TGX

Install Guide

Version 2023.1

Mechdyne Corporation

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TGX INSTALL GUIDE VERSION 2023.1

WELCOME TO TGX

TGX installers are available from the Mechdyne Software Portal. Contact Mechdyne Support to receive your login credentials and licenses for the software.

TGX provides separate installers for the sender and the receiver. The sender is the remote workstation whose desktop and applications are shared by TGX to a receiver. The receiver is the local computer that displays and interacts with the remote desktop of the sender via TGX.
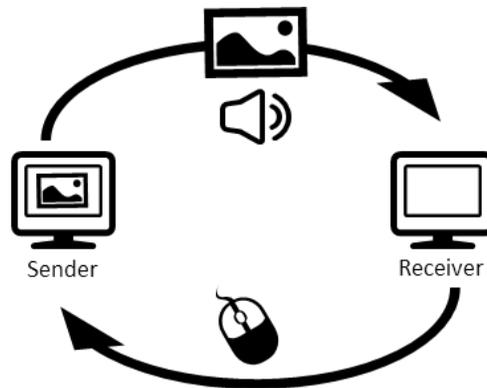
TECHNICAL SUPPORT

Please submit questions and issues by email. A ticket will be created in the TGX support portal.

EMAIL

software_support@mechdyne.com

OVERVIEW

This document consists of three sections:

WINDOWS INSTALL GUIDE

LICENSE MANAGEMENT

The TGX sender requires a valid license to function. On Windows, install a single node-locked license file (e.g., `TGX.lic`) to `C:\ProgramData\Mechdyne\licenses`.

TGX uses FlexLM for floating license management. To use floating licenses with a FlexLM server, please contact software_support@mechdyne.com for instructions on how to download and configure the FlexLM license server software.

SYSTEM REQUIREMENTS

OPERATING SYSTEM

The TGX sender and receiver support Windows 10, 11 and Server 2016, 2019, 2022.

HARDWARE – SENDER

The TGX sender is designed to leverage hardware/driver optimizations provided by NVIDIA Quadro, GeForce GTX/RTX/Titan, and GRID/TESLA GPUs. The sender must support NVIDIA NVENC, typically available starting with Kepler architecture. Please see NVIDIA (https://developer.nvidia.com/video-encode-decode-gpu-support-matrix) for details. Mechdyne recommends using the latest available drivers from the NVIDIA website, minimum compatible driver is 451.22. For GRID vGPU modes, the drivers ship in a package containing a host driver and guest drivers for Windows and Linux. The host and guest drivers must match.

At this time, TGX sender does not support AMD GPUs. In the absence of a discrete GPU, TGX can leverage hardware optimized encoding provided by Intel integrated GPU (Intel UHD 610 or newer, recommend using the latest driver). However, to provide acceptable performance, Mechdyne recommends using NVIDIA GPUs in the sender for graphically intensive applications.

HARDWARE – RECEIVER

The TGX receiver is designed to leverage hardware/driver optimizations provided by Intel integrated GPU (Intel UHD 610 or newer, recommend using the latest driver) and NVIDIA GPUs. In the case of NVIDIA, the receiver must support NVIDIA NVDEC, typically available starting with Kepler architecture. Please see NVIDIA (https://developer.nvidia.com/video-encode-decode-gpu-support-matrix) for details. Mechdyne recommends using the latest available drivers from the NVIDIA website. GPU-based decoding is also supported on AMD Radeon R9 and above. In the absence of GPU decoders, TGX will use software decoding. For large desktop configurations (UHD and above), the use of a discrete GPU is recommended for best performance.

SENDER INSTALLATION OPTIONS

USB REMOTING COMPONENT

TGX provides support for USB devices being redirected from a Windows receiver to a Windows sender. This is currently only supported for human interface device (HID) class devices, though others may work. See the *Administrator Guide* for more information on configuring devices. If the USB component is not selected during install, USB redirection will not be available on this sender. The USB Remoting component adds a USB service and drivers to enable the USB redirection.

Note: Teradici or other products that also use Electronic Team, Inc. USB redirection must be uninstalled before TGX can install USB.

UPDATING TGX FROM PREVIOUS VERSION

Currently only one version of TGX may be installed at a time. When upgrading TGX, the installer will prompt that it will uninstall the existing version, you must answer 'Yes' to continue. The sender installation also requires a reboot after the uninstall. The TGX installer will continue upon login to the computer after reboot. If you are upgrading from a TGX 1.10.x version to TGX 2.x, please use Windows Add/Remove program to manually uninstall TGX 1.10.x and reboot before using the TGX 2.x installer.

CERTIFICATE

TGX requires a certificate to be installed on each TGX Sender. Upon connection, the TGX Receiver will attempt to verify the identity of the Sender and will warn the user if that identity cannot be verified.

