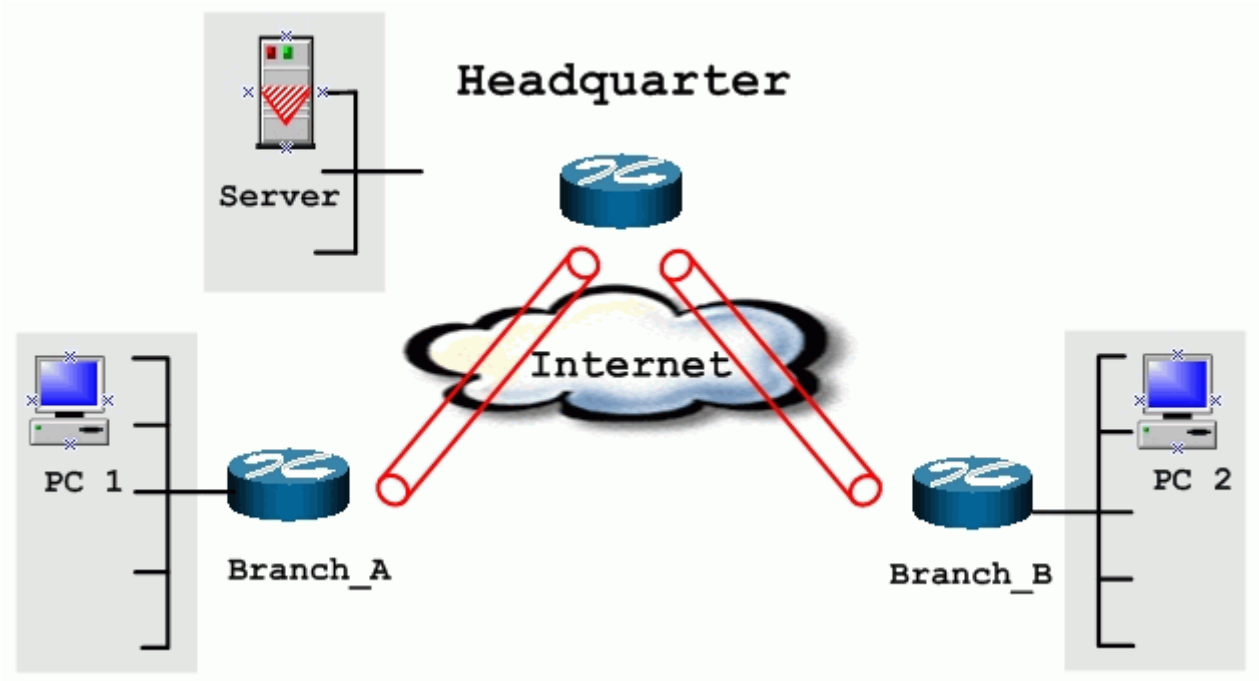
VPN Routing between Branch Offices

1. Setup VPN in Branch Office A
2. Setup VPN in Branch Office B
3. Setup VPN in Headquarter

This page guides us how to setup VPN routing between branch offices through headquarter. So that whenever branch office A wants to talk to branch office B, headquarter plays as a VPN relay. Users can gain benefit from such application when the scale of branch offices is very large, because no additional VPN tunnels between branch offices are needed. In this support note, we skip the detailed configuration steps for Internet access and presume that you are familiar with basic ZyNOS VPN configuration.

As the figure shown below, each branch office have a VPN tunnel to headquarter, thus PCs in branch offices can access systems in headquarter via the tunnel. Through VPN routing, ZyWALL series now provide you a solution to let PCs in branch offices talk to each other through the existing VPN tunnels concentrated on the headquarter. This feature is available in ZyWALL10, ZyWALL50 and ZyWALL100.



The IP addresses we use in this example are as shown below.

Branch_A	Headquarter	Branch_B
WAN:202.3.1.1 LAN:192.168.3.1	WAN:202.1.1.1 LAN:192.168.1.1	WAN:202.2.1.1 LAN:192.168.2.1

LAN of Branch_A	LAN of Headquarter	LAN of Branch_B
192.168.3.0/24	192.168.1.0/24	192.168.2.0/24

