Progress®
Kemp® LoadMaster®

Quick Start Guide Zero Trust Access Gateway

Generated on: 12 January 2026

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Introduction

The Progress Kemp Zero Trust Access Gateway (ZTAG) delivers a simple, flexible, and secure solution for providing the necessary access for users and applications to access backend systems while greatly reducing the exposure to today's threats. The Zero Trust Access Gateway architecture leverages the customer's existing Progress Kemp load balancers to deliver this security model.

The Zero Trust Access Gateway delivers secure publishing of workloads using the following attributes:

- Authentication
- Group Membership
- Location
- HTTP Header
- Path

Related Links

For details, see the following topics:

- Document Purpose

Document Purpose

This document describes how to get started using the Zero Trust Access Gateway.

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Progress Kemp Zero Trust Access Gateway

The Zero Trust Access Gateway provides administrators with a policy builder to implement granular least privileged access to resources published through the load balancer. A configuration file is used to clearly define the application as well as the access policy rules. This configuration file is called by a script that allows the administrator to choose different options during each run, dependent on the use case being addressed. Example XML configuration files are provided to assist with the configuration of policies for each use case.

Related Links

For details, see the following topics:

- Supported Use Cases

Supported Use Cases

The following are the supported use cases for Zero Trust Access Gateway while additional variations are being developed and released.

Source IP/Method/Path

This security policy, although developed for object storage solutions, is not limited to this workload. The traffic must match all three attributes to be permitted access to the published system.

Who – The source IP Address of the requestor.

What – The HTTP Method (GET, PUT, DELETE, etc.) being passed to the published system.

Where – The path of the object being requested or written, defined using regular expression (regex) for flexible implementations.

Authentication Header/Method/SourceIP

This security policy is also developed for object storage solutions but can be applied to other workloads. The Content Rules for this use case are as follows.

Who – The Authentication Header within the HTTP traffic.

What – The HTTP Method being passed to the published system.

Where – This is the Source IP address from where the traffic originated.

SteeringGroup/Path/SourceIP

This security policy is designed for any application that performs pre-authentication on the Progress Kemp Load Balancer. This utilizes the Edge Security Pack feature to determine a user's group membership in combination with the client's source IP address and the path within the application they request.

Who – Group membership. This attribute looks at the Active Directory group a user is a member of and directs them to a specific element of the published application.

What – The path within the published application the user is trying to access. By defining this using regular expressions (regex), an application can be segmented to suit many scenarios

Where – This is the Source IP address from where the traffic originated.

Trusted/ Untrusted Zone

This security policy also requires the Edge Security Pack but determines the type of authentication required for a user based on group and location. Should the traffic match the attributes for a Trusted zone, the user is presented with a simple form to authenticate to the application, but should the traffic be identified as Untrusted; the user will be required to provide multi-factor authentication to gain access.

Who – Permitted Group. This is a Progress Kemp-specific attribute that looks at the Active Directory group a user is a member of and permits or denies access dependent on their group membership.

Where – This is the Source IP address from where the traffic originated.

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Getting Started

Refer to the following sections for details on how to get started with the Zero Trust Access Gateway.

Related Links

For details, see the following topics:

- Pre-Requisites
- Import the Kemp PowerShell Module
- Download the Progress Kemp Zero Trust Access Gateway Package
- Modify the Configuration Files for the Desired Use Case
- Run the Zero Trust Policy Builder Script

Pre-Requisites

The Zero Trust Access Gateway does not require the user to have in-depth knowledge of Progress Kemp products or PowerShell, but some familiarity is recommended.

The components that make up the Zero Trust Access Gateway are as follows:

- LoadMaster or ECS Connection Manager
- Progress Kemp Load Balancer PowerShell Module
- Zero Trust Policy Builder PowerShell Script

- Zero Trust Policy Builder Configuration File (XML)

Import the Kemp PowerShell Module

Download the Progress Kemp PowerShell Module

The latest Progress Kemp PowerShell Module can be found on the following page: LoadMaster Other Downloads.

Import the Progress Kemp PowerShell Module

Copy the Kemp.LoadBalancer.Powershell folder to the relevant folder.

Install the module in a folder that is available in PSModulePath ($Env:PSModulePath).

Import the module to start using it:

Import-Module Kemp.LoadBalancer.Powershell

Note: For the PowerShell commands to work, the API interface must be enabled on the LoadMaster. To enable it using the Web User Interface (WUI), go to **Certificates and Security > Remote Access** and select **Enable API Interface**

Download the Progress Kemp Zero Trust Access Gateway Package

The latest Progress Kemp ZTAG Package can be found on the following page: LoadMaster Other Downloads.

Unzip the ZTAG Package.

