

Networking Solutions for VoIP Application Notes







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INTRODUCTION

Voice over IP (VoIP) has become a mainstream technology with quality of service (QoS) as the most important factor underlying this change. Businesses that previously held back because of the early reputation for poor VoIP quality need no longer be concerned about quality. Today, excellent quality of service can be achieved with VoIP, though it is not guaranteed. QoS ultimately depends on the switches that control the VoIP traffic, and of course, the network over which that traffic travels.

Regardless of the size of a VoIP network, it will always include one or more of the following components:

- User agents. These may be commercial IP phones, or "soft phones" residing in a desktop or laptop PC.
- Voice gateway. The gateway acts as the bridge between a VoIP network and the PSTN network of the "outside world."
- **IPBX**. The IPBX (sometimes referred to as an IP PBX) replaces the conventional PBX of the past, and performs all its functions (voice mail, call forwarding, conference calling and many, many more). It connects to the PSTN network via the voice gateway. The IPBX is available in three deployment options:
 - Dedicated, on-site hardware device
 - Software that runs on a standard on-site server
 - Managed service via the cloud
- Switches to manage network traffic. The switches are crucial, because if they lack the appropriate capabilities or bandwidth capacity, QoS will suffer, leading to user complaints, poor customer service and problems with external telephone communication in general.
- **Cabling**. For adequate performance, Cat5E or better cabling is recommended.

HOW TO USE THIS DOCUMENT

The Networking Solutions for VoIP Solution Guide provides technical guidance and details about reference designs for installations with 20, 200 and 1000 phones. Use the Solution Guide to plan your solution architecture and determine the needed equipment.

This Application Note is a companion document to the Solution Guide. After you have planned and have the equipment for your network, use this guide to configure your VoIP solution. Example configurations are provided for 20-phone, 200-phone, and 1000-phone deployments.



REFERENCE CONFIGURATIONS AND ASSUMPTIONS

The following figures show reference configurations for 20-phone, 200-phone, and 1000-phone solutions.



Figure 1. Sample Solution – 20 Phones

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Figure 2. Sample Solution – 200 Phones

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Figure 3. Sample Solution – 1000 Phones



CONFIGURATION FOR THE 20-PHONE SOLUTION

Refer to Figure 1 for a diagram of the solution. You can use the CLI or Web GUI for configuration.

Assumptions for the 20-Phone Solution

- A DHCP server on the switch will be used. If a third-party DCHP solution is used, refer to the vendor's documentation and the documentation for the phone backend to configure DHCP options.
- The VoIP network is a dedicated, isolated network with a single uplink to the customer's enterprise network.
- VoIP backend systems will be protected by security measures local to the individual systems. ACLs can be used to further restrict access but are not configured in this application note. Visit support.netgear.com for further information.
- The tested VoIP phones have an internal switch to support a second device connected to a secondary port on the phone, allowing a voice and data VLAN to be configured on the switch port.
- Tested phones are SIP-enabled Cisco 79x5 series phones, and the tested PBX system is an AsteriskNOW VM installation. Refer to vendor documentation for further configuration guidance on these platforms.
- Best practices are used to implement switch stacking and failover/redundancy.

Global Configuration Notes

- Be sure to save your configuration using the **save** or **write memory** CLI command. Alternatively, choose **Maintenance > Save Config** in the GUI. Select the box, and click **APPLY**.
- Physical interfaces are referred to interfaces and ports interchangeably throughout this document.

Sample Configuration Values

The following values are used in the sample configuration:

- Voice VLAN: 100
- Voice VLAN subnet: 192.168.100.0/24
- Data VLAN: 200
- Data VLAN subnet: 192.168.200.0/24



CLI Configuration Steps: 20-Phone Solution

These steps provide an example CLI configuration for the 20-phone solution. To use the Web GUI for configuration, see Web GUI Configuration Steps: 20-Phone Solution on page 12.

1. Create voice VLAN 100 and data VLAN 200 and their respective interfaces using subnet 192.168.100.0/24 for VLAN 100 and 192.168.200.0/24 for VLAN 200.

(M4100-50-POE)	#vlan database
(M4100-50-POE)	(Vlan)#vlan 100
(M4100-50-POE)	(Vlan)#vlan 200
(M4100-50-POE)	(Vlan)#vlan routing 100
(M4100-50-POE)	(Vlan)#vlan routing 200
(M4100-50-POE)	(Vlan) #exit
(M4100-50-POE)	#configure
(M4100-50-POE)	(Config)#interface vlan 100
(M4100-50-POE)	(Interface vlan 100) #routing
(M4100-50-POE)	(Interface vlan 100)#ip address 192.168.100.1 255.255.255.0
(M4100-50-POE)	(Interface vlan 100)#exit
(M4100-50-POE)	(Config)#interface vlan 200
(M4100-50-POE)	(Interface vlan 200)#routing
(M4100-50-POE)	(Interface vlan 200)#ip address 192.168.200.1 255.255.255.0
(M4100-50-POE)	(Interface vlan 200)#exit

2. Enable the DHCP server and configure DHCP pools for each VLAN. Add DHCP option 66 for the TFTP server on VLAN 100 to allow the phones to download their images and configuration files. In this example, the TFTP server has an address of 192.168.100.100.

(M4100-50-POE)	(Config) #service dhcp
(M4100-50-POE)	(Config)#ip dhcp pool pool100
(M4100-50-POE)	(Config-dhcp-pool)#network 192.168.100.0 255.255.255.0
(M4100-50-POE)	(Config-dhcp-pool)#default-router 192.168.100.1
(M4100-50-POE)	(Config-dhcp-pool)#option 66 ascii 192.168.100.100
(M4100-50-POE)	(Config-dhcp-pool)#exit
(M4100-50-POE)	(Config)#ip dhcp pool pool200
(M4100-50-POE)	(Config-dhcp-pool)#network 192.168.200.0 255.255.255.0
(M4100-50-POE)	(Config-dhcp-pool)#default-router 192.168.200.1
(M4100-50-POE)	(Config-dhcp-pool)#exit



3. Enable auto-VoIP on VLAN 100.

(M4100-50-POE) (Config) #auto-voip vlan 100

4. By default, the auto-voip feature prioritizes voice traffic in queue 6. This step raises the priority to class 3.

(M4100-50-POE) (Config) # auto-voip protocol-based traffic-class 3

5. Enable the Voice VLAN feature globally.

```
(M4100-50-POE) (Config) #voice vlan
```

6. Configure the phone ports for voice VLAN 100 and data VLAN 200. Select all the desired interfaces to support VoIP devices. Tag the traffic on phone interfaces, but leave the data VLAN 200 traffic untagged on these ports. For all VoIP device interfaces, set the configured PVID to data VLAN 200.

(M4100-50-POE)	(Config)#int	cerface 0/1-0/20)		
(M4100-50-POE)	(Interface	0/1-0/20)#vlan	participation	exclude	1
(M4100-50-POE)	(Interface	0/1-0/20)#vlan	participation	include	100,200
(M4100-50-POE)	(Interface	0/1-0/20)#vlan	tagging 100		
(M4100-50-POE)	(Interface	0/1-0/20)#voice	e vlan 100		
(M4100-50-POE)	(Interface	0/1-0/20)#vlan	pvid 200		
(M4100-50-POE)	(Interface	0/1-0/20)#exit			

7. Configure infrastructure ports on VLAN 100. For each interface on each unit that will support a VoIP phone, include voice VLAN 100.

(M4100-50-POE)	(Config)#int	terface 0/23	3		
(M4100-50-POE)	(Interface	0/23)#vlan	participation	exclude	1
(M4100-50-POE)	(Interface	0/23)#vlan	participation	include	100
(M4100-50-POE)	(Interface	0/23)#vlan	pvid 100		
(M4100-50-POE)	(Interface	0/23)#exit			



Web GUI Configuration Steps: 20-Phone Solution

These steps provide an example Web GUI configuration for the 20-phone solution. To use the CLI for configuration, see CLI Configuration Steps: 20-Phone Solution on page 8.

1. Specify voice VLAN 100 and data VLAN 200. Choose **Switching > VLAN > Advanced > VLAN Configuration**. Enter each VLAN ID and name, and click **ADD** to add the VLAN.

NETGEAR Connect with Innovation"						M4100-50-POE Pro5ale 48-port FastEthernet 12- Intelligent Edge PoE Managed Switch
System Switching	Routing	QoS Security	Monitoring	Maintenance	Help Inde	LOGOVT
VLAN Auto-VolP STP	Multicest MV	R Address Table	Ports LAG			
* Basic	VLAN Config	uration				
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> Advanced	Reset Configural	tion	8			
	Television I and	A Conflorentian				
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	Internal VLAN A	location Policy	O vacanong 🖷	rescenting		
	VLAN Config	juration			T	
	VLAN ID	VLAN Name	VLAN Type	Make Static		
				Disable 💌		
	1	default	Default	Disable		
	2	Auto VoIP	AUTO VoIP	Disable		
	100	VLAN0100	Static	Disable		
	200	VLAN0200	Static	Disable		
_						ADD DELETE CANCEL APPLY



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NETGEAR Connect with Innovation*		M4100-50-POE ProSofe 48-port FostEthernet 12+ Intelligent Edge PoE Monaged Switch
System Switching	Routing QoS Security Monitoring Maintenance Help Index	LOGOUT
Routing Table IP VLAN	ARP Router Discovery	
> VLAN Routing	VLAN Routing Configuration	
Vizard V VLAN Routing	VLAN Routing Configuration	
	VLAN ID Port MAC Address IP Address Subnet Mask	
	100 4/1 28:C6:8E:15:E7:52 192.168.100.1 255.255.255.0	
	200 4/2 28:C6:8E:15:E/:52 192.168.200.1 255.255.0	
		ADD DELETE CANCEL



3. Enable the DHCP server. Choose **System > Services > DHCP Server > DHCP Server Configuration**. Enable Admin Mode and click **APPLY**.

NETGEAR Connect with Innovation *					M4100-50-POE ProSofie 48-port FourTherman 12+ Intelligent Edge PoE Managed Switch
System Switching	Routing QoS	Security Monitoring	Maintenance	Help Index	LOGOUT
Management Device View	Services PoE SNMP	LLDP ISDP Timer Schedule			
System Switching Managament Device View V DICP Server • DHCP Server Configuration • DHCP Pool Configuration • DHCP Pool Options • DHCP Server Statistics • DHCP Conflicts Information • DHCP Conflicts Information • DHCP Relay • UDP Relay	Routing GoS Services PoE SNMP DHCP Server Configu Admin Mode Ping Packet Count Conflict Logging Mode Bootp Automatic Mode Excluded Address IP Range From	Security Monitoring LLDP ISDP Timer Schedule uration ration Disable @ Disable @ IP Range To	Enable (0, 2 to 10) Enable Enable	O Image: Second seco	
					ADD DELETE CANCEL APPLY



4. Choose System > Services > DHCP Server > DHCP Pool Configuration. Select Create for Pool Name and specify "pool<VLANID>" as the name for each VLAN. Enter the network address for each VLAN and the network mask. Under Default Router Addresses, enter the gateway you configured for each VLAN interface. You can also optionally change the least time value. Click ADD to create the pool.

ETGE ect with Innova	AR'								M4100-50- ProSafe 48-port FastEther Intelligent Edge PoE Manager
System	Switching	Routing	QoS	Security	Monitoring	Maintenance	Help	Index	LOG
Aanagement	Device View	Services PoE	SNMP	LLDP ISDP	Timer Schedule				
		DHCP Pool	Configura	ation					
DHCP Serve	ar	DHCP Pool	Configura	tion			đ	Ð	
Configuratio	n	Pool Name	_		pool100 💌				
	in	Type of Binding	1		Dynamic				
DHCP Pool (Options	Network Addre	cc		192.168.100	.0			
DHCP Serve Statistics	er.	Network Mask			255.255.255	.0			
HCP Bindir	ngs	Network Prefix	Length			(0 to 32)			
nformation		Client Name				(,			
HCP Confi formation	icts	Hardware Addr	955						
CP Relay		Hardware Addr	ess Ivpe		Ethernet -				
CP L2 Rel	ay	Client ID							
P Relay		Host Number							
		Host Mask							
		Host Prefix Len	ath			(1-32)			
		Lease Time			Specified D	ration -			
		Davs			1	(0 to 59)			
		Hours			0	(0 to 23)			
		Minutor			0	(0 to 59)			
		T Default Poute	• Addresses			(0 (0 55)			
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		ADNE Conver A	ld		0.0.0.0				
		2 NetBIOS Name	a Server Add	leases					
		NetBIOS Node	Type		b-node Bros	dcast			
		Next Server Ad	dress		0.0.0.0				
		Domain Name				(0 to 255	characters)		
		Bootfile				(0.10.100			



 Configure the DHCP option to allow the phones to reach the TFTP server containing the phones' necessary firmware images and configuration files. Choose System > Services > DHCP Server > DHCP Pool Options. Select the VLAN 100 pool and enter Option Code 66 with Option Type Ascii and Option Value 192.168.100.100 (your TFTP server's IP address). Click ADD.

NETGEAR Connect with Innovation		M4100-50-POE ProSafe 48-port FastEthernet 12+ Intelligent Edge Pot Managed Switch
System Switching	Routing QoS Security Monitoring Maintenance Help Index	LOGOUT
Management Device View	/ Services PoE SNMP LLDP ISDP Timer Schedule	
 UHCP Server Configuration DHCP Pool Configuration DHCP Pool Options DHCP Fool Options DHCP Server Statistics DHCP Eindings Information DHCP Conflicts Information DHCP Relay DHCP 12 Relay UDP Relay UDP Relay 	JICP Pool Options Pool Name Option Code Option 1ype Option Value Dool DO 6 Acci 192.168.100.100	
		ADD DELETE APPLY



6. Choose **Switching > Auto-VoIP > Protocol based > Port Settings**. Set the Prioritization Type to Traffic Class and Class Value to 3. Select all the interfaces and select Enable for Auto VoIP Mode. Click **APPLY**.

NETGEAR Connect with Innovation							M4100-50-POE ProSafe 48-port FastEthernet 12+ Intelligent Edge PoE Managed Switch
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	Pri	oritization Ty	pe Tra	ffic Class 👻			
	Cla	ss Value	7	¥1			
		Protocol Ba	sed Port Settings		(ī)		
	1	LAGS AII	- Go To Interface		60		
		Interface	Auto VoTP Mode	Operation	al Status		
			-				
		0/1	Epable	UP			E
		0/2	Enable	UP			
		0/3	Enable	UP			
		0/4	Enable	UP			
		0/5	Enable	UP			
		0/6	Enable	UP			
		0/7	Enable	UP			
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		0/18	Enable	UP			
		0/19	Enable	UP			
		0/20	Enable	UP			
		0/21	Enable	UP			
		0/22	Enable	UP			
		0/23	Enable	UP			
		0/24	Enable	UP			
		0/25	Enable	UP			
		0/26	Lhable	UP			
							CANCEL



 Set up the voice VLAN feature on the phone ports. Choose Switching > VLAN > Advanced > Voice VLAN Configuration. Enable Admin Mode. Select all the desired interfaces to support VoIP devices. Set the Interface Mode to VLAN ID and enter 100 as the Value. Click APPLY.

M4 IOO- ProSate 48-port Fas Intelligent Edge PoE Mar									AR'	ETGE ect with Innovat
(Index	Help	Maintenance	Monitoring	Security	QoS	Routing		Switching	System
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					tion	Configurat	ce vlan	VOI		asic
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									ership	VLAN Membe
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			GO	erface	Go To Inte		All	1 .	n	Configuration
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		Enable	Disable		100	VLAN ID	0/1		ed	Protocol Bas
		Enable	Disable		100	VLAN ID	0/2			VLAN Group
		Disable	Disable		100	VLAN ID	0/3			Membership
		Disable	Disable		100	VLAN ID	0/4		sed	VI AN
		Disable	Disable		100	VLAN ID	0/5			Port DVLAN
		Disable	Disable		100	VLAN ID	0/6		n	Configuration
		Disable	Disable		100	VLAN ID	0/7			
		Disable	Disable		100	VLAN ID	0/8			Configuration
		Disable	Disable		100	VLAN ID	0/9		n .	Configuratio
		Disable	Disable		100	VLAN ID	0/10			GARP Port
		Disable	Disable		100	VLAN ID	0/11		n	Configuration
		Disable	Disable		100	VLAN ID	0/12			
		Disable	Disable		100	VLAN ID	0/13			
		Disable	Disable		100	VLAN ID	0/14			
		Disable	Disable		100	VLAN ID	0/15			
		Disable	Disable		100	VLAN ID	0/16			
		Disable	Disable		100	VLAN ID	0/17			
		Disable	Disable		100	VLAN ID	0/18			
		Disable	Disable		100	VLAN ID	0/19			
		Disable	Disable		100	VLAN ID	0/20			
		Disable	Disable		0	Disable	0/21			
		Disable	Disable		0	Disable	0/22			
		Disable	Disable		0	Disable	0/23			
		Disable	Disable		0	Disable	0/24			
		Disable	Disable		0	Disable	0/25			
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NETGEAR Connect with Innovation		M4100-50-POE ProSofe 48-port FastEthernet 12+ Intelligent Edge PoE Managed Switch
System Switching	Routing QoS Security Monitoring Maintenance Help Index	LOGOUT
VLAN Auto-VolP STP	Multicost MVR Address Table Ports LAG	
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		CANCEL



9. Choose **Switching > VLAN > Port PVID Configuration.** For all VoIP device interfaces, set the Configured PVID to data VLAN 200. All infrastructure ports must be set to Configured PVID 100. Click **APPLY**.