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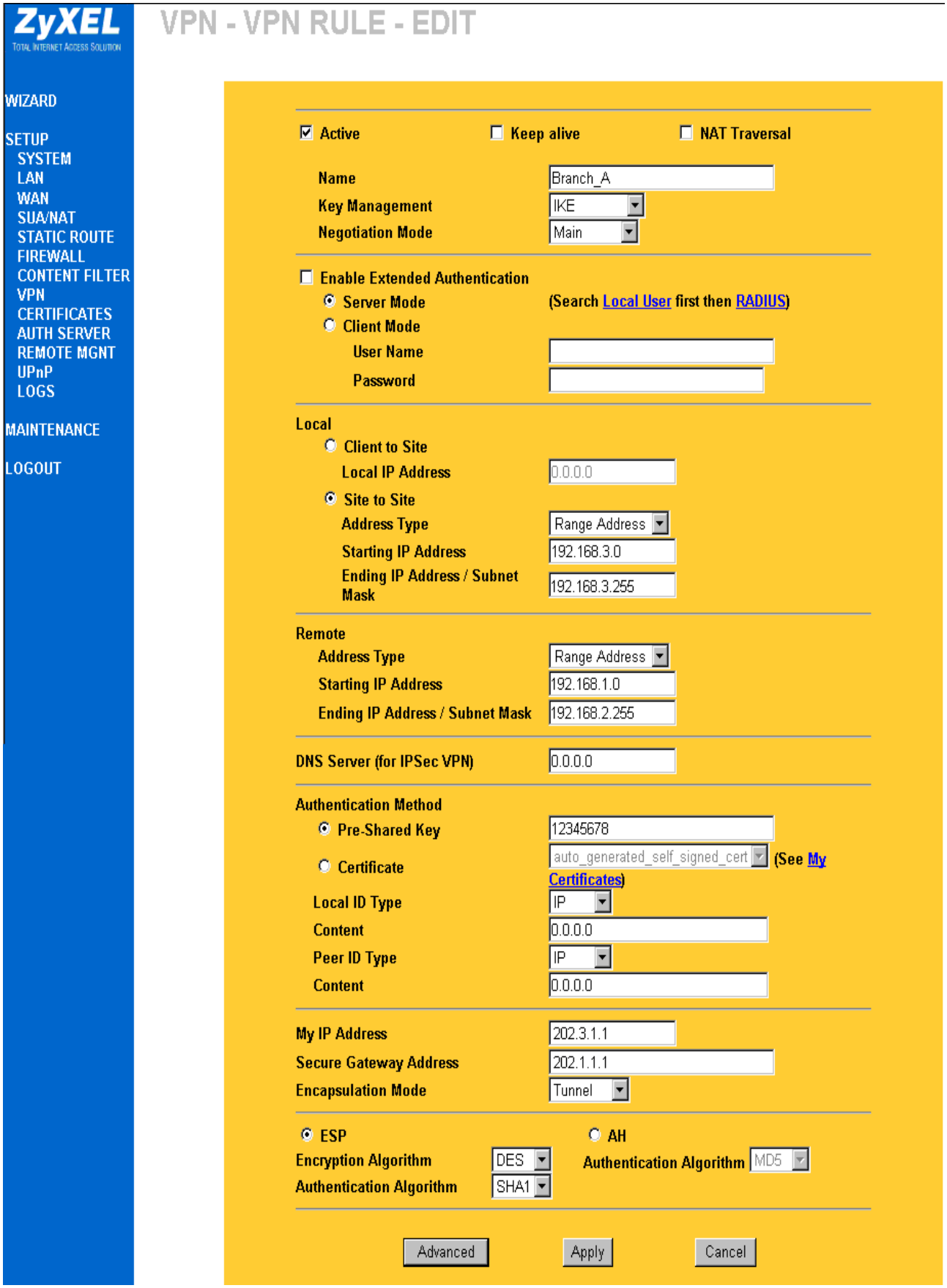
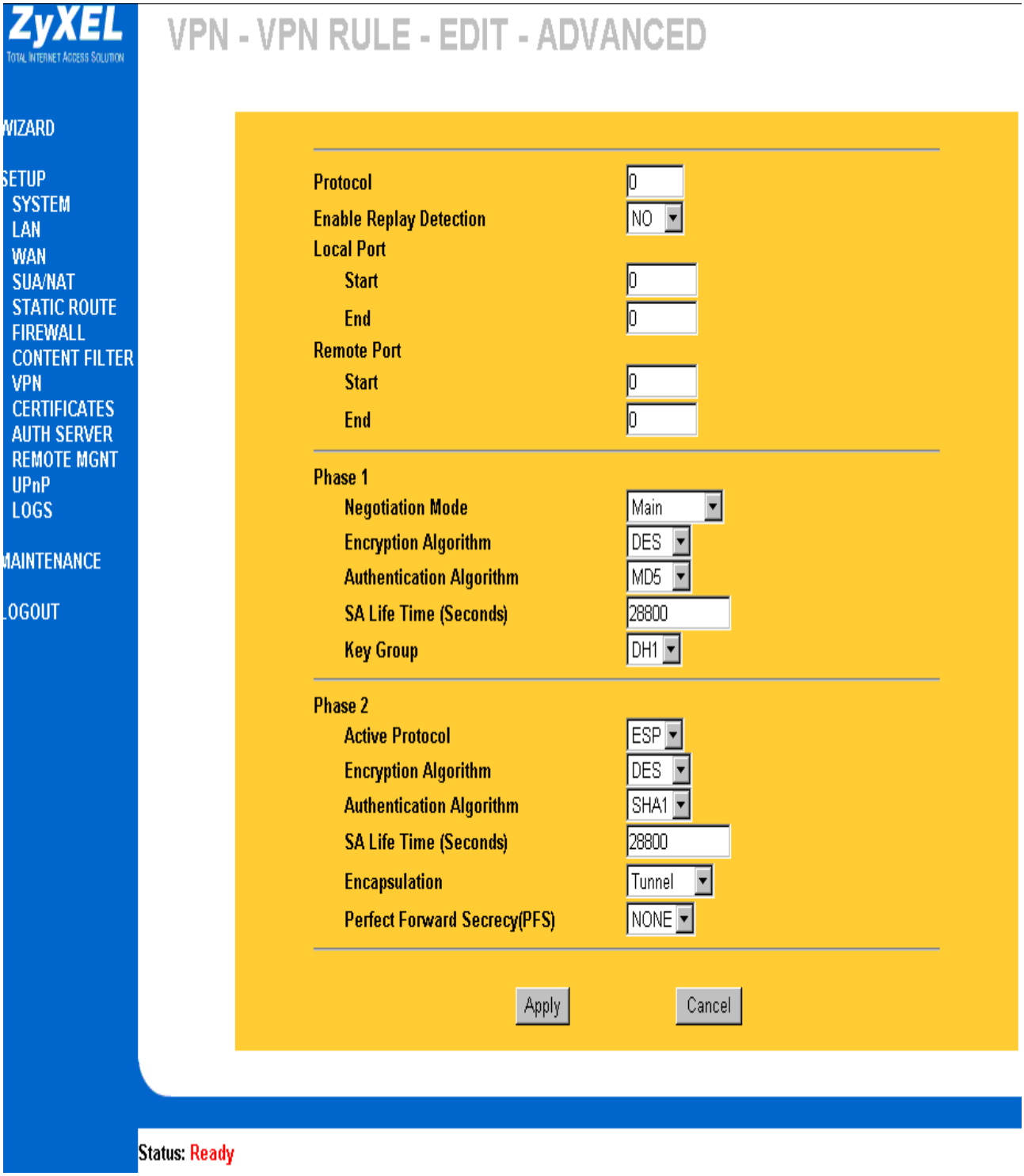
1. Setup VPN in branch office A

Because VPN routing enables branch offices to talk to each other via tunnels concentrated on headquarter. In this step, we configure an IPSec rule in ZyWALL (Branch_A) for PCs behind branch office A to access both LAN segments of headquarter and branch office B. Because the LAN segments of headquarter and branch office B are continuous, we merge them into one single rule by including these two segments in **Remote** section. If by any chance, the two segments are not continuous, we strongly recommend you to setup different rules for these segments.

1. Click **Advanced**, and click **VPN** tab on the left.
2. On the **SUMMARY** menu, Select a policy to edit by clicking **Edit**.
3. On the **CONFIGURE-IKE** menu, check **Active** check box and give a name to this policy.
4. Give this VPN rule a name, **Branch_A**.
5. Select **Key Management** to **IKE** and **Negotiation Mode** to **Main**.
6. In **Local** section, select **Address Type** to **Range Address**, set **IP Address Start** to **192.168.3.0**, and **End** to **192.168.3.255**. This section covers the LAN segment of branch office A.
7. In **Remote** section, select **Address Type** to **Range Address**, set **IP Address Start** to **192.168.1.0** and **End** to **192.168.2.255**. This section covers the LAN segment of both headquarter and branch office B.
8. **My IP Addr** is the **WAN IP of this ZyWALL**, **202.3.1.1**.
9. Set **Secure Gateway Addr** to the **IP address of Headquarter**, **202.1.1.1**.
10. Select **Encapsulation Mode** to **Tunnel**.
11. Check the **ESP** check box. (AH can not be used in SUA/NAT case)
12. Select **Encryption Algorithm** to **DES** and **Authentication Algorithm** to **SHA-1**. These parameters are for IKE phase 2 negotiation. You can set more detailed configuration by pressing **Advanced** button.
13. Enter the key string **12345678** in the **Pre-shared Key** text box, and click **Apply**.



You can setup IKE phase 1 and phase 2 parameters by pressing **Advanced** button. Please make sure that parameters you set in this menu match with all the parameters with the correspondent VPN rule in headquarter.



