

NETGEAR® ProSAFE® WC7520 Wireless Controller

Configuring Office and Guest SSIDs
Using a Layer 3 Switch on Separate Layer 3 Subnets

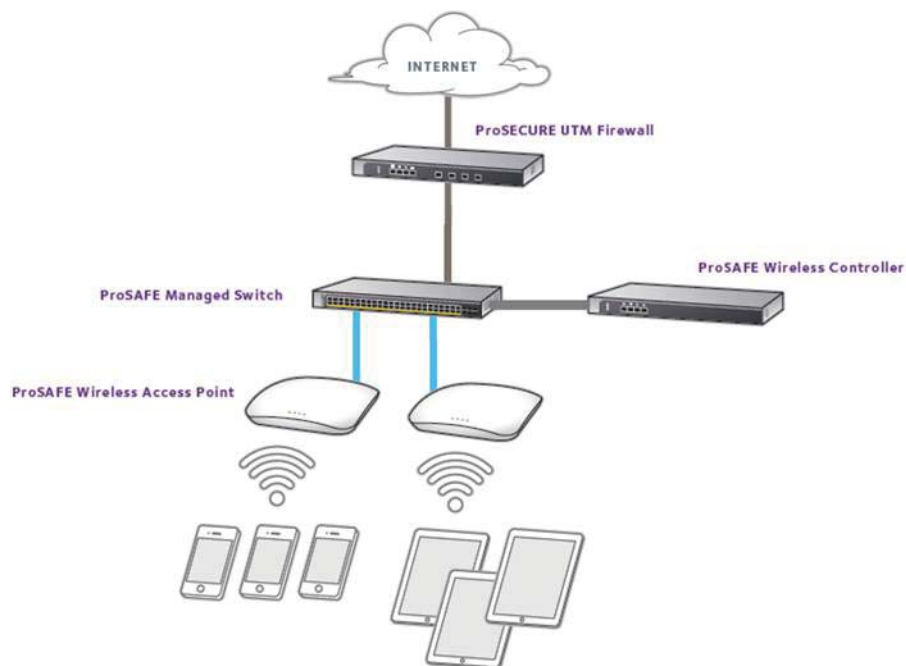
INTRODUCTION

Business environments are dynamic in nature, with many different types of users, each with a wide range of networking needs. Employees and contractors require Internet connectivity and access to printers, files, and other shared resources through the wireless network. The organization may also want to enable Internet access for visitors, without allowing them to see the other users or access any corporate resources. This paper will discuss how to use the NETGEAR® ProSAFE® wireless system to provide an appropriate level of access to multiple groups of users while maintaining the highest level of security.

OVERVIEW

There are two ways to go about resolving this challenge. One way is to use two access points – one for employees and contractors, and one for the guest users. However, this strategy requires twice the amount of equipment to be purchased, configured, and managed long-term, thereby increasing capital and operating expenses.

A superior solution is to use access points that support multiple SSIDs, such as NETGEAR ProSAFE access points. Then, using the NETGEAR ProSAFE WC7520 Wireless Controller, the organization can easily configure and maintain two separate SSIDs on one access point – one for employees and the other for guests. A single ProSafe WC7520 can manage up to 50 access points from a single interface, blending extraordinary flexibility with robust security administration.



CONFIGURATION

The first thing that needs to be done is to separate the guests from the employees using VLANs on the wired network. To do this, we'll create an Office VLAN and a Guest VLAN. Then, we'll enable routing on that VLAN and provide Guests with their own subnet.

Here's the address scheme we'll use:

Switch

VLAN1 (Management and internet)

192.168.1.2

VLAN10 (Office)

192.168.10.1

VLAN20 (Guest)

192.168.20.1

WC7520

192.168.1.250

PC

192.168.1.3

In this scenario we're assuming that there is already a wired network set up on VLAN 1, 192.168.1.0/24, with a router with a DHCP server and internet access on 192.168.1.1.