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System Switchin	9	Routing	QoS	Security	Monitoring	Mainten	ance	Help Index	(
VLAN Auto-VolP ST	P Mul	ticast M	/R Address	Table Pa	rts LAG				
_									
lasic	PO	re PVID C	oniiguratio	n					
> VLAN		PVID Config	juration					(1)	
Configuration	1	LAGS All		Go	To Interface	G	0		
VLAN Membership VLAN Status Port PVID Control/returns		Interface	Configured PVID	Current PVID	Acceptable Frame Types	Configured Ingress Filtering	Current Ingress Filtering	Port Priority	
MAC Based VLAN									
Protocol Based		0/1	200	200	Admit All	Disable	Disable	0	
VLAN Group		0/2	200	200	Admit All	Disable	Disable	0	
Configuration		0/3	200	200	Admit All	Disable	Disable	0	
VLAN Group		0/4	200	200	Admit All	Disable	Disable	0	
Membership		0/5	200	200	Admit All	Disable	Disable	0	
» IP Subnet Based		0/6	200	200	Admit All	Disable	Disable	0	
VLAN > Rort DVLAN		0/7	200	200	Admit All	Disable	Disable	0	
Configuration		0/8	200	200	Admit All	Disable	Disable	0	
» Voice VLAN		0/9	200	200	Admit All	Disable	Disable	0	
Configuration		0/10	200	200	Admit All	Disable	Disable	0	
 GARP Switch Configuration 		0/11	200	200	Admit All	Disable	Disable	0	
» GARP Port		0/12	200	200	Admit All	Disable	Disable	0	
Configuration		0/13	200	200	Admit All	Disable	Disable	0	
		0/14	200	200	Admit All	Disable	Disable	0	
		0/15	200	200	Admit All	Disable	Disable	0	
		0/16	200	200	Admit All	Disable	Disable	0	
		0/17	200	200	Admit All	Disable	Disable	0	
		0/18	200	200	Admit All	Disable	Disable	0	
		0/19	200	200	Admit All	Disable	Disable	0	
		0/20	200	200	Admit All	Disable	Disable	0	
		0/21	1	1	Admit All	Disable	Disable	0	
		0/22	1	1	Admit All	Disable	Disable	0	
		0/23	100	100	Admit All	Disable	Disable	0	
		0/24	100	100	Admit All	Disable	Disable	0	
		0/25	1	1	Admit All	Disable	Disable	0	
		0/26	1	1	Admit All	Disable	Disable	0	
		0/27	1	1	Admit All	Disable	Disable	0	
		0/28	1	1	Admit All	Disable	Disable	0	



CONFIGURATION FOR THE 200-PHONE SOLUTION

Refer to Figure 2 for a diagram of the solution. You can use the CLI or Web GUI for configuration.

Assumptions for the 200-Phone Solution

- A DHCP server on the switch will be used. If a third-party DCHP solution is used, refer to the vendor's documentation and the documentation for the phone backend to configure DHCP options.
- The VoIP network is a dedicated, isolated network with a single uplink to the customer's enterprise network.
- VoIP backend systems will be protected by security measures local to the individual systems. ACLs can be used to further restrict access but are not configured in this application note. Visit support.netgear.com for further information.
- The tested VoIP phones have an internal switch to support a second device connected to a secondary port on the phone, allowing a voice and data VLAN to be configured on the switch port.
- Tested phones are SIP-enabled Cisco 79x5 series phones, and the tested PBX system is an AsteriskNOW VM installation. Refer to vendor documentation for further configuration guidance on these platforms.
- Best practices are used to implement switch stacking and failover/redundancy.

Global Configuration Notes

- Be sure to save your configuration using the **save** or **write** memory CLI command. Alternatively, choose **Maintenance > Save Config** in the GUI. Select the box, and click **APPLY**.
- Physical interfaces are referred to interfaces and ports interchangeably throughout this document.

Sample Configuration Values

The following values are used in the sample configuration:

- Infrastructure VLAN: 10
- Infrastructure VLAN subnet: 192.168.1.0/24
- Voice VLAN: 200
- Voice VLAN subnet: 192.168.100.0/24

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CLI Configuration Steps: 200-Phone Solution

These steps provide an example CLI configuration for the 200-phone solution. For the Web GUI configuration, see Web GUI Configuration Steps: 200-Phone Solution on page 24.

1. Configure the M5300-28GF3 stack. Create VLAN interfaces on this stack and trunk them out to neighboring stacks as necessary. Allocate VLAN and subnets as follows: infrastructure VLAN 10 (192.168.1.0/24), voice VLAN 100 (192.168.100.0/24), and data VLAN 200 (192.168.200.0/24).

(M5300-28GF3)	#vlan data
(M5300-28GF3)	(Vlan)#vlan 10,100,200
(M5300-28GF3)	(Vlan)#vlan routing 10
(M5300-28GF3)	(Vlan)#vlan routing 100
(M5300-28GF3)	(Vlan)#vlan routing 200
(M5300-28GF3)	(Vlan) #exit
(M5300-28GF3)	#configure
(M5300-28GF3)	(Config)#interface vlan 10
(M5300-28GF3)	(Interface vlan 10)#ip address 192.168.1.1 255.255.255.0
(M5300-28GF3)	(Interface vlan 10) #routing
(M5300-28GF3)	(Interface vlan 10) #exit
(M5300-28GF3)	(Config)#interface vlan 100
(M5300-28GF3)	(Interface vlan 100)#ip address 192.168.100.1 255.255.255.0
(M5300-28GF3)	(Interface vlan 100) #routing
(M5300-28GF3)	(Interface vlan 100)#exit
(M5300-28GF3)	(Config)#interface vlan 200
(M5300-28GF3)	(Interface vlan 200) #routing
(M5300-28GF3)	(Interface vlan 200)#ip address 192.168.200.1 255.255.255.0
(M5300-28GF3)	(Interface vlan 200) #exit

2. Enable the built-in DHCP server and set up DHCP pools for subnets.

(M5300-28GF3)	(Config)#ip dhcp pool pool10
(M5300-28GF3)	(Config-dhcp-pool)#default-router 192.168.1.1
(M5300-28GF3)	(Config-dhcp-pool)#network 192.168.1.0 255.255.255.0
(M5300-28GF3)	(Config-dhcp-pool) #exit
(M5300-28GF3)	(Config) #ip dhcp pool pool100
(M5300-28GF3)	(Config-dhcp-pool)#default-router 192.168.100.1
(M5300-28GF3)	(Config-dhcp-pool)#network 192.168.100.0 255.255.255.0
(M5300-28GF3)	(Config-dhcp-pool) #exit
(M5300-28GF3)	(Config)#ip dhcp pool pool200
(M5300-28GF3)	(Config-dhcp-pool)#default-router 192.168.200.1
(M5300-28GF3)	(Config-dhcp-pool)#network 192.168.200.0 255.255.255.0
(M5300-28GF3)	(Config-dhcp-pool) #exit



3. Add DHCP option 66 to the voice VLAN DHCP pool so that the phones can reach the TFTP server to download necessary firmware and configuration files upon boot-up. In this case, the TFTP server has an IP address of 192.168.1.100.

```
(M5300-28GF3) (Config)#ip dhcp pool pool100
(M5300-28GF3) (Config-dhcp-pool)#option 66 ascii 192.168.100.100
(M5300-28GF3) (Config-dhcp-pool)#exit
```

4. Enable IP routing globally.

(M5300-28GF3) (Config) #ip routing

5. Configure uplink ports to the neighboring switches. Configurations will be the same on both sides of the uplink. Add or remove VLANs as needed. All transported VLANs must be tagged to create the trunk.

```
(M5300-28GF3) (Config)#interface 1/0/25
(M5300-28GF3) (Interface 1/0/25)#vlan participation exclude 1
(M5300-28GF3) (Interface 1/0/25)#vlan participation include 10,100,200
(M5300-28GF3) (Interface 1/0/25)#vlan tagging 10,100,200
(M5300-28GF3) (Interface 1/0/25)#exit
```

6. Configure the infrastructure ports. For each interface on each unit that will support a VoIP phone, include infrastructure VLAN 10.

```
(M5300-28GF3) (Config)#interface 1/0/21
(M5300-28GF3) (Interface 1/0/25)#vlan participation exclude 1
(M5300-28GF3) (Interface 1/0/25)#vlan participation include 10
(M5300-28GF3) (Interface 1/0/25)#vlan pvid 10
(M5300-28GF3) (Interface 1/0/25)#exit
```

 Move to the M4100-50-POE stacks to replicate the configuration on each one. Start by declaring the VLANs 10, 100, and 200.

```
(M4100-50-POE) #vlan database
(M4100-50-POE) (Vlan)#vlan 10,100,200
(M4100-50-POE) (Vlan)#exit
```

8. Enable IP routing on each M4100-50-POE stack.

```
(M4100-50-POE) #configure
(M4100-50-POE) (Config)#ip routing
```



9. Configure each uplink to the M5300-28GF3 stack. Both sides of the uplink must have the same configuration. All transported VLANs must be tagged to create the trunk.

```
(M4100-50-POE) (Config)#interface 0/49
(M4100-50-POE) (Interface 0/49)#vlan participation exclude 1
(M4100-50-POE) (Interface 0/49)#vlan participation include 10,100,200
(M4100-50-POE) (Interface 0/49)#vlan tagging 10,100,200
(M4100-50-POE) (Interface 0/49)#exit
```

10. Raise the VoIP traffic priority and enable the voice VLAN feature. Send VoIP traffic with a dot1p priority of 5 and map priority 5 to queue 5.

```
(M4100-50-POE) (Config) # classofservice dot1p-mapping 5 5
(M4100-50-POE) (Config) #cos-queue strict 5
(M4100-50-POE) (Config) #voice vlan
```

11. Create a DiffServ class map policy to provide QoS for voice traffic on the phone ports. This policy will be copied onto all stacks in the LAN network supporting VoIP devices.

(M4100-50-POE)	(Config)#diffserv
(M4100-50-POE)	(Config)#class-map match-all class_voip
(M4100-50-POE)	(Config-classmap)#match protocol udp
(M4100-50-POE)	(Config-classmap)#match ip dscp ef
(M4100-50-POE)	(Config-classmap) #exit
(M4100-50-POE)	(Config)#policy-map pol_voip in
(M4100-50-POE)	(Config-policy-map)#class class_voip
(M4100-50-POE)	(Config-policy-classmap)#assign-queue 5
(M4100-50-POE)	(Config-policy-classmap) #exit
(M4100-50-POE)	(Config-policy-map) #exit

12. Configure the phone ports with voice VLAN 100 and data VLAN 200 and apply the VoIP policy to the phone ports.

```
(M4100-50-POE) (Config)#interface 0/1
(M4100-50-POE) (Interface 0/1)#vlan participation exclude 1
(M4100-50-POE) (Interface 0/1)#vlan participation include 100,200
(M4100-50-POE) (Interface 0/1)#vlan tagging 100
(M4100-50-POE) (Interface 0/1)#voice vlan 100
(M4100-50-POE) (Interface 0/1)#vlan pvid 200
(M4100-50-POE) (Interface 0/1)#service-policy in pol_voip
(M4100-50-POE) (Interface 0/1)#exit
```



13. Move to the M5300-52G3 stack to replicate the configuration. Declare the VLANs, enable IP routing, and enable the voice VLAN features globally.

```
(M5300-52G3) #vlan database
(M5300-52G3) (Vlan)#vlan 10,100,200
(M5300-52G3) (Vlan)#exit
(M5300-52G3) #configure
(M5300-52G3) (Config)#ip routing
(M5300-52G3) (Config)#voice vlan
```

14. Configure the uplink to the M5300-28GF3 stack. Both sides of the uplink must have the same configuration. All transported VLANs must be tagged to create the trunk.

```
(M5300-52G3) (Config)#interface 1/0/25
(M5300-52G3) (Interface 1/0/25)#vlan participation exclude 1
(M5300-52G3) (Interface 1/0/25)#vlan participation include 10,100,200
(M5300-52G3) (Interface 1/0/25)#vlan tagging 10,100,200
(M5300-52G3) (Interface 1/0/25)#exit
```

15. Finish the configuration by setting up ports on the other endpoints with the appropriate VLAN, in this case, data VLAN 200.

```
(M5300-52G3) (Config)#interface 1/0/1
(M5300-52G3) (Interface 1/0/1)#vlan participation exclude 1
(M5300-52G3) (Interface 1/0/1)#vlan participation include 200
(M5300-52G3) (Interface 1/0/1)#vlan pvid 200
(M5300-52G3) (Interface 1/0/1)#exit
(M5300-52G3) (Config)#exit
```

Web GUI Configuration Steps: 200-Phone Solution

These steps provide an example Web GUI configuration for the 200-phone solution. For the CLI configuration, see CLI Configuration Steps: 200-Phone Solution on page 20.

1. Create the VLAN interfaces for the three subnets. Choose **Switching > VLAN > Advanced > VLAN Configuration**. Enter each VLAN ID, its name, and click ADD to add the VLAN to the configuration.

t with Innovati	AR'								M 5300-: ProSale 2 Stackable fiber GE Switch with I
ystem	Switching	Routing	Qo5	Security	Monitoring	Maintenance	Help	Index	
Auto	-VolP iSCSI	STP Multio	cast MVR	Address Tol	ble Ports LAG				
c anced		VLAN Conf	iguration				6	5)	
an ofiguration	n	Reset Configu	ration						
AN Membe	ership	Internal V	/LAN Configu	ration			(1	D	
t PVID figuration	n	Internal VLAN	Allocation Bas	e	4093				
C Based \	VLAN	Internal VLAN	Allocation Pol	icy	Ascending (Descending			
tocol Bas	ed								
figuration	n	ULAN Con	figuration				0	0	
tocol Bas	ed	VLAN ID	VLAN Name	3	VLAN Type	Make Stati	c		
N Group						Disable 🚽			
lubnet Ba	ased	1	default		Default	Disable			
N		2	Auto VoIP		AUTO VoIP	Disable			
DVLAN figuration	_	5	VLAN0005		Static	Disable			
e VLAN		10	VLAN0010		Static	Disable			
iguration	n	100	VLAN0100		Static	Disable		_	
P Switch	1	200	VLAN0200		Static	Disable			
ifiguration	n								
ntiouration	n								



Choose Routing > VLAN > VLAN Routing. Configure each VLAN interface and enable routing on it. Allocate VLANs and subnets as follows: infrastructure VLAN 10 (192.168.1.0/24), voice VLAN 100 (192.168.100.0/24), and data VLAN 200 (192.168.200.0/24). Select the VLAN ID and enter the corresponding gateway IP address and subnet mask for each. Click ADD after completing each entry.

ETGE	AR.								M53 Pro5 Stackable fiber GE Switch	00-28G Safe 24-po with L3 Roi
System	Switching	Routing	Qos	S Security	Monitoring	Maintenance	e Help	Index		LOGOU
Routing Table	IP IPv6	VLAN ARP	RIP	OSPF OSPFv3	Router Discovery	VRRP Multicast	IPv6 Multicast			
VLAN Routing		VLAN Routi	ng Co	nfiguration						
Wizard VLAN Routing		VLAN Rout	ing Con	nfiguration			(<u>(</u>		
		VLAN ID	Port	MAC Address	IP Address	Subne	t Mask			
			0/4/4	28-C6-8E-17-6C-37	10 10 10 1	255.25	5 255 0	1		
		10	0/4/1	28:C6:8E:17:6C:37	192,168,1,1	255.25	5.255.0			
		100	0/4/3	28:C6:8E:17:6C:37	192.168.100.1	255.25	5.255.0			
		200	0/4/2	28:C6:8E:17:6C:37	192.168.200.1	255.25	5.255.0			
									 ADD DELETE	CANCE



3. Choose **System > Services > DHCP Server > DHCP Server Configuration**. Enable Admin Mode and click **APPLY**. Set up any IP address ranges you want to exclude from the DHCP pools. Click **ADD** after configuring any excluded ranges for static IP addresses.

NETGEAR Connect with Innovation								M.5300-28GF3 ProSate 24 port 13 Stockable faber GE switch with 13 Routing
System Switching	Routing	QoS	Security	Monitoring	Maintenance	Help	Index	LOGOUT
Management Device View	Services Sto	cking SNM	P LLDP I	SDP Timer Sche	dule			
• DHCP Server • DHCP Server	DHCP Serve	er Configu	ration				()	
Configuration * DHCP Pool	Admin Mode	rer comigar		O Disable @	Enable		•	
Configuration	Ping Packet Co	unt		2	(0, 2 to)	0)		
» DHCP Pool Options	Conflict Loggin	g Mode		O Disable ()	Enable			
» DHCP Server Statistics	Bootp Automa	tic Mode		O Disable ()	Enable			
» DHCP Bindings								
Information	: Excluded A	Address					(<u>?</u>)	
* Unce Connicts Information	IP Range	From	IP Range	То				
> DHCP Relay								
> DHCP L2 Relay > UDP Palay	10.10.10.0	0	10.10.10.2	23				
> DHCPv6 Server	192.168.1	00.0	192.168.10	0.223				
> DHCPv6 Relay	192.168.1	.0	192.168.1.	15				
	192.168.2	00.0	192.168.20	0.15				
								ADD DELETE CANCEL APPLY



4. Choose System > Services > DHCP Server > DHCP Pool Configuration. Create a pool for each subnet associated with the VLANs. Set Type of Binding to Dynamic and enter the address and gateway for each. Set Default Router Address to the IP address of the subnet gateway. You can optionally change the lease time. Click ADD.

NETGEAR Connect with Innovation			M5300-28GF3 ProSate 24 port 13 Stackable fiber GE Switch with 13 Routing
System Switching	Routing QoS Secu	rity Monitoring Maintenance Help Index	LOGOUT
Management Device View	Services Stocking SNMP LU	DP ISDP Timer Schedule	
DHCP Server = DHCP Server Configuration = DHCP Pool Configuration = DHCP Pool Options = DHCP Pool Options = DHCP Server Statistics = DHCP Bindings Information = DHCP Conflicts Information	DHCP Pool Configuration DHCP Pool Configuration Pool Name Type of Dinding Network Address Network Mask Network Prefix Length Client Name Lanchurge Address	pool100 p	
 bHCP Relay bHCP L2 Relay bHCP L2 Relay bHCP V6 Server bHCPv6 Relay 	Hardware Addreas Hardware Addreas Type Client ID Host Number Host Mask Host Prefix Length	Ethernet v (8 to 32)	
	Days Ilours Minutes * Default Router Addresses	I (0 to 59) 0 (0 to 23) 0 (0 to 59)	
		192.168.100.1 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0	
	DNS Server Addresses NetBIOS Name Server Addresses NetBIOS Node Type NetS Server Addresse	b-nade Broadcast	
	next server Address Domain Name Dootfile	(0 to 255 characters) (0 to 120 characters)	



5. Set DHCP option 66 on the voice VLAN 100 so that the phones can download firmware and configuration files from a TFTP server. Choose System > Services > DHCP Server > DHCP Pool Options. Select the pool name for the VLAN 100 DHCP pool. Enter 66 for Option Code, select Ascii as Option Type, and enter the TFTP server IP address as Option Value. In this example, the TFTP server's address is 192.168.1.10. Click ADD.