The package contains the following files:

- ZTAG-Policy-Builder.ps1
- Config_AuthHeader.xml
- Config_SourceIP.xml
- Config_SteeringGroup.xml
- Config_Trusted_Zones.xml

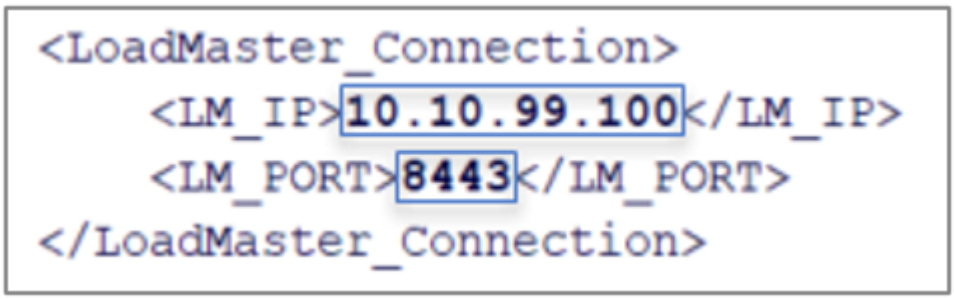
Modify the Configuration Files for the Desired Use Case

The Zero Trust Policy Builder currently supports four different use cases. Each is defined within a sample configuration XML file. These configuration files determine the state of the environment which is being secured.

Note: It is recommended that Notepad++ or some other XML aware application is used when working with the ZTAG configuration files

---

Open the desired sample configuration file. The XML files contain similar sections for the Virtual Service configuration that will be used to publish and secure the application/workload. Policy-specific sections will be unique based on the use case.



1. Modify the LoadMaster connection settings for the LoadMaster or ECS Connection Manager:
   - The LoadMaster or ECS Connection Manager IP Address
   - The LoadMaster or ECS Connection Manager TCP Port

```
<VirtualService_Configuration>
    <VS_NickName>objectStore</VS_NickName>
    <VS_IP>10.10.99.103</VS_IP>
    <VS_PORT>443</VS_PORT>
    <VS_Scheduling>lc</VS_Scheduling>
    <Enable_TLS>Y</Enable_TLS>
 <!-- ##These TLS settings are optional if a TLS certificate is already imported onto the Load Balancer to be used for this service ##-->
    <TLS_Cert_Location_Path></TLS_Cert_Location_Path>
    <TLS_Cert_Identifier></TLS_Cert_Identifier>
    <TLS_Cert_PassPhrase></TLS_Cert_PassPhrase>
</VirtualService_Configuration>
```

2. Modify the Virtual Service configuration with settings based on workload requirements.
   - A Nickname (friendly name) to identify the workload being published
   - A Virtual IP Address to publish the workload
   - A Scheduling Method on how the distribution of the traffic to backend systems should occur.
     - rr = round-robin
     - wrr = weighted round robin
     - lc = least connection
     - wlc = weighted least connection
     - fixed = fixed weighting

- adaptive = resource based (adaptive)
- sh = source IP hash
- dl = weighted response time
- sdn-adaptive = resource based (SDN adaptive)
- uhash = URL hash

- Select whether SSL/TLS Acceleration should be enabled on the Virtual Service.
  - Y
  - N

Optional – If a certificate is present on the LoadMaster/ ECS Connection Manager, a prompt will be provided to select which certificate should be used in the configuration. A certificate can be uploaded and applied by entering the following parameters

- Path/ location to the certificate file (PFX)
- A friendly name or identifier for the certificate
- The passphrase for importing the certificate

```
<RealServer_Configuration>
    <RS_Check_Method>tcp</RS_Check_Method>
    <RS_Check_Port>9020</RS_Check_Port>
    <RS_Port>9020</RS_Port>
    <!-- ## This setting is used to specify whether the Real Servers are on a directly connected interface
    <Non_Local_RS>Y</Non_Local_RS>
</RealServer_Configuration>
```

3. Modify the Real Server configuration with settings based on workload requirements.

   Real Server Check Method

   - https
   - http
   - tcp

   Real Server Check Port to use

   Real Server Port should it differ from the check port

   Non_Local Real Servers to specify whether the Real Servers are on a directly connected interface or on a remote network

   - Y
   - N

```
<RealServer_List>
    <RS>10.10.99.150</RS>
    <RS>10.10.99.151</RS>
    <RS>10.10.99.152</RS>
    <RS>10.10.99.153</RS>
</RealServer_List>
```

4. Modify the Real Server list with the IP Address or FQDN of the backend systems being published. Lines can be removed or added based on the number of Real Servers in the environment.

```
<Identify_Networks>
    <Network SourceIP="/192\.168\.10\..*/" Description="SecureZone 11"></Network>
    <Network SourceIP="/10\.100\.110\..*/" Description="SecureZone 21"></Network>
    <Network SourceIP="/172\.16\.10\..*/" Description="SecureZone 31"></Network>
</Identify_Networks>
```

