Deploying F5 with Microsoft Active Directory Federation Services

This F5 deployment guide provides detailed information on how to deploy Microsoft Active Directory Federation Services (AD FS) with F5’s BIG-IP LTM and APM modules. The BIG-IP LTM provides high availability, performance, and scalability for both AD FS and AD FS Proxy servers. Additionally, you can choose to deploy the Access Policy Manager to secure AD FS traffic without the need for AD FS Proxy servers.

For more information on Microsoft AD FS, see http://social.technet.microsoft.com/wiki/contents/articles/2735.ad-fs-content-map.aspx
For more information on the BIG-IP system, see http://www.f5.com/products/bigip/
You can also visit the Microsoft page of F5’s online developer community, DevCentral, for Microsoft forums, solutions, blogs and more: http://devcentral.f5.com/Microsoft/.

<table>
<thead>
<tr>
<th>Products and versions tested</th>
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<tbody>
<tr>
<td>BIG-IP LTM and APM</td>
<td>Microsoft AD FS 2.0 (BIG-IP v11.0 - 12.0)</td>
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<td>Microsoft AD FS 3.0 (BIG-IP v11.4.1 - 12.0)</td>
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<td>Microsoft Active Directory Federation Services</td>
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Important: Make sure you are using the most recent version of this deployment guide, available at http://www.f5.com/pdf/deployment-guides/microsoft-adfs-dg.pdf

If you are looking for older versions of this or other deployment guides, check the Deployment Guide Archive tab at: https://f5.com/solutions/deployment-guides/archive-608

To provide feedback on this deployment guide or other F5 solution documents, contact us at solutionsfeedback@f5.com.
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Prerequisites and configuration notes

The following are general prerequisites for this deployment; each section contains specific prerequisites:

- All of the configuration procedures in this document are performed on F5 devices. For information on how to deploy or configure AD FS, consult the appropriate Microsoft documentation.
- You must be on BIG-IP LTM version 11.0 or later. We recommend version 11.4 or later.
- You must have already installed the F5 device(s) in your network and performed the initial configuration tasks, such as creating Self IP addresses and VLANs. For more information, refer to the appropriate BIG-IP LTM manual, available at http://support.f5.com/kb/en-us.html.
- You must have correctly installed and configured AD FS 2.0 or 3.0 in your environment, and confirmed that you have enabled a service endpoint, such as https://localhost/adfs/fs/federationserverservice.asmx from the AD FS server(s), and can browse to it.
- When deploying APM in front of AD FS, the AD FS Global Primary Authentication Policy for the Intranet zone should be set to Windows Authentication.
- If you are forwarding traffic from AD FS Proxy servers to a virtual server load balancing AD FS servers, and using the iApp template, you must select Encrypted traffic is forwarded without decryption (SSL pass-through) in response to the question How should the BIG-IP system handle SSL traffic? Due to certificate authentication requirements between the AD FS proxy servers and AD FS servers, terminating and re-encrypting SSL is not supported in this configuration.

Configuration example

There are three ways you can configure the BIG-IP system for Microsoft AD FS deployments: using the BIG-IP LTM to load balance AD FS servers, using the BIG-IP LTM to load balance AD FS proxy servers, and using the BIG-IP APM to secure AD FS traffic without the need for proxy servers.

Load balancing AD FS with the BIG-IP system

In this scenario, the F5 LTM module optimizes and load balances requests to an internal AD FS server farm.

![Figure 1: Logical configuration diagram: Load Balancing AD FS](image)

The following is the traffic flow for this scenario.

1. A client attempts to access the AD FS-enabled external resource.
2. The client is redirected to the resource’s applicable federation service.
3. The client is redirected to its organization’s internal federation service, (assuming the resource’s federation service is configured as trusted partner).
4. The AD FS server authenticates the client to Active Directory.

5. The AD FS server provides the client with an authorization cookie containing the signed security token and set of claims for the resource partner.

6. The client connects to the resource partner federation service where the token and claims are verified. If appropriate, the resource partner provides the client with a new security token.

7. The client presents the new authorization cookie with included security token to the resource for access.

Load balancing AD FS proxy servers with the BIG-IP system

In this scenario, the F5 LTM module optimizes and load balances requests to an external AD FS Proxy server farm.

Figure 2: Logical configuration diagram: Load Balancing AD FS proxy servers

The following is the traffic flow for this scenario.

1. A client attempts to access the AD FS-enabled internal or external resource.

2. The client is redirected to the resource’s applicable federation service.

3. The client is redirected to its organization’s internal federation service, (assuming the resource’s federation service is configured as trusted partner).

4. The AD FS proxy server presents the client with a customizable sign-on page.

5. The AD FS proxy presents the end-user credentials to the AD FS server for authentication.

6. The AD FS server authenticates the client to Active Directory.

7. The AD FS server provides the client, (via the AD FS proxy server) with an authorization cookie containing the signed security token and set of claims for the resource partner.

8. The client connects to the resource partner federation service where the token and claims are verified. If appropriate, the resource partner provides the client with a new security token.

9. The client presents the new authorization cookie with included security token to the resource for access.
Securing AD FS with the BIG-IP APM

In this scenario, the F5 APM module secures, optimizes, and load balances requests to an internal or external AD FS server farm, eliminating the need to deploy AD FS Proxy servers in a perimeter network.

The following is the traffic flow for this scenario.

1. Both clients attempt to access the Office 365 resource;
2. Both clients are redirected to the resource's applicable federation service, (Note: This step may be skipped with active clients such as Microsoft Outlook);
3. Both clients are redirected to their organization's internal federation service;
4. The AD FS server authenticates the client to Active Directory;
5. Internal clients are load balanced directly to an AD FS server farm member; and
6. External clients are:
   7. Pre-authenticated to Active Directory via APM's customizable sign-on page;
   8. Authenticated users are directed to an AD FS server farm member.
   9. The AD FS server provides the client with an authorization cookie containing the signed security token and set of claims for the resource partner;
   10. The client connects to the Microsoft Federation Gateway where the token and claims are verified. The Microsoft Federation Gateway provides the client with a new service token;
   11. The client presents the new cookie with included service token to the Office 365 resource for access.
Configuring the iApp template for Microsoft AD FS

Use the following guidance to help configure the BIG-IP system for Microsoft AD FS using the BIG-IP iApp template.

Downloading and importing the new iApp
The first task is to download and import the new iApp template.

To download and import the iApp
1. Open a web browser and go to downloads.f5.com.
2. Click Find a Download, and then click BIG-IP v11.x / Virtual Edition.
3. If necessary, select a BIG-IP product version from the list, and then click iApp-Templates.
4. Accept the EULA, and then download the iapps zip file to a location accessible from your BIG-IP system.
5. Extract (unzip) the f5.microsoft_adfs.v<latest version>.tmpl file.
6. Log on to the BIG-IP system web-based Configuration utility.
7. On the Main tab, expand iApp, and then click Templates.
8. Click the Import button on the right side of the screen.
9. Click a check in the Overwrite Existing Templates box.
10. Click the Browse button, and then browse to the location you saved the iApp file.
11. Click the Upload button. The iApp is now available for use.

Upgrading an Application Service from previous version of the iApp template
If you upgraded your BIG-IP system from previous version and had an existing Application Service that used the f5.microsoft_adfs template from one of those versions, you will see a warning that the source template has changed.

When you upgrade to the current template version, the iApp retains all of your settings for use in the new template.

To upgrade an Application Service to the current version of the template
1. On the Main tab, expand iApp and then click Application Services.
2. From the list, click the name of the Application Service you created using the f5.microsoft_adfs template.
3. On the Menu bar, click Reconfigure.
4. In the Template Options section, from the Do you want to upgrade this template question, select Yes.
5. Without changing any settings, click the Finished button. The system creates an Application Service object with only the new template object in the Component view.

⚠️ Warning ⚠️ Your application will be offline from now until you complete the process in step 9.
6. On the Menu bar, click Reconfigure. Note the Template options section with inline help and configuration mode options. A number of additional questions appear if you select Advanced mode.
7. In the Virtual Server and Pool section, in the What FQDNs will clients use to access the servers question, you must add the host name.
8. No additional changes are necessary, but you may modify any of the other settings as applicable for your implementation. Use the inline help and this deployment guide for information on specific settings.
9. Click Finished. The upgrade is now complete and all applicable objects appear in the Component view.
Getting Started with the iApp for Microsoft Active Directory Federation Services

To begin the iApp Template, use the following procedure.

1. Log on to the BIG-IP system.
2. On the Main tab, expand iApp, and then click Application Services.
3. Click Create. The Template Selection page opens.
4. In the Name box, type a name. In our example, we use AD-FS-iapp_.
5. From the Template list, select f5.microsoft_adfs.v<latest version>. The Microsoft AD FS template opens.

Advanced options

If you select Advanced from the Template Selection list at the top of the page, you see Device and Traffic Group options for the application. This feature, new to v11, is a part of the Device Management configuration. This functionality extends the existing High Availability infrastructure and allows for clustering, granular control of configuration synchronization and granular control of failover. To use the Device and Traffic Group features, you must have already configured Device and Traffic Groups before running the iApp. For more information on Device Management, see the product documentation.

1. **Device Group**
   To select a specific Device Group, clear the Device Group check box and then select the appropriate Device Group from the list.

2. **Traffic Group**
   To select a specific Traffic Group, clear the Traffic Group check box and then select the appropriate Traffic Group from the list.

Template Options

This section contains general questions about the way you configure the iApp template.

1. **Do you want to see inline help?**
   Choose whether you want to see informational and help messages inline throughout the template, or if you would rather hide this inline help. If you are unsure, we recommend having the iApp display the inline help.
   Important and critical notes are always shown, no matter which selection you make.

   - Yes, show inline help text
     Select this option to see all available inline help text.

   - No, do not show inline help text
     If you are familiar with this iApp template, or with the BIG-IP system in general, select this option to hide the inline help text.

2. **Which configuration mode do you want to use?**
   Select whether you want to use F5 recommended settings, or have more granular, advanced options presented.

   - Basic - Use F5's recommended settings
     In basic configuration mode, options like load balancing method and parent profiles are all set automatically. The F5 recommended settings come as a result of extensive testing with web applications, so if you are unsure, choose Basic.