If your IT organization has already created a trusted certificate, you may skip this step. Otherwise, leave the box checked and TGX will use a pre-generated, self-signed certificate. Your IT organization can replace the certificate created by the installer at any time. **If a trusted certificate is already installed by your IT organization it will <u>not</u> be replaced by the TGX provided certificate.** The instructions to install a trusted certificate can be found in the *Administrator Guide.*

DISPLAY CONFIGURATION

TGX provides support for the sender desktop to be reconfigured to match that of the receiver. This option is enabled by default on the sender as part of the installation. To disable this capability, uncheck the box. It is recommended that this option to be disabled on senders that are physically connected to complex display systems, especially those configured with NVIDIA Quadro Sync or Mosaic mode. The current version of TGX requires an NVIDIA Quadro card on the Sender to support desktop configuration. If the Sender has a Geforce or Intel Integrated GPU, the sender desktop is used 'as is' by the Receiver.

TGX SINGLE LOGON

TGX requires credentials from the user to ensure they are authorized to access the remote computer. These same credentials may then be used to logon to the sender, such that the user sees their Windows desktop immediately upon connection. **It is recommended that you leave this box checked**. Clearing this check box means that users will be required to provide credentials twice: once to authorize the TGX connection, and a second time to logon to the remote computer.

PORT CONFIGURATION

TGX reserves one port for communication between sender and receiver. The default port is 40001. However, this is configurable as part of the installation. Note, the default port must be identical on the sender and receiver. The port must be open on any firewalls that might be between the sender and receiver hosts.

ADD FIREWALL EXCEPTIONS

By default, the installation process will create an exception to the standard Windows Firewall rules to allow TGX connections. Uncheck this box if your IT security does not use the Windows Firewall and have your IT group manually configure your firewall system to allow TGX connections.

RESTART REQUIRED AFTER INSTALLATION

After the installation is completed, you will need to restart your machine.

RECEIVER INSTALLATION OPTIONS

USB REMOTING COMPONENT

TGX provides support for USB devices being redirected from a Windows receiver to a Windows sender. This is currently only supported for human interface device (HID) class devices, though others may work. The USB devices that may be used are restricted based on the sender configuration. If the USB component is not selected during install, USB redirection will not be available on this receiver. The USB Remoting component adds a USB service and drivers to enable the USB redirection. Note: Teradici or other products that also use Electronic Team, Inc. USB redirection must be uninstalled before TGX can install USB.

UPDATING TGX FROM PREVIOUS VERSION

Currently only one version of TGX may be installed at a time. When upgrading TGX, the installer will prompt that it will uninstall the existing version, you must answer 'Yes' to continue.

ADD FIREWALL EXCEPTIONS

By default, the installation process will create an exception to the standard Windows Firewall rules to allow outbound traffic by TGX. Uncheck this box if your IT security does not use the Windows Firewall and have your IT group manually configure your firewall system to allow TGX connections.

PORT CONFIGURATION

TGX reserves one port for communication between sender and receiver. The default port is 40001. However, this is configurable as part of the installation. Note, the default port must be identical on the sender and receiver. The port must be open on any firewalls that might be between the sender and receiver hosts.

UNATTENDED INSTALL

Both the sender and receiver can be installed unattended via command-line. The following arguments will accept all defaults, hide all message boxes, and log results.

/VERYSILENT /SUPPRESSMSGBOXES /LOG

Logs are stored:

> Windows as C:\ProgramData\Mechdyne\TGX\logs
> Linux as /var/log/mechdyne/TGX

If an existing version of TGX is already installed, the uninstaller must be run first. Direction for unattended uninstall are included below.

There are two options, installation of TGX with USB and installation of TGX without USB. Details of the TGX Sender are shown below, simply replace "Sender" with "Receiver", for unattended uninstall, install of Receiver.

INSTALLATION OF TGX SENDER WITHOUT USB

```
    1. Remove an existing version of TGX Sender
          a. Go to C:\Program Files\Mechdyne\TGX Sender\uninstall
          b. Run the uninstaller
             unins000.exe /VERYSILENT /SUPPRESSMSGBOXES /LOG

             Note, the system will automatically reboot upon completion of the
             uninstall process

    2. To install a new version of TGX Sender without USB
          a. Go to the directory where the Sender installer was placed
          b. Run the installer
             TGX_Sender_{version#_bld#}_64-bit.exe /VERYSILENT /SUPPRESSMSGBOXES /LOG

             Note the system will automatically reboot upon completion of the install
             process
```

INSTALLATION OF TGX WITH USB

```
    1. Remove an existing version of TGX Sender with USB
          a. Go to C:\Program Files\Mechdyne\TGX Sender\uninstall
          b. Run the uninstaller
             unins000.exe /VERYSILENT /SUPPRESSMSGBOXES /LOG

             Note, the system will automatically reboot upon completion of the
             uninstall process

    2. To install a new version of TGX Sender with USB
          a. Go to the directory where the Sender installer was placed
          b. Run the installer
             TGX_Sender_{version#_bld#}_64-bit.exe /VERYSILENT /SUPPRESSMSGBOXES /LOG
             /COMPONENTS="main,usb"

             Note the system will automatically reboot upon completion of the install
             process
```

LINUX INSTALL GUIDE

LICENSE MANAGEMENT

The TGX sender requires a valid license to function. On Linux, a single-machine (nodelocked) license file (e.g., TGX.lic) should be placed in /opt/mechdyne/licenses.

