# aws migration evaluator

# On-Premises Collector System Requirements & Installation Guide

## Get Started Now

Formerly TSO Logic

# On-Premises Collector System Requirements and Installation Guide

## Table of Contents

# Pre-Install Checklist

The following preconditions should be completed before proceeding to step 1.

- Has an account been created on https://console.tsologic.com?
    - Please contact your Migration Evaluator specialist if you have not received an invitation request
- Has the server for the TSO Logic Collector been created and provisioned according to this guideline?
    - Please see **Appendix A** for more details on required specifications
    - If your environment exceeds the sizing specifications, please contact your Migration Evaluator specialist
- Does your Windows account have local administrator rights on the new server for the TSO Logic Collector?
    - Please see **Appendix B** for more details around accounts required
- If you have VMware infrastructure being monitored, have you verified account credentials and network connectivity?
    - Please see **Appendix C** for more details around VMware access
- If you have bare metal infrastructure being monitored, have you verified account credentials, network connectivity and completed the CSV template?
    - If connecting via SNMP, please see **Appendix D** for more details
    - If connecting via WMI, please see **Appendix E** for more details
    - Have the servers to be monitored been listed in a CSV file? Please see **Appendix H** for more details.
- If you have Hyper-V infrastructure being monitored, have you verified account credentials, network connectivity, and completed the optional CSV template?
    - Please see **Appendix F** for more details around Hyper-V access
    - If discovering Hyper-V hosts via Active Directory scanning, please see **Appendix K** for more details
    - If manually providing the Hyper-V hosts to be included, have the hosts been listed in a CSV file? Please see **Appendix I** for more details.
- If you have SQL Server infrastructure to be discovered, have you verified account credentials and network connectivity?
    - Please see **Appendix J** for more details around T-SQL access
- Have you verified network connectivity from the server for the TSO Logic Collector to the analytics engine hosted in the US East region?
    - Please see **Appendix G** for more details
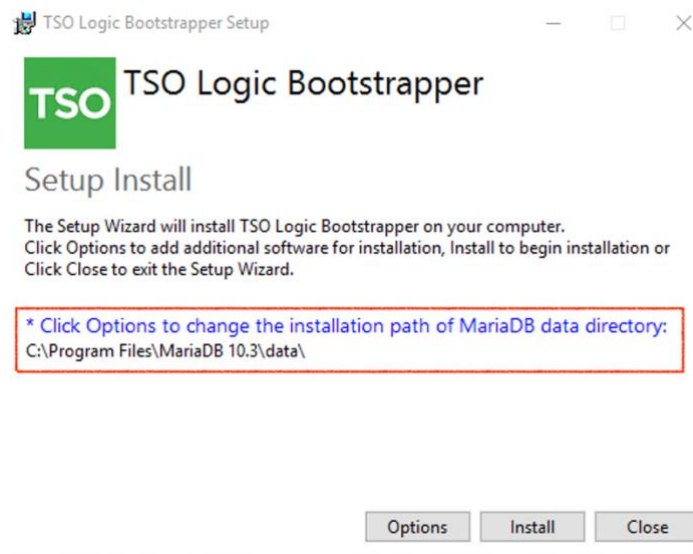
# 1 – Install the TSO Logic Bootstrapper

**Preconditions**

- Has the server for the TSO Logic Collector been created and provisioned according to this guideline?

    o   Please see **Appendix A** for more details on required specifications

- Does your Windows account have administrator rights on the new server for the TSO Logic Collector?

    o   Please see **Appendix B** for more details around accounts required

- Have you logged into the TSO Logic Management Console at https://console.tsologic.com?

    o   Please contact your Migration Evaluator specialist if you have not received an invitation request

**Steps**

The TSOBootstrapper.exe automatically scans the server you provisioned to run the TSO Logic Collector and installs any missing software packages. You may be prompted to restart Windows during this process. Depending on the speed of your server and Windows version, this may take up to 20 minutes.

1. Download and save the **TSOBootstapper.exe** from https://console.tsologic.com/discover/tools onto the new designated server.

    a.   You may have to rename the file extension to .exe after the download. This is normal and is due to Windows internal security settings.

2. Ensure you are logged in as a local Administrator.

3. If a non-C: drive was allocated to meet the collector storage requirement (see **Appendix A**), click **Options** and select the correct drive.



4. Select **Install** and wait while the packages are installed. Once done, select the **Close** button to complete the process.