Internet/Corporate Router

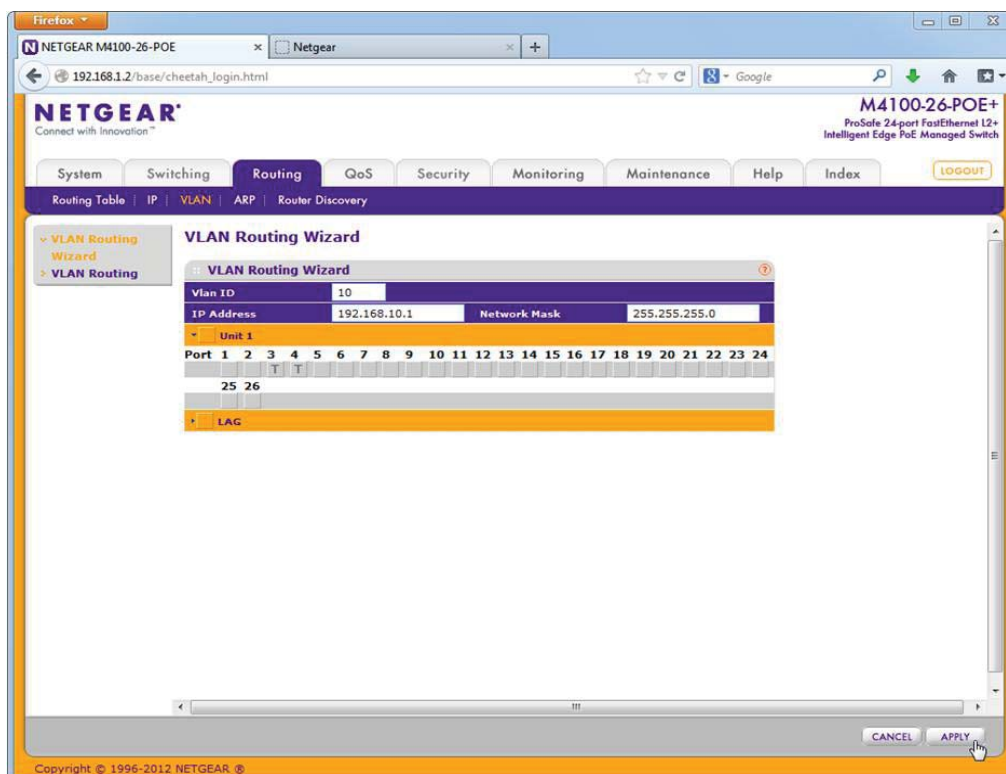
192.168.1.1

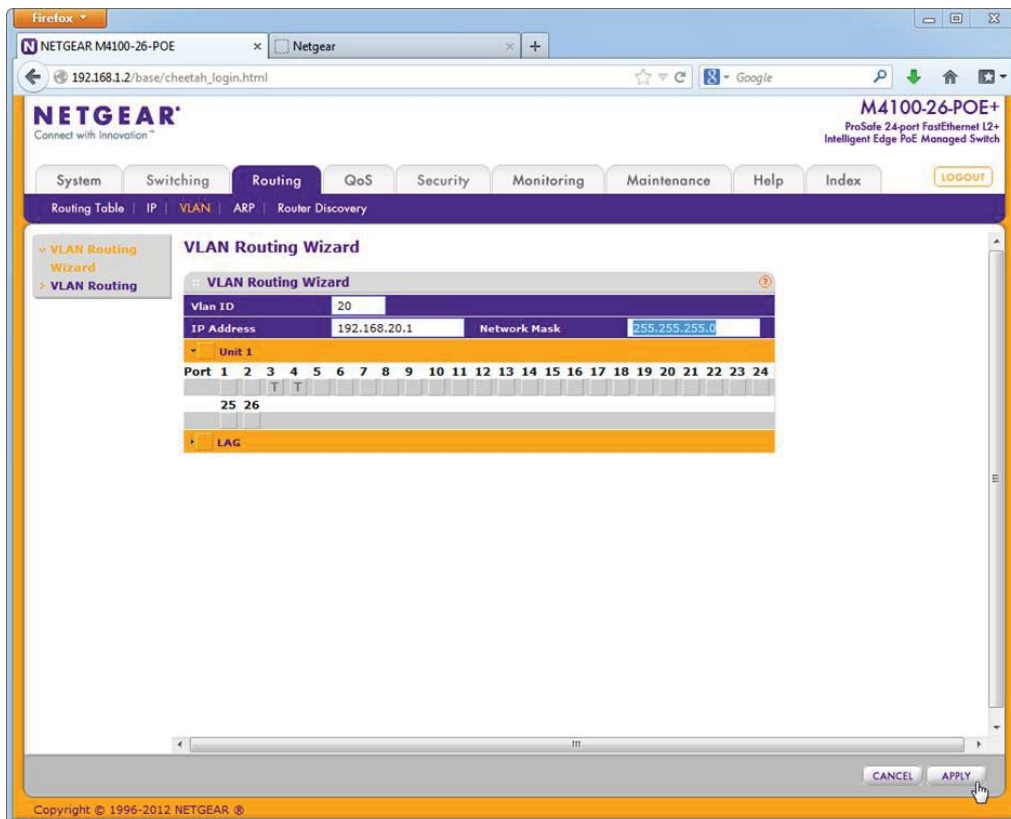
CONFIGURATION

M4100 Switch

Step 1 – Add VLAN 10 and 20 for Wireless

Select *Routing* – *VLAN* – *VLAN Routing Wizard* for each VLAN to add the VLAN, IP address and enable routing.





You only need to tag the ports that have the access points in them. Since the actual traffic will go through the switch, it doesn't go through the WC7520 itself. After, make sure that the ports for the APs and WC7520 have VLAN1 Untagged and PVID 1 set, for discovery of the access points later.

NETGEAR M4100-26-POE+
ProSafe 24-port FastEthernet L2+ Intelligent Edge PoE Managed Switch

System | **Switching** | Routing | QoS | Security | Monitoring | Maintenance | Help | Index | LOGOUT

VLAN | Auto-VoIP | STP | Multicast | MVR | Address Table | Ports | LAG

Port PVID Configuration

PVID Configuration

LAGS All Go To Interface GO

Interface	Configured PVID	Current PVID	Acceptable Frame Types	Configured Ingress Filtering	Current Ingress Filtering	Port Priority
<input type="checkbox"/> 0/1	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/2	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/3	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/4	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/5	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/6	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/7	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/8	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/9	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/10	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/11	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/12	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/13	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/14	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/15	1	1	Admit All	Disable	Disable	0