<form> System Watching Rading Rest Rest System Rading Rading Rading Rest System Rading Rading Rading Rading Rading System Rading Rading Rading Rading System Rading Rading Rading Rading <th>NETGEAR Connect with Innovation</th><th></th><th>M.5300-28CF3 ProSale 24 port 13 Stackable fiber GE Switch with 13 Routing</th></form>	NETGEAR Connect with Innovation		M.5300-28CF3 ProSale 24 port 13 Stackable fiber GE Switch with 13 Routing
Weeqweed Week week Week wiek Week week Week week week Week week week Week week Week week Week week week Week week week week Week week week week Week week week week week week Week week week week week Week week week week week week week week	System Switching	Routing QoS Security Monitoring Maintenance Help Index	
<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	Management Device View	Services Stocking SNMP LLDP ISDP Timer Schedule	
ADD DELETE APPLY	Monogement Device View > DHCP Server Configuration > DHCP Pool Configuration > DHCP Pool Configuration > DHCP Server Statistics > DHCP Endings Information > DHCP Conflicts Information > DHCP Conflicts Information > DHCP Conflicts > DHCP Kelay > UDP Relay > UDP Relay > UDP Relay > DHCPV6 Relay	Service Stocking SNMP LLDP ISDP Timer Schedule DHCP Pool Options	
			ADD DELETE APPLY



6. Choose Routing > IP > Basic > IP Configuration to enable routing globally. Enable Routing Mode and click APPLY.

NETGEAI Connect with Innovation	R.								M5300-28GF3 ProSafe 24-port 13 Stackable fiber GE Switch with L3 Routing
System Sw	itching	Routing	QoS	Security	Monitoring	Maintenance	Help	Index	LOGOUT
Routing Table IP	IPv6	VLAN ARP	RIP OSPF	OSPFv3	Router Discovery	VRRP Multicast	IPv6 Multicast		
* Basic		IP Configu	ation						
* IP Configuration		IP Configu	iration					(?)	
» Statistics		Default Time t	o Live		64				
Auvanceu		Routing Mode			Enable ()	Disable			
		ICMP Echo Rep	olies		Enable	Disable			
		ICMP Redirect	a it Interval		1000	(0 to 3	(147403647 ms)		
		ICMP Rate Lim	it Burst Size		100	(1 to 2	200)		
		Maximum Nex	L Hops		4				
		Maximum Rou	tes		6112				
		Select to confi	gure Global Def	fault Gateway					
		Global Default	Gateway		0.0.0.0				
									CANCEL

NETGEAR[®]

7. Enable the voice VLAN feature globally. Choose **Switching > VLAN > Advanced > Voice VLAN Configuration**. Enable Admin Mode and click **APPLY**.

TGEAR								M.530 ProSa Stackable fiber GE Switch w
lem Switching		Routing	QoS Secu	rity Monitorin	g Maintenance	Help Ir	dex	0
Auto-VolP iSC	SI ST	P Multicos	t MVR Ad	dress Table Ports	LAG			
_	14-1		Con Connection					
c unced	VOI	CE VLAN	configuration					
IN	- D 1	Voice VLAN	Global Admin			0		
figuration	Ad	min Mode		💮 Disabl	le 💿 Enable			
N Membership N Status			6 . C			~		
PVID		Voice VLAN	Configuration			(U)		
figuration	1	∧II	G	To Interface	GO			
tocol Based		Interface	Interface Mode	Value	CoS Override Mode	Operational State		
N Group	-				Hode	State		
figuration	1000		The shale		The state of the s	Rights		
OCOL Based N Group		1/0/1	Disable	0	Disable	Disable		
ibership		1/0/2	Disable	0	Disable	Disable		
ubnet Based		1/0/3	Disable	0	Disable	Disable		
N		1/0/4	Disable	0	Disable	Disable		
figuration		1/0/5	Disable	0	Disable	Disable		
e VLAN		1/0/0	Disable	0	Disable	Disable		
figuration		1/0/7	Disable	0	Disable	Disable		
tP Switch		1/0/0	Disable	0	Disable	Disable		
P Port		1/0/10	Disable	0	Disable	Disable		
figuration		1/0/10	Disable	0	Disable	Disable		
		1/0/12	Disable	0	Disable	Disable		
		1/0/13	Disable	0	Disable	Disable		
		1/0/14	Disable	0	Disable	Disable		
		1/0/15	Disable	0	Disable	Disable		
		1/0/16	Disable	0	Disable	Disable		
		1/0/17	Disable	0	Disable	Disable		
		1/0/18	Disable	0	Disable	Disable		
		1/0/19	Disable	0	Disable	Disable		
		1/0/20	Disable	0	Disable	Disable		
		1/0/21	Disable	0	Disable	Disable		
		1/0/22	Disable	0	Disable	Disable		
		1/0/23	Disable	0	Disable	Disable		
		1/0/24	Disable	0	Disable	Disable		
		1/0/25	Disable	0	Disable	Disable		
		1/0/26	Disable	0	Disable	Disable		



8. Configure the switch ports. Choose Switching > VLAN > Advanced > VLAN Membership. For each of the three VLANs, set all uplink ports to neighboring stacks as T for tagged. For the infrastructure ports, set all ports to U for untagged. Click APPLY after configuring ports for each of the VLANs.

NETGEAR Connect with Innovation						M 5300-28GF3 ProSale 24 port L3 Stackable fiber GE Switch with L3 Routing
System Switching	Routing	QoS Security	Monitoring	Maintenance	Help Index	LOGOUT
VLAN Auto-VolP iSCSI	STP Multico	ast MVR Address	Table Ports LAG	-		
 > Basic > Advanced > VLAN Configuration > VLAN Membership 	VLAN Mem	bership Ibership	Group	Operation Untag	() All	-
 VLAN Status Port PVID Configuration MAC Based VLAN Protocol Based 	VLAN Name VLAN Type Unit 1 Port 1 2 3	VLAN0010 Static 4 5 6 7 8 9 :	10 11 12 13 14 1	GGED PORT MEMBERS	21 22 23 24 U T	
VLAN Group Configuration > Protocol Dased VLAN Group Memborship > IP Subret Based VLAN = Port DVLAN Configuration > Voice VLAN	25 26 27 T T LAG	7 28			5	
Configuration • GARP Switch Configuration • GARP Port Configuration						
						CANCEL APPLY



9. For infrastructure ports, configure the port PVID. Choose **Switching > VLAN > Advanced > Port PVID Configuration**. Enter infrastructure VLAN ID 10 as Configured PVID for all infrastructure ports. Click **APPLY**.

Innovation									Pro Stackable fiber GE Swite
Switching		Routing	QoS	Security	Monitoring	Mainten	ance	Helo Index	
					his here to be	~		ine en	
Auto-volr ISC	31 31	r i Mullicos	ri wvak	Address H	able i Ports i LAV				
	Por	t PVID C	onfiguratio	n					
ed	_		-						
		PVID Config	juration					0	
uration	1	LAGS All		Go	To Interface	(G	0		
Status		Interface	Configured	Current	Acceptable Frame	Configured Ingress	Current Ingress	Port Priority	
uration			110		Types	Filtering	Filtering		
ased VLAN									
ol Based		1/0/1	1	1	Admit All	Disable	Disable	0	
sroup		1/0/2	1	1	Admit All	Disable	Disable	0	
ol Based		1/0/3	1	1	Admit All	Disable	Disable	0	
roup		1/0/4	1	1	Admit All	Disable	Disable	0	
rship		1/0/5	1	1	Admit All	Disable	Disable	0	
net Based		1/0/6	1	1	Admit All	Disable	Disable	0	
/LAN		1/0/7	1	1	Admit All	Disable	Disable	0	
uration		1/0/8	1	1	Admit All	Disable	Disable	0	
/LAN		1/0/9	1	1	Admit All	Disable	Disable	0	
uration		1/0/10	1	1	Admit All	Disable	Disable	0	
Switch		1/0/11	1	1	Admit All	Disable	Disable	0	
Port		1/0/12	1	1	Admit All	Disable	Disable	0	
uration		1/0/13	1	1	Admit All	Disable	Disable	0	
		1/0/14	1	1	Admit All	Disable	Disable	0	
		1/0/15	1	1	Admit All	Disable	Disable	0	
		1/0/16	1	1	Admit All	Disable	Disable	0	
		1/0/17	1	1	Admit All	Disable	Disable	0	
		1/0/18	1	1	Admit All	Disable	Disable	0	
		1/0/19	1	1	Admit All	Disable	Disable	0	
		1/0/20	1	1	Admit All	Disable	Disable	0	
		1/0/21	10	10	Admit All	Disable	Disable	0	
		1/0/22	1	1	Admit All	Disable	Disable	0	
		1/0/23	1	1	Admit All	Disable	Disable	0	
		1/0/24	1	1	Admit All	Disable	Disable	0	
		1/0/25	1	1	Admit All	Disable	Disable	0	
		1/0/26	1	1	Admit All	Disable	Disable	0	
	101	1/0/27	1	0	Admit All	Disable	Disable	0	
		1/0/28	1	0	Admit All	Disable	Disable	0	



Switch – M4100-50-POE

1. Create the VLAN interfaces for the three subnets. Choose **Switching > VLAN > Advanced > VLAN Configuration**. Declare each VLAN ID and click **ADD** after each one.

NETGE Connect with Innovat	AR'								ProSafe 4 Intelligent Edg	4100-50-POE 8 port FastEthernet L2+ e PoE Managed Switch
System	Switching	Rout	ing QoS	Security	Monitoring	Maintenance	Help	Index		LOBOUT
VIAN : Auto	V-ID : CTD :	Multicent		Ideau Tabla i Dae		mannenance	marp	moux		
TAIN AUTO	woir : air :	Municasi	i wirk i Ad	ioness toble : Por	IS DAG					
> Basic		VLAN (Configuration							
* Advanced		Rese	YT.				G	0		
		Parat C	anfiguration		100					
» VLAN Memb	ership	resser co	oningeration							
» VLAN Status		Inter	rnal VLAN Confi	juration			(1			
 Port PVID Configuration 		Internal	VLAN Allocation [ase	4093			1		
» MAC Based	VLAN	Interna	VLAN Allocation F	olicy	Ascending	Descending				
» Protocol Bas	ed									
VLAN Group		. VLAN	N Configuration				(7	0		
 Protocol Bas 	n ied	VL	AN ID VLAN Na	ne	VLAN Type	Make Stati	2			
VLAN Group						Disable 💌	1			
Membership		1	default		Default	Disable	9			
» IP Subnet B VLAN	ased	2	Auto VoIP		AUTO VoIP	Disable		í.		
» Port DVLAN		5	VLAN0005		Static	Disable		1		
Configuratio	n	10	VLAN0010		Static	Disable		É .		
 Voice VLAN Continuation 		100	VLAN0100		Static	Disable				
» GARP Switch		200	VLAN0200		Static	Disable				
Configuratio	n									
» GARP Port Configuration										
Comgurado										
									ADD DELETE CAN	APPLY



2. Choose **Routing > IP > Basic > IP Configuration** to enable routing globally. Enable Routing Mode and click **APPLY**.

NETGE Connect with Innova	AR.								M4100-50-POE ProSafe 40-port FastEthernet L2+ Intelligent Edge PoE Managed Switch
System	Switching	Routing	QoS	Security	Monitoring	Maintenance	Help	Index	LOGOUT
Routing Table	IP VLAN	ARP Router [Discovery						
* Basic		IP Configur	ration						
	n	: IP Configu	ration					(7)	
 Statistics 		Default Time t	o Live		64				
Advanced		Routing Mode			Enable ()	Disable			
		ICMP Echo Rep	olies		Enable ()	Disable			
		ICMP Redirect	5 14 Tota		Enable ()	Uisable	100017		
		ICMP Rate Lim	it Interval		1000	(U to 214)	403647 ms)		
		Maximum Nevi	t Hoos		1	(1 to 200)			
		Maximum Rout	tes		64				
		Select to confi	gure Global De	fault Gateway					
		Global Default	Gateway		0.0.0.0				
									CANCEL



3. Configure the switch ports. Choose **Switching > VLAN > Advanced > VLAN Membership**. For each of the three VLANs, set all uplink ports to neighboring stacks as T for tagged. For the phone ports, set VLAN 100 as T for tagged and VLAN 200 as U for untagged. Click **APPLY** after configuring the ports for each VLAN.

NETGEAR'						M4100- PreSate 48 port Fad Intelligent Edge PoE Man	50-POE IEthernet L2+ naged Switch
System Switching	Routing	QoS Se	curity Monitoring	Maintenance	Help Index	C	LOGOUT
VLAN Auto-VolP STP	Multicost A	WVR Address Tol	ble Ports LAG				
> Basic	VLAN Mem	bership Nbership			1		ŕ
Configuration	VLAN ID	100 💌	Grou	p Operation Untag	All 💌		
 VLAN Membership VLAN Status 	VLAN Name	VLAN0100	UNT	AGGED PORT MEMBERS			
» Port PVID	VLAN Type	Static		GGED PORT MEMBERS			
Configuration » MAC Based VLAN	• Unit 1						
» Protocol Based	TT	4 3 6 7 8	9 10 11 12 13 14 1	5 16 17 18 19 20	11 11 13 14		
VLAN Group Configuration	25 26 2	7 28 29 30 31 3	2 33 34 35 36 37 38 3	9 40 41 42 43 44	45 46 47 48		
» Protocol Based	49 50						
VLAN Group	Т						
» IP Subnet Based	LAG						
VLAN							
» Port DVLAN Configuration							
» Voice VLAN							
Configuration » GARP Switch							=
Configuration							-
» GARP Port Configuration							
Configuration							
							-
						CANCEL	APPLY



 Configure the PVID for the data VLAN to pass through the phone's internal switch. Choose Switching > VLAN > Advanced > Port PVID Configuration. For all of the phone ports, set Configured PVID to 200 for the data VLAN. Click APPLY.

ETGEAR nect with Innovation "									M4100-5 ProSate 4Pport Fault Intelligent Edge PoE Mana
System Switching		Routing	QoS	Security	Monitoring	Mainten	ance	Help Index	e e e e e e e e e e e e e e e e e e e
Auto-VolP STP	Mult	icast MV	/R Address	Table Pa	orts LAG				
	Por		onfiguratio	n					
dvanced			omgurudo						
VLAN		PVID Config	juration					٢	
Configuration	1	LAGS All		Go	To Interface		0		
VLAN Membership			Configured	Current	Acceptable	Configured	Current		
Port PVID		Interface	PVID	PVID	Frame	Ingress	Ingress	Port Priority	
Configuration					Types	Fittering	Fittering		
MAC Based VLAN					-				
Protocol Based		0/1	200	200	Admit All	Disable	Disable	0	
Configuration		0/2	200	100	Admit All	Disable	Disable	0	
Protocol Based		0/3	1	1	Admit All	Disable	Disable	0	
VLAN Group		0/4	1	1	Admit All	Disable	Disable	0	
Membership		0/5	1	1	Admit All	Disable	Disable	0	
IP Subnet Based		0/6	1	1	Admit All	Disable	Disable	0	
Port DVLAN		0/7	1	1	Admit All	Disable	Disable	0	
Configuration		0/8	1	1	Admit All	Disable	Disable	0	
Voice VLAN		0/9	1	1	Admit All	Disable	Disable	0	
Configuration		0/10	1	1	Admit All	Disable	Disable	0	
GARP Switch		0/11	1	1	Admit All	Disable	Disable	0	
GARP Port		0/12	1	1	Admit All	Disable	Disable	0	
Configuration		0/13	1	1	Admit All	Disable	Disable	0	
		0/14	1	1	Admit All	Disable	Disable	0	
		0/15	1	1	Admit All	Disable	Disable	0	
		0/16	1	1	Admit All	Disable	Disable	0	
		0/17	1	1	Admit All	Disable	Disable	0	
		0/18	1	1	Admit All	Disable	Disable	0	
		0/19	1	1	Admit All	Disable	Disable	0	
		0/20	1	1	Admit All	Disable	Disable	0	
		0/21	1	1	Admit All	Disable	Disable	0	
		0/22	1	1	Admit All	Disable	Disable	0	
		0/23	1	1	Admit All	Disable	Disable	0	
		0/24	1	1	Admit All	Disable	Disable	0	
		0/25	1	1	Admit All	Disable	Disable	0	
		0/26	1	1	Admit All	Disable	Disable	0	
		0/27	1	1	Admit All	Disable	Disable	0	
		0/28	1	1	Admit All	Disable	Disable	0	
	100	0/20			Adoubt All	Disable	Disable	0	


 Enable the voice VLAN feature globally. Choose Switching > VLAN > Advanced > Voice VLAN Configuration. Enable Admin Mode and select all interfaces to support phones. Change the Interface Mode to VLAN ID and set Value to voice VLAN 100. Click APPLY to commit the changes.

_							
Lio Lio	ce Help Index	g Maintenand	rity Monitorin	QoS Secu	Routing	tching	System Switchi
			Ports LAG	R Address Toble	icast MV	STP Mul	LAN Auto-VolP S
				Configuration	ce VLAN (Voi	
							dvanced
	(1)			Global Admin	Voice VLAN		VLAN
		e 🔘 Enable	O Disabl		min Mode	Ad	Configuration
				Conflorentian	1-1 1/1 A.M.		VLAN Membership VLAN Status
	س			Configuration	VOICE VLAN		Port PVID
		GO	To Interface	Gu	All	1	Configuration
	le Operational State	CoS Overrid	Value	Interface Mode	Interface		Protocol Based
		noue					VLAN Group
							Configuration
	Enable	Disable	100	VLAN ID	0/1		Protocol Based
	Disable	Disable	0	Disable	0/2		Membership
	Disable	Disable	0	Disable	0/3		IP Subnet Based
	Disable	Disable	0	Disable	0/4		VLAN
	Disable	Disable	0	Disable	0/5		Port DVLAN
	Disable	Disable	0	Disable	0/6		Voice VLAN
	Disable	Disable	0	Disable	0/7		Configuration
	Disable	Disable	0	Disable	0/8		GARP Switch
	Disable	Disable	0	Disable	0/9		Configuration
	Disable	Disable	0	Disable	0/10		Configuration
	Disable	Disable	0	Disable	0/11		
	Disable	Disable	0	Disable	0/12		
	Disable	Disable	0	Disable	0/13		
	Disable	Disable	0	Disable	0/14		
	Disable	Disable	0	Disable	0/15		
	Disable	Disable	0	Disable	0/15		
	Disable	Disable	0	Disable	0/17		
	Disable	Disable	0	Disable	0/10		
	Disable	Disable	0	Disable	0/19		
	Disable	Disable	0	Disable	0/20		
	Disable	Disable	0	Disable	0/22		
	Disable	Disable	0	Disable	0/22		
	Disable	Disable	0	Disable	0/23		
	Disable	Disable	0	Disable	0/25		
	Disable	Disable	0	Disable	0/26		



To queue and prioritize VoIP traffic properly, change the 802.1p queue mapping. Choose QoS > CoS > Advanced > 802.1p to Queue Mapping. Select All from the Interface Selection drop-down menu and change the Queue value to 5 for 802.1p Priority 5. Click APPLY.