## 2 – Install the TSO Logic Collector
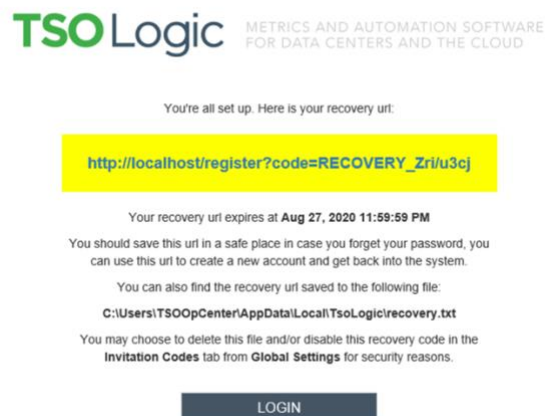
**Preconditions**

- Has the Bootstrapper been installed?

    o    Please see **1 - Install the TSO Logic Bootstrapper** for details

- Have you logged into the TSO Logic Management Console at https://console.tsologic.com?

    o    Please contact your Migration Evaluator specialist if you have not received an invitation request

**Steps**

The TSO Logic Collector software is a Windows Service and IIS application used to monitor your on-premises infrastructure.

1.  Download and save the TSO Logic Collector software MSI from https://console.tsologic.com/discover/tools onto the new designated server.

2.  Download and save the collector specific encryption certificate from https://console.tsologic.com/discover/collectors onto the new designated server.  If you have multiple collectors, each instance must have a unique certificate.

3.  Ensure you are logged in as a local Administrator.

4.  Run the TSOCollector_.msi

    a.  Select the certificate file (<assessment>-<number>.crt) previously downloaded.

    b.  Select to run the collector under a local system account or the service account created prior to install. The account selected cannot be changed after install. See **Appendix B** for more details on service accounts.

        i.  If the service account does not have the permissions outlined in **Appendix B**, a dialog requesting to grant the permissions will be presented. Select **Yes** to proceed.

    c.  Select **HTTPS** for communication with the IIS application. See **Appendix L** if after installation, you wish to replace the auto-generated self-signed certificate.

    d.  Select **Yes** to automatically start the collection service once the install sequence finishes.

5.  Once installation has completed, your next step will be to create your local account for managing the collector.  This is not the account used on https://console.tsologic.com.

    a.  Access the TSO Logic Collector software by clicking on the newly-created desktop shortcut, or by opening your browser at: *https://localhost*.

    b.  Enter your desired credentials, and click Create Account

6.  Take note of your recovery key.  This will allow you access to the TSO Logic Collector if you forget your password.

# 3 – Configure Collection from VMware

*Skip this section if you do not have VMware infrastructure to monitor.*

**Preconditions**

- Has the TSO Logic Collector software been installed?
    - Please see **2 - Install the TSO Logic Collector Software** for details
- Have you verified vCenter account credentials and network connectivity?
    - Please see **Appendix C** for more details around VMware access
- Have you logged into the TSO Logic Collector software?
    - Select the newly-created desktop shortcut, or by opening your browser at: https://localhost and using the local account created in step 2-4.

**Steps**

If you have VMware infrastructure being monitored, the following section outlines the steps needed to configure the TSO Logic Collector. This process will need to be repeated for each vCenter in scope.

1. Select **Add Data Provider** from the navigation bar
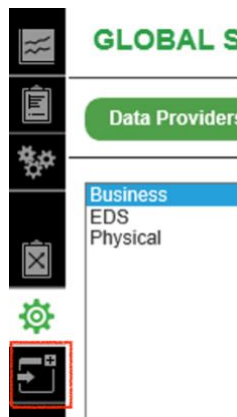


2. Select **VMware vSphere**, and click the **Next** button.

3. Populate the following details of your vCenter where:

    a. **Name** is descriptive label for the vCenter instance, the **Address** is either the IP or FQDN of the vCenter, and the **User Name** includes the domain if applicable.

    b. The **Advanced Settings** is our default polling cycle, you don't need to edit this unless suggested by your Migration Evaluator specialist.

4. Select **Save** and then **Done**.

5. Check the **Status**. Most vCenter instances are deployed with a self-signed certificate, you may need to either disable SSL certificate validation or fix the certificate installed on the vCenter instance being monitored.



6. After a configuration change, you may force the software to try connecting again by selecting **Advanced Status**, then **Force Data Collection**.

# 3 – Configure Operating System Credentials

*Skip this section if you do not have servers to be monitored directly (bare metal or virtual machine) or Hyper-V infrastructure to monitor.*

**Preconditions**

- Has the TSO Logic Collector software been installed?

    o Please see **2 - Install the TSO Logic Collector Software** for details

- If you have servers (bare metal or virtual machines) being monitored directly, have you verified account credentials and network connectivity?

    o If connecting via SNMP, please see **Appendix D** for more details

    o If connection via WMI, please see **Appendix E** for more details

- If you have Hyper-V infrastructure being monitored, have you verified account credentials and network connectivity?

    o Please see **Appendix F** for more details around Hyper-V access.