<input type="checkbox"/> 0/16	1	1	Admit All	Disable	Disable	0

CANCEL APPLY

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Routing Table | IP | VLAN | ARP | Router Discovery

VLAN Routing Wizard

VLAN Routing Wizard

Vlan ID: 20

IP Address: 192.168.20.1 Network Mask: 255.255.255.0

Unit 1

Port 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

25 26

LAG

CANCEL APPLY

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Step 2 – Configure the DHCP pools

Select *System – Services – DHCP Server*. Select *DHCP Pool Configuration* and add 2 pools, one for each VLAN. Making sure you pick the correct subnet, assign default gateway matching the switch VLAN IP address created earlier in the wizard, and assign a DNS server. Don't forget to turn on the server under *System – Services – DHCP Server – DHCP Server Configuration*.

The screenshot displays the Netgear M4100-26-POE+ web interface. The browser address bar shows the URL `192.168.1.2/base/cheetah_login.html`. The page title is "NETGEAR M4100-26-POE+ ProSafe 24-port FastEthernet L2+ Intelligent Edge PoE Managed Switch". The navigation menu includes "System", "Switching", "Routing", "QoS", "Security", "Monitoring", "Maintenance", "Help", and "Index". The "System" menu is expanded to show "Management", "Device View", "Services", "PoE", "SNMP", "LLDP", "ISDP", and "Timer Schedule". The "Services" menu is further expanded to show "DHCP Server", "DHCP Server Configuration", "DHCP Pool Configuration", "DHCP Pool Options", "DHCP Server Statistics", "DHCP Bindings Information", "DHCP Conflicts Information", "DHCP Relay", "DHCP L2 Relay", and "UDP Relay". The "DHCP Pool Configuration" page is active, showing a form for creating a new pool. The form fields are as follows:

Field	Value	Range/Notes
Pool Name	Office	(1 to 31 alphanumeric characters)
Type of Binding	Dynamic	
Network Address	192.168.10.0	
Network Mask		
Network Prefix Length	24	(0 to 32)
Client Name		
Hardware Address	00:00:00:00:00:00	
Hardware Address Type	Ethernet	
Client ID		
Host Number	0.0.0.0	
Host Mask	0.0.0.0	
Host Prefix Length		(8 to 32)
Lease Time	Infinite	
Days	0	(0 to 59)
Hours	0	(0 to 23)
Minutes	0	(0 to 59)
- Default Router Addresses		
	192.168.10.1	
	0.0.0.0	
	0.0.0.0	

At the bottom of the form, there are buttons for "ADD", "DELETE", "CANCEL", and "APPLY". The footer of the page reads "Copyright © 1996-2012 NETGEAR®".

NETGEAR M4100-26-POE

192.168.1.2/base/cheetah_login.html

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System | Switching | Routing | QoS | Security | Monitoring | Maintenance | Help | Index | LOGOUT

Management | Device View | Services | PoE | SNMP | LLDP | ISDP | Timer Schedule

DHCP Server Configuration

DNS Server Addresses

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

NetBIOS Name Server Addresses

NetBIOS Node Type: b-node Broadcast

Next Server Address: 0.0.0.0

Domain Name: (0 to 255 characters)

Bootfile: (0 to 128 characters)

ADD DELETE CANCEL APPLY

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NETGEAR M4100-26-POE

192.168.1.2/base/cheetah_login.html

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System | Switching | Routing | QoS | Security | Monitoring | Maintenance | Help | Index | LOGOUT

Management | Device View | Services | PoE | SNMP | LLDP | ISDP | Timer Schedule

DHCP Pool Configuration

DHCP Pool Configuration

Pool Name: Guest (1 to 31 alphanumeric characters)

Type of Binding: Dynamic

Network Address: 192.168.20.0

Network Mask: 24 (0 to 32)

Client Name:

Hardware Address:

Hardware Address Type: Ethernet

Client ID:

Host Number:

Host Mask:

Host Prefix Length: (8 to 32)

Lease Time: Infinite

Days: 0 (0 to 59)

Hours: 0 (0 to 23)

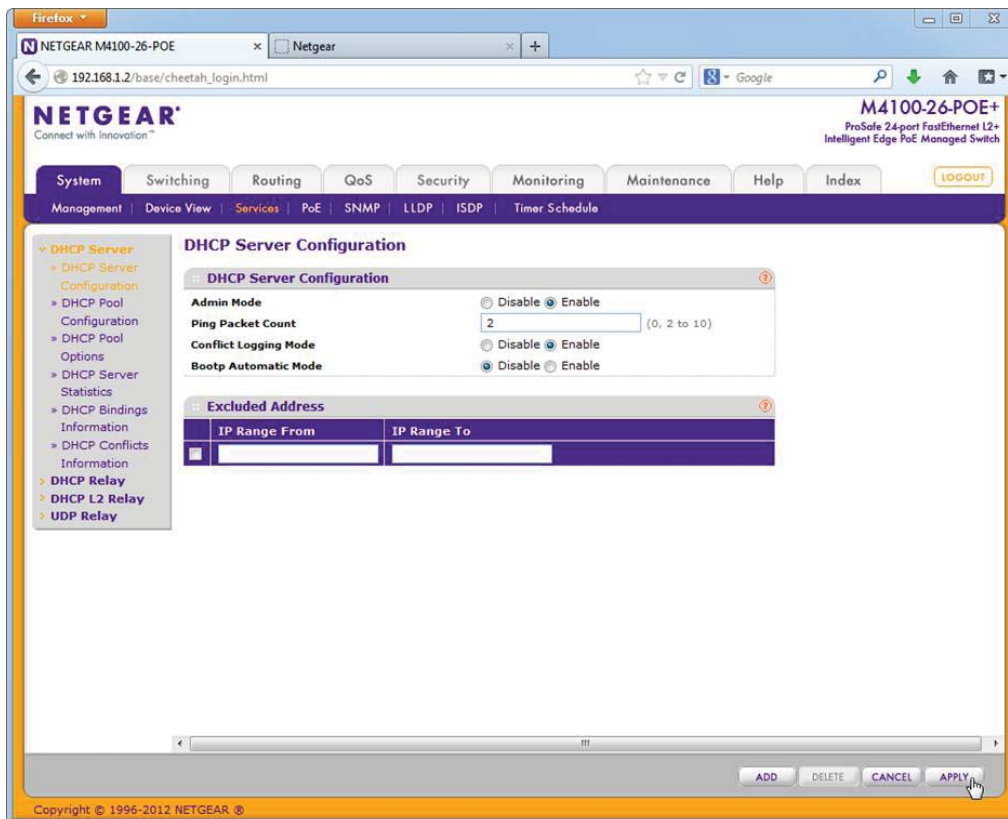
Minutes: 0 (0 to 59)