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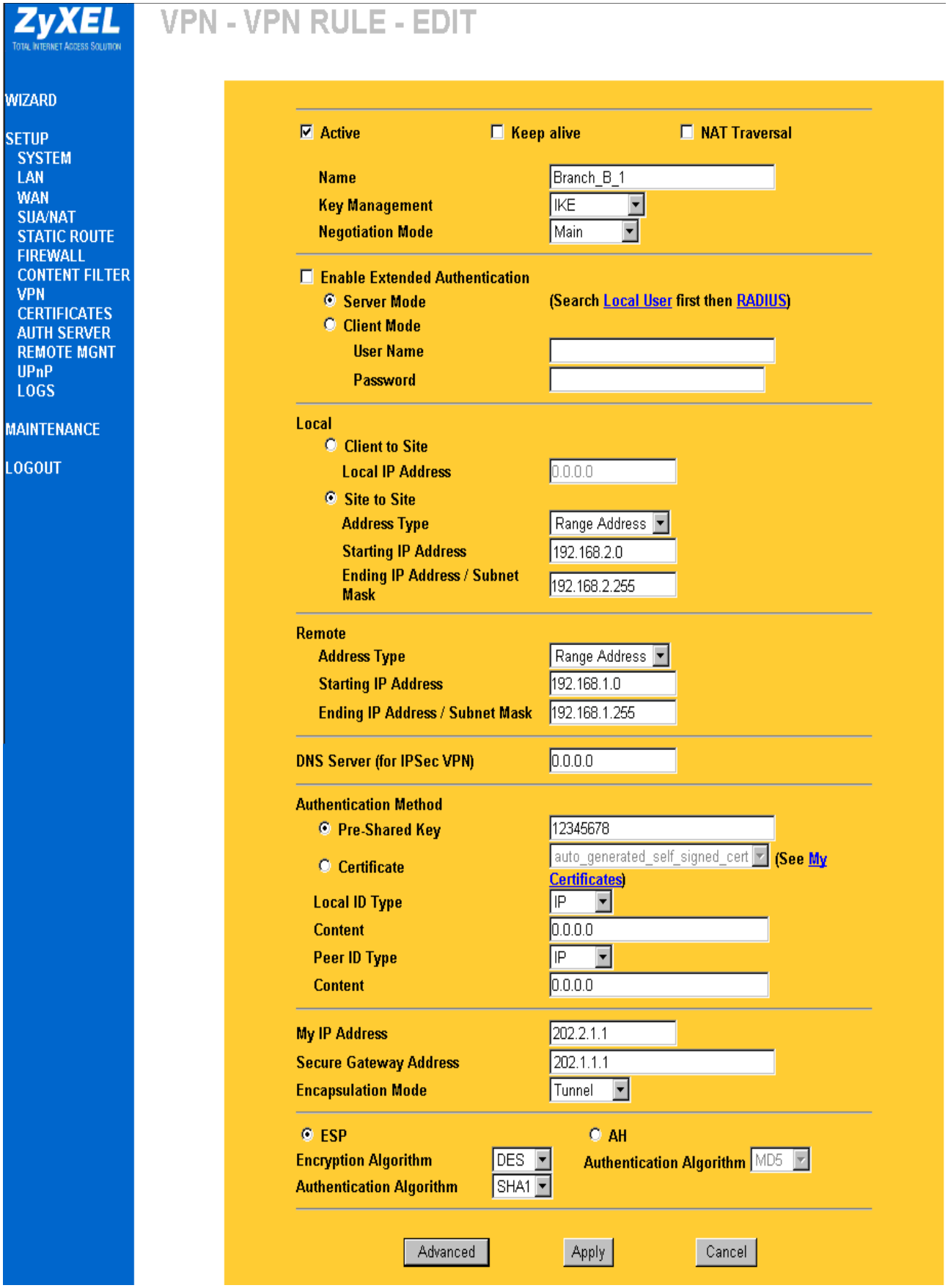
2. Setup VPN in branch office B

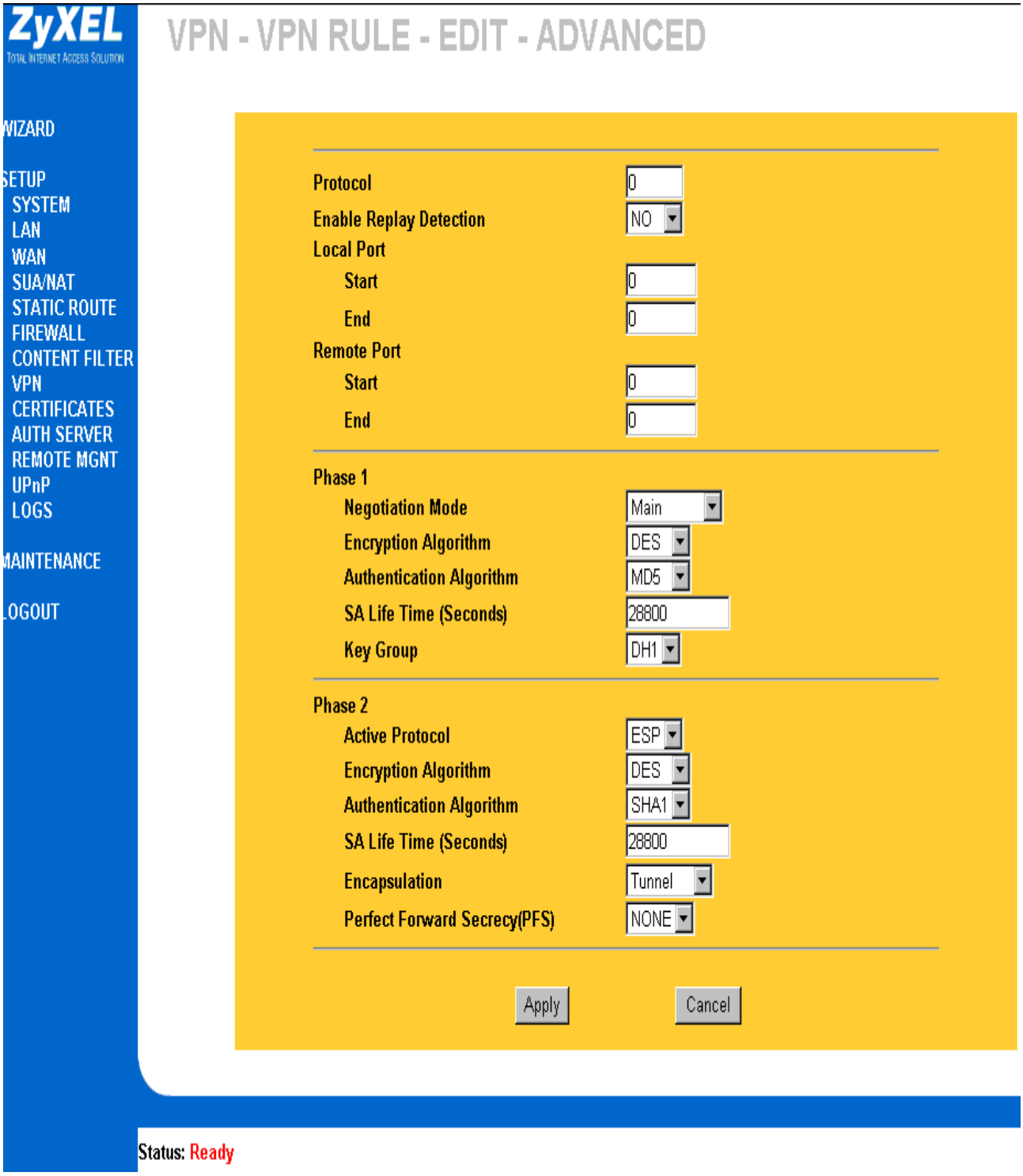
Be very careful about the remote IP address in branch office B, because for systems behind branch office B want to systems behind branch office A and headquarter, we have to specify these two segments in **Remote** section. However if we include these two segments in one rule, the LAN segment of branch office B will be also included in this single rule, which means intercommunication inside branch office B will run into VPN tunnel. To avoid such situation, we need two separate rules to cover the LAN segment of branch office A and headquarter.

1. **The first rule in Branch_ B.**

This rule is for branch office B to access headquarter.