5. **SourceIP/Method/Path Only** - The SourceIP/Method/Path use case identifies where the traffic originates from based on IP Address. This section defines the networks and descriptions for each within an environment.
   - Source IP Address using Regular Expression (RegEx) to identify the networks in the environment.
   - Description (friendly name) of the networks in the environment.

```
<Zero_Trust_Access_Gateway_Policies>
    <Policy SourceIP="/192\.168\.10\..*/" Method="GET" Path="bucket1"></Policy>
    <Policy SourceIP="/172\.16\.10\..*/" Method="PUT" Path="bucket2"></Policy>
    <Policy SourceIP="/172\.16\.10\..*/" Method="DELETE" Path="bucket3"></Policy>
    <Policy SourceIP="/10\.100\.110\..*/" Method="GET" Path="bucket3"></Policy>
    <Policy SourceIP="/192\.168\.10\..*/" Method="DELETE" Path="bucket4"></Policy>
</Zero_Trust_Access_Gateway_Policies>
```

6. **SourceIP/Method/Path Only** - The policy section is where the security settings are configured. Lines can be added or removed depending on the number of rules that should be applied in the policy.
   - Source IP Address to apply the security policy too.
   - The method that should be permitted for the defined path/ bucket.
     - GET
     - PUT
     - DELETE
     - POST
   - The path or bucket to apply the security policy too.

Note: Any Source IP Addresses that are applied here must be identified in the Identify_Network section for the SourceIP use case above

---

```
<Identify_Users>
    <User name="object_admin1" Description="SecureLevel 1"></User>
    <User name="object_admin2" Description="SecureLevel 2"></User>
    <User name="object_admin3" Description="SecureLevel 3"></User>
</Identify_Users>
```

7. **AuthHeader/Method/ SourceIP Only** - The AuthHeader/Method/SourceIP use case identifies who is accessing the workload with the user account that appears in the Authentication Header. This section defines the user accounts or Object IDs and descriptions for each within an environment.
   - Username to identify the account or object ID in the environment.
   - Description (friendly name) of the user account in the environment.

```
<Zero_Trust_Access_Gateway_Policies>
    <Policy UserName="Object_Admin1" Method="GET" SourceIP="/10\.100\.110\..*/"></Policy>
    <Policy UserName="Object_Admin2" Method="PUT" SourceIP="/192\.168\.10\..*/"></Policy>
    <Policy UserName="Object_Admin1" Method="DELETE" SourceIP="/172\.16\.10\..*/"></Policy>
    <Policy UserName="Object_Admin3" Method="GET" SourceIP="/172\.16\.10\..*/"></Policy>
    <Policy UserName="Object_Admin3" Method="DELETE" SourceIP="/192\.168\.10\..*/"></Policy>
</Zero_Trust_Access_Gateway_Policies>
```

8. **AuthHeader/Method/ SourceIP Only** - The policy section is where the security settings are configured. Lines can be added or removed depending on the number of rules that should be applied in the policy.
   - Username to apply the security policy too.
   - The method that should be permitted for the defined path/ bucket.
     - GET
     - PUT
     - DELETE
     - POST
   - The source IP Address as to where the traffic originates from using Regular Expression (RegEx).

Note: Any Usernames that are applied here **must** be identified in the Identify_Users section for the SteeringGroup use case above

---

```
<Identify_Groups>
    <Group  Name="Admin_Group" Description="Administrators"></Group>
    <Group  Name="Dev_Group" Description="Developers"></Group>
    <Group  Name="Sales_Group" Description="Sales"></Group>
</Identify_Groups>
```

9. **SteeringGroup/SourceIP/Path Only** -The SteeringGroup/SourceIP/Path use case identifies who is accessing the workload with the Active Directory Group they are a member of. This section defines the Active Directory Groups and description for each within an environment.
   - Active Directory Group Names used to secure the environment.
   - Description (friendly name) of the AD Groups in the environment.

Note: If using the Steering Group Use Case, the Edge Security Pack Single Sign On domain must be configured before running the ZTAG Policy Builder

```
<Zero_Trust_Access_Gateway_Policies>
    <Policy Group="Admin_Group" SourceIP="/10\.100\.110\..*/" Path="admin"></Policy>
    <Policy Group="Dev_Group" SourceIP="/192\.168\.10\..*/" Path="release"></Policy>
    <Policy Group="Sales_Group" SourceIP="/172\.16\.10\..*/" Path="opps"></Policy>
    <Policy Group="Admin_Group" SourceIP="/10\.100\.110\..*/" Path="release"></Policy>
    <Policy Group="Dev_Group" SourceIP="/172\.16\.10\..*/" Path="admin"></Policy>
</Zero_Trust_Access_Gateway_Policies>
```

10. **SteeringGroup/SourceIP/Path Only** - The policy section is where the security settings are configured. Lines can be added or removed depending on the number of rules that should be applied in the policy.
    - Username to apply the security policy too.
    - The source IP Address as to where the traffic originates from using Regular Expression (RegEx)
    - The path of the application that the AD group should have access to.

