**Network**

**Q: Network checklist for PCoIP protocol LAN and WAN deployments**

**A:** The PCoIP Protocol Virtual Desktop Network Design Checklist (download from Leadtek website) is an essential document for any PCoIP protocol deployment. It covers key network design considerations as well as documents a number of network configuration issues that impact desktop performance.

- Ensure consistent desktop performance
- Avoid session disconnects
- Avoid common network configuration pitfalls
- Reduce bandwidth used for each session

**Q: Does PCoIP technology require special networking equipment?**

**A:** No, a typical PCoIP deployment uses a standard IP network and does not require special equipment.

**Note:** Do not use half-duplex network equipment or configuration for PCoIP deployment.

**Q: Can I use Wi-Fi, optical fiber, coaxial cable, HomePlug or other connection methods with PCoIP technology?**

**A:** Yes. The host and zero client work with any standard Ethernet network regardless of physical media, although some physical media can have inherent bandwidth, latency and congestion tendencies that may affect user experience.

**Q: Can I use a software VPN between a PCoIP zero client or software client and a host card?**

**A:** It depends how the connection to the Remote Workstation Card (host card) is established:

- If a VPN is required, and if the session is established from a PCoIP zero
client, then you must use an external hardware VPN router.

- If a VPN is required, and if the session is established from a PCoIP software client, such as the Horizon View Client or Teradici PCoIP Software Client, then you can use a software VPN application or a VPN router.

Q: **Over what distance can I remote a PCoIP session?**

A: PCoIP technology is not specifically distance-sensitive. That said, network latency due to distance and switch hops may inhibit the user experience. Generally, PCoIP sessions over a corporate LAN have little noticeable network latency.

PCoIP sessions over Wide Area Networks with additional network latency may be noticeable to users. In a workstation environment, where the Local Cursor and Keyboard feature enabled, the user experience over WAN can be greatly enhanced.

Q: **Should I configure “Maximum Initial Image Quality” to “100” if I want lossless still image?**

A: No. Regardless of firmware image-quality settings, still images are always lossless. The time it takes to display them depends on your image-quality settings and available network bandwidth.

For most situations, it is recommended to use 40 for Minimum Image Quality and 90 for Maximum Initial Image Quality.

Q: **Is the maximum display resolution limited by available bandwidth? How does PCoIP share bandwidth over the network interface? How does network traffic affect screen update rates?**

A: Although maximum display resolution is limited only by the video port specification, practical limitations are network-based and depend on content and the desired user experience. Network bandwidth requirements generally scale with display resolution. Network bandwidth limitations – if configured or real – result in reduced update rate and image quality.

PCoIP technology firmware is aware of network congestion via packet loss and delay variation. When the network is congested, the PCoIP firmware reduces image quality, frame rate, and associated bandwidth usage, and later increases them to
take advantage of the available bandwidth when the network is not congested.

The screen update rate is affected by network congestion, bandwidth settings and imaging settings. Minimum image quality and device bandwidth settings are available to optimize PCoIP for your network configuration.

### Security

**Q:** What type of security is provided for PCoIP technology configuration? Is it password protected?

**A:** Access to both the PCoIP zero client and PCoIP host card Administrative Web Interface can be password-protected. You can also password-protect configuration changes via the PCoIP zero client on-screen-display. However, password protection is disabled by default for some PCoIP products. It can be enabled using the PCoIP Management Console.

The password is configurable if password-protection is enabled.

**Q:** How do I change USB authorizations? Does authorizing a USB hub provide authorization to all USB devices plugged into it?

**A:** USB devices can be authorized according to class, sub-class, vendor ID, and product ID. Authorizing a hub device lets any type of USB device be subsequently authorized through the hub to the host PC/workstation.

When it is preferred to maintain USB security (e.g., not allow mass storage devices) while still enabling a multi-function keyboard implemented with an on-board USB hub, we recommend to authorize the multi-function keyboard’s hub using Vendor ID/Product ID. If the multi-function keyboard does not have externally available USB ports, then security is maintained. If there are externally available USB ports, then this implementation lets any USB device function (including USB mass storage device, etc.).
Problem

Q: I cannot reset the Password or have forgotten the password for a PCoIP Zero Client.

A: Please send request to Leadtek sales rep. or Leadtek support site and provide the Password Reset Challenge Code

1. On the PCoIP zero client OSD screen under Options select Password and in the Password dialogue box select Reset.
2. You will be presented with a Challenge Code.
3. Provides the Challenge Code to Leadtek sales rep or Leadtek support site.
4. Leadtek may have some additional questions to verify ownership of the device. Once ownership has been determined Leadtek will open a ticket with Teradici asking for a Response to the Challenge Code.

Leadtek will provide the Response to the customer.

Q: Why is audio not working?

A: This is a brief list of troubleshooting steps for common issues. Scenarios covered include:

1. Audio issues using VMware View virtual desktops (and Teradici Virtual Audio Driver)
2. Audio issues using PCoIP host cards
3. USB audio

Scenario 1: Audio issues using VMware View virtual desktops

By default, VMware View will install the VMware audio driver. As an alternative, consider using the Teradici Virtual Audio Driver. Audio issues using VMware View virtual desktops can include:

• No audio output. If you use the Teradici Virtual Audio Driver and then upgrade or re-install VMware View, the installer will set the VMware audio
driver as the default device. Re-enable the Teradici Virtual Audio Driver.

- No analog audio input. The VMware audio driver in VMware View 5.0 does not support analog audio input. Consider using the Teradici Virtual Audio Driver, which supports bi-directional analog audio.
- Lip sync issues on video playback in the VM. Consider using the Teradici Virtual Audio Driver, which is optimized to minimize lip sync issues.
- Audio pops and cracks. You can check for network congestion, packet loss, and latency. In View 5.1.x - 5.2, consider disabling temporal_image_caching. You can also check the VM loading for resource contention and consider using two vCPU's, increase virtual memory, etc.

**Scenario 2: Audio issues using PCoIP host cards**

Analog audio issues using PCoIP host cards. The PCoIP host card is a multi-function PCIe controller supporting a USB controller and HD audio controller.

- Check that the PCoIP host card and zero client have audio enabled.
- Generate an Audio Test Tone from the zero client via the Administrative Web Interface (AWI) -> Diagnostics -> Audio Start. The zero client must be out of session.

To access the instructions for any of the above steps, refer to the PCoIP Zero Client and Host Administrators Guide.

**Scenario 3: USB audio (including composite/multifunction USB devices)**

- **If using firmware 4.2.0 or newer:**
  In firmware 4.2.0, we introduced local USB audio support for virtual desktops. This feature automatically terminates USB audio devices locally and is enabled by default. This uses the virtual audio driver configured on the host OS. For optimal performance, we suggest using the Teradici Virtual Audio Driver. If you prefer to use the USB audio device's original driver, then you can disable this feature through the Administrative Web Interface (AWI) -> Configuration -> Audio and deselecting Enable Local USB Audio Driver.

  If you are using a USB composite device that contains audio functionality but also has one or more functions that must be terminated remotely (i.e. bridged to the host), the local USB audio driver cannot be used for the device. For example, the Bloomberg keyboard contains multiple USB devices (composite). The audio device is part of the fingerprint scanner and can
therefore not be locally terminated on the zero client, the fingerprint scanner needs to be remote while audio is needed locally.

- **If using firmware prior to 4.2.0 OR when the device is bridged on firmware after 4.2.0:**
  USB audio uses a USB driver and doesn't use the Teradici Virtual Audio Driver nor the VMware audio driver. Since USB is sent on a reliable channel, it's not as resilient to network congestion or packet loss. As an alternative, we recommend using analog audio headsets.

Q: **Why is USB not working?**

A: This is a brief list of troubleshooting steps for common issues involving USB peripherals (e.g. DVD drives/burners, keyboards, mice, usb, smart phones, storage devices, hard drives, scanners, printers). This is not intended to be a comprehensive troubleshooting guide, but it does cover many of the common issues that have been reported.

Scenarios included:

- USB device does not work on VMware View virtual desktops.
- USB device does not work on Remote workstations using PCoIP host cards.
- Poor USB performance.
- USB device is a HID device that is automatically terminated on the zero client.
- USB device fails when first accessed.
- USB device fails when first accessed on a Tera 1 device.

1. **Scenario** : VMware View virtual desktops

- Confirm that the issue is not with the specific peripheral unit. Test another unit to confirm whether it is a specific unit failing;
- Test the peripheral on a physical PC with the same version of Windows as in the virtual desktop. If the USB device does not work, then it is a Windows driver issue. Contact the USB peripheral vendor for support.
- Test the peripheral on a VMware View Client (e.g. thin client, notebook or re-purposed PC). If the USB device does not work, then it is a VMware USB driver issue.
- If USB device does not work, check the AWI Attached Devices status.
• Test on a PCoIP zero client running the latest firmware. If the USB device does not work, then gather the client logs (set USB verbose logging) and the associated virtual desktop logs (set level 3 logging) and contact Leadtek.
• For View 5.0.1 or earlier you experience device connectivity problems. Consider reattaching the USB audio device to the zero client.

Note: Windows XP 32 bit hosts in session with the VMware view client 5.1 may experience brief audio outages. There is no known work around at this time.

For USB audio issues please see http://kb.vmware.com/kb/2047808.

2. Scenario: PCoIP Host Cards

• Is the client a VMware View client? Connecting a View client to a PCoIP host card supports HID (i.e. keyboard/mouse) devices only for firmware 4.1.x and prior and View 5.x.
• Connecting a zero client to both PCoIP host cards and View desktops may experience USB device connectivity problems when connected to the View desktop. Workaround: After ending a session with a PCoIP host card, reset the zero client before establishing a session with a View desktop.
• Test the peripheral directly on a USB port of the host PC (the PC that has the PCoIP host card installed). If the USB device does not work when directly connected to the host PC, then it is a host driver issue (i.e. Windows driver issue, or Linux driver issue for a Linux host PC). Contact the peripheral vendor for support.
• Test on a PCoIP zero client running the latest firmware. If the USB device does not work, then gather the client and host card logs and contact Leadtek.

3. Scenario: Poor USB performance

Note: VMware View 5.0 does not support media playback or burning. Newer versions of Horizon View include enhancements which may improve the USB issue.

• Slow file transfers from a USB device
  o Network latency impacts USB throughput
  o Check for Network congestion and packet loss
  o PCoIP Zero clients support USB 2.0 on firmware 3.5.x or newer
• Poor read/burn times when using CD/DVD drives
  o Check for network congestion
PCoIP Zero clients support USB 2.0 on firmware 3.5.x or newer

- EHCI / OHCI Controllers
  - Disable EHCI in the PCoIP firmware (forces all USB devices to use OHCI controller)
  - Use a USB 1.1 hub for the device having the issue

### 4. Scenario:
USB devices that are human interface device (HID) class will be terminated locally on the zero client. However, some devices that advertise HID class must be terminated on the host virtual machine or host PC (when using a PCoIP host card). These devices will need to be bridged to the host.

Some examples include: Presenter tools, dictation foot-pedals, tablets, 3D mice, and HID devices with features requiring a vendor specific driver (Logitech SetPoint driver)

### 5. Scenario:
USB devices (i.e. DVD drive, IP Phone, Scanner, Printer, Whiteboard) successfully connects to the zero client but upon first use the device fails and disconnects from the zero client. When accessing the USB device for the first time after it successfully connects, the device has a larger power draw which requires an external power source such as a powered USB hub. Another alternative is to use a Y or dual head USB cable.

The dual head USB cable has one end with two connectors that plug into the zero client, and the other end with one connector that plugs into the device. Only one of the connectors at the zero client end is used for data, but both provide power. As a result, the device can draw twice as much current as could be supplied by a single port.

### 6. Scenario:
USB devices using USB cables over 5 meters in length may not work when connected to a zero client.

The round-trip propagation delay of the USB cable is greater than or equal to 52 ns, which corresponds approximately to about 5m (16.4 ft) of cable-length. The USB specification requires a USB cable to have a maximum propagation delay of 5.2ns per meter. However, some low quality USB cables could have round-trip propagation delays in the order of 52ns even though they are less than 5m long.
Try one of the following two fixes.

- If the USB cable is approaching the 5 meter length, use a shorter cable
- Use a USB hub between the zero client and the USB peripheral

**Q: Why is the session disconnected?**

**A:** This is a brief list of troubleshooting steps for common issues, it is not intended to be a comprehensive troubleshooting guide.

By default the PCoIP protocol will disconnect a session if there is no network activity for more than 30 seconds for a zero client or host card, or 60 seconds for a Horizon View Client. Typically this will be the result of a network interruption. This can also occur with PCoIP Software, when the PCoIP server in VMware View stops responding due to some resource contention.

Also, in some cases, the disruption of less than 30 seconds of network traffic on TCP 4172 can cause a session disconnect.

Three common scenarios are covered including:

- Random frequent session disconnects enterprise wide
- Random infrequent session disconnects enterprise wide
- User specific or isolated session disconnects

**Scenario 1:** Random frequent disconnects enterprise wide

- Check for intrusion detection IPS, IDS (including switch port-based IDS)
- Check if endpoint device security is enabled and disconnecting the client NIC
- Check for network load balancing or Cisco VSS interswitch links
- Check for use of unsupported USB devices
- Did the View Connection Server session timeout expire? Default is set to 600 minutes
- Check that network QoS is implemented correctly
- Check network loading including uplinks to ensure there is sufficient bandwidth
- Check that portfast is enabled on switches
- Corrupt "Connecting using DNS Name" GPO
Scenario 2: Random infrequent session disconnects enterprise wide

- Is there storage or network contention?
- Check logs for migration events (ie storage, server or VM vMotion)
- Check for network load balancing or Cisco VSS interswitch links
- Check that network QoS is implemented correctly
- Check that portfast is enabled on switches
- Application or windows updates from an enterprise system management platform that forces a reboot after installation
- Check network loading including uplinks to ensure there is sufficient bandwidth
- Check to ensure that Windows is not set to install updates automatically

Scenario 3: User specific or isolated session disconnects

- Check for application dependencies, especially if the application changes the screen resolution. These applications are not supported by VMware in View 5.x or earlier
- User specific USB device
- Defective switch port or other connectivity point to that client
- Defective client device