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MEZZANINE TECHNICAL OVERVIEW

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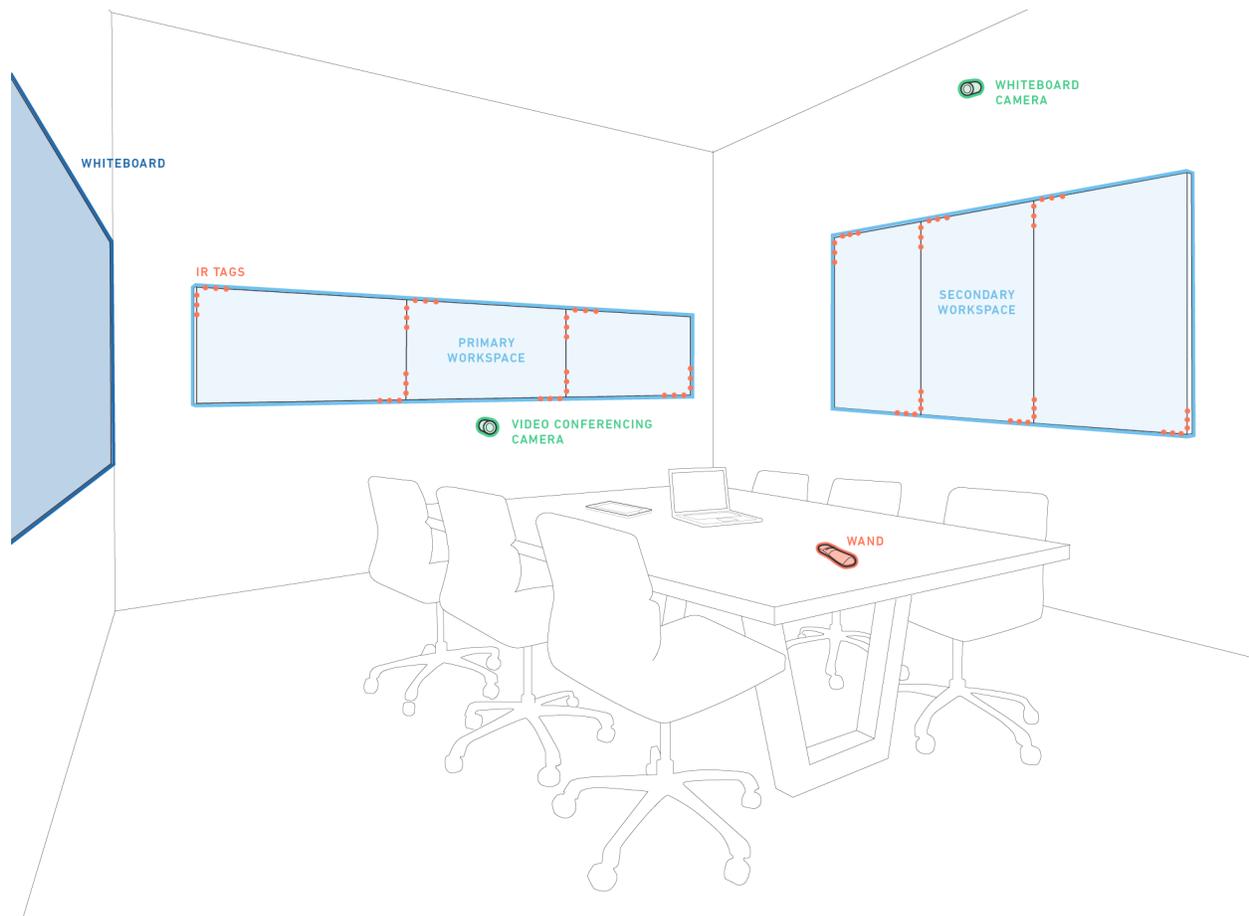
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Overview

What is Mezzanine?

Mezzanine's state-of-the-art, 3D, visual collaboration platform gives your teams a huge competitive advantage. Mezzanine adds punch to presentations, delivering an unsurpassed visual impact that demands attention. Real-time collaborative content-sharing and interaction create a data-rich environment that engages teams in the work at hand.