NETGEAR Connect with Innovation								P Intelly	M4100-50-POE toSafe 48-port FastEthernet L2+ sent Edge PoE Managed Switch
System Switchi	ng Routing	QoS	Security	Monitoring	Maintenance	Help	Index		LOGOUT
CoS DiffServ									
> Basic	802.1p to (Queue Map	ping						
 Advanced CoS Configuration 	Interface :	Selection				0)		
» 802.1p to Queue Mapping	Interface			0/1					
» IP DSCP Queue Mapping	a 802.1p to	Queue Mappi	ng			C			
 CoS Interface Configuration Interface Queue 	802.1p Priority Queue	, 0 1 1.	2 0 • 0 •	3 4 1 2	5 6 5 3	7 • 3•			
Configuration									



 Assign queue priority to the phone ports. Choose QoS > CoS > Advanced > Interface Queue Configuration. Select all phone ports, change the Queue ID to 5, and change the Scheduler Type to Strict. Click APPLY.

ETGEAR'							M4100-50- ProSafe 48-port FastEther Intelligent Edge PoE Managed
vstem Switchin	a Routi	ng	QoS	Security	Monitorina Main	tenance Help Index	LOG
S DiffServ	3				a		
sic	Interfa	ce Quei	ue Cor	nfiguration			
Ivanced	Inter	ace Que	ue Conf	iguration		0	
802.1p to Queue	1 LAGS	All		Go To I	terface	GO	
Mapping	Teste	Q	ueue	Minimum	Schurdeden Torre	Owner Newsymmetry Territory	
Apping	-	TIACE I	D	Bandwidth	scheduler Type	Queue Hanagement Type	
oS Interface					Strict 💌		
iterface Queue	0/1	5		0	Weighted	TailDrop	
onfiguration	0/2	5		0	Weighted	TailDrop	
	0/3	5		0	Weighted	TailDrop	
	0/4	5		0	Weighted	TailDrop	
	0/5	5		0	Weighted	TailDrop	
	☑ 0/6	5		0	Weighted	TailDrop	
	0/7	5		0	Weighted	TailDrop	
	0/8	5		0	Weighted	TailDrop	
	0/9	5		0	Weighted	TailDrop	
	0/10	5		0	Weighted	TailDrop	
	0/11	. 5		0	Weighted	TailDrop	
	0/12	5		0	Weighted	TailDrop	
	0/13	5		0	Weighted	TailDrop	
	0/14	5		0	Weighted	TailDrop	
	0/15	5		0	Weighted	TailDrop	
	0/10	5		0	Weighted	TailDrop	
	0/1/	5		0	Weighted	TailDrop	
	0/18	5		0	Weighted	TailDrop	
	0/19	5		0	Weighted	TailDrop	
	0/20	5		0	Weighted	TailDrop	
	0/21	5		0	Weighted	TailDrop	
	0/22	5		0	Weighted	TailDrop	
	0/23	5		0	weighted	TailDrop	
	0/24			0	Weighted	TailDrop	
	0/25	5		0	Weighted	TailOrep	
	0/20	5		0	Weighted	Tailoren	
	0/2/	5		0	Weighted	Tailbren	
	0/28	5			Weighted	Tailbrop	
	0/29	5		0	Weighted	raibrop	



8. Enable the DiffServ feature. Choose QoS > DiffServ > Advanced > DiffServ Configuration. Enable DiffServ Admin Mode and click APPLY.

NETGE Connect with Innova	AR'									M4100-50-POP ProSafe 48-port FastEthernet L2 Intelligent Edge PoE Managed Swite
System	Switching	Routing	QoS	Security	Monitoring	Maintenance	Help	Index		LOGOUT
CoS DiffSer	v									
		DiffServ Co	nfiguratio							
 Diffserv Wiz Basic 	ard									
~ Advanced		DiffServ Co	ontiguration				Q	D		
	n	DiffServ Admir	Mode		Uisable 🧿	Enable				
» Class		Status					(0		
 Configuratio » IPv6 Class 	n	MIB Table			Current Size	Max 9	lize			
Configuratio	n	Class Table			0	32				
 Policy Configuration 		Class Rule tabl	c		0	192				
 Service Inte 	rface	Policy table			0	64				
Configuratio	n	Policy Instance	table		0	768				
 » Service Stat 	istics	Policy Attribute	s table		0	2304				
										CANCEL



9. Create a DiffServ class for the DiffServ policy and queue VoIP traffic on the protocol level. Choose **QoS > DiffServ > Advanced > Class Configuration**. Enter the VoIP class name, change the Class Type to All, and click **ADD**. When the class is created, click athe class to open the VoIP class configuration page.

NETGE Connect with Innova	AR'								M4100-50-POE ProSafe 40-port Faulthermet L2+ Intelligent Edge PoE Managed Switch
System	Switching	Routing	QoS	Security	Monitoring	Maintenance	Help	Index	LOGOUT
CoS DiffSe	rv								
 Diffserv Wiz Basic Advanced Diffserv 	ard	Class Name Class Name			lace tune		Q	D	
Configuratio	in		18						
 Class Configuration 	in i	class voip		,	All				
 » IPv6 Class Configuration 	'n								
 Policy Configuration 	n								
 Service Inte Configuration 	erface in								
» Service Sta	tistics								
									ADD DELETE CANCEL APPLY



10. On the VoIP class configuration page, notice the various settings that can be applied to the class. Click Protocol Type and select UDP from the drop-down menu. Click **APPLY**. Then click IP DSCP and select EF from the drop-down menu. Click **APPLY**. Next, click Class of Service and select 5 from the drop-down menu. Click **APPLY**.

NETGEA Connect with Innovation	R.					M4100-50-PC ProSafe 40-port FastEthernet I Intelligent Edge PoE Managed Swi
System 5	Switching	Routing QoS	Security Monitoring	Maintenance	Help Index	LOGOUT
CoS DiffServ						
Diffcom Withow	4	Class Configuration				
> Basic	·	Class Information				
 Advanced DiffServ 		Class Name	class voin			
Configuration		Class Type	All			
» IPv6 Class		:: DiffServ Class Configu	ation		0	
Configuration » Policy		Match Every	Any 📼			
Configuration		Reference Class	Ţ			
 Service Interface Configuration 	ce	Class Of Service	0 🖵			
 » Service Statisti 	ics	💮 VLAN	(1 to 4093)			
		Secondary Class of Service				
		Ethernet Type	Appletalk	(600 to (((how))		
		Source MAC		(000 to millex)		
		Destination MAC	Address	Mask		
		Protocol Type	ICMD (0 to 255	Plase		
		Source IP	Address	Mack		
		Source 14 Port	domain - (0 to 6	(525)		
		Destination IP	Address	Mask		
		Destination L4 Port	domain v (0 to 65	(535)	_	
		IP DSCP	af11 (0 to 63)			
		Precedence Value	0 y (0 to 7)			
		IP TuS	Bit Value	Bit Mask		
		:: Class Summary			0	
		Match Criteria		Values		
		IP DSCP		17(udp) 46(ef)		
						CANCEL



11. Apply the class to a policy map. To create the policy map, choose **QoS** > **DiffServ** > **Advanced** > **Policy Configuration**. Enter the VoIP policy name, change the Policy Type to In, and change the Member Class to the VoIP class you created. Click **ADD**. When the policy is created, click the VoIP policy to enter its configuration page.

NETGE Connect with Innoval	AR'								M4100-50-POE ProSofe 40-port Faulthernet L2+ Intelligent Edge PoE Managed Switch
System	Switching	Routing	QoS	Security	Monitoring	Maintenance	Help	Index	LOGOUT
CoS DiffSer	v								
> Diffserv Wiz	ard	Policy Confi	guration						
> Basic > Advanced		Policy Conf	figuration				(D	
» DiffServ		Policy Na	me	Policy Type	3	Member Class			
Configuratio » Class	n								
Configuratio	n	pol voip		In		class voip			
 IPv6 Class Configuratio 	n								
* Policy									
 Service Inte 	n rface								
Configuratio	n								
- Service Stat	istics								
									ADD DELETE CANCEL APPLY



12. On the VoIP policy configuration page, change the Assign Queue value to 5 and click **APPLY**.

NETGEAR Connect with Innovation [®]						M4100-50-POE ProStife 48-port FostEthernet 12+ Intelligent Edge PoE Managed Switch
System Switching	Routing QoS	Security Monitoring	Maintenance	Help Index		LOGOUT
CoS DiffSorv		,				
> Diffserv Wizard > Basic	Policy Class Configur	ation				ŕ
* Advanced	Class Information				0	
Configuration	Policy Name		pol_voip			
» Class	Policy Type		In class weig			
> IPv6 Class	Hember Class Name		class_voip			
Configuration	Policy Attribute				0	
 Folicy Configuration Service Interface 	Policy Attribute 💿 Assign Q 💮 Drop	lueue 5 💌				
Configuration	Mark VL/	AN CoS 0 🚽				
» Service Statistics	Mark Cos	S As Secondary CoS				
	Mark IP	Precedence 0 -				-
	Mark IP Ginnels D	DSCP af11 v				
	- Simple P	Color Mode	Color Blind			
		Comitted Rate				
		Comitted Burst Size				
		Conform Action	Send			
			O Drop	0		
			Mark CoS As Seco	ndary CoS		
			Mark IP Preceden	ce 0 -		
			Mark IP DSCP	af11 - 1	10	
		Violate Action	() Send			
			Drop			
			Mark CoS As Seco	ndary CoS		
			Mark IP Preceden	ce 0 -		
			Mark IP DSCP	af11 🚽 1	10	
	🖱 Two Rate	•				
		Color Mode	Color Blind			
		Comitted Rate				
		Comitted Burst Size	•			
		Peak Rate				
		Conform Action	(ā) Send			-
						CANCEL APPLY



13. Apply the policy to all the phone ports. Choose **QoS** > **DiffServ** > **Advanced** > **Service Interface Configuration**. Select all phone ports and change the Policy In Name to the VoIP policy created. Click **APPLY**.

NETGEAR'					M4100-50-P ProSafe 40-port FastEthern Intelligent Edge PoE Managed 3
System Switching	g Routing QoS	Security Ma	onitoring	Maintenance Help Index	(1060
CoS DiffServ					
Diffserv Wizard	Service Interface	Configuration			
Basic	Service Interface	Configuration		(1)	
» DiffServ	1 LAGS All	Go To Interfa	ce	GO	
Configuration » Class	Interface	Policy In	Direction	Operational Status	
Configuration		Name			
Configuration		poi_voip 💌			
 Policy 	0/2				
Configuration	0/2				
 Service Interface Configuration 	0/4				
» Service Statistics	0/5				
	0/6				
	0/7				
	0/8				
	0/9				
	0/10				
	0/11				
	0/12				
	0/13				
	0/14				
	0/15				
	0/16				
	0/17				
	☑ 0/18				
	0/19				
	☑ 0/20				
	0/21				
	♥ 0/22				
	0/23				
	0/24				
	0/25				
	0/26				
	0/27				
	0/28				
	0/29				



Switch - M5300-52G3

1. Create VLAN interfaces for the three subnets. Choose **Switching > VLAN > Advanced > VLAN Configuration**. Declare each VLAN ID and click **ADD** after each one.

NETGEA Connect with Innovation	R'									M5300-28G3 ProSafe 24-port L3 itackable GE Switch with L3 Routing
System Sv	witching	Routing	QoS	Security	Monitoring	Maintenance	Help	Index		LOGOUT
VLAN Auto-Vol	P i iSCSI	STP Multic	ost i MVR	Address Tab	ole i Ports i LAG					
System St VLAN Auto-Vol > Basic * Advanced > VLAN Configuration > VLAN Hendrey > VLAN Hendrey > VLAN Hendrey > Port FVID Configuration > Portocol Based VLAN > Protocol Based VLAN > Port DVLAN Configuration > Voice VLAN Configuration > Configuration Galage Switch Configuration GARP Port Configuration Galage Port	P iSCSI	Routing STP Multic VLAN Confi Reset Reset Configur Internal VLAN Internal VLAN VLAN ID VLAN CON VLAN CON 1 2 5 10 100 200	GoS ati AVX guration ation LAN Configur Allocation Bas Allocation Bas Allocation Bas Allocation Bas Allocation Bas default Auto VoIP VLAN Nome VLAN Nome VLAN 0005 VLAN0005 VLAN0100 VLAN0200	Security Address Tot	Monitoring No Ports LAG	Maintenance Maintenance Descending Descending Disable Disable Disable Disable Disable Disable Disable Disable	Help () ()			
									ADD DELET	E CANCEL APPLY



2. Choose Routing > IP > Basic > IP Configuration to enable routing globally. Enable Routing Mode and click APPLY.

NETGE Connect with Innovat	AR'										Stac	M5300 ProSafe : kable GE Switch with)-28G3 24-port L3 L3 Routing
System	Switching	Routing	QoS	Security	Monitoring	Mai	ntenance	Help	Index			10	GOUT
Routing Table	IP IPv6	VLAN ARP	RIP OSPF	OSPFv3	Router Discovery	VRRP	Multicast	IPv6 Multicast					
* Basic		IP Configu	ration										
	,	IP Config	uration					¢	D				
» Statistics		Default Time	to Live		64								
Advanced		Routing Mode	1		🔘 Enable 🔘	Disable							
		ICMP Echo Re	plies		💿 Enable 💮	Disable							
		ICMP Redirect	ts		🔘 Enable 🖲	Disable	_						
		ICMP Rate Lin	nit Interval		1000		(0 to 214	17483647 ms)					
		ICMP Rate Lin	nit Burst Size		100		(1 to 20	0)					
		Maximum Nex	ct Hops		4								
		Maximum Rou	ites		6112								
		Select to conf	figure Global De	fault Gateway			_						
		Global Defaul	t Gateway		0.0.0.0								
												CANCEL	PLY

NETGEAR[®]

3. Enable the voice VLAN feature globally. Choose **Switching > VLAN > Advanced > Voice VLAN Configuration**. Enable Admin Mode and click **APPLY**.

ETGEAR nnect with Innovation ⁻							M530 ProSott Stackable GE Swech wit
System Switchin	ng	Routing	QoS Secu	rity Monitorin	g Maintenance	Help	Index
VLAN Auto-VolP iS	SCSI ST	P Multicos	t MVR Ad	dress Toble Ports	LAG		
			o (î				
Basic	VO	ce vlan	Configuration				
• VLAN		Voice VLAN	Global Admin			Ō	
Configuration	Ad	min Mode		💮 Disəb	le 🔘 Enable		
VLAN Membership	_						
Port PVID		Voice VLAN	Configuration			0	
Configuration	1	All	Ge	To Interface	GO		
MAC Based VLAN Protocol Based		Interface	Interface Mode	Value	CoS Override	Operational	
VLAN Group	_				Mode	State	
Configuration							
Protocol Based		1/0/1	Disable	0	Disable	Disable	
Membership		1/0/2	Disable	0	Disable	Disable	
IP Subnet Based		1/0/3	Disable	0	Disable	Disable	
VLAN		1/0/4	Disable	0	Disable	Disable	
Port DVLAN		1/0/5	Disable	0	Disable	Disable	
Voice VLAN		1/0/6	Disable	0	Disable	Disable	
Configuration		1/0/7	Disable	0	Disable	Disable	
GARP Switch		1/0/8	Disable	0	Disable	Disable	
Configuration		1/0/9	Disable	0	Disable	Disable	
GARP Port		1/0/10	Disable	0	Disable	Disable	
Comguration		1/0/11	Disable	0	Disable	Disable	
		1/0/12	Disable	0	Disable	Disable	
		1/0/13	Disable	0	Disable	Disable	
		1/0/14	Disable	0	Disable	Disable	
		1/0/15	Disable	0	Disable	Disable	
		1/0/16	Disable	0	Disable	Disable	
		1/0/17	Disable	0	Disable	Disable	
		1/0/18	Disable	0	Disable	Disable	
		1/0/19	Disable	0	Disable	Disable	
		1/0/20	Disable	0	Disable	Disable	
		1/0/21	Disable	0	Disable	Disable	
		1/0/22	Disable	0	Disable	Disable	
		1/0/23	Disable	0	Disable	Disable	
		1/0/24	Disable	0	Disable	Disable	
		1/0/25	Disable	0	Disable	Disable	
		1/0/26	Disáble	0	Disable	Disable	



4. Configure the switch ports. Choose **Switching > VLAN > Advanced > VLAN Membership**. For each of the three VLANs, set all uplink ports to neighboring stacks as T for tagged. For the other endpoints, set all ports to U for untagged on VLAN 200. Click **APPLY** after configuring the ports for each VLAN.

NETGEAR Connect with Innovation								M5300-28G3 ProSafe 24-port L3 Stackable GE Switch with L3 Routing
System Switching	Routing	QoS	Security	Monitoring	Maintenance	Help	Index	LOGOUT
VLAN Auto-VolP iSCSI	STP Multica	st MVR	Address To	ble Ports LAG				
> Basic ~ Advanced	VLAN Meml	bership						Î.
» VLAN Configuration	VLAN Mem	bership		C	Ormation Units		(1)	
» VLAN Membership	VIAN Name	VI AN0200		Group	ODED PORT MEMBERS			
» VLAN Status » Port PVID	VI AN Type	Static		TAC	GED PORT MEMBERS			
Configuration	• Unit 1							
 MAC Based VLAN Protocol Based 	Port 1 2 3	4567	8 9 10	11 12 13 14 15	5 16 17 18 19 20	21 22 23 2	24	
VLAN Group Configuration	25 26 27	28						
» Protocol Based	LAG							
VLAN Group Membership		·····					-	
» IP Subnet Based								
> Port DVLAN								
Configuration								
» Voice VLAN Configuration								
» GARP Switch								
Configuration								
Configuration								
								 CANCEL APPLY



5. Configure the PVID for the endpoints on the data VLAN. Choose **Switching > VLAN > Advanced > Port PVID Configuration**. For all of the phone ports, set Configured PVID to 200 and click **APPLY**.