   - Advanced - Configure advanced options
     In advanced configuration mode, you have more control over individual settings and objects, such as server-side optimizations and advanced options like Slow Ramp Time and Priority Group Activation. You can also choose to attach iRules you have previously created to the Application Service. The Advanced option provides more flexibility for experienced users.

     As mentioned, advanced options in the template are marked with the Advanced icon: [Advanced]. If you are using Basic/F5 recommended settings, you can skip the questions with the Advanced icon.

3. **Which version of AD FS are you deploying?**
   Choose which version of Microsoft Active Directory Federation Services you are using. The selection you make here determines some of the options that appear later in this template.

   - AD FS 2.0
     Select this option if you are deploying this iApp template for AD FS 2.0.
• **AD FS 3.0**
  Select this option if you are deploying this iApp template for AD FS 3.0.

4. **Which AD FS server role are you deploying?**
   Choose the Active Directory Federation Services role you are deploying. You can deploy AD FS Proxy, or AD FS with optional Access Policy configuration, to protect your AD FS servers.
   - **AD FS**
     Select this option deploying AD FS only, and not the AD FS Proxy. In this case, the BIG-IP system can securely pre-authenticate AD FS requests, eliminating the need for AD FS Proxy.
   - **AD FS Proxy**
     Select this option if you are deploying this iApp template for AD FS Proxy. If you choose this option, the BIG-IP APM options do not appear.

**Network**

This section contains questions about your networking configuration.

1. **What type of network connects clients to the BIG-IP system?**
   Choose the type of network that connects your clients to the BIG-IP system. If you choose WAN or LAN, the BIG-IP system uses this information to determine the appropriate TCP optimizations. If you choose WAN through another BIG-IP system, the system uses a secure and optimized tunnel (called an iSession tunnel) for traffic between BIG-IP systems on opposite sides of the WAN. Only choose this option if you have another BIG-IP system across the WAN that will be a part of this implementation.
   - **Local area network (LAN)**
     Select this option if most clients are connecting to the BIG-IP system on a LAN. This field is used to determine the appropriate TCP profile which is optimized for LAN clients. In this case, the iApp creates a TCP profile using the `tcp-lan-optimized` parent with no additional modifications.
   - **Wide area network (WAN)**
     Select this option if most clients are connecting to the BIG-IP system over a WAN. This field is used to determine the appropriate TCP profile which is optimized for WAN clients. In this case, the iApp creates a TCP profile using the `tcp-wan-optimized` parent with no additional modifications.

2. **Which VLANs transport client traffic?**
   The BIG-IP system allows you to restrict client traffic to specific VLANs that are present on the system. This can provide an additional layer of security, as you can allow or deny traffic from the VLANs you choose. By default, all VLANs configured on the system are enabled. The VLAN objects must already be configured on this BIG-IP system before you can select them.
   - If there are VLANs on the BIG-IP system that should not transport client traffic, select the VLAN(s) and use the remove arrows (>>) to move the VLAN(s) to the Options box.

3. **What type of network connects servers to the BIG-IP system?**
   Choose the type of network that connects your servers to the BIG-IP system. Similar to the question about clients connecting to the BIG-IP system, if you choose WAN or LAN, the system uses this information to determine the appropriate TCP optimizations. If you choose WAN through another BIG-IP system, the system uses a secure and optimized tunnel (called an iSession tunnel) for traffic between BIG-IP systems on opposite sides of the WAN. Only choose this option if you have another BIG-IP system across the WAN that will be a part of this Microsoft AD FS implementation.
   - **Local area network (LAN)**
     Select this option if the servers connect to the BIG-IP system on a LAN. This field is used to determine the appropriate TCP profile. In this case, the iApp creates a TCP profile using the `tcp-lan-optimized` parent with no additional modifications.
   - **Wide area network**
     Select this option if the servers connect to the BIG-IP system over a WAN. This field is used to determine the appropriate TCP profile. In this case, the iApp creates a TCP profile using the `tcp-wan-optimized` parent with no additional modifications.

4. **Where will the virtual servers be in relation to the AD FS servers?**
   Select whether your BIG-IP virtual servers are on the same subnet as your AD FS servers, or on different subnets. This setting is used to determine the **SNAT** (secure NAT) and routing configuration.
• **Virtual server IP and AD FS servers are on the same subnet**
  
  If the BIG-IP virtual servers and AD FS servers are on the same subnet, SNAT is configured on the BIG-IP virtual server and you must specify the number of concurrent connections.

  a. **How many connections to you expect to each AD FS server?**
  
  Select whether you expect more or fewer than 64,000 concurrent connections to each server. This answer is used to determine what type of SNAT that system uses. A SNAT is an object that maps the source client IP address in a request to a translation address defined on the BIG-IP device. The system configures SNAT Auto Map (fewer than 64,000) or a SNAT pool (more than 64,000).

  • **Fewer than 64,000 concurrent connections**
    
    Select this option if you expect fewer than 64,000 concurrent connections per AD FS server. With this option, the system applies SNAT Auto Map, doesn’t require any additional IP addresses, as an existing self IP address is used for translation. Continue with the next section.

  • **More than 64,000 concurrent connections**
    
    Select this option if you have a very large deployment and expect more than 64,000 connections at one time. The iApp creates a SNAT Pool, for which you need one IP address for each 64,000 connections you expect.

    a. **Create a new SNAT pool or use an existing one?**
    
    If you have already created a SNAT pool on the BIG-IP system, you can select it from the list. Otherwise, the system creates a new SNAT pool with the addresses you specify.

      • **Create a new SNAT pool**
        
        Select this option (the default) to enable the system to create a new SNAT pool. You must specify the appropriate number of IP addresses in the next question.

        a. **What are the IP addresses you want to use for the SNAT pool?**
        
        Specify one otherwise unused IP address for every 64,000 concurrent connections you expect, or fraction thereof. Click **Add** for more rows. Do not use any self IP addresses on the BIG-IP system.

      • **Select a SNAT pool**
        
        Select the SNAT pool you created for this deployment from the list.

        **Important** If you choose more than 64,000 connections, but do not specify enough SNAT pool address(es), after the maximum connection limit of 64,000 concurrent connections per server is reached, new requests fail.

  • **Virtual servers and AD FS servers are on different subnets**
  
  If the BIG-IP virtual servers and servers are on different subnets, the following question appears.

  a. **How have you configured routing on your AD FS servers?**
  
  If you chose different subnets, this question appears asking whether the AD FS servers use this BIG-IP system’s self IP address as their default gateway. Select the appropriate answer.

  • **Servers have a route to clients through the BIG-IP system**
    
    Choose this option if the servers use the BIG-IP system as their default gateway. In this case, no configuration is needed to support your environment to ensure correct server response handling. Continue with the next section.

  • **Servers do not have a route to clients through the BIG-IP system**
    
    If the AD FS servers do not use the BIG-IP system as their default gateway, SNAT is configured on the BIG-IP virtual server and you must select the expected number of concurrent connections in the next question.

    a. **How many connections to you expect to each AD FS server?**
    
    Select whether you expect more or fewer than 64,000 concurrent connections to each server. This answer is used to determine what type of SNAT that system uses. A SNAT is an object that maps the source client IP address in a request to a translation address defined on the BIG-IP device. The system configures SNAT Auto Map (fewer than 64,000) or a SNAT pool (more than 64,000).

    • **Fewer than 64,000 concurrent connections**
      
      Select this option if you expect fewer than 64,000 concurrent connections per AD FS server. With this option, the system applies SNAT Auto Map, doesn’t require any additional IP addresses, as an existing self IP address is used for translation. Continue with the **SSL Encryption** section.

    • **More than 64,000 concurrent connections**
      
      Select this option if you have a very large deployment and expect more than 64,000 connections at one time. The iApp creates a SNAT Pool, for which you need one IP address for each 64,000 connections.
a. **Create a new SNAT pool or use an existing one?**
   If you have already created a SNAT pool on the BIG-IP system, you can select it from the list. Otherwise, the system creates a new SNAT pool with the addresses you specify.
   - **Create a new SNAT pool**
     Select this option (the default) to enable the system to create a new SNAT pool. You must specify the appropriate number of IP addresses in the next question.
     a. **Which IP addresses do you want to use for the SNAT pool?**
        Specify one otherwise unused IP address for every 64,000 concurrent connections you expect, or fraction thereof. Click **Add** for additional rows. Do not use any self IP addresses on the BIG-IP system.
        - **Select a SNAT pool**
          Select the SNAT pool you created for this deployment from the list.

   **Important** If you choose more than 64,000 connections, but do not specify enough SNAT pool address(es), after the maximum connection limit of 64,000 concurrent connections per server is reached, new requests fail.

**Access Policy Manager (BIG-IP APM)**

The section in this scenario asks about BIG-IP APM. You must have APM fully licensed and provisioned to use APM. If you are not deploying APM, continue with the next section. As mentioned in the prerequisites, if you are deploying APM, you must have configured the BIG-IP system for DNS and NTP. See Appendix B: Configuring DNS and NTP on the BIG-IP system on page 30 for instructions.

**Note:** This entire section does not appear if you selected to deploy the BIG-IP system for the AD FS Proxy server role. Continue with Advanced Firewall Manager (BIG-IP AFM) on page 11.

1. **Provide secure authentication with BIG-IP Access Policy Manager?**
   Specify whether you want to deploy BIG-IP APM to provide proxy authentication and secure remote access for Microsoft AD FS.
   - **No, do not provide secure authentication using BIG-IP APM**
     Select this option if you do not want to use the BIG-IP APM at this time. You can always reconfigure the iApp template at a later date should you decide to add BIG-IP APM functionality. Continue with Advanced Firewall Manager (BIG-IP AFM) on page 11.
   - **Yes, provide secure authentication using BIG-IP APM**
     Select this option if you want to use the BIG-IP APM to provide proxy authentication and secure remote access for AD FS.
     a. **Which Active Directory servers in your domain can this BIG-IP system contact?**
        Specify both the FQDN and IP address of each Active Directory server you want the BIG-IP APM to use for servicing authentication requests. Click Add to include additional servers.
     b. **Does your Active Directory domain allow anonymous binding?**
        Select whether anonymous binding is allowed in your Active Directory environment.
        - **Yes, anonymous binding is allowed**
          Select this option if anonymous binding is allowed. No further information is required.
        - **No, credentials are required for binding**
          If credentials are required for binding, you must specify an Active Directory user name and password for use in the AAA Server.
          a. **Which Active Directory user with administrative permissions do you want to use?**
             Type a user name with administrative permissions.
          b. **What is the password associated with that account?**
             Type the associated password.
     c. **Create a new monitor for the Active Directory servers?**
        Choose whether you want the template to create a new LDAP or ICMP monitor, or if you want to select an existing monitor you created for the AD servers. For more accurate monitoring, we recommend using an LDAP monitor.
• Select an existing monitor for the Active Directory pool
If you already created a health monitor (only monitors with a Type of LDAP or External can be used) for the Active Directory pool that will be created by the template, select it from the list. If you want to create a health monitor manually, but have not already done so, you must exit the template and create the object before it becomes available from the list.
The iApp allows you to select monitors that are a part of another iApp Application Service. If you select a monitor that is a part of another Application Service, be aware that any changes you make to the monitor in the other Application Service will apply to this Application Service as well.

