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1 Login VSI 4.0

In this document you can find all the basics you need to know about Login VSI, as well as advanced configuration examples accompanied with helpful videos. To be successful with Login VSI it is highly recommended to read this document before using it.

For the most recent version of the documentation please visit the Login VSI website: http://www.loginvsi.com/documentation
2 Getting Started

2.1 About Login VSI

2.1.1 The software

Login Virtual Session Indexer (Login VSI) is the industry standard benchmarking tool for measuring the performance and scalability of centralized desktop environments such as Virtual Desktop Infrastructure (VDI) and Server Based Computing (SBC).

Login VSI works without additional scripting and does not require any additional infrastructure. Login VSI was designed by experienced VDI and SBC specialists, who created a tool that was easy to implement, easy to use and very cost-effective. Because Login VSI can be deployed very quickly it allows you to profit from the benefits of testing in every phase of your VDI project.

*Testing in the project phase helps you to make the right decisions:*

**Benchmarking**

Login VSI enables you to test and compare the performance of different software and hardware solutions in your own environment. This helps you to make educated and objective decisions. Leading industry analysts recognize Login VSI as the de-facto industry standard testing and benchmarking tool for VDI and SBC.

**Capacity Planning**

Login VSI helps you to decide the optimal hardware configuration (right sizing) to support the desired number of users and applications. Not based on guesswork but based on objective data. Login VSI is compatible with VMware Horizon View, Citrix XenDesktop, XenApp, Microsoft Remote Desktop Services or any other VDI or SBC solution.

*Testing in the production phase helps you to stay out of trouble:*

**Load / Stress Testing**

Login VSI allows you to measure the maximum capacity of your current infrastructure in a quick and easy way. The simulated users work with the same applications as your average employee such as Word, Excel, Outlook and Internet Explorer. And if you want, you can easily add your own custom applications to the tests.

**Change Impact Analysis**

With Login VSI you can test and predict the impact of any change in software and hardware, on the performance of your VDI or SBC Infrastructure. By integrating Login VSI workload simulations into your operational change management routines, your users will never be surprised by unexpected performance issues.
2.1.2 The Company

Login VSI B.V. is a young and energetic international software company focused on helping both end-users and vendors of virtual desktop infrastructures to design, build, implement and protect the best performing hosted desktop infrastructures possible.

Login VSI B.V. focuses on the development and worldwide marketing, sales and support of its flagship product Login Virtual Session Indexer (Login VSI). Started as a spin-off of Login Consultants, Login VSI B.V. became a separate legal entity in the summer of 2012 and now operates as a fully independent company. The global headquarters of Login VSI B.V. is based in Amsterdam, The Netherlands.

The design and development of the product Login VSI is managed out of the Netherlands, development tasks are divided between two development centers in The Netherlands and Lithuania. Login VSI is sold worldwide through a dedicated sales-force and a fast growing network of partners. Product support is handled out of Amsterdam and since early 2012, through our customer support office in Campbell, California, USA.
2.2 Environment overview

A typical Login VSI 4.x environment consists of the following (optional) components:

- Login VSI Fileshare (VSISHare)
  - Login VSI Binaries
    - Management Console
    - Launcher
    - Analyzer
    - Session Monitor
    - Data library
- A Microsoft Active Directory infrastructure (Optional)
  - Login VSI user accounts
  - Login VSI group
  - A set of policies that make sure a test runs smooth
- Launcher(s)
  - Connection clients (e.g. Microsoft RDP, Citrix ICA, VMware Horizon View or other client)
- Target
  - Microsoft Office

The Microsoft Active Directory (AD) component is optional. To use Login VSI with existing users check: Using Login VSI with existing users
3 Installation

3.1 Download Login VSI
- Browse to http://www.loginvsi.com/download
- Execute the steps displayed to download

3.2 Request a license
- Browse to http://www.loginvsi.com/license-request
- Execute the steps displayed to request a license file
- The file will be emailed to you after approval automatically

3.3 VSIshare
To store the results gathered by Login VSI and to store the binaries to run from a single location a file share in the network is needed. Create a dedicated file share with the following permissions when running a default Login VSI installation. Default groups inherited within your domain do not need to be removed as long as they do not conflict with specified settings below.

- Share security:
  - Group LoginVSI – Modify
  - Group Administrators – Modify
- NTFS security:
  - Group LoginVSI – Modify
  - Group Administrators – Modify

Preferably disable or exclude anti-virus protection, a lot of read/write occur in this share. Ensure there is no other load on the file server while conducting the tests; this could negatively impact the results.

3.3.1 Requirements
- Minimum of 5GB free disk space
- Preferably no anti-virus solutions as this impacts performance

3.3.2 Steps

<table>
<thead>
<tr>
<th>Description</th>
<th>Screenshot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy the Setup.exe to your file server and run the Setup.exe.</td>
<td><img src="VSISetup" alt="VSISetup" /></td>
</tr>
</tbody>
</table>
Click “Next”.

Select the local file share and click “Next”.

Wait until the setup is complete.

Mark the checkbox “Start Login VSI Management Console” to start the Management Console when the setup is completed (enabled by default).
Click “Finish” to complete the setup.
3.4 First start of the Login VSI Management Console

When starting Login VSI Management Console for the first time you have to import the license file that is provided by Login VSI. The license file can be requested for free at http://www.loginvsi.com/license-request

3.4.1 Requirements

- .Net version 3.5
- Valid Login VSI license file

3.4.2 Steps

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start the Login VSI Management Console from the VSIshare.</td>
</tr>
<tr>
<td>Location: (VSIshare)_VSI_ManagementConsole\VSI Management Console.exe</td>
</tr>
</tbody>
</table>

At first run the Login VSI license file needs to be imported.

Make sure the VSIshare path points to the VSIshare you just installed.

To import the license uncheck the check box “Login VSI License is stored in VSI share” and click browse.
Open the LoginVSI.lic that has been provided by Login VSI. If your license file is in .zip format make sure to unzip it first.

Click “Save”.

The LoginVSI.lic will be saved at the following location:

\(\text{\{VSIshare\}}\_\text{VSI\_Configuration}\\text{\{LoginVSI.lic\}}

The splash screen will appear with your license information.
The Login VSI Management Console will appear with the home screen.

3.5 Microsoft Active Directory preparation (optional)

The Active Directory preparation will prepare the Microsoft Active Directory for use with Login VSI. A new OU at a location of choice is created, test users are created and GPO’s are imported and linked.

Please note that AD preparation is completely optional. It is there for your convenience. When testing Login VSI preferably uses unique user accounts, to save you the hassle of creating them manually. You can generate a PowerShell script from within the Login VSI Management console to do this work for you. If you are not allowed to or do not want to run the AD preparation tool within your domain then please follow the steps outlined in the chapter: Running Login VSI without AD or Manual AD preparation.

Ensure the domain controller is performing accordingly. Login VSI has a minimal load, but you want to prevent the domain controller or your Microsoft Active Directory becomes a bottleneck.

3.5.1 Requirements

- Sufficient privileges to create User accounts / Groups and GPO’s in Active Directory
- An installed copy of the Login VSI Management Console
- The AD Deployment script should be run on the domain controller/member server logged on as Domain Admin.
- Group Policy Management Console has to be installed on the domain controller/member server.
- When choosing a password for the Login VSI users make sure it meets the basic requirements of the password complexity set on your domain.
3.5.2 Setup

Phase 1: Creating a script that can create all required users, groups and policy objects.