- Have you logged into the TSO Logic Collector software?

    o Select the newly-created desktop shortcut, or by opening your browser at: https://localhost and using the local account created in step 2-4.

**Steps**

If you have bare metal or Hyper-V infrastructure being monitored, you will need to configure credentials for SNMP and/or WMI.  You may also optionally configure credentials for collecting utilization directly from each virtual machine. See section **8 - Configure Virtual Machine OS Metrics** Collection for more details.

1. Select **Global Settings** from the Navigation bar, then the **OS Credentials** tab
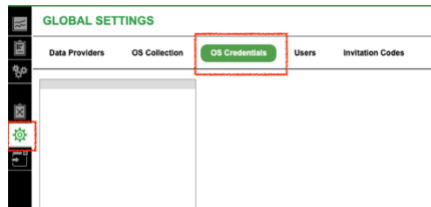


2. If SNMP will be used, select **New**, then **SNMP v2c or v3** from the protocol dropdown.

    a. For both Windows & Linux, there can be up to 1 default SNMP credential profile. If selected, all bare metal servers will leverage this profile.

    b. If your environment leverages more than 1 set of SNMP credentials, please contact your Migration Evaluator specialist.

3. If WMI will be used, select **New**, then **WMI** from the protocol dropdown

    a. For Windows, there can be up to 1 default WMI credential profile. If selected all Windows bare metals servers will leverage this protocol.

    b. If your environment leverages more than 1 set of WMI credentials, please contact your Migration Evaluator specialist.

# 5 – Configure Collection from Bare Metal Servers

*Skip this section if you do not have bare metal infrastructure to monitor.*

**Preconditions**

- Has the TSO Logic Collector software been installed?

    o Please see **2 - Install the TSO Logic Collector Software** for details

- Have you verified account credentials and network connectivity?

    o Please see **4 - Configure Operating System Credentials** for details

- Have you logged into the TSO Logic Collector software?

    o Select the newly-created desktop shortcut, or by opening your browser at: https://localhost and using the local account created in step 2-4.

**Steps**

If you have bare metal infrastructure being monitored, the following section outlines the steps needed to configure the TSO Logic Collector. This process will need to be repeated for each list of bare metal servers in scope.

1. Create a CSV file containing the list of servers to be monitored (see **Appendix H** for details).

    a. Note that the file must have a .CSV file extension.

2. Select **Add Data Provider** from the navigation bar:
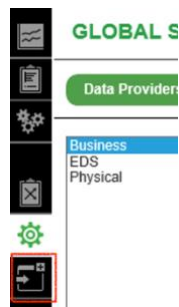


3. Select **TSO Logic CSV**, and click the **Next** button.

4. Populate the details of your CSV file including a descriptive label for this list of servers.

5. Select **Save** and then **Done**. The system will now start to asynchronously add the servers. This initial cycle can take more than 10 minutes to complete.

6. Verify that at least one server you feel should work can be monitored. To do this, select the **Device Settings** from the navigation bar and select the **Bare Metals** view. Navigate to a server you would like to test and select **Test Connection**.



    a. If you run into problems, please contact your Migration Evaluator specialist.

# 6 – Configure Collection from Hyper-V Servers

*Skip this section if you do not have Hyper-V infrastructure to monitor.*
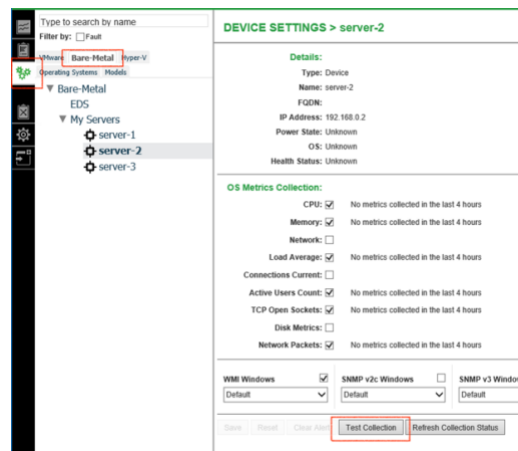
**Preconditions**

- Has the TSO Logic Collector software been installed?
    - Please see **2 - Install the TSO Logic Collector Software** for details
- Have you verified account credentials and network connectivity?
    - Please see **4 - Configure Operating System Credentials** for details
- Have you logged into the TSO Logic Collector software?
    - Select the newly-created desktop shortcut, or by opening your browser at: https://localhost and using the local account created in step 2-4.