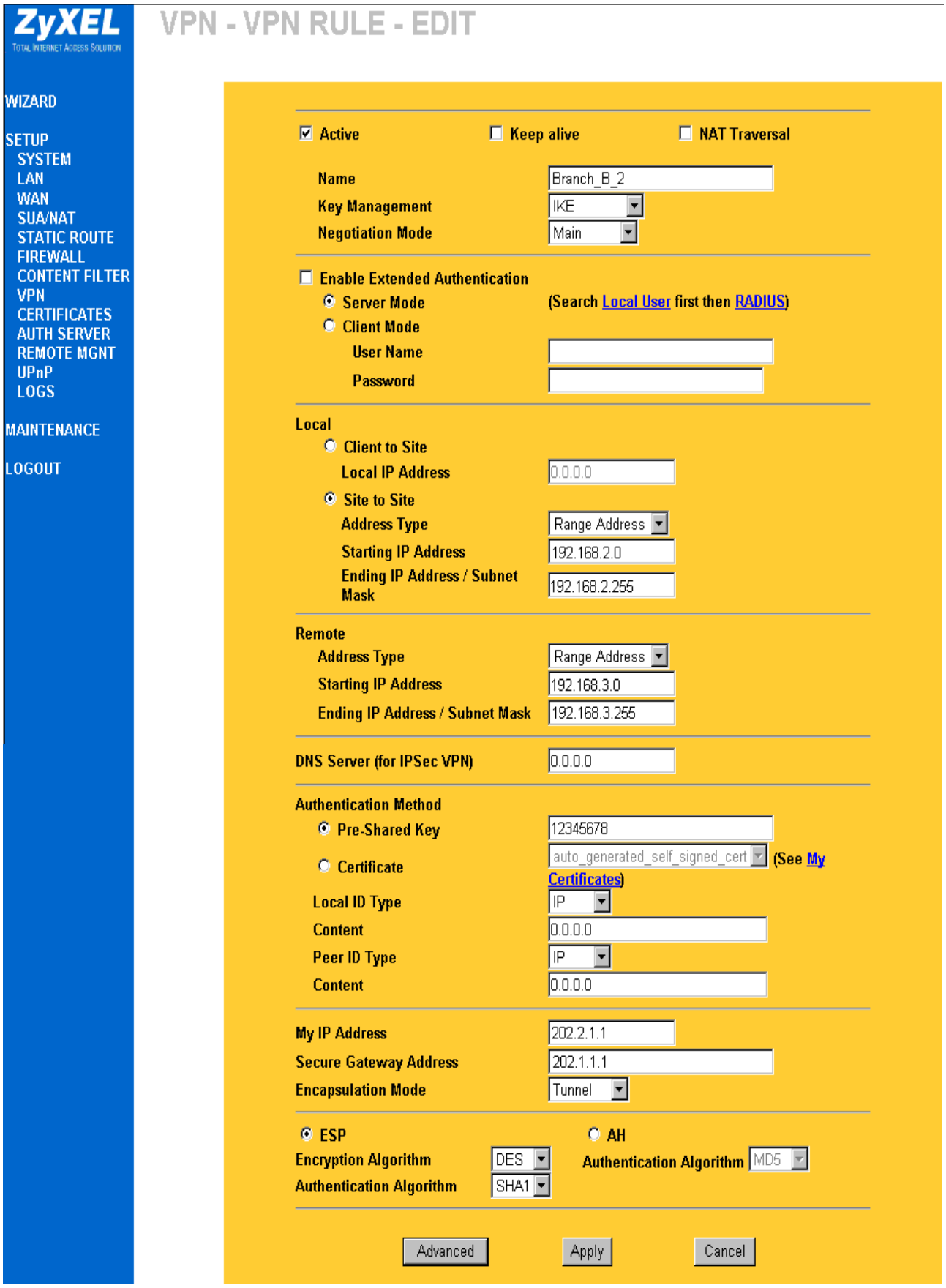


You can setup IKE phase 1 and phase 2 parameters by pressing **Advanced** button. Please make sure that parameters you set in this menu match with all the parameters with the correspondent VPN rule in headquarter.

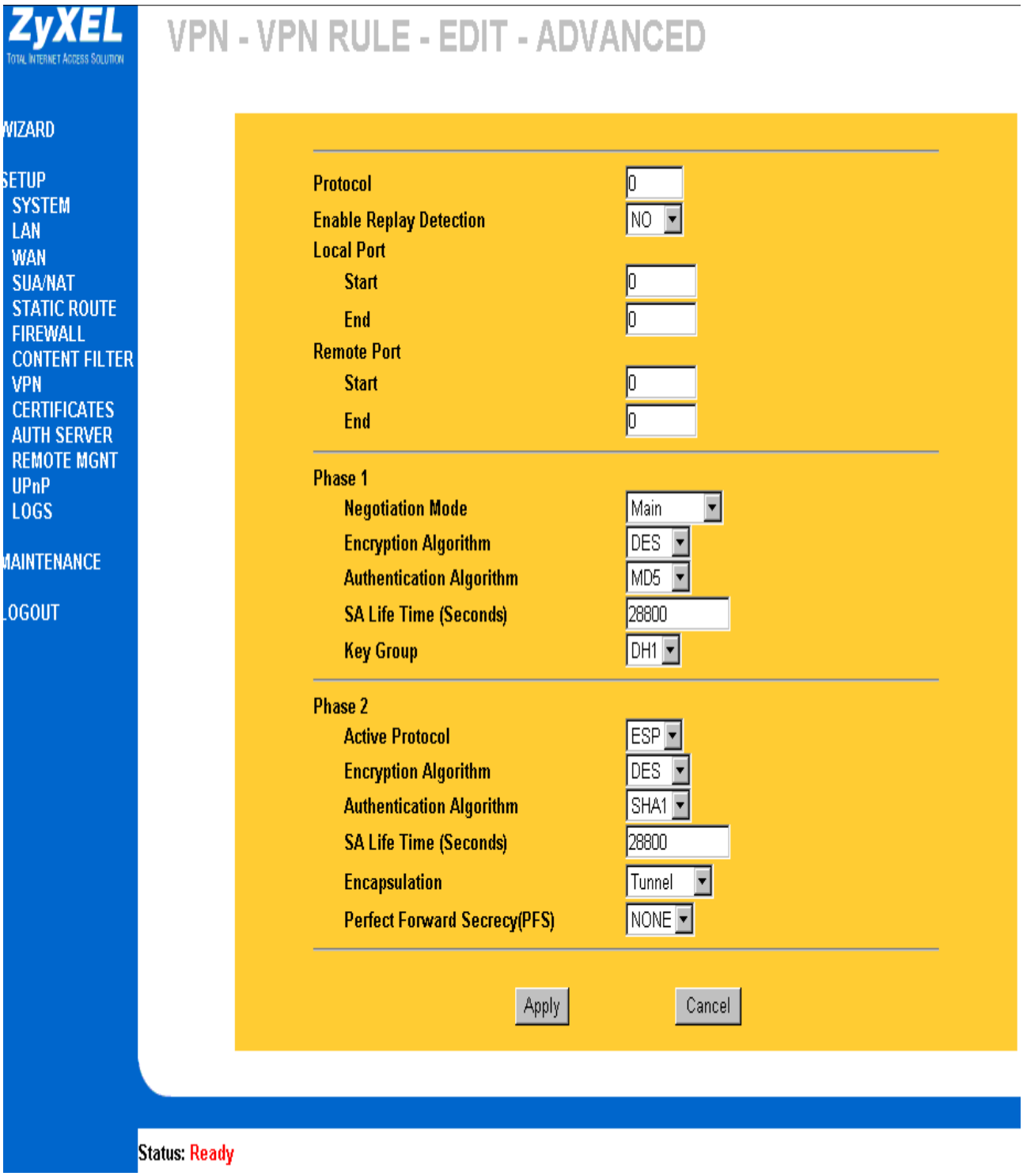


2. **The second rule in Branch_B**

This rule is for branch office B to access branch office A.