<table>
<thead>
<tr>
<th>Description</th>
<th>Screenshot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start the Login VSI Management Console and select: 1. Setup AD</td>
<td><img src="image1.png" alt="Screenshot" /></td>
</tr>
</tbody>
</table>

In this screen you can generate a PowerShell script to create the Login VSI Active Directory components. By default the root of the domain is selected. To create the users in a sub OU click browse to select the correct OU.

Note: The script will always create a sub OU named LoginVSI that contains the OU’s Users and Targets.
Select the preferred OU and click "Ok".

Base OU = Location to create the VSI OU
Username = LoginVSI username, the username will contain a number at the end of the username that will be auto incremented starting at 1
Password = Default password for all users
Domain = The domain wherein the AD objects should be created.
VSIshare = Path to the VSIShare created earlier
Number of Users = The total amount of users you want to create
Formatting Length = The amount of leading zeroes in the username for example: 1 results in: LoginVSI1 or 2 results in: LoginVSI001
Launcher username: Username for the launcher machine.
Launcher user password: Default password for the launcher account.
Note: There will be one Launcher user account created.
Save to PS1:

Save to PS1 will save the script with reference to the VSIShare. This way you can directly run the script, please make sure you have sufficient privileges to create the objects.

Save to ZIP:

When you are not allowed to write in the Microsoft Active Directory you can use “Save to ZIP” option to save the PowerShell script and GPO settings to a ZIP file. This way you can hand over the pre-configured AD preparation scripts to the person responsible for AD changes.

Click Save to PS1 or Save to ZIP.

Select the location to save the VSIADSetup.ps1 or VSIADSetup.zip and click Save.

The PowerShell script can be reviewed and edited to add or change specific options.

The GPO files are located on the VSIShare\_VSI_Binaries\AD Setup
The VSIADSetup.zip also contains the VSI System and VSI User GPO files.

Phase 2: Running the script that creates the users, groups, ou’s and GPO’s in AD

<table>
<thead>
<tr>
<th>Description</th>
<th>Screenshot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logon to a machine that is configured as a domain controller and logon with an account that has sufficient privileges. Start an elevated PowerShell window.</td>
<td><img src="image.png" alt="Screenshot" /></td>
</tr>
</tbody>
</table>

Note: Please make sure the Execution policy is set to unrestricted.

Set-executionpolicy unrestricted


Execute the following command:

& "VSIADSetup.ps1"
Execute the script and wait to the script to complete.

The following information will be displayed.

The OU’s, Users and Groups are created.

The Group Policy Objects are added and linked to the Login VSI Target OU and Computer OU.
3.6 Manually creating test accounts

If you do not want to or are not allowed to run the automated Login VSI user creation PowerShell scripts within your environment then it's also possible to manually create test accounts using the steps outlined below. These steps describe every object normally created by the automated preparation.

During the automated creation process Login VSI will create the following OU structure, please note that the OU structure is there to help you keep overview. It is not required for Login VSI to work.

Organizational Unit (OU) structure

- <Select a root OU within your domain>
- LoginVSI
  - User
    - Launcher
    - Target
  - Computers

Users

The Automated AD preparation will create 2 types of users.

1. So called target users. These users will logon to your target environment (the environment that you want to test). The users have a logon script specified that will start the test once the users log on. This logon script is by default placed in the sysvol folder of your domain (%\YourDomain%\SYSVOL\YourDomain\scripts\V4-VSI Logon.cmd) although the script can be placed anywhere. More details on the logon script below. Create as many user accounts as you like to test with.

2. A single launcher user. This user is used in the launcher workflow. It is a user that will logon to the so called launcher machines (the machines that initiate session). Once it logs on the users logon script will make sure that the launcher agent is started. This user also uses a logon script in the sysvol folder. More details on the script below. This is just a single user account.

Create a group

Every user mentioned above will be a member of a group. This group allows you to easily set permissions or allow access to resources. The group that is crated is called LoginVSI. This group is also referenced in the (optional) Target setup. If you choose to create a group that is not named LoginVSI then please remember to uncheck the “Add Login VSI group to local RDP group” checkbox in the Target setup.

Import and link Group Policy objects

The automated AD preparation imports and links backups of group policy objects. These are intended to make the implementation easier. The VSI-system object is linked to the Computers OU mentioned above while the VSI-user object is linked to the Target OU mentioned above.

The most important settings made in the GPO’s are:

- Logon synchronously. This allows the VSI script to complete before the users are logged on, preventing timing issues.
- Disable User Account Control (UAC). Disabling UAC makes sure that UAC prompts will not interfere with the actual test runs.

The backups can be found in %Server%\VSIshare\VSI_Binaries\AD Setup\.

If you want to manually import the pre-build Login VSI GPO’s please execute the steps below. Please note that the Login VSI Policy objects are split in User and System settings.
Logon to a machine that is configured as a domain controller and start the "Group Policy Management Console" (GPMC.msc)

Browse to the OU containing the Login VSI test computer objects. Right click and select "Create a GPO in this domain, and link it here"

The system asks to provide a name for the newly created GPO. Use (for example): LoginVSI-System-M.
In the GPMC tree browse to the “Group policy objects” container. Right click the newly created GPO and select “Import settings”.

A wizard will now guide you through the steps required to import the predefined settings. It also asks to create a backup of the policy object. If you just created this object there is no need to backup as its empty. If you are using an existing GPO make sure a backup is created.

Browse to the location of your VSIShare and browse to the folder: \Server\VSIShare\VSI_Binaries\AD Setup\VSI System\ and click “next”.
Select the “VSI-System-V4” GPO backup and click “Next”

Complete the steps in the wizard to finish the import process.

Complete the steps in the wizard to finish the import process.
Check if the “VSI-System-M” policy object now contains the imported settings.

Browse to the OU containing the Login VSI test User objects. Right click and select “Create a GPO in this domain, and link it here”.

The system asks to provide a name for the newly created GPO. Use (for example): LoginVSI-User-M.
In the GPMC tree browse to the “Group policy objects” container. Right click the newly created GPO and select “Import Settings”.

A wizard will now guide you through the steps required to import the predefined settings. It also asks to create a backup of the policy object. If you just created this object there is no need to backup as its empty. If you are using an existing GPO make sure a backup is created.

Browse to the location of your VSIshare and browse to the folder: \Server\VSIShare\_VSI_Binaries\AD Setup\VSIShare User and click “next”.

---

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21
Select the “VSI-User-V4” GPO backup and click “next”.

Complete the steps in the wizard to finish the import process.

Complete the steps in the wizard to finish the import process.
Check if the “VSI-User-M” policy object now contains the imported settings.

Create the logon scripts

The logon scripts used by the test user and the launcher accounts are, by default, created in the netlogon folder. These scripts are easy to create as they only contain one line of code:

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logon to a machine that is configured as a domain controller and start “Notepad” with administrative privileges. These steps will describe how to add the Login VSI engine to a User logon script that will be executed at the target machines.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Screenshot</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image.png" alt="Screenshot" /></td>
</tr>
</tbody>
</table>
Within Notepad goto File > Open and browse to the netlogon folder within your domain. Typically found at:
`\Nameofyourdomain.TLD\Netlogon`
Make sure to set the File extension filter to "All files *.*"

Within the netlogon folder right click to create a new TXT file

After creation rename this file to: V4-VSI-Logon.CMD and open it for editing.
Add the following line to the file:

```
CALL \server\VSIshare\VSI_Binaries\Target\Logon.cmd
```

Make sure to replace `\server\VSIshare` with the actual path to the VSIshare within your environment!

Save and close the file.

Description

Logon to a machine that’s configured as a domain controller and start “Notepad” with administrative privileges. These steps will describe how to add the Login VSI engine to a User logon script that will be executed at the launcher machines.
Within Notepad goto File > Open and browse to the netlogon folder within your domain. Typically found at:

\Nameofyourdomain.TLD\Netlogon

Make sure to set the File extension filter to "All files *.*"

Within the netlogon folder right click to create a new Text Document.