## Steps

If you have Hyper-V infrastructure being monitored, the following section outlines the steps needed to configure the TSO Logic Collector. This process will need to be repeated for each Active Directory server or list of Hyper-V hosts in scope.

1. Select **Add Data Provider** from the navigation bar



2. Select **Microsoft Hyper-V**, and click the **Next** button.

3. If using Active Directory to discover the Hyper-V hosts on your network, select **Active Directory Scan**. See **Appendix K** for details

    a. **Name** is a descriptive label for the Active Directory instance + base distinguished name (DN)

    b. **Address** is either the IP or FQDN of the Active Directory server

    c. **User Name** includes the domain if applicable.

    d. **Base DN** specifies the root for searches in the Active Directory. By default this is ou=users,dc=domain,dc=com. Modify this to reduce the scope of Hyper-V hosts to be included.

4. If using a known list of Hyper-V hosts, select **CSV File Containing the Hyper-V Hosts**

    a. Create a CSV file containing the list of Hyper-V hosts to be monitored (see **Appendix I** for details)

    b. **Name** is a descriptive label for the Hyper-V hosts in the file

    c. Select your CSV file

5. Select **Save** and then **Done**. The system will now start to asynchronously add the servers. This initial cycle can take more than 10 minutes to complete.

6. Verify that the Hyper-V hosts and their virtual machines were discovered. To do this, select the **Device Settings** from the navigation bar and select the **Hyper-V** view.

# 7 - Configure SQL Server Discovery

*Skip this section if you do not have SQL Server instances to discover.*

**Preconditions**

- Has the TSO Logic Collector software been installed?
    - Please see **2 - Install the TSO Logic Collector Software** for details
- Have all the data sources been configured?
    - Please see **3 - Configure Collection from VMware** for details
    - Please see **5 - Configure Collection from Bare Metal Servers** for details
    - Please see **6 - Configure Collection from Hyper-V Servers** for details
- Have you logged into the TSO Logic Collector software?
    - Select the newly-created desktop shortcut, or by opening your browser at: https://localhost and using the local account created in step 2-4.

**Steps**

If you have SQL Server infrastructure to be discovered, you will need to configure T-SQL credentials, then initiate the scan.  Further scans will occur in the background every 24 hours.

1. Select **Global Settings** from the Navigation bar, then the **OS Credentials** tab
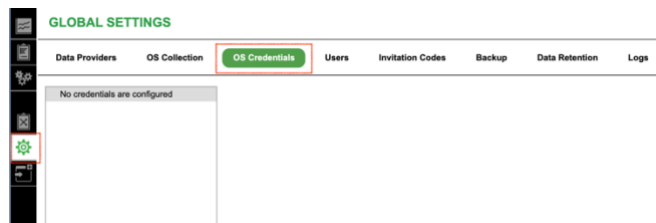


2. Select **New**, then **T-SQL** from the protocol dropdown.

    a. Domain accounts are not supported.

    b. Configure as many T-SQL credentials as needed.  See Appendix J for details.

3. Select **Global Settings** from the Navigation bar, then the **OS Collection** tab.
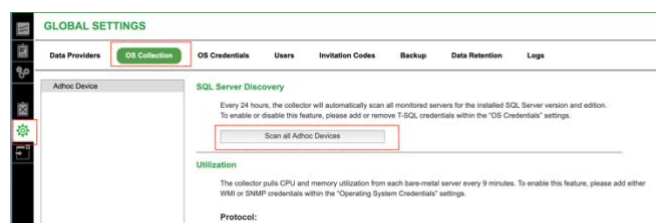


    a. For each data type configured (VMware, Adhoc, and Hyper-V), select **Scan now** to initiate the scan.

        i. Note: Every 24 hours the system will automatically look for new servers running SQL Server. Selecting Scan now is only needed to accelerate discovery during installation.

# 8 – Configure Virtual Machine OS Metrics Collection

*Skip this section if you do not have VMware or Hyper-V infrastructure to monitor.*

**Preconditions**

- Has the TSO Logic Collector software been installed?
    - Please see **2 - Install the TSO Logic Collector Software** for details
- Have all the data sources been configured?
    - Please see **3 - Configure Collection from VMware** for details
    - Please see **6 - Configure Collection from Hyper-V Servers** for details
- Have you verified account credentials and network connectivity?
    - Please see **4 - Configure Operating System Credentials** for details
- Have you logged into the TSO Logic Collector software?
    - Select the newly-created desktop shortcut, or by opening your browser at: https://localhost and using the local account created in step 2-4.

