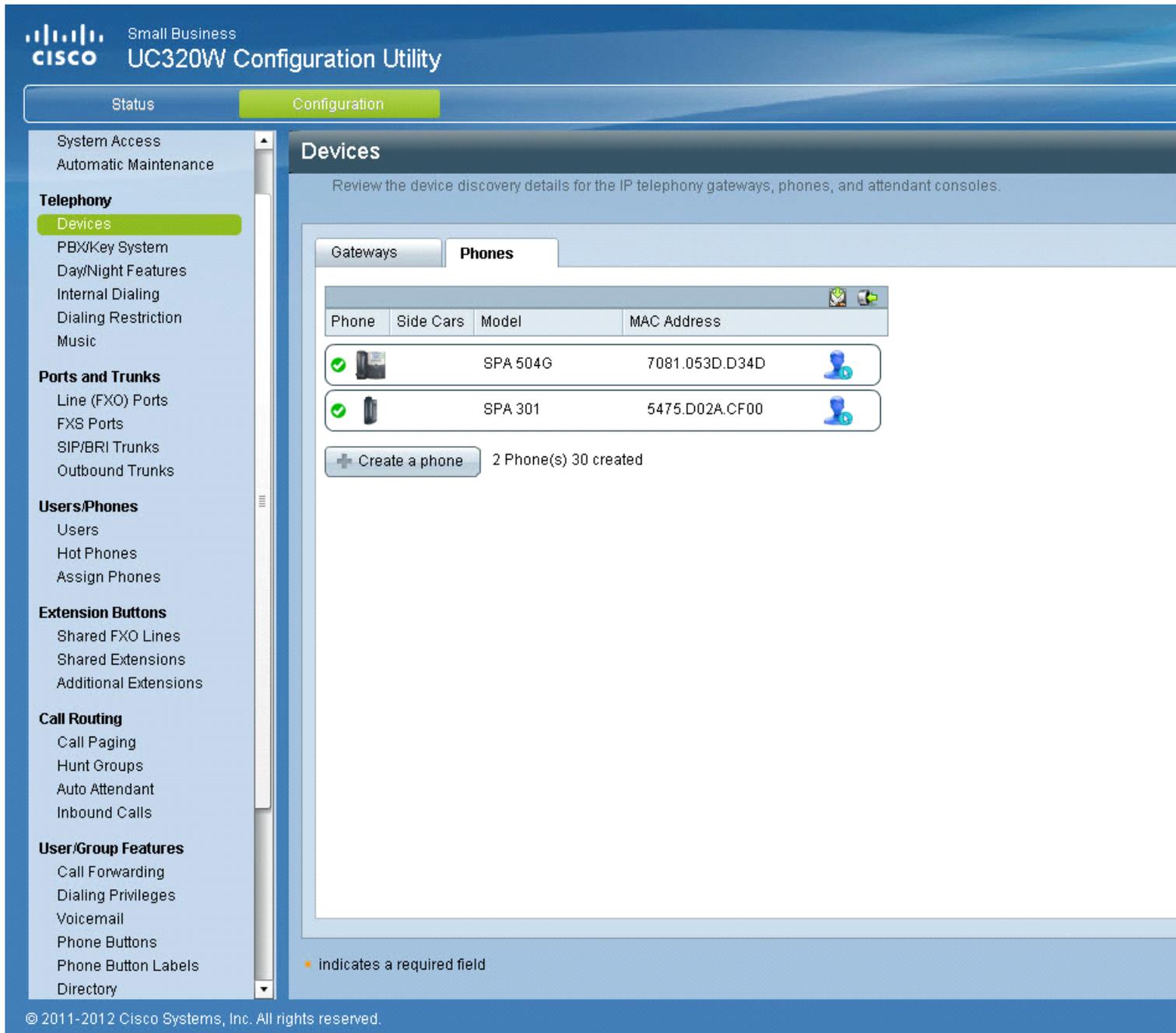
Email

Comments

* indicates a required field

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3. If the System does not detect any phones that are plugged into the LAN side of the PBX, go to Telephony>Devices>Phones and you can add phones there. After adding phones there hit apply configuration and select option either for applying now or apply later.



The screenshot shows the Cisco UC320W Configuration Utility interface. The left sidebar contains a navigation menu with categories like System Access, Telephony, Ports and Trunks, Users/Phones, Extension Buttons, Call Routing, and User/Group Features. The 'Telephony' section is expanded to show 'Devices'. The main content area is titled 'Devices' and includes a sub-tab for 'Phones'. Below the sub-tab is a table with columns for Phone, Side Cars, Model, and MAC Address. Two phones are listed: SPA 504G and SPA 301. A '+ Create a phone' button is visible below the table, along with a status message '2 Phone(s) 30 created'. A legend at the bottom indicates that a yellow asterisk indicates a required field.

Phone	Side Cars	Model	MAC Address
		SPA 504G	7081.053D.D34D
		SPA 301	5475.D02A.CF00

+ Create a phone 2 Phone(s) 30 created

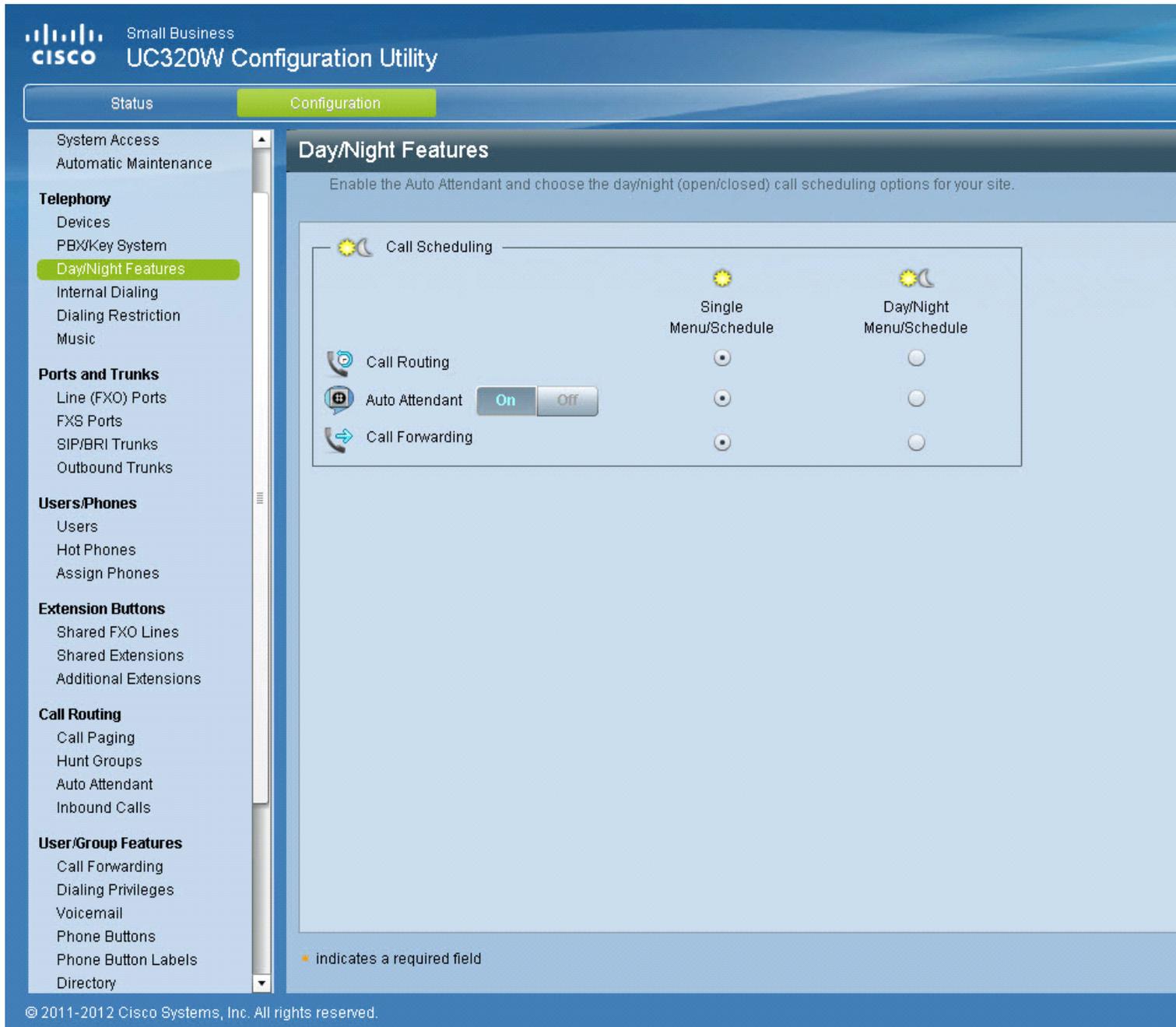
* indicates a required field

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4. Now go to the PBX/Key stream option from the left side configuration menu and select the operation mode of your UC3XX PBX. And then hit apply configuration select option either for applying now or apply later.