You can setup IKE phase 1 and phase 2 parameters by pressing **Advanced** button. Please make sure that parameters you set in this menu match with all the parameters with the correspondent VPN rule in headquarter.



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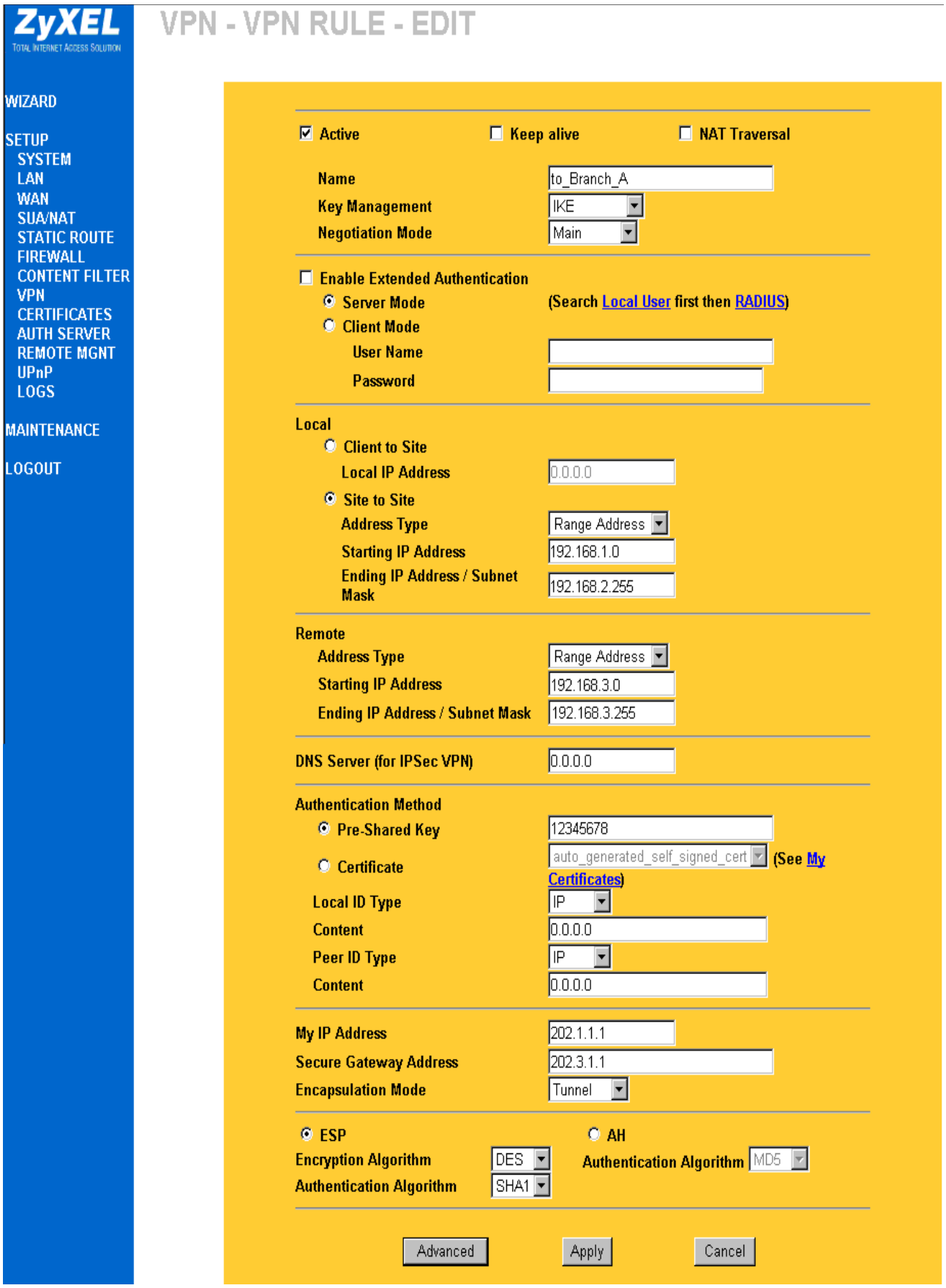
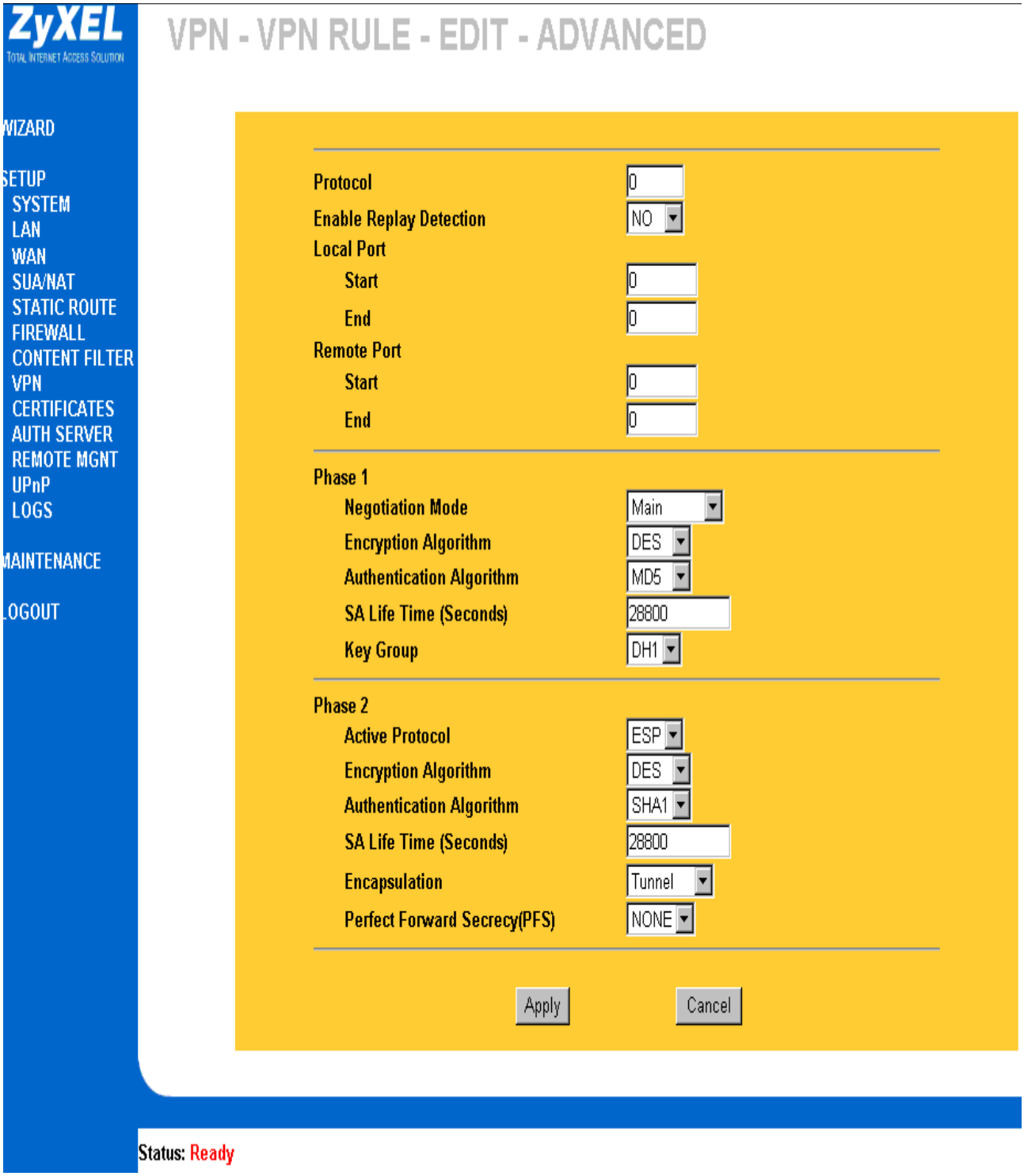
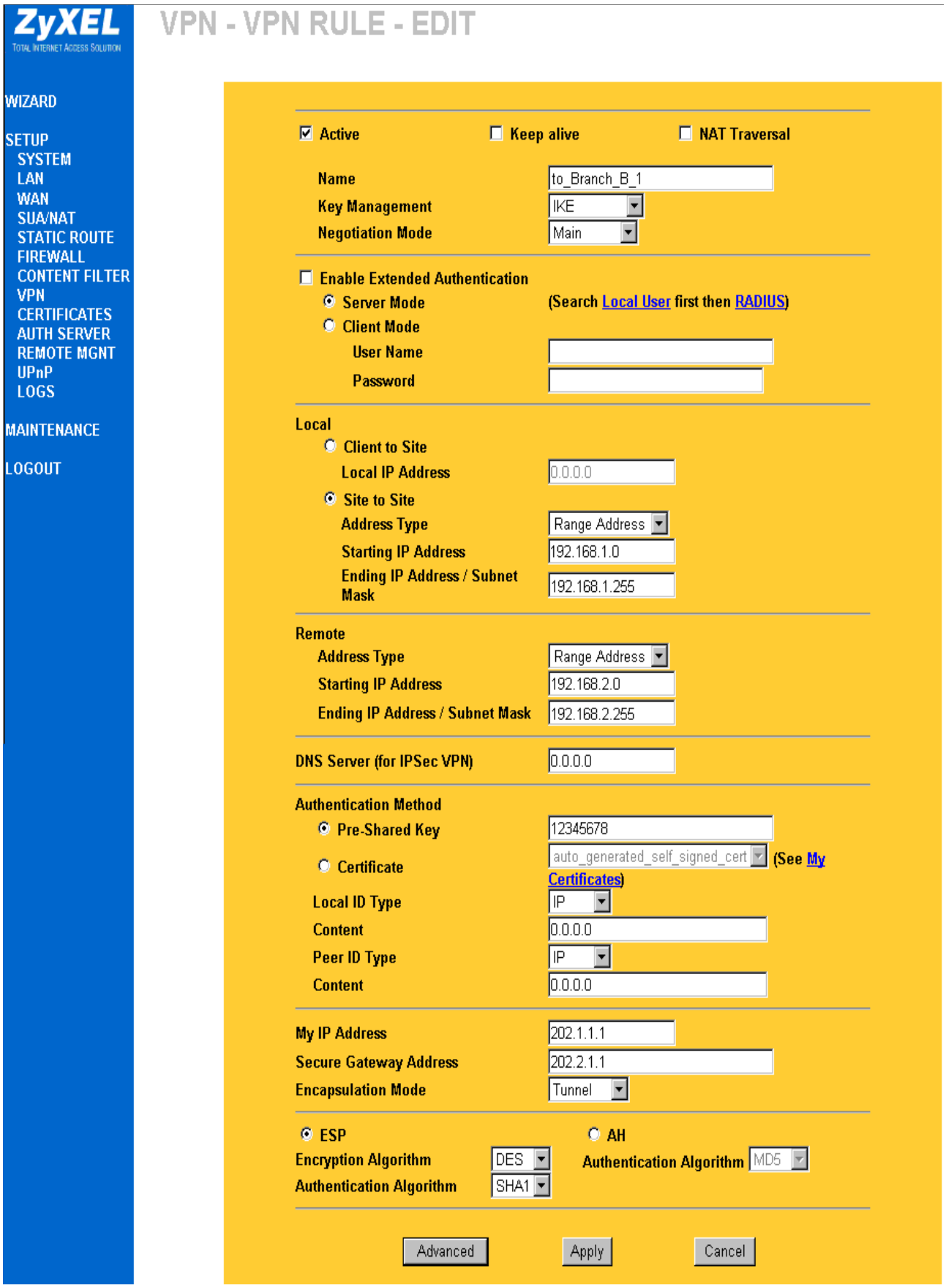
3. Setup VPN in Headquarter