After creation rename this file to: V4-VSI-Launcher.cmd. Open the created file to edit.
Add the following line to the file:

```
CALL "\server\VSIshare\VSI_Binaries\Launcher\Agent.exe"
```

Make sure to replace \server\VSIshare with the actual path to the VSIsrare within your environment.

Save and close the file.
3.7 Target Setup

The Target Setup will prepare the test machine with the necessary software, registry settings. First you need to configure and prepare your target platform. Logically, you need to ensure you setup the required infrastructure components for the tested platform (such as licensing and connection broker). The Target Setup will install the following software, when already available either installed or delivered via application virtualization the installation of the specific application can be disabled.

Applications that will be installed when selected:

- Doro PDF version v1.82
- Adobe Reader XI v11.0.01
- Adobe Flash 11 ActiveX
- Sun Java 7 Update 13
- Microsoft .Net 3.5

Configuration changes:

- Set FreeMind FTA (Sets a filetype association so freemind documents can be opened)
- Add Login VSI group to local RDP group (Allows Login VSI users to logon to the machine)

3.7.1 Requirements

- Microsoft .net Framework 2.0 or above
- Only install drivers that are truly required. It is not recommended to install management/security software if you do not intend to analyze their specific performance impact.
- Install a default installation of Microsoft Office. Note: Service pack 1 for Office 2007 seems to have a considerable performance overhead caused by a bug in Outlook. It is therefore recommended to install SP2, instead of SP1; or we suggest you to use Office 2007 without service packs or Office 2007 with SP2. The latest service pack resolves the Outlook bug.
- Install the latest Microsoft hot fixes from Microsoft Update.
- Citrix/Microsoft Remote Desktop Services only:
  - Enable Remote Desktop Services (Terminal Server).
- VDI specific:
  - Install client/agent software.
  - Do not forget to perform additional system tuning recommended by the vendor.
3.7.2 Steps

<table>
<thead>
<tr>
<th>Description</th>
<th>Screenshot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy the Login VSI target setup to the target and run the TargetSetup.exe as an administrator with elevated privileges.</td>
<td><img src="image" alt="Screenshot of TargetSetup" /></td>
</tr>
</tbody>
</table>

Select the components that need to be installed. Default = all

- Install DoioPDF
- Install Adobe Reader
- Install Adobe Flash
- Install Java
- Set MindMap FTA
- Install .Net 3.5
- Add VSI group to local FDP group

VSIShare

Start Target Setup
Specify the path to the VSIs@re and click on Start Target Setup.

During the setup all the individual installations will be shown. The process can be seen in the CMD box.

Wait for the setup to finish.
When the bar is at 100% the setup is completed.

You can verify if the applications are installed by running Appwiz.cpl or opening the Programs and Features from the control panel.

The listed application are:
Adobe Reader
Doro
Java

3.8 Adding launchers

Launchers are required to initiate the remote connection to the target. Launchers require a Microsoft Windows based OS that contains the remote client that is used (e.g. RDP client, VMware View client, Citrix client etc). We recommend using the launcher workflow to start all launchers or set auto logon to automatically start the Login VSI Launcher Agent.

3.8.1 Requirements

- When testing Microsoft Remote Desktop Services, the Microsoft Remote Desktop Services Client must be installed. RDP 5 and more recent are supported.
- When testing Citrix XenApp or Citrix XenDesktop, the Citrix client must be installed in the default location. (Program Files\Citrix\ICA Client).
- When testing VMware Horizon View the Horizon View Client must be installed.

Recommendations:
The amount of sessions you can run on a launcher workstation with RDP/ICA is limited to system recourses. Especially memory and CPU (single core) can be a limiting factor which can influence the results. A safe method to calculate how many sessions you can start from one workstation/server is:

- RECOMMENDED: Use a maximum of 50 sessions per machine with 2 Cores (or 2 dedicated vCPU’s) and 2GB RAM, when the GDI limit not has been tuned (default).
- When the GDI limit has been tuned, calculate 30 sessions per CPU core (Intel core2 duo or AMD equivalent).
- Subtract 256MB from total memory which is already consumed by the operating system. Divide the remaining total memory by 15MB per session (on 32-bit platforms).
- When using the multimedia workload, do not exceed more than 20 sessions per launcher. The multimedia workloads will put a considerably higher load on launcher clients.

It is not recommended to start more than 50 sessions per launcher workstation. If you need to launch more sessions run additional launcher workstations when the first launcher is finished.

### 3.8.2 Steps

**Description**

Start the Login VSI Management Console from the VSishare.

**Screenshot**

Click on 2. “Add Launchers”.

![Add Launchers Screenshot](image-url)
Click on “Yes” in the blue bar or “Add Launchers” down in the right corner.

Click “Next”.

Depending of the total amount of launchers to add you can select Single machine or Batch entry.

Start with “Single entry”.

Click “Next”.
Provide the hostname of the computer that will be used as the launcher.

Note: The “Name” must be identical with the hostname of the launcher computer.

Provide the “Maximum capacity” of total sessions that can be launched on the launcher. It is not recommended to go above 50 sessions per launcher.

Mark the checkbox enable to enable the launcher for use.

Click “Next”.

Review the information and click on Finish.

The launcher machine is added and ready for use.
Optional: To add a batch of launchers please continue the wizard until the “Select method” tab.

Select “Batch entry” and click “Next”.

Provide the base-hostname of the computer that will be used as the launcher.

Note: The “Name” must be identical to the hostname of the launcher computer.

Provide the “Start number”, default = 1
“Increment” can be configured, default = 1
“Count” will be the total of launchers that will be created.

Provide the “Maximum capacity” of total sessions that can be launched on the launcher.
It is not recommended to go above 50 sessions per launcher.

“Formatting length” is the amount of numbers that will be used after the name.

“Enabled” will enable all launchers.

When every option is configured properly click “next”.

The following screen will provide you with an overview of the launchers that will be added.
In this view you can modify the name, capacity or disable/enable the launcher.

Click “next” to continue.
The review information is shown with all the launchers that will be added. Click “finish” to add all the launchers.

The launchers machines are added and ready for use.
3.9 Basic workload settings

The medium workload is the only workload available in Login VSI Express and also available in Login VSI Pro. The medium workload is the default workload in Login VSI.

3.9.1 Steps

Start the Login VSI Management Console located in the VSIshare.

In the Home screen on the left side click "workload".
In this overview all the workload settings can be configured. The only required setting is the “Office version”.

The setting “Office version” is required to configure, all other settings are optional. In this quick setup the office version 2013 is used.

Please see chapter 3.9.2 for a detailed overview of all settings.

By leaving the tab the settings will be saved.