Note: Any Groups that are applied here **must** be identified in the Identify_Groups section for the SteeringGroup use case above

```
<Zero_Trust_Access_Gateway_Trusted_Zones>
    <SourceIP>/10\.100\.110\..*/</SourceIP>
    <SourceIP>/192\.168\.99\..*/</SourceIP>
    <SourceIP>/172\.16\.99\..*/</SourceIP>
    <SourceIP>/10\.111\.111\..*/</SourceIP>
    <SourceIP>/10\.102\.102\..*/</SourceIP>
</Zero_Trust_Access_Gateway_Trusted_Zones>
```

11. **Trusted/Un-Trusted Only** - The Trusted Zone section identifies the known networks in the environment. These are the networks where Multi-Factor Authentication will not be required.
    - The Source IP will be the network address using Regular Expression (RegEx) that clients will be connecting from. Lines can be added or removed depending on the number of known networks in the environment.

```
<PermittedGroups_Trusted_Zone>
    <Group>admins</Group>
    <Group>developers</Group>
    <Group>sales</Group>
    <Group>operations</Group>
    <Group>customer_support</Group>
</PermittedGroups_Trusted_Zone>
```

12. **Trusted/Untrusted Only** - The Permitted Groups Trusted Zone section is where the Active Directory groups are defined. Members of these groups should be granted access to the application if they connect to the application from a network listed in the Trusted Zones section above. Lines can be added or removed depending on the number of groups that need access to the application.
    - Group – Active Directory group name

Note: If using the Trusted/ Untrusted Use Case, the Edge Security Pack Single Sign On domain for the trusted zone must be configured before running the ZTAG Policy Builder

---

```
<PermittedGroups_UnTrusted_Zone>
    <Group>special_projects</Group>
    <Group>customer_support</Group>
</PermittedGroups_UnTrusted_Zone>
```

13. Trusted/Un-Trusted Only - The Permitted Groups Un-Trusted Zone section is where the Active Directory groups are defined. Members of these groups should be granted access to the application if they connect to the application from a network that is NOT listed in the Trusted Zone section above. If the same group should have access regardless of the network they are connected to; the group names should be listed in both sections. Lines can be added or removed depending on the number of groups that need access to the application.
    - Group – Active Directory group name

Note: Using the Trusted/ Un-Trusted Use Case, the Edge Security Pack Single Sign On domain for the un-trusted zone must be configured before running the ZTAG Policy Builder.

```
<Backup_Options>
    <BackupFilePath>C:\temp</BackupFilePath>
    <BackupFileName>ZTAG_Backup</BackupFileName>
</Backup_Options>
```

14. **Optional** - During each run of the Zero Trust Policy Builder, the option to take a backup before any changes are applied is presented. These options are used to define the name and where the backup should be stored. A date and time stamp will also be included in the backup file name.
    - File Path – Ensure the proper permissions are applied to the folder.
    - Backup file name – Used to identify the backup being taken

```
<Logging_Options>
    <LogFilePath>C:\temp\ZTAG.log</LogFilePath>
    <MaxLogSizeKB>500</MaxLogSizeKB>
    <MaxLogRollovers>1</MaxLogRollovers>
</Logging_Options>
```

15. Logging is generated for each run of the Zero Trust Policy Builder. These settings will provide the location for the log files and how much of the disk can be utilized to store files.
    - File Path – Ensure the proper permissions are applied to the folder.
    - Max Log Size – The maximum size of each of the log files.
    - Max Log Rollovers – The maximum number of log file rollovers to allow. The setting of 2 rollover files and 500KB maximum size will allow 1000KB of storage to be used on the system running the Zero Trust Policy Builder.

Run the Zero Trust Policy Builder Script

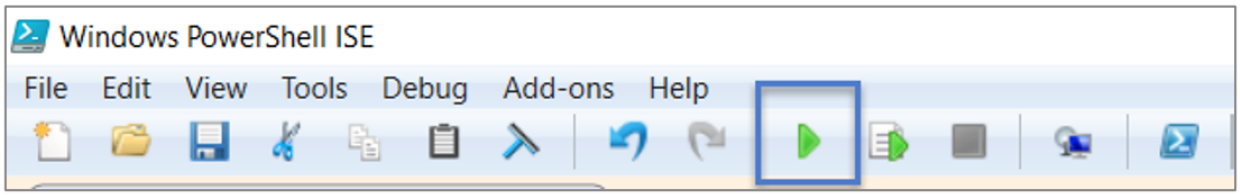
There are two approaches for running the Zero Trust Policy Builder PowerShell script. The PowerShell console and the PowerShell Integrated Scripting Environment (ISE). The interaction with the Zero Trust Policy Builder will be different between these two approaches, but the results will be identical. This document will focus on using PowerShell ISE since it provides more user-friendly prompts than the PowerShell Console.

CAUTION: The Zero Trust Policy Builder is a fixed script that should not be modified under any circumstances.