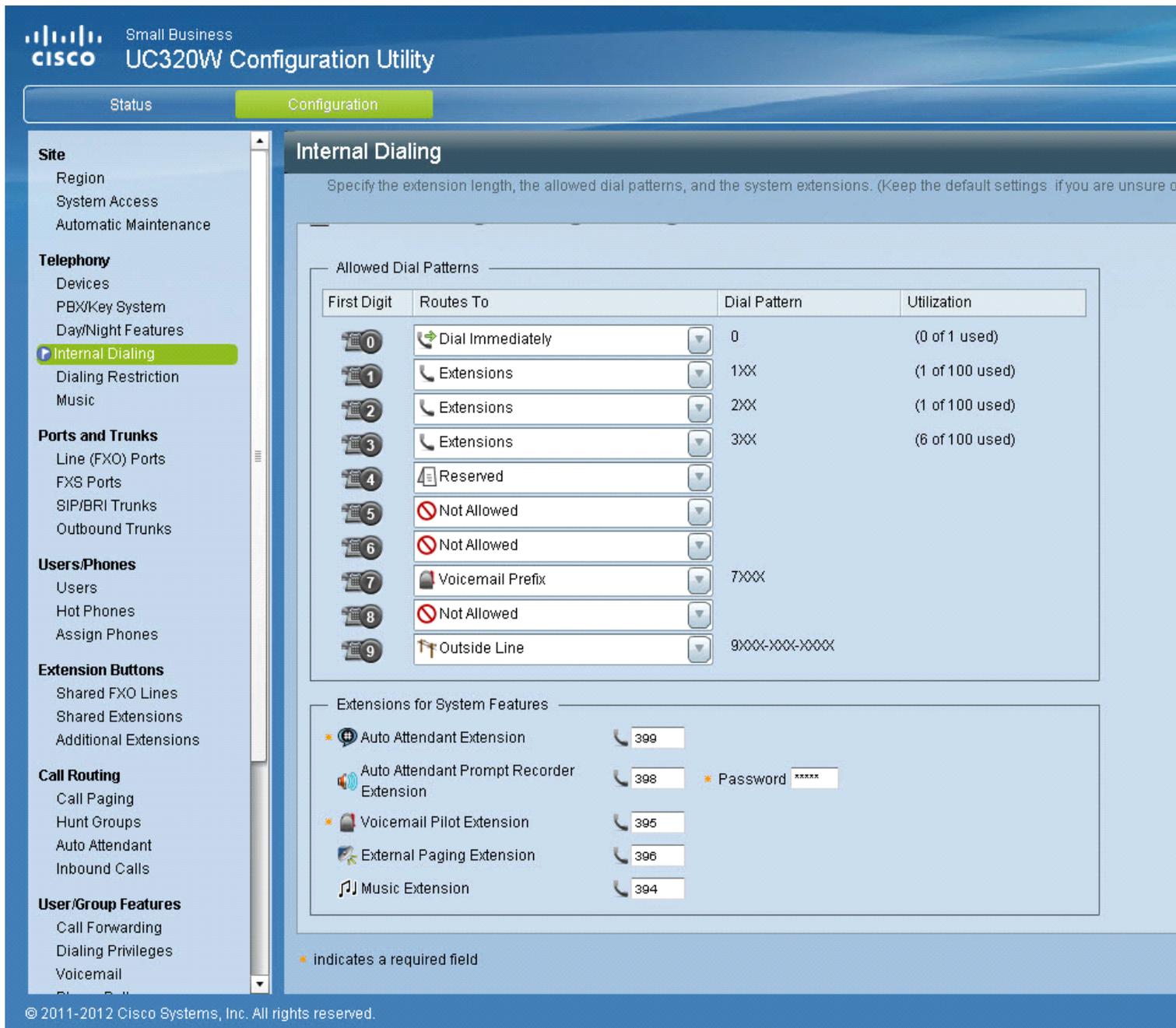
The screenshot displays the Cisco UC320W Configuration Utility interface. The top navigation bar includes 'Status' and 'Configuration' tabs. A left-hand menu lists various configuration categories such as 'System Access', 'Automatic Maintenance', 'Telephony', 'Ports and Trunks', 'Users/Phones', 'Extension Buttons', 'Call Routing', and 'User/Group Features'. The 'PBX/Key System' option under 'Telephony' is selected and highlighted. The main content area is titled 'PBX/Key System' and contains the instruction: 'Choose the operational mode for the telephony system. For more information, click the "Help Me Choose" button. If you are unsure, k...'. Below this, there is a 'Choose a system mode:' section with a 'Help Me Choose' button. Three radio button options are presented: 'PBX' (selected), 'Blend', and 'Key System'. Each option is accompanied by a representative diagram: 'PBX' shows a server connected to two phones, 'Blend' shows a server and two phones, and 'Key System' shows two phones connected to a central switch. A double-headed arrow is positioned between the 'PBX' and 'Blend' diagrams. At the bottom left of the main area, a small asterisk indicates a required field. The footer of the interface contains the copyright notice: '© 2011-2012 Cisco Systems, Inc. All rights reserved.'

5. Select Day/Night feature option from the configuration menu and enable auto attendant and other feature of call routing and call forwarding. And then hit apply configuration and select option either for applying now or apply later.



The screenshot shows the Cisco UC320W Configuration Utility interface. The left sidebar contains a navigation menu with categories like System Access, Telephony, Ports and Trunks, Users/Phones, Extension Buttons, Call Routing, and User/Group Features. The 'Day/Night Features' option is highlighted. The main content area is titled 'Day/Night Features' and includes a sub-header 'Call Scheduling' with a sun/moon icon. Below this, there are two columns of radio buttons: 'Single Menu/Schedule' and 'Day/Night Menu/Schedule'. The 'Auto Attendant' feature is currently set to 'On' with a toggle switch. Other features like 'Call Routing' and 'Call Forwarding' have radio buttons for both scheduling options. A legend at the bottom indicates that a star icon denotes a required field.

- Go to Telephony>Internal Dialing and specify the extension length to 3 digits and configure the dial patterns and and system extension or keep the default settings for this option. And then hit apply configuration and select option either for applying now or apply later.



The screenshot shows the Cisco UC320W Configuration Utility interface. The left sidebar contains a navigation menu with categories: Site, Telephony, Ports and Trunks, Users/Phones, Extension Buttons, Call Routing, and User/Group Features. The 'Internal Dialing' option under Telephony is selected and highlighted in green.

The main content area is titled 'Internal Dialing' and includes the instruction: 'Specify the extension length, the allowed dial patterns, and the system extensions. (Keep the default settings if you are unsure o...)'

The 'Allowed Dial Patterns' section contains a table with the following data:

First Digit	Routes To	Dial Pattern	Utilization
0	Dial Immediately	0	(0 of 1 used)
1	Extensions	1XX	(1 of 100 used)
2	Extensions	2XX	(1 of 100 used)
3	Extensions	3XX	(6 of 100 used)
4	Reserved		
5	Not Allowed		
6	Not Allowed		
7	Voicemail Prefix	7XXX	
8	Not Allowed		
9	Outside Line	9XXX-XXX-XXXX	

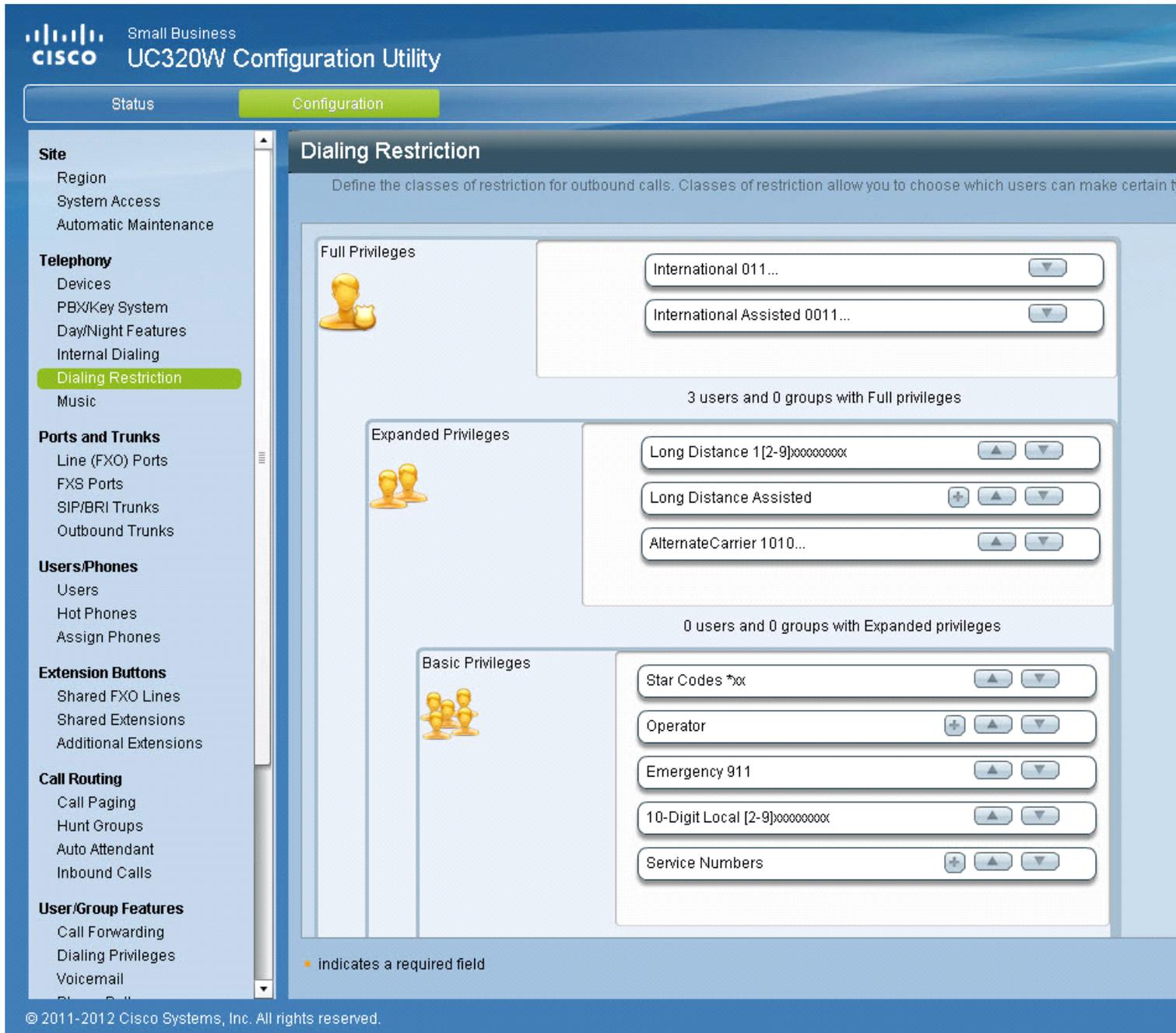
The 'Extensions for System Features' section lists several features with their respective extension numbers:

- * Auto Attendant Extension: 399
- * Auto Attendant Prompt Recorder Extension: 398 (Password: *****)
- * Voicemail Pilot Extension: 395
- * External Paging Extension: 396
- * Music Extension: 394

A note at the bottom states: '* indicates a required field'

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- Now select Telephony>Dialing Restriction and configure classes of restriction for outbound calls. And then hit apply configuration and select option either for applying now or apply later.



