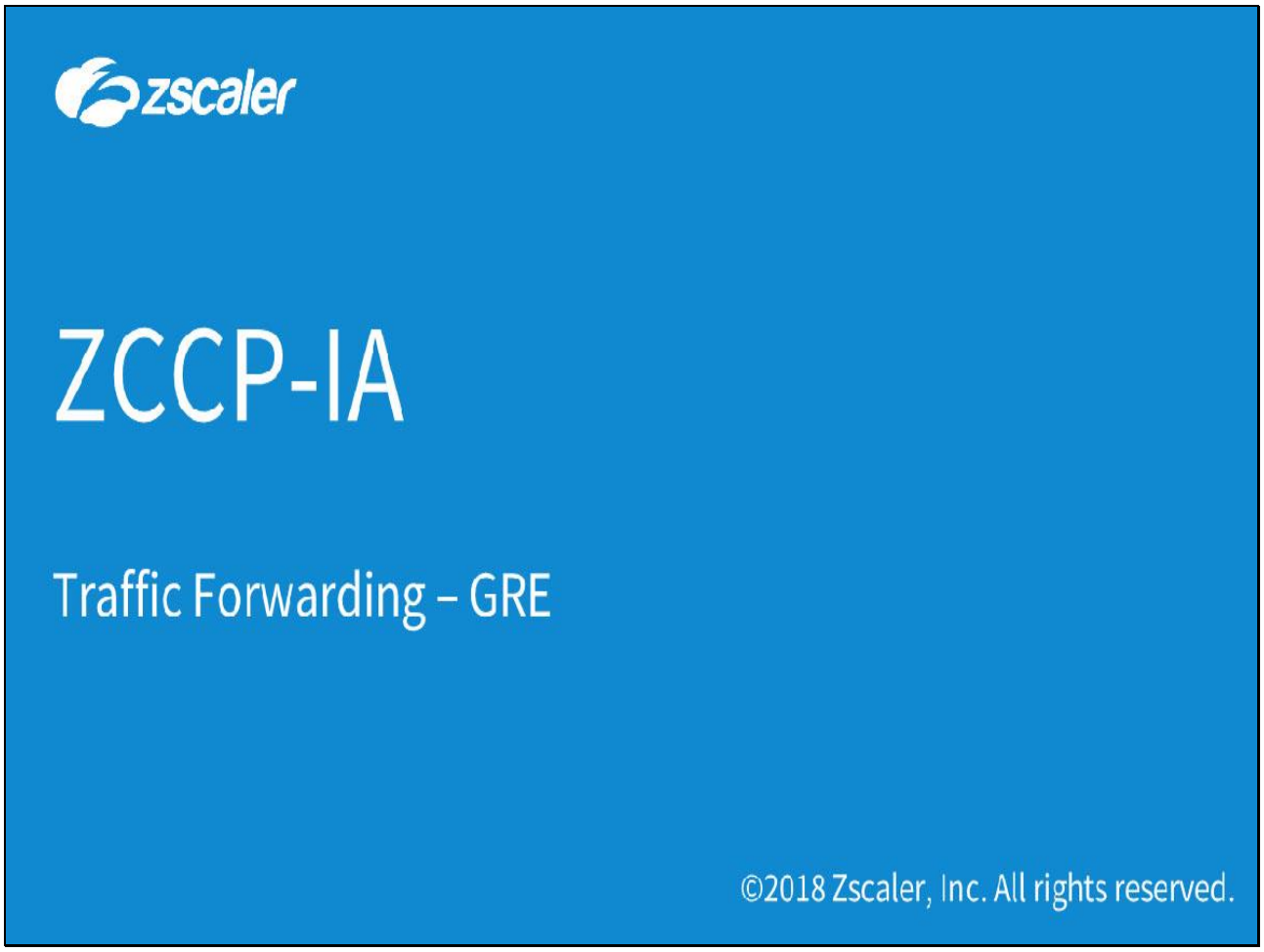
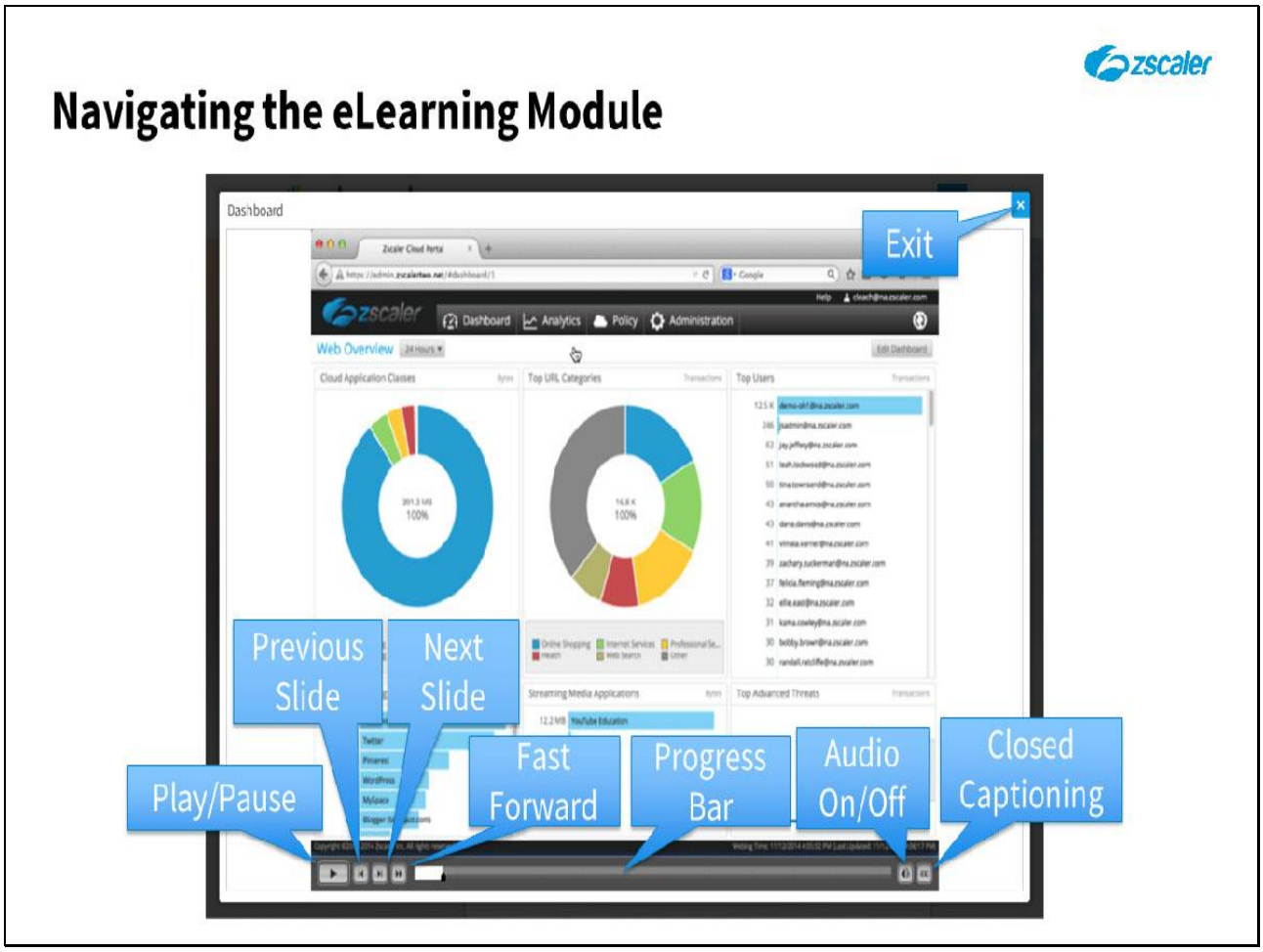
Slide 1 - ZCCP-IA



Slide notes

Thank you for viewing this elearning module on Traffic forwarding to the Zscaler solution using GRE tunnels.

Slide 2 - Navigating the eLearning Module



Slide notes

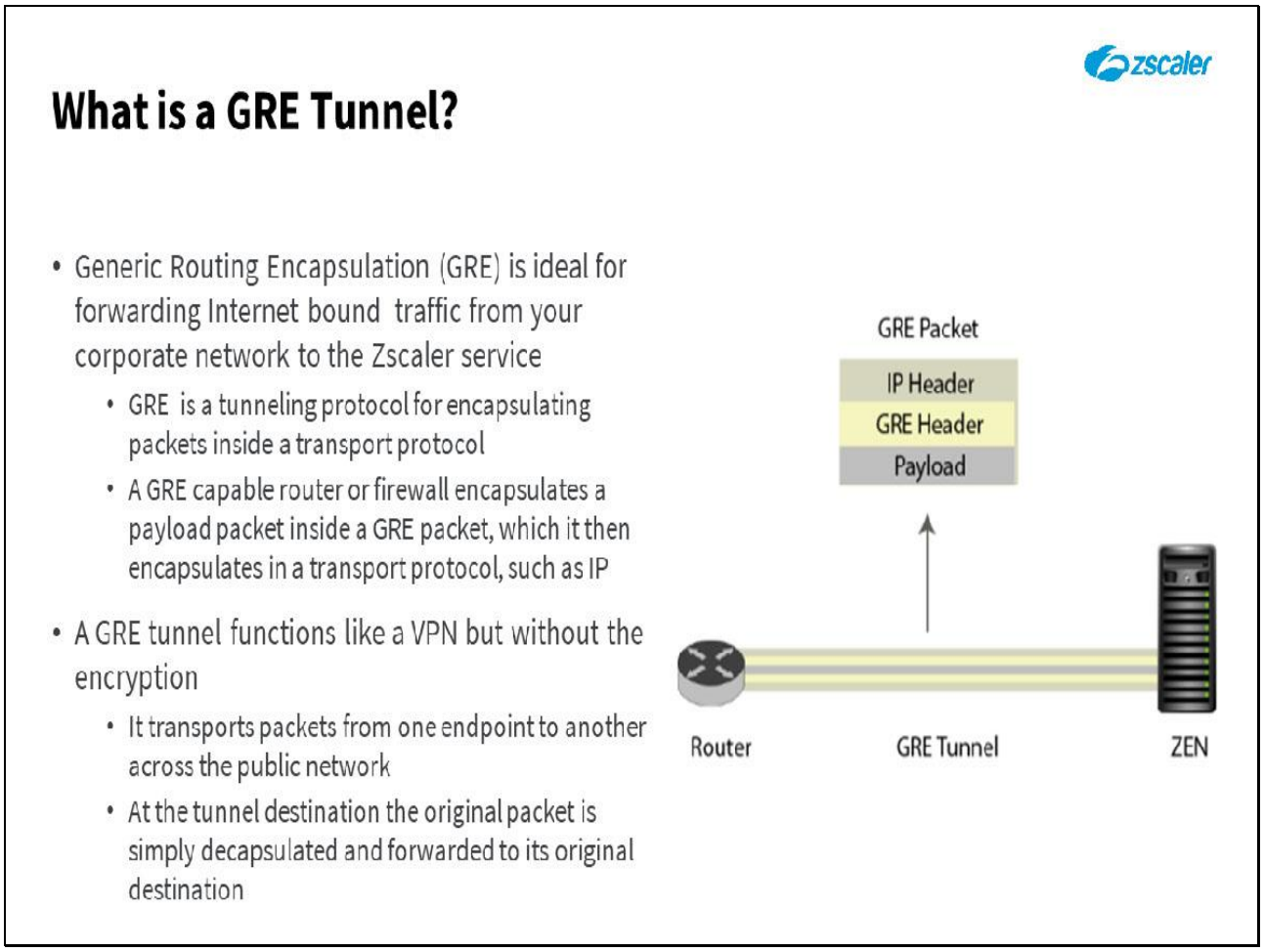
Here is a quick guide to navigating this eLearning module. There are various controls for playback including Play/Pause, Previous and Next Slide, and Fast Forward. You can also mute the Audio or enable Closed Captioning which will cause a transcript of the module to be displayed on the screen. Finally, you can click the “X”button if you wish to exit.

Slide 3 - Agenda

Slide notes

During this session we will examine Generic Routing Encapsulation, or GRE and how to connect your locations to the Zscaler solution using GRE. This will be followed by a demonstration of configuring a GRE tunnel.

Slide 4 - What is a GRE Tunnel?



Slide notes

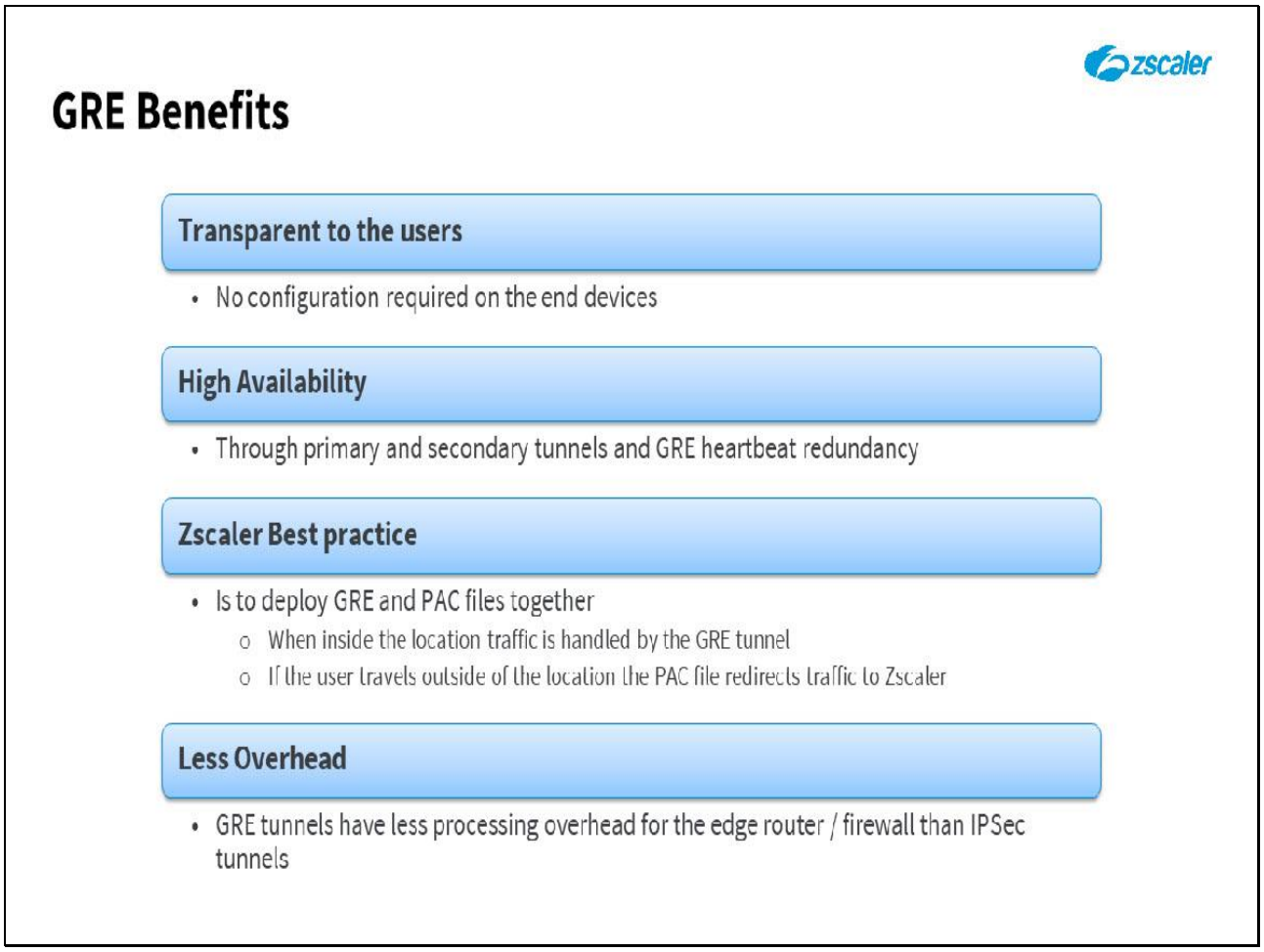
GRE Tunnel is ideal for forwarding Internet-bound traffic from your corporate network to the Zscaler service. GRE is a tunneling protocol for encapsulating packets inside a transport protocol. A GRE capable router or firewall encapsulates a payload packet inside a GRE packet, which it then encapsulates into a transport protocol such as IP, as shown in the following figure.

A GRE tunnel functions like a VPN, but without the encryption. It transports packets from one end point, through the public network to another end point. When a tunnel destination receives a packet, it just decapsulates the original packet and forwards it on to its original destination

Generic Routing Encapsulation (GRE) is an industry standard tunneling protocol that can encapsulate a wide variety of network layer protocols inside virtual point-to-point links over an Internet Protocol network.

Tunneling provides a private, secure path for transporting packets through an otherwise public network by encapsulating packets inside a transport protocol known as an IP encapsulation protocol. GRE is an IP encapsulation protocol that is used to transport packets over a network. Information is sent from one network to the other through a GRE tunnel which is ideal for forwarding all traffic types from your corporate network to the Zscaler service.