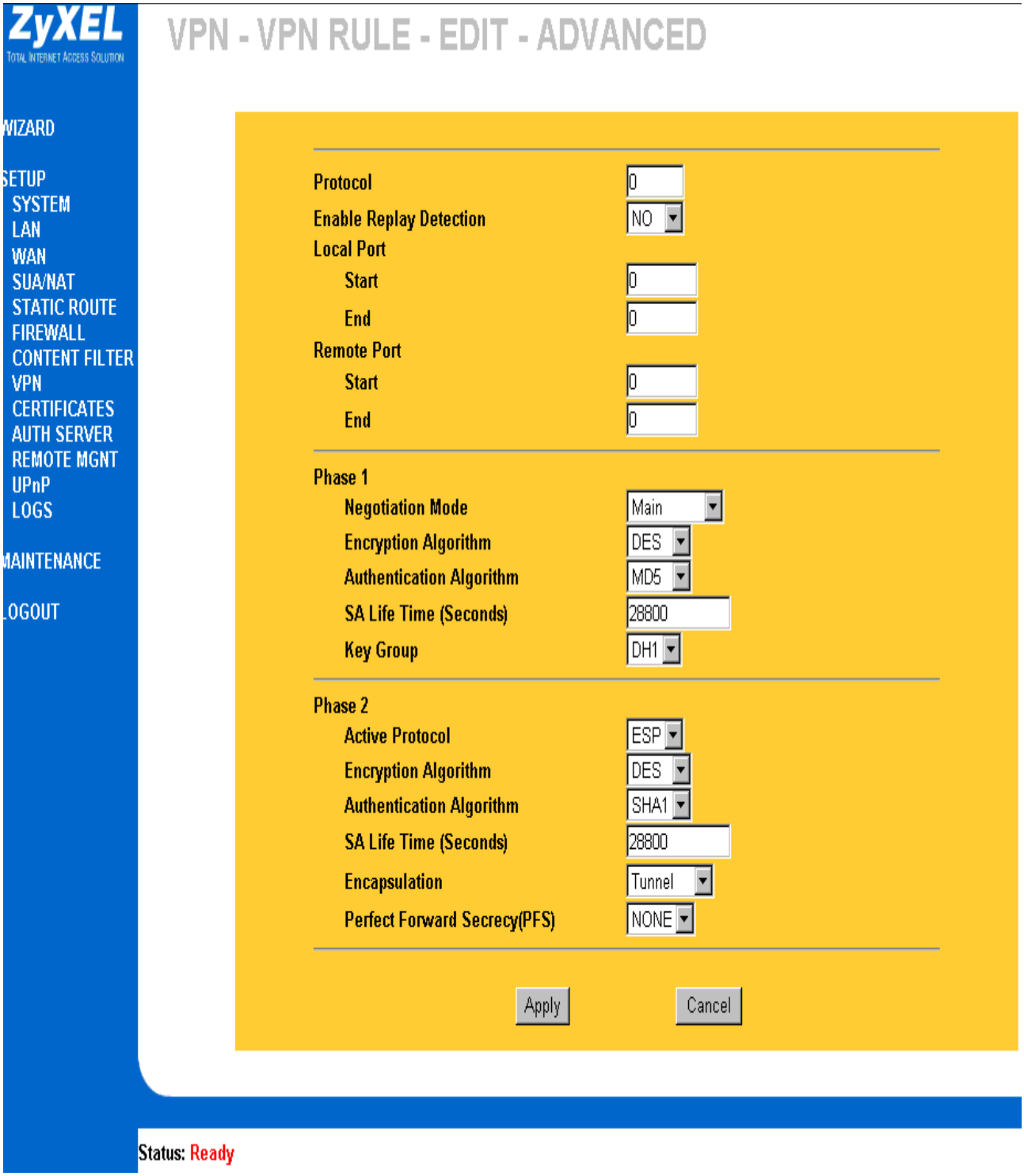
1. **The correspondent rule for Branch_A in headquarter**