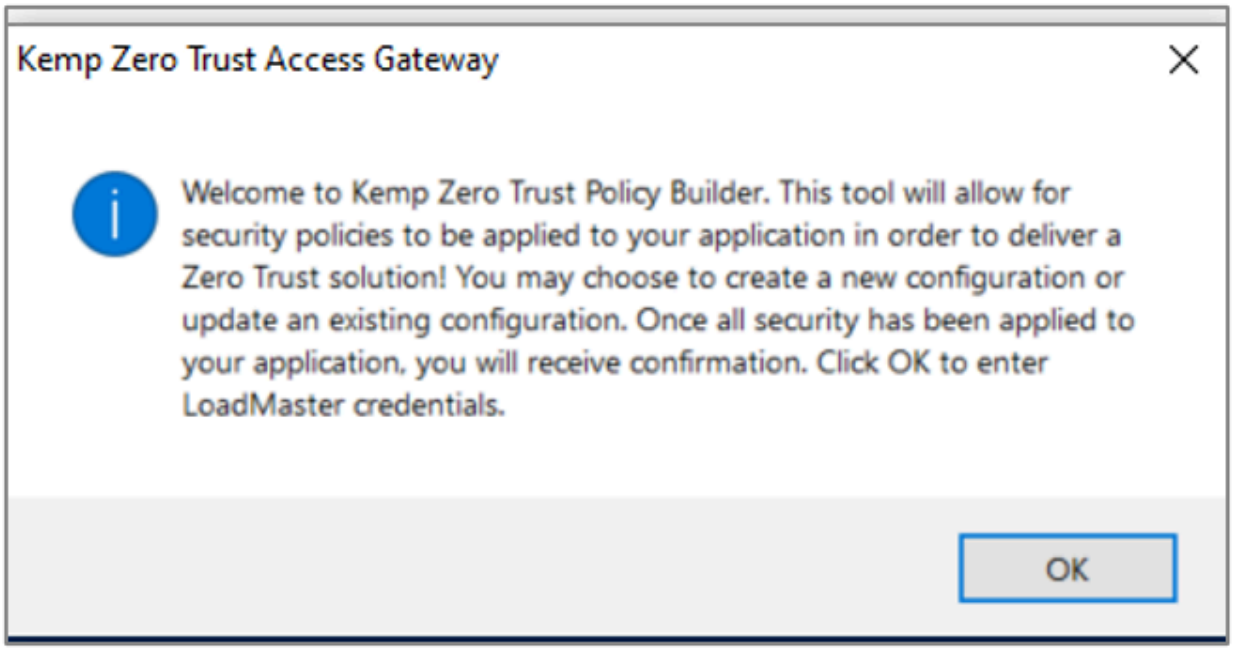
Although some interactions that are presented are common across the different use cases, there are some unique for each.

Deploy a new workload

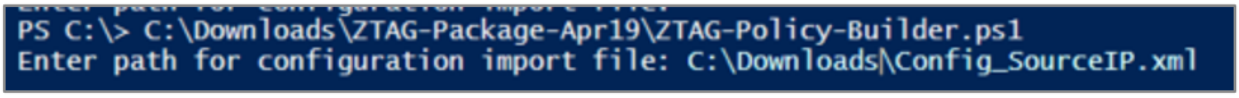
1. Open the ZTAG-Policy-Builder.ps1 script using PowerShell ISE.



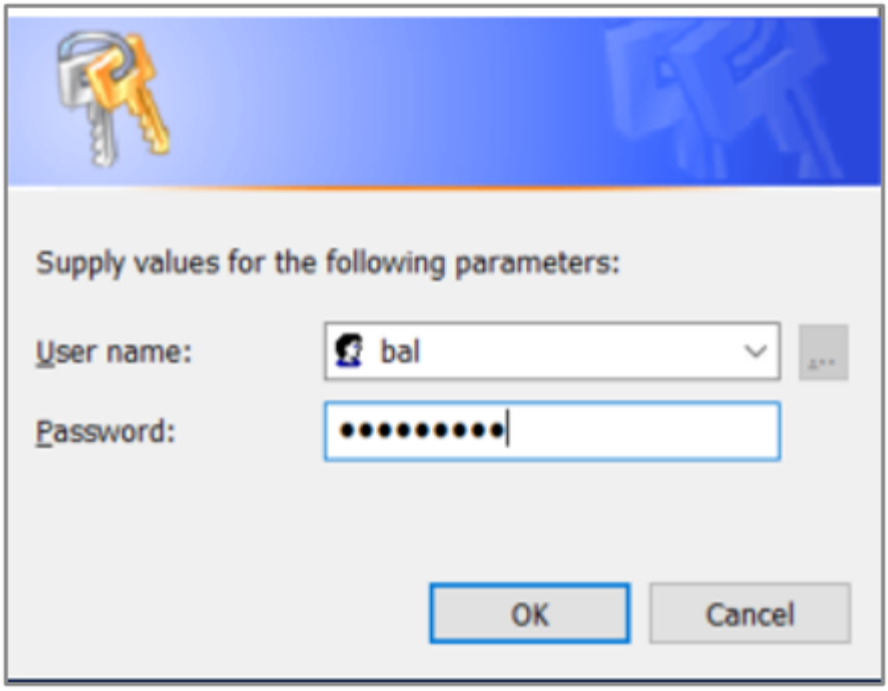
2. Click the Green Arrow to run the ZTAG Policy Builder script.