Default Router Addresses

192.168.20.1
0.0.0.0
0.0.0.0

ADD DELETE CANCEL APPLY

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Step 3 – Add ACLs to deny Guests from reaching the Office LAN and WLAN

Add ACLs like in the screenshots below, making sure that there is a *Permit – Match Every* at the end, and above that, rules to deny traffic to the Office LAN and Office WLAN, but allowing access to the router for DNS. After creating the ACLs, you have to bind them to the Guest VLAN.

The screenshot shows the Netgear M4100-26-POE web interface. The browser address bar shows '192.168.1.2/base/cheetah_login.html'. The page title is 'NETGEAR M4100-26-POE+'. The navigation menu includes System, Switching, Routing, QoS, Security, Monitoring, Maintenance, Help, and Index. The Security menu is expanded, showing Management Security, Access, Port Authentication, Traffic Control, Control, and ACL. The ACL Wizard is active, showing the IP ACL configuration page. The current number of ACLs is 3, and the maximum is 50. The IP ACL Table shows three entries: Guest (3 rules, Named IP ACL), OfficeLAN (0 rules, Named IP ACL), and OfficeWLAN (0 rules, Named IP ACL). Buttons for ADD, DELETE, and CANCEL are visible at the bottom.

The screenshot shows the Netgear M4100-26-POE web interface. The browser address bar shows '192.168.1.2/base/cheetah_login.html'. The page title is 'NETGEAR M4100-26-POE+'. The navigation menu includes System, Switching, Routing, QoS, Security, Monitoring, Maintenance, Help, and Index. The Security menu is expanded, showing Management Security, Access, Port Authentication, Traffic Control, Control, and ACL. The ACL Wizard is active, showing the Extended ACL Rule Configuration page for rule 100-199. The rule is named 'Guest' and has Rule ID 10. The action is 'Permit'. The logging is disabled. The mirror interface is empty. The redirect interface is empty. The match every is 'True'. The protocol type is 'IP'. The TCP flag is 'URG'. The src IP address is empty. The src IP mask is empty. The src L4 port is 'Other'. The dst IP address is empty. The dst IP mask is empty. The dst L4 port is 'Other'. The service type is 'IP DSCP'. The rate limit conform data rate is '1-4294967295'. Buttons for APPLY and CANCEL are visible at the bottom.