**Steps**

To remove the dependency on network connectivity and server credentials (SNMP or WMI), the TSO Logic Collector by default pulls virtual machine resource utilization metrics from the hypervisors (via Hyper-V hosts and vSphere appliances).  For Hyper-V, this means that no memory utilization is able to be captured. For VMware, the consumed host memory metric is used which is the total "amount of host memory that is allocated to the virtual machine".

If you would like the business case to factor in resource utilization from the operating system's point of view, WMI or SNMP monitoring may be optionally enabled. For any virtual server that WMI or SNMP fails to collect due to network connectivity, authentication or authorization, the collector will continue to use utilization from the hypervisor.

1. Select **Global Settings** from the Navigation bar, then the **OS Collection** tab.
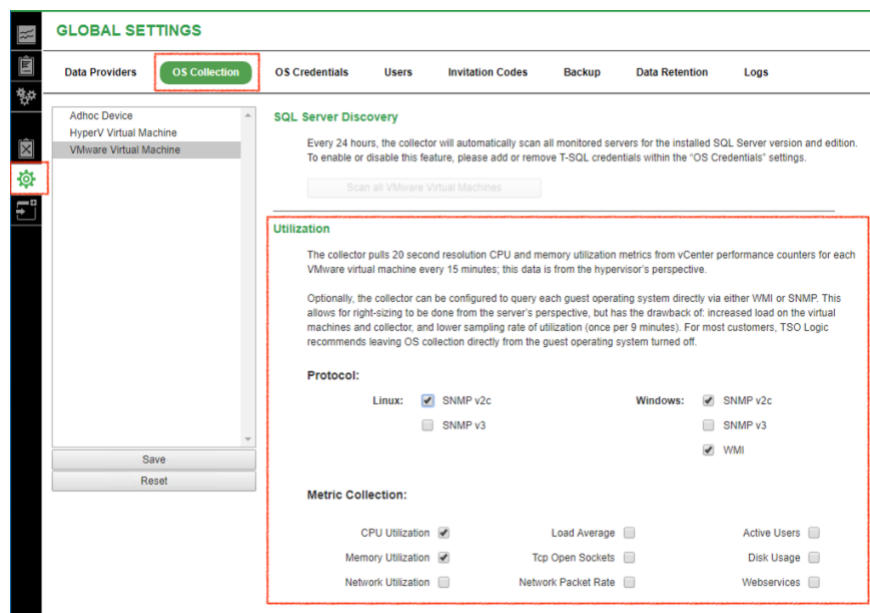


2. For each data type configured (VMware and Hyper-V):

    a. Configure the desired protocols.  For Windows virtual machines, WMI is preferred if both WMI and SNMP are available.

    b. Configure which metrics should be collected. For cost modelling to AWS, only CPU and Memory Utilization is factored into right-sizing.

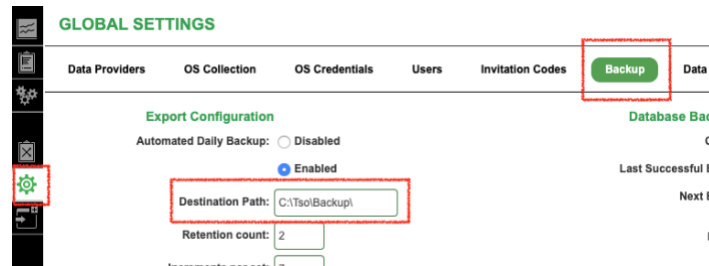# 9 – Configure Synchronization with the TSO Logic Analytics Engine

**Preconditions**

- Have you verified network connectivity to AWS S3 from the server for the TSO Logic Collector?

    o   Please see **Appendix G** for more details

- Has the TSO Logic Collector software been installed?

    o   Please see **2 - Install the TSO Logic Collector Software** for details

- Have you logged into the TSO Logic Collector software?

    o   Select the newly-created desktop shortcut, or by opening your browser at: https://localhost and using the local account created in step 2-4.

- Have you logged into the TSO Logic Management Console at https://console.tsologic.com?

    o   Please contact your Migration Evaluator specialist if you have not received an invitation request

**Steps**

Once the collector software is installed and monitoring your infrastructure, it is time to configure data synchronization to the TSO Logic analytics engine hosted in US East.

1.  Verify the destination path for the nightly export is correct based on the server provisioning in **Appendix A**.  To see, select **Global Settings**, then **Backup**.