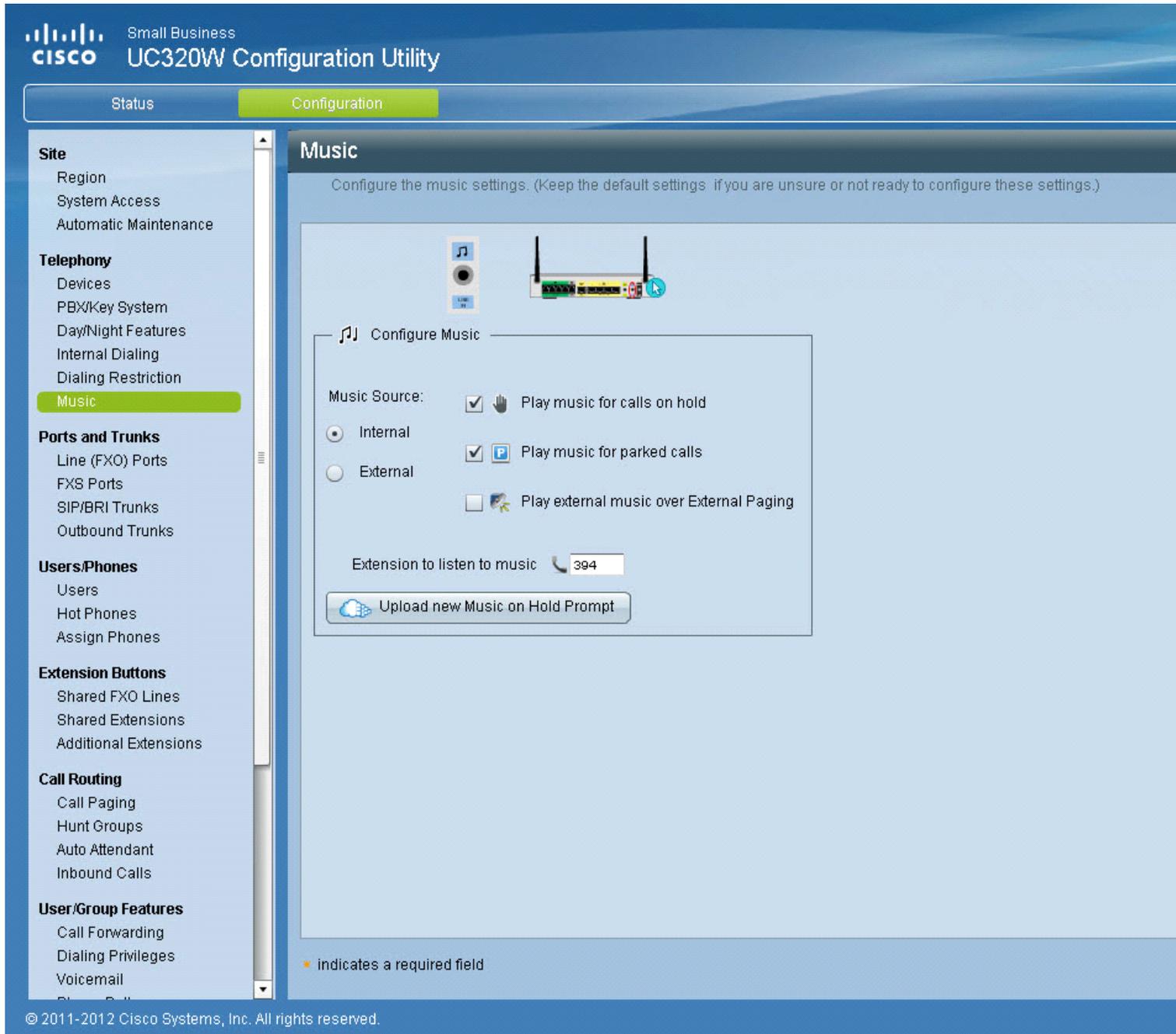
The screenshot shows the Cisco UC320W Configuration Utility interface. The left sidebar contains a navigation menu with categories: Site, Telephony, Ports and Trunks, Users/Phones, Extension Buttons, Call Routing, and User/Group Features. The 'Dialing Restriction' option under Telephony is highlighted. The main content area is titled 'Dialing Restriction' and includes a descriptive text: 'Define the classes of restriction for outbound calls. Classes of restriction allow you to choose which users can make certain t...'. Below this, there are three sections for configuring privilege classes:

- Full Privileges:** Contains two dropdown menus: 'International 011...' and 'International Assisted 0011...'. Below these, it states '3 users and 0 groups with Full privileges'.
- Expanded Privileges:** Contains three dropdown menus: 'Long Distance 1 [2-9]xxxxxxxx', 'Long Distance Assisted', and 'AlternateCarrier 1010...'. Below these, it states '0 users and 0 groups with Expanded privileges'.
- Basic Privileges:** Contains five dropdown menus: 'Star Codes *xx', 'Operator', 'Emergency 911', '10-Digit Local [2-9]xxxxxxxx', and 'Service Numbers'.

A legend at the bottom indicates that a yellow star icon indicates a required field.

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8. Go to Telephony > Music feature and keep the default settings here. And then hit apply configuration and select option either for applying now or apply later.

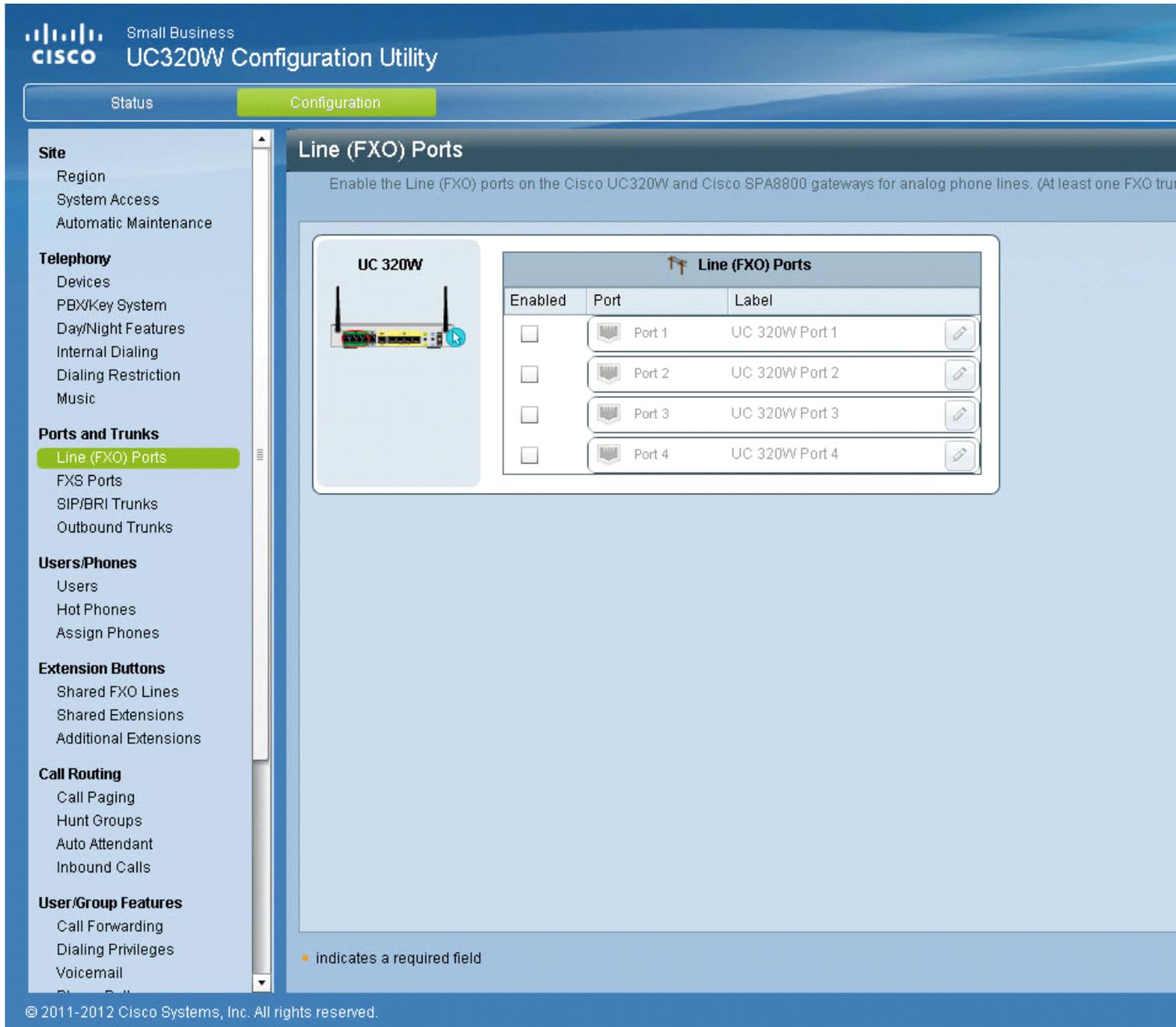


The screenshot shows the Cisco UC320W Configuration Utility interface. The left sidebar contains a navigation menu with categories: Site, Telephony, Ports and Trunks, Users/Phones, Extension Buttons, Call Routing, and User/Group Features. The 'Music' option under Telephony is highlighted. The main content area is titled 'Music' and includes a sub-header: 'Configure the music settings. (Keep the default settings if you are unsure or not ready to configure these settings.)'. Below this, there are icons for a music note and a router. The 'Configure Music' section contains the following settings:

- Music Source:**
 - Play music for calls on hold
 - Internal
 - External
- Play music for parked calls
- Play external music over External Paging

Below these settings, there is a field for 'Extension to listen to music' with the value '394' and an 'Upload new Music on Hold Prompt' button. A note at the bottom states: '* indicates a required field'. The footer of the page reads: '© 2011-2012 Cisco Systems, Inc. All rights reserved.'

- Now after configuring Telephony go to Ports and Trunks>Line (FXO) ports and disable all the FXO ports. And then hit apply configuration and select option either for applying now or apply later.