TGEAR' with Innovation									M530 ProSal Stackable GE Switch w/
stem Switchir	ng	Routing	QoS	Security	Monitoring	Mainten	ance	Help Index	0
N Auto-VolP iS	SCSI ST	P Multicas	t MVR	Address To	able Ports LA	G			
c	Por	rt PVID C	onfiguratio	n					
anced		PVID Config	juration					(7)	
figuration	1			Ge	To Interface		0		
N Membership	-				Acceptable	Configured	Current		
N Status		Interface	Configured	Current	Frame	Ingress	Ingress	Port Priority	
t PVID figuration			PVID	PVID	Types	Filtering	Filtering		
C Based VLAN									
tocol Based		1/0/1	200	200	Admit All	Disable	Disable	0	
N Group		1/0/2	1	1	Admit All	Disable	Disable	0	
figuration		1/0/3	1	1	Admit All	Disable	Disable	0	
N Group		1/0/4	1	1	Admit All	Disable	Disable	0	
bership		1/0/5	1	1	Admit All	Disable	Disable	0	
ubnet Based		1/0/5	1		Admit All	Disable	Disable	0	
N		1/0/0	-		Admit All	Disable	Disable	0	
DVLAN		1/0/7	1	1	Admit All	Disable	Disable	0	
figuration		1/0/8	1	1	Admit All	Disable	Disable	0	
E VLAN figuration		1/0/9	1	1	Admit All	Disable	Disable	0	
RP Switch		1/0/10	1	1	Admit All	Disable	Disable	0	
figuration		1/0/11	1	1	Admit All	Disable	Disable	0	
RP Port		1/0/12	1	1	Admit All	Disable	Disable	0	
figuration		1/0/13	1	1	Admit All	Disable	Disable	0	
		1/0/14	1	1	Admit All	Disable	Disable	0	
		1/0/15	1	1	Admit All	Disable	Disable	0	
		1/0/16	1	1	Admit All	Disable	Disable	0	
		1/0/17	1	1	Admit All	Disable	Disable	0	
		1/0/18	1	1	Admit All	Disable	Disable	0	
		1/0/19	1	1	Admit All	Disable	Disable	0	
		1/0/20	1	1	Admit All	Disable	Disable	0	
		1/0/21	1	1	Admit All	Disable	Disable	0	
		1/0/22	1	1	Admit All	Disable	Disable	0	
		1/0/23	1	1	Admit All	Disable	Disable	0	
		1/0/24	1	1	Admit All	Disable	Disable	0	
		1/0/25	1	1	Admit All	Disable	Disable	0	
		1/0/26	1	1	Admit All	Disable	Disable	0	
		1/0/27	1	0	Admit All	Disable	Disable	0	
	103	1/0/29		0	Admit All	Disable	Disable	0	
		1/0/20	1	0	Addition Add	Disable	Disable	0	



CONFIGURATION FOR THE 1000-PHONE SOLUTION

Refer to Figure 3 for a diagram of the solution. You can use the CLI or Web GUI for configuration.

Assumptions for the 1000-Phone Solution

- A DHCP server on the switch will be used. If a third-party DCHP solution is used, refer to the vendor's documentation and the documentation for the phone backend to configure DHCP options.
- The VoIP network is a dedicated, isolated network with a single uplink to the customer's enterprise network.
- VoIP backend systems will be protected by security measures local to the individual systems. ACLs can be used to further restrict access but are not configured in this application note. Visit support.netgear.com for further information.
- The tested VoIP phones have an internal switch to support a second device connected to a secondary port on the phone, allowing a voice and data VLAN to be configured on the switch port.
- Tested phones are SIP-enabled Cisco 79x5 series phones, and the tested PBX system is an AsteriskNOW VM installation. Refer to vendor documentation for further configuration guidance on these platforms.
- Best practices are used to implement switch stacking and failover/redundancy.
- Layer 3 licenses have been installed on switches when necessary.

Global Configuration Notes

- Be sure to save your configuration using the save or write memory CLI command. Alternatively, choose Maintenance > Save Config in the GUI. Select the box, and click APPLY.
- Physical interfaces are referred to interfaces and ports interchangeably throughout this document.
- While the LLDP MED discovery protocol utilizes network policies, there is only one network policy available on these switches already assigned to the voice Vlan.
- While the management VLAN is used as the Layer 3 route between the switches in this application note, a separate VLAN can be used to further isolate communication.
- VoIP backend systems will be protected by security measures local to the individual systems. ACLs can be used to further restrict access but are not configured in this application note. Please visit support.netgear.com for further information.
- The default OSPF area ID is 0.0.0.0 but is stressed for technical purposes in this application note for more complex environments.
- While M5300-28G3 switches are used for illustrative purposes instead of the M5300-52G3 switches in the design, all configuration and features apply.



Sample Configuration Values

The following values are used in the sample configuration:

- Management VLAN: 5
- Management VLAN subnet: 192.168.10.0/24
- Infrastructure VLAN: 10
- Infrastructure VLAN subnet: 192.168.1.0/24
- Voice VLAN: 100
- Voice VLAN subnet: 192.168.100.0/24
- Data VLAN: 200
- Data VLAN subnet: 192.168.200.0/24



CLI Configuration Steps: 1000-Phone Solution

These steps provide an example CLI configuration for the 1000-phone solution. For the Web GUI configuration, see Web GUI Configuration Steps: 1000-Phone Solution on page 59.

Switch – XSM7224S

 Create all of the VLAN interfaces on the XSM7224S stack and trunk them out to the neighboring stacks as necessary. Allocate VLANs and subnets as follows: management VLAN 5 (10.10.10.0/24) infrastructure VLAN 10 (192.168.1.0/24), voice VLAN 100 (192.168.100.0/22), and data VLAN 200 (192.168.200.0/21).

(XSM7224S)	#vlan data
(XSM7224S)	(Vlan)#vlan 5,10,100,20
(XSM7224S)	(Vlan)#vlan routing
(XSM7224S)	(Vlan)#vlan routing 1
(XSM7224S)	(Vlan)#vlan routing 10
(XSM7224S)	(Vlan)#vlan routing 20
(XSM7224S)	(Vlan) #exit
(XSM7224S)	#configure
(XSM7224S)	(Config)#interface vlan 5
(XSM7224S)	(Interface vlan 5)#ip address 10.10.10.1 255.255.255.0
(XSM7224S)	(Interface vlan 5) #routing
(XSM7224S)	(Interface vlan 5) #exit
(XSM7224S)	(Config)#interface vlan 10
(XSM7224S)	(Interface vlan 10)#ip address 192.168.1.1 255.255.255.0
(XSM7224S)	(Interface vlan 10) #routing
(XSM7224S)	(Interface vlan 10) #exit
(XSM7224S)	(Config)#interface vlan 100
(XSM7224S)	(Interface vlan 100)#ip address 192.168.100.1 255.255.252.0
(XSM7224S)	(Interface vlan 100) #routing
(XSM7224S)	(Interface vlan 100)#exit
(XSM7224S)	(Config)#interface vlan 200
(XSM7224S)	(Interface vlan 200) #routing
(XSM7224S)	(Interface vlan 200)#ip address 192.168.200.1 255.255.248.0
(XSM7224S)	(Interface vlan 200)#exit

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2. Enable the built-in DHCP server and set up DHCP pools for the non-management subnets.

```
(XSM7224S) (Config)#service dhcp
(XSM7224S) (Config)#ip dhcp pool pool10
(XSM7224S) (Config-dhcp-pool)#default-router 192.168.1.1
(XSM7224S) (Config-dhcp-pool)#network 192.168.1.0 255.255.255.0
(XSM7224S) (Config-dhcp-pool)#exit
(XSM7224S) (Config-dhcp-pool)#exit
(XSM7224S) (Config-dhcp-pool)#default-router 192.168.100.1
(XSM7224S) (Config-dhcp-pool)#network 192.168.100.0 255.255.255.0
(XSM7224S) (Config-dhcp-pool)#network 192.168.100.0 255.255.255.0
(XSM7224S) (Config-dhcp-pool)#exit
(XSM7224S) (Config-dhcp-pool)#exit
(XSM7224S) (Config-dhcp-pool)#exit
(XSM7224S) (Config-dhcp-pool)#default-router 192.168.200.1
(XSM7224S) (Config-dhcp-pool)#network 192.168.200.0 255.255.255.0
(XSM7224S) (Config-dhcp-pool)#network 192.168.200.0 255.255.255.0
```

3. Add DHCP option 66 to the voice VLAN DHCP pool so that the phones can reach the TFTP server to download necessary firmware and configuration files upon boot-up. In this case, the TFTP server has an IP address of 192.168.1.100.

(XSM7224S)	(Config)#ip dhcp pool pool100
(XSM7224S)	(Config-dhcp-pool) #option 66 ascii 192.168.1.100
(XSM7224S)	(Config-dhcp-pool)#exit

4. Enable IP routing globally.

(XSM7224S) (Config) #ip routing

5. Configure uplink ports to the neighboring switches. Configurations will be the same on both sides of the uplink. Add or remove VLANs as needed. All transported VLANs must be tagged to create the trunk.

```
(XSM7224S) (Config)#interface 1/0/25
(XSM7224S) (Interface 1/0/25)#vlan participation exclude 1
(XSM7224S) (Interface 1/0/25)#vlan participation include 5,10,100,200
(XSM7224S) (Interface 1/0/25)#vlan tagging 5,10,100,200
(XSM7224S) (Interface 1/0/25)#exit
```

6. After trunking the VLANS on the uplinks, configure the stack for OSPF routing. Enable OSPF and configure a router ID that is unique to each stack in the LAN. Configure OSPF to redistribute any connected routes.

(XSM7224S)	(Config)#router ospf
(XSM7224S)	(Config-router) #enable
(XSM7224S)	(Config-router) #router-id 10.10.10.1
(XSM7224S)	(Config-router) #redistribute connected
(XSM7224S)	(Config-router)#exit



```
(XSM7224S) (Config)#interface vlan 5
(XSM7224S) (Interface vlan 5)#ip ospf area 0.0.0.0
(XSM7224S) (Interface vlan 5)#exit
(XSM7224S) (Config)#interface vlan 10
(XSM7224S) (Interface vlan 10)#ip ospf area 0.0.0.0
(XSM7224S) (Interface vlan 10)#exit
(XSM7224S) (Config)#interface vlan 100
(XSM7224S) (Interface vlan 100)#ip ospf area 0.0.0.0
(XSM7224S) (Interface vlan 100)#exit
(XSM7224S) (Interface vlan 200)#ip ospf area 0.0.0.0
(XSM7224S) (Interface vlan 200)#ip ospf area 0.0.0.0
```

8. Configure infrastructure ports. For all VoIP device interfaces, set the configured PVID to infrastructure VLAN 10.

NETGEAR

```
(XSM7224S) (Config)#interface 1/0/21
(XSM7224S) (Interface 1/0/21)#vlan participation exclude 1
(XSM7224S) (Interface 1/0/21)#vlan participation include 10
(XSM7224S) (Interface 1/0/21)#vlan pvid 10
(XSM7224S) (Interface 1/0/21)#exit
(XSM7224S) (Config)#exit
```

Switch – M5300-52G-POE+

 Move to the M5300-52G-POE+ stacks to replicate the configuration on each one. Start by declaring VLANs 5, 10, 100, and 200.

```
(M5300-52G-POE+) #vlan database
(M5300-52G-POE+) (Vlan)#vlan 5,10,100,200
(M5300-52G-POE+) (Vlan)#exit
```

2. Enable routing and configure the management VLAN interface to be able to participate in OSPF routing. In this example, the switch has IP address 10.10.10.5.

```
(M5300-52G-POE+) #vlan database
(M5300-52G-POE+) (Vlan)#vlan routing 5
(M5300-52G-POE+) (Vlan)#exit
(M5300-52G-POE+) #configure
(M5300-52G-POE+) (Config)#vlan interface 5
(M5300-52G-POE+) (Interface vlan 5)#routing
(M5300-52G-POE+) (Interface vlan 5)#ip address 10.10.10.5 255.255.255.0
(M5300-52G-POE+) (Interface vlan 5)#ip
```



3. Enable IP routing.

(M5300-52G-POE+) #configure (M5300-52G-POE+) (Config)#ip routing

4. Configure the uplink to the XSM7224S stack. Remember both sides of the uplink must have the same configuration. All transported VLANs must be tagged to create the trunk.

```
(M5300-52G-POE+) (Config)#interface 1/0/49
(M5300-52G-POE+) (Interface 1/0/49)#vlan participation exclude 1
(M5300-52G-POE+) (Interface 1/0/49)#vlan participation include 5,10,100,200
(M5300-52G-POE+) (Interface 1/0/49)#vlan tagging 5,10,100,200
(M5300-52G-POE+) (Interface 1/0/49)#exit
```

5. After trunking the VLANs on the uplinks, configure the stack for OSPF routing. Enable OSPF and configure a router ID that is unique to each stack in the LAN. Configure OSPF to redistribute any connected routes.

(M5300-52G-POE+)	(Config)#router ospf
(M5300-52G-POE+)	(Config-router) #enable
(M5300-52G-POE+)	(Config-router) #router-id 10.10.10.5
(M5300-52G-POE+)	(Config-router) #redistribute connected
M5300-52G-POE+)	(Config-router)#exit

6. Configure the correct OSPF area ID for the management VLAN interfae.

```
(M5300-52G-POE+) (Config)#interface vlan 5
(M5300-52G-POE+) (Interface vlan 5)#ip ospf area 0.0.0.0
(M5300-52G-POE+) (Interface vlan 5)#exit
```

7. Raise the VoIP traffic priority and enable the voice VLAN feature as on the XSM7224S stack. Send VoIP traffic with a dot1p priority of 5 and map priority 5 to queue 5.

```
(M5300-52G-POE+) (Config)# classofservice dot1p-mapping 5 5
(M5300-52G-POE+) (Config)#cos-queue strict 5
(M5300-52G-POE+) (Config)#voice vlan
```

8. Enable the LLDP-MED discovery protocol, which works in conjuction with the voice VLAN feature to auto-detect a phone on a port and apply the appropriate QoS and voice VLAN.

(M5300-52G-POE+) (Config) #lldp med all



9. Create a Diffserv class map policy to provide QoS for voice traffic on on the phone ports. This policy will be copied onto all stacks in the LAN that support VoIP devices.

(M5300-52G-POE+)	(Config)#diffserv
(M5300-52G-POE+)	(Config)#class-map match-all class_voip
(M5300-52G-POE+)	(Config-classmap)#match protocol udp
(M5300-52G-POE+)	(Config-classmap)#match ip dscp ef
(M5300-52G-POE+)	(Config-classmap) #exit
(M5300-52G-POE+)	(Config)#policy-map pol_voip in
(M5300-52G-POE+)	(Config-policy-map)#class class_voip
(M5300-52G-POE+)	(Config-policy-classmap)#assign-queue 5
(M5300-52G-POE+)	(Config-policy-classmap) #exit
(M5300-52G-POE+)	(Config-policy-map)#exit

10. Configure the phone ports to auto-register on voice VLAN 100 and pass data VLAN 200 to the phone's secondary port. If there is no phone detected on the port, the connected device will use the data VLAN. Make sure to place them in the correct OSPF area. Assign the DiffServ voice policy to the phone ports.

```
(M5300-52G-POE+) (Config)#interface 0/1
(M5300-52G-POE+) (Interface 0/1)#voice vlan 100
(M5300-52G-POE+) (Interface 0/1)#vlan participation exclude 200
(M5300-52G-POE+) (Interface 0/1)#vlan participation include 100,200
(M5300-52G-POE+) (Interface 0/1)#vlan pvid 200
(M5300-52G-POE+) (Interface 0/1)#service-policy in pol_voip
(M5300-52G-POE+) (Interface 0/1)#exit
```

Switch - M5300-52G3

1. Declare the VLANs and enable IP routing and the voice VLAN features globally.

(M5300-52G3) #vlan database (M5300-52G3) (Vlan)#vlan 5,10,100,200 (M5300-52G3) (Vlan)#exit (M5300-52G3) #configure (M5300-52G3) (Config)#ip routing (M5300-52G3) (Config)#voice vlan



2. Enable routing and configure the management VLAN interface to be able participate in OSPF routing. In this example, the management IP address is 10.10.10.10.

```
(M5300-52G3) #vlan database
(M5300-52G3) (Vlan)#vlan routing 5
(M5300-52G3) (Vlan)#exit
(M5300-52G3) #configure
(M5300-52G3) (Config)#vlan interface 5
(M5300-52G3) (Interface vlan 5)#routing
(M5300-52G3) (Interface vlan 5)#ip address 10.10.10.10 255.255.255.0
(M5300-52G3) (Interface vlan 5)#exit
```

3. Configure the uplink to the XSM7224S stack. Both sides of the uplink must have the same configuration. All transported VLANs must be tagged to create the trunk.

```
(M5300-52G3) (Config)#interface 1/0/49
(M5300-52G3) (Interface 1/0/49)#vlan participation exclude 1
(M5300-52G3) (Interface 1/0/49)#vlan participation include 5,10,100,200
(M5300-52G3) (Interface 1/0/49)#vlan tagging 5,10,100,200
(M5300-52G3) (Interface 1/0/49)#exit
```

4. After trunking the VLANs on the uplinks, configure the stack for OSPF routing. Enable OSPF and configure a router ID that is unique to each stack in our LAN. Configure OSPF to redistribute any connected routes.

```
(M5300-52G3) (Config) #router ospf
(M5300-52G3) (Config-router) #enable
(M5300-52G3) (Config-router) #router-id 10.10.10.10
(M5300-52G3) (Config-router) #redistribute connected
```

5. Configure the management VLAN interface with the correct OSPF area ID.

```
(M5300-52G3) (Config)#interface vlan 5
(M5300-52G3) (Interface vlan 5)#ip ospf area 0.0.0.0
(M5300-52G3) (Interface vlan 5)#exit
```

6. Finish the configuration by configuring any ports with the necessary VLAN (data VLAN 200).

```
(M5300-52G3) (Config)#interface 1/0/1
(M5300-52G3) (Interface 1/0/1)#vlan participation exclude 1
(M5300-52G3) (Interface 1/0/1)#vlan participation include 200
(M5300-52G3) (Interface 1/0/1)#vlan pvid 200
(M5300-52G3) (Interface 1/0/1)#exit
(M5300-52G3) (Config)#exit
```



Web GUI Configuration Steps: 1000-Phone Solution

These steps provide an example Web GUI configuration for the 1000-phone solution. For the CLI configuration, see CLI Configuration Steps: 1000-Phone Solution on page 53.

Switch – XSM7224S

 Create VLAN interfaces for the subnets: management (VLAN ID 5), infrastructure (VLAN ID 10), voice (VLAN ID 100), and data (VLAN ID 200). Choose Switching > VLAN > Advanced > VLAN Configuration. Declare each VLAN ID and click ADD after each one.