• Use a simple ICMP monitor for the Active Directory pool
Select this option if you only want a simple ICMP monitor for the Active Directory pool. This monitor sends a ping to the servers and marks the server UP if the ping is successful.
Continue with the next section.

• Create a new LDAP monitor for the Active Directory pool
Select this option if you want the template to create a new LDAP monitor for the Active Directory pool. You must answer the following questions:

a. Which Active Directory user name should the monitor use?
Specify an Active Directory user name for the monitor to use when attempting to log on as a part of the health check. This should be a user account created specifically for this health monitor, and must be set to never expire.

b. What is the associated password?
Specify the password associated with the Active Directory user name.

c. What is the LDAP tree for this user account?
Specify the LDAP tree for the user account. As noted in the inline help, ADSI editor, an tool for Active Directory LDAP administration, is useful for determining the correct LDAP tree value. For example, if the user name is ‘user1’ which is in the organizational unit ‘F5 Users’ and is in the domain ‘f5.example.com’, the LDAP tree would be: ou=F5 Users, dc=f5, dc=example, dc=com.

d. Does your Active Directory domain require a secure protocol for communication?
Specify whether your Active Directory implementation requires SSL or TLS for communication, or does not require a secure protocol. This determines the port the health monitor uses.

• Yes, SSL communication is required
Select this option if your Active Directory domain requires SSL communication. The health check uses port 636 as the Alias Service Port.

• Yes, TLS communication is required
Select this option if your Active Directory domain requires TLS communication. The health check uses port 389 as the Alias Service Port.

e. How many seconds between Active Directory health checks?
Specify how many seconds the system should use as the health check Interval for the Active Directory servers. We recommend the default of 10 seconds.

f. Which port is used for Active Directory communication?
Specify the port being used by your Active Directory deployment. The default port displayed here is determined by your answer to the secure protocol question. When using the TLS security protocol, or no security, the default port 389. The default port used when using the SSL security protocol is 636.

g. What is the FQDN of your Active Directory domain for your AD FS users?
Specify the FQDN of the Active Directory deployment for your AD FS users. This is the FQDN for your domain, such as example.com, rather than the FQDN for any specific host.

Advanced Firewall Manager (BIG-IP AFM)
This section gathers information about BIG-IP Advanced Firewall Manager if you want to use it to protect the AD FS deployment. For information on configuring BIG-IP AFM, see http://support.f5.com/kb/en-us/products/big-ip-afm.html, and then select your version.

1. Do you want to use BIG-IP AFM to protect your application?
Choose whether you want to use BIG-IP AFM, F5’s network firewall, to secure this AD FS deployment. If you choose to use BIG-IP AFM, you can restrict access to the AD FS virtual server to a specific network or IP address. See the BIG-IP AFM documentation for specific details on configuring AFM.
No, do not use Application Firewall Manager
Select this option if you do not want to enable BIG-IP AFM at this time. You can always re-enter the template at a later date to enable BIG-IP AFM. Continue with SSL Encryption on page 13.

Select an existing AFM policy from the list
If you already created a BIG-IP AFM policy for this implementation, select it from the list. Continue with c.

Yes, use F5’s recommended AFM configuration
Select this option if you want to enable BIG-IP AFM using F5’s recommended configuration.

a. Do you want to restrict access to your application by network or IP address?
Choose whether you want to restrict access to the AD FS implementation via the BIG-IP virtual server.

• No, do not restrict source addresses (allow all sources)
By default, the iApp configures the AFM to accept traffic destined for the AD FS virtual server from all sources. If you do not have a need to restrict access to the virtual server, leave this option selected and then continue with b.

• Restrict source addresses
Select this option if you want to restrict access to the AD FS virtual server by IP address or network address.

  a. What IP or network addresses should be allowed to access your application?
Specify the IP address or network access that should be allowed access to the AD FS virtual server. You can specify a single IP address, a list of IP addresses separated by spaces (not commas or other punctuation), a range of IP addresses separated by a dash (for example 192.0.2.10-192.0.2.100), or a single network address, such as 192.0.2.200/24.

b. How do you want to control access to your application from sources with a low reputation score?
The BIG-IP AFM uses an IP intelligence database to categorize IP addresses coming into the system. Choose what you want the system to do for sources that are attempting to access the AD FS virtual server with a low reputation score. For more information, see the BIG-IP AFM documentation.

  Important You must have an active IP Intelligence license for this feature to function. See https://f5.com/products/modules/ip-intelligence-services for information.

  • Allow all sources regardless of reputation
Select this option to allow all sources, without taking into consideration the reputation score.

  • Reject access from sources with a low reputation
Select this option to reject access to the AD FS virtual server from any source with a low reputation score.

  • Allow but log access from sources with a low reputation
Select this option to allow access to the AD FS virtual server from sources with a low reputation score, but add an entry for it in the logs.

c. Would you like to stage a policy for testing purposes?
Choose whether you want to stage a firewall policy for testing purposes. A staged policy allows you to evaluate the effect a policy has on traffic by analyzing the system logs, without actually modifying traffic based on the firewall rules. You must already have a policy on the system in order to select it.

  • Do not apply a staging policy
Select this option if you do not want to apply a logging profile at this time. You can always re-enter the template at a later date to add a logging profile. Continue with the next question.

  • Select an existing policy from the list
If you have already created a firewall policy for this implementation, select it from the list. Only policies that already exist on the system appear in the list. To create a new policy, on the Main tab, click Security > Network Firewall > Policies. Specific instructions for creating a firewall policy is outside the scope of this iApp and deployment guide.

d. Which logging profile would you like to use?
Choose whether you or not you want to use a logging profile for this AFM implementation. You can configure the BIG-IP system to log detailed information about BIG-IP system Network Firewall events and store those logs on the BIG-IP system or a remote logging server (supports syslog and Splunk). If you want to use a logging profile, we recommend creating one outside this template. The list only contains profiles with Network Firewall enabled.
- **Do not apply a logging profile**
  Select this option if you do not want to apply a logging profile at this time. You can always re-enter the template at a later date to add a logging profile. Continue with the next question.

- **Select an existing logging profile from the list**
  If you have already created a logging profile for this implementation, select it from the list. You must create a profile before it is available in the list. To create a logging profile, on the Main tab, click **Security > Event Logs > Logging Profiles**. Specific instructions for creating a logging profile is outside the scope of this iApp and deployment guide. See the online help or the **About Local Logging with the Network Firewall** chapter of the *BIG-IP Network Firewall: Policies and Implementations* guide for more information.

### SSL Encryption

Before running the template you should have already imported a certificate and key onto the BIG-IP system. While the BIG-IP system does include a self-signed SSL certificate that can be used internally or for testing, we strongly recommend importing a certificate and key issued from a trusted Certificate Authority for processing client-side SSL.

For information on SSL certificates on the BIG-IP system, see the online help or the **Managing SSL Certificates for Local Traffic** chapter in the *Configuration Guide for BIG-IP Local Traffic Manager* available at [http://support.f5.com/kb/en-us.html](http://support.f5.com/kb/en-us.html).

1. **How should the BIG-IP system handle SSL traffic?**
   This question does not appear if you are using BIG-IP APM. If using APM, start this section with the "Which Client SSL Profile do you want to use?" question.

   Choose how you want the system to handle encrypted traffic from AD FS clients.

   - **Encrypted traffic is forwarded without decryption (SSL pass-through)**
     Select this method if you want the highest performance, or if your environment does not allow SSL decryption. In this case, the BIG-IP system sends encrypted traffic to the servers without unencrypting it.

     If you select this method, the system creates a Performance (Layer 4) virtual server. Continue with **High Availability on page 14**.

   - **Terminate SSL from clients, re-encrypt to servers (SSL Bridging)**
     Select this method if you want the BIG-IP system to terminate SSL to process it, and then re-encrypt the traffic to the servers (SSL Bridging). You need a valid SSL certificate and key for the client-side.

     a. **Which Client SSL profile do you want to use?**
        Choose whether you want the iApp to create a new Client SSL profile, or if you have already created a Client SSL profile which contains the appropriate SSL certificate and key.

        Unless you have requirements for configuring specific Client SSL settings, we recommend allowing the iApp to create a new profile. To select a profile from the list, it must already be present on the BIG-IP system. Creating a custom profile is not a part of this template; see **Local Traffic >> Profiles : SSL : Client** to create a Client SSL profile. To select any new profiles you create, you need to restart or reconfigure this template.

        - **Select an existing Client SSL profile**
          If you created a Client SSL profile for this implementation, select it from the list. If you select an existing Client SSL profile, the rest of the questions in this section disappear. Continue with the next section.

        - **Create a new Client SSL profile**
          Select this option for the iApp to create a new Client SSL profile

            a. **Which SSL certificate do you want to use?**
               Select the SSL certificate you imported for this implementation.

            b. **Which SSL private key do you want to use?**
               Select the associated SSL private key.

            c. **Which intermediate certificate do you want to use?**
               If your deployment requires an intermediate or chain certificate, select the appropriate certificate from the list. Intermediate certificates are intended to create a chain of trust between the CA that signed the certificate and the CA that is already trusted by the recipient of the certificate. This allows the recipient to verify the validity of the certificates presented, even when the signing CA is unknown.
d. **Which Server SSL profile do you want to use?**

Select whether you want the iApp to create the F5 recommended Server SSL profile, or if you want to choose a Server SSL profile you already created. In this scenario, the BIG-IP system is acting as an SSL client and by default, we assume the servers do not expect the BIG-IP system to present its client certificate on behalf of clients traversing the virtual server. If your servers expect the BIG-IP system to present a client certificate, you must create a custom Server SSL profile with the appropriate certificate and key.