Slide 5 - GRE Benefits



Slide notes

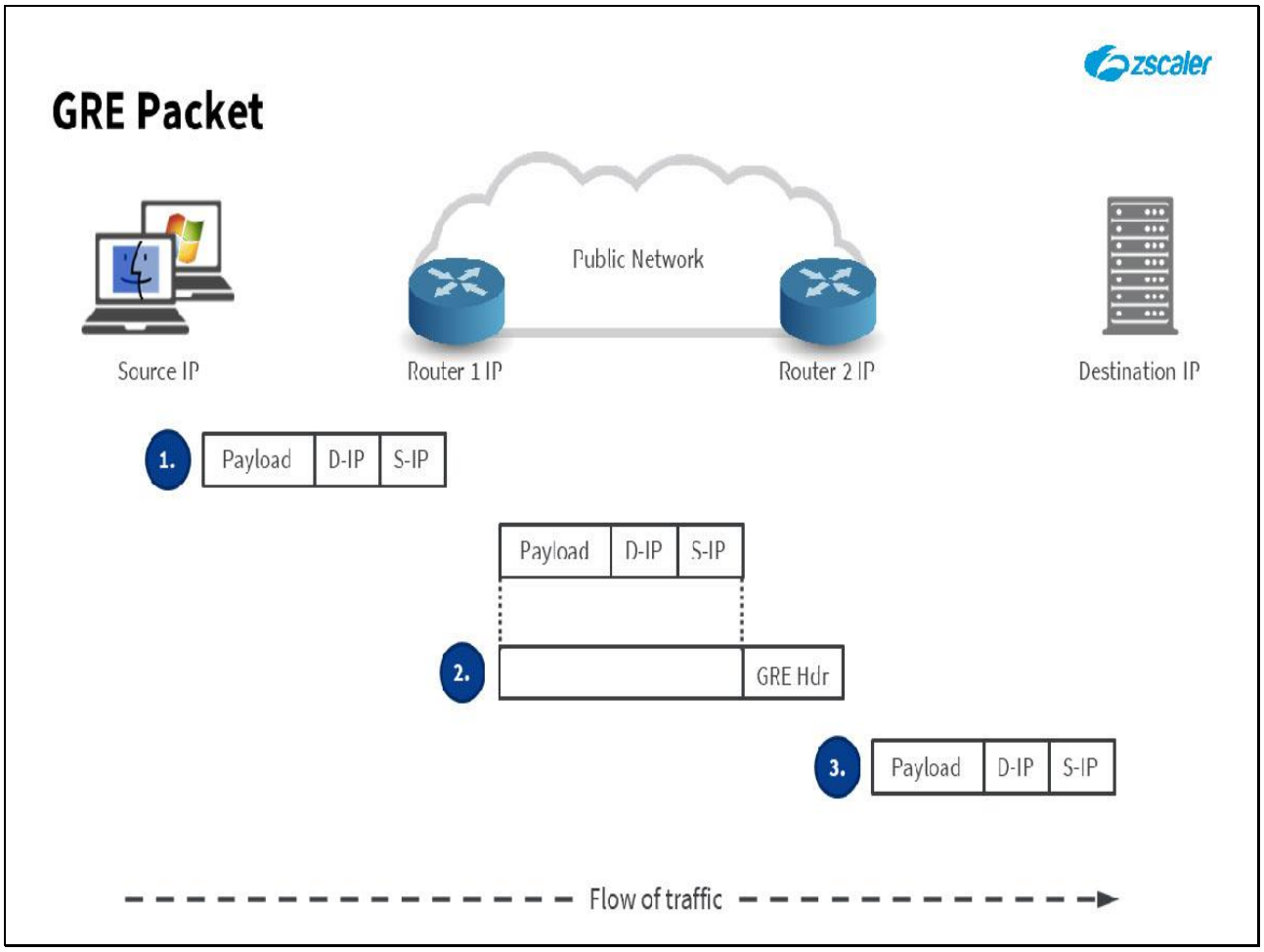
A few of the benefits of using GRE tunnels are:

- That it is transparent to the users;
- No configuration is required on the end devices;
- GRE provides high availability through primary and secondary tunnels and a GRE heartbeat mechanism.

Zscaler Best practice is to deploy GRE and PAC files (or the Zscaler App) together. When inside the location traffic is handled by the GRE tunnel; however, if the user travels outside of the location the PAC file (or Zscaler App) redirects traffic to Zscaler.

GRE tunnels have less processing overhead for the edge router / firewall than IPSec tunnels.

Slide 6 - GRE Packet



Slide notes

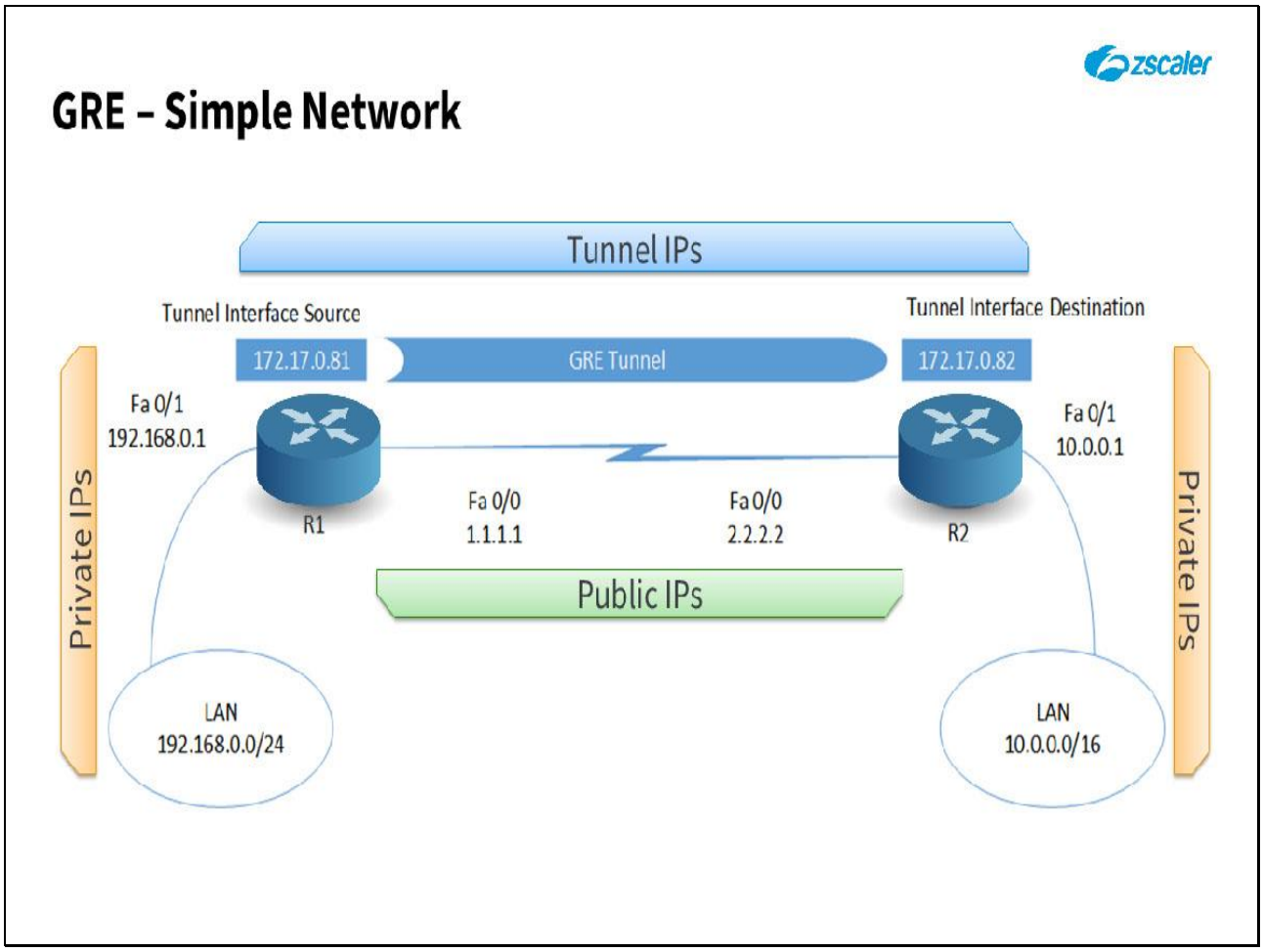
GRE (Generic Routing Encapsulation) is a tunneling protocol for encapsulating packets inside a transport protocol. A GRE capable router or firewall encapsulates a payload packet inside a GRE packet, which it then encapsulates in a transport protocol, such as IP, as shown in the diagram:

A GRE tunnel is built between R1 and R2. When the IP packet from the host is received by R1 and the destination is behind R2 R1 will encapsulate the original frame within a GRE packet. The new GRE payload contains the original information with the originating source and destination IPs. When R2 receives the packet is decapsulates the original content and forwards it on to the original destination.

A GRE tunnel functions like a VPN but without the encryption; it transports packets from one endpoint through the public network to another endpoint. GRE tunnels typically use keepalive packets to determine if a tunnel is up. The GRE tunnel source creates a keepalive request packet and a keepalive response packet that it encapsulates and sends to the tunnel destination together with the response packet.

When the tunnel destination receives the request packet, it just decapsulates the original packet and forwards the inner response packet back to the originating peer. For more information about GRE, refer to RFC 2784.

Slide 7 - GRE – Simple Network

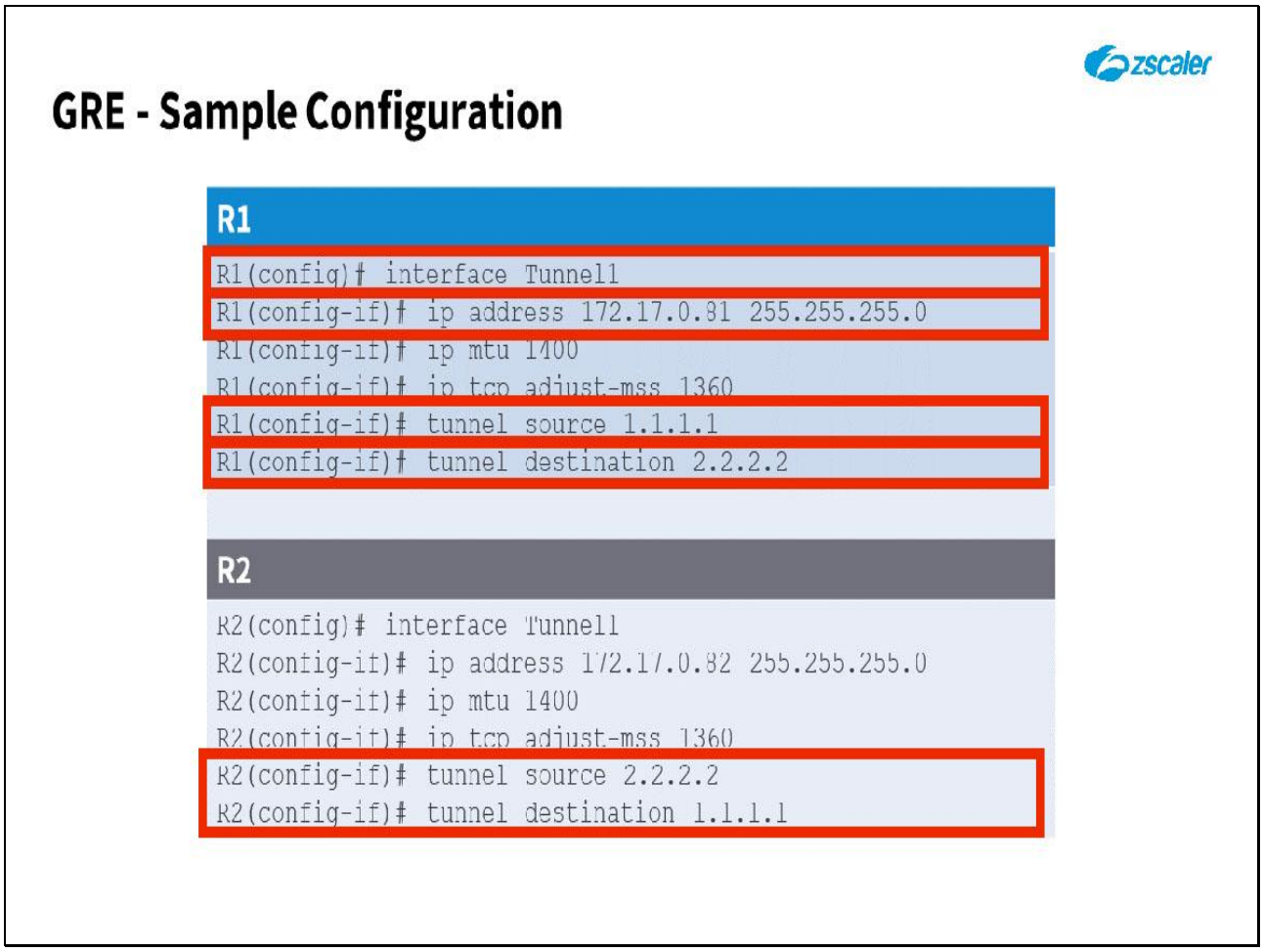


Slide notes

In this generic example you can see that we have two separate networks connected via a GRE tunnel. The tunnel has an Outer IP address, in this case 172.17.0.81 and 172.17.0.82, inner IP addresses of 1.1.1.1 and 2.2.2.2, then their internal LAN netwoks.

Traffic from R1 destined for traffic behind R2 is encapsulated and sent through the tunnel. R2 then decapsulates the traffic and sends it to its original destination.

Slide 8 - GRE - Sample Configuration



Slide notes

This config snippet reflects the GRE tunnel configuration for the diagram we discussed on the previous slide. First, create a tunnel, next, provide the IP address of the Tunnel on this side, next, you see the tunnel Source IP which is the inner IP address and is the interface on the router.

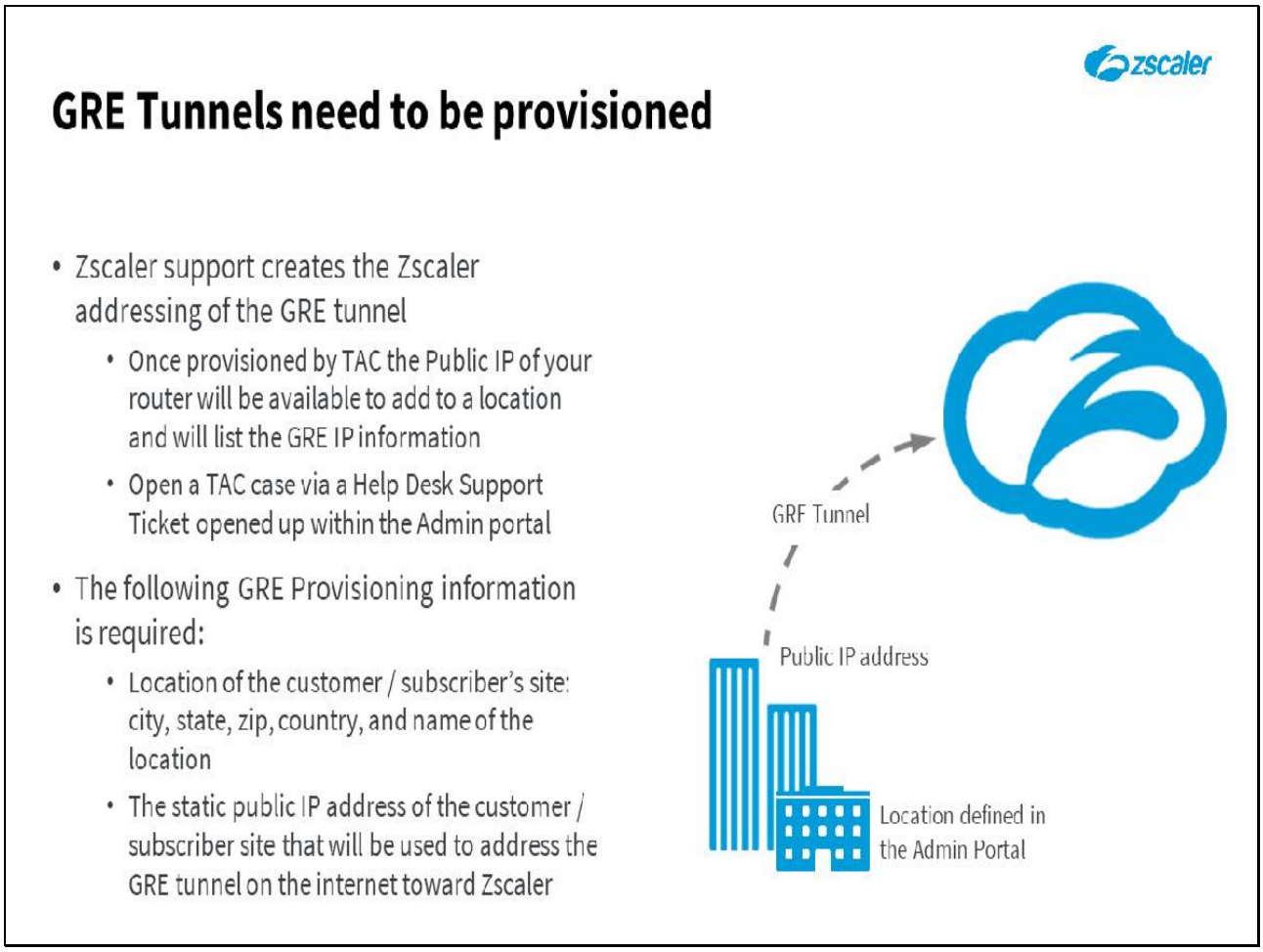
Last, the remote inner IP is configured - this is the interface on R2. On R2, we see basically the same config as R1 just with the tunnel source and destinations reversed.

Slide 9 - Slide 9

Slide notes

Let’s take a look at the items you will need to take care of before provisioning your GRE tunnels and review some sample deployments.