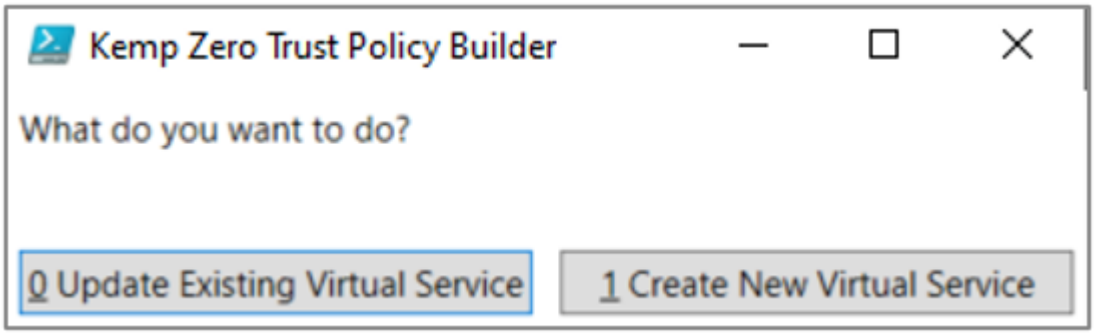
3. Click OK on the Welcome Message.



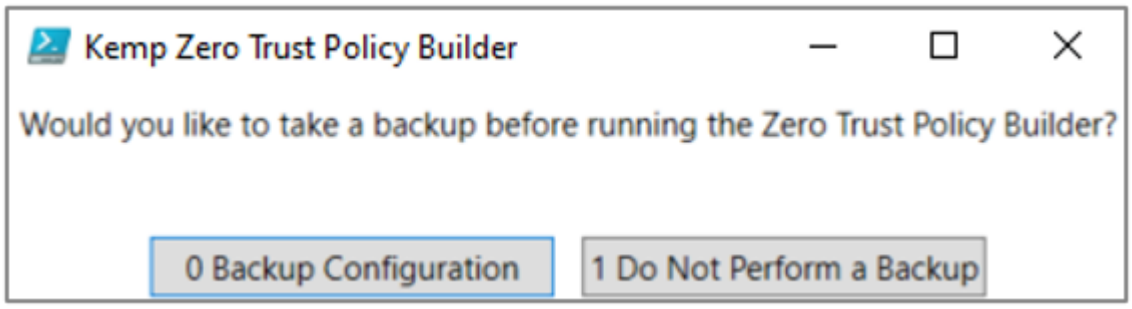
4. Enter the path to the configuration file that should be used and Enter



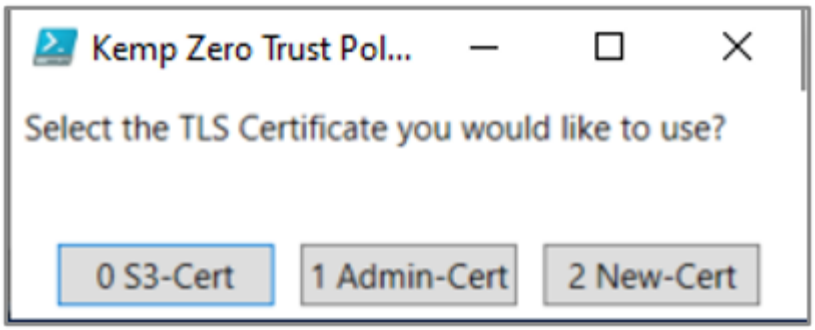
5. Enter the credentials to authenticate to the LoadMaster or ECS Connection Manager.



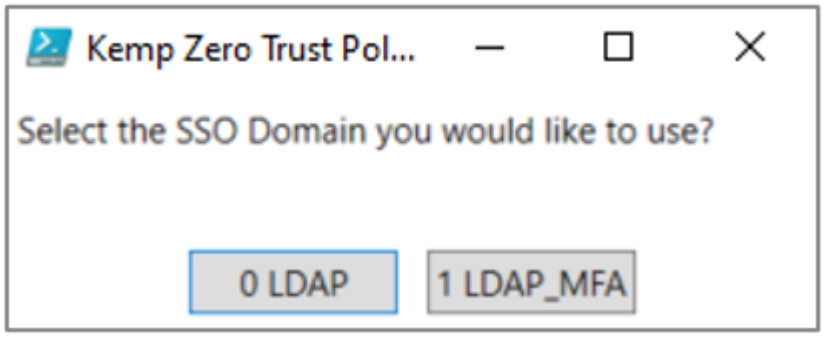
6. Select **Create New Virtual Service**