### High Availability

This section gathers information about your AD FS deployment that is used in the BIG-IP virtual server and load balancing pool.

1. **What IP address do you want to use for the virtual server?**
   
   Type the IP address you want to use for the BIG-IP virtual server. This is the address clients use (or a DNS entry resolves to this address) to access the AD FS deployment via the BIG-IP system.

   If necessary for your configuration, this can be a network address to create a network virtual server (you must specify an IP mask in the following question for a network virtual server). A network virtual server is a virtual server whose IP address has no bits set in the host portion of the IP address (that is, the host portion of its IP address is 0), allowing the BIG-IP system to direct client connections that are destined for an entire range of IP addresses, rather than for a single destination IP address. Thus, when any client connection targets a destination IP address that is in the network specified by the virtual server IP address, the system can direct that connection the pool of AD FS servers.

2. **What port do you want to use for the virtual server?**
   
   Type the port number you want to use for the BIG-IP virtual server. For AD FS deployments, this is typically 80 (HTTP) or 443 (HTTPS). The default port in the box is based on your answer to the How should the system handle SSL traffic question.

3. **Which FQDNs will clients use to access the AD FS?**
   
   Type each fully qualified domain name clients will use to access the AD FS deployment. Click the **Add** button to insert additional rows. If you only have one FQDN, do not click Add.

   If you are also deploying the BIG-IP system for AD FS Apps in AD FS 2013, or if you have Office Web Apps accessed through the AD FS virtual server, you must also add those FQDN(s).

4. **Which HTTP profile do you want to use?**
   
   The HTTP profile contains settings for instructing the BIG-IP system how to handle HTTP traffic. Choose whether you want the iApp to create a new HTTP profile or if you have previously created an HTTP profile for this deployment.

   Unless you have requirements for configuring specific HTTP settings, we recommend allowing the iApp to create a new profile. To select a profile from the list, it must already be present on the BIG-IP system. Creating a custom profile is not a part of this template; see Local Traffic >> Profiles : Services : HTTP to create a HTTP profile. To select any new profiles you create, you need to restart or reconfigure this template.

   - **Select an existing HTTP profile from the list**
     
     If you already created an HTTP profile for this implementation, select it from the list.

   - **Create a new HTTP profile (recommended)**
     
     Select this option for the iApp to create a new HTTP profile.

     a. **Should the BIG-IP system insert the X-Forwarded-For header?**
        
        Select whether you want the BIG-IP system to insert the X-Forwarded-For header in the HTTP header for logging purposes.

        - **Insert the X-Forwarded-For header**
          
          Select this option if you want the system to include the X-Forwarded-For header. You may have to perform additional configuration on your AD FS servers to log the value of this header. For more information on configuring logging see Appendix C: Using X-Forwarded-For to log the client IP address in IIS 7.0, 7.5, and 8 (optional) on page 31.

        - **Do not insert the X-Forwarded-For header**
          
          Select this option if you do not want the system to include X-Forwarded-For in the HTTP header.
5. **Do you want to create a new pool or use an existing one?**

A load balancing pool is a logical set of servers, grouped together to receive and process traffic. When clients attempt to access the application via the BIG-IP virtual server, the BIG-IP system distributes requests to any of the servers that are members of that pool.

- **Select an existing pool**
  
  If you have already created a pool for your AD FS servers, you can select it from the list.
  
  If you do select an existing pool, all of the rest of the questions in this section disappear.

- **Create a new pool**
  
  Leave this default option to create a new load balancing pool and configure specific options.

  a. **Which load balancing method do you want to use?** [Advanced]
     
     Specify the load balancing method you want to use for this AD FS server pool. We recommend the default, **Least Connections (member)**.

  b. **Should the BIG-IP system queue TCP requests?**
     
     Select whether you want the BIG-IP system to queue TCP requests. TCP request queuing provides the ability to queue connection requests that exceed the capacity of connections for a pool, as determined by the connection limit. Consequently, instead of dropping connection requests that exceed the capacity of a pool, TCP request queuing enables those connection requests to reside within a queue according to defined conditions until capacity becomes available. For more information on TCP Request Queuing, see the Preventing TCP Connection Requests From Being Dropped chapter in the BIG-IP Local Traffic Manager: Implementations guide, available on AskF5.

     i. **Important** TCP Request Queuing is an advanced feature and should be used only if you understand how it will affect your deployment, including application behavior and BIG-IP performance. If you enable TCP Request Queuing, you must have a Connection Limit set on at least one of the nodes when configuring the Address/Port for the nodes.

     - **No, do not enable TCP request queuing (recommended)**
       
       Select this option if you do not want the BIG-IP system to queue TCP requests.

     - **Yes, enable TCP request queuing**
       
       Select this option if you want to enable TCP request queuing on the BIG-IP system.

       a. **What is the maximum number of TCP requests for the queue?**
          
          Type the maximum number of requests you want to queue. We do not recommend using 0, which means unlimited and is only constrained by available memory.

       b. **How many milliseconds should requests remain in the queue?**
          
          Type a number of milliseconds for the TCP request timeout value.

  c. **Use a Slow Ramp time for newly added servers?** [Advanced]
     
     With Slow Ramp, the BIG-IP system gradually adds connections to a newly-enabled or newly-added AD FS server over a time period you specify, rather than sending a full proportion of the traffic immediately. Slow Ramp is essential when using the Least Connections load balancing method (our recommended method for AD FS servers), as the BIG-IP system would otherwise send all new connections to a new server immediately, potentially overwhelming that server.

     Select whether you want to use a Slow Ramp time.

     - **Use Slow Ramp**
       
       Select this option for the system to implement Slow Ramp time for this pool.

       a. **How many seconds should Slow Ramp time last?**
          
          Specify a duration in seconds, for Slow Ramp. The time period you select for Slow Ramp is highly dependent on the speed of your server hardware and the behavior of your web services. The default setting of 300 seconds (5 minutes) is very conservative in most cases.

     - **Do not use Slow Ramp**
       
       Select this option if you do not want to use Slow Ramp. If you select this option, we recommend you do not use the Least Connections load balancing method.

  d. **Do you want to give priority to specific groups of servers?** [Advanced]
     
     Select whether you want to use Priority Group Activation. Priority Group Activation allows you to segment your servers into priority groups. With Priority Group Activation, the BIG-IP system load balances traffic according to the priority number you assign to the pool members. A higher number indicates higher priority. Traffic is only sent to the servers with the highest priority.
priority, unless the number of available servers in that priority group falls below the value you specify as the minimum. The BIG-IP then sends traffic to the group of servers with the next highest priority, and so on. See the BIG-IP documentation for more details.

- **Do not use Priority Group Activation (recommended)**
  Select this option if you do not want to enable Priority Group Activation.

- **Use Priority Group Activation**
  Select this option if you want to enable Priority Group Activation.
  You must add a priority to each server in the Priority box described in #c.
  
  a. **What is the minimum number of active members for each priority group?**
  Specify the minimum number of servers that must be active to continue sending traffic to the priority group. If the number of active servers falls below this minimum, traffic will be sent to the group of servers with the next highest priority group number.

  e. **Which servers should be included in this pool?**
  Specify the IP address(es) of your AD FS servers. If you have existing nodes on this BIG-IP system, you can select them from the list, otherwise type the addresses. You can optionally add a Connection Limit. If you enabled Priority Group Activation, you must also specify a Priority for each device. Click Add to include additional servers.

**Application Health**

In this section, you answer questions about how you want to implement application health monitoring on the BIG-IP system.

1. **Create a new health monitor or use an existing one?**
   Application health monitors are used to verify the content that is returned by an HTTP request. The system uses these monitors to ensure traffic is only sent to available AD FS servers.

   Unless you have requirements for configuring other options not in the following list of questions, we recommend allowing the iApp to create a new monitor. Creating a custom health monitor is not a part of this template; see Local Traffic >> Monitors. To select any new monitors you create, you need to restart or reconfigure this template.

   - **Select the monitor you created from the list**
     If you manually created the health monitor, select it from the list.
     Continue with iRules on page 17.

   - **Create a new health monitor**
     If you want the iApp to create a new monitor, continue with the following.

     a. **How many seconds should pass between health checks?**
        Specify how long the system should wait between each health check. This is used as the Interval setting for the monitor. We recommend the default of 30 seconds.

     b. **What HTTP URI should be sent to the servers?**
        The HTTP URI is used to specify the resource on the AD FS server for a given request. This parameter can be customized to request a specific federation endpoint. The default is /adfs/fs/federationserverservice.asmx.

     c. **What is the expected response to the HTTP request?**
        Specify the response you expect returned from the request. The system checks the response from the server against the response you enter here to determine server health.

     d. **Should the health monitor require credentials?**
        Choose whether you want the system to attempt to authenticate to the AD FS servers as a part of the health check.

        - **No, allow anonymous access**
          Select this option if you do not want the monitor to attempt authentication.

        - **Yes, require credentials for Basic authentication**
          Select this option if you want to attempt Basic authentication as a part of the health monitor. To require credentials, you should have a user account specifically for this health monitor which has no other privileges, and has a password set to never expire.

          a. **What user name should the monitor use?**
             Type the domain and user name for the account you created for the health monitor. You must include the domain in front of the user, such as EXAMPLE:USER.
b. **What is the associated password?**
   Type the password for the account.

- **Yes, require credentials for NTLM authentication**
  Select this option if you want to attempt NTLM authentication as a part of the health monitor. To require credentials, you should have a user account specifically for this health monitor which has no other privileges, and has a password set to never expire.

a. **What user name should the monitor use?**
   Type the user name for the account you created for the health monitor.

   ▶️ **Warning**  Do not include DOMAIN\ for the NTLM monitor user name.

b. **What is the associated password?**
   Type the password for the account.

### Client Optimization

This section gathers information on the type of client optimization you want the system to perform.

1. **How do you want to optimize client-side connections?**  Advanced
   The client-side TCP profile optimizes the communication between the BIG-IP system and the client by controlling the behavior of the traffic which results in higher transfer rates, improved connection reliability and increased bandwidth efficiency.