ZyXEL
TOTAL INTERNET ACCESS SOLUTION
VPN - VPN RULE - EDIT
WIZARD
SETUP
SYSTEM
LAN
WAN
SUA/NAT
STATIC ROUTE
FIREWALL
CONTENT FILTER
VPN
CERTIFICATES
AUTH SERVER
REMOTE MGNT
UPnP
LOGS
MAINTENANCE
LOGOUT
Active
Keep alive
NAT Traversal
Name
to_Branch_A
Key Management
IKE
Negotiation Mode
Main
Enable Extended Authentication
Server Mode
(Search Local User first then RADIUS)
Client Mode
User Name
Password
Local
Client to Site
Local IP Address
0.0.0.0
Site to Site
Address Type
Range Address
Starting IP Address
192.168.1.0
Ending IP Address / Subnet Mask
192.168.2.255
Remote
Address Type
Range Address
Starting IP Address
192.168.3.0
Ending IP Address / Subnet Mask
192.168.3.255
DNS Server (for IPSec VPN)
0.0.0.0
Authentication Method
Pre-Shared Key
12345678
Certificate
auto_generated_self_signed_cert
(See My Certificates)
Local ID Type
IP
Content
0.0.0.0
Peer ID Type
IP
Content
0.0.0.0
My IP Address
202.1.1.1
Secure Gateway Address
202.3.1.1
Encapsulation Mode
Tunnel
ESP
AH
Encryption Algorithm
DES
Authentication Algorithm
MD5
Authentication Algorithm
SHA1
Advanced
Apply
Cancel