### 3.9.2 All workload settings

<table>
<thead>
<tr>
<th>Login VSI Logon Processor</th>
<th></th>
<th>Import registry settings that: Configure Outlook and office for first use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import office registry</td>
<td>Enabled</td>
<td>Import registry settings that: Configure Outlook and office for first use</td>
</tr>
<tr>
<td>Copy PST file</td>
<td>Enabled</td>
<td>Copy a PST file during logon that will be used to populate Microsoft Outlook with data during test</td>
</tr>
<tr>
<td>Map User home</td>
<td>Enabled</td>
<td>Map user home drive during Login VSI Logon procedure</td>
</tr>
<tr>
<td>Map group drive</td>
<td>Enabled</td>
<td>Map user group drive during Login VSI Logon procedure</td>
</tr>
<tr>
<td>Setting</td>
<td>Value</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Set FreeMind FTA</td>
<td>Enabled</td>
<td>Connect the .mm File type association to mindmap application</td>
</tr>
<tr>
<td><strong>Workload</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office version</td>
<td></td>
<td>The office version to use during the tests</td>
</tr>
<tr>
<td>Enable engine debugging</td>
<td>Disabled</td>
<td>Log engine errors during a test, only enable for troubleshooting purposes, has a significant performance overhead.</td>
</tr>
<tr>
<td>Enable workload debugging</td>
<td>Disabled</td>
<td>Log workload errors during a test, only enable for troubleshooting purposes, has a significant performance overhead.</td>
</tr>
<tr>
<td>PDFPrinting</td>
<td>Enabled</td>
<td>Print a PDF file during the workload, when disabled a pre-generated PDF file will be used</td>
</tr>
<tr>
<td>Pause hotkey</td>
<td>{Pause}</td>
<td>Hotkey to pause the workload simulation during a test in the session</td>
</tr>
<tr>
<td>Maximum loops</td>
<td>99999</td>
<td>Maximum loops a VSI workload will execute</td>
</tr>
<tr>
<td>Logoff action</td>
<td>Shutdown /l</td>
<td>Command VSI executes to logoff a user session</td>
</tr>
<tr>
<td>Workload language</td>
<td>EN</td>
<td>Language of the OS and Office on the target VM’s</td>
</tr>
<tr>
<td>User home drive</td>
<td>H:</td>
<td>Default drive letter that VSI uses as a home drive</td>
</tr>
<tr>
<td>User group drive</td>
<td>G</td>
<td>Default drive letter that VSI uses as a group drive</td>
</tr>
<tr>
<td>Logoff sessions at</td>
<td>Timer</td>
<td>At what position in the workload should VSI logoff when a test is completed</td>
</tr>
<tr>
<td>Segments per log file</td>
<td>20</td>
<td>How many segments should VSI store per log file to prevent log files becoming too large</td>
</tr>
<tr>
<td>Random initial wait</td>
<td>15</td>
<td>How long should Login VSI wait before initiating a session within the desktop (maximum)</td>
</tr>
<tr>
<td><strong>Progress bar</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine startup</td>
<td>Shell</td>
<td>Shell: Start Login VSI using the run once registry keys</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chained: Start Login VSI using only the logon script</td>
</tr>
<tr>
<td>Progress bar shadow</td>
<td>Enabled</td>
<td>Disable shadows for the progress bar to improve display performance</td>
</tr>
<tr>
<td>Progress bar display</td>
<td>Normal</td>
<td>Minimize the Login VSI progress bar</td>
</tr>
</tbody>
</table>
3.10 Creating a scenario

Scenarios are used to control the amount of users Login VSI will logon during one or multiple timeframes. Login VSI can logon users in one single phase with a fixed interval or in multiple phases all with different intervals.

3.10.1 Setup

Start the Login VSI Management Console in the VSishare

Click 4. Configure Scenario
On this tab you can create a scenario for your test.

By default the medium workload is selected. Click on sessions and enter the amount of sessions you want to run.

The timeframe is shown in seconds and by default all sessions will be launched in 48 minutes (2880 seconds).

By leaving the tab all settings will be saved automatically.

The basephase is used to measure the performance of the environment without the user load. This way Login VSI can estimate the normal response times to calculate the baseline that is used in the VSImax results.

Click save.
3.11  Connection configuration

3.11.1  Setup

**Description**

Start the Login VSI Management console from the VSIShare

**Screenshot**

Click on 5. Configure connection.

Here you can configure the connection command line. In this demo we will configure a RDP connection to a Windows Terminal Server.

Click on start connection wizard.
Click next.

Select the connection type. In this case we will select RDP Connection.

Click next.

In this step you have to specify the connection information. To specify the user or session host numbers you can use the \{Count\} variable. In case a formatting length is used you can specify the length with a \{Count/number\}. Example: LoginVSI(Count/3) will generate the username LoginVSI001. Default = LoginVSI(Count)

Specify a RD Session Host.

Enter a username

Enter the password, default = Password!

Domain is optional
In this step you can specify the session display settings.

Click next.

In this step you can enable resource mappings. Mapping printers is not recommended.

Click next.

In this step you can edit the connection experience.

Click next.
If required, you can configure a remote desktop gateway.

Click next.

The final command line is shown.

Click finish.

All settings are configured and can be edited.
4 Start your first test

In this chapter the steps required to start your first test are described.

4.1 Requirements

- VSIshare
- Login VSI Management Console
- At least 1 launcher

4.1.1 Steps

**Description**

First we are going to start the Session monitor. The Session Monitor needs to run on the server that is hosting the VSIShare.

Browse to the local VSIShare to the following location: `{VSIshare}\_VSI_Binaries\Launcher`

Start the SessionMonitor.exe.
Provide the location of the local file share.
Click on start to start the session monitor

Start the Login VSI Management Console

Click on 6. Start Test
This page will contain an overview of the current configured settings.

Click in the top right corner start test.

Click next.

To automatically logoff all sessions mark the Logoff sessions when all session have been launched. By default 120 seconds is configured.

Click next.
Provide a name for the first test.  
Click next.  

Mark the checkbox Use launcher workflow.  
Enter the Launcher username: Launcher-v4  
Enter the Launcher password: Password!  
Click next.  

This feature is only available in Login VSI PRO, express users can skip this step.

Click next.  

This feature is only available in Login VSI PRO, express users can skip this step.
Click on next.

The launcher workflow will launch a RDP connection to the launcher.

The automatic agent start feature (launcher workflow) is only available in Login VSI PRO, express users have to make sure that `\server\VSIshare\VSI_binaries\Launcher\Agent.exe` is running at the Launcher machine.

When the launcher agent.exe is running he will inform the Management Console that he is ready.
The launcher will give the status ready.
Click on next.

Make sure the launcher is added by HOSTNAME only, not IP of FQDN otherwise the status will stay pending at “waiting”

Click on finish

The launcher will start the connections to the target.
The dashboard will open automatically and will provide you the information of current test.

For a detailed overview of the dashboard please see chapter ....

4.2 Finishing your first test

4.2.1 Steps

<table>
<thead>
<tr>
<th>Description</th>
<th>Screenshot</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Dashboard will indicate when a test is finished. On the bottom the message “The test is finished, please click “reload” to reload this page.”</td>
<td><img src="image-url" alt="Screenshot" /></td>
</tr>
</tbody>
</table>

4.3 Analyzing the results

The Login VSI Analyzer will process the data collected during the VSI workload. The analyzer will calculate if the target environment has reached its saturation point and if so, at how many concurrent session. This point is called VSMax.

<table>
<thead>
<tr>
<th>Description</th>
<th>Screenshot</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image-url" alt="Screenshot" /></td>
</tr>
</tbody>
</table>
Start the Login VSI Analyzer by clicking the Analyzer button in the bottom left corner of the Login VSI Management Console.

The location of the cache and the location of the VSIshare will need to be specified if the Analyzer runs for the first time.

Specify the path to the VSIshare. Change the location of the cache if desired. Click Save to continue.
Select the test that you want to analyze and click Open to start the analysis.

4.4 Analyzer tabs

4.4.1 VSImax v4

<table>
<thead>
<tr>
<th>Description</th>
<th>Screenshot</th>
</tr>
</thead>
<tbody>
<tr>
<td>The VSImax v4 tab is the main tab of the Login VSI analyzer. This tab shows the most important information.</td>
<td>![Screenshot of VSImax v4 tab]</td>
</tr>
</tbody>
</table>
This section shows the following.