1.  Configure the AWS S3 synchronization setting based on your collector details listed in the TSO Logic Management Console: https://console.tsologic.com/discover/collectors
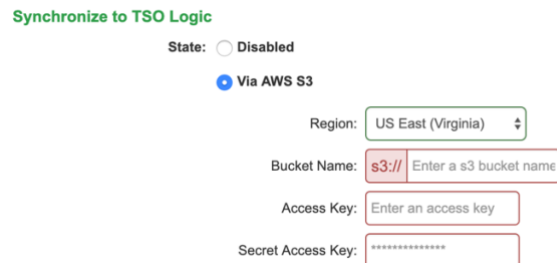


    a.   If required for your network to have connectivity to S3, enable the optional HTTP proxy. Please see **Appendix H** for more details.

2.  Select **Initiate Backup Now** to verify both the backup and synchronization is working.

    a.   If you run into problems, please contact your Migration Evaluator specialist.

    b.   If the collector was installed to run as Local System, logs are found under:

        i.   C:\Windows\System32\config\systemprofile\AppData\Local\tsologic

    c.   If the collector was installed to run as a User Account, logs are found under:

        i.   C:\Users\<USER>\AppData\Local\tsologic

# 10 - Annotating Discovered Inventory with Business Data and Provisioning

**Preconditions**

- Has the TSO Logic Collector software been installed and configured?
  - Please see **2 - Install the TSO Logic Collector Software** for details
  - Please see **3 - Configure Collection from VMware** for details
  - Please see **5 - Configure Collection from Bare Metal Servers** for details
  - Please see **6 - Configure Collection from Hyper-V Servers** for details
- Have you logged into the TSO Logic Collector software?
  - Select the newly-created desktop shortcut, or by opening your browser at: https://localhost and using the local account created in step 2-4.
- Have you logged into the TSO Logic Management Console?
  - Open a browser at https://console.tsologic.com. Please contact your Migration Evaluator specialist if you have not received an invitation request

**Steps**

Once the collector software is installed and monitoring your infrastructure, it is time to annotate the discovered inventory with business data (logical environments) as well as any provisioning not detected.

1. Generate an export of the collector's inventory by selecting **Global Settings**, then **Backup**, then **Download Inventory & Utilization Export**.

2. Open the Excel document.
   a. On the **Virtual Assets** sheet:
      i. Verify the inventory contains everything expected to be in-scope
      ii. For VMs running SQL Server, verify the Database Type column was populated. If not, manually add either: SQL Server Enterprise or SQL Server Standard
   b. On the **Physical Assets** sheet:
      i. Verify the inventory contains everything expected to be in-scope
      ii. For servers without detected physical provisioning, fill in as much as possible with values acceptable for modelling. This includes the CPU core count, CPU processor model, memory and storage configuration
      iii. For servers running SQL Server, verify the Database Type column was populated. If not, manually add either: SQL Server Enterprise or SQL Server Standard
   c. On the **Asset Ownership** sheet:
      i. Fill in as much as possible, including the server's logical environment. By providing production vs development tags, extra projected savings may be able to be modelled.
   d. On the **Utilization** sheet:
      i. No change is needed as values are populated automatically based on utilization patterns detected.

3. Upload the updated Excel workbook for your engagement in the TSO Logic Management Console: https://console.tsologic.com/discover/self-reported-files

# Appendix A – Server Hardware Requirements

The TSO Logic Collector requires one new server running Windows Server 2012 R2 or greater. Based on the mix of data sources, the following minimum specifications must be provisioned. When monitoring from multiple sources, select the largest server configuration tier.

*Example: a data center with 3000 virtual machines, 50 Hyper-V Host Systems and 200 Linux bare metal servers will require at least 6 CPU cores and 16GB of RAM.*

| Virtual Machines | Physical Servers | | | CPU | RAM | Storage |
|---|---|---|---|---|---|---|
| | Hyper-V | Linux | Windows | | | |
| 1-500 | | 1-500 | | 2 | 8 GB | 100 GB primary, SSD preferred |
| 500-2.5k | | 500-2.5k | | 4 | 12 GB | 200 GB primary, SSD required |
| 2.5k-5k | 1-100 | 2.5k-5k | 1-500 | 6 | 16 GB | 300 GB primary, SSD required |
| 5k-10k | 100-200 | 5k-10k | 500-1k | 8 | 32 GB | 500 GB primary, SSD required |
| 10k+ | 200+ | 10k+ | 1k+ | Please consult your Migration Evaluator specialist | | |

- Storage allocation will grow over time. The numbers above are for a typical three-month period and must be reviewed at term.