TGX uses FlexLM for license management. To use floating licenses with a FlexLM server, please contact software support@mechdyne.com for instructions on how to download and configure the FlexLM license server software.

SYSTEM REQUIREMENTS

OPERATING SYSTEM

The TGX sender and receiver support RHEL 7,8 (including derivatives, Centos and Rocky) and Ubuntu 18.04,20.04.

HARDWARE – SENDER

The TGX sender on Linux requires an NVIDIA Quadro, GeForce GTX/RTX/Titan, or GRID/TESLA GPU. The sender must support NVIDIA NVENC, typically available starting with Kepler architecture. Please see NVIDIA (https://developer.nvidia.com/video-encode-decode-gpu-support-matrix) for details. Mechdyne recommends using the latest available drivers from the NVIDIA website, minimum compatible driver is 450.36.06. For GRID vGPU modes, the drivers ship in a package containing a host driver and guest drivers for Windows and Linux. The host and guest drivers must match (or come from the same package). Note Screen Blanking is not supported on Linux

HARDWARE – RECEIVER

GPU decoding is supported on all capable NVIDIA, AMD, and Intel GPUs on Linux. In the absence of GPU decoders, TGX will use software decode.

SENDER INSTALLATION OPTIONS

UPDATING TGX FROM PREVIOUS VERSION

Currently only one version of TGX may be installed at a time. When upgrading TGX, the installer will prompt that it will uninstall the existing version, you must answer 'Yes' to continue.

DO YOU WANT TGX TO CONFIGURE X?

The TGX installer will check for a functional NVIDIA driver and Xorg configuration. If the installer fails to find a valid Xorg configuration, it will prompt to generate one. Select **Yes** to generate a working Xorg configuration (/etc/X11/xorg.conf). The existing configuration will be backed up.

ALLOW TGX TO OVERWRITE THE EXISTING DISPLAY CONFIGURATION?

TGX provides support for the sender desktop to be reconfigured to match that of the receiver. This option is enabled by default on the sender as part of the installation. To disable this capability, select **No**. It is recommended that this option be disabled on senders that are physically connected to complex display systems, especially those configured with NVIDIA Quadro Sync or Mosaic mode.

SHOULD TGX START A NEW X SESSION?

If no user is logged into an X session, the TGX sender will, by default, start a new X session for the connection rather than connect to an existing (such as the display manager) session. This mode of operation is suitable for a server (either physical or VM) where no displays are attached and X is not started on boot.

Select **No** to connect to the existing (display manager or user) X session rather than starting a new instance of X. It may be desirable to use the default X session on a desktop machine with connected displays (e.g., a conference room), or if the TGX login mechanism does not match security policy (e.g., multi-factor authentication).

On Ubuntu, this feature is not supported. The prompt will not be displayed and TGX will not start a new X session.

GENERATE SELF-SIGNED CERTIFICATES

TGX requires a certificate to be installed on each remote computer. Upon connection, the TGX Receiver will attempt to verify the identity of the Sender and will warn the user if that identity cannot be verified.

If your IT organization has already created a trusted certificate, you may skip this step. Otherwise, leave the box checked and TGX will use generate a self-signed certificate.   Your IT organization can replace the certificate created by the installer at any time. **If a trusted certificate is already installed by your IT organization it will <u>not</u> be replaced by the TGX provided certificate.** The instructions to install a trusted certificate can be found in the *Administrator Guide.*

PORT CONFIGURATION

TGX reserves one port for communication between sender and receiver. The default port is 40001, however this is configurable as part of the installation. Note, the default port must be identical on the sender and receiver.

FIREWALL CONFIGURATION

The TGX installer detects Firewalld (RHEL/CentOS) and UFW (Ubuntu) firewalls and will install the necessary exceptions to allow incoming connections on the default port. Additional network firewalls must be configured manually by your IT organization.

START TGX SERVICE?

TGX will fail to connect until a valid license is installed to /opt/mechdyne/licenses. See "License Management" for more information on license installation. Select **Yes** to start the TGX service. The TGX service can be manually started with the command: `# systemctl start tgxserverd`

RECEIVER INSTALLATION OPTIONS

UPDATING TGX FROM PREVIOUS VERSION

Currently only one version of TGX may be installed at a time. When upgrading TGX, the installer will prompt that it will uninstall the existing version, you must answer 'Yes' to continue.