**VSImax v4:**
VSImax v4 shows the amount of sessions can be active on a system before the system is saturated. The blue X shows the point where VSImax was reached. This number gives you an indication of the scalability of the environment (higher is better).

**VSIbase:**
VSIbase is the performance of the system while there is no load on the environment. This number is used to determine what the performance threshold will be. VSIbase gives an indication of the base performance of the environment (lower is better). VSIbase is also indicated within the graph.

**VSImax v4 threshold:**
VSImax v4 threshold indicates at which point the environments saturation point is reached. It is based on VSIbase. VSImax v4 threshold is also indicated within the graph.

**Stuck sessions:**
How many sessions got stuck during the test. This number should be 0. Stuck sessions indicate a problem during the test. As stuck session do not generate load the VSImax score will be reduced by the number of stuck sessions.
Minimum Response:
Minimum response indicates the minimum response time for all the measurements taken when the indicated number of sessions on the X axis were active.

Average Response:
Average response indicates the average response time for all the measurements taken when the indicated number of sessions on the X axis were active.

Maximum Response:
Maximum response indicates the maximum response time for all the measurements taken when the indicated number of sessions on the X axis were active.

VSI Index Average:
VSI Index Average indicates the average value as calculated by VSI. The VSI Index Average differs from Average Response on the fact that Average Response is the pure average. VSI Index Average applies certain statistical rules to the average to avoid spikes from influencing the average too much.

4.4.2 VSImax v4 detailed

The VSImax v4 detailed tab shows the individual measurements taken during a test in a combined graph. This graph shows the minimum, average and maximum response times for each individual measurement. There is also a Total metric that combines all of the metric into a single number. The minimum, average and maximum for this combined value is shown as well.
The metrics are as follows.

**Total:**
The sum of all the metrics.

**FCDL:**
File Copy Doc Local. Copy a doc (Microsoft Word) file locally.

**FCDS:**
File Copy Doc Share. Copy a doc (Microsoft Word) file from the VSI content location to the local file system.

**FCTL:**
File Copy Text Local. Copy a txt (plain text) file locally.

**FCTS:**
File Copy Text Share. Copy a txt (plain text) file locally.

**NFP:**
Notepad File Print. Open the print dialog in notepad.

**NSLD:**
Notepad Start/Load file. Start notepad by file type association, loading a text file.

**WFO:**
Windows File Open. Open the file > open dialog in notepad.

**WSLD:**
Word File Start/Load. Open Microsoft Word by file type association, loading a doc file.

**ZHC:**
Zip High Compression. Zip a PST (Outlook Personal Folder) file, which is approximately 5 megabytes in size, using high compression.

**ZNC:**
Zip No Compression. Zip a PST (Outlook Personal Folder) file, which is approximately 5 megabytes in size, using no compression.
4.4.3 VSImax v4 detailed weighted

The VSImax v4 detailed weighted tab shows the individual measurements taken during a test in a combined graph where a multiplier is applied. This graph shows the minimum, average and maximum response times for each individual measurement. In this graph you can clearly see which measurement has an impact on your environment. For each individual weights please see chapter 4.5.3

The metrics are as follows.

**NFP:**
Notepad File Print. Open the print dialog in notepad.

**NSLD:**
Notepad Start/LoaD file. Start notepad by file type association, loading a text file.

**WFO:**
Windows File Open. Open the file > open dialog in notepad.

**WSLD:**
Word File Start/LoaD. Open Microsoft Word by file type association, loading a doc file.

**ZHC:**
Zip High Compression. Zip a PST (Outlook Personal Folder) file, which is approximately 5 megabytes in size, using high compression.

**ZNC:**
Zip No Compression. Zip a PST (Outlook Personal Folder) file, which is approximately 5 megabytes in size, using no compression.
4.4.4 VSImax v4 Scatter

<table>
<thead>
<tr>
<th>Description</th>
<th>Screenshot</th>
</tr>
</thead>
<tbody>
<tr>
<td>The VSImax Scatter tab allows you to see the measurements based on time. Every tab before this tab shows the measurements consolidated by active session count. This tab allows you to see the data based on the time it was collected. This is particularly useful to get an insight in trends after the sessions have finished logging on. The other tabs will consolidate all of the data collected after the last session has become active into a single data point. Namely the last active session count.</td>
<td><img src="image1.png" alt="Screenshot" /></td>
</tr>
</tbody>
</table>

4.4.5 WSLD, NSLD, WFO, NFP, ZHC, ZNC

<table>
<thead>
<tr>
<th>Description</th>
<th>Screenshot</th>
</tr>
</thead>
<tbody>
<tr>
<td>These tabs show information for the individual measurements taken during the test. These specific measurements are zoomed in to because they are used to calculate VSIbase and VSImax v4 threshold.</td>
<td><img src="image2.png" alt="Screenshot" /></td>
</tr>
</tbody>
</table>
The tab is similar to the VSImax v4 detailed tab except that it, by default, will only show the measurement for the tab. The graphs scale has also been scaled for the individual measurement.

The tab will also display the baseline value for this measurement. This is the time it takes to complete this measurement during baseline measurements. These measurements are taken while the system is under no or very little load. It is used to see how the measurement trends from a system that isn’t under load.

These tabs also allow you to add any of the other metrics. The baseline for the tabs specific metric will not disappear though.
4.4.6 LogonTimer

The LogonTimer tab gives you an indication of the time it takes for a session to logon. The graph shows the trend of logon times during the test. The logon time is specified in seconds.

Please note that this is an indication of the logon time. VSI measures the time from the logon scripts running, shortly after group policy has been processed but before the shell has loaded (Windows Explorer), and the windows shell being loaded.

4.4.7 VSImax v4 Data & Raw Data

These tabs contain the raw and processed data used to create the graphs in the analyzer. You can use this data to run your own analysis on.

4.5 Description

4.5.1 VSImax

The philosophy behind Login VSI is different to conventional benchmarks. In general, most system benchmarks are steady state benchmarks. These benchmarks execute one or multiple processes, and the measured execution time is the outcome of the test. Simply put: the faster the execution time or the bigger the throughput, the faster the system is according to the benchmark.

Login VSI is different in approach. Login VSI is not primarily designed to be a steady state benchmark (however, if needed, Login VSI can act like one). Login VSI was designed to perform benchmarks for SBC or VDI workloads through system saturation. Login VSI loads the system with simulated user workloads using well known desktop applications like Microsoft Office, Internet Explorer and Adobe PDF reader. By gradually increasing the amount of simulated users, the system will eventually be saturated. Once the system is saturated, the response time of the applications will increase significantly. This latency in application response times a clear indication whether the system is (close to being) overloaded. As a result, by nearly overloading a system it is possible to find out what its true maximum user capacity is.

After a test is performed, the response times can be analyzed to calculate the maximum active session/desktop capacity. Within Login VSI this is calculated as VSImax. When the system is coming closer to its saturation point, response times will rise. When reviewing the average response time it will be clear the response times escalate at saturation point. With previous versions of Login VSI (LoginVSI 3.x and older), if the system was not saturated during the test, it will not be able to calculate VSImax. This has changed with LoginVSI 4.0.
This VSImax is the “Virtual Session Index (VSI)”. With Virtual Desktop Infrastructure (VDI) and Terminal Services (RDS) workloads this is valid and useful information. This index simplifies comparisons and makes it possible to understand the true impact of configuration changes on hypervisor host or guest level.

4.5.2 Server side response time measurements

It is important to understand why specific Login VSI design choices have been made. An important design choice is to execute the workload directly on the target system within the session instead of using remote sessions. The scripts simulating the workloads are performed by an engine that executes workload scripts on every target system, and are initiated at logon within the simulated user’s desktop session context.