Slide 10 - GRE Tunnels need to be provisioned

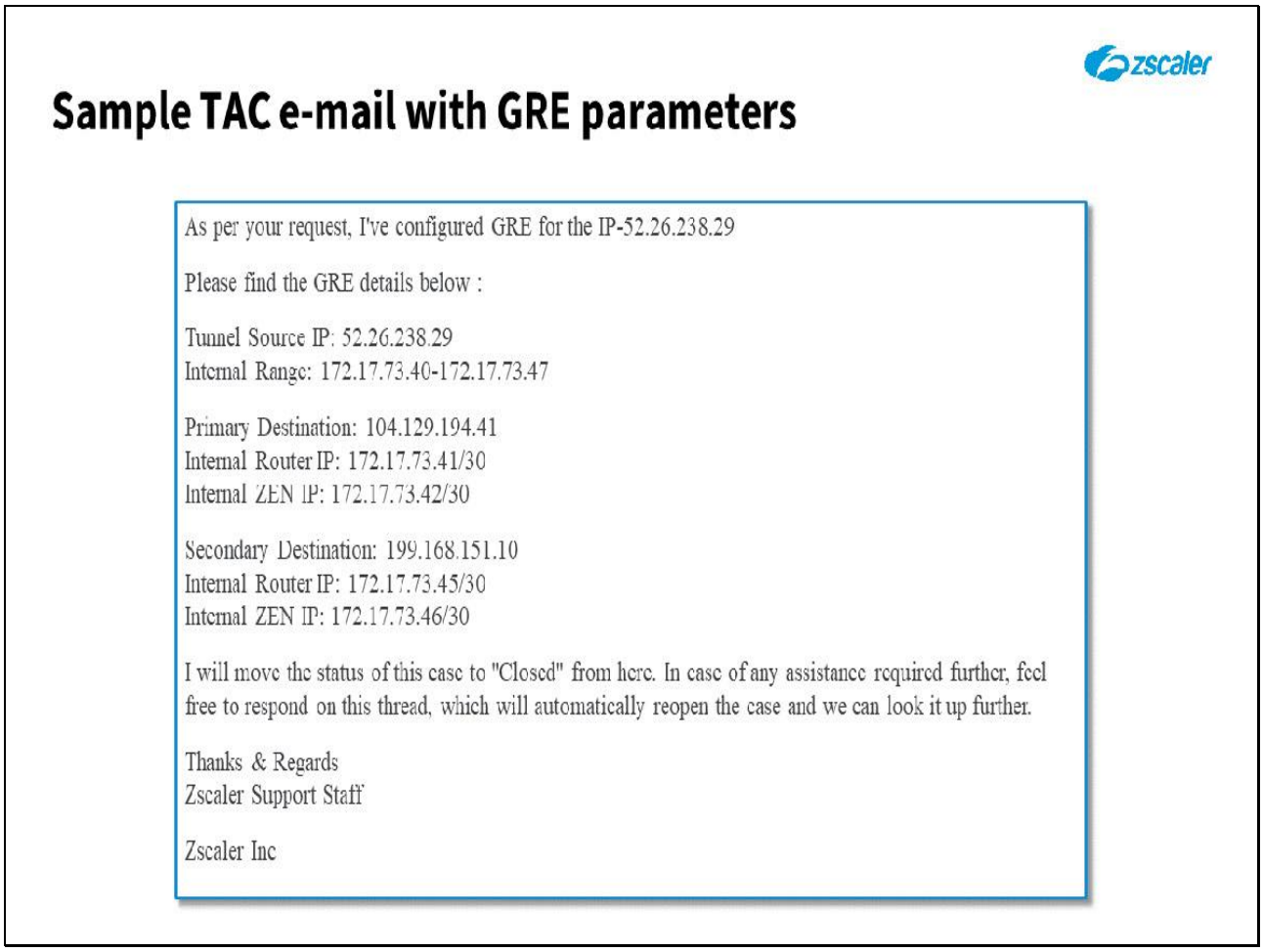


Slide notes

Before you can configure your GRE tunnel you must first contact Zscaler support and request that a GRE tunnel be provisioned. You must provide the location information for the site including the city, state, zip, country, and name of the location.

A static public IP is also required, and you must provide this IP address to TAC. You should also be familiar with configuring GRE tunnels on your router. Sample GRE config snippets can be found in the Support Knowledge base articles as well as in this presentation.

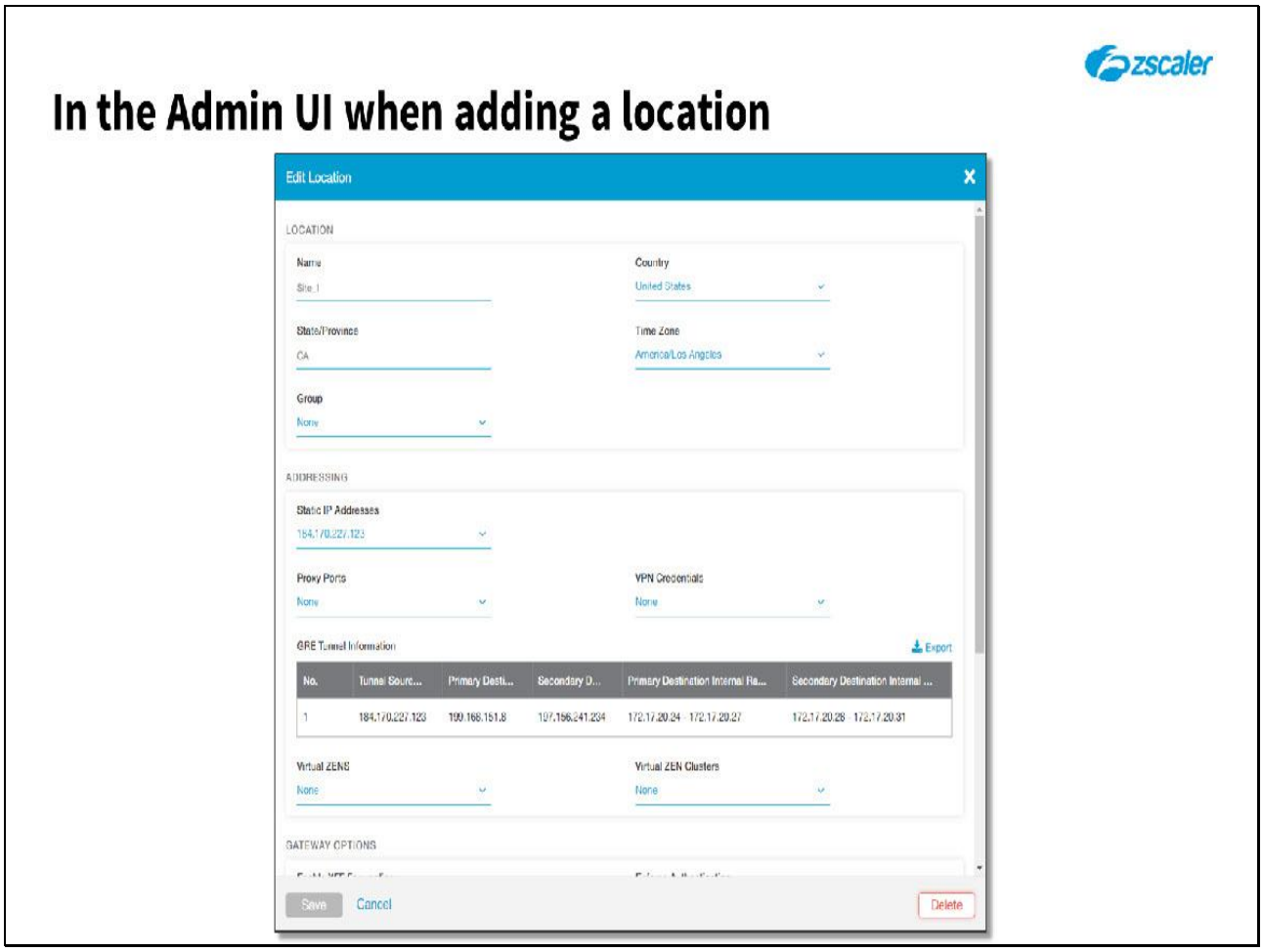
Slide 11 - Sample TAC e-mail with GRE parameters



Slide notes

Once the TAC case has been submitted you will receive a response with similar information as you see here. The tunnel source IP is your static Public IP address on your router. TAC also provisions addressing for both a primary GRE tunnel and a secondary GRE tunnel for redundancy.

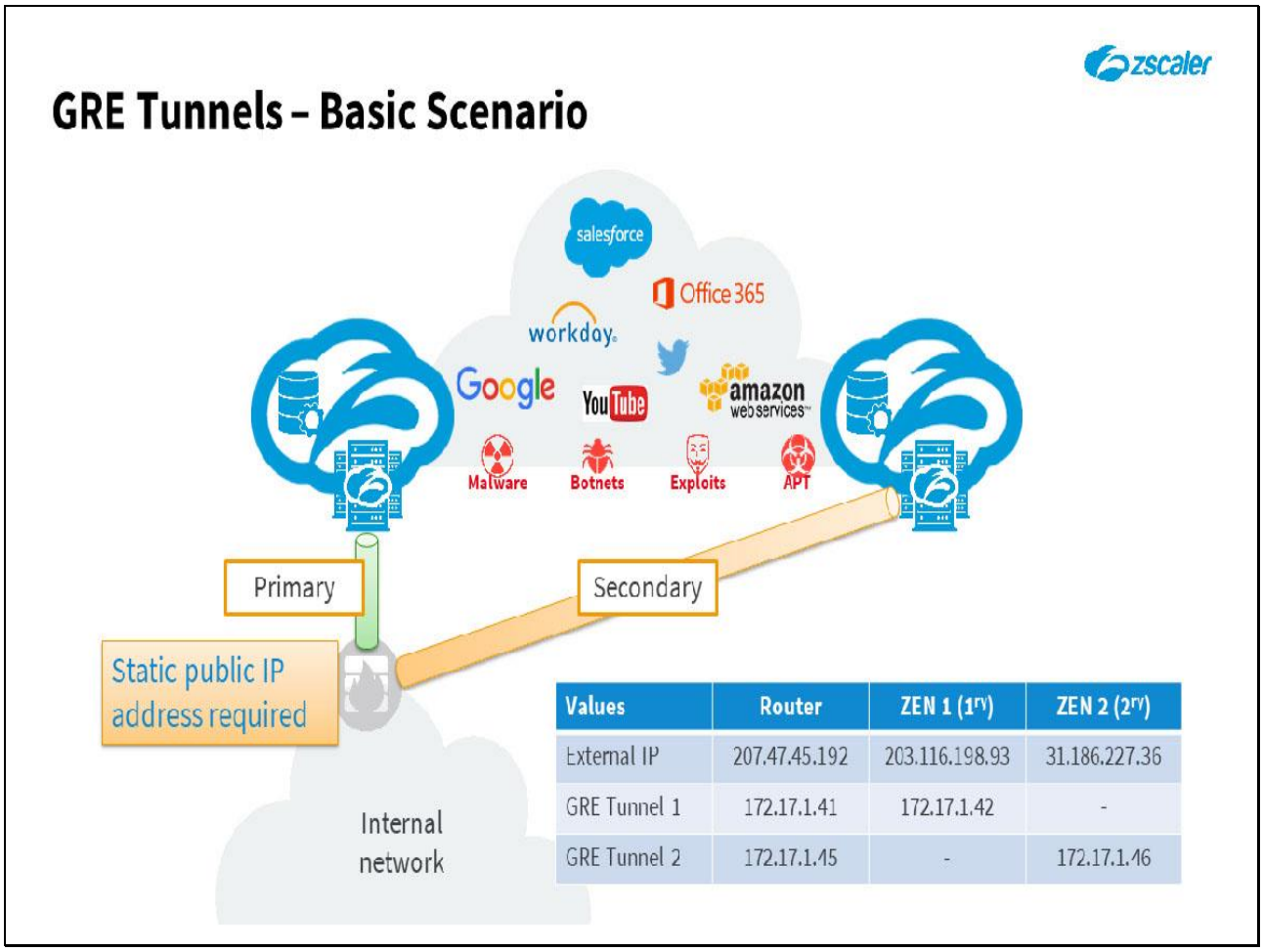
Slide 12 - In the AdminUI when adding a location



Slide notes

This is an example of the Admin Portal after your location has been created. You can see that the information provided is the same that you received in the TAC email.

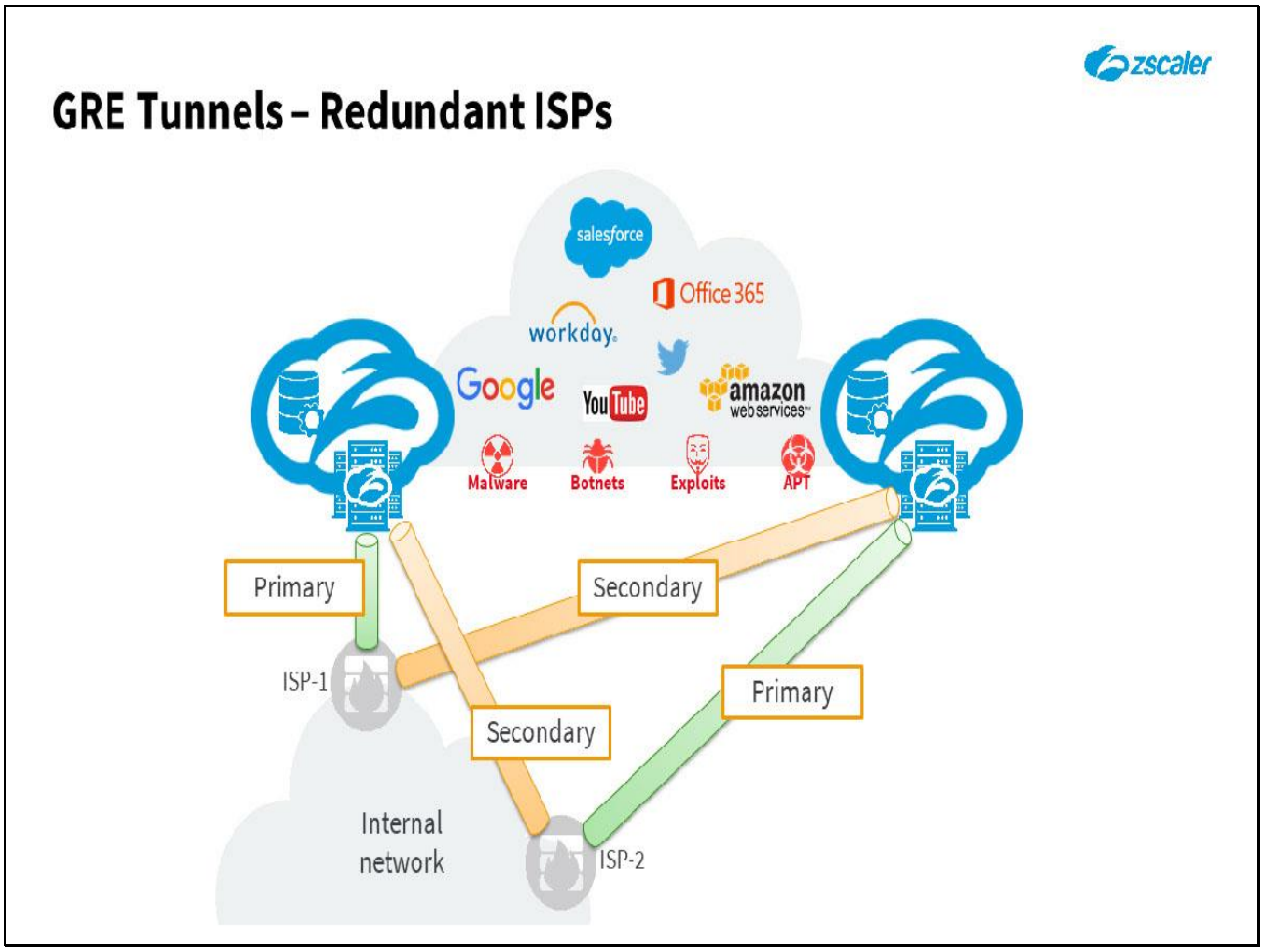
Slide 13 - GRE Tunnels – Basic Scenario



Slide notes

In this example the GRE tunnel is being built between the customer's router and both a primary and backup tunnel are configured for redundancy. Taking the IP information from the email TAC provided you can see where the IP addresses belong.

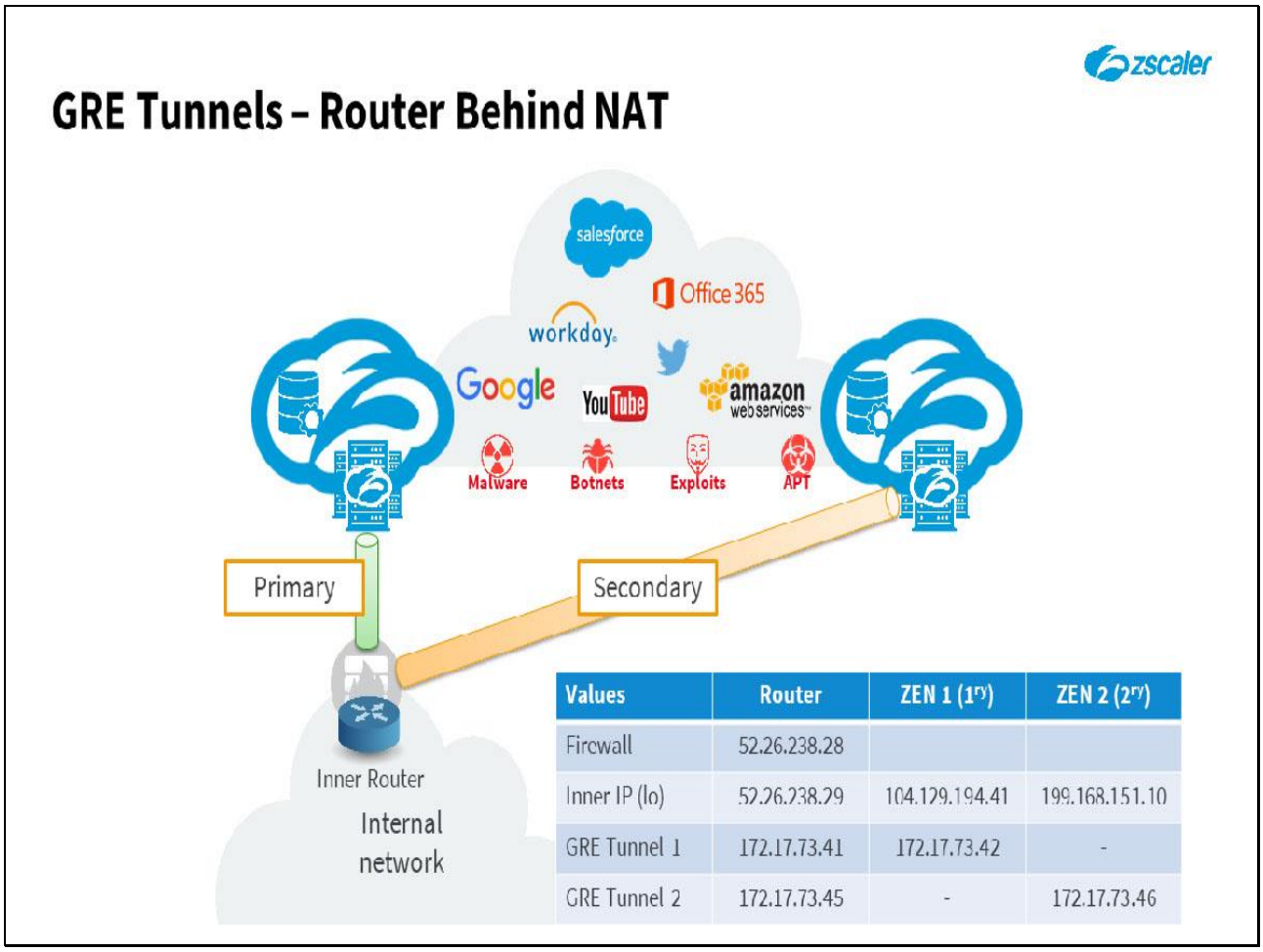
Slide 14 - GRE Tunnels – Redundant ISPs



Slide notes

Expanding on the basic configuration from the previous side, if your organization has redundant routers and/or ISPs you can configure the routers so failover to a redundant ISP is automatic.