   Unless you have requirements for configuring specific TCP optimization settings, we recommend allowing the iApp to create a new profile. Creating a custom profile is not a part of this template; see [Local Traffic >> Profiles : Protocol : TCP](#) to create a TCP profile. To select any new profiles you create, you need to restart or reconfigure this template.

   - **Create the appropriate tcp-optimized profile (recommended)**
     Select this option to have the system create the recommended TCP profile. The parent profile (either WAN or LAN optimized) is determined by your selection to the “What type of network connects clients to the BIG-IP system” question.

   - **Select the TCP profile you created from the list**
     If you created a custom TCP profile for the AD FS servers, select it from the list.

### Server Optimization

This section gathers information on the type of server optimization you want the system to perform.

1. **How do you want to optimize server-side connections?**  Advanced
   The server-side TCP profile optimizes the communication between the BIG-IP system and the server by controlling the behavior of the traffic which results in higher transfer rates, improved connection reliability and increased bandwidth efficiency.

   Unless you have requirements for configuring specific TCP optimization settings, we recommend allowing the iApp to create a new profile. Creating a custom profile is not a part of this template; see [Local Traffic >> Profiles : Protocol : TCP](#) to create a TCP profile. To select any new profiles you create, you need to restart or reconfigure this template.

   - **Create the appropriate tcp-optimized profile (recommended)**
     Select this option to have the system create the recommended TCP profile. The parent profile (either WAN or LAN optimized) is determined by your selection to the “What type of network connects servers to the BIG-IP system” question.

   - **Select the TCP profile you created from the list**
     If you created a custom TCP profile for the AD FS servers, select it from the list.

### iRules

In this section, you can add custom iRules to the AD FS deployment. This section is available only if you selected Advanced mode. iRules are a scripting language that allows an administrator to instruct the system to intercept, inspect, transform, direct and track inbound or outbound application traffic. An iRule contains the set of instructions the system uses to process data flowing through it, either in the header or payload of a packet.
1. **Do you want to add any custom iRules to the AD FS virtual server?** Advanced
   Select if have preexisting iRules you want to add to your AD FS implementation.

   **Warning** While iRules can provide additional functionality not present in the iApp, improper use or misconfiguration of an iRule can result in unwanted application behavior and poor performance of your BIG-IP system. We recommended you verify the impact of an iRule prior to deployment in a production environment.

   If you do not want to add any iRules to the configuration, continue with the following section.

   If you have iRules you want to attach to the virtual server the iApp creates for your AD FS servers, from the Options box, click the name of the applicable iRule(s) and then click the Add (<<) button to move them to the Selected box.

**Finished**

Review the answers to your questions. When you are satisfied, click the Finished button. The BIG-IP system creates the relevant objects for the AD FS application.
Next steps

After completing the iApp Template, the BIG-IP Application Services page opens for the Microsoft AD FS service you just created. To see the list of all the configuration objects created to support the AD FS application, on the Menu bar, click Components. The complete list of all related objects opens. You can click individual objects to see the settings.

Once the objects have been created, you are ready to use the new deployment.

Modifying DNS settings to use the BIG-IP virtual server address

Before sending traffic to the BIG-IP system, your DNS administrator may need to modify any DNS entries for the AD FS implementation to point to the BIG-IP system’s virtual server address.

Modifying the iApp configuration

The iApp Application Service you just created can be quickly and easily modified if you find it necessary to make changes to the configuration. The Strict Updates feature of the iApp prevents users from manually modifying the iApp configuration (Strict Updates can be turned off, but use extreme caution). iApp allows you to re-enter the template, make changes, and then update the template. The modifications are automatically made to any of the associated objects.

To modify the configuration
1. On the Main tab, expand iApp and then click Application Services.
2. Click the name of your AD FS Application Service from the list.
3. On the Menu bar, click Reconfigure.
4. Make the necessary modifications to the template.
5. Click the Finished button.

Viewing statistics

You can easily view a number of different statistics on the BIG-IP system related to the configuration objects created by the iApp template. You can get statistics specific to the Application Service if you have provisioned AVR. Otherwise, you can always get object-level statistics.

AVR statistics

If you have provisioned AVR, you can get application-level statistics for your AD FS Application Service.

To view AVR statistics
1. On the Main tab, expand iApp and then click Application Services.
2. From the Application Service List, click the AD FS service you just created.
3. On the Menu bar, click Analytics.
4. Use the tabs and the Menu bar to view different statistics for your iApp.

Object-level statistics

If you haven’t provisioned AVR, or want to view object-level statistics, use the following procedure.

To view object-level statistics
1. On the Main tab, expand Overview, and then click Statistics.
2. From the Statistics Type menu, you can select Virtual Servers to see statistics related to the virtual servers.
3. You can also choose Pools or Nodes to get a closer look at the traffic.
4. To see Networking statistics in a graphical format, click Dashboard.

For more information on viewing statistics on the BIG-IP system, see the online help or product documentation.
Appendix A: Manual Configuration tables

The following tables contain a list of BIG-IP configuration objects along with any non-default settings you should configure as a part of this deployment scenario. Unless otherwise specified, settings not mentioned in the tables can be configured as applicable for your configuration. For specific instructions on configuring individual objects, see the online help or product manuals.

Configuring the BIG-IP LTM for load balancing AD FS or AD FS proxy servers: SSL Bridging

Use this table if you are configuring the system for SSL Bridging (you must configure bridging if using APM). If using SSL Pass-through, see Configuring the BIG-IP LTM for load balancing AD FS or AD FS proxy servers: SSL Pass-through on page 22.

### Health Monitors (Main tab > Local Traffic > Monitors)

If using AD FS 2.0, choose one of the first two monitors. If using AD FS 3.0, you must use the External monitor.

#### AD FS 2.0: Monitor if load balancing AD FS servers

<table>
<thead>
<tr>
<th>Name</th>
<th>Type a unique name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>HTTPS</td>
</tr>
<tr>
<td>Interval</td>
<td>30 (recommended)</td>
</tr>
<tr>
<td>Timeout</td>
<td>91 (recommended)</td>
</tr>
</tbody>
</table>
| Send String¹ | GET/adfs/fs/federationserverservice.asmx HTTP/1.1
Host: sts1.example.com
Connection: Close |
| Receive String | 200 OK |

#### AD FS 2.0: Monitor if load balancing AD FS Proxy servers

<table>
<thead>
<tr>
<th>Name</th>
<th>Type a unique name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>HTTPS</td>
</tr>
<tr>
<td>Interval</td>
<td>30 (recommended)</td>
</tr>
<tr>
<td>Timeout</td>
<td>91 (recommended)</td>
</tr>
</tbody>
</table>
| Send String | GET /
(the default) |

#### AD FS 3.0: External Monitor

<table>
<thead>
<tr>
<th>Name</th>
<th>Type a unique name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>External</td>
</tr>
<tr>
<td>Interval</td>
<td>30 (recommended)</td>
</tr>
<tr>
<td>External Program</td>
<td>See Importing the script file for AD FS 3.0 health monitor on page 21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variables</th>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOST</td>
<td>Type the FQDN clients will use to access the AD FS deployment, such as sts.example.com.</td>
<td></td>
</tr>
<tr>
<td>URI</td>
<td>Type the URI of the resource you want to monitor, such as /adfs/fs/federationsserverservice.asmx.</td>
<td></td>
</tr>
<tr>
<td>RECV</td>
<td>Type the expected response, such as 200 OK.</td>
<td></td>
</tr>
</tbody>
</table>

### Pools (Main tab > Local Traffic > Pools)

<table>
<thead>
<tr>
<th>Name</th>
<th>Type a unique name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Monitor</td>
<td>Select the monitor you created above</td>
</tr>
<tr>
<td>Load Balancing Method</td>
<td>Least Connections (Member)</td>
</tr>
<tr>
<td>Address</td>
<td>Type the IP Address of an AD FS server or AD FS Proxy Server</td>
</tr>
<tr>
<td>Service Port</td>
<td>443 Click Add to repeat Address and Port for all nodes</td>
</tr>
</tbody>
</table>

### Profiles (Main tab > Local Traffic > Profiles)

#### HTTP (Profiles > Services)

<table>
<thead>
<tr>
<th>Name</th>
<th>Type a unique name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Profile</td>
<td>http</td>
</tr>
</tbody>
</table>

#### TCP WAN (Profiles > Protocol)

<table>
<thead>
<tr>
<th>Name</th>
<th>Type a unique name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Profile</td>
<td>tcp-wan-optimized</td>
</tr>
</tbody>
</table>

#### TCP LAN (Profiles > Protocol)

<table>
<thead>
<tr>
<th>Name</th>
<th>Type a unique name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Profile</td>
<td>tcp-lan-optimized</td>
</tr>
</tbody>
</table>

#### Persistence (Profiles > Protocol)

<table>
<thead>
<tr>
<th>Name</th>
<th>Type a unique name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistence Type</td>
<td>Source Address Affinity</td>
</tr>
</tbody>
</table>

#### Client SSL (Profiles > SSL)

<table>
<thead>
<tr>
<th>Name</th>
<th>Type a unique name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Profile</td>
<td>clientssl</td>
</tr>
<tr>
<td>Certificate and Key</td>
<td>Select the Certificate and Key you imported from the associated list</td>
</tr>
</tbody>
</table>

¹ Replace red text with your FQDN
Profiles continued

<table>
<thead>
<tr>
<th>Profiles continued</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Server SSL</strong> (Profiles &gt; Other)</td>
</tr>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Parent Profile</td>
</tr>
<tr>
<td>Server Name &lt;only 3.0&gt;</td>
</tr>
</tbody>
</table>

Virtual Servers (Main tab > Local Traffic > Virtual Servers)

| Name | Type a unique name. |
| Type | Standard |
| Destination Address | Type the IP address for this virtual server |
| Service Port | 443 |
| VLAN and Tunnel Traffic | If applicable, select specific VLANs and Tunnels on which to allow or deny traffic. |
| Protocol Profile (client) | Select the WAN optimized TCP profile you created |
| Protocol Profile (server) | Select the LAN optimized TCP profile you created |
| HTTP Profile | Select the HTTP profile you created |
| SSL Profile (Client) | Select the Client SSL profile you created |
| SSL Profile (Server) | If you created a Server SSL profile, select it from the list |
| Source Address Translation | Auto Map² |
| Default Pool | Select the pool you created |
| Default Persistence Profile | Select the persistence profile you created |

² In version 11.0-11.2.x, this field is SNAT Pool. If you want to use SNAT, and you have a large deployment expecting more than 64,000 simultaneous connections, you must configure a SNAT Pool with an IP address for each 64,000 simultaneous connections you expect. See the BIG-IP documentation specific information.