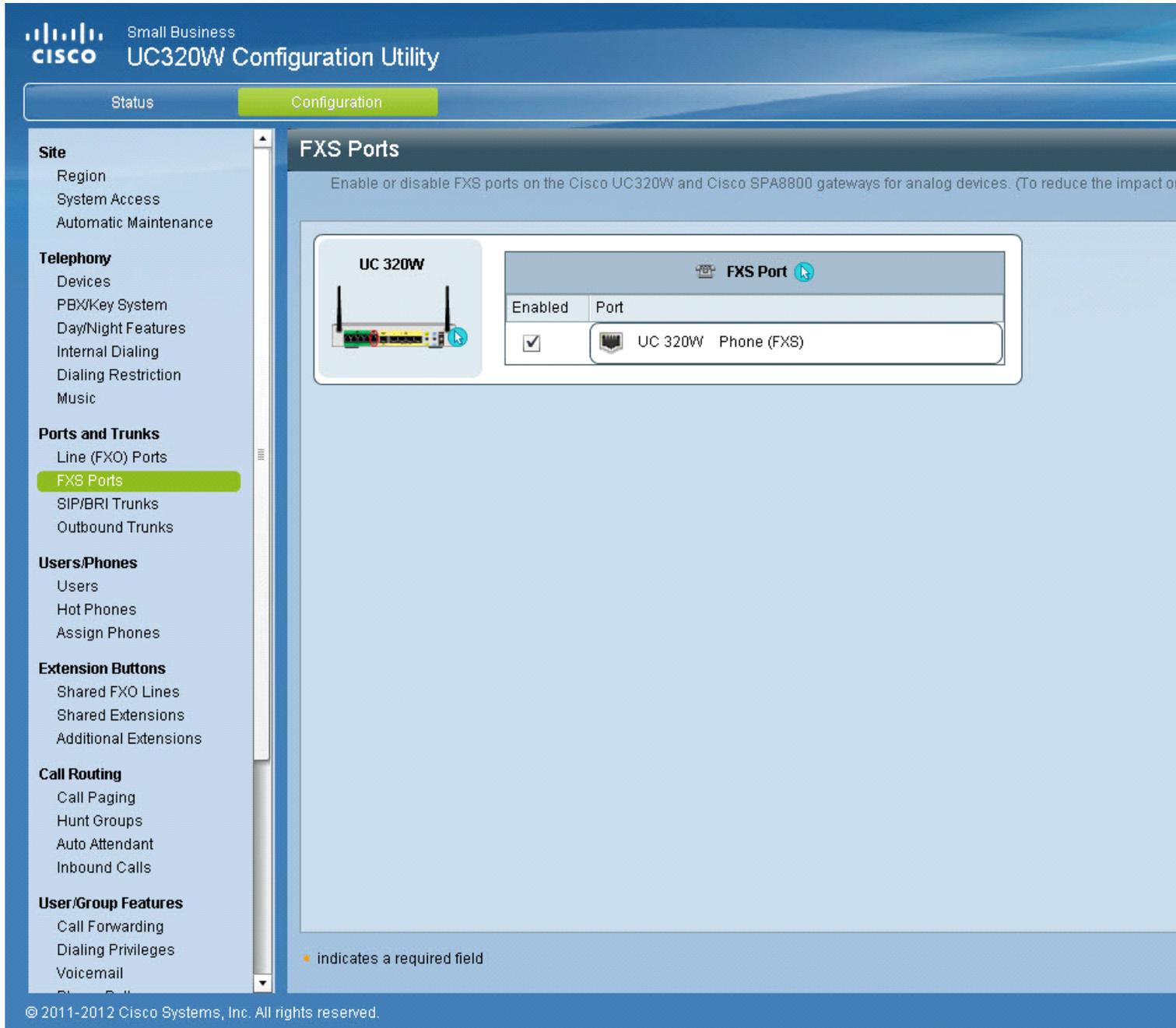
The screenshot shows the Cisco UC320W Configuration Utility interface. The left sidebar contains a navigation menu with categories: Site, Telephony, Ports and Trunks (highlighted), Users/Phones, Extension Buttons, Call Routing, and User/Group Features. Under 'Ports and Trunks', 'Line (FXO) Ports' is selected. The main content area is titled 'Line (FXO) Ports' and includes a sub-header: 'Enable the Line (FXO) ports on the Cisco UC320W and Cisco SPA8800 gateways for analog phone lines. (At least one FXO trunk must be configured.)'. Below this is a 'UC 320W' device icon and a table for 'Line (FXO) Ports'.

Enabled	Port	Label	
<input type="checkbox"/>	Port 1	UC 320W Port 1	
<input type="checkbox"/>	Port 2	UC 320W Port 2	
<input type="checkbox"/>	Port 3	UC 320W Port 3	
<input type="checkbox"/>	Port 4	UC 320W Port 4	

At the bottom of the interface, there is a note: * indicates a required field.

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10. go to ports and trunks>FXS ports and enable FXS port on cisco UC3XX.And then hit apply configuration and select option either for applying now or apply later.



The screenshot shows the Cisco UC320W Configuration Utility web interface. The left sidebar contains a navigation menu with categories: Site, Telephony, Ports and Trunks (with 'FXS Ports' highlighted), Users/Phones, Extension Buttons, Call Routing, and User/Group Features. The main content area is titled 'FXS Ports' and includes a sub-header: 'Enable or disable FXS ports on the Cisco UC320W and Cisco SPA8800 gateways for analog devices. (To reduce the impact of...'. Below this is a configuration table for a 'UC 320W' device.

UC 320W		FXS Port	
Enabled	Port		
<input checked="" type="checkbox"/>	UC 320W Phone (FXS)		

At the bottom of the configuration area, there is a note: * indicates a required field.

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11. Now go to ports and Trunks>SIP/BRI trunks and select provider to generic SIP provider and then configure settings for Edgemarc 4552 for the generic SIP provider.
 - Description: EM-4552
 - Proxy: 10.10.102.1
 - Required registration: Enabled
 - outbound proxy: (Keep this field blank)
 - Only allow calls to: (Use this setting to block unauthorized voice traffic or keep this field blank)
 - Call Capacity: 4
 - Prefix dialednumber with"+1": Disabled
 - Company Name: EM-4552
 - Account ID: 6782384025 (What ever provided by your provider)
 - Authentication ID: 6782384025
 - Password: 6782384025
 - Disable SRV records and NAT
 - Systemwide SIP Parameters: Keep this settings defaulted.
 - Now hit apply configuration and then select option either for applying now or apply later.

Small Business
UC320W Configuration Utility

Status Configuration

Internal Dialing
 Dialing Restriction
 Music

Ports and Trunks
 Line (FXO) Ports
 FXS Ports
SIP/BRI Trunks
 Outbound Trunks

Users/Phones
 Users
 Hot Phones
 Assign Phones

Extension Buttons
 Shared FXO Lines
 Shared Extensions
 Additional Extensions

Call Routing
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User/Group Features
 Call Forwarding
 Dialing Privileges
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SIP/BRI Trunks

Enter the settings for your SIP providers and BRI gateways for Voice over IP service. (At least one FXO trunk or SIP/BRI trunk must be configured.)

*** Settings** EM-4552

* Description	EM-4552
* Proxy	10.10.102.1
Require registration	<input checked="" type="checkbox"/>
Outbound Proxy	
Only Allow Calls To	
* Call Capacity	4 ~0% of WAN upstream bandwidth Maximum Call Capacity is 12
Prefix dialed numbers with "+1"	<input type="checkbox"/>
Company Name	 Special characters may cause some SIP Providers to reject calls. EM-4552
* Account ID	6782384025 (often Account Phone Number)
Digest Authentication	
Authentication ID	6782384025
Password	*****
SRV Record	
SRV Record Lookup	<input type="checkbox"/>

1 Trunk(s) of 4 created

* indicates a required field

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UC320W Configuration Utility

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Internal Dialing
 Dialing Restriction
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Ports and Trunks
 Line (FXO) Ports
 FXS Ports
SIP/BRI Trunks
 Outbound Trunks

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SIP/BRI Trunks

Enter the settings for your SIP providers and BRI gateways for Voice over IP service. (At least one FXO trunk or SIP/BRI trunk must be configured.)

Authentication ID: 6782384025
 Password: *****

SRV Record

SRV Record Lookup:
 SRV Auto Prefix:

NAT

NAT Mapping:
 Send NAT Keep Alive:
 Local SIP Port: 5060

*** Systemwide SIP Parameters**

These settings affect all SIP providers on the system

Codec: G711u
 Outbound FAX: passthrough
 Packetization Size in milliseconds: 30
 NAT STUN Server:
 Static IP Address for Site:

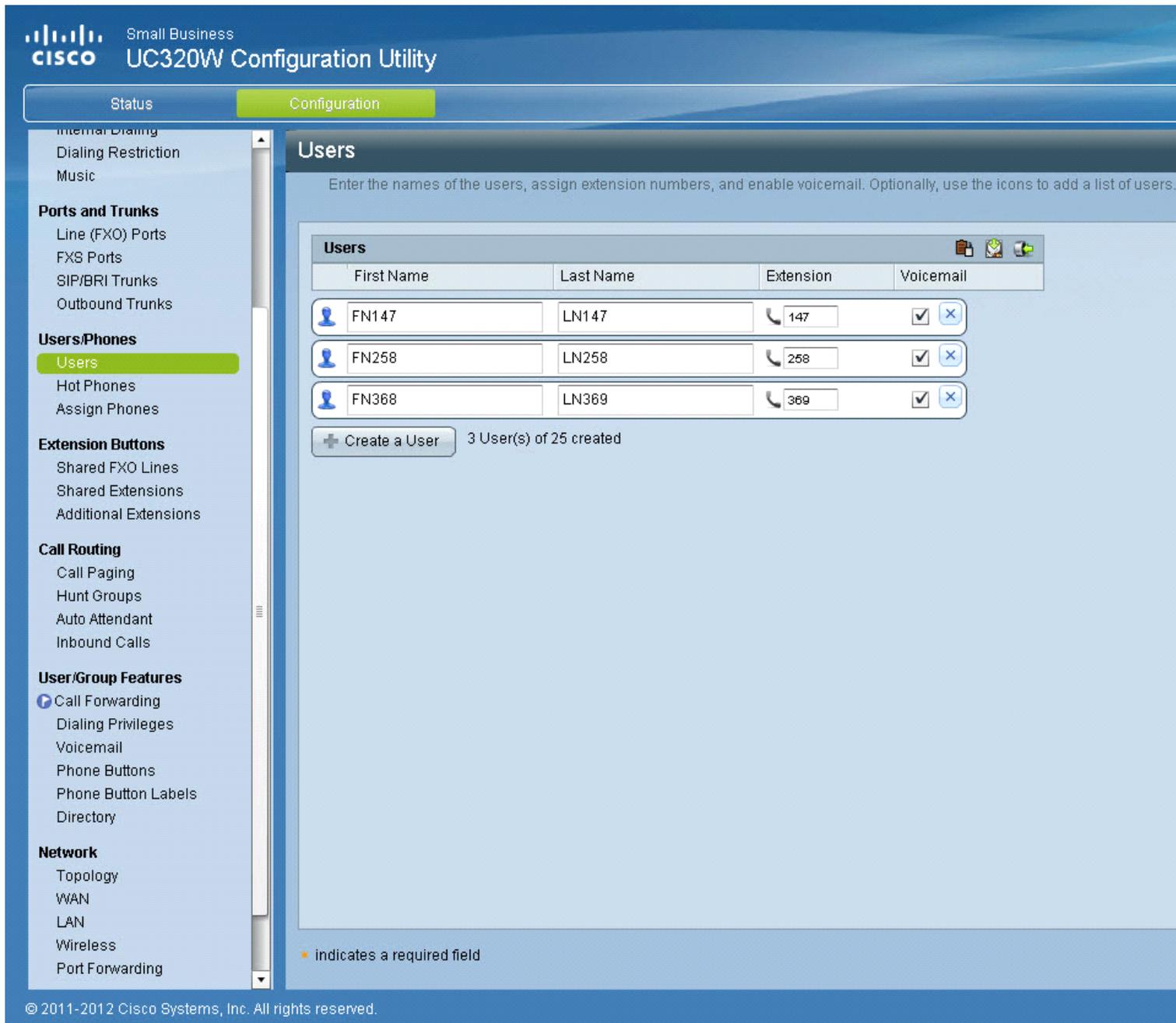
+ Add a SIP/BRI Trunk 1 Trunk(s) of 4 created

* indicates a required field

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12. The settings for outbound trunks are not required because we dont have two types of trunks (FXO and SIP/BRI) or multiple SIP/BRI trunks.

- Now go to Users/Phones>Users and enter the name of the user and assign extension numbers and enable voice mail for the users. hit apply configuration and then select option either for applying now or apply later.



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UC320W Configuration Utility

Status Configuration

Internal Dialing
 Dialing Restriction
 Music

Ports and Trunks
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 SIP/BRI Trunks
 Outbound Trunks

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Users
 Enter the names of the users, assign extension numbers, and enable voicemail. Optionally, use the icons to add a list of users.

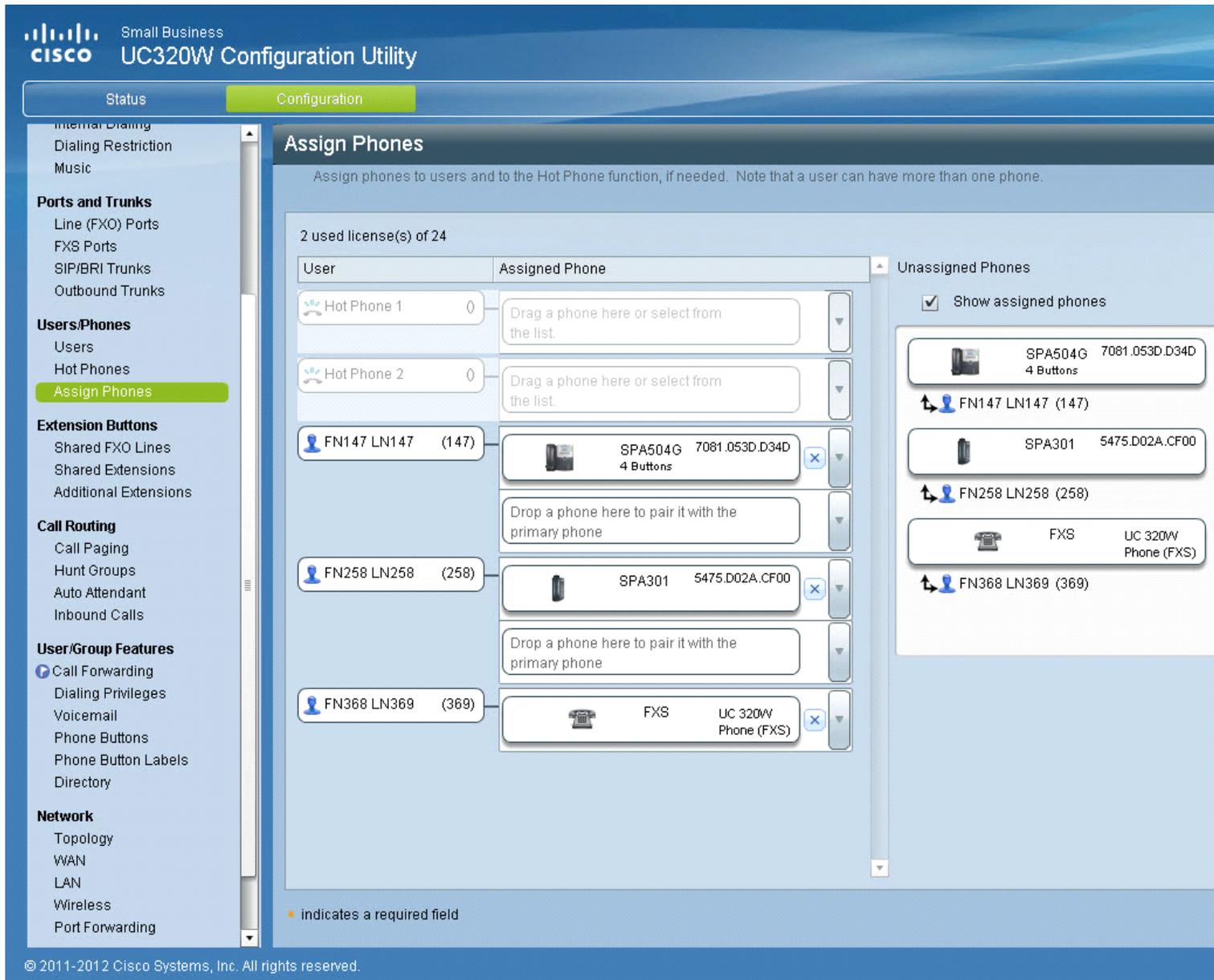
Users	First Name	Last Name	Extension	Voicemail
	FN147	LN147	147	<input checked="" type="checkbox"/>
	FN258	LN258	258	<input checked="" type="checkbox"/>
	FN368	LN369	369	<input checked="" type="checkbox"/>

[+ Create a User](#) 3 User(s) of 25 created

* indicates a required field

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14. Select Users/Phones>Assign Phones and assign the user to the phone. hit apply configuration and then select option either for applying now or apply later.



Assign Phones
Assign phones to users and to the Hot Phone function, if needed. Note that a user can have more than one phone.

2 used license(s) of 24

User	Assigned Phone
Hot Phone 1 (0)	Drag a phone here or select from the list.
Hot Phone 2 (0)	Drag a phone here or select from the list.
FN147 LN147 (147)	 SPA504G 7081.053D.D34D 4 Buttons
	Drop a phone here to pair it with the primary phone
FN258 LN258 (258)	 SPA301 5475.D02A.CF00
	Drop a phone here to pair it with the primary phone
FN368 LN369 (369)	 FXS UC 320W Phone (FXS)