NETGEAR Connect with Innovation						XSM7224S 24-Port 10G SFP+ Ports Managed L2+ Stackable Switch
System Switching	Routing	QoS Securi	ty Monitoring	Maintenance Help In	dex	
VLAN STP Multicast	Address Table	Ports LAG PFC				
	VI AN Con	figuration				-
> Basic x Advanced	VLAN CON	inguration				
» VLAN	Reset			0		
Configuration » VLAN Membership	Reset Config	uration				
» VLAN Status	: Internal	VLAN Configuration		٢		
* Port PVID	Internal VLA	N Allocation Base	4093			
» MAC Based VLAN	Internal VLA	N Allocation Policy	🔿 Ascending 🔘	Descending		
» IP Subnet Based						
VLAN Port DVLAN	··· VLAN Co	onfiguration		0		
Configuration	VLAN T	D VLAN Name	VLAN Type	Make Static		
» Protocol Based VLAN Group				Disable 🚽		
Configuration	1	default	Default	Disable		
» Protocol Based	5	VLANOOOS	Static	Disable		
VLAN Group Membership	10	VLANDIOD	Static	Disable		
» Voice VLAN	200	VLAN0200	Static	Disable		
Configuration						
Configuration						
» GARP Port						
Configuration						
						ADD DELETE CANCEL APPLY



Choose Routing > VLAN > VLAN Routing. Configure each VLAN interface and enable routing on it. Allocate VLANs and subnets as follows: management VLAN 5 (10.10.10.0/24), infrastructure VLAN 10 (192.168.10.0/24), voice VLAN 100 (192.168.100.0/24), and data VLAN 200 (192.168.200.0/24). Select the VLAN ID and enter the corresponding gateway IP address and subnet mask for each. Click ADD after completing each entry.

System Switching Routing GoS Security Monitoring Routing Toble IP IPv6 VIAN ARP RIP OSPF OSPFv3 Routing Discovery V > VLAN Routing Wizard VLAN Routing Configuration VIAN ID Pert MAC Address IP Address VLAN Routing VIAN ID Pert MAC Address IP Address Image: VLAN Routing Configuration VIAN ID Pert MAC Address IP Address Image: VLAN Routing Configuration VIAN ID Pert MAC Address IP Address Image: VLAN Routing Configuration Image: VIAN ID Pert MAC Address IP Address Image: VLAN Routing Configuration Image: VIAN ID Pert MAC Address IP Address Image: VLAN Routing Configuration Image: VIAN ID Pert MAC Address IP Address Image: VLAN Routing Configuration Image: VIAN ID Pert MAC Address IP Address Image: VLAN Routing Configuration Image: VIAN ID Image: VIAN ID Pert MAC Address IP Address Image: VIAN Routing Configuration Image: VIAN ID		XSM7224S 24-Port 10G SFP+ Ports Managed L2+ Stackable Switch
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> VLAN Routing Wizard > VLAN Routing > VLAN Routing Configuration □ 10 0/4/1 □ 10 0/4/2 00:8E:F2:59:67:36 192:168.200.1	RRP Multicast IPvó Multicast	
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Image: Constraint of the system Image: Constand of the system Image: Constando	Subnet Mask	
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10 0/4/1 00:8E:F2:59:67:36 192.168.1.1 100 0/4/2 00:0E:F2:59:67:36 192.168.100.1 200 0/4/3 00:8E:F2:59:67:36 192.168.200.1	255.255.255.0	
100 0/4/2 00:0E:F2:59:67:36 192.168.100.1 200 0/4/3 00:8E:F2:59:67:36 192.168.200.1	255.255.255.0	
200 0/4/3 00:8E:F2:59:67:36 192.168.200.1	255.255.252.0	
	255.255.248.0	



3. Choose System > Services > DHCP Server > DHCP Server Configuration. Enable Admin Mode and click APPLY. You can also configure any IP address ranges to exclude from the DHCP pools. Click ADD after configuring any excluded ranges for static IP addresses.

NETGEAR Connect with Innovation"		XSM7224S 24-Port 10G SFP+ Ports Managed L2+ Stackable Switch
System Switching	Routing QoS Security Monitoring Maintenance Help Index	LOGOUT
Management : Device View	: Liconso ; Sorvicos ; Stacking ; SNMP ; LLDP ; ISDP	
DHCP Server DHCP Server DHCP Server Configuration DHCP Pool Configuration DHCP Pool Options DHCP Server DHCP Server	DHCP Server Configuration DHCP Server Configuration Admin Mode Disable © Disable © Enable Ping Packet Count Conflict Logging Mode Disable © Disable © Enable Docta Automatic Mode Disable © Enable	
 > DICP Dindings Information > DHCP Conflicts Information > DHCP Relay > DHCP L2 Relay > DHCPK0 Server > DHCPv6 Relay 	Excluded Address IP Range From IP Range To 192.160.1.0 192.160.1.223	
		ADD DELETE CANCEL APPLY



4. Choose System > Services > DHCP Server > DHCP Pool Configuration. Create a pool for each subnet associated with the VLANs. Set Type of Binding to Dynamic and enter the address and gateway for each. Set Default Router Address to the IP of the subnet gateway. Optionally change the lease time. Click ADD.

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Noncysendt Dirke View Lisona Sorkan () Stocking	System	Switching	Routing	QoS	Security	Monitoring	Maintenance	Help	Index		LOGOUT
OHCP Server OHCP Server Configuration DHCP Pool Configuration DHCP Pool Configuration DHCP Pool Configuration Deck Name Configuration DHCP Pool Configuration Deck Name	Management	Device View	License Servi	ices Stacki	ng SNMP	LLDP ISDP					
Lease time Specified Duration Days 1 (0 to 59) Hours 0 (0 to 23) Minutes 0 (0 to 55) * Default Mouter Addresses 192.168.100.1 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0	Management > DHCP Server > DHCP Server Configuration > DHCP Pool (D > DHCP Pool (D > DHCP Pool (D > DHCP Pool (D > DHCP Server Statistics > DHCP Conflet Information > DHCP Conflet Information > DHCP L2 Relay > DHCP L2 Relay > DHCPv6 Serve > DHCPv6 Relay	Device View otions is is is	Ucense Sarvi DHCP Pool Pool Name Type of Dinding Network Mask Network Prefix Client Name Hardware Addi Client ID Host Number Host Namber	configura Config	ng SNMP ation tion	pool100 pool100	(0 to 32)	0			
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NETGEAR Connect with Innovation		XSM7224S 24-Port 100 SFP+ Ports Managed L2+ Stackable Switch
System Switchin	g Routing QoS Security Monitoring Maintenance Help Index	
Management Device Vie	w License Services Stocking SNMP LLDP ISDP	
Atonogement Davice Vie * DHCP Server = DHCP Pool Configuration * DHCP Pool * DHCP Pool * DHCP Pool * DHCP Server Statistice * DHCP Conflicts Information * DHCP Conflicts Information > DHCP Conflicts > DHCP Relay > DHCP Server > DHCP Kelay > DHCP V6 Server > DHCPv6 Server	v Lons Survicus Survicus Survicus NMP LDP ISDP DICP Pool Option Image: Colspan="4">Image: Colspan="4" Image: Colspan="4" Image: Colspan="4	
		ADD DELETE APPLY



6. Choose **Routing > IP > Basic > IP Configuration** to enable routing globally. Enable Routing Mode and click **APPLY**.

NETGEA Connect with Innovation	R'										XSM7224 24-Port 10G SFP+ Port Managed L2+ Stackable Swite
System	iwitching	Routing	QoS	Security	Monitoring	Main	tenance	Help	Index		LOGOUT
Routing Table	P IPv6	VLAN ARP	RIP OSPF	OSPFv3	Router Discovery	VRRP	Multicast	IPv6 Multicast			
v Basic		IP Configu	ation								
		IP Configu	ration						7)		
Configuration * Statistics		Default Time t	o Live		64						
Advanced		Routing Mode			Enable ()	Disable					
		ICMP Echo Rep	olies		Enable ()	Disable					
		ICMP Redirect	5		💮 Enable 🔘	Disable					
		ICMP Rate Lim	it Interval		1000		(0 to 214	7483647 ms)			
		ICMP Rate Lim	it Burst Size		100		(1 to 200)			
		Maximum Nex	t Hops		4						
		Maximum Rou	tes		6112						
		Select to confi	gure Global Def	ault Gateway			_				
											CANCEL



7. Configure the switch ports. Choose **Switching > VLAN > Advanced > VLAN Membership**. For each of the four VLANs, set all uplink ports to neighboring stacks as T for tagged. For the infrastructure ports, set all ports to U for untagged on the infrastructure VLAN. Click **APPLY** after configuring the ports for each VLAN.





8. For infrastructure ports, configure the port PVID. Choose **Switching > VLAN > Advanced > Port PVID Configuration**. Enter infrastructure VLAN ID 10 as the Configured PVID for all infrastructure ports and click **APPLY**.

n Switching		Routing	QoS	Security	Monitoring	Mainten	ance	Help Index		
P Multicast	Addre	aa Table Pa	orta LAG	PFC						
	Port PVID Configuration									
ed	PVID Configuration									
uration	1	LAGS All		Ge	To Interface	6	0			
Membership					Acceptable	Configured	Current			
Status		Interface	PVID	PVID	Frame	Ingress	Ingress	Port Priority		
uration	-				Types	Filtering	Filtering			
ised VLAN										
onet Based		1/0/1	1	1	Admit All	Disable	Disable	0		
DVLAN		1/0/2	1	1	Admit All	Disable	Disable	0		
figuration		1/0/4	1	1	Admit All	Disable	Disable	0		
tocol Based		1/0/5	1	1	Admit All	Disable	Disable	0		
ifiguration		1/0/6	1	1	Admit All	Disable	Disable	0		
rotocol Based		1/0/7	1	1	Admit All	Disable	Disable	0		
N Group nbership		1/0/8	1	1	Admit All	Disable	Disable	0		
ce VLAN		1/0/9	1	1	Admit All	Disable	Disable	0		
nfiguration		1/0/10	1	1	Admit All	Disable	Disable	0		
RP Switch		1/0/11	1	1	Admit All	Disable	Disable	0		
RP Port		1/0/12	1	1	Admit All	Disable	Disable	0		
nfiguration		1/0/13	1	1	Admit All	Disable	Disable	0		
		1/0/14	1	1	Admit All	Disable	Disable	0		
		1/0/15	1	1	Admit All	Disable	Disable	0		
		1/0/16	1	1	Admit All	Disable	Disable	0		
		1/0/17	1	1	Admit All	Disable	Disable	0		
		1/0/18	1	1	Admit All	Disable	Disable	0		
		1/0/20	1	1	Admit All	Disable	Disable	0		
		1/0/21	10	10	Admit All	Disable	Disable	0		
		1/0/22	1	1	Admit All	Disable	Disable	0		
	101	1/0/23	1	1	Admit All	Disable	Disable	0		
		1/0/24	1	1	Admit All	Disable	Disable	0		



9. Choose **Routing > OSPF > Basic > OSPF Configuration**. Select Enable and set the router ID to 10.10.10.1. Click **APPLY**. The router ID must be unique to each stack in the LAN.

NETGEAR' Connect with Innovation"		XSM7224S 24-Port 10G SFP+ Ports Managed L2+ Stackable Switch
System Switching	Routing QoS Security Monitoring Maintenance Help Index	LOGOUT
Routing Table IP IPv6	VLAN ARP RIP OSPF OSPFv3 Router Discovery VRRP Multicast IPv6 Multicast	
* Basic	OSPF Configuration	
» OSPF	© OSPF Configuration ()	
Advanced	Admin Mode O Disable Enable	
	Router ID 10.10.10.1	
		CANCEL APPLY



10. Choose Routing > OSPF > Advanced > Route Redistribution. Select the box for Connected and set Redistribution Option to Enable. Click APPLY.

System Switching Osulting Osulting Osulting Maintennone Halp Index Vertem Toke IP Na APP OS Sourciny VLRP Muliceant Hadp Index	NETGEAR Connect with Innovation								XSM7224S 24-Port 10G SFP+ Ports Managed L2+ Stackable Switch
Roding Table IP IVAN APP RPP OSFF Confurvation * Advanced Configuration Configuration Config	System Switching	Routing	QoS Sec	urity Monitoring	Maintenance	Help Index			LOGOUT
 Bask Carifiguratian Common Area Carifiguratian Stub Area Carifiguratian Stub Area Carifiguratian Stub Area Carifiguratian A fare Ray Carifiguratian Carifiguratian Carifiguratian Carifiguratian Carifiguratian Stub Area <	Routing Table IP IPv6	VLAN ARP	RIP OSPF O	SPFv3 Router Discovery	VRRP Multicast	IPv6 Multicast			
Configuration Common Area Configuration Sub Area Configuration Sub Area Configuration Star Range Configuration Area Configuration	> Basic > Advanced	Route Redist	tribution Redistribution						5)
Configuration Image: Configuration Image: Configuration Image: Configuration Image: Configuration NSSA Area Exact O External Type 2 O Disable Area Rauge Configuration Image: Configuration Image: Configuration Image: Configuration Image: Configuration Interface	 OSPF Configuration Common Area 	Source	Redistribute Option	Metric	Metric Type	Тад	Subnets	Distribute List	
* Story Arcia Configuration i i Deable 0 External Type 2 0 Diable * Kars Range Configuration Ix1P Diable 0 External Type 2 0 Diable * Intraface Statictics Ix1P Diable 0 External Type 2 0 Diable * Intraface Statictics ix1P Diable 0 External Type 2 0 Diable * Intraface Statictics ix1P Diable 0 External Type 2 0 Diable * Intraface Statictics ix1P Diable 0 External Type 2 0 Diable * Intraface Statictics ix1P Diable 0 External Type 2 0 Diable * Nethods/notion Intraface Statictics ix1P Diable Intraface Statictics Intraface Statictics * Nethods/notion Note Note Note Note Note Note * Note Note Note Note Note Note Note * Note Soute Note Note Note Note Note	Configuration						×]
> Nosh Area Disable 0 External Type 2 0 Disable > Area Range Configuration > Static Disable 0 External Type 2 0 Disable > Interface Configuration > Static Disable 0 External Type 2 0 Disable > Interface Configuration > Static	 Stub Area Configuration 	Connected	Enable (0	External Type 2	0	Disable		
Configuration RIP Dicable 0 External Type 2 0 Dicable Configuration Interface Statistic Configuration * Interface Statistic Otablese * Virtual link Configuration * Notat Interface Statistic Configuration * Notat Notationse * Notat Notationse * NSF OSFF Summary	» NSSA Area	Static	Disable (J	External Type 2	0	Disable		
 A List Kange Configuration Interface Configuration Interface statistice Neighbor Table Vitual Link Configuration Youtual Link Configuration NSF OSFP Summary 	Configuration	RIP	Disable (0	External Type 2	0	Disable		
	 Sinterface Statistics Neighbor Table Link State Database Virtual Link Configuration Rodute Rodute Rodutibution NSF OSPF Summary 								



11. Choose **Routing > OSPF > Advanced > Interface Configuration**. Click All above the column headings to list all physical and VLAN interfaces. By default, all interfaces are set to the OSPF area ID 0.0.0.0. Select the box above the first interface's check box to select all interfaces. Enable Admin Mode and click **APPLY**.

IGEAR.									X 24-Por Managed L2+	SM7224 t 10G SFP+ Por Stackable Swit					
tem Switching		Routing	QoS S	ecurity N	onitoring A	Agintenance He	Index			LOGOUT					
ng Table IP IPv6	VLA	N ARP	RIP OSPF	OSPFv3 Route	Discovery VRRP	Multicast IPv6 Mu	lticast								
	Int	erface Co	nfiguration												
anced		Interface Computation													
PF		OSPF Interface Configuration													
figuration	1	1 VLANS AII													
nmon Area			IP Subnet			Admin	Router	Retransmit	Hello	De					
ib Area		Interface	Address	Mask	Area ID	Mode	Priority	Interval	Interval	In					
iniguration															
afiguration		1/0/1	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
a Range		1/0/2	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
figuration		1/0/3	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
artace		1/0/4	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
arface Statistics		1/0/5	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
ghbor Table		1/0/6	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
k State		1/0/7	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
abase		1/0/8	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
figuration		1/0/9	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
ite		1/0/10	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
listribution		1/0/11	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
OSPF		1/0/12	0.0.0	0.0.0	0.0.0.0	Enable	1	5	10	40					
initial y		1/0/13	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
		1/0/14	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
		1/0/15	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
		1/0/16	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
		1/0/17	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
		1/0/18	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
		1/0/19	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
		1/0/20	0.0.0.0	0.0.0	0.0.0.0	Enable	1	5	10	40					
		1/0/21	0.0.0	0.0.0	0.0.0.0	Enable	1	5	10	40					
		1/0/22	0.0.0	0.0.0	0.0.0.0	Enable	1	5	10	40					
		1/0/23	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	40					
		1/0/24	0.0.0	0.0.0	0.0.0.0	Enable	1	5	10	40					
		vlan 10	192.168.1.1	255.255.255.0	0.0.0.0	Enable	1	5	10	40					
		vlan 100	192.168.100.1	255.255.252.0	0.0.0.0	Enable	1	5	10	40					
		vlan 200	192.168.200.1	255.255.248.0	0.0.0.0	Enable	1	5	10	40					
		vlan 5	10.10.10.1	255.255.255.0	0.0.0.0	Enable	1	5	10	40					



Switch – M5300-52G-POE+

 Move over to configure the M5300-52G-POE+ switch. Configuration for the M5300-52G-POE+ stacks will be replicated on each one. Create VLAN interfaces for the subnets: management (VLAN ID 5), infrastructure (VLAN ID 10), voice (VLAN ID 100), and data (VLAN ID 200). Choose Switching > VLAN > Advanced > VLAN Configuration. Declare each VLAN ID and click ADD after each one.

NETGEAR						M5300-28G-POE+ ProSale 24 port 12 Stackable GE PoE Switch with State Routing
System Switching	Routing	QoS Securi	ty Monitoring	Maintenance Help	Index	LOGOUT
VLAN Auto-VolP iSCSI	STP Multi	icost MVR Addr	ess Table Ports LAG			
> Basic	VLAN Con	figuration				
* Advanced	Reset					
 VLAN Configuration 	Reset Config	uration				
» VLAN Membership						
» VLAN Status	Internal	VLAN Configuration			(2)	
Configuration	Internal VLA	N Allocation Base	4093			
» MAC Based VLAN	Internal VLA	N Allocation Policy	Ascending ()	Descending		
» Protocol Based VLAN Group						
Configuration	VLAN CO	nfiguration			0	
» Protocol Based	VLAN TI	D VLAN Name	VLAN Type	Make Static		
VLAN Group Membership				Disable 👻		
» IP Subnet Based	1	default	Default	Disable		
VLAN	2	Auto VoIP	AUTO VoIP	Disable		
» Port DVLAN	5	VLAN0005	Static	Disable		
» Voice VLAN	10	VLAN0010	Static	Disable		
Configuration	100	VLAN0100	Static	Disable		
» GARP Switch Configuration	200	VLAN0200	Static	Disable		
» GARP Port						
Configuration						
						ADD DELETE CANCEL APPLY



2. Choose **Routing > VLAN > VLAN Routing**. Configure the managment VLAN 5 (10.10.10.0/24). Select the VLAN ID and enter the corresponding gateway IP address and subnet mask. The management gateway address will be unique to each switch stack. In this case, it is 10.10.10.5. Click **ADD**.