Note: Your DNS A record for the AD FS endpoint must reference the AD FS or AD FS Proxy BIG-IP virtual server. If you are deploying the BIG-IP system in front of both AD FS and AD FS Proxy servers, you must use a host file entry on the AD FS Proxy servers that resolves the AD FS endpoint FQDN to the IP address of the AD FS BIG-IP virtual server.

Importing the script file for AD FS 3.0 health monitor

Before you can create the advanced monitors you must download and import the applicable monitor file onto the BIG-IP system.

Note: If you are using a redundant BIG-IP system, you need to make sure any modifications to the script EAVs are manually copied between BIG-IP LTMs, and given the required permissions when configuration is synchronized.

To download and install the script

2. Extract the appropriate file(s) to a location accessible by the BIG-IP system.
3. From the Main tab of the BIG-IP Configuration utility, expand System, and then click File Management.
5. Click the Import button.
6. In the File Name row, click Browse, and then locate the appropriate file.
7. In the Name box, type a name for the file related to the script you are using.
8. Click the Import button.

Now when you create the advanced monitors, you can select the name of the file you imported from the External Program list.
Configuring the BIG-IP LTM for load balancing AD FS or AD FS proxy servers: SSL Pass-through

Use this table if you are configuring the system for SSL Bridging (you must configure bridging if using APM).

<table>
<thead>
<tr>
<th>Health Monitors (Main tab &gt; Local Traffic &gt; Monitors)</th>
</tr>
</thead>
<tbody>
<tr>
<td>If using AD FS 2.0, choose one of the first two monitors. If using AD FS 3.0, you must use the External monitor.</td>
</tr>
</tbody>
</table>

**AD FS 2.0: Monitor if load balancing AD FS servers**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type a unique name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>HTTPS</td>
</tr>
<tr>
<td>Interval</td>
<td>30 (recommended)</td>
</tr>
<tr>
<td>Timeout</td>
<td>91 (recommended)</td>
</tr>
</tbody>
</table>

**Send String**

GET /adfs/fs/federationserverservice.asmx HTTP/1.1
Host: sts1.example.com
Connection: Close

**Receive String**

200 OK

**AD FS 2.0: Monitor if load balancing AD FS Proxy servers**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type a unique name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>HTTPS</td>
</tr>
<tr>
<td>Interval</td>
<td>30 (recommended)</td>
</tr>
<tr>
<td>Timeout</td>
<td>91 (recommended)</td>
</tr>
</tbody>
</table>

**Send String**

GET / (the default)

**AD FS 3.0: External Monitor**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type a unique name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>External</td>
</tr>
<tr>
<td>Interval</td>
<td>30 (recommended)</td>
</tr>
</tbody>
</table>

**External Program**

See Importing the script file for AD FS 3.0 health monitor on page 21

**Variables**

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOST</td>
<td>Type the FQDN clients will use to access the AD FS deployment, such as sts.example.com.</td>
</tr>
<tr>
<td>URI</td>
<td>Type the URI of the resource you want to monitor, such as /adfs/fs/federationserverservice.asmx.</td>
</tr>
<tr>
<td>RECV</td>
<td>Type the expected response, such as 200 OK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pools (Main tab &gt; Local Traffic &gt; Pools)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Health Monitor</td>
</tr>
<tr>
<td>Load Balancing Method</td>
</tr>
<tr>
<td>Address</td>
</tr>
<tr>
<td>Service Port</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Profiles (Main tab &gt; Local Traffic &gt; Profiles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast L4 (Profiles &gt; Services)</td>
</tr>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Parent Profile</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Persistence (Profiles &gt; Protocol)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Persistence Type</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Virtual Servers (Main tab &gt; Local Traffic &gt; Virtual Servers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Destination Address</td>
</tr>
<tr>
<td>Service Port</td>
</tr>
<tr>
<td>VLAN and Tunnel Traffic</td>
</tr>
<tr>
<td>Protocol Profile (client)</td>
</tr>
<tr>
<td>Source Address Translation</td>
</tr>
<tr>
<td>Default Pool</td>
</tr>
</tbody>
</table>

---

1. Replace red text with your FQDN
2. In version 11.0-11.2.x, this field is SNAT Pool. If you want to use SNAT, and you have a large deployment expecting more than 64,000 simultaneous connections, you must configure a SNAT Pool with an IP address for each 64,000 simultaneous connections you expect. See the BIG-IP documentation specific information.
Manually configuring the BIG-IP Access Policy Manager for AD FS

In this section, we provide guidance on configuring the BIG-IP Access Policy Manager (APM) to help protect your Microsoft AD FS deployment without the need for AD FS proxy servers. This part of the configuration is in addition to the BIG-IP LTM configuration described previously. If you have not yet configured the BIG-IP LTM, we recommend you return to Configuring the iApp template for Microsoft AD FS on page 6 and configure the LTM first.

Use the following table to manually configure the BIG-IP APM. This table contains a list of BIG-IP configuration objects along with any non-default settings you should configure as part of this deployment. Unless otherwise specified, settings not mentioned in the table can be configured as applicable for your configuration. For instructions on configuring individual objects, see the online help.

**Important** As stated in the prerequisites, when deploying APM in front of AD FS, the Intranet Global Primary Authentication Policy should be set to Windows Authentication.

<table>
<thead>
<tr>
<th><strong>DNS and NTP</strong></th>
<th><strong>See Appendix B: Configuring DNS and NTP on the BIG-IP system on page 30 for instructions.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AAA Server</strong></td>
<td><strong>Main tab---&gt;Access Policy--&gt;AAAA Servers</strong></td>
</tr>
<tr>
<td>Name</td>
<td>Type a unique name</td>
</tr>
<tr>
<td>Type</td>
<td>Active Directory</td>
</tr>
<tr>
<td>Domain Name</td>
<td>Type the FQDN of Active Directory domain where users will authenticate (i.e. <em>example.com</em>)</td>
</tr>
<tr>
<td>Server Connection</td>
<td>Use Pool</td>
</tr>
<tr>
<td>Domain Controller Pool Name</td>
<td>Type a name for this pool of Active Directory servers</td>
</tr>
<tr>
<td>Domain Controllers</td>
<td>Type the IP address and the FQDN for each Domain Controller you want to add and then click Add.</td>
</tr>
<tr>
<td>Server Pool Monitor</td>
<td>gateway_icmp (or a custom monitor if you created one).</td>
</tr>
<tr>
<td>Admin Name/Password</td>
<td>If required, type the Admin name and Password</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SSO Configuration</strong></th>
<th><strong>Main tab &gt; Access Policy &gt; SSO Configuration</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Type a unique name</td>
</tr>
<tr>
<td>SSO Method</td>
<td>NTLMV1</td>
</tr>
<tr>
<td>Username Conversion</td>
<td>Enable</td>
</tr>
<tr>
<td>NTLM Domain</td>
<td>Type the NTLM Domain name</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>iRules</strong></th>
<th><strong>Main tab &gt; Local Traffic &gt; iRules</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Type a unique name</td>
</tr>
<tr>
<td>Definition</td>
<td>Use the Definition in Optional iRule to disable APM for MS Federation Gateway on page 24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Connectivity Profile</strong></th>
<th><strong>Main tab &gt; Access Policy &gt; Secure Connectivity</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Type a unique name</td>
</tr>
<tr>
<td>Parent Profile</td>
<td>connectivity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Access Profile</strong></th>
<th><strong>Access Policy--&gt;Access Profiles</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Type a unique name</td>
</tr>
<tr>
<td>Profile Type</td>
<td>LTM-APM (BIG-IP v11.5 and later only)</td>
</tr>
<tr>
<td>Inactivity Timeout</td>
<td>We recommend a short time period here, such as 10 seconds.</td>
</tr>
<tr>
<td>Domain Cookie</td>
<td>If deploying for AD FS only, we recommend leaving this field blank. If you are applying this profile to multiple virtual servers, type the parent domain.</td>
</tr>
<tr>
<td>Primary Authentication URI</td>
<td><em>(Optional): for Multiple Domains mode only. See the Access Profile help or documentation for information)</em> \ Type the URL of the AD FS service, such as <a href="https://sts1.example.com">https://sts1.example.com</a>. Include additional domains if necessary.</td>
</tr>
<tr>
<td>SSO Configuration</td>
<td>Select the SSO configuration you created.</td>
</tr>
<tr>
<td>Languages</td>
<td>Move the appropriate language(s) to the Accepted box.</td>
</tr>
</tbody>
</table>

**Edit the Access Policy**

Edit the Access Profile you just created using the Visual Policy Editor. Continue now with Editing the Access Policy.

<table>
<thead>
<tr>
<th><strong>Virtual Servers</strong></th>
<th><strong>Main tab &gt; Local Traffic &gt; Virtual Servers</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Open the BIG-IP LTM virtual server you created by clicking Local Traffic &gt; Virtual Servers &gt; name you gave the LTM virtual server. After editing the Access Policy, add the following BIG-IP APM objects you just created.</td>
</tr>
<tr>
<td>Access Profile</td>
<td>Select the Access profile you created</td>
</tr>
<tr>
<td>Connectivity Profile</td>
<td>Select the Connectivity profile you created</td>
</tr>
<tr>
<td>iRules</td>
<td>If you created the iRule to disable APM for MS Federation Gateway, select the iRule and Enable it.</td>
</tr>
</tbody>
</table>
Editing the Access Policy

In the following procedure, we show you how to edit the Access Policy on the APM using the Visual Policy Editor (VPE). The VPE is a powerful visual scripting language that offers virtually unlimited options in configuring an Access Policy. The Policy shown in the following procedure is just an example, you can use this Access Policy or create one of your own.