- System Locale configured for en-US (English United States)

# Appendix B – Server Account Requirements

To install the software, you will need an account with local administrator rights on your new server for the TSO Logic Collector. This includes the permission to:

- Execute local unsigned PowerShell scripts

- Use non-FIPS compliant algorithms for encryption, hashing and signing

The TSO Logic Collector can optionally be configured to run under a local or domain user account. This configuration restricts decryption of collection credentials to only this user and cannot be changed post installation. The following rights are required for the service account:

- Logon as service

- Logon as batch job

- Logon locally

- Member of Builtin\Performance Monitor Users group

- Member of Administrators group

# Appendix C – Connectivity to VMware vCenter

The TSO Logic Collector requires the following to monitor VMware vCenter:

- Version 4.1 and greater of vSphere Web API provided from VMware

- Network connectivity via TCP port 443

- An account that:

    o Is a member of the 'Read-only' role

    o Is associated with the vCenter Server

    o Has inventory read on the Root folder

To test:

1. From a browser on your Server for the TSO Logic Collector, connect to the vCenter Managed Object Browser (MOB) interface

    a. https://<yourvcenter.yourcompany.com>/mob

2. Enter the vCenter user account and password to be used by the TSO Logic Collector

If the MOB authenticates and reveals objects, this should be sufficient to assume that read-only access is working as required. If not, please verify the expected permissions have been applied.


# Appendix D – Connectivity via SNMP

The TSO Logic Collector requires the following to monitor either Microsoft, Linux, RHEL or SUSE bare metal servers via SNMP:

- Network connectivity via ICMP

- Network connectivity via UDP port 161

- If using SNMP v2c:

    o a read-only community string

- If using SNMP v3:

    o a username/password and auth/privacy details for read-only permission

- Access to the following OIDs:

| Description | Linux | Windows |
|---|---|---|
| CPU Utilization | 1.3.6.1.2.1.25.3.3.1.2 | 1.3.6.1.2.1.25.3.3.1.2 |
| Memory Utilization | 1.3.6.1.4.1.2021.4 | 1.3.6.1.2.1.25 |
| Active Users | 1.3.6.1.2.1.25.1.5.0 | 1.3.6.1.2.1.25.1.5.0 |
| Active or Open TCP Connections | 1.3.6.1.2.1.6.9.0 | 1.3.6.1.2.1.6.9.0 |
| Network Packet Rate | 1.3.6.1.2.1.2.2.1.11 | 1.3.6.1.2.1.2.2.1.11 |
| Load Average | 1.3.6.1.4.1.2021.10 | |

To test:

1. From a SNMP MIB Browser of your choice on your server for the TSO Logic Collector, enter either an IP or FQDN of a bare metal server to be monitored and the community string.

2. Try to pull metrics from the required OIDs.

# Appendix E – Connectivity via WMI

The TSO Logic Collector requires the following to monitor Microsoft bare metal servers via WMI:

- Windows Server 2008 or greater

- Network connectivity via ICMP

- Network connectivity via TCP port 135 + ephemeral TCP port range (49152 - 65535)

  - WMI can be problematic through firewalls due to maintaining contracts in the ephemeral port range

- An account that is a member of the following groups:

  - Performance Monitor Users

- An account with the following permissions:

  - Execute Methods

  - Enable Account

  - Remote Enable

  - Remote Activation

- Access to the following namespaces (and their subfolders)

  - \root\cimv2

  - \root\default

To test:

1. From the WBEMtest utility on your new Server for the TSO Logic Collector, enter either an IP or FQDN of the server to be monitored and user account/password to be used by the TSO Logic Collector

2. Run the following queries against the root\cimv2 namespace:

   a. SELECT PercentIdleTime FROM Win32_PerfFormattedData_PerfOS_Processor WHERE name = '_Total'

   b. SELECT * FROM Win32_ComputerSystem

   c. SELECT Caption FROM Win32_OperatingSystem

For ideas around troubleshooting WMI issues, please consult the following Microsoft guides:

- https://docs.microsoft.com/en-us/windows/desktop/WmiSdk/troubleshooting-a-remote-wmi-connection

- https://docs.microsoft.com/en-us/windows/desktop/WmiSdk/securing-a-remote-wmi-connection

# Appendix F – Connectivity to Hyper-V Hosts

The TSO Logic Collector requires the following to monitor Microsoft Hyper-V hosts:

- Windows Server 2008 R2 or greater

- Network connectivity via ICMP

- Network connectivity via TCP port 135 + ephemeral TCP port range (49152 - 65535)

    o WMI can be problematic through firewalls due to maintaining contracts in the ephemeral port range

- An account that is a member of the following groups:

    o Performance Monitor Users

    o Hyper-V Administrator (Windows Server 2012 R2 or greater)