Mezzanine's technology transforms meetings, by allowing users to:

- Present and share content and video streams across multiple displays and walls
- Unite multiple Mezzanine rooms so everyone collaborates in and sees the same workspace, regardless of location
- Share up to 10 video streams simultaneously including videoconferencing and screen sharing
- Plug in their device or share their screen wirelessly with the Mezzanine Screencast application
- Share ideas captured on their physical whiteboard in their digital workspace
- Add graphics and PDFs directly to the workspace before and during the meeting to view presentations and documents

- Simultaneously control and contribute to the workspace from multiple locations and devices, including laptop browsers and iOS/Android devices
- Gesturally control and organize the workspace with the wand. Just point and click, drag and drop from the comfort of your chair
- Save and discard workspaces to streamline meeting transitions and pick up where they left off
- Download their workspaces to review and share after the meeting
- Easily integrate with enterprise authentication systems that utilize LDAP, Active Directory, or SAML 2.0

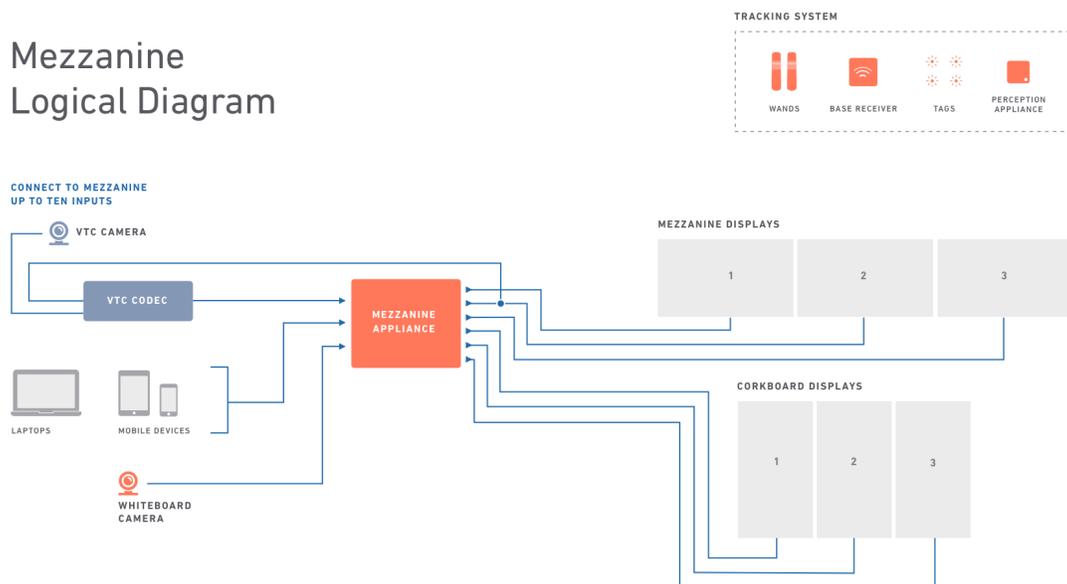
A Mezzanine for Every Space

Teams, and the business problems they solve, come in all shapes and sizes and so does Mezzanine. From briefing centers to executive meeting rooms to huddle spaces, Mezzanine transforms workplaces into hives of high-performance activity.

Mezzanine is designed to enable collaboration in large and executive conference rooms. A typical Mezzanine installation is comprised of the following components:

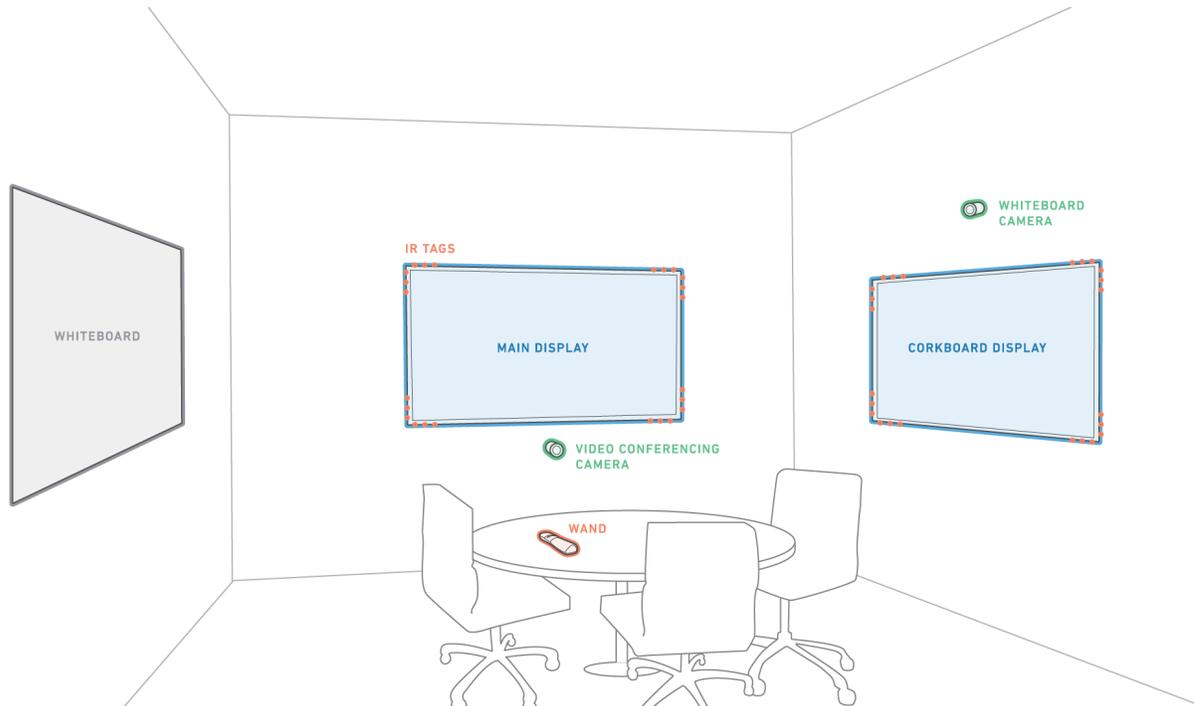
- Mezzanine appliance running Oblong's proprietary software that drives up to 6 displays
- A tracking system for the spatial wand, communicating with the appliance
- Whiteboard camera connected to Mezzanine over a private network connection
- Peripherals for ingesting video from laptops and other devices into Mezzanine
- Various user devices, connected to Mezzanine using Oblong's proprietary software

Mezzanine Logical Diagram

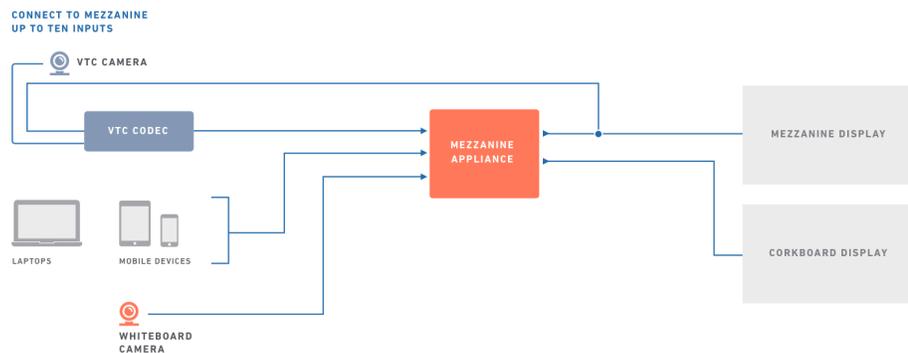


Introducing Mezzanine Teamwork

Mezzanine Teamwork is a new offering purpose-built for small- to medium-sized spaces and the teams that work in them. It delivers powerful capabilities previously available only in larger meeting rooms. Its dual-display configuration makes efficient use of wall space but sacrifices none of the power and capabilities of its larger brethren.



Mezzanine Teamwork Logical Diagram



What are Mezzanine's technical specifications?

	MEZZANINE: IN-ROOM	MEZZANINE: SERVER ROOM	MEZZANINE TEAMWORK
Form Factor	(2) Intel-based mini appliances	2U rackmount appliance	Intel-based mini appliance
Video Inputs	10 simultaneous inputs: <ul style="list-style-type: none"> • 4 x HDMI streams (common formats: 1080p60, 720p60) • 1 x IP camera stream • 5 x Network video streams (Screencast) 		
Video Outputs	6 x HDMI outputs Supported Format: 1080p60	6 x HDMI outputs Supported Format: 1080p60	2 x HDMI outputs Supported Format: 1080p60
Network Interface Connections	1 x Network port / appliance	1 x Network port 1 x Mezzanine port	1 x Network port
Serial Connections	N/A	1 x Serial port	N/A
Hard Drives	512 GB Solid-state drive		
Operating System	Ubuntu 16.04 LTS		
Dimensions	211 x 116 x 28 mm (W x D x H)	482 x 514 x 84 mm (W x D x H)	211 x 116 x 28 mm (W x D x H)
Weight	0.62 kg	10.89 kg	0.62 kg
Power	V: 100-240 V Hz: 50-60 Hz W: 120 W	V: 100-240 V Hz: 47-63 Hz W: 500 W	V: 100-240 V Hz: 50-60 Hz W: 120 W
Operating Environment	0°C to 40°C (32°F to 104°F)	-5°C to 35°C (23°F to 95°F)	0°C to 40°C (32°F to 104°F)

What are Mezzanine's room design guidelines?