To edit the Access Policy

1. On the Main tab, expand Access Policy, and then click Access Profiles.
2. Locate the Access Profile you created, and then, in the Access Policy column, click Edit. The VPE opens in a new window.
3. Click the + symbol between Start and Deny. A box opens with options for different actions.
4. Click the Logon Page option button, and then click the Add Item button.
5. Configure the Properties as applicable for your configuration. In our example, we leave the settings at the defaults. Click Save.
6. Click the + symbol on between Logon Page and Deny.
7. Click the AD Auth option button, and then click the Add Item button.
   a. From the Server list, select the AAA server you configured in the table above.
   b. All other settings are optional.
   c. Click Save. You now see a Successful and Fallback path from AD Auth.
8. On the Successful path between AD Auth and Deny, click the + symbol.
9. Click the SSO Credential Mapping option button, and then click the Add Item button.
10. Click the Save button.
11. Click the Deny link in the box to the right of SSO Credential Mapping.
12. Click Allow and then click Save. Your Access policy should look like the example below.
13. Click the yellow Apply Access Policy link in the upper left part of the window. You have to apply an access policy before it takes effect.
14. The VPE should look similar to the following example. Click the Close button on the upper right to close the VPE.

Figure 4: Logical configuration diagram: Using BIG-IP APM

Optional iRule to disable APM for MS Federation Gateway

For clients that use the Active WS-Trust protocol, an iRule is required to disable BIG-IP APM for requests to the MS Federation Gateway. Attach the following iRule to the previously created APM-enabled BIG-IP virtual server to proxy passive protocol requests from browser-based clients, and bypass the BIG-IP APM for requests from clients such as Outlook and Lync.

To create the iRule, go to Local Traffic > iRules and then click Create. Use the following code in the Definition section.
when HTTP_REQUEST {
    # For external Lync client access all external requests to the
    # /trust/mex URL must be routed to /trust/proxymex. Analyze and modify the URI
    # where appropriate
    HTTP::uri [string map {/trust/mex /trust/proxymex} [HTTP::uri]]
    # Analyze the HTTP request and disable access policy enforcement WS-Trust calls
    if {[HTTP::uri] contains "/adfs/services/trust"} {
        ACCESS::disable
    }
    # OPTIONAL ---- To allow publishing of the federation service metadata
    if {[HTTP::uri] ends_with "FederationMetadata/2007-06/FederationMetadata.xml"} {
        ACCESS::disable
    }
}
Manually configuring the BIG-IP Advanced Firewall Module to secure your AD FS deployment

This section describes how to manually configure BIG-IP AFM, F5’s Network Firewall module, to secure your AD FS deployment. BIG-IP AFM is particularly useful if you want to only allow access from specific clients or networks. Because this configuration can be complex, we recommend using the iApp template in version 11.6 and later to configure BIG-IP AFM.

Network Firewall settings

When configuring the BIG-IP Advanced Firewall Manager, you may want to configure your BIG-IP system to drop all traffic that you have not specifically allowed with firewall rules. This is known as firewall mode. By default, your BIG-IP system is set to default-accept, or ADC mode. Instructions for configuring your BIG-IP system, and the implications to consider, can be found on AskF5. For example, for BIG-IP v11.5: http://support.f5.com/kb/en-us/products/big-ip-afm/manuals/product/network-firewall-policies-implmentations-11-5-0-1.html.

If you have licensed IP Intelligence on the BIG-IP system, you can prohibit connections from sources with low reputation scores.

The following instructions cover a basic firewall configuration that is effective for the most common scenario of wanting to allow connections from a single trusted network. If you have complex requirements, such as the need to schedule different policies for different times of the day, or you want to create complicated rule or address lists, consult the BIG-IP AFM documentation. The basic steps for Policy and Rule creation apply to all scenarios.

To configure the BIG-IP AFM to allow connections from a single trusted network

1. Create a Network Firewall Policy:
   a. From the Configuration utility, click Security > Network Firewall > Policies, and then click Create.
   b. In the Name field, type a unique name for the policy, such as AD-FS-Policy.
   c. Click Finished.

2. Create a rule to allow authorized hosts or networks to connect:
   a. Click Security > Network Firewall > Policies.
   b. Click the name of the policy you just created.
   c. In the Rule section (below the General Properties section), click the Add button.
   d. Leave the Type list set to Rule.
   e. From the Order list, select First. The Order list only appears in version 11.5 and later. In 11.4.x, you must reorder the rules from the Policy General Properties page.
   f. In the Name field, type a unique name, for instance AD-FS-traffic-Allowed.
   g. Ensure the State list is set to Enabled.
   h. From the Protocol list, select TCP. Leave the box to the right of TCP set to 6.
   i. In the Source section, from the Address/Region list, select Specify.
      You are now able to list the trusted source addresses for your connection. In the following example, we will configure a single subnet as trusted.
      • Select Address.
      • In the box, type the network address you want to allow, including netmask if more than a single host. Specify a network using CIDR notation, such as 10.0.0.0/24.
      • Do not configure a source port.
      • Optional: If you want to limit inbound connections to a specific VLAN or Tunnel, from the VLAN / Tunnel list, select Specify, and then move the VLANs or tunnels that are allowed access to the Selected box.
      • Click Add.
      • Repeat these steps for additional hosts or networks. Use Address List or Address Range when appropriate.
   j. In the Destination section, leave the Address/Region and Port set to Any. Because you will be applying your policy to a virtual server that listens only on a single desired address and port, do not specify that information here.
k. If necessary, from the **Action** list, select **Accept**.
l. **Optional:** If you have configured a logging profile and want to log connections, from the **Logging** list, select **Enabled**. Typically, allowed connections do not need to be logged.
m. Click **Finished**.

3. **Creating a firewall rule to block all other traffic**
The next task is to create a firewall rule to block all other traffic that you have not allowed. Although this is not a required step if your BIG-IP system is set to default deny (**Firewall mode**), it is required in default-accept (**ADC mode**), and is a good practice to always configure such a rule.

a. Click **Security > Network Firewall > Policies**.
b. Click the name of the policy you created in step 1.
c. In the Rule section (below the General Properties section), click the **Add** button.
d. Leave the **Type** list set to **Rule**.
e. Leave the **Order** list, select **Last**.
f. In the **Name** field, type a unique name, for example **AD-FS-traffic-Prohibited**.
g. Ensure the **State** list is set to **Enabled**.
h. From the **Protocol** list, select **TCP**. Leave the box to the right of TCP set to **6**.
i. In the **Source** section, leave all the lists set to **Any**
j. From the **Action** list, select either **Drop** (to silently discard incoming connections) or **Reject** (to send a Destination Unreachable message to the sender).
k. If you configured a logging profile as described in **Optional: Configuring the BIG-IP system to log network firewall events on page 28**, from the **Logging** list, select **Enabled**.
l. Click **Finished**. You return to the Policy Properties page.
m. On the Policy Properties page, in the Rules section, ensure the rule with the Action of Accept comes before the Drop or Reject rule you just created. If it does not, use the **Reorder** button and drag the rules into the correct order.

4. **Apply Your Firewall Policy to your Virtual Server**

a. Click **Security > Network Firewall > Active Rules**.
b. In the Rule section (below the General Properties section), click the **Add** button.
c. From the **Context** list, select **Virtual Server**, and then select the virtual server you created for your AD FS traffic.
d. From the **Type** list, select **Policy**, and then select the firewall policy you created.
e. From the **Policy Type** list, select **Enforced**.
f. Click **Finished**.

**Optional: Assigning an IP Intelligence Policy to your AD FS virtual server**
If you want to restrict access to your AD FS virtual server based on the reputation of the remote sender, you can enable and assign an IP Intelligence policy. This requires an IP intelligence license; contact your F5 Sales representative for more information.

It is outside the scope of this document to provide instructions on configuring an IP Intelligence Policy. Full documentation on enabling and configuring the IP Intelligence feature can be found on AskF5. For example, the manual for BIG-IP AFM v11.5 is: [https://support.f5.com/kb/en-us/products/big-ip-afm/manuals/product/network-firewall-policies-implementations-11-5-0/5.html](https://support.f5.com/kb/en-us/products/big-ip-afm/manuals/product/network-firewall-policies-implementations-11-5-0/5.html)

After you have enabled and configured an IP Intelligence policy, use the following steps to assign the policy to your virtual server:

**To assign the IP intelligence policy to the AD FS virtual server**

1. On the Main tab, click **Local Traffic > Virtual Servers**. The Virtual Server List screen opens.
2. Click the name of your AD FS virtual server.
3. From the **Security** menu, choose **Policies**.

4. Next to **IP Intelligence**, select **Enabled**, then select the IP intelligence policy to apply to traffic on the virtual server.

5. Click **Update**. The list screen and the updated item display. The IP Intelligence policy is applied to traffic on the virtual server.

### Optional: Configuring the BIG-IP system to log network firewall events

If you are using BIG-IP AFM, you have the option of logging network firewall events to one or more remote syslog servers (recommended) or to log events locally. You can either use an iApp template to create the logging profile, or create the logging profile manually.

For specific information on logging on the BIG-IP system, see the appropriate guide for your version. For example, for 11.5.0:


### Creating the logging profile using the iApp template


#### To configure the logging profile iApp

1. Log on to the BIG-IP system.

2. On the Main tab, click **iApp > Application Services**.

3. Click **Create**. The Template Selection page opens.

4. In the **Name** box, type a name. In our example, we use **logging-iapp_**.

5. From the **Template** list, select **f5.remote_logging.v<latest-version>**. The template opens.

6. Use the following table for guidance on configuring the iApp template. Questions not mentioned in the table can be configured as applicable for your implementation.