Unassigned Phones

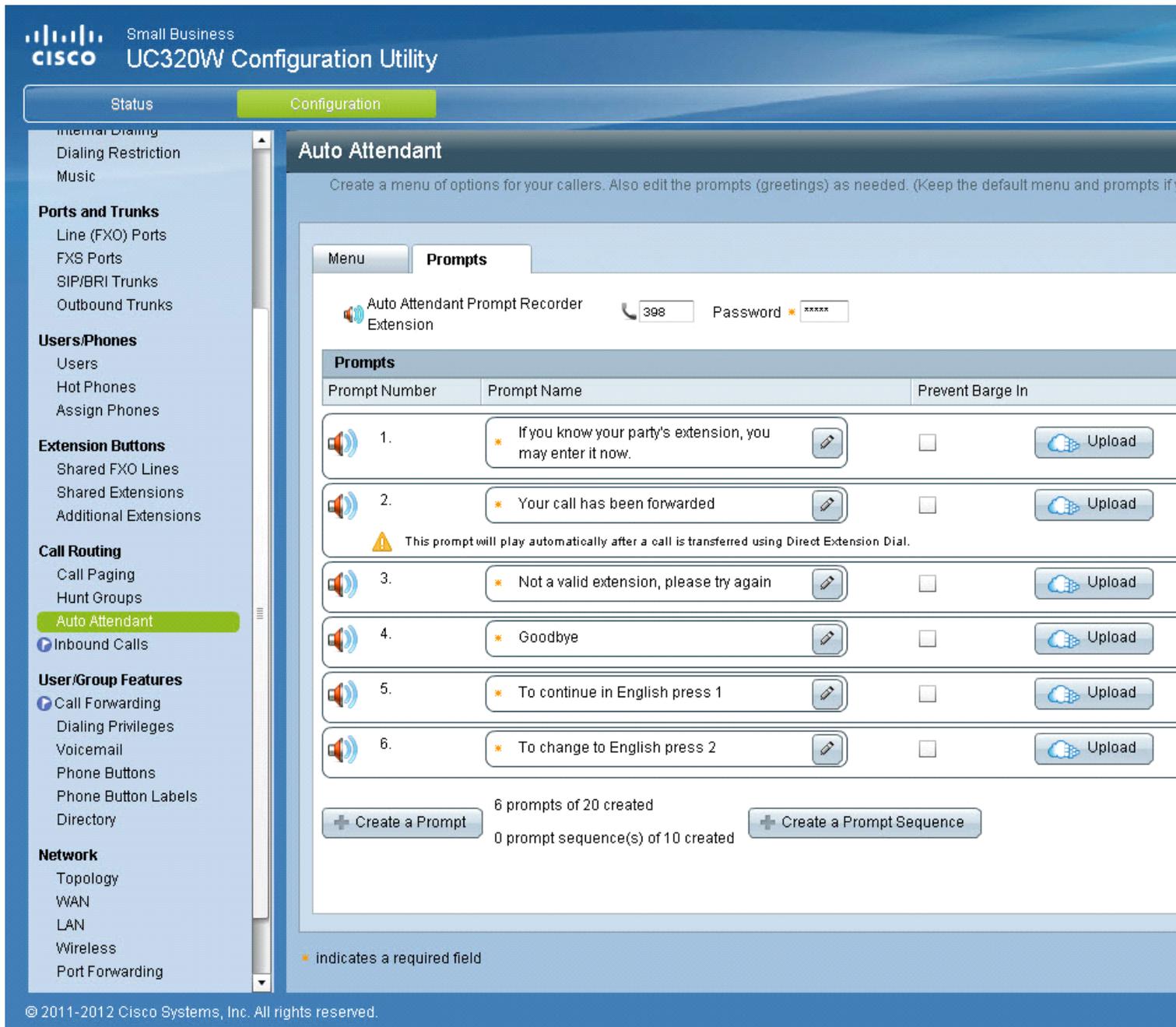
Show assigned phones

-  SPA504G 7081.053D.D34D 4 Buttons
-  FN147 LN147 (147)
-  SPA301 5475.D02A.CF00
-  FN258 LN258 (258)
-  FXS UC 320W Phone (FXS)
-  FN368 LN369 (369)

* indicates a required field

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- Go to call Routing > Auto attendant> Prompts and create menu of option for your callers and also edit prompts or greetings as needed. For an example, you can set initial menu prompt with the message”if you know your Party's extension,you..”hit apply configuration and then select option either for applying now or apply later.



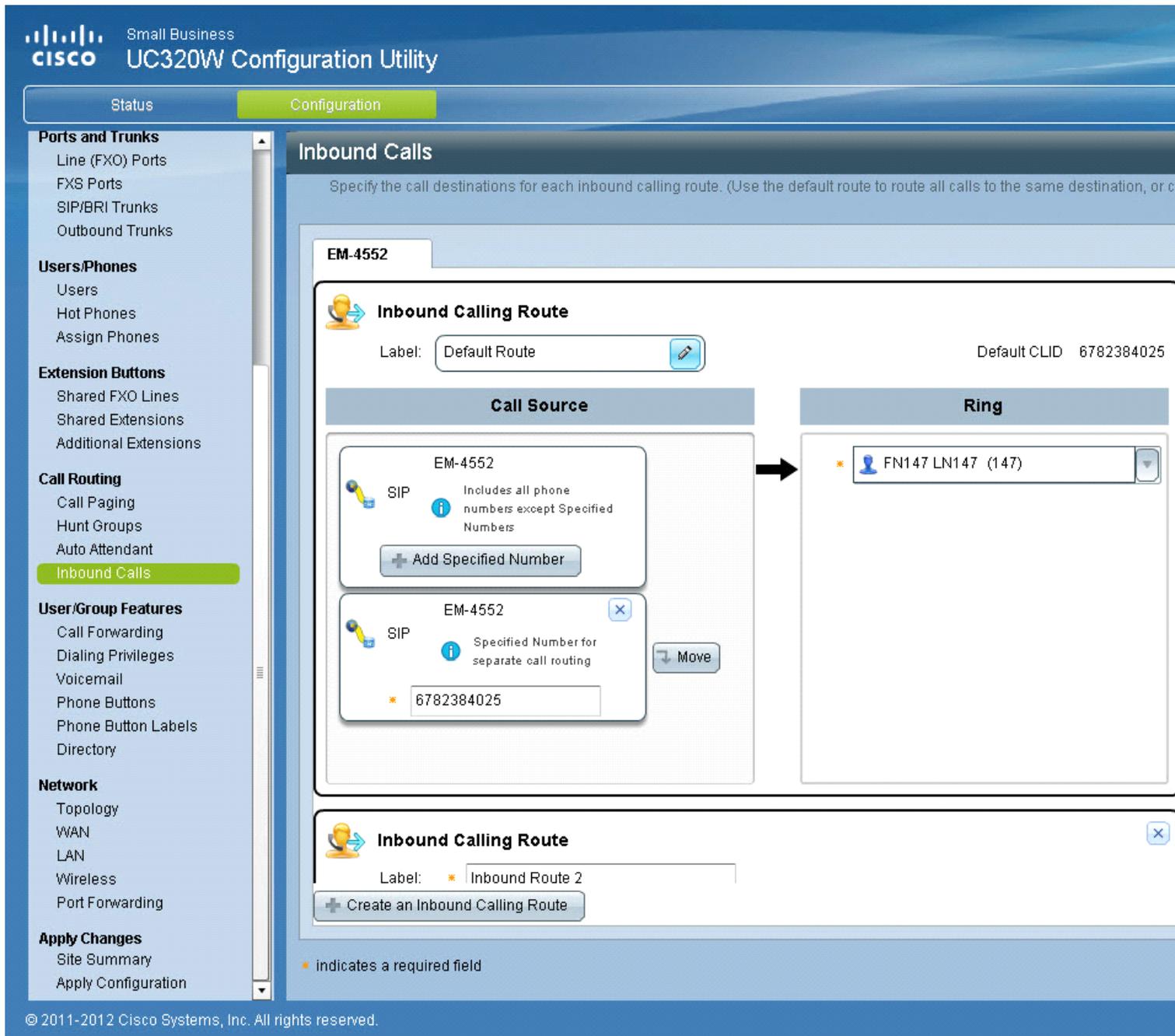
The screenshot shows the Cisco UC320W Configuration Utility interface. The left sidebar contains a navigation menu with categories like Ports and Trunks, Users/Phones, Extension Buttons, Call Routing, User/Group Features, and Network. The 'Auto Attendant' option is highlighted. The main content area is titled 'Auto Attendant' and includes a sub-tab for 'Prompts'. At the top, there are fields for 'Auto Attendant Prompt Recorder Extension' (398) and 'Password' (*****). Below this is a table of prompts:

Prompt Number	Prompt Name	Prevent Barge In
1.	* If you know your party's extension, you may enter it now.	<input type="checkbox"/>
2.	* Your call has been forwarded	<input type="checkbox"/>
⚠ This prompt will play automatically after a call is transferred using Direct Extension Dial.		
3.	* Not a valid extension, please try again	<input type="checkbox"/>
4.	* Goodbye	<input type="checkbox"/>
5.	* To continue in English press 1	<input type="checkbox"/>
6.	* To change to English press 2	<input type="checkbox"/>

At the bottom of the prompts section, there are two buttons: '+ Create a Prompt' and '+ Create a Prompt Sequence'. Below these buttons, it shows '6 prompts of 20 created' and '0 prompt sequence(s) of 10 created'. A legend at the bottom indicates that an asterisk (*) indicates a required field.

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16. Now go to Call routing>Inbound calls and here specify the call destination for each inbound calling route. Here use the default route to route all calls to the same destination.hit apply configuration and then select option either for applying now or apply later.



The screenshot displays the Cisco UC320W Configuration Utility interface. The left sidebar shows a navigation menu with categories: Ports and Trunks, Users/Phones, Extension Buttons, Call Routing (with 'Inbound Calls' selected), User/Group Features, and Network. The main content area is titled 'Inbound Calls' and contains a configuration panel for 'EM-4552'. This panel is divided into 'Call Source' and 'Ring' sections. The 'Call Source' section lists two SIP entries: one for 'EM-4552' that includes all phone numbers except specified numbers, and another for 'EM-4552' that is a specified number (6782384025) for separate routing. The 'Ring' section shows a selected destination: 'FN147 LN147 (147)'. Below this, there is a section for creating a new 'Inbound Calling Route' with a label 'Inbound Route 2'. A legend at the bottom indicates that an asterisk (*) denotes a required field. The footer of the interface shows the copyright notice: © 2011-2012 Cisco Systems, Inc. All rights reserved.

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UC320W Configuration Utility

Status Configuration

Ports and Trunks
 Line (FXO) Ports
 FXS Ports
 SIP/BRI Trunks
 Outbound Trunks

Users/Phones
 Users
 Hot Phones
 Assign Phones

Extension Buttons
 Shared FXO Lines
 Shared Extensions
 Additional Extensions

Call Routing
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Inbound Calls
 Specify the call destinations for each inbound calling route. (Use the default route to route all calls to the same destination, or

EM-4552

Inbound Calling Route
 Label: * Inbound Route 2

Call Source
 SIP EM-4552
 Specified Number for separate call routing
 * 6782384025

Ring
 * FN258 LN258 (258)
 Use 6782384025 as calling line ID.

Inbound Calling Route
 Label: * Inbound Route 3

Call Source
 SIP EM-4552
 Specified Number for separate call routing

Ring
 * FN368 LN369 (369)

+ Create an Inbound Calling Route

* indicates a required field

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UC320W Configuration Utility

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Ports and Trunks
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Inbound Calls
 Specify the call destinations for each inbound calling route. (Use the default route to route all calls to the same destination, or

EM-4552
 Label: * Inbound Route 3

Call Source
 SIP EM-4552
 Specified Number for separate call routing
 * 6782384025

Ring
 * FN368 LN369 (369)
 Use 6782384025 as calling line ID.