NETGEAR Connect with Innovation		M 5300-28G-POE+ ProSafe 24-port L2 Stackable GE PGE Switch with State Kouting
System Switching	Routing QoS Security Monitoring Maintenance Help Index	LOGOUT
Routing Table IP IPv6	VLAN ARP RIP OSPF OSPFv3 Router Discovery VRRP Multicast IPv6 Multicast	
> VLAN Routing	VLAN Routing Configuration	
Wizard	:: VLAN Routing Configuration	
	VLAN ID Port MAC Address IP Address Subnet Mask	
	■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■	
		ADD DELETE CANCEL



3. Choose **Routing > IP > Basic > IP Configuration** to enable routing globally. Enable Routing Mode and click **APPLY**.

NETGEAP				M5300-28G-POE+
Connect with Innovation"				ProSafe 24-port L2 Stackable GE PoE Switch with Static Routing
System Switching	Routing QoS Security	Monitoring Maintenance Help	Index	LOGOUT
Routing Table IP IPv6	VLAN ARP RIP OSPF OSPFv3 R	outer Discovery i VRRP i Multicast i IPvó Multicast		
		,		-
* Basic	IP Configuration			
Configuration	: IP Configuration		0	
» Statistics	Default Time to Live	64		
Advanced	Routing Mode	Enable O Disable		
	ICMP Echo Replies	Enable Disable Disable		
	ICMP Redirects	Enable Disable		
	ICMP Rate Limit Interval	1000 (0 to 2147483647 ms)		
	ICMP Rate Limit Burst Size	100 (1 to 200)		
	Maximum Next Hops	4		
	Maximum Routes	6112		
	Select to configure Global Default Galeway			
	Giobal Default Gateway	0.0.0.0		
				CANCEL APPLY


4. Enable auto-VoIP on all interfaces and increase voice traffic priority. Choose **Switching > Auto-VoIP > Protocol based > Port Settings**. Select Traffic Class as the Prioritization Type and set Class Value to 5. Select all interfaces by checking the box above the first interface and change Auto VoIP Mode to Enable. Click **APPLY**.

NETGEAR					M5300-28G-POE+ ProSate 24 port L2 Stackable GE PoE switch with Static Routing
System Switching		Routing	QoS Security	Monitoring Maintenance Help Index	LOGOUT
VLAN Auto-VolP iSCSI	ST	P Multicos	t MVR Address Table	Ports LAG	
× Protocol-based = Port Settings ≥ OUT-based	Pro	tocol Bas Protocol Ba	ed Port Settings sed Global Settings	0	,
	Pric	pritization Ty	pe	Traffic Class 💌	
	Clas	ss Value		5 💌	
		Instanal Up	and Dort Cottings		
			sed Port Settings		
	1	LAGS AII	Go To In	GO GO	
	_	Interface	Auto VolP Mode	Operational Status	
		4 10 14	E a b b a		
		1/0/1	Enable		
	100	1/0/2	Enable		
		1/0/4	Enable		
		1/0/5	Enable	UP	
		1/0/6	Enable	UP	
		1/0/7	Enable	UP	
		1/0/8	Enable	UP	
		1/0/9	Enable	UP	
		1/0/10	Enable	UP	
		1/0/11	Enable	UP	
		1/0/12	Enable	UP	
		1/0/13	Enable	UP	
		1/0/14	Enable	UP	
		1/0/15	Enable	UP	
		1/0/16	Enable	UP	
		1/0/17	Enable	UP	
		1/0/18	Enable	UP	
		1/0/19	Enable	UP	
		1/0/20	Enable	UP	
		1/0/21	Enable	UP	
		1/0/22	Enable		
		1/0/23	Enable		
		1/0/24	Enable		
		1/0/25	Enable		
	12	1/0/20	chable		



5. Enable the voice VLAN feature globally. Choose **Switching > VLAN > Advanced > Voice VLAN Configuration**. Select the box above the first port to select all ports. Change Interface Mode to VLAN ID and Value to 100. Enable Admin Mode and click **APPLY**.

ETGEAR nect with Innovation"							ProSofe 24-port L2 GE PoE Switch with Sto
System Switchin	g Ro	outing	QoS Secu	rity Monitoring	Maintenance	Help Inde	
/LAN Auto-VolP iS	CSI STP	Multicas	MVR Ad	dress Table Ports LAG			
	Voice		Configuration				
Advanced	Voice		comguration				
= VLAN	Vo	ICE VLAN	Global Admin			(1)	
Configuration	Admi	n Mode		Disable Image: Dis	Enable		
» VLAN Status	Vo	ice VLAN	Configuration			0	
Port PVID		ICE VEAN	comgaration				
Configuration	1 AI		Gu	to interface	00		
» Protocol Based	1	Interface	Interface Mode	Value	Cos Override Mode	State	
VLAN Group							
Configuration » Protocol Based		/0/1	VIAN ID	100	Disable	Enable	
VLAN Group		/0/2	VLAN ID	100	Disable	Enable	
Membership		/0/3	Disable	0	Disable	Disable	
» IP Subnet Based		/0/4	Disable	0	Disable	Disable	
» Port DVI AN		/0/5	Disable	0	Disable	Disable	
Configuration		1/0/6	Disable	0	Disable	Disable	
» Voice VLAN		1/0/7	Disable	0	Disable	Disable	
Configuration		L/0/8	Disable	0	Disable	Disable	
Configuration	1	/0/9	Disable	0	Disable	Disable	
» GARP Port	1	1/0/10	Disable	0	Disable	Disable	
Configuration		/0/11	Disable	0	Disable	Disable	
	E 1	/0/12	Disable	0	Disable	Disable	
	1	/0/13	Disable	0	Disable	Disable	
	1	/0/14	Disable	0	Disable	Disable	
	1	/0/15	Disable	0	Disable	Disable	
	E 1	1/0/16	Disable	0	Disable	Disable	
	1	/0/17	Disable	0	Disable	Disable	
	1	/0/18	Disable	0	Disable	Disable	
	1	/0/19	Disable	0	Disable	Disable	
	1	1/0/20	Disable	0	Disable	Disable	
	1	/0/21	Disable	0	Disable	Disable	
	1	1/0/22	Disable	0	Disable	Disable	
	1	/0/23	Disable	0	Disable	Disable	
	1	1/0/24	Disable	0	Disable	Disable	
	1	/0/25	Disable	0	Disable	Disable	
		1/0/26	Disable	0	Disable	Disable	



6. Configure the switch ports. Choose **Switching > VLAN > Advanced > VLAN Membership**. For each of the 4 VLANS, set all uplink ports to neighboring stacks as T for tagged. Since our phone ports will also support our data VLAN, set all ports to U for untagged on VLAN 200. Click **APPLY** after configuring each VLAN's ports.

NETGEAR'				M5300-28G-POE+ ProSolie 24-port 12 Stockable GE PoE Switch with Static Routing
System Switching	Routing	QoS Security	Monitoring Maintenance Help Index	LOGOUT
VLAN Auto-VolP iSC	SI STP Multic	ast MVR Address	: Table Ports LAG	
> Basic	VLAN Mem	bership		-
» VLAN	VLAN Men	ibership	0	
Configuration	VLAN ID	200 💌	Group Operation Untag All	
» VLAN Status	VLAN Name	VLAN0200	UNTAGGED PORT MEMBERS	
 Port PVID Configuration 	VLAN Type	Static	TAGGED PORT MEMBERS	
» MAC Based VLAN	Port 1 2 3	456789	10 11 12 13 14 15 16 17 10 19 20 21 22 23 24	
» Protocol Based VLAN Group	UU	7.20		
Configuration	T T	/ 25		
» Protocol Based VLAN Group	LAG			
Membership				
» IP Subnet Based VLAN				
» Port DVLAN				
Configuration				
Configuration				
» GARP Switch				=
> GARP Port				
Configuration				
				-
				CANCEL



For phone ports, the port PVID must be configured to support the data VLAN. Choose Switching > VLAN >
Advanced > Port PVID Configuration. Enter our data VLAN ID 200 as the Configured PVID for all phone ports and
click APPLY.





8. Choose **Routing > OSPF > Basic > OSPF Configuration**. Select Enable and set the router ID to 10.10.10.5. Click **APPLY**. Remember that the router ID must be unique to each stack in your LAN network.

	AR'								M 5300-28G-POE+ ProSolie 24-port 12 Stockable GE PoE Switch with Static Routing
System	Switching	Routing	Qo5	Security	Monitoring	Maintenance	Help	Index	LOGOUT
Routing Table	IP IPv6	VLAN ARP	RIP OSPF	OSPFv3	Router Discovery	VRRP Multicost	IPv6 Multicast		
* Basic		OSPF Confi	iguration						
 SPF Configurati 	on	· OSPF Con	figuration				(D	
> Advanced		Admin Mode			🔘 Disable 🔘	Enable			
		Router ID			10.10.10.5				
									CANCEL



- M5300-28G-POE+ NETGEAR' ProSafe 24-port L2 Stackable GE PoE Switch with Static Routing System Switching Routing QoS Security Monitoring Maintenance Help LOGOUT Index Routing Toble | IP | IPv6 | VLAN | ARP | RIP | OSPF | OSPFv3 | Router Discovery | VRRP | Multicost | IPv6 Multicost **Route Redistribution** Basic OSPF Route Redistribution » OSPF Source Redistribute Option Metric Configuration Common Area Configuration Metric Type Subnets Distribute List Tag --Г 1 - Stub Area
 Configuration
 NSSA Area Connected Enable 0 External Type 2 0 Disable External Type 2 Disable 0 0 Configuration » Area Range Disable 0 RIP RIP External Type 2 0 Disable Configuration » Interface Interface Configuration
 Interface Statistics
 Neighbor Table
 Link State Database
 Virtual Link
 Contemption Configuration » NSF OSPF Summary
- 9. Choose **Routing > OSPF > Advanced > Route Redistribution**. Check the box next to the source Connected and set the Redistribution Option to Enable. Click **APPLY**.



10. Choose **Routing > OSPF > Advanced > Interface Configuration**. Click All above the column headings to list all physical and VLAN interfaces. By default, all interfaces are set to the OSPF area ID 0.0.0.0. Select the box above the first interface's check box to select all interfaces. Enable Admin Mode and click **APPLY**.

ETGEAR'									Pro Sal GE PoE Sv	to 24 port L2 S witch with Stati
System Switching		Routing	QoS	Security	Monitoring	Maintenance	Help Index			[100
	; ; , , , , , ,				Deuter Discourse in MDD		(Malfand			
Couting Table IP IPv6	I VLA	N AKP	KIP OSPI	OSPIVA	Kouter Discovery YKK	P Multicost IPv	o Multicast			
Basic	Int	erface Co	nfigurati	on						
Advanced										
OSPF		OSPF Interf	ace Config	uration						
Configuration	1	VLANS All								
Common Area			10	Subnet		Admin	Router	Retransmit	Hello	
Stub Area		Interface	Address	Mask	Area ID	Mode	Priority	Interval	Interval	
Configuration										
NSSA Area										
Configuration		1/0/1	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
Configuration	V	1/0/2	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
Interface	2	1/0/3	0.0.0.0	0.0.0	0.0.0	Disable	1	5	10	
Configuration	1	1/0/4	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
nterface Statistics	1	1/0/5	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
Neighbor Table	1	1/0/6	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
link State	V	1/0/7	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
/irtual Link		1/0/8	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
Configuration		1/0/9	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
Route	121	1/0/10	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
Redistribution		1/0/11	0.0.0.0	0.0.0.0	0.0.0.0	Disable		-	10	
ISF OSPF	17	1/0/12	0.0.0.0	0.0.0.0	0.0.0.0	Disable		-	10	
summary	177	1/0/12	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1		10	
	177	1/0/13	0.0.0.0	0.0.0.0	0.0.0.0	Disable		1	10	
		1/0/14	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1		10	
		1/0/15	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	2	10	
		1/0/16	0.0.0.0	0.0.0.0	0.0.0	Disable	1	5	10	
	121	1/0/17	0.0.0.0	0.0.0	0.0.0	Disable	1	5	10	
	2	1/0/18	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
	3	1/0/19	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
	V	1/0/20	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
	V	1/0/21	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
		1/0/22	0.0.0.0	0.0.0.0	0.0.0	Disable	1	5	10	
	V	1/0/23	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
		1/0/24	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
	1	1/0/25	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
	V	1/0/26	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
	V	1/0/27	0.0.0.0	0.0.0	0.0.0	Disable	1	5	10	
	V	1/0/28	0.0.0.0	0.0.0.0	0.0.0.0	Disable	1	5	10	
	•			III						



To queue and prioritize VoIP traffic properly, change the 802.1p queue mapping. Choose QoS > CoS > Advanced > 802.1p to Queue Mapping. Select All from the Interface Selection drop-down menu and change the Queue value to 5 for 802.1p Priority 5. Click APPLY.

NETGEAR Connect with Innovation					M5300-28G-POE ProSale 24-port L2 Stackable GE POE Switch with Static Routing
System Switching	Routing QoS	Security Monitoring	Maintenance Help	Index	
CoS DiffServ					
> Basic	802.1p to Queue Ma	pping			
 CoS Configuration 802 to to Output 	Interface Selection	2/0/1		۲	
Mapping * IP DSCP Queue	Interface	1/0/1 💌			
Mapping » CoS Interface	802.1p to Queue Map	ping 1 2 3 4	5 6 7	0	
Configuration > Interface Queue	Queue 1	0 • 0 • 1 • 2	• 5• 3• 3		
Configuration » CoS Queue Drop					
Precedence Configuration					
					CANCEL APPLY



12. Assign queue priority to our phone ports. Choose **QoS** > **CoS** > **Advanced** > **Interface Queue Configuration**. Select all phone ports, change the Queue ID to 5, and change the Scheduler Type to Strict. Click **APPLY**.

ETGEAR'							M5300-28G ProSolie 24-port 12 3 GE PoE Switch with Stati
System Switchin	a	Routing	QoS	Security	Monitoring Main	tenance Help Ind	
CoS DiffServ	9	g				in the part of the	
	Int	erface O	ieue Co	onfiguration			
lasic Idvanced		critice q	-				
CoS Configuration		Interface Q	ueue Con	figuration		0	
802.1p to Queue	1	LAGS All		Go To I	nterface	GO	
Mapping IP DSCP Queue		Interface	Queue TD	Minimum Bandwidth	Scheduler Type	Queue Management Type	
CoS Interface			5 💌		Strict 🗸	-	
Configuration		1/0/1	0	0	Weighted	TailDrop	
Interface Queue	2	1/0/2	0	0	Weighted	TailDrop	
Configuration		1/0/3	0	0	Weighted	TailDrop	
Precedence	7	1/0/4	0	0	Weighted	TailDrop	
Configuration	2	1/0/5	0	0	Weighted	TailDrop	
		1/0/6	0	0	Weighted	TailDrop	
		1/0/7	0	0	Weighted	TailDrop	
	1	1/0/8	0	0	Weighted	TailDrop	
		1/0/9	0	0	Weighted	TailDrop	
	2	1/0/10	0	0	Weighted	TailDrop	
		1/0/11	0	0	Weighted	TailDrop	
	1	1/0/12	0	0	Weighted	TailDrop	
	1	1/0/13	0	0	Weighted	TailDrop	
		1/0/14	0	0	Weighted	TailDrop	
	2	1/0/15	0	0	Weighted	TailDrop	
		1/0/16	0	0	Weighted	TailDrop	
	V	1/0/17	0	0	Weighted	TailDrop	
	V	1/0/18	0	0	Weighted	TailDrop	
	V	1/0/19	0	0	Weighted	TailDrop	
	V	1/0/20	0	0	Weighted	TailDrop	
	V	1/0/21	0	0	Weighted	TailDrop	
	1	1/0/22	0	0	Weighted	TailDrop	
	1	1/0/23	0	0	Weighted	TailDrop	
	2	1/0/24	0	0	Weighted	TailDrop	
	1	1/0/25	0	0	Weighted	TailDrop	
	1	1/0/26	0	0	Weighted	TailDrop	
	1	1/0/27	0	0	Weighted	TailDrop	
	2	1/0/28	0	0	Weighted	TailDrop	
	1	LAGS All		Go To I	nterface	GO	



13. Enable the DiffServ feature. Choose **QoS > DiffServ > Advanced > DiffServ Configuration**. Enable DiffServ Admin Mode and click **APPLY**.

NETGE Connect with Innovatio	A R'								M 5300-28G-POE ProSafe 24-port L2 Stackable GE PoE Switch with Static Routing
System	Switching	Routing	QoS	Security	Monitoring	Maintenand	Help	Index	LOGOUT
CoS DiffServ		0		,					
		- 1//-	a						
Diffserv Wizar Nacio	rd	DiffServ Co	nfiguration	1					
* Dasic * Advanced		DiffServ Co	onfiguration					0	
* DiffServ		DiffServ Admin	Mode		💮 Disable 🔘 I	Enable			
 Configuration Class 		Charles							
Configuration		Status						w	
» IPv6 Class		MIB Table			Current Size	Ma	Size		
 Policy 		Class Table			0	32			
Configuration		Policy table	-		0	64			
 Service Interf Configuration 	ace	Policy Instance	table		0	179	2		
» Service Statis	tics	Policy Attribute	s table		0	537	5		
		Service table			0	480			
									CANCEL APPLY



14. Create a DiffServ class for our DiffServ policy. In this class, we will specifically queue VoIP traffic on the protocol level. Go to **QoS** > **DiffServ** > **Advanced** > **Class Configuration**. Enter the VoIP class name, change the Class Type to All, and Click **ADD**. Once the class is created, click on the class to open the VoIP class' configuration page.