Mezzanine is designed for use in a variety of conference room environments, ranging in size from huddle rooms to Executive Briefing Centers. Explore the room configurations and guidelines listed below to understand how Mezzanine's product family can be deployed into different rooms across your enterprise.

Configurations

- **Mezzanine:**

- Appliance options:

- In-room: For quicker, simpler installations, Mezzanine can be installed directly into a target conference room.
 - Server room: For more secure installations, Mezzanine can be installed in a server room, allowing all equipment to be stored and controlled centrally.

- Tracking options:

- Optical tracking: Suitable for most spaces, enable gestural control using display mounted sensors without additional room remediation.
 - Ultrasonic tracking: Best suited for larger, more complex spaces, enable gestural control using ceiling mounted sensor.

- **Mezzanine Teamwork:** Mezzanine Teamwork is powered by an in-room appliance and is equipped with optical tracking.

Location

- Class A (business / commercial) facilities
- Indoor environments only

Room Characteristics

	MEZZANINE: OPTICAL	MEZZANINE: ULTRASONIC	MEZZANINE TEAMWORK
Typical Room Sizes	4.5 x 4.5 m and up	4.5 x 4.5 m and up	Up to 4 x 4 m
Ceiling Height	Any	2.75 – 4 m	Any
Tracking Area	Up to 6 m from displays	Up to 7 x 7 m	Up to 6 m from displays
Considerations	Avoid placing displays directly in front of exterior windows or windowed walls	Drop ceilings with standard T-bar and ceiling tile sizes are recommended	Avoid placing displays directly in front of exterior windows or windowed walls

Facility Requirements

	MEZZANINE: IN-ROOM	MEZZANINE: SERVER ROOM	MEZZANINE TEAMWORK
Appliance Location	Conference room	Server room	Conference room
Rack space	10U	10U	5U
Conference Room Power	1950 W	1500 W	850 W
Server Room Power	N/A	1150 W	N/A
Conference Room HVAC	6650 BTU/hr	5100 BTU/hr	2900 BTU/hr
Server Room HVAC	N/A	4000 BTU/hr	N/A

Notes:

- Conference room power includes in-room appliances and peripherals, such as displays and video conferencing hardware
- Server room power includes the Mezzanine appliance, peripherals, and supporting hardware
- In the conference room, power distribution is required at the conference table, appliance locations, display locations, camera locations, and wand charging stations
- When installed using ultrasonic tracking, the Mezzanine appliance must be within 50 meters of the target conference room
- For ultrasonic tracking, when possible, airflow should be limited near the ceiling mounted sensors
- Heat loads listed above include Mezzanine hardware and peripherals; other heat sources, such as lighting, people, and other electronics is not included

Tracking Considerations

- Optical tracking:
 - While in use, wands must have a clear line of sight to the displays
 - Display surfaces must be free from obstruction, allowing IR tags to be visible
 - Recessed displays require 6mm of spacing in both height and width to ensure the IR tags are visible
 - Bluetooth receivers should be mounted away from metal objects or surfaces and close to the users. Mounting underneath a conference room table is preferred, whenever possible

- Ultrasonic tracking:
 - Ultrasonic occupancy sensors must be avoided within the desired room; passive infrared sensors should be used when possible
 - Since Mezzanine's tracking system utilizes radio communication at 900MHz, ensure that there is an open channel in the 900MHz range in the desired room
 - For deployments outside of the US, Mezzanine's tracking system will utilize 2.4 GHz radios, where 2 channels are required

UPS Support

- Mezzanine deployed to a server room should be connected to a UPS in order to keep Mezzanine active during brief power outages. While not required, Oblong recommends a UPS with the following specs:
 - Output power capacity: 1000 Watts / 1440 VA
 - Max configurable power: 1000 Watts / 1440 VA
 - Nominal output voltage: 120V or 230V (depending on