Slide 15 - GRE Tunnels – Router Behind NAT

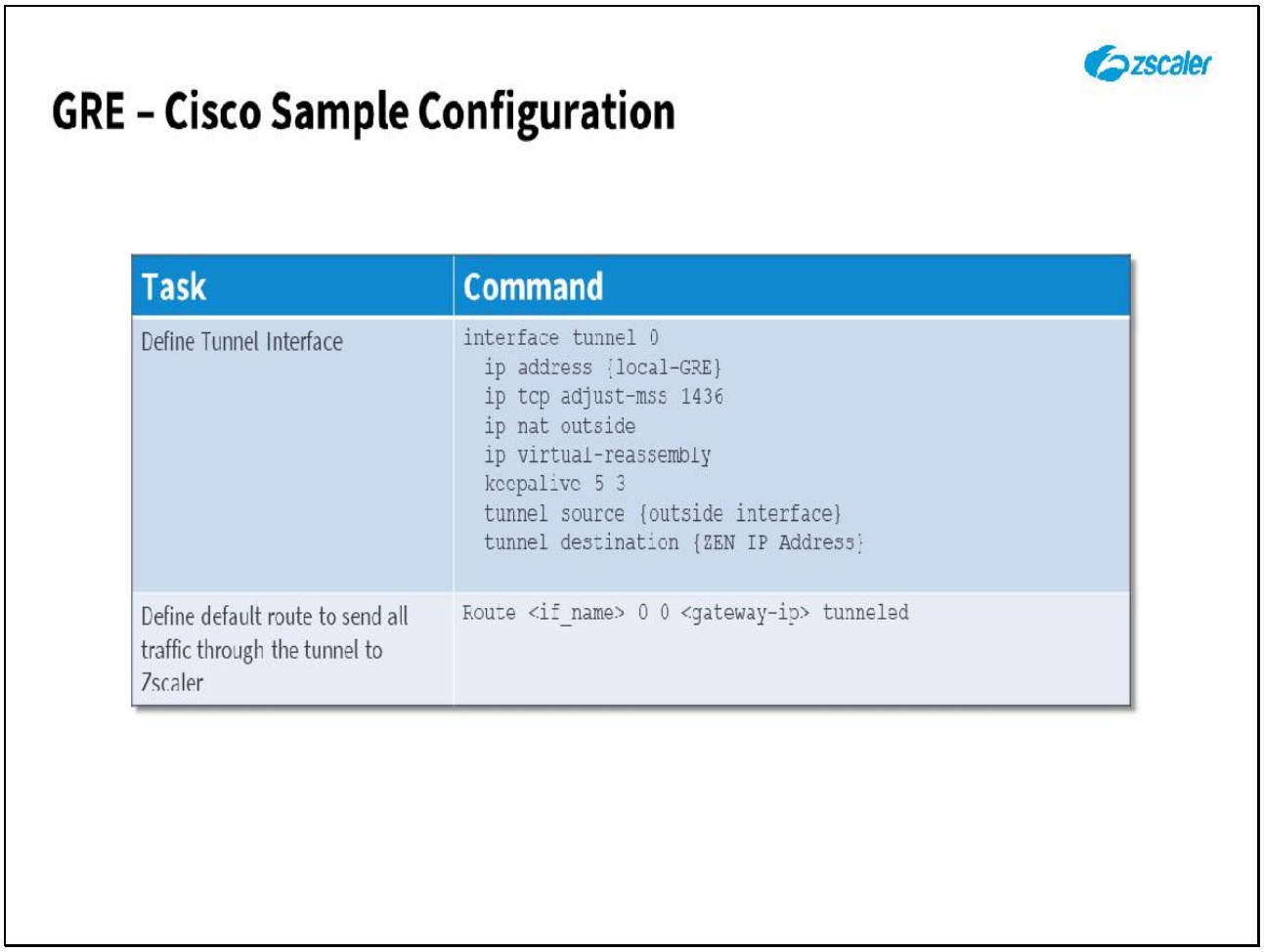


Slide notes

Zscaler recommends that you configure two GRE tunnels from an internal router behind the firewall to the ZENs; a primary tunnel from the router to a ZEN in one data center, and a secondary tunnel from the router to a ZEN in another data center. This type of deployment provides visibility into the internal IP addresses, which can be used for the Zscaler security policies and logging.

In this deployment, the GRE tunnel source IP address is a public IP address that is configured on the loopback interface of the router. On the firewall, you'll need to define a rule that allows GRE traffic from the router. Additionally, if your organization has redundant routers and/or ISPs, as shown in the diagram below, you can configure the routers so failover to a redundant ISP is automatic.

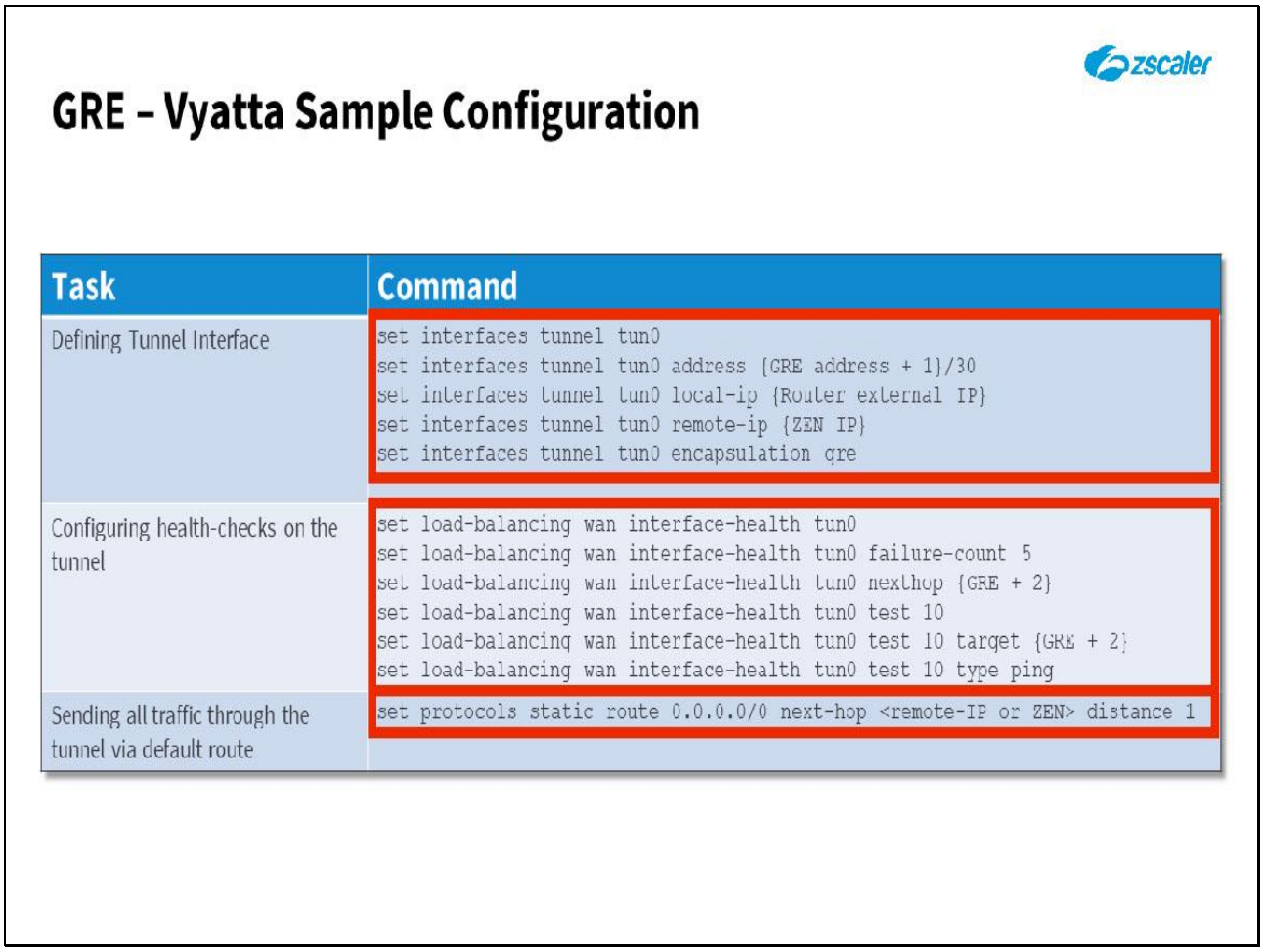
Slide 16 - GRE – Cisco Sample Configuration



Slide notes

For your reference here is a sample configuration for Cisco. Syntax may differ depending on the hardware platform and version of software running on the Cisco router.

Slide 17 - GRE – Vyatta Sample Configuration



Slide notes

Here is a sample config for a Vyatta router. Note that only one tunnel, **tun0**, is defined in this configuration. If a secondary tunnel is to be built for redundancy another tunnel, **tun1**for example, would be configured using the same syntax.

Begin by creating the tunnel using the command **set interfaces tunnel tun0**, next configure the routers tunnel IP. This is derived from the email TAC sent or as viewed in the Admin Portal. In our example the primary GRE range is **172.17.73.40-172.17.73.43/30**. So, our tunnel IP is the **GRE address + 1**or **172.17.73.41/30**.

Next, configure the local IP which is the static public facing IP address of your router. Next configure the remote IP which is the Primary Gateway address on Zscaler. Last, set the encapsulation type to GRE. Optionally, health-checks can be configured to monitor the health of the GRE tunnel. If the checks fail and a secondary tunnel has been configured the tunnel will automatically fail over.

Last, set a default route to send all traffic through the tunnel to Zscaler.

Slide 18 - Slide 18

Slide notes

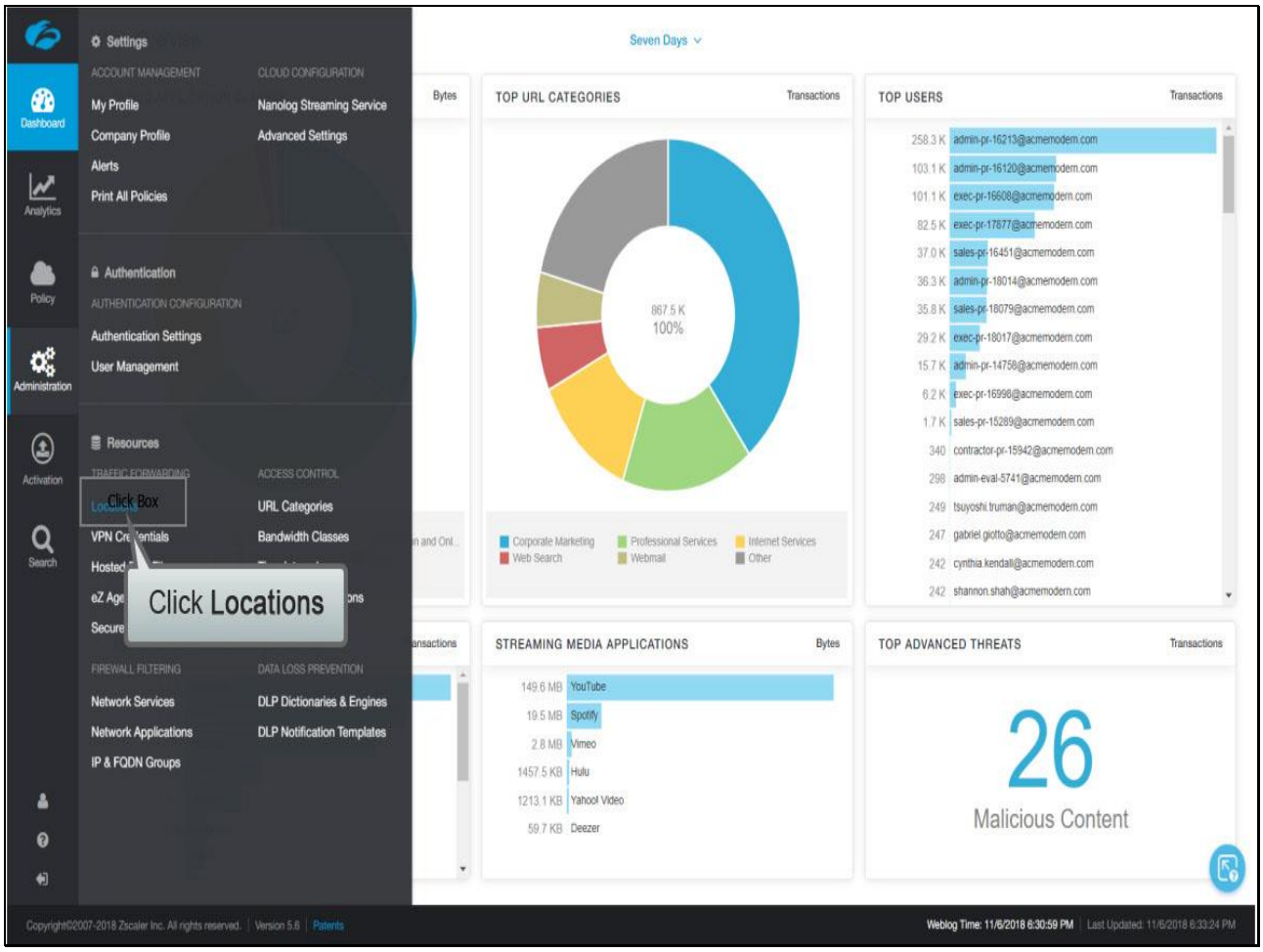
During this demonstration you will see the steps needed to configure a single GRE tunnel from a Vyatta router to the Zscaler solution.

Slide 19 - Slide 19

Slide notes

Begin in the Admin Portal under **Administration**.

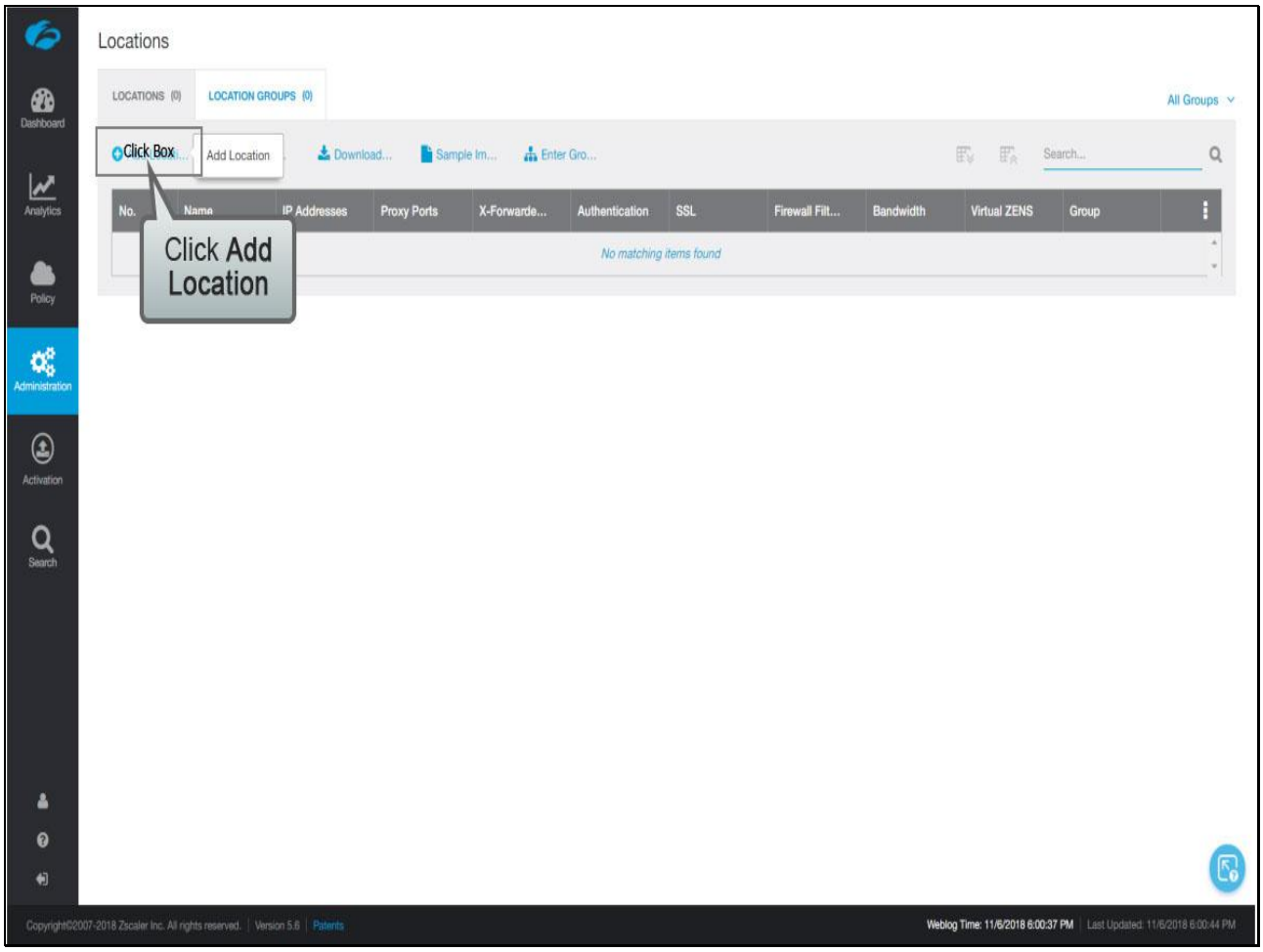
Slide 20 - Slide 20



Slide notes

Then **Locations**.