<table>
<thead>
<tr>
<th>Question</th>
<th>Your selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you want to create a new pool of remote logging servers, or use an existing one?</td>
<td>Unless you have already created a pool on the BIG-IP system for your remote logging servers, select <strong>Create a new pool</strong>.</td>
</tr>
<tr>
<td>Which servers should be included in this pool?</td>
<td>Specify the IP addresses of your logging servers. Click <strong>Add</strong> to include more servers.</td>
</tr>
<tr>
<td>What port do the pool members use?</td>
<td>Specify the port used by your logging servers, typically <strong>514</strong>.</td>
</tr>
<tr>
<td>Do the pool members expect UDP or TCP connections?</td>
<td><strong>TCP</strong></td>
</tr>
<tr>
<td>Do you want to create a new monitor for this pool, or use an existing one?</td>
<td>Unless you have already created a health monitor for your pool of logging servers, select <strong>Use a simple ICMP (ping) monitor</strong>.</td>
</tr>
<tr>
<td>Do your log pool members require a specific log format?</td>
<td>If your logging servers require a specific format, select the appropriate format from the list.</td>
</tr>
</tbody>
</table>

7. Click **Finished**.

8. On the Main tab, click **Local Traffic > Virtual Servers**. The Virtual Server List screen opens.

9. Click the name of your AD FS virtual server.

10. From the **Security** menu, choose **Policies**.

11. Next to **Log Profile**, select **Enabled**, then select the Logging profile you created.

12. Click **Update**. The list screen and the updated item are displayed.

⚠ **Note** The iApp template creates a log publisher and attaches it to the logging profile. If the publisher does not appear in the BIG-IP Configuration utility (GUI), you can verify the configuration by running the following command from the Traffic Management shell (tmsh): `list security log profile <your profile name>`.
Creating logging profile manually

If you do not want to use the iApp template to create a logging profile, use this section for guidance on configuring the logging profile manually. You must have access to the tmsh command line to use this method.

To manually configure a logging profile

1. Use the following guidance for configuring a health monitor and load balancing pool for the logging servers.

<table>
<thead>
<tr>
<th>BIG-IP LTM Object</th>
<th>Non-default settings/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Monitor</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>ICMP</td>
</tr>
<tr>
<td>Interval</td>
<td>30 (recommended)</td>
</tr>
<tr>
<td>Timeout</td>
<td>91 (recommended)</td>
</tr>
<tr>
<td>Pool</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Type a unique name</td>
</tr>
<tr>
<td>Health Monitor</td>
<td>Select the appropriate monitor you created</td>
</tr>
<tr>
<td>Slow Ramp Time</td>
<td>300</td>
</tr>
<tr>
<td>Load Balancing Method</td>
<td>Choose a load balancing method. We recommend Least Connections (Member)</td>
</tr>
<tr>
<td>Address</td>
<td>Type the IP Address of a server.</td>
</tr>
<tr>
<td>Service Port</td>
<td>Type the appropriate port, such as UDP port 514, the port on which logging typically occurs. Click Add, and then repeat Address and Port for all nodes</td>
</tr>
</tbody>
</table>

2. Log into the BIG-IP system using the command line. Enter the tmsh shell, by typing `tmsh` from the prompt.

3. Create a Remote High Speed Log (HSL) destination:

   `(tmos)# create / sys log-config destination remote-high-speed-log [name] pool-name [specified pool] protocol [udp or tcp]`

4. If you have a specific log format requirement, create a format-specific log destination, and forward that to the previously-created HSL destination:

   `(tmos)# create / sys log-config destination [splunk|arcsight|remote-high-speed-log] [name] forward-to [HSL name]`

5. Create a log publisher:

   `(tmos)# create / sys log-config publisher [name] destinations add { [logdestination name] }`

6. Create the logging profile to tie everything together.

   If you chose to log allowed connections, include the green text (as in step 2 substep i in To configure the BIG-IP AFM to allow connections from a single trusted network on page 26).
   If you set the rule to drop incoming connections, include the text in blue.
   If you chose to log IP intelligence events, include the text in red to add the parameter that sets the log publisher.

   `(tmos)# create / security log profile [name] network add { [name] { filter { log-acl-match-accept enabled, log-acl-match-drop enabled, log-acl-match-reject enabled } format { field-list { date_time action drop_reason protocol src_ip src_port dest_ip dest_port } type field-list } publisher [logpublisher name] } } ip-intelligence { log-publisher [logpublisher name] } )`

Assigning the logging profile to the virtual server

The final task is to assign the logging profile to the virtual server.

To assign the logging profile to the AD FS virtual server

2. Click the name of your AD FS virtual server.
4. Next to Log Profile, select Enabled, then select the Logging profile you created.
5. Click Update. The list screen and the updated item are displayed.

This completes the BIG-IP AFM configuration.
Appendix B: Configuring DNS and NTP on the BIG-IP system

If you are using BIG-IP APM, before beginning the iApp, you must configure DNS and NTP settings on the BIG-IP system.

Configuring DNS and NTP settings

If you are configuring the iApp to use BIG-IP APM, you must configure DNS and NTP settings on the BIG-IP system before beginning the iApp.

Configuring the DNS settings

In this section, you configure the DNS settings on the BIG-IP system to point to a DNS server that can resolve your Active Directory server or servers. In many cases, this IP address will be that of your Active Directory servers themselves.

Note: DNS lookups go out over one of the interfaces configured on the BIG-IP system, not the management interface. The management interface has its own, separate DNS settings.

Important The BIG-IP system must have a self IP address in the same local subnet and VLAN as the DNS server, or a route to the DNS server if located on a different subnet. The route configuration is found on the Main tab by expanding Network and then clicking Routes. For specific instructions on configuring a route on the BIG-IP system, see the online help or the product documentation.

To configure DNS settings

1. On the Main tab, expand System, and then click Configuration.
2. On the Menu bar, from the Device menu, click DNS.
3. In the DNS Lookup Server List row, complete the following:
   a. In the Address box, type the IP address of a DNS server that can resolve the Active Directory server.
   b. Click the Add button.
4. Click Update.

Configuring the NTP settings

The next task is to configure the NTP settings on the BIG-IP system for authentication to work properly.

To configure NTP settings

1. On the Main tab, expand System, and then click Configuration.
2. On the Menu bar, from the Device menu, click NTP.
3. In the Address box, type the fully-qualified domain name (or the IP address) of the time server that you want to add to the Address List.
4. Click the Add button.
5. Click Update.

To verify the NTP setting configuration, you can use the ntpq utility. From the command line, run ntpq -np.

Appendix C: Using X-Forwarded-For to log the client IP address in IIS 7.0, 7.5, and 8 (optional)

When you configure BIG-IP LTM to use SNAT, the BIG-IP system replaces the source IP address of an incoming connection with its local self IP address (in the case of SNAT Auto Map), or an address you have configured in a SNAT pool. As a result, Microsoft IIS logs each connection with its assigned SNAT address, rather than the address of the client. The iApp produces an HTTP profile on the BIG-IP system which inserts an X-Forwarded-For header, so the original client IP address is sent as well; however, in default IIS configuration, this information is not logged.

Beginning with IIS 7, Microsoft provides an optional Advanced Logging Feature for IIS that allows you to define custom log definitions that can capture additional information such as the client IP address included in the X-Forwarded-For header.

Modifying the iApp to insert the X-Forwarded-For header if necessary

First, you must make sure you have enabled the iApp to insert the X-Forwarded-For header. To change or verify the value of this setting, use the following procedure.

**To insert the X-Forwarded-For header.**

1. On the Main tab, expand **iApp** and then click **Application Services**.
2. From the list, click the name of the AD FS Application Service you created.
3. On the Menu bar, click **Reconfigure**.
4. In the Virtual Server and Pools section, from the *Should the BIG-IP system insert the X-Forwarded-For header?* question, select **Insert X-Forwarded-For HTTP header**.
5. Click **Finished**.

Deploying the Custom Logging role service

The first task is to deploy the Custom Logging role service. If you do not deploy this role service, you may receive a “Feature not supported” error when trying to edit the log definition in the next section. If you receive this error, ensure that you are editing the log definition at the server level in IIS Manager.

The configuration is slightly different depending on which version of IIS you are running. Use the procedure applicable to your version of IIS.

**To deploy the Custom Logging role service for IIS 7.0 and 7.5 (Windows Server 2008)**

1. From your Windows Server 2008 or Windows Server 2008 R2 device, open Server Manager.
2. In the Navigation pane, expand **Roles**.
3. Right-click **Web Server**, and then click **Add Role Services**.
4. Under Health and Diagnostics, check the box for **Custom Logging**, and then click **Next**.
5. On the Confirmation page, click **Install**.
6. After the service has successfully installed, click the **Close** button.

**To deploy the Custom Logging role service for IIS 8.0 (Windows Server 2012)**

1. From your Windows Server 2012 device, open Server Manager.
2. Click **Manage** and then **Add Roles and Features**.
3. Select Role-based or feature-based installation.
4. On the Roles screen, expand **Web Server (IIS)** and **Health and Diagnostics** and then check the box for **Custom Logging**.
5. Click **Next** and then on the Features screen, click **Next** again.
6. Click **Install**.
7. After the service has successfully installed, click the **Close** button.
Adding the X-Forwarded-For log field to IIS

Before beginning the following procedure, you must have installed IIS Advanced Logging. For installation instructions, see http://www.iis.net/community/files/media/advancedlogging_readme.htm

If you are using IIS version 6, F5 has a downloadable ISAPI filter that performs a similar function to the Advanced Logging Feature discussed here. For information on that solution, see the DevCentral post at http://devcentral.f5.com/weblogs/Joe/archive/2009/08/19/x_forwarded_for_log_filter_for_windows_servers.aspx

The following procedure is the same for IIS versions 7.0, 7.5, and 8.0.

To add the X-Forwarded-For log field to IIS

1. From your Windows Server device, open the Internet Information Services (IIS) Manager.
2. From the Connections navigation pane, click the appropriate server on which you are configuring Advanced Logging. The Home page appears in the main panel.
3. From the Home page, under IIS, double-click Advanced Logging.
4. From the Actions pane on the right, click Edit Logging Fields.
5. From the Edit Logging Fields dialog box, click the Add Field button, and then complete the following:
   6. In the Field ID box, type X-Forwarded-For.
   7. From the Category list, select Default.
   8. From the Source Type list, select Request Header.
   9. In the Source Name box, type X-Forwarded-For.
10. Click the OK button.
11. Click a Log Definition to select it. By default, there is only one: %COMPUTERNAME%-Server. The log definition you select must have a status of Enabled.
12. From the Actions pane on the right, click Edit Log Definition.
13. Click Select Fields, and then check the box for the X-Forwarded-For logging field.
14. Click the OK button.
15. From the Actions pane, click Apply.
16. Click Return To Advanced Logging.
17. In the Actions pane, click Enable Advanced Logging.
   Now, when you look at the Advanced Logging logs, the client IP address is included.
### Document Revision History

<table>
<thead>
<tr>
<th>Version</th>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>New version of this deployment guide for the AD FS iApp template</td>
<td>09-09-2015</td>
</tr>
</tbody>
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