PORT CONFIGURATION

TGX reserves one port for communication between sender and receiver. The default port is 40001, however this is configurable as part of the installation. Note, the default port must be identical on the sender and receiver and must be open on any firewalls that might be between the sender and receiver hosts.

SENDER INSTALLATION TROUBLESHOOTING

MISSING DEPENDENCY PACKAGES

TGX requires libraries that may not already be installed on your machine. For both attended and unattended TGX installations, you will be notified of any libraries that are missing. An example notification for a missing library will look like this:

> *"TGX requires libxcb-damage to run, but the library was not found. Please verify a package containing libxcb-damage.so.0 has been installed before installing TGX."*

If there are no missing dependencies, the TGX installation will proceed. Otherwise, please install the dependencies and rerun the TGX installer.

SENDER CONFIGURATION ON A LINUX VMWARE VIRTUAL MACHINE

Once installed, NVIDIA drivers become the default for X, therefore, the display is no longer backed by the VMware display adapter. This causes the desktop to be unviewable through the VMware console. When building a new Linux VM, the recommended method is as follows:

1. Build VM using the VMware Console
2. SSH to VM to install and configure NVIDIA drivers and TGX. When installing TGX, allow the default for TGX to configure X. This allows TGX to set flags in the `xorg.conf`.
3. The VMware console will display a text login prompt vs. the X desktop.

INSTALL NVIDIA PROPRIETARY DRIVERS

TGX requires that the proprietary NVIDIA drivers for Linux are installed. For RHEL/CentOS, the drivers can be obtained from the NVIDIA web site (nvidia.com). For RHEL/CentOS, installing the drivers requires:

1. X is not currently running.
2. Open-source Nouveau drivers are not active.
3. Linux kernel development package and GCC are installed.

DISABLE X START ON BOOT

For a headless server or VM that is intended only for remote access by TGX, it is preferable to disable X start on boot. TGX on Ubuntu doesn't support starting X. Do not disable X startup on Ubuntu.

To stop X, execute:

`# systemctl isolate multi-user`

To permanently disable X start on boot, execute:

`# systemctl set-default multi-user`

DISABLE NOUVEAU MODESET

The NVIDIA drivers will fail to install if the open-source Nouveau drivers are activated. To disable the Nouveau drivers, add "modprobe.blacklist=nouveau" to the kernel command line and reboot.

- Edit `/etc/default/grub`, add the arguments to `GRUB_CMDLINE_LINUX`
- Run `grub2-mkconfig -o /boot/grub2/grub.cfg`

XORG CONFIGURATION

The TGX installer will check for a functional NVIDIA driver and Xorg configuration. If the installer fails to find a valid Xorg configuration, it will prompt to generate one. Answer yes to "Xorg configuration not found. Do you want TGX to configure X?" to have the TGX installer generate a working Xorg configuration (`/etc/X11/xorg.conf`). The existing configuration will be backed up to `/etc/X11/xorg.conf.before-tgx`. If the TGX installer does not prompt to generate an Xorg configuration, remove or rename `/etc/X11/xorg.conf` and re-execute the installer.

AMAZON AWS CONFIGURATION

TGX requires some extra configuration when running in the Amazon AWS cloud. Edit the TGX config.ini file (`/opt/mechdyne/TGX/etc/config.ini`) and in the `[ServerSettings]` section add the line:

`DisplayPrefix=VGA`

After this change has been made, restart the instance and TGX should function normally.

UNATTENDED INSTALL

Both the sender and receiver can be installed unattended via command-line.

The following arguments will hide all message boxes and accept all defaults:

- `sudo ./TGX-Sender-X.Y.Z.W-64bit.gz2.run -- -q`

MACOS INSTALL GUIDE

SYSTEM REQUIREMENTS

OPERATING SYSTEM

The TGX Receiver supports macOS Mojave 10.14 through macOS Monterey 12.5.

RECEIVER INSTALLATION OPTIONS

PORT CONFIGURATION

TGX reserves one port for communication between sender and receiver. The default port is 40001, however this is configurable. Note, the default port must be identical on the sender and receiver. There are three ways to modify the default port and all require elevated permissions.

- On the TGX Launcher menu bar, select **TGX → Preferences**. Enter the desired port and click **OK**.
- On the command line, navigate to the bundle and run (requires elevated privileges):
  `# TGX.app/Contents/MacOS/tgx_config_helper -p=<port>`
- Edit `/Library/Application Support/com.mechdyne.TGX/config.ini` (requires elevated privileges), find the `DefaultPort=` line and change the number to the desired port.