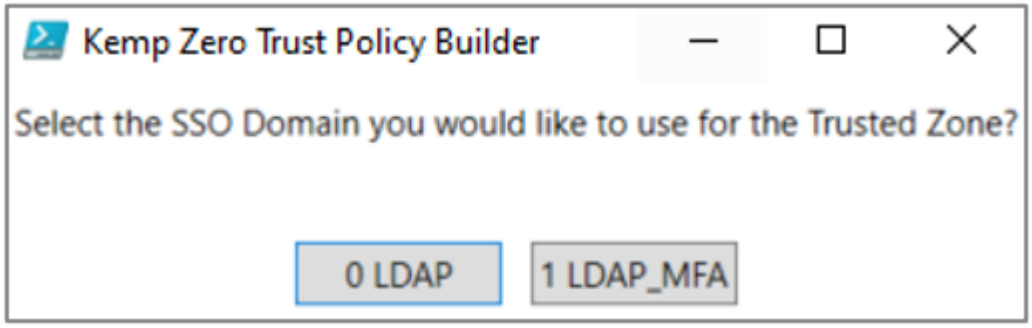
7. Choose whether to perform a backup before making any updates on the LoadMaster/ ECS Connection Manager.



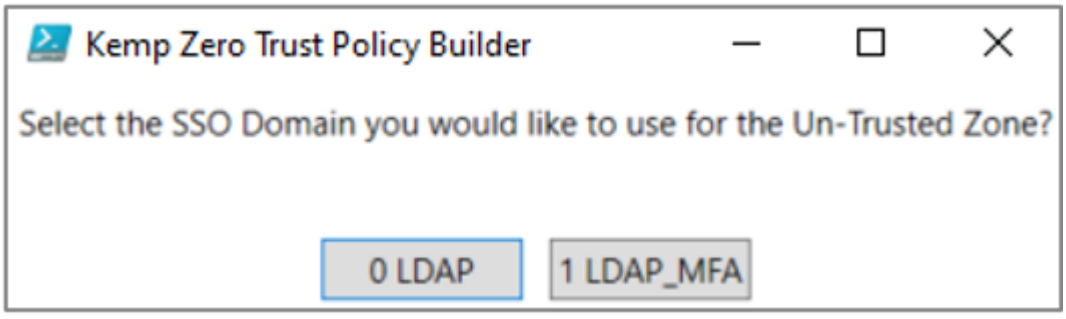
8. If enable TLS was set to “Y” in the configuration file, and no parameters were provided to add a new certificate, a prompt to select an existing certificate is provided.



9. **Steering Group Use Case Only** – A prompt is presented to select an existing SSO domain to use to pre-authenticate users.



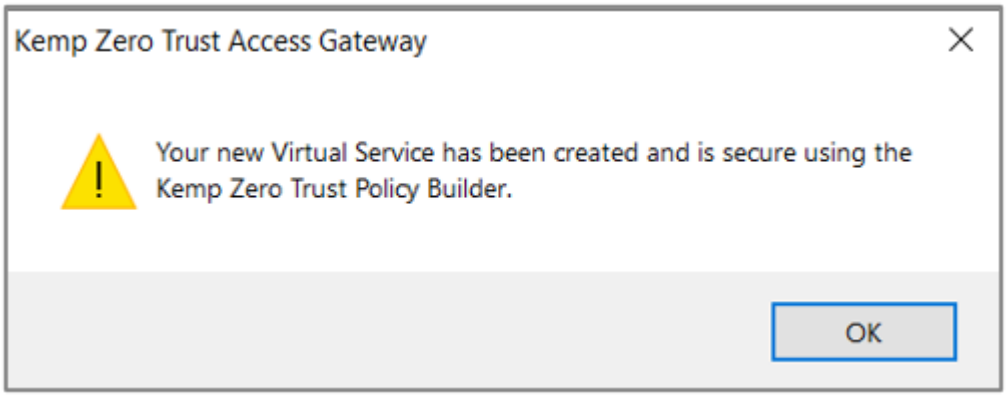
10. **Trusted/Untrusted Zone Use Case Only** – Select the SSO domain to use for known networks within the environment.



11. **Trusted/UnTrusted Zone Use Case Only** – Select the SSO domain to use for all other networks that do not exist in the environment.

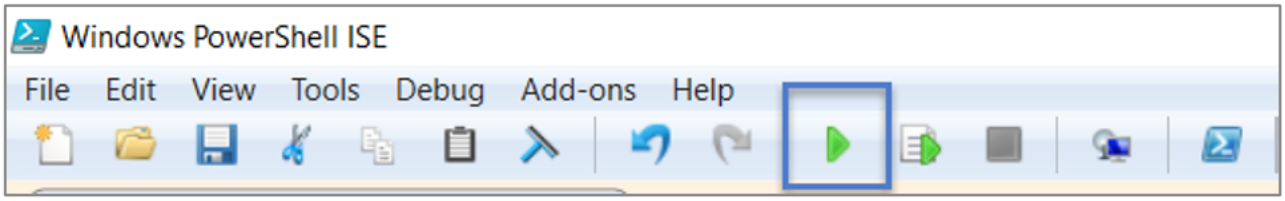
```
Enter path for configuration import file: C:\Downloads\ZTAG-Package-Apr19\Config_SourceIP.xml
cmdlet Get-Credential at command pipeline position 1
Supply values for the following parameters:
Creating rules based on Source IP
Creating rules based on Methods
Creating rules based on Paths/Buckets
Creating Virtual Service
Creating Sub Virtual Service(s)
Configuration of Sub Virtual Service(s)
Applying Method Rules
Applying Source IP Rules
Adding Real Servers to each Sub Virtual Service
Adding Path Rules to each Real Server and finalizing configuration
```

