Network guide and security

EShare

Bandwidth Requirements

Local Mirroring (from laptop or phone to IFPD)

The maximum bitrate can reach up to 30 Mbps, although average bitrates will generally be lower. For a reliable user experience, it is recommended to connect the large display using Ethernet and the laptop/phone using the 5GHz Wi-Fi band. It is advised to reserve a consistent 30 Mbps local traffic bandwidth for each screen mirroring session.

TV Mirror and Display Group

The average bitrates for each TV Mirror or Display Group connection are around 4 Mbps, and the bandwidth should be reserved accordingly. For example, if there are 40 pads or laptops in a classroom using TV Mirror, it would require a total of 40 * 4 Mbps = 160 Mbps local traffic bandwidth.

Cloud Cast

The average bitrates for each WebCast or Broadcast connection are 4 Mbps. To ensure a smooth experience, it is recommended to reserve a steady 5 Mbps bandwidth for each user.

Network Configuration

Network ports

This information can be valuable for advanced setups, enterprise networks, or troubleshooting purposes.

EShare utilizes the following ports on your network:

Network Area	Port	Type	Service or Protocol	Used By
Local Connections (LAN)	51010-51060, 8121, 57395, 8080, 52025, 8600	TCP	AirPlay & EShare Apps proprietary	EShare Apps, AirPlay
	48689	UDP	Device discovery	EShare Apps
	5353	UDP	Multicast DNS (MDNS)	AirPlay, Bonjour
	8008, 8009	TCP	GoogleCast proprietary	ChromeCast
	7500	UDP	Miracast MICE	Miracast
Remote Connections (Internet)	80/443	TCP	Hypertext Transfer Protocol (HTTP, HTTPS) **FQDNs**: *.eshare.app *.casts.app	WebCast, Broadcast
	10000-65535	UDP	DTLS **FQDNs**: *.casts.app	WebCast Broadcast

If there is Layer 7 filtering or proxy with protocol filtering on these ports, then the following protocols will need to be allowed:

> Bonjour protocols (mDNS)
> STUN
> TURN
> DTLS
> HTTP
> HTTPS
> SRTP
> ICE

Our SaaS provides services at the following FQDNs:

> STUN
  stun.l.google.com
  stun*.l.google.com

> TRUN
  *.casts.app

The server resources are elastically scalable, and we dynamically increase server resources to ensure high service availability.

Fetch list of STUN/TURN servers dynamically
This enhancement improves the reliability and performance of the casting experience, particularly in complex network environments. By dynamically fetching the optimal list of STUN/TURN servers, EShare can now better facilitate peer-to-peer communication between devices and bypass potential network obstacles, ensuring a more seamless and consistent connection for wireless casting in classrooms. This feature not only enhances the overall user experience but also reduces the burden on IT administrators by simplifying network configuration and management.

Proxy support
The EShare Windows/OSX software supports proxy configuration.
The following proxy types are supported:

> HTTP Proxy (with or without authentication)
> SOCKS 5 (with or without authentication)
> Proxy with Auto-Configuration File (PAC). Windows only.
> Windows System proxy.

Cloud Infrastructure

EShare uses a combination of Amazon and Google services to provide a resilient and redundant back-end while delivering the lowest latency possible.

Amazon AWS
We use Amazon AWS to host and support the services we offer to our clients. Amazon AWS is a well-known cloud service managed by Amazon, a trusted provider of cloud services that provide geographical dispersion - allowing us to have a server closer to the end-user, which reduces latency in cloud connectivity.

All our cloud services running on Amazon AWS are running under a Virtual Private Cloud (VPC). Each environment has its own virtual network protected by Amazon's availability zone and firewall.

Amazon AWS servers are geographically dispersed and have many certifications and third-party assessments, including ISO/IEC 27001:2005, SOC 1 and SOC 2, and CSA STAR certification. Further information can be found in their security whitepaper.

Google
We also use Google's cloud services. Google's data centers are geographically dispersed and comply with a wide range of industry-specific standards and regulations. This includes certifications such as ISO/IEC 27001, SOC 2, and HIPAA, demonstrating the commitment to meeting stringent security and compliance requirements.

These data centers are managed and operated by Google. Google has much experience building enterprise software and running the world's most extensive online services. Google Cloud's global network is designed to offer a robust defense against potential threats.

Security
All communication between the EShare software and the server is over TLS (port 443) with 2048-bit asymmetric encryption and 256-bit symmetric encryption. For video streams, STUN is used to establish a peer-to-peer connection. If this fails, the client will attempt to use our relay service using the TURN protocol over DTLS.

In addition to DTLS encryption, we also encrypt data through Secure Real-Time Protocol, which safeguards IP communications from hackers. This ensures your video and audio data are kept private point-to-point.