An alternative to the Login VSI method would be to generate user actions client side through the remoting protocol. These methods are always specific to a product and vendor dependent. More importantly, some protocols simply do not have a method to script user actions client side.

For Login VSI the choice has been made to execute the scripts completely server side. This is the only practical and platform independent solution, for a benchmark like Login VSI. The relative overhead and footprint of a benchmark engine scripted in AutoIT is small enough (1-5% range) for Login VSI’s purposes.

4.5.3 Calculating VSImax v4

The simulated desktop workload is scripted in a 48 minute loop when a simulated Login VSI user is logged on, performing generic Office worker activities. After the loop is finished it will restart automatically. Within each loop the response times of twelve specific operations are measured in a regular interval: twelve times in within each loop. The response times of these six operations are used to determine VSImax.

The six operations from which the response times are measured are:

**Starting “VSI Notepad”**

This operation is handled by the OS (loading and initiating VSINotepad.exe) and by the VSINotepad.exe itself through execution. This operation seems almost instant from an end-user’s point of view.

**Starting the “File Open” dialogue**

This operation is handled for a small part by Word and a large part by the operating system. The file open dialogue uses generic subsystems and interface components of the OS. The OS provides the contents of this dialogue.

**Starting the “Print” dialogue**

This operation is handled for a large part by the OS subsystems, as the print dialogue is provided by the OS. This dialogue loads the print-subsystem and the drivers of the selected printer. As a result, this dialogue is also dependent on disk performance.

**Compress the document into a zip file with 7-zip command line (2x)**

This operation is handled by the command line version of 7-zip. The compression will very briefly spike CPU and disk IO. This action is performed twice: once with no compression (IO intensive) and with high compression (CPU intensive)

**Starting Microsoft Word with a document**
This operation will measure the responsiveness of the Operating System and the file system. Microsoft Word is started and loaded into memory, also the new document is automatically loaded into Microsoft Word. When the disk IO is extensive or even saturated, this will impact the file open dialogue considerably.

These measured operations within Login VSI do hit considerably different subsystems such as CPU (user and kernel), Memory, Disk, the OS in general, the application itself, print, GDI, etc. These operations are specifically short by nature. When such operations become consistently long: the system is saturated because of excessive queuing on any kind of resource. As a result, the average response times will then escalate. This effect is clearly visible to end-users. If such operations consistently consume multiple seconds the user will regard the system as slow and unresponsive.

![Figure 1 Sample of a VSI max responsetime graph, representing a normal test](image-url)
Once the test is finished, VSImax v4 can be calculated. Previous VSImax models (Classic and Dynamic) could not be calculated when the system was not saturated. In VSImax v4 this is not a requirement anymore. When the system is not saturated, and it could complete the full test without exceeding the average response time latency threshold, VSImax is now considered the maximum of active sessions that were launched.

The response times are very different per measurement type, for instance Zip with compression can be around 2800 ms, while the Zip action without compression can only take 75ms. These response time of these actions are weighted before they are added to the total. This ensures that each activity has an equal impact on the total response time.

In comparison to previous VSImax models, this weighting much better represent system performance. All action have very similar weight in the VSImax total, both in VSImax classic and dynamic the opening of word had far greater impact on the total than other activities. The following weighting of the response times are applied:

The following actions are part of the VSImax v4 calculation and are weighted as follows:

- Start VSINotepad with large text file: 0.5
- Start File Open Dialogue: 1.25
- Start Print dialogue: 4
- Zip PST file without compression: 6
- Zip PST file with high compression: 0.175
- Start Word with new document from document pool: 0.15

This weighting is applied on the baseline and normal Login VSI response times.
The average VSImax baseline response time (also called VSIbase) in Login VSI 4.0 is calculated from the results recorded in the baseline phase. In total 30 VSI response time samples are taken by 5 baseline sessions. To ensure the VSIbase represents the optimal performance of the system, the highest 15 results are removed from the average calculation. To ensure no fluke low measurements are affecting the results unrealistically, the bottom 2 results are removed from the average VSIbase calculation. Over the remaining 13 VSI response time measurements the average VSImax baseline response time VSIbase is calculated.

The VSImax average response time in Login VSI 4.0 is calculated on the amount of active users that are logged on the system.

Always a 5 Login VSI response time samples are averaged + 40% of the amount of “active” sessions. For example, if the active sessions is 60, then latest 5 + 24 (=40% of 60) = 31 response time measurement are used for the average calculation.

To remove noise (accidental spikes) from the calculation, the top 5% and bottom 5% of the VSI response time samples are removed from the average calculation, with a minimum of 1 top and 1 bottom sample. As a result, with 60 active users, the last 31 VSI response time sample are taken. From those 31 samples the top 2 samples are removed and lowest 2 results are removed (5% of 31 = 1.55, rounded to 2). At 60 users the average is then calculated over the 27 remaining results.

VSImax v4 is reached when the VSIbase + a 2600 ms latency threshold is not reached by the average VSI response time result. Depending on the tested system, VSImax response time can grow 2 - 3x the baseline average. In end-user computing, a 3x increase in response time in comparison to the baseline is typically regarded as the maximum performance degradation to be considered acceptable.

Note: In VSImax Dynamic the latency threshold was dependent on the baseline measurement at the beginning of the test. 25% of the baseline measurement was added to a latency threshold. While this was not a problem with most tests, in some cases, especially when the systems performance was very close between two different configurations, the slower system might get a higher VSImax score simply because the higher baseline results gave the slower system a higher latency threshold.

In VSImax v4 this latency threshold is fixed to 2600ms, this allows better and fairer comparisons between two different systems, especially when they have different baseline results. Ultimately, in VSImax v4, the performance of the system is not decided by the total average response time, but by the latency is has under load. For all systems, this is now 2600ms (weighted).

The threshold for the total response time is: average weighted baseline phase response time + 2600ms.

When the system has a weighted baseline response time average of 1500ms, the maximum average response time may not be greater than 4100ms (1500+2600). If the average baseline is 3000 the maximum average response time may not be greater than 5600ms (3000+2600).

VSImax v4 is determined before the system has exceeded it threshold. For example, when the VSImax average on system has exceeded the VSI threshold at 80 users, the VSImax will be 79.

When the threshold is not exceeded by the average VSI response time during the test, VSImax is now considered the maximum amount of users that was launched. This approach is fundamentally different in comparison to previous VSImax methods, as is it was always required to saturate the system beyond VSImax threshold.
Lastly, VSImax v4 is now always reported with the average baseline VSI response time result. For example: ‘The VSImax v4 was 125 with a baseline of 1526ms’. This helps considerably in the comparison of systems and gives a more complete understanding of the system. The baseline performance helps to understand the best performance the system can give to an individual user. VSImax indicates what the total user capacity is for the system. These two are not automatically connected and related.

When a server with a very fast dual core CPU, running at 3.6 GHZ, is compared to a 10 core CPU, running at 2.26 GHZ, the dual core machine will give and individual user better performance than the 10 core machine. This is indicated by the baseline VSI response time. The lower this score is, the better performance an individual user can expect.

However, the server with the slower 10 core CPU will easily have a larger capacity than the faster dual core system. This is indicated by VSImax v4, and the higher VSImax is, the larger overall user capacity can be expected.

With Login VSI 3.6 it is was possible to choose between ‘VSImax Classic’ and ‘VSImax Dynamic’. With Login VSI 4.0 a new VSImax method is introduced: VSImax v4. This methodology gives much better insight in system performance and scales to extremely large systems. ‘VSImax Classic’ and ‘VSImax Dynamic’ are not suitable for large systems.