NETGEA Connect with Innovation*	R'								M5300-28G-POE Pro5afe 24-port 12 Stockable GE PoE Switch with Static Routing
System Sw	vitching	Routing	Qo5	Security	Monitoring	Maintenance	Help	Index	LOGOUT
CoS DiffServ									
> Diffserv Wizard		Class Name							
 Basic Advanced 		: Class Name	•				Q	Ø	
» DiffServ		Class Nan	ıe		Class Type				
 Class 									
Configuration > IPv6 Class		Class Volp		,	AII.				
Configuration » Policy									
Configuration									
Configuration									
* Service Statistics									
									ADD DELETE CANCEL APPLY



15. On the VoIP class' configuration page, notice the settings that can be applied to the class. Click Protocol Type and select UDP from the drop-down menu. Click **APPLY**. Then click IP DSCP and select EF from the drop-down menu. Click **APPLY**. Next, click Class of Service and select 5 from the drop-down menu. Click **APPLY**.

onnect with Innovation*							ProSafe 24-port L2 Stac GE PoE Switch with Static Re
System Switching	Routing QoS	Security	Monitoring	Maintenance	Help	Index	LOGO
CoS DiffServ							
	Class Configuration						
· Diffserv Wizard · Basic	class configuration						
Advanced	Class Information				0	1	
 DiffServ Configuration 	Class Name		class_voip				
» Class	Class Type		All				
Configuration	DiffServ Class Config	uration			a		
Configuration	Match Every	Any -					
 Policy 	Reference Class						
Configuration > Service Interface	Class Of Service	0 -					
Configuration	O VLAN	(0 to 40	05)				
» Service Statistics	Secondary Class of Servi	ce 0 -					
	Secondary VLAN	(0 to 40	95)				
	Ethernet Type	Appletalk	v (G00 to ffff hex)			
	Source MAC	Address		Mask			
	Destination MAC	Address		Mask			
	Protocol Type	ICMP 👻	(0 to 255)				
	Source IP	Address		Mask			
	Source L4 Port	domain 🖵	(0 to 65	35)			
	Destination IP	Address		Mask			
	Destination L4 Port	domain 👻	(0 to 65	535)			
	O IP DSCP	afii -	(0 to 63)	,			
	Precedence Value	0 x (0 to 7)	(******,				
		Bit Value		Bit Mask			
	Class Summary				C		
	Match Criteria			Values			
	Protocol			17(udp)			
	IP DSCP			46(ef)			



16. Apply the class to a policy map. To create the policy map, choose QoS > DiffServ > Advanced > Policy Configuration. Enter the VoIP policy name, change the Policy Type to In, and change the Member Class to the VoIP class you created. Click ADD. When the policy is created, click the VoIP policy to enter its configuration page.

NETGEAR Connect with Innovation*							M5300-28G-POE4 Pro5ofe 24-point 12 Stackable OE FoE Switch with Static Routing
System Switching	Routing	QoS Secur	ity Monitoring	Maintenance	Help	Index	LOGOUT
CoS : DiffSorv							
> Diffserv Wizard	Policy Confi	guration					
Basic Advanced	Policy Con	figuration			0		
» DiffServ	Policy Na	me Polic	/ Турс	Member Class			
» Class							
> IPv6 Class		IN		Class Void			
Configuration * Policy							
Configuration > Service Interface							
Configuration							
							ADD DELETE CANCEL APPLY



17. On the VoIP policy configuration page, change the Assign Queue value to 5 and click **APPLY**.

NETGEAR Connect with Innovation						M5300-28G-POE+ ProSate 24 port L2 Stackable GE POE switch with Static Routing
System Switching	Routing QoS Security	Monitoring	Maintenance Help	Index		LOGOUT
CoS DiffServ						
Diffserv Wizard Basic Advanced Diffserv Configuration Class Configuration Idea	Policy Class Configuration Class Information Policy Name Policy Type Member Class Name		pol_voip In class_voip		Ø	•
Configuration * Policy Configuration * Service Interface Configuration * Service Statistics	 Policy Attribute Acsign Queue Drop Mark VLAN CoS Mark LP Drecedence Mark IP DSCP Simple Policy 	S v O v Af11 v Color Mode Comitted Rate Comitted Burst Size Conform Action Violate Action Violate Action Color Mode Comitted Rate Comitted Rate Comitted Rate	Color Blind Send Orop Mark CoS As Secondary Cos Mark IP Precedence Mark IP DSCP Send Drop Mark CoS As Secondary Cos Mark CoS Mark IP DSCP Color Blind	0 0 3 ^f 11 0 5 0 3 ^f 11	 (1) 10 10 	
	<u> </u>	Conform Action	(i) Send			CANCEL APPLY



18. Apply the policy to all the phone ports. Choose **QoS** > **DiffServ** > **Advanced** > **Service Interface Configuration**. Select all phone ports and change the Policy In Name to the VoIP policy created. Click **APPLY**.

NETGE onnect with Innovati	AR'								M 5300-2 ProSafe 24-port GE PoE Switch with :
System	Switching	Routing	QoS	Security	Monitoring	Mainte	nance Help	Index	(
CoS DiffSen	Y								
		Comico Int	torface Confi	guration					
Diffserv Wiza Basic	ard	Service Im	criace com	guration					
Advanced		Service Ir	nterface Config	uration			0	ļ	
» DiffServ		1 LAGS All		Go To Inte	erface	GC			
» Class		Interfac	e	Policy In Name	Policy Out Name	Direction	Operational Status		
Configuration » IPv6 Class	·			pol voip 💌					
Configuration	n	1/0/1							
Policy		1/0/2							
Configuration	1	1/0/3							
	тасе	1/0/4							
» Service Stati	stics	1/0/5							
		1/0/5							
		7 1/0/3							
		V 1/0/7							
		V 1/0/8							
		V 1/0/9							
		V 1/0/10							
		1/0/11							
		1/0/12							
		V 1/0/13							
		J 1/0/14							
		1/0/15							
		1/0/16							
		1/0/17							
		1/0/18							
		1/0/19							
		1/0/20							
		1/0/21							
		1/0/22							
		1/0/23							
		1/0/24							
		1/0/25							
		1/0/26							
		1/0/27							
		1/0/28							
		1 LAGS All		Go To Inte	erface	GC			



Switch – M5300-52G3

 We now move over to the M5300-52G3 stacks. The configuration will be replicated on each one. Create VLAN interfaces for the subnets: management (VLAN ID 5), infrastructure (VLAN ID 10), voice (VLAN ID 100), and data (VLAN ID 200). Choose Switching > VLAN > Advanced > VLAN Configuration. Declare each VLAN ID and click ADD after each one.

NETGEAR Connect with Innovation							M5300-28G3 ProSafe 24-port J3 Stackable GE Swech with J3 Routing
System Switching	Rou	ting Qo5	Security Monitoring	Maintenance	Help	Index	LOGOUT
VLAN Auto-VolP iSCSI	STP	Multicast i MVR	i Address Table i Ports i LAG				
			,				
> Basic	VLAN	Configuration					
 Advanced MAN 	Rese	et			(1)		
Configuration	Reset C	onfiguration					
» VLAN Membership							
» VLAN Status » Port PVID	Inte	rnal VLAN Configu	ration		0		
Configuration	Interna	I VLAN Allocation Ba	se 4093				
» MAC Based VLAN	Interna	I VLAN Allocation Pol	licy 💮 Ascending	Descending			
» Protocol Based VLAN Group							
Configuration	: VLA	N Configuration			0		
» Protocol Based	VL	AN ID VLAN Name	e VLAN Type	Make Stati	-		
Membership				Disable 🗸			
» IP Subnet Based	1	default	Default	Disable			
VLAN	2	Auto VoIP	AUTO VoIP	Disable			
» Port DVLAN Configuration	5	VLAN0005	Static	Disable			
» Voice VLAN	10	VLAN0010	Static	Disable			
Configuration	10	0 VLAN0100	Static	Disable			
» GARP Switch Configuration	201	U VLANUZUU	Static	Uisabie			
» GARP Port							
Configuration							
							ADD DELETE CANCEL APPLY



2. Choose **Routing > VLAN > VLAN Routing**. Configure management VLAN 5 (10.10.10.0/24). Select the VLAN ID and enter the corresponding gateway IP address and subnet mask. The management gateway address will be unique to each switch stack. In this case, it is 10.10.10.10. Click **ADD**.

NETGEAR Connect with Innovation									M 5300-28 ProSafe 24-po Stackable GE Switch with L3 Ro	G3 ort L3 outing
System Switching	Routing	QoS	Security	Monitoring	Maintenance	Help	Index		LOGOL	т
Routing Table IP IPv6	VLAN ARP	RIP	OSPF OSPFv3 I	Couter Discovery	VRRP Multicast	IPv6 Multicast				
> VLAN Routing	VLAN Rout	ting Con	figuration							
Wizard ~ VLAN Routing	VLAN Rou	ting Conf	iguration			((P)			
	VLAN ID	Port	MAC Address	IP Address	Subnet M	lask				
	5	0/4/1	10:0D:7F:4C:18:E0	10.10.10.10	255.255.2	255.0	-			
									ADD DELETE CANCEL)



3. Choose **Routing > IP > Basic > IP Configuration**. Enable Routing Mode and click **APPLY**.

NETGE Connect with Innoval	AR'										M5300-28G ProSafe 24-port Stackable GE Switch with L3 Routi
System	Switching	Routing	QoS	Security	Monitoring	Maintena	ance	Help	Index		LOGOUT
Routing Table	IP IPv6	VLAN ARP	RIP OSPF	OSPFv3	Router Discovery	VRRP Multic	cast IPv	6 Multicast			
* Basic		IP Configu	ation								
		IP Configu	iration					6	Ð		
 Statistics 	1	Default Time t	o Live		64						
Advanced		Routing Mode			Enable ()	Disable					
		ICMP Echo Rep	olies		💿 Enable 🖱	Disable					
		ICMP Redirect	5		💮 Enable 🔘	Disable					
		ICMP Rate Lim	it Interval		1000	(0) to 21474	83647 ms)			
		ICMP Rate Lim	it Burst Size		100	(1	t to 200)				
		Maximum Nex	t Hops		4						
		Select to confi	oure Global Dei	fault Gateway							
		Global Default	Gateway		0.0.0.0						
											CANCEL APPLY



4. Configure the switch ports. Select **Switching > VLAN > Advanced > VLAN Membership**. For each of the four VLANs, set all uplink ports to neighboring stacks as T for tagged. For all other ports, set ports to U for untagged on the necessary VLAN. Click **APPLY** after configuring the ports for each VLAN.

NETGEAD				M5300-28G3
Connect with Innovation "				ProSafe 24-port L3 Stackable GE Switch with L3 Routing
System Switching	Routing	QoS Security	Monitoring Maintenance Help Index	LOGOUT
VLAN Auto-VolP iSCS	I STP Multice	ost MVR Address	Table Ports LAG	
* Basic	VLAN Mem	bership		^
* Advanced	VI AN More	herchin	(9)	
Configuration	VLAN ID	200 -	Group Operation Unlag All	
» VLAN Membership	VLAN Name	VLAN0200	UNTAGGED PORT MEMBERS	
» Port PVID	VLAN Type	Static	TAGGED PORT MEMBERS	
Configuration MAC Based VI AN	• Unit 1			
 Protocol Based 	Port 1 2 3	456789 JU	10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	
VLAN Group	25 26 2	7 28		
» Protocol Based				
VLAN Group	- Ling			
» IP Subnet Based				
VLAN				
Configuration				
» Voice VLAN				
» GARP Switch				E
Configuration				
 GARP Port Configuration 				



5. For untagged ports, configure the port PVID to support the data VLAN. Choose **Switching > VLAN > Advanced > Port PVID Configuration**. Enter the corresponding VLAN ID as the Configured PVID for all non-trunk ports in that VLAN and click **APPLY**.

ct with Innovation -									Stockable GE Switch with
ystem Switchin	g	Routing	QoS	Security	Monitoring	Mainten	ance	Help Index	l u
AN Auto-VolP is	CSI S	P Multicos	t MVR	Address To	able Ports LA	G			
sic	Po	rt PVID C	onliguratio	n					
/LAN		PVID Config	uration					۲	
Configuration	1	LAGS All		Go	To Interface	(e	0		
/LAN Membership /LAN Status fort PVID		Interface	Configured PVID	Current PVID	Acceptable Frame Types	Configured Ingress Filtering	Current Ingress Filtering	Port Priority	
AC Based VLAN									
rotocol Based		1/0/1	1	1	Admit All	Disable	Disable	0	
LAN Group		1/0/2	1	1	Admit All	Disable	Disable	0	
onfiguration		1/0/3	1	1	Admit All	Disable	Disable	0	
LAN Group		1/0/4	1	1	Admit All	Disable	Disable	0	
embership	101	1/0/5	1	1	Admit All	Disable	Disable	0	
P Subnet Based		1/0/6	1	1	Admit All	Disable	Disable	0	
LAN		1/0/7	1	1	Admit All	Disable	Disable	0	
onfiguration		1/0/8	1	1	Admit All	Disable	Disable	0	
oice VLAN	101	1/0/9	1	1	Admit All	Disable	Disable	0	
onfiguration		1/0/10	1	1	Admit All	Disable	Disable	0	
ARP Switch		1/0/11	1	1	Admit All	Disable	Disable	0	
Onfiguration		1/0/12	1	1	Admit All	Disable	Disable	0	
onfiguration		1/0/13	1	1	Admit All	Disable	Disable	0	
		1/0/14	1	1	Admit All	Disable	Disable	0	
		1/0/15	1	1	Admit All	Disable	Disable	0	
		1/0/16	1	1	Admit All	Disable	Disable	0	
		1/0/17	1	1	Admit All	Disable	Disable	0	
		1/0/18	1	1	Admit All	Disable	Disable	0	
		1/0/19	1	1	Admit All	Disable	Disable	0	
		1/0/20	1	1	Admit All	Disable	Disable	0	
		1/0/21	1	1	Admit All	Disable	Disable	0	
		1/0/22	1	1	Admit All	Disable	Disable	0	
		1/0/23	1	1	Admit All	Disable	Disable	0	
		1/0/24	1	1	Admit All	Disable	Disable	0	
		1/0/25	1	1	Admit All	Disable	Disable	0	
		1/0/25	1	1	Admit All	Disable	Disable	0	
	100	1/0/27	1	0	Admit All	Dicable	Disable	0	
		1/0/28	1	0	Admit All	Disable	Disable	0	
		2/0/20	•	·	And the second second	changele	chaebie		



6. Choose **Routing > OSPF > Basic > OSPF Configuration**. Select Enable and set the router ID to 10.10.10.10. Click **APPLY**. The router ID must be unique to each stack in the LAN network.

NETGE Connect with Innoval	AR'								M5300-28G ProSale 24 port Stockable GE Switch with UI Koute
System	Switching	Routing	QoS	Security	Monitoring	Maintenance	Help	Index	LOGOUT
Routing Table	IP IPv6	VLAN ARP	RIP OSPF	OSPFv3	Router Discovery	VRRP Multicost	IPv6 Multicast		
v Basic		OSPF Confi	guration						
	0	· OSPF Con	figuration				(D	
+ Advanced		Admin Mode			🗇 Disable 🧕) Enable			
		Router ID			10.10.10.10)			
									CANCEL



7. Choose **Routing > OSPF > Advanced > Route Redistribution**. Check the box next to the source Connected and set the Redistribution Option to Enable. Click **APPLY**.

NETGEAR Connect with Innovation										M 5300 ProSafe 2 Stackablo GE Switch with L	-28G3 :4-port L3 L3 Routing
System Switching	Routing	QoS S	Security Mo	onitoring	Maintenance	Help	Index			(LOC	GOUT
Routing Table IP IPv6	VLAN ARP	RIP OSPF	OSPFv3 Router	Discovery \	/RRP Multicast	IPv6 Multicast					
	Douto Dodi	atallantian									
 Basic Advanced 	Route Reas	scribution									
> OSPF	OSPF Rout	e Redistribution	n							0	
Configuration » Common Area	Source	Redistribute Option	Metric	M	etric Type	Тад		Subnets	Distribute List		
Configuration											
 Stub Area Configuration 	Connected	Enable	0	Ex	ternal Type 2	0		Disable			
» NSSA Area	Static	Disable	0	Ex	ternal Type 2	0		Disable			
Configuration » Area Range	RIP	Disable	0	Ex	ternal Type 2	0		Disable			
Configuration = Interfaces Ratistics = Neighbor Table = Link State Database = Virtual Link Configuration = Route Redistribution = NSF CoSFF Summary										CANCEL APP	



8. Choose **Routing > OSPF > Advanced > Interface Configuration**. Click All above the column headings to list all physical and VLAN interfaces. By default, all interfaces are set to the OSPF area ID 10.10.10.10. Check the box above the first interface's check box to select all interfaces. Enable Admin Mode and click **APPLY**.

ETGE rect with Innovat	AR'									Stackable GE	M 5300 ProSafe 2 Switch with L
System	Switching		Routing	QoS	Security	Monitoring A	Aaintenance	Help Index			LO
outing Table	IP IPv6	VLA	N ARP	RIP OSPF	OSPFv3 Roi	Iter Discovery VRRP	Multicast IPv	6 Multicast			
	_										
sic			SPF Interf	ace Configu	ration						
SPF		1	LANS All								
onfiguratio	n		T-1	TP	Subnet	8 TD	Admin	Router	Retransmit	Hello	
ommon An	ea		Interface	Address	Mask	Arca ID	Mode	Priority	Interval	Interval	
tub Area								1			
onfiguratio	n	1001	1/0/1	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
SSA Area	_		1/0/2	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
rea Range			1/0/3	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	_
onfiguratio	n		1/0/4	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
terface			1/0/5	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
Infiguration Iterface Stu	n atistics		1/0/6	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
eighbor Tal	ble		1/0/7	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
nk State			1/0/8	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
atabase			1/0/9	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
rtual Link onfiguratio			1/0/10	0.0.0.0	0.0.0	0.0.0.0	Enable	1	5	10	
oute			1/0/11	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
distributio	n		1/0/12	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
SF OSPF			1/0/13	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
ummary			1/0/14	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
			1/0/15	0.0.0.0	0.0.0	0.0.0.0	Enable	1	5	10	
			1/0/16	0.0.00	0.0.0.0	0.0.0.0	Enable	1	5	10	
			1/0/17	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
			1/0/18	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
			1/0/19	0.0.00	0.0.0.0	0.0.0.0	Enable	1	5	10	
			1/0/20	0.0.0.0	0.0.0	0.0.0.0	Enable	1	5	10	
			1/0/21	0.0.00	0.0.0.0	0.0.0.0	Enable	1	5	10	
			1/0/22	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
			1/0/23	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
			1/0/24	0.0.0.0	0.0.0	0.0.0.0	Enable	1	5	10	
			1/0/25	0.0.0	0.0.0.0	0.0.0	Enable	1	5	10	
			1/0/26	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
			1/0/27	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
			1/0/28	0.0.0.0	0.0.0.0	0.0.0.0	Enable	1	5	10	
			vlan S	10.10.10.10	255.255.255.0	0.0.0	Enable	1	5	10	
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