Inbound Calling Route
 Label: * Inbound Route 3

Call Source
 SIP EM-4552
 Specified Number for separate call routing
 * 6782384025

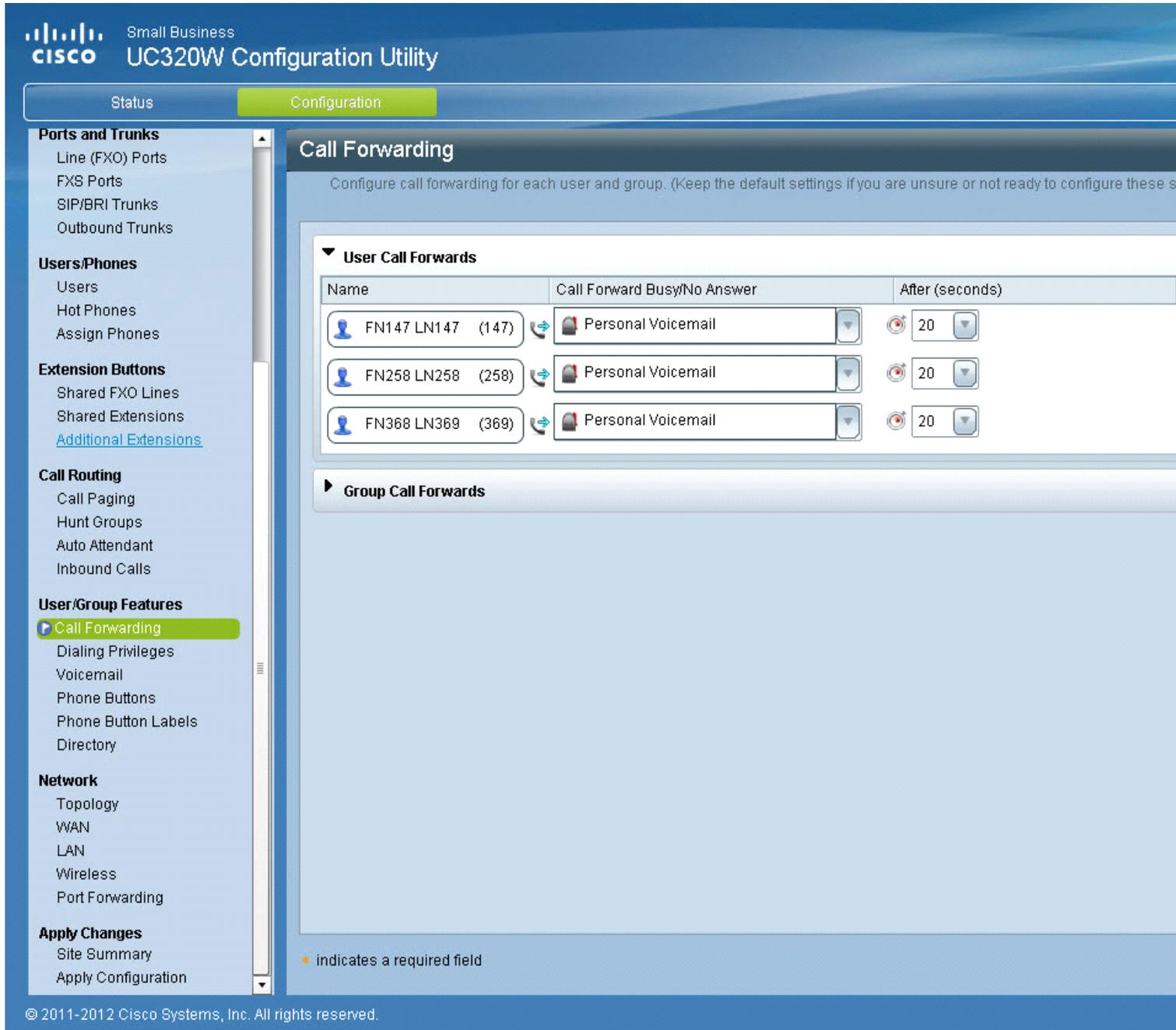
Ring
 * Auto Attendant (399)
 Use 6782384025 as calling line ID.

+ Create an Inbound Calling Route

* indicates a required field

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17. Configure Users/Group Features>Call forwarding for each user and group. Hit apply configuration and then select option either for applying now or apply later.



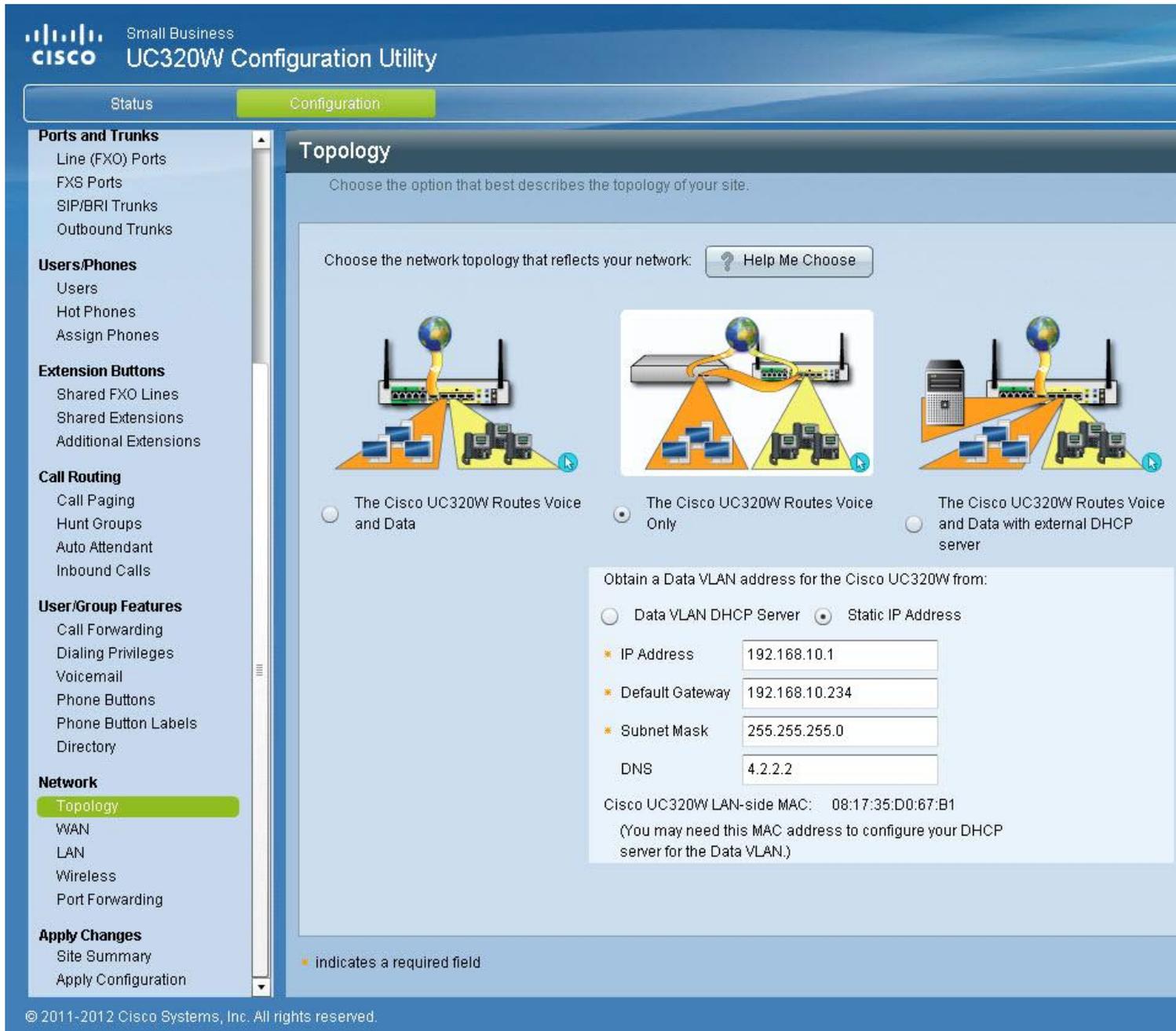
The screenshot shows the Cisco UC320W Configuration Utility interface. The left sidebar contains a navigation menu with categories: Ports and Trunks, Users/Phones, Extension Buttons, Call Routing, User/Group Features (with 'Call Forwarding' selected), and Network. The main content area is titled 'Call Forwarding' and includes a sub-section for 'User Call Forwards'. Below this is a table with columns for Name, Call Forward Busy/No Answer, and After (seconds). Three users are listed: FN147 LN147 (147), FN258 LN258 (258), and FN368 LN369 (369). Each user's 'Call Forward Busy/No Answer' is set to 'Personal Voicemail' and the 'After (seconds)' is set to 20. A legend at the bottom indicates that an asterisk (*) denotes a required field.

Name	Call Forward Busy/No Answer	After (seconds)
FN147 LN147 (147)	Personal Voicemail	20
FN258 LN258 (258)	Personal Voicemail	20
FN368 LN369 (369)	Personal Voicemail	20

* indicates a required field

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- Now Configure Network for UC3XX. Go to Network > Topology and chose the best topology for your site, here we will choose the topology for cisco UC3XX routes voice only. And configure the Cisco UC3XX to obtain data VLAN address and we will set static IP address here. Hit apply configuration and then select option either for applying now or apply later.