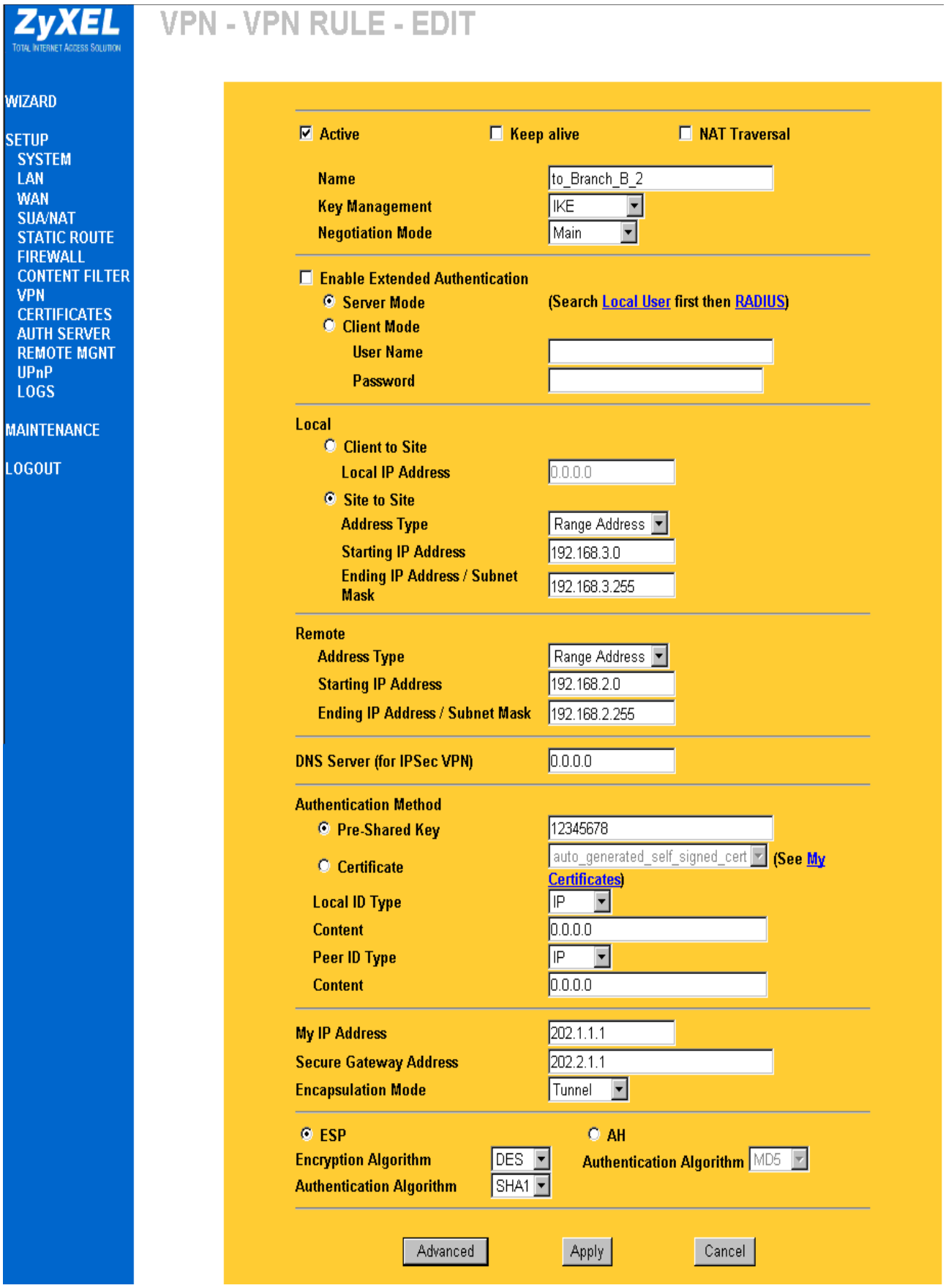


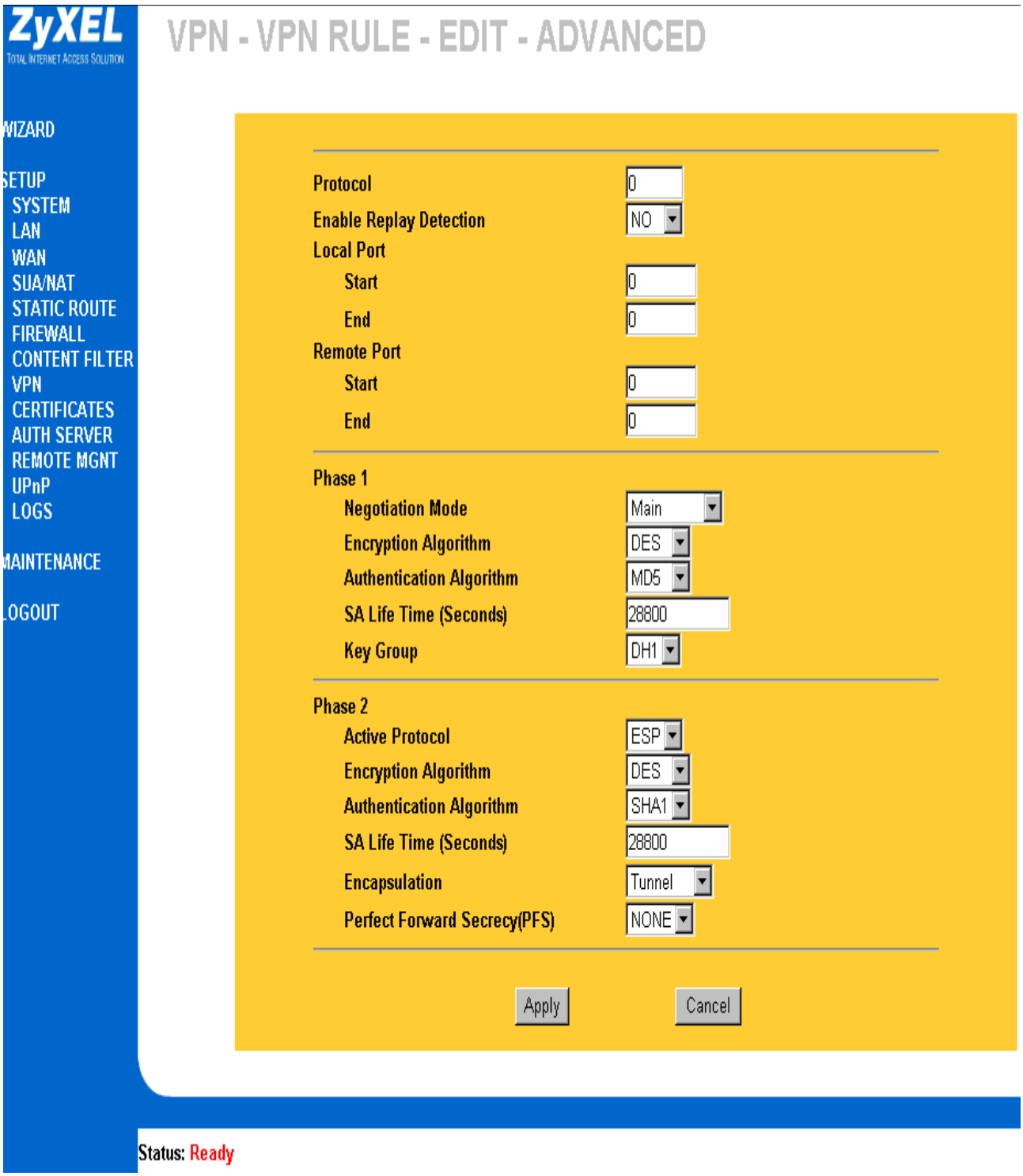
2. **The correspondent rule for Branch_B_1 in headquarter**


ZyXEL
TOTAL INTERNET ACCESS SOLUTION
VPN - VPN RULE - EDIT
WIZARD
SETUP
SYSTEM
LAN
WAN
SUA/NAT
STATIC ROUTE
FIREWALL
CONTENT FILTER
VPN
CERTIFICATES
AUTH SERVER
REMOTE MGNT
UPnP
LOGS
MAINTENANCE
LOGOUT
Active
Keep alive
NAT Traversal
Name
to_Branch_B_1
Key Management
IKE
Negotiation Mode
Main
Enable Extended Authentication
Server Mode
(Search Local User first then RADIUS)
Client Mode
User Name
Password
Local
Client to Site
Local IP Address
0.0.0.0
Site to Site
Address Type
Range Address
Starting IP Address
192.168.1.0
Ending IP Address / Subnet Mask
192.168.1.255
Remote
Address Type
Range Address
Starting IP Address
192.168.2.0
Ending IP Address / Subnet Mask
192.168.2.255
DNS Server (for IPSec VPN)
0.0.0.0
Authentication Method
Pre-Shared Key
12345678
Certificate
auto_generated_self_signed_cert
(See My Certificates)
Local ID Type
IP
Content
0.0.0.0
Peer ID Type
IP
Content
0.0.0.0
My IP Address
202.1.1.1
Secure Gateway Address
202.2.1.1
Encapsulation Mode
Tunnel
ESP
AH
Encryption Algorithm
DES
Authentication Algorithm
MD5
Authentication Algorithm
SHA1
Advanced
Apply
Cancel



2. **The correspondent rule for Branch_B_2 in headquarter**


ZyXEL
TOTAL INTERNET ACCESS SOLUTION
VPN - VPN RULE - EDIT
WIZARD
SETUP
SYSTEM
LAN
WAN
SUA/NAT
STATIC ROUTE
FIREWALL
CONTENT FILTER
VPN
CERTIFICATES
AUTH SERVER
REMOTE MGNT
UPnP
LOGS
MAINTENANCE
LOGOUT
Active
Keep alive
NAT Traversal
Name
to_Branch_B_2
Key Management
IKE
Negotiation Mode
Main
Enable Extended Authentication
Server Mode
(Search Local User first then RADIUS)
Client Mode
User Name
Password
Local
Client to Site
Local IP Address
0.0.0.0
Site to Site
Address Type
Range Address
Starting IP Address
192.168.3.0
Ending IP Address / Subnet Mask
192.168.3.255
Remote
Address Type
Range Address
Starting IP Address
192.168.2.0
Ending IP Address / Subnet Mask
192.168.2.255
DNS Server (for IPSec VPN)
0.0.0.0
Authentication Method
Pre-Shared Key
12345678
Certificate
auto_generated_self_signed_cert
(See My Certificates)
Local ID Type
IP
Content
0.0.0.0
Peer ID Type
IP
Content
0.0.0.0
My IP Address
202.1.1.1
Secure Gateway Address
202.2.1.1
Encapsulation Mode
Tunnel
ESP
AH
Encryption Algorithm
DES
Authentication Algorithm
MD5
Authentication Algorithm
SHA1
Advanced
Apply
Cancel


ZyXEL
TOTAL INTERNET ACCESS SOLUTION
VPN - VPN RULE - EDIT - ADVANCED
WIZARD
SETUP
SYSTEM
LAN
WAN
SUA/NAT
STATIC ROUTE
FIREWALL
CONTENT FILTER
VPN
CERTIFICATES
AUTH SERVER
REMOTE MGNT
UPnP
LOGS
MAINTENANCE
LOGOUT
Protocol
0
Enable Replay Detection
NO
Local Port
Start
0
End
0
Remote Port
Start
0
End
0
Phase 1
Negotiation Mode
Main
Encryption Algorithm
DES
Authentication Algorithm
MD5
SA Life Time (Seconds)
28800
Key Group
DH1
Phase 2
Active Protocol
ESP
Encryption Algorithm
DES
Authentication Algorithm
SHA1
SA Life Time (Seconds)
28800
Encapsulation
Tunnel
Perfect Forward Secrecy(PFS)
NONE
Apply
Cancel
Status: Ready