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System | Switching | Routing | QoS | **Security** | Monitoring | Maintenance | Help | Index | LOGOUT

Management Security | Access | Port Authentication | Traffic Control | Control | ACL

ACL Wizard
Basic
Advanced
IP ACL
IP Rules
IP Extended Rules
IPv6 ACL
IPv6 Rules
IP Binding Configuration
Binding Table
Vlan Binding Table

Extended ACL Rule Configuration

Extended ACL Rule Configuration(100-199)

ACL ID/Name: Guest
Rule ID: 1
Action: Permit Deny
Egress Queue: (0-7)
Logging: Disable Enable

Mirror Interface:
Redirect Interface:
Match Every: False
Protocol Type: IP
TCP Flag: URG RST
Src IP Address: 192.168.20.0
Src IP Mask: 0.0.0.255
Src L4 Port: Other
Dst IP Address: 192.168.1.1
Dst IP Mask: 255.255.255.255
Dst L4 Port: Other
Service Type: IP DSCP IP Precedence IP TOS
Rate Limit Conform Data Rate: (1-4294967295)

APPLY CANCEL

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ACL Wizard
Basic
Advanced
IP ACL
IP Rules
IP Extended Rules
IPv6 ACL
IPv6 Rules
IP Binding Configuration
Binding Table
Vlan Binding Table

Extended ACL Rule Configuration

Extended ACL Rule Configuration(100-199)

ACL ID/Name: Guest
Rule ID: 2
Action: Permit Deny Disable
Egress Queue: (0-7)
Logging: Disable Enable

Mirror Interface:
Redirect Interface:
Match Every: False
Protocol Type: IP
TCP Flag: URG RST
Src IP Address: 192.168.20.0
Src IP Mask: 0.0.0.255
Src L4 Port: Other
Dst IP Address: 192.168.0.0
Dst IP Mask: 0.0.255.255
Dst L4 Port: Other
Service Type: IP DSCP IP Precedence IP TOS
Rate Limit Conform Data Rate: (1-4294967295)

APPLY CANCEL

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Management Security | Access | Port Authentication | Traffic Control | Control | **ACL**

ACL Wizard
Basic
Advanced
 > IP ACL
 > IP Rules
 > IP Extended Rules
 > IPv6 ACL
 > IPv6 Rules
 > IP Binding Configuration
 > Binding Table
 > **Vlan Binding Table**