- An account with the following permissions:

    o Execute Methods

    o Enable Account

    o Remote Enable

    o Remote Activation

- Access to the following namespaces (and their subfolders)

    o \root\cimv2

    o \root\default

    o \root\virtualization (Windows Server 2008 R2)

    o \root\virtualization\v2 (Windows Server 2012 or greater)

To test:

1. From the WBEMtest utility on your new Server for the TSO Logic Collector, enter either an IP or FQDN of the server to be monitored and user account/password to be used by the TSO Logic Collector

2. Run the following queries against the root\cimv2 namespace:

    a. SELECT * FROM Win32_ComputerSystem

    b. SELECT Caption,OSArchitecture,Version FROM Win32_OperatingSystem

    c. SELECT UUID,Vendor,Name,IdentifyingNumber FROM Win32_ComputerSystemProduct

    d. SELECT MediaType,Size FROM Win32_LogicalDisk WHERE MediaType = 12

3. Run the following query against the root\virtualization namespace for Windows Server 2008 R2 or older. If the result set is empty, the calling account does not have the required permissions.

    a. SELECT * FROM Msvm_ComputerSystem

4. Run the following query against the root\virtualization\v2 namespace for Windows Server 2012 or greater. If the result set is empty, the calling account does not have the required permissions.

    a. SELECT * FROM Msvm_ComputerSystem

For ideas around troubleshooting WMI issues, please consult the following Microsoft guides:

- https://docs.microsoft.com/en-us/windows/desktop/WmiSdk/troubleshooting-a-remote-wmi-connection

- https://docs.microsoft.com/en-us/windows/desktop/WmiSdk/securing-a-remote-wmi-connection

# Appendix G – Connectivity to Analytics Engine

Egress HTTPS traffic from the TSO Logic Collector to the TSO Logic managed, AWS S3 bucket in US East-1 (https://s3.amazonaws.com/tsologic-match-us-east/).

This URL will resolve to the following address ranges:

- 52.92.16.0/20

- 52.216.0.0/15

- 54.231.0.0/17

If direct egress traffic is not available, configuration of an HTTP proxy is supported. If a proxy is not available within your network, multiple manual exports out of the Server for the TSO Logic Collector will be required during the engagement.

## Appendix H – CSV Example for Monitoring Bare Metal Servers

The TSO Logic Collector requires a CSV (comma separated value) file containing the list of servers to be monitored via SNMP or WMI.  The file is required to be in the following format where **NAME** is required along with either **IP** or **FQDN** in the first row.

```
NAME,IP,FQDN
server-1,192.168.0.1,
server-2,192.168.0.2,
server-3,,baz.example.com
```

## Appendix I – CSV Example for Monitoring Hyper-V Servers

The TSO Logic Collector requires a CSV (comma separated value) file containing the list of Hyper-V hosts to be monitored via WMI.  The file is required to be in the following format where **HOSTNAMEORIP** is required in the first row.

```
HOSTNAMEORIP
Host-server-1
192.168.10.1
```

## Appendix J – Connectivity via T-SQL

The TSO Logic Collector requires the following to discover SQL Server version and edition via T-SQL:

- Network connectivity via TCP port 1433

- A local database account with:

    o PUBLIC role (this is the default permission given to all SQL Server accounts)

## Appendix K – Connectivity via Active Directory

The TSO Logic Collector requires the following to discover Hyper-V hosts via Active Directory:

- Active Directory server running schema 2016 or greater

- Network connectivity via TCP port 389

- An account that is a member of the domain

## Appendix L – Replace Self-Signed Certificate

Browsers connecting to the TSO Logic Collector's web application will generate a warning due to the default self-signed certificate provided. If you wish to remove the warning, replace the certificate with your own.

- Open Internet Information Services (IIS) Manager

    o Start > Run > inetmgr or search "IIS" from the start menu

- Import SSL Certificate (.pfx file)

    o Select the top-level node from menu on the left

- o Double click **Server Certificates** to open

- o Select **Import** from the menu on the right

- o Select your certificate file and enter the associated password. Click **Ok**.

- Assign your imported certificate to the HTTPS site binding

  - o Click **TSO.OpCenter** from the menu on the left

  - o Choose **Bindings** from the menu on the right

  - o Edit the existing **https** binding

  - o Replace the LocalHostCertificate certificate with your own certificate. Click **Ok**

- With **TSO.OpCenter** selected on the left, click **Restart** from the menu on the right

More details can be found:

- https://docs.microsoft.com/en-us/iis/manage/configuring-security/how-to-set-up-ssl-on-iis#iis-manager