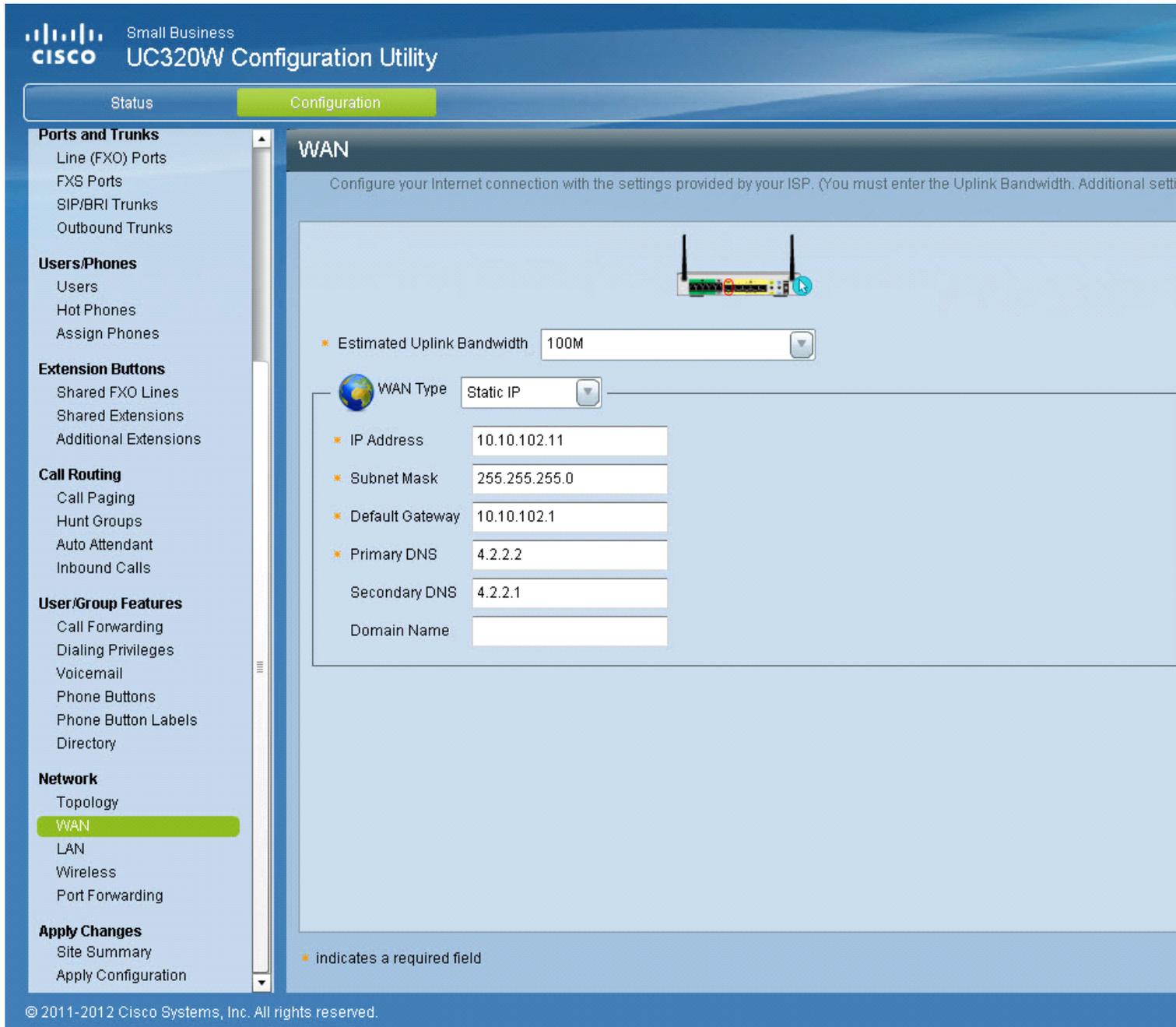


The screenshot shows the Cisco UC320W Configuration Utility interface. The left sidebar contains a navigation menu with categories: Ports and Trunks, Users/Phones, Extension Buttons, Call Routing, User/Group Features, Network, and Apply Changes. The 'Network' section is expanded to show 'Topology' as the selected option. The main content area is titled 'Topology' and contains the following elements:

- Instruction: "Choose the option that best describes the topology of your site."
- Instruction: "Choose the network topology that reflects your network: [? Help Me Choose](#)"
- Three topology options, each with a radio button:
 - The Cisco UC320W Routes Voice and Data
 - The Cisco UC320W Routes Voice Only
 - The Cisco UC320W Routes Voice and Data with external DHCP server
- Section: "Obtain a Data VLAN address for the Cisco UC320W from:"
 - Data VLAN DHCP Server
 - Static IP Address
- Form fields for Static IP Address configuration:
 - IP Address: 192.168.10.1
 - Default Gateway: 192.168.10.234
 - Subnet Mask: 255.255.255.0
 - DNS: 4.2.2.2
- Text: "Cisco UC320W LAN-side MAC: 08:17:35:D0:67:B1 (You may need this MAC address to configure your DHCP server for the Data VLAN.)"
- Footnote: "★ indicates a required field"

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19. Now goto Network>WAN and configure the WAN with static IP information of IP address,subnet mask,default gateway,primary and secondary DNS servers and domain name.

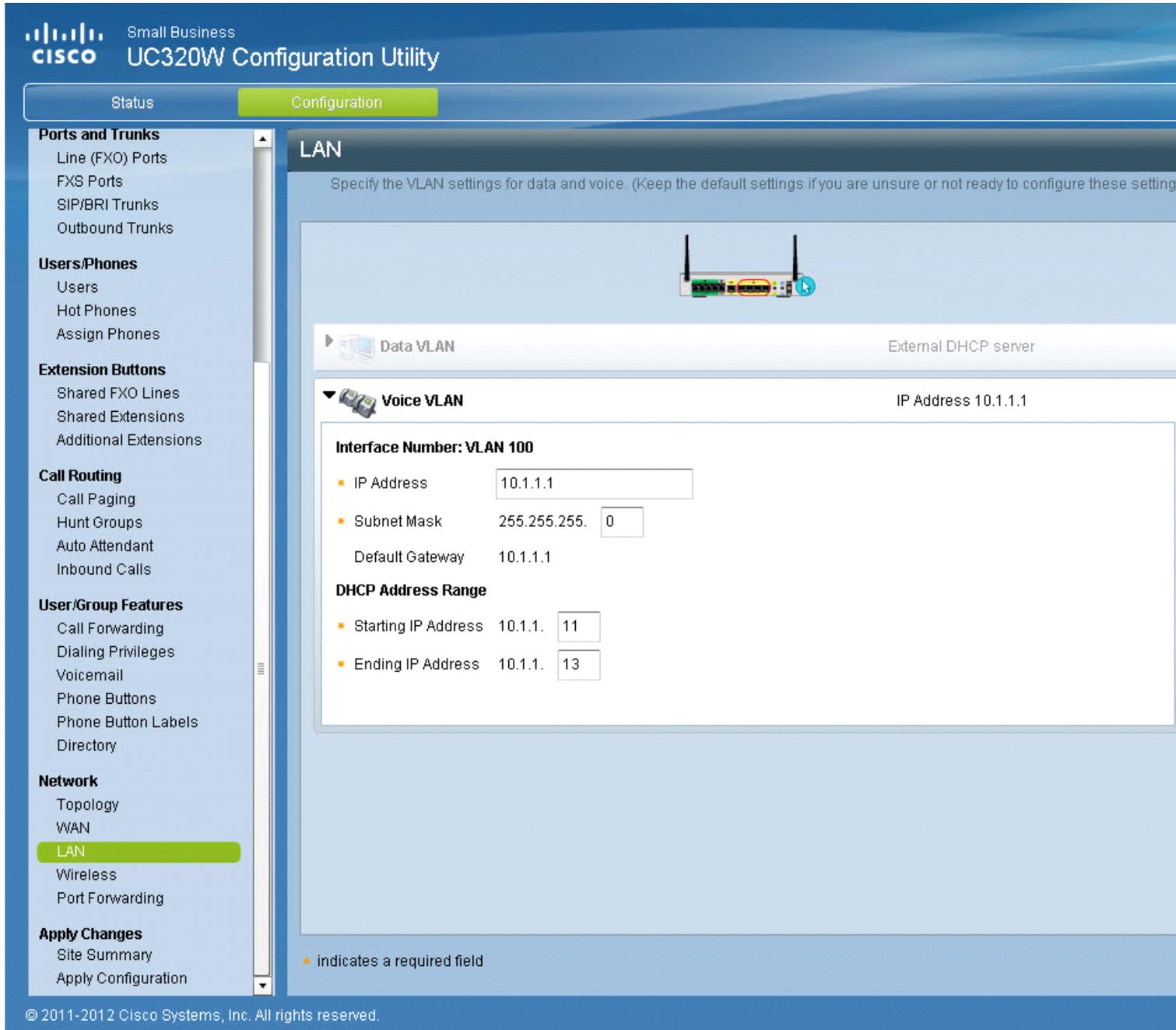


The screenshot shows the Cisco UC320W Configuration Utility interface. The left sidebar contains a navigation menu with categories: Ports and Trunks, Users/Phones, Extension Buttons, Call Routing, User/Group Features, Network, and Apply Changes. The 'Network' section is expanded, and 'WAN' is selected. The main content area is titled 'WAN' and includes a router icon and a sub-header: 'Configure your Internet connection with the settings provided by your ISP. (You must enter the Uplink Bandwidth. Additional settings are available in the Advanced tab.)' The configuration fields are as follows:

- Estimated Uplink Bandwidth: 100M
- WAN Type: Static IP
- IP Address: 10.10.102.11
- Subnet Mask: 255.255.255.0
- Default Gateway: 10.10.102.1
- Primary DNS: 4.2.2.2
- Secondary DNS: 4.2.2.1
- Domain Name: (empty)

A legend at the bottom indicates that an asterisk (*) denotes a required field. The footer contains the copyright notice: © 2011-2012 Cisco Systems, Inc. All rights reserved.

20. Configure Network>LAN and specify the VLAN settings for data and voice and hit apply configuration and then select option either for applying now or apply later.



The screenshot shows the Cisco UC320W Configuration Utility interface. The left sidebar contains a navigation menu with categories: Ports and Trunks, Users/Phones, Extension Buttons, Call Routing, User/Group Features, Network, and Apply Changes. The 'LAN' option under the 'Network' category is selected and highlighted in green. The main content area is titled 'LAN' and includes a sub-header: 'Specify the VLAN settings for data and voice. (Keep the default settings if you are unsure or not ready to configure these settings)'. Below this is a router icon and two expandable sections: 'Data VLAN' (set to 'External DHCP server') and 'Voice VLAN' (set to 'IP Address 10.1.1.1'). The 'Voice VLAN' section is expanded to show configuration for 'Interface Number: VLAN 100'. The fields are as follows:

- IP Address: 10.1.1.1
- Subnet Mask: 255.255.255.0
- Default Gateway: 10.1.1.1
- DHCP Address Range:
 - Starting IP Address: 10.1.1.11
 - Ending IP Address: 10.1.1.13

A legend at the bottom indicates that an asterisk (*) denotes a required field. The footer of the utility shows the copyright notice: © 2011-2012 Cisco Systems, Inc. All rights reserved.