ACL Vlan Binding Table

VLAN Binding Configuration

VLAN ID	Direction	Sequence Number	ACL Type	ACL ID
20		1	IP ACL	Guest

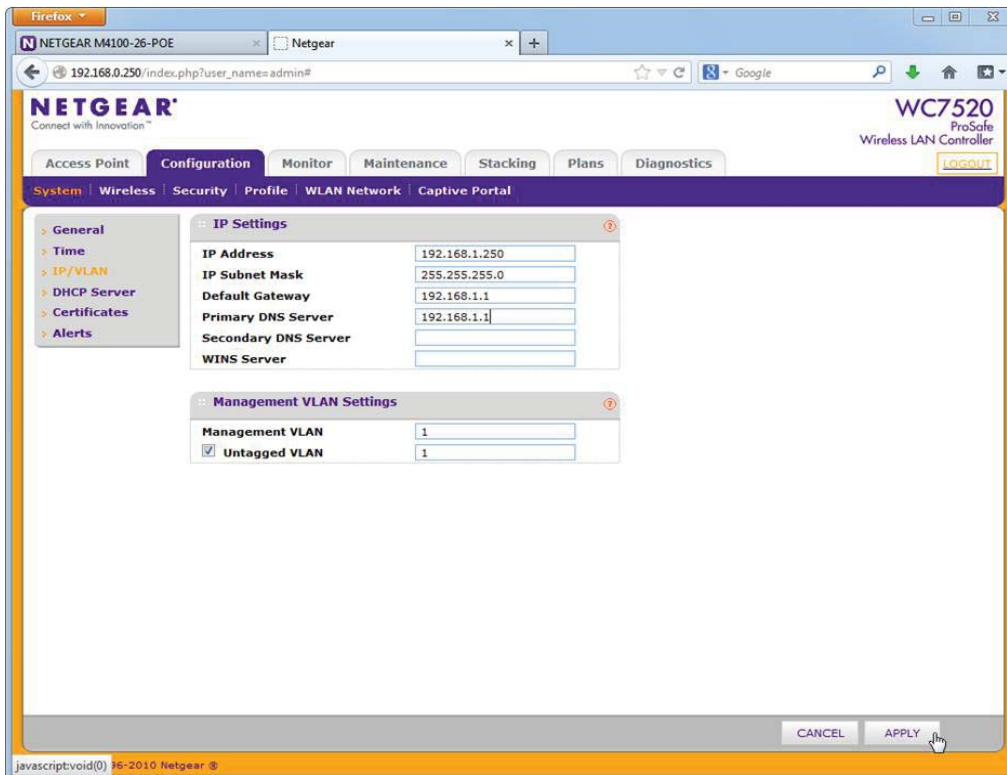
ADD DELETE CANCEL

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WC7520

Step 1 – Configure the IP settings

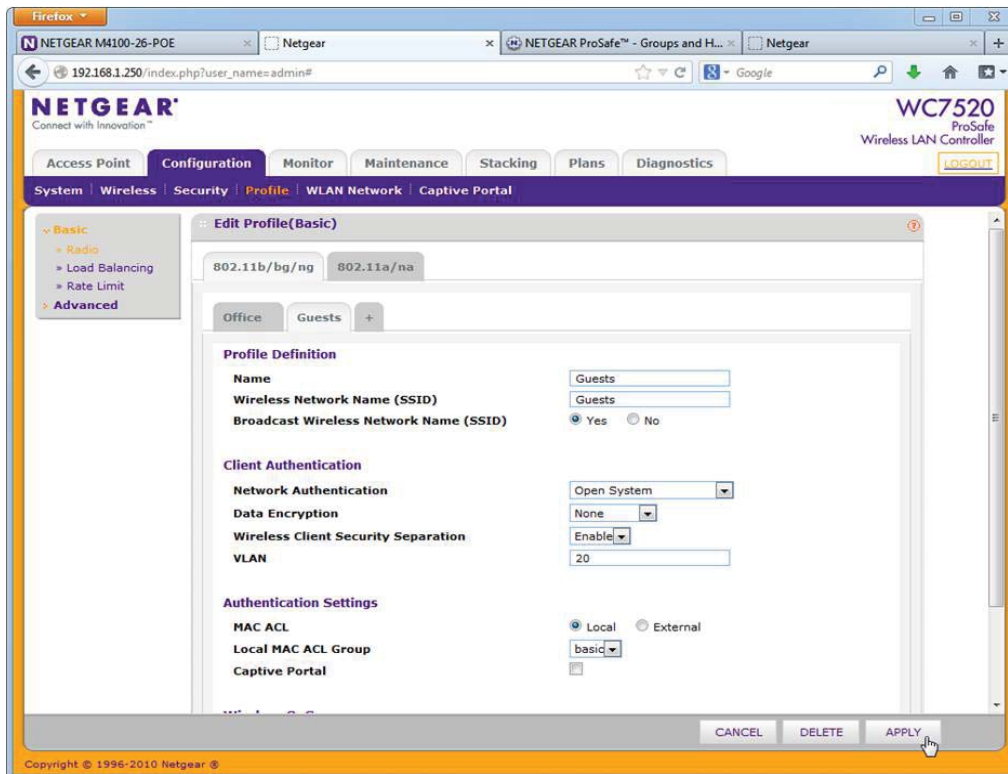
Log in to the WC7520 and select *Configuration – System – IP/VLAN*.



Connect to the default IP of the WC7520, `192.168.0.250`. Change the IP address; we'll use `192.168.1.250/24`. The default gateway and the DNS server will be the router on `192.168.1.1`. You'll have to change IP now, and reconnect to the WC7520 on its new IP address.

