

# AVer IFP Screen Share App Network Requirements

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This document is intended to help the network administrator to ensure that the network environment is compatible with AVer IFP Screen Share App for AirPlay, Chromecast, and Miracast protocols.

## **AVer IFP Screen Sharing Network Requirements**

AVer IFP Screen Sharing Application supports native screen sharing from Apple, Google, and Microsoft devices using AirPlay, Chromecast, and Miracast respectively. Miracast employs the peer-to-peer Wi-Fi Direct standard; therefore the network requirements are limited to Wi-Fi connection only for the IFP and the Miracast device, typically Windows and some Android devices.

This document is intended to help the network administrator to ensure that the network environment is compatible with AirPlay and Chromecast protocols.

In addition to allowing the software to communicate through any security barriers in place, such as firewalls, the network must also be capable of using the correct communication protocols required for automatic discovery of the mirroring device. Included in this document is an overview of all networking requirements needed for proper use of Bonjour services such as AirPlay.

### **Local traffic only**

AirPlay applications use a direct connection method through the local network. AVer IFP takes a direct connection from iOS devices, Chromebooks, Android devices, and AirPlay-enabled Mac computers. The device must be on the same VLAN or subnet within the network to connect. Apple's AirPlay cannot cross subnets/VLANs natively. This is an AirPlay limitation. If your environment requires the connecting devices to be on different subnets, then you may wish to have the IT department consider a Bonjour Gateway for the network. Some network hardware has this functionality built in, while others may require a third-party solution.

The Bonjour Gateway allows AirPlay to cross subnets/VLANs so your devices can communicate. This, however, will broadcast all AirPlay devices on the network; however the AVer IFP will only broadcast its ID when Screen Share App is launched. And further, before screen share can occur an "accept/reject" prompt is displayed. [If too many erroneous attempts are made to screen share, AVer can enable AirPlay password as well.]

Aerohive is one such developer for a Bonjour Gateway. Many large users have added this capability to their network and are able to mirror across subnets/VLANs. Cisco's Wireless LAN Apple Bonjour Deployment Guide can be found at: <https://www.cisco.com/c/en/us/support/docs/wireless/aironet-1100-series-access-point/113443-cuwn-apple-bonjour-dg-00.html>

### **Multicast availability**

The local network must be allowed to run Bonjour and mDNS, and multicast must be enabled. The Bonjour protocol consists of service announcements and service queries that allow devices to ask for and advertise specific applications, such as file or printer sharing and AirPlay. For our purposes, we are primarily concerned with AirPlay availability.

Each query or advertisement is sent to the Bonjour multicast address for delivery to all clients on the subnet. Apple's Bonjour protocol relies on multicast DNS (mDNS) operating at UDP port 5353 and sends to these reserved group addresses:

IPv4 Group Address - 224.0.0.251

IPv6 Group Address - FF02::FB

The addresses used by the Bonjour protocol are link-local multicast addresses and thus are only forwarded locally. Routers cannot use multicast routing to redirect traffic because the time to live (TTL) is set to one, and link-local multicast is meant to stay local by design.

AVer IFP Screen Share uses mDNS to discover Chromecast Devices. [There are some Chromecast casting applications that use Discovery And Launch (DIAL) to enable users to mirror their devices, however AVer does not use this.]

Cisco's "Chromecast as mDNS Service in order to Cast Screen Configuration on WLC" can be found at <https://www.cisco.com/c/en/us/support/docs/wireless-mobility/wireless-mobility/119017-config-chromecast-mdns-wlc-00.html>

### **Required ports**

AirPlay ports must be available on the subnet or VLAN being used to connect your devices as well. Following is the port list that AirPlay and Google Cast use with the IFP Screen Sharing application:

224.0.0.251 > tcp > port 5353 MDNS - Apple

224.0.0.251 > udp > port - 5353 These ports are used for AirPlay detection on the network

udp > port 1990 Google Cast detection

tcp > port - 5000 Seen with music

tcp > port - 7001 Seen with video

tcp > port - 7000 Seen with picture/file

tcp > port - 7100 Seen with display-mirroring

udp > port - 7010 Seen with display-mirroring

udp > port - 7011 Seen with display-mirroring

tcp > port - 47000 Audio connection negotiation

tcp > port - 49152-65535 Dynamic ports, audio connection

udp > port - 49152-65535 Dynamic ports, audio connection

tcp > port 8008 Google Cast

tcp > port 8009 Google Cast

Additionally, Google Cast uses SSDP multicast (UDP 1900) for advertising to Android, mDNS multicast (UDP 5353) for advertising to Windows and Mac, TCP 8008 for the second phase of SSDP, and TCP 8009. The actual Cast screen mirroring uses a randomly-selected UDP port.

### **Multicast groups**

Some networks may use a multicast group to manage multicast traffic. When multicast is enabled, all multicast traffic will flow to all connected clients in a subnet. By using a multicast group to limit the amount of clients receiving the multicast data, you can reduce the overall workload being placed on the network.

Using groups is typically not required, but it can be helpful in the event that there are many AirPlay devices on the network. When creating multicast groups, there are three important factors to consider:

1. Multicast groups must include the subnets or VLANs where AirPlay devices (and clients that may mirror to those devices) are connected.
2. All AirPlay devices and clients must be members of the multicast group.
3. If using multicast groups, then IGMP Snooping must be enabled on your network in order to allow your devices to listen to the multicast group. This allows your devices to see the multicast group traffic without affecting the rest of your network.

Cisco Chromecast Deployment Guide can be found at:

<https://www.cisco.com/c/en/us/td/docs/wireless/controller/technotes/7-6/chromecastDG76/ChromecastDG76.html>

Using all of the information contained in this guide, you should be able to ensure that any network is compatible with Chromecast, AirPlay and Bonjour services.

Contact AVer for additional information.