4.5.4 VSImax Classic

VSImax Classic is based on the previous versions of VSI, and is achieved when the average VSI response time is higher than a fixed threshold of 4000ms. This method proves to be reliable when no anti-virus or application virtualization is used.

In practice however, tests have shown a substantial increase of application response time when antivirus and/or application virtualization is used. The baseline response time is typically around 1400 – 1800 ms without application virtualization or antivirus. However, when anti-virus or application virtualization is used, the baseline response time varies between 2500 – 3500 ms.

When the baseline response time is already so high the VSImax Classic threshold of 4000ms is too easily reached. ‘VSImax Classic’ will report a maximum long before system resources like CPU, RAM or disk are actually saturated.

It was therefore decided to further optimize VSImax calculation.

4.5.5 VSImax Dynamic

Similar to ‘VSImax Classic’, VSImax Dynamic is calculated when the response times are consistently above a certain threshold. However, this threshold is now dynamically calculated on the baseline response time of the test. VSImax Dynamic was introduced in VSI 3.0.

For this the average VSImax response times need to consistenly higher than a dynamically calculated threshold. To determine this dynamic threshold, first the average baseline response time is calculated. This is done by averaging the baseline response time of the first 15 VSI users on the system.

The formula for the dynamic threshold is: \( \text{Avg. Baseline Response Time} \times 125\% + 3000 \). As a result, when the baseline response time is 1800, the VSImax threshold will now be 1800 \( \times 125\% + 3000 = 5250ms \).

Especially when application virtualization is used, the baseline response time can wildly vary per vendor and streaming strategy.
4.5.6 Baseline update patch 4.0.7

The Login VSI analyzer used to plot an imaginary line at the start of a test which interferes with the baseline when the Basephase is not used. We have noticed the line can be confusing when analyzing the results and to eliminate any confusing we have decided to remove the incorrect calculation. When the Basephase is not used there will be 6% increase in millisecond on the Baseline. Because the baseline will increase this will have an effect on the VSImax. To be precise the VSImax will increase with 1%.

The following screenshot shows the imaginary line from the previous analyzer.

![Previous Analyzer Screenshot]

The following screenshot shows the current analyzer where the line is removed.

![Current Analyzer Screenshot]

Note: This is only applies when the BasePhase is not used. We recommend to always use the BasePhase if possible for the accurate baseline results.
5 All settings

5.1 AD Overview

5.1.1 Logon Scripts
In order to run Login VSI properly Login VSI uses a logon script.

V4-VSI_Launcher.cmd
Contains the command to run the Agent.exe from the VSI Share.

V4-VSI_Logon.cmd
Contains the command to run the Logon.cmd on the VSI Share.

5.1.2 User Account
In order to run Login VSI on the user side the logon script needs to be specified. This is automatically done when the VSIADSetup.ps1 is used.

5.1.3 Group Policies Settings
In the Group Policy objects are the following settings configured.
<table>
<thead>
<tr>
<th>Policy</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Account Control: Admin Approval Mode for the Built-In Administrator account</td>
<td>Disabled</td>
<td>To prevent the user account control interrupt the test.</td>
</tr>
<tr>
<td>User Account Control: Allow UIAccess applications to prompt for elevation without using the secure desktop</td>
<td>Disabled</td>
<td></td>
</tr>
<tr>
<td>User Account Control: Behavior of the elevation prompt for administrators in Admin Approval Mode</td>
<td>Elevate without prompting</td>
<td></td>
</tr>
<tr>
<td>User Account Control: Detect application installations and prompt for elevation</td>
<td>Disabled</td>
<td></td>
</tr>
<tr>
<td>User Account Control: Only elevate executables that are signed and validated</td>
<td>Disabled</td>
<td></td>
</tr>
<tr>
<td>User Account Control: Only elevate UIAccess applications that are installed in secure locations</td>
<td>Disabled</td>
<td></td>
</tr>
<tr>
<td>User Account Control: Run all administrators in Admin Approval Mode</td>
<td>Disabled</td>
<td></td>
</tr>
<tr>
<td>User Account Control: Switch to the secure desktop when prompting for elevation</td>
<td>Disabled</td>
<td></td>
</tr>
<tr>
<td>Administrative Templates/System/Group Policy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allow asynchronous user Group Policy processing when logging on through Remote Desktop Services</td>
<td>Disabled</td>
<td></td>
</tr>
<tr>
<td>User Group Policy loopback processing mode</td>
<td>Merge</td>
<td></td>
</tr>
<tr>
<td>Administrative Templates/System/Logon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always wait for the network at computer startup and logon</td>
<td>Enabled</td>
<td></td>
</tr>
<tr>
<td>Don't display the Getting Started welcome screen at logon</td>
<td>Enabled</td>
<td></td>
</tr>
<tr>
<td>Administrative Templates/System/Script</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run logon scripts synchronously</td>
<td>Enabled</td>
<td></td>
</tr>
<tr>
<td>Administrative Templates/Internet Explorer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disable showing the splash screen</td>
<td>Enabled</td>
<td></td>
</tr>
<tr>
<td>Administrative Templates/Remote Desktop Services/Remote Desktop Session Host/Connections</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allow users to connect remotely using Remote Desktop Services</td>
<td>Enabled</td>
<td></td>
</tr>
<tr>
<td>Set rules for remote control of Remote Desktop Services user sessions</td>
<td>Enabled</td>
<td>Option: Full Control without user's permission</td>
</tr>
<tr>
<td>Administrative Templates/Remote Desktop Services/Remote Desktop Session Host/Device and Resource Redirection</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### VSI-User-v4