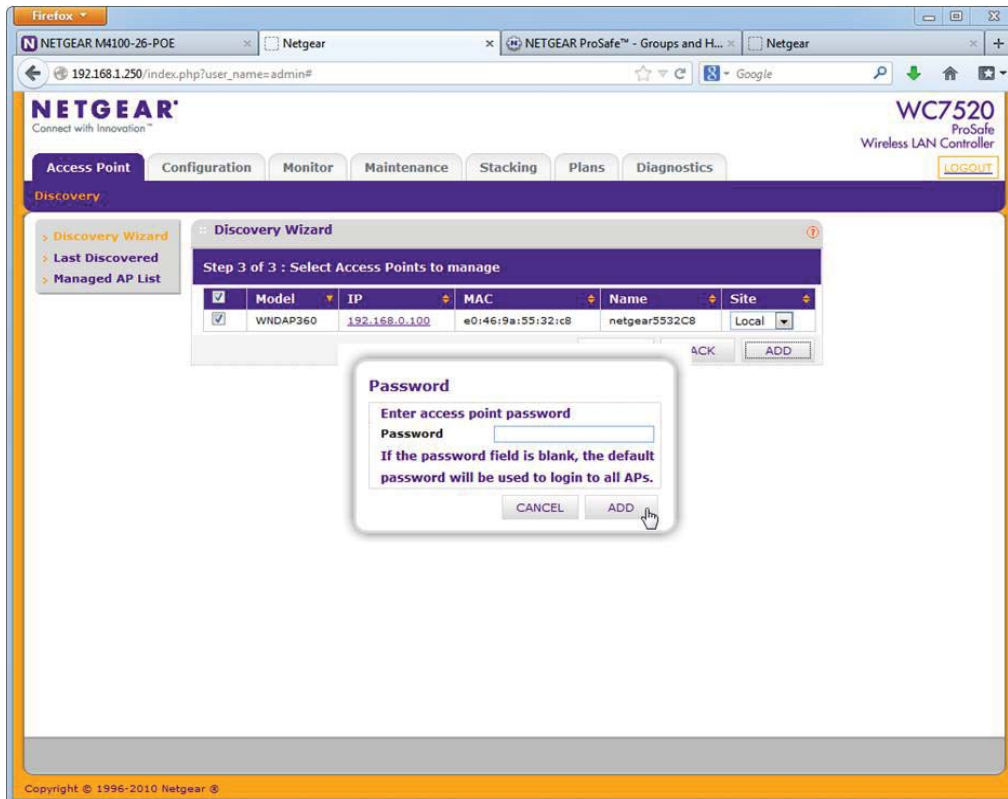
Step 2 – Configure the Office SSIDs

Select *Configuration – Profile – Basic – Radio*. We will call the first wireless network *Office*; we won't use any encryption for now. We will call the second wireless network *Guests*. We'll enable client separation to prevent wireless guests from seeing each other.



Step 3 – Plug in your Access Points to port 3 and 4

Make sure the Access Point is on Factory Defaults, and wait until it's fully booted up.



Step 4 - Discover and add your AP

Select Access Point – Discovery Wizard. Choose *Factory Default state* and *Same L2 network*. You should find the Access Point on its default IP address. Select it, and select *Add*. Leave the password field blank and select *Add*. Wait until you see *Connected* in the status column. This will take a few minutes

Router

Step 1 – Add static routes to new Wireless LANs

The router needs to know about these new IP subnets. So we need to add two static routes. One for 192.168.10.0/255.255.255.0 and one for 192.168.20.0/255.255.255.0, through the gateway, which is the switch on 192.168.1.2.

The screenshot shows the Netgear web interface for adding a static route. The navigation bar includes: Network Configuration | Security | VPN | Users | Administration | Monitoring | Web Support | Logout. The breadcrumb trail is: WAN Settings :: Protocol Binding :: Dynamic DNS :: LAN Settings :: DMZ Setup :: Routing :: Add Static Route. The main content area shows a success message: "Operation succeeded." Below this is the "Static Route" configuration form with the following fields:

- Route Name:
- Active Private
- Destination IP Address:
- IP Subnet Mask:
- Interface:
- Gateway IP Address:
- Metric:

At the bottom of the form are two buttons: "Apply" and "Reset". The footer of the page reads: "2013 © Copyright NETGEAR®".

NOTES

This guide is based on a factory default WC7520, running firmware 2.5.0.5_3215.