12. The script steps will be presented as the configuration takes place.

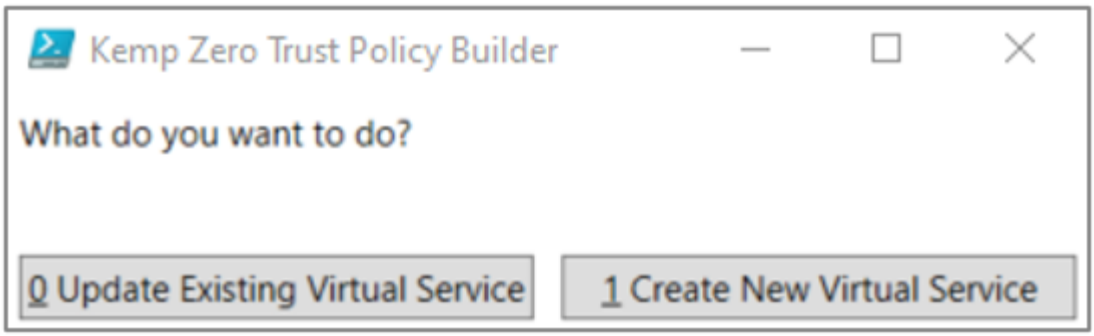


13. 13. A confirmation that the script ran successfully will be presented at completion.

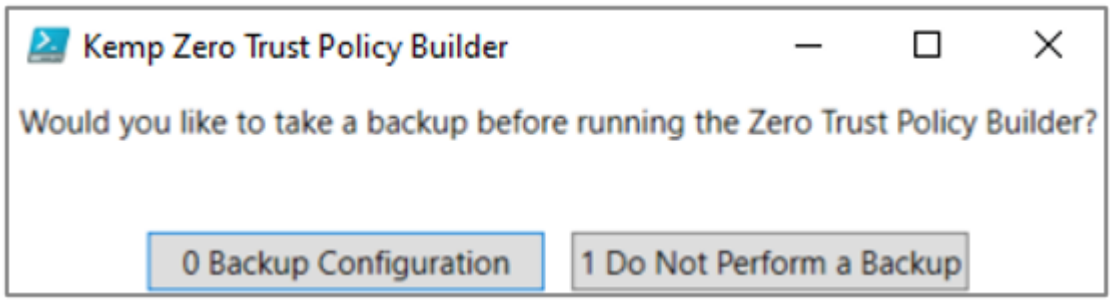
Update an existing workload



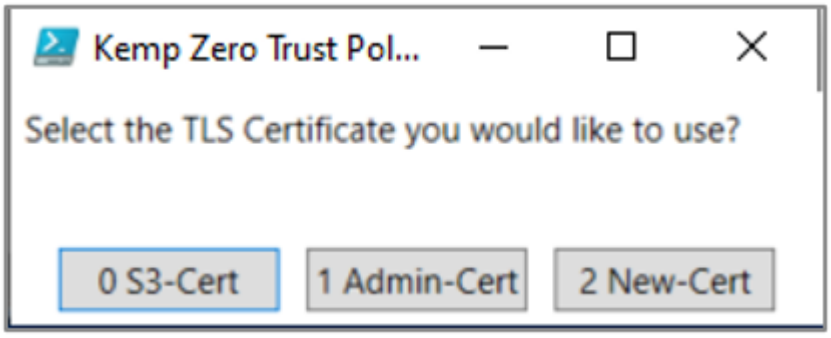
1. Run the script and accept the welcome message



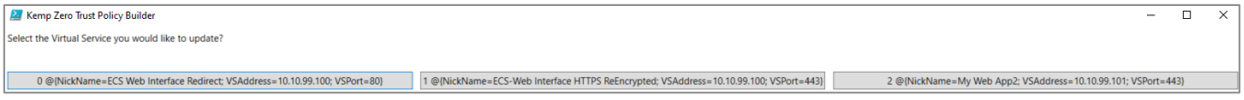
2. Select **Update Existing Virtual Service**



3. Choose whether to perform a backup before making any updates on the LoadMaster/ ECS Connection Manager.



4. If enable TLS was set to “Y” in the configuration file, and no parameters were provided to add a new certificate, a prompt to select an existing certificate is provided.



5. Select the Virtual Service you would like updated.

The remaining steps will be identical to the steps outlined in the **Deploy a New Workload** section.