<table>
<thead>
<tr>
<th>Policy</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Administrative Templates /Windows Components/Remote Desktop Services/Remote Desktop Session Host</strong>&lt;br&gt;Do not use temporary folders per session</td>
<td>Enabled</td>
<td></td>
</tr>
<tr>
<td><strong>Policy</strong></td>
<td><strong>Setting</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>Administrative Templates /Control Panel/Personalization <strong>Enable screen saver</strong></td>
<td>Disabled</td>
<td></td>
</tr>
<tr>
<td>Administrative Templates /Desktop <strong>Remove the Desktop Cleanup Wizard</strong></td>
<td>Enabled</td>
<td></td>
</tr>
<tr>
<td>Administrative Templates /Microsoft Office Outlook 2007 /Tools</td>
<td><strong>AutoArchive Settings</strong></td>
<td>Enabled</td>
</tr>
<tr>
<td></td>
<td><strong>Turn on AutoArchive</strong></td>
<td>Disabled</td>
</tr>
<tr>
<td></td>
<td><strong>Run AutoArchive every &lt;x&gt; days</strong></td>
<td>14</td>
</tr>
<tr>
<td></td>
<td><strong>Prompt before AutoArchive &lt;x&gt; runs</strong></td>
<td>Disabled</td>
</tr>
<tr>
<td></td>
<td><strong>During AutoArchive:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Delete expired items (e-mail folders only)</strong></td>
<td>Disabled</td>
</tr>
<tr>
<td></td>
<td><strong>Archive or delete old items</strong></td>
<td>Disabled</td>
</tr>
<tr>
<td></td>
<td><strong>Show archive folder in folder list</strong></td>
<td>Disabled</td>
</tr>
<tr>
<td></td>
<td><strong>Clean out items older than</strong></td>
<td>6 Months</td>
</tr>
<tr>
<td></td>
<td><strong>Permanently delete old items</strong></td>
<td>Disabled</td>
</tr>
<tr>
<td></td>
<td>**Disable File</td>
<td>Archive**</td>
</tr>
<tr>
<td>Administrative Templates /System <strong>Prevent access to registry editing tools</strong></td>
<td>Disabled</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Prevent access to the command prompt</strong></td>
<td>Disabled</td>
</tr>
<tr>
<td></td>
<td><strong>Windows Automatic Updates</strong></td>
<td>Disabled</td>
</tr>
<tr>
<td></td>
<td><strong>Administrative Templates /System/Scripts</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Run legacy logon scripts hidden</strong></td>
<td>Disabled</td>
</tr>
<tr>
<td></td>
<td><strong>Run logon scripts synchronously</strong></td>
<td>Enabled</td>
</tr>
<tr>
<td></td>
<td><strong>Run logon scripts visible</strong></td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/AutoPlay Policies</td>
<td>Turn off Autoplay</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer</td>
<td>Disable changing home page settings</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer</td>
<td>Disable Internet Connection wizard</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Approved Controls</td>
<td>Prevent performance of First Run Customize settings</td>
<td>Enabled Go directly to home page</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Accelerators</td>
<td>Shockwave Flash</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Administrator</td>
<td>Allow active content from CDs to run on user machines</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Control Panel/Advanced Page</td>
<td>Allow Install On Demand (Internet Explorer)</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Control Panel/Security Page/Local Machine Zones</td>
<td>Allow software to run or install even if the signature is invalid</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Control Panel/Security Page/Locked-Down Intranet Zone</td>
<td>Allow third-party browser extensions</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Control Panel/Security Page/Locked-Down Intranet Zone</td>
<td>Allow animations in web pages</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Control Panel/Security Page/Locked-Down Intranet Zone</td>
<td>Play animations in web pages</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Control Panel/Security Page/Locked-Down Intranet Zone</td>
<td>Play sounds in web pages</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Control Panel/Security Page/Locked-Down Intranet Zone</td>
<td>Play videos in web pages</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Control Panel/Security Page/Locked-Down Intranet Zone</td>
<td>Allow Scriptlets</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Control Panel/Security Page/Locked-Down Intranet Zone</td>
<td>Display mixed content</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Control Panel/Security Page/Locked-Down Intranet Zone</td>
<td>Download signed ActiveX controls</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Control Panel/Security Page/Locked-Down Intranet Zone</td>
<td>Download unsigned ActiveX controls</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Control Panel/Security Page/Locked-Down Intranet Zone</td>
<td>Initialize and script ActiveX controls not marked as safe</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Control Panel/Security Page/Locked-Down Intranet Zone</td>
<td>Run ActiveX controls and plugins</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Control Panel/Security Page/Locked-Down Intranet Zone</td>
<td>Script ActiveX controls marked safe for scripting</td>
<td>Enabled</td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Internet Settings/Advanced Wizard Settings</td>
<td>Turn on the Internet Connection Wizard Auto Detect Disabled</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Security Features/Information Bar</td>
<td>Internet Explorer Processes Disabled</td>
<td></td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Security Features/Local Machine Zone Lockdown Security</td>
<td>Internet Explorer Processes Disabled</td>
<td></td>
</tr>
<tr>
<td>Administrative Templates /Windows Components/Internet Explorer/Security Features/Restrict ActiveX Install</td>
<td>Internet Explorer Processes Disabled</td>
<td></td>
</tr>
<tr>
<td>Windows Components/Windows PowerShell</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## 5.2 Workloads

### 5.2.1 Introduction

Login VSI comes with 3 built in workloads. These prebuilt workloads allow you to immediately start testing after installing Login VSI. Below is a brief description of the built in workloads.

### 5.2.2 Medium workload

The medium workload is the only workload available in Login VSI Express and also available in Login VSI Pro. The medium workload is the default workload in Login VSI. The standard Login VSI medium workload designed to run on 2vCPU’s per desktop VM.

This workload emulates a medium knowledge worker using Office, IE, PDF and Java/FreeMind.

- Once a session has been started the workload will repeat (loop) every 48 minutes.
- The loop is divided in 4 segments, each consecutive Login VSI user logon will start a different segments. This ensures that all elements in the workload are equally used throughout the test. • During each loop the response time is measured every 3---4 minutes.
- The medium workload opens up to 5 applications simultaneously.
- The keyboard type rate is 160 ms for each character.
- Approximately 2 minutes of idle time is included to simulate real-world users.

Each loop will open and use:

- Outlook, browse messages.
- Internet Explorer, browsing different webpages and a YouTube style video (480p movie trailer) is opened three times in every loop.
- Word, one instance to measure response time, one instance to review and edit a document.
- Doro PDF Printer & Acrobat Reader, the word document is printed and reviewed to PDF.
- Excel, a very large randomized sheet is opened.
• PowerPoint, a presentation is reviewed and edited.
• FreeMind, a Java based Mind Mapping application.

5.2.3 Light workload
The light workload runs fewer applications and starts/stops them less frequently. This results in lower CPU, memory and IO usage.

5.2.4 Heavy workload
The heavy workload is based on the medium workload except that the heavy workload:

- Begins by opening 4 instances of Internet Explorer. These instances stay open throughout the workload loop.
- Begins by opening 2 instances of Adobe Reader. These instances stay open throughout the workload loop.
- There are more PDF printer actions in the workload.
- Instead of 480p videos a 720p and a 1080p video are watched.
- Increased the time the workload plays a flash game.
- The idle time is reduced to 2 minutes.

5.2.5 Workload comparison
This graph shows the relative differences in resource usage between the Light, Medium and Heavy Login VSI Workloads.

5.3 Launcher workflow
The launcher workflow allows you to initiate the launcher agent remotely. The launcher workflow will logoff every user currently logged on the launcher machine(s). A remote desktop connection will be initiated to the launcher machine. The launcher user created by the Login VSI AD setup will initiate the launcher agent when logging on.

The launcher workflow is only available on Login VSI PRO in Login VSI Express it’s greyed out. In that case what you have to do on the launcher machine is make sure that
\server\vsishare\VSI_Binaries\Launcher\Agent.exe running on your launcher machine. That will allow you to start a test.
6  IIS

A webserver is required to serve the websites that Login VSI uses during the workload. The webserver used is not important as long as it can serve standard HTML pages.

6.1  IIS on Windows Server 2008

<table>
<thead>
<tr>
<th>Description</th>
<th>Screenshot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open the Server Manager and click on Add Roles to add the Internet Information Services role</td>
<td><img src="image1.png" alt="Screenshot" /></td>
</tr>
</tbody>
</table>

Click on Next to continue.

<table>
<thead>
<tr>
<th>Description</th>
<th>Screenshot</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image2.png" alt="Screenshot" /></td>
<td></td>
</tr>
</tbody>
</table>
Select the Web Server (IIS) role and click next.

Click on next to continue

Keep the default Role Services selected and click on Next to continue.
Click on Install to start the installation.

Click on Close to close the Add Roles Wizard.

Open the IIS management console and browse to the default website. Open the Manage Web Site > Advanced Settings menu.
Point the physical path to the location where the Login VSI websites are stored.

Click OK to close the advanced setting dialog.
7 Frequently asked questions (FAQ)

Could not start the test: An active test is running?

Make sure there is no !!!_Example.IsActivetest or .Preptest file exists in the root of your VSIshare, if one exists delete it and you will be able to start a new test.
8 Known workarounds

8.1 Windows XP & Powerpoint 2003 font popup

When running a Login VSI test on a Windows XP environment with Office 2003 you can expect the following popup.

![Image of Install Embed Fonts popup]

This popup will cause the workload to timeout. To prevent the popup please make sure the users has enough privileges on the following directory: C:\Windows\Fonts.

![Image of Fonts Properties]

By adding write access to the user or group the popup will not appear.