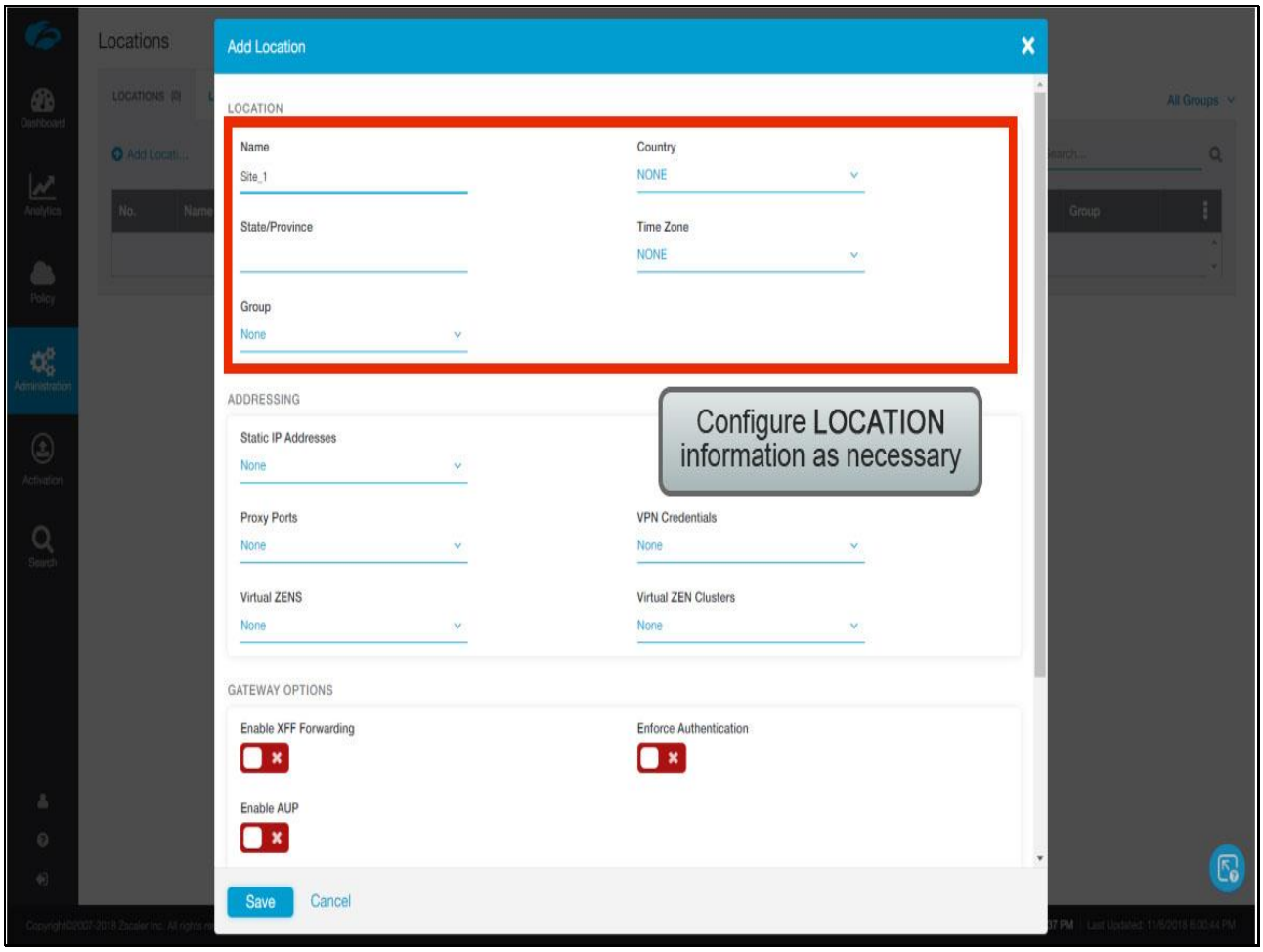
Slide 21 - Slide 21



Slide notes

Then click **Add Location**.

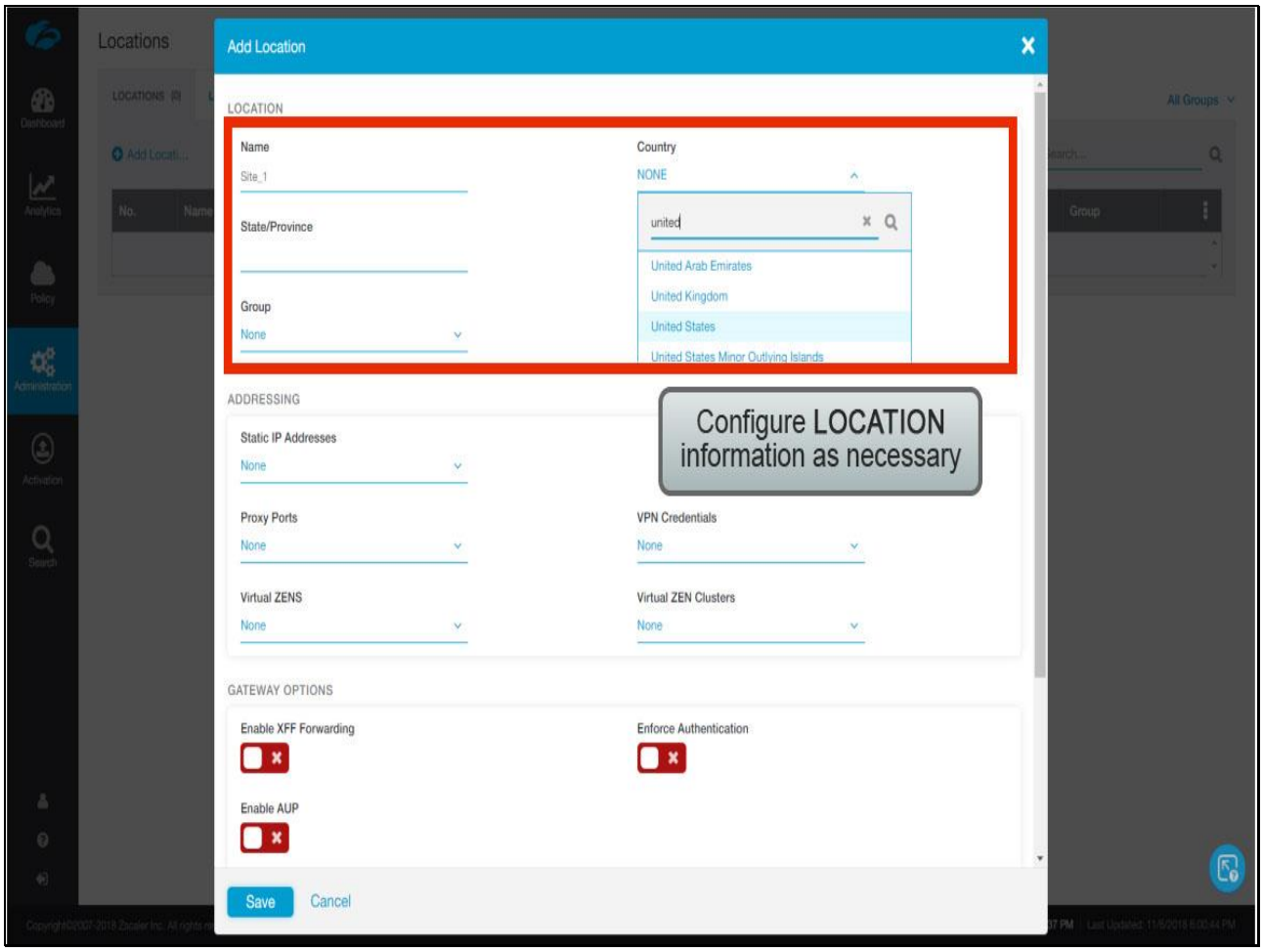
Slide 22 - Slide 22



Slide notes

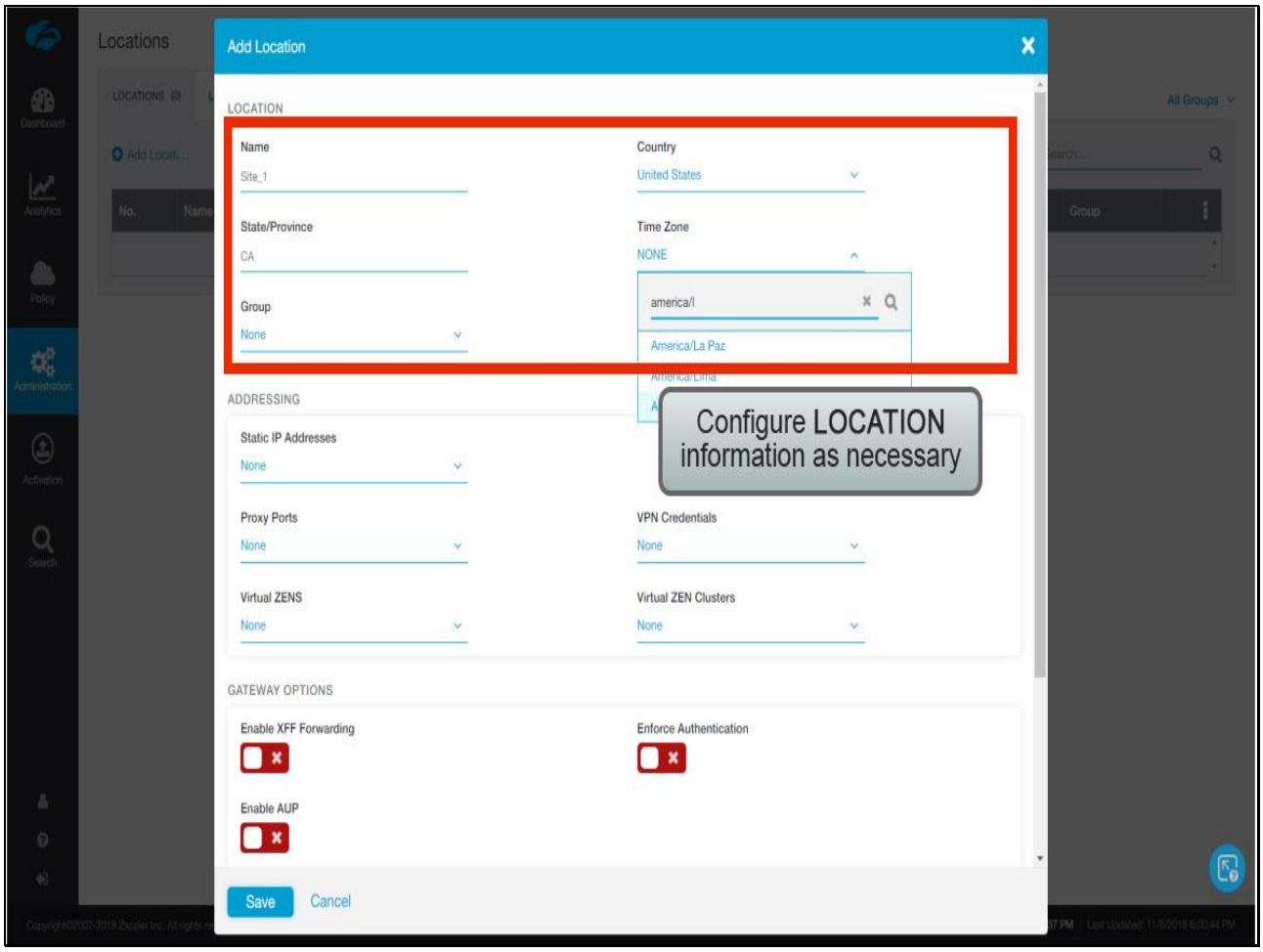
Provide a name for the **LOCATION** and the location information.

Slide 23 - Slide 23



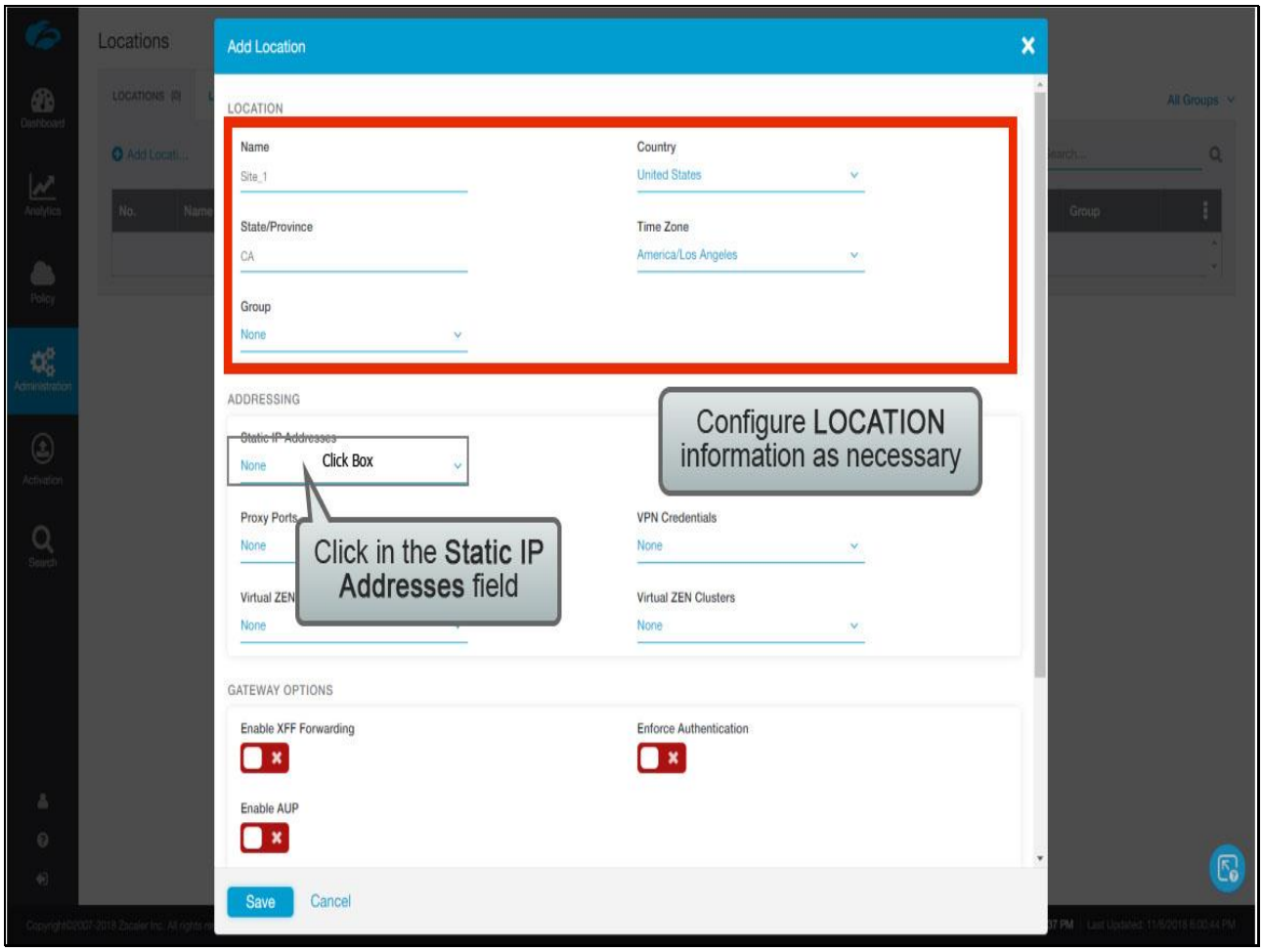
Slide notes

Slide 24 - Slide 24



Slide notes

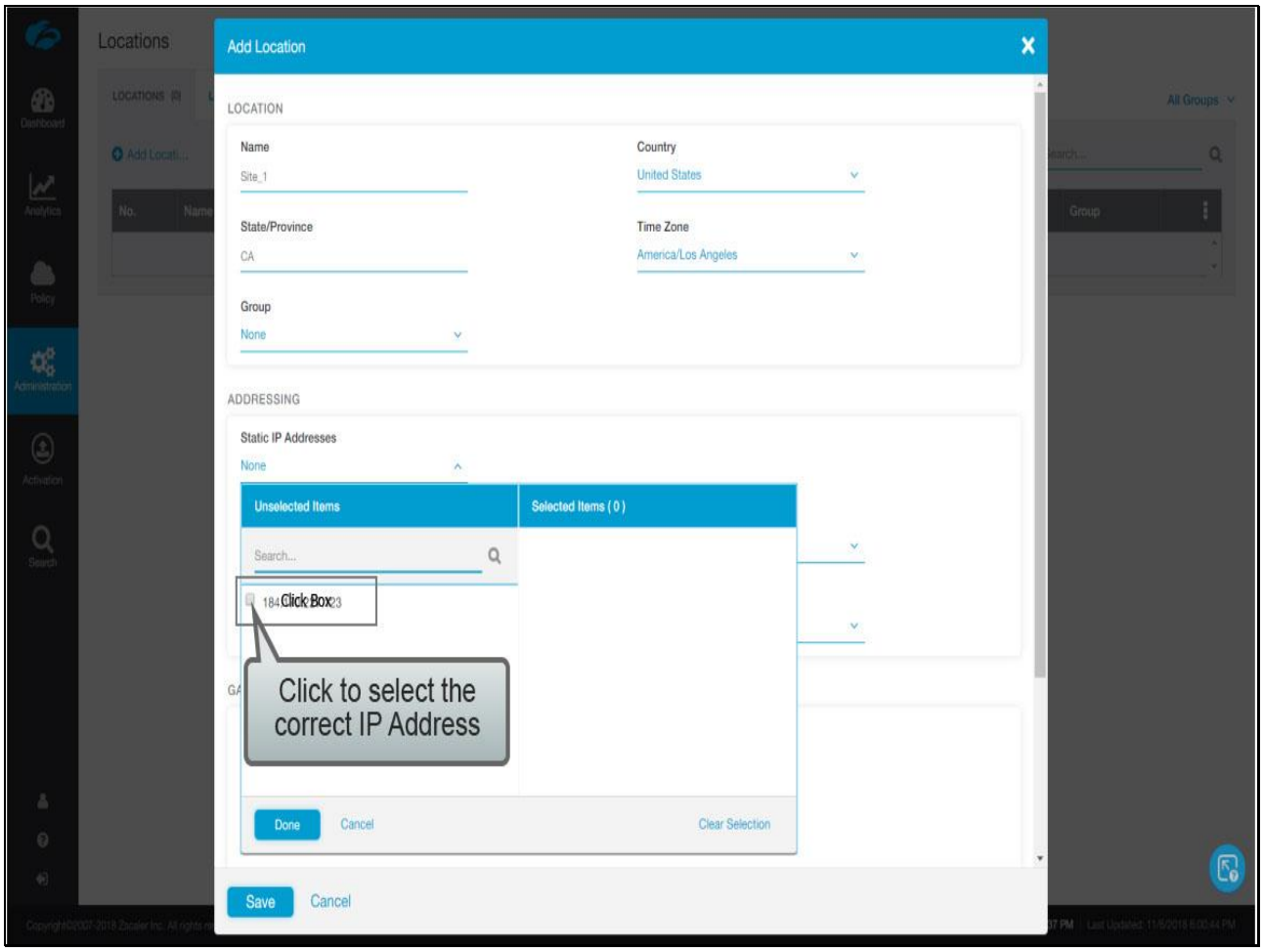
Slide 25 - Slide 25



Slide notes

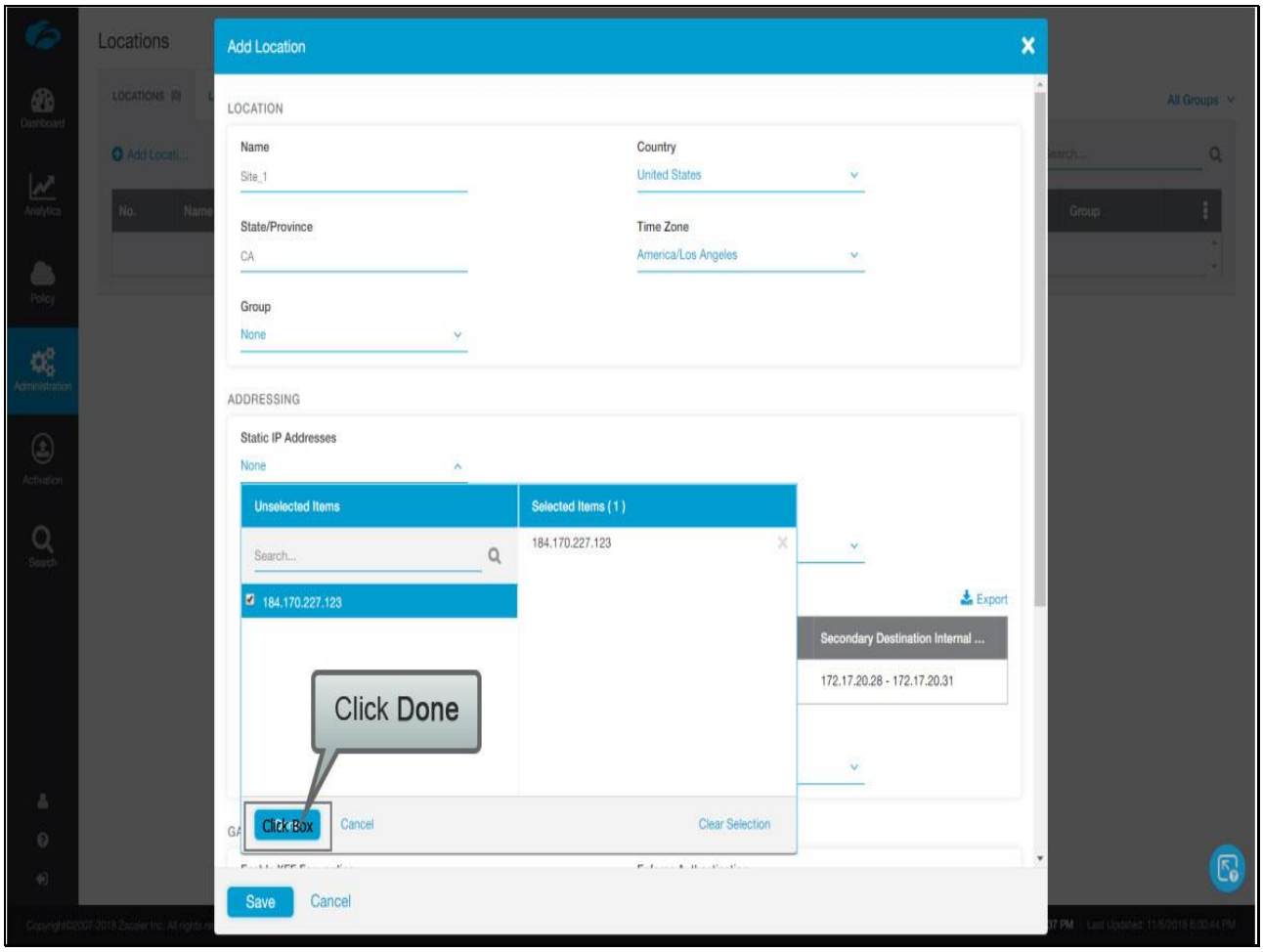
Under the **ADDRESSING** configuration select the IP address of the new location from the drop-down.

Slide 26 - Slide 26



Slide notes

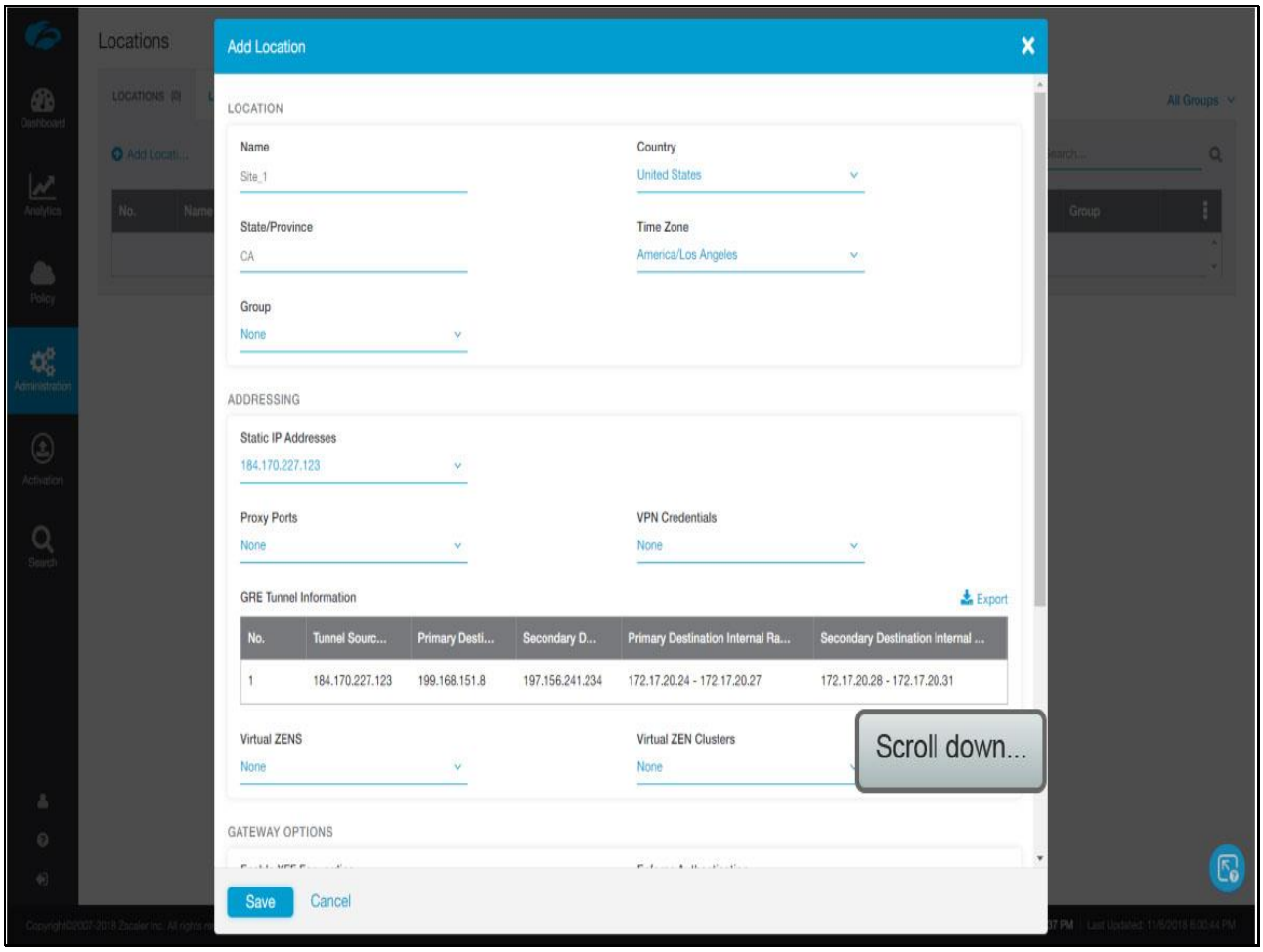
Slide 27 - Slide 27



Slide notes

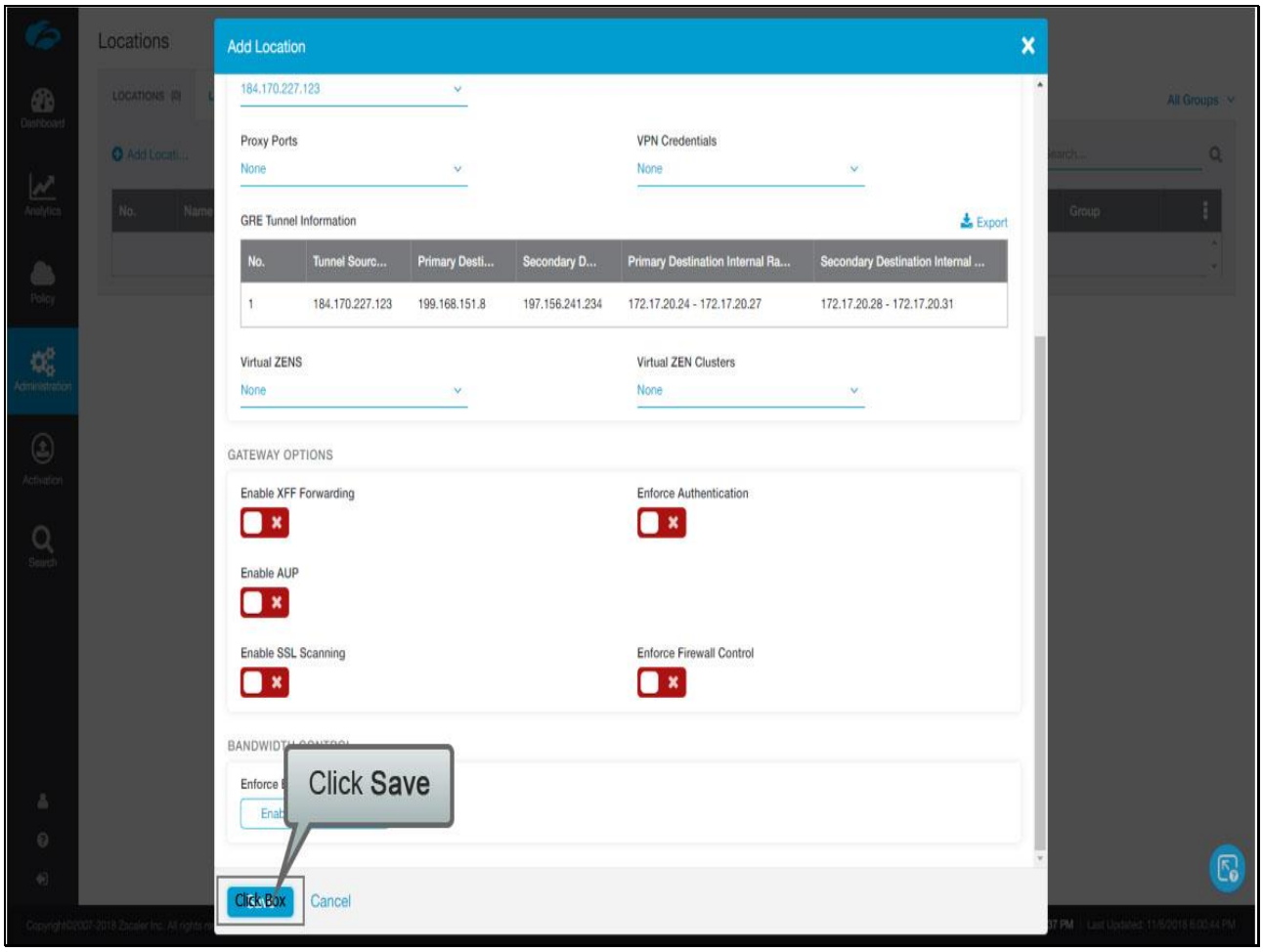
Then click **Done**.

Slide 28 - Slide 28



Slide notes

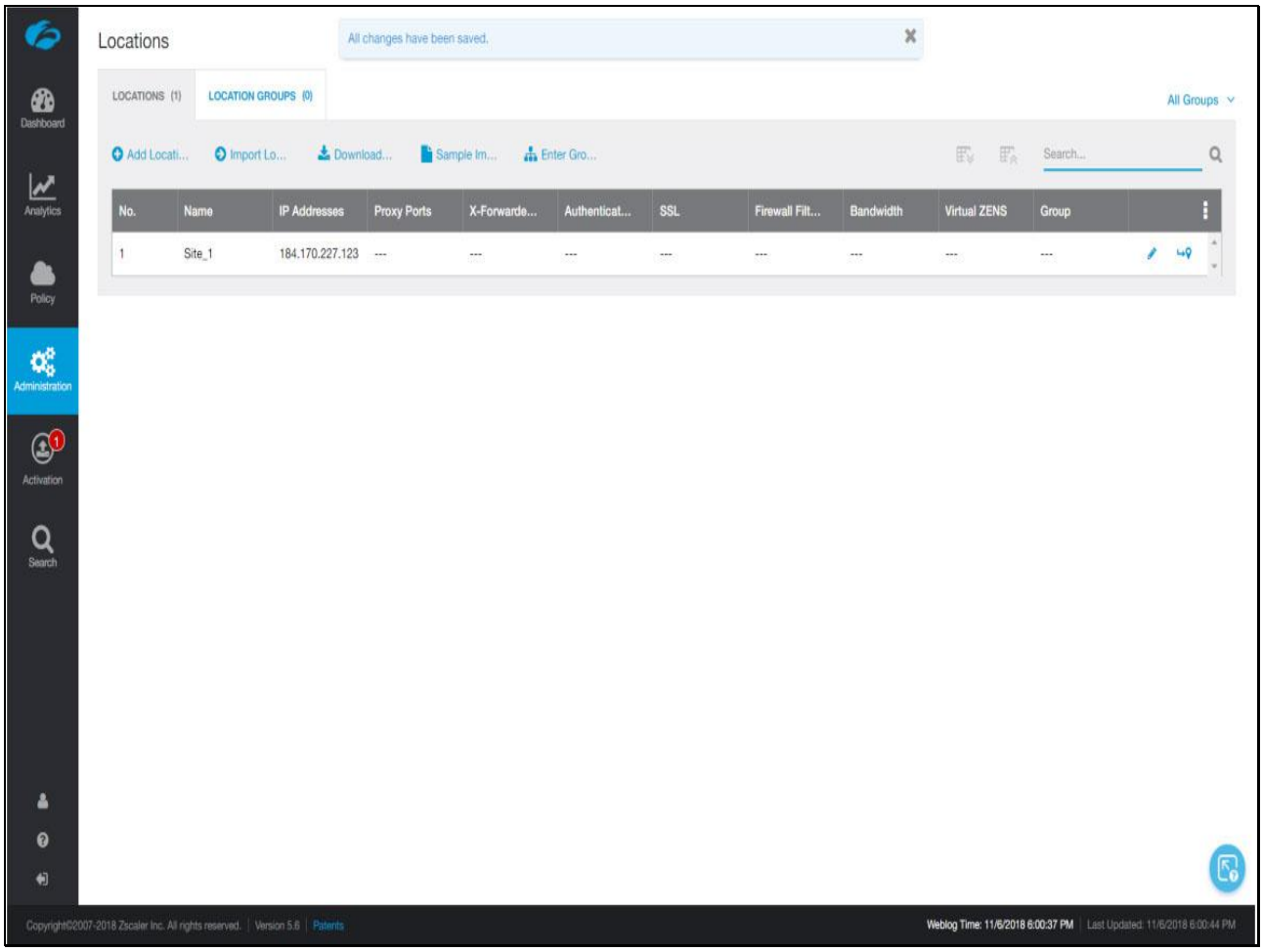
Slide 29 - Slide 29



Slide notes

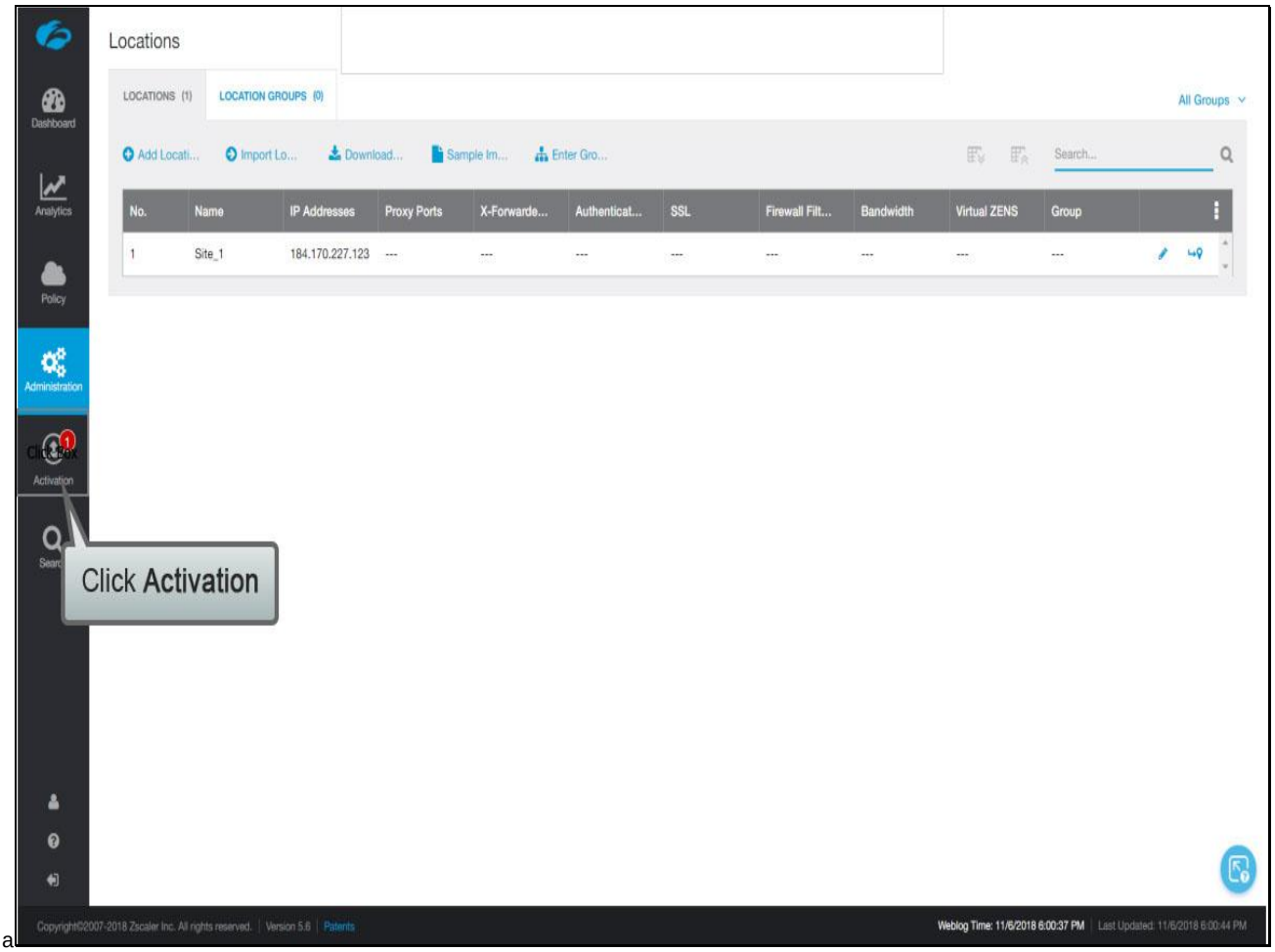
Then **Save** your changes.

Slide 30 - Slide 30



Slide notes

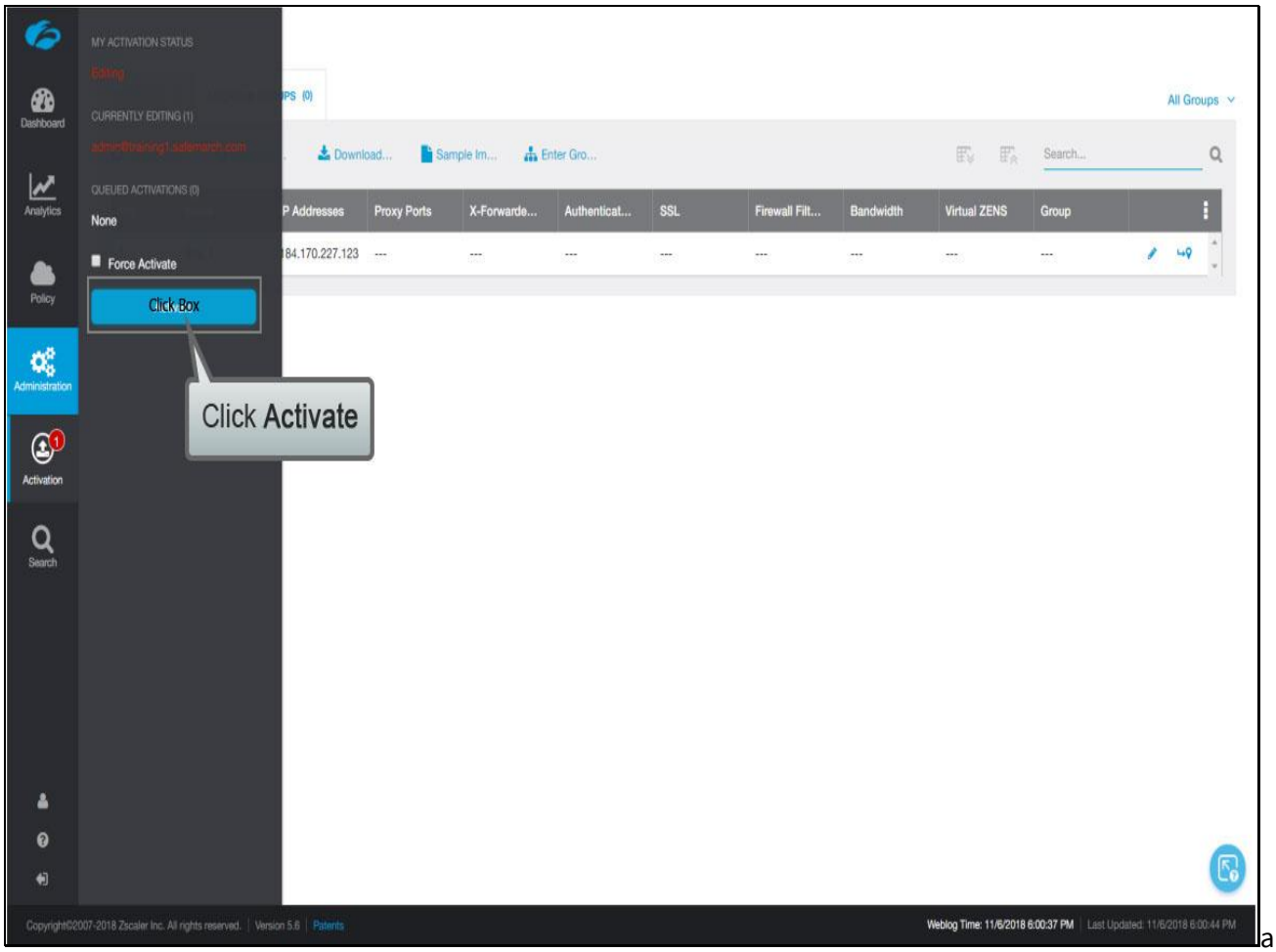
Slide 31 - Slide 31



Slide notes

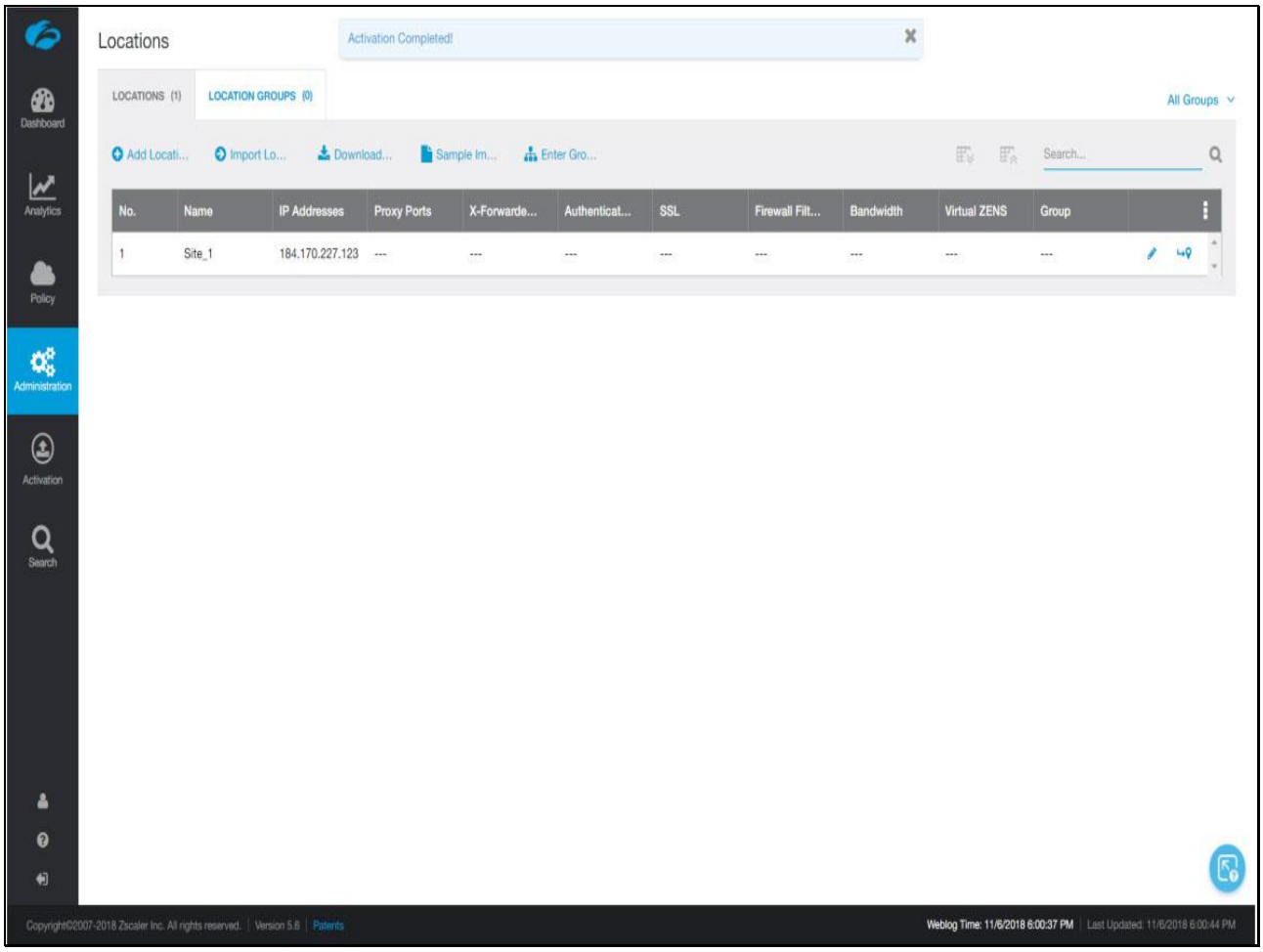
Then finish by activating your changes.

Slide 32 - Slide 32



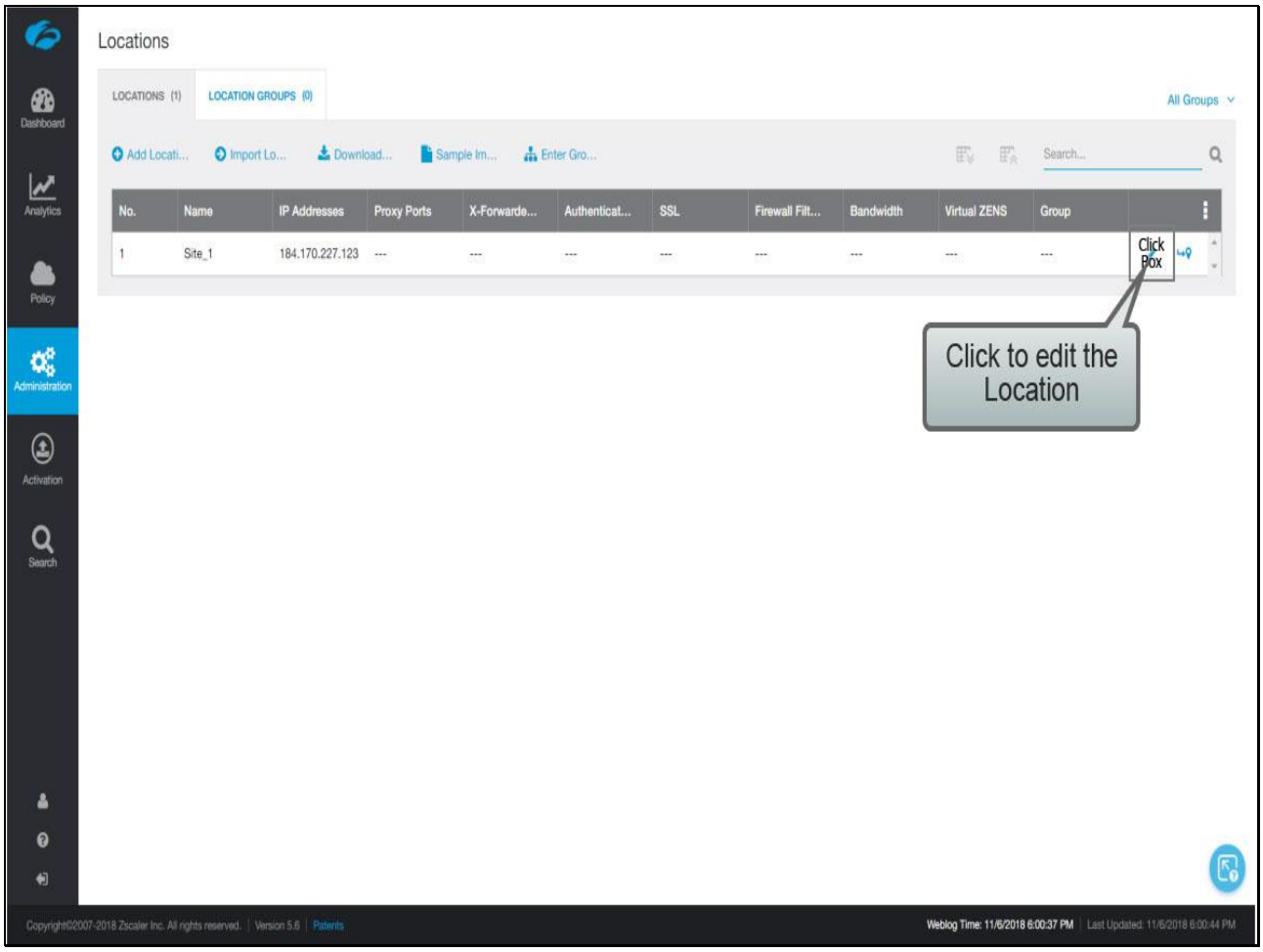
Slide notes

Slide 33 - Slide 33



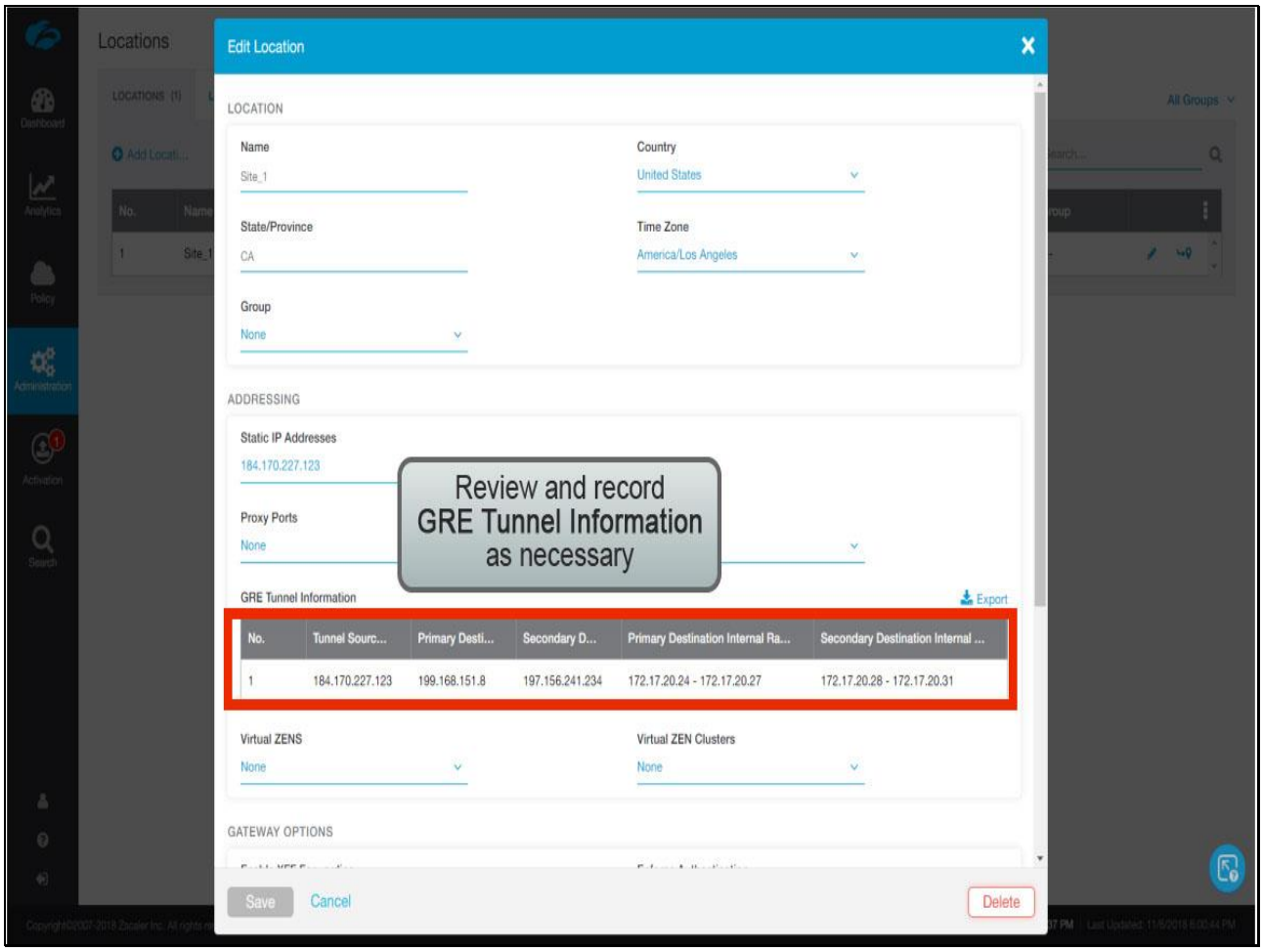
Slide notes

Slide 34 - Slide 34



Slide notes

Slide 35 - Slide 35

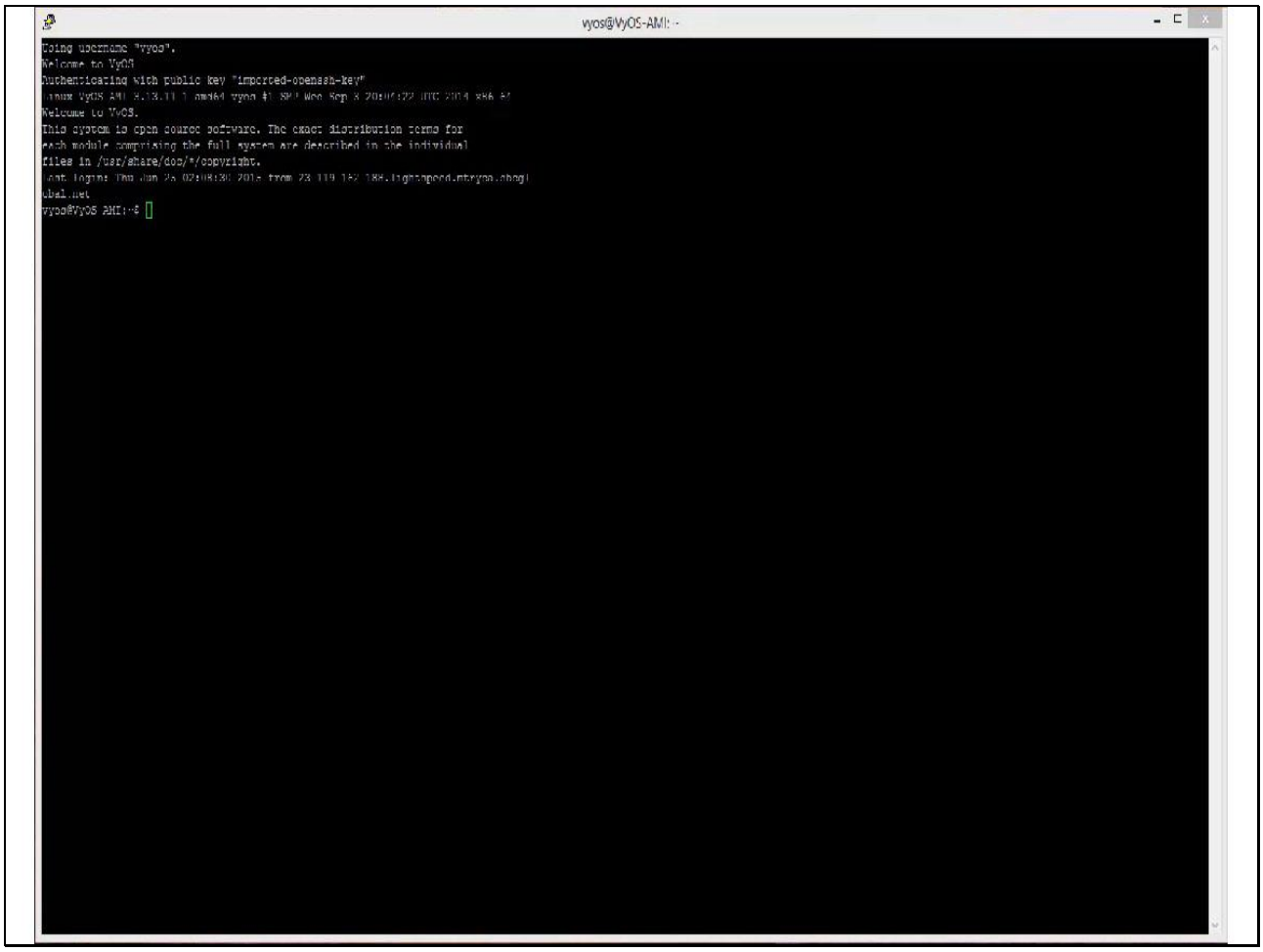


Slide notes

Go back to the Location that you just created to view the IP information provisioned for this location and tunnel. This can also be found in an email TAC sent to you after they provisioned the GRE tunnel. This information will be used when configuring the Vyatta router.

The GRE IP information may appear as abbreviated, to see the complete IP address, hover your mouse over the abbreviated IP and a pop-up box will appear. You can also hover over the description, to get a complete description in the pop-up box.

Slide 36 - Slide 36

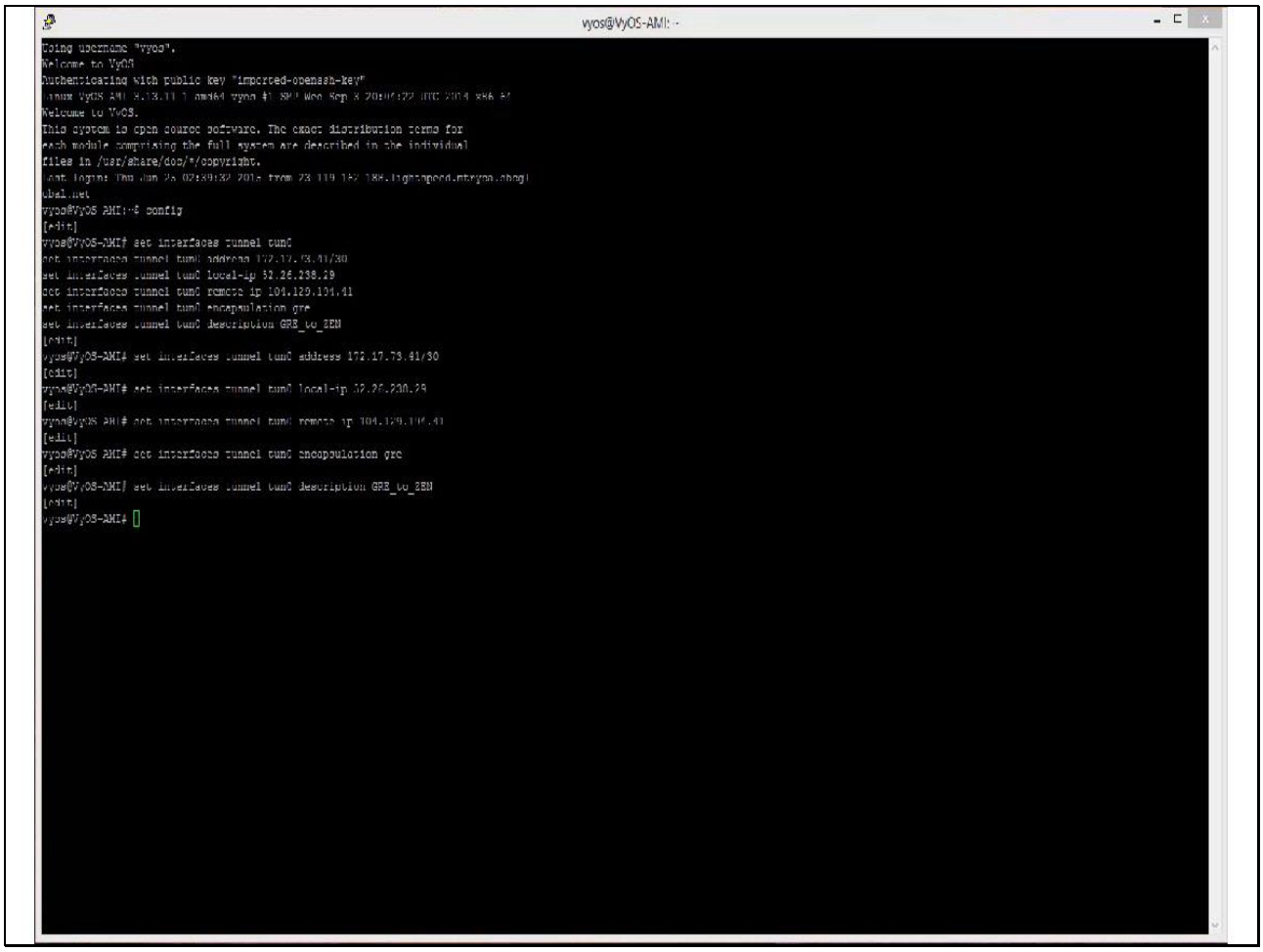


Slide notes

Begin configuring a GRE tunnel in the Vyatta router by first creating the tunnel interface and set the GRE parameters.

- First, create the tunnel.
- Next, set the GRE tunnel IP address.
- Set the tunnel local-IP. This is the routers static public IP address.
- Next, set the remote IP. This is the Zscaler primary gateway as shown in the Admin Portal.
- Set the encapsulation type to GRE.
- Add an optional description for the tunnel.

Slide 37 - Slide 37

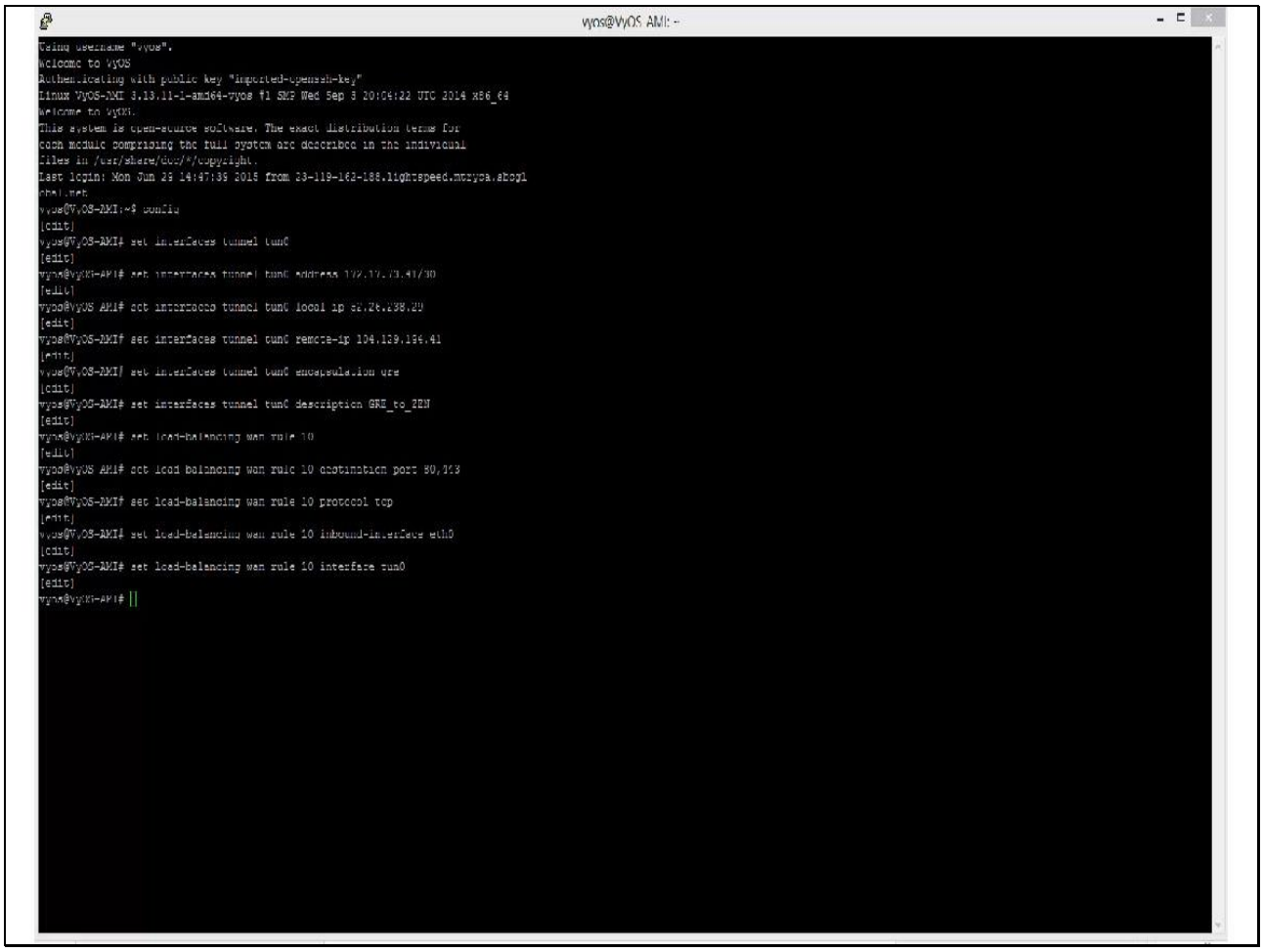


Slide notes

Next, set the monitoring for the tunnel.

- Configure the failure count.
- Set the tunnel next-hop. The next-hop is the remote end of the GRE tunnel.
- Set the test-target which is, again, the remote end of the tunnel.
- And set the test type to PING.

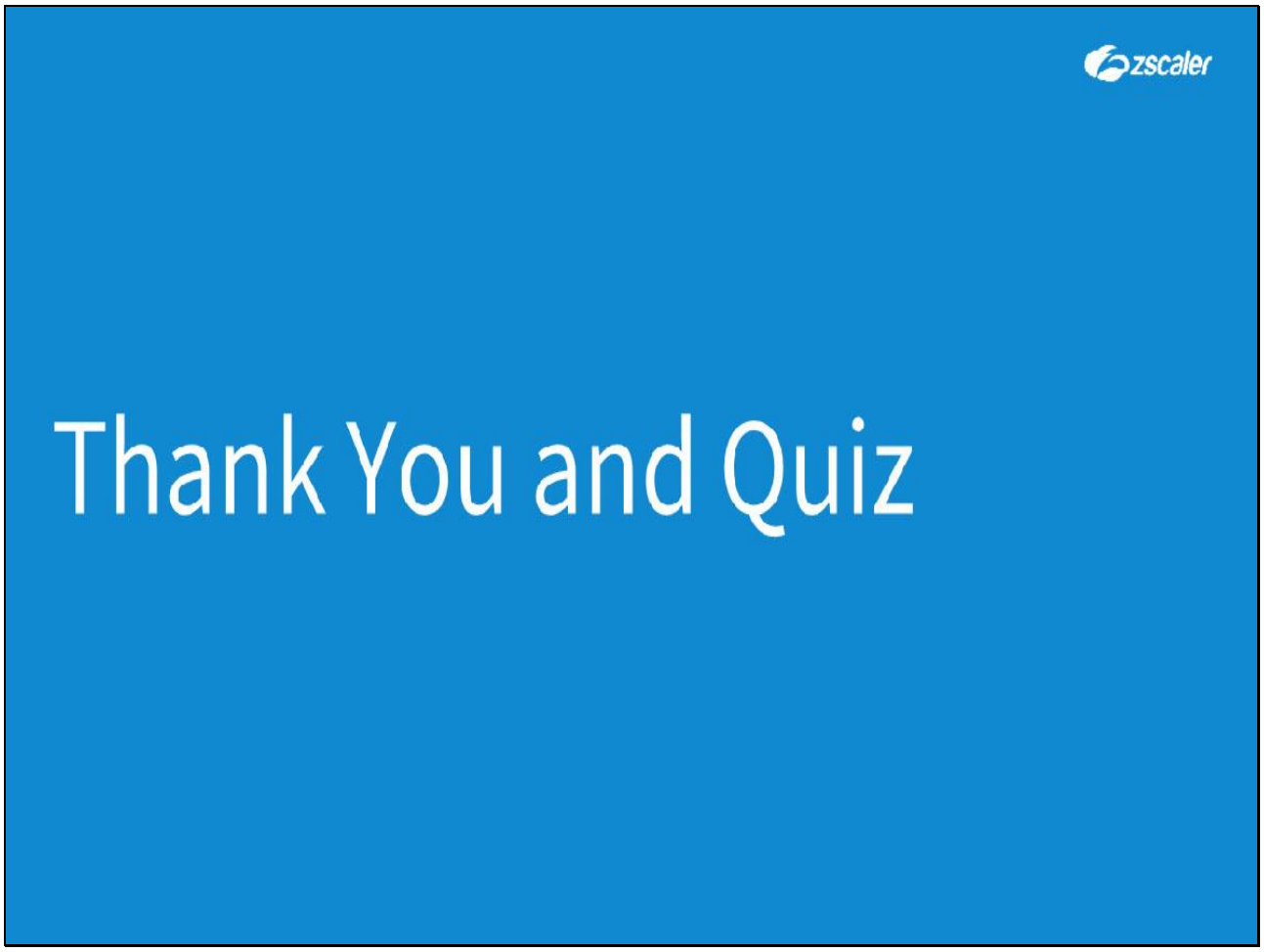
Slide 38 - Slide 38



Slide notes

Last, configure a default route to send all traffic to Zscaler.

Slide 39 - Slide 39



Slide notes

This completes the Traffic Forwarding using GRE tunnels module.

We hope this module has been useful to you and thank you for your time. What will follow is a short quiz to test your knowledge of the material presented in this module. You may retake the quiz as many times as necessary to pass.