

# Minimum Requirements

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## VRI Direct Requirements

### Desktop/Laptop Hardware:

- **Processors:**
  - Intel:
    - 2.0 GHz or faster second-generation (Sandy Bridge) Intel Core i3, i5, i7 CPU (third-generation (Ivy Bridge) or newer Intel Core i3, i5, i7 processors strongly recommended)
    - Quad-core Bay Trail Atom processors or newer (quad-core Cherry Trail Atom processors strongly recommended)
  - AMD: 1.8 GHz or faster AMD Athlon 64 X2 processor
  - **NOTE: Faster processors provide higher video frame rates. While multi-core processors slower than 2.0 GHz will work, they are not guaranteed to provide the best video quality. *Video pixellation and freezing may occur on systems that don't meet our processor requirements.***
- **Memory: 2 GB RAM or more**
- **Video Chipset: Discrete video card, or integrated Intel HD Graphics 3000 or better (found on second-generation (Sandy Bridge) or newer Core i3, i5, i7 processors). Video pixellation and freezing may occur on systems that don't meet our video chipset requirements.**
- **Webcam: Any external, HD 720p or better webcam from our list of officially supported cameras; please see [Webcam Recommendations](#) for details**
- **Speakers/Headset/Microphone**

### Mobile Hardware and Software:

- Apple iPad: iPad 3rd Generation or newer, iPad Air 2 or newer, or iPad Mini 2nd Generation or newer, running iOS 9.1 or higher with VRI Direct Mobile for iOS 1.6 or newer. **NOTE: iOS 11 is not officially supported yet. Support will be added soon after iOS 11 is released.**
- Apple iPhone: iPhone 6 or newer, running iOS 9.1 or higher with VRI Direct Mobile for iOS 1.6 or newer
- Microsoft Tablets (not comprehensive): Tablets using Intel Atom Z3770 chipset or better or Core i3 or better, running Windows 8.1 in desktop mode; please refer to the Desktop Software Platforms section for additional software requirements. Some tested systems include Dell Venue 8 Pro, Microsoft Surface Pro, Surface Pro 2, Surface Pro 3, Surface Pro 4, Surface Book, Surface Book 2
- Android Tablets (not comprehensive): Tablets running Android 5.0 (Lollipop) or newer, manufactured since November 2014, using Google Chrome for Android 52 or newer, in landscape orientation. Quad-core tablet processors tend to test better than dual-core. Some tested systems include: Google Pixel C, Galaxy Tab 4 series, Galaxy Tab S2 series, ASUS Zenpad 3S and 10 series.  
**NOTE: Video on older Android tablets and older iPads may not be suitable for VRI, especially for Sign Language/ASL interpreting. For ASL interpreting, we recommend newer Android tablets and iPads. See our [Mobile Device Recommendations](#) article.**

### Desktop/Notebook/Windows Tablet Software:

- Microsoft OS (32-bit/64-bit): Windows 7, Windows 8.1 (Desktop mode), Windows 10

- Apple Desktop OS: Mac OS X 10.8 (Mountain Lion) or higher
- Web Browsers: At least one of the following (some interpreters may need two options):
  - Google Chrome 52 (56 or newer recommended)
    - On Windows, you can use our installer to add VRI Direct icons to your desktop after you've installed Google Chrome. Please see our [Desktop Software](#) article for more information
  - Mozilla Firefox 48 (52 or newer recommended).
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### Network Requirements:

- Bandwidth:
  - 2 Mbps upstream/downstream strongly recommended; minimum 1 Mbps upstream/downstream supported
  - 4G LTE connections/mobile hotspots are sufficient for most situations with an adequate connection to your LTE service provider; however, LTE quality is heavily influenced by your location and by the number of users connected to the same cellphone tower as you. Interpreters should always rely on wired Internet service over LTE service for consistent network quality.
  - 3G connections/mobile hotspots not recommended but may be sufficient for two-party calls when the 3G connection is not in use by other Internet applications and you have a strong connection to your 3G service provider
- Required Domain and Port Configuration:
  - **TCP outbound 443 (Web traffic; encrypted videoconference streaming fallback when all UDP ports are unavailable):**
    - **vridirect.com and \*.vridirect.com (23.21.189.195)**
    - **\*.twilio.com**
    - **\*.twilio.com**
    - **NOTE: Firewall rules for the above sites should be URI-based rather than IP address-based in order to support dynamic IP assignment for disaster recovery.**
  - **TCP outbound 80 (Web traffic for our knowledge base support site):**
    - **support.vridirect.com**
- ◦ **TCP/UDP outbound 3478 (TURN services for encrypted audio/video streaming when using our desktop app or when using Google Chrome; also provides fallback streaming when other UDP ports unavailable)**
  - **TURN Server IP List:**
    - **54.172.60.0 - 54.172.61.255**
    - **54.244.51.0 - 54.244.51.255**
    - **54.169.127.128 - 54.169.127.191**
    - **54.65.63.192 - 54.65.63.255**
    - **54.171.127.192 - 54.171.127.255**
    - **177.71.206.192 - 177.71.206.255**
    - **54.252.254.64 - 54.252.254.127**
    - **All IP addresses must allow traffic on ports 443 (TCP), 3478 (TCP/UDP outbound), 5349 TCP**
- **Test your TURN server configuration**
  1. **Open a Google Chrome web browser and visit <https://networktest.twilio.com/>**
  2. **Click "Network".**
  3. **Click "Run" beside TURN UDP Connectivity and review the log messages. If you do not see "Successfully established a UDP connection", please verify that you meet our network requirements as stated above, then retest.**
  4. **Click "Run" beside TURN TCP Connectivity and review the log messages. If you do not see "Successfully established a TCP connection", please verify that you meet our network requirements as stated above, then retest.**
  5. **Click "Twilio Client".**
  6. **Click "Run" beside Bandwidth and review the log messages. We strongly recommend an**

average bandwidth of at least 2048 kBits/sec, but no less than 1024 kBits/sec. Ideally, you will see "This connection should support 2 simultaneous Twilio Client connections". If you do not meet these minimums, video quality will be reduced and VRI calls may not stay connected.

7. Click "Run" beside Test Call to verify that you can send/receive WebRTC media. The Test Call tool only tests audio, but if you can send/receive audio, your network is also configured to send/receive video. After our service updates, you will still need to test a VRI Direct call to completely ensure your audio and video are properly configured.
- WebSockets Secure (wss://):
    - To test, please visit <http://websocketstest.com> and wait for the tests to complete. We only care about the *WebSockets (Port 443)* section of the test suite. Ignore all other test sections on the page. If the Port 443 tests do not pass, your proxy server, firewall, or Web filtering appliance may need to be configured to allow the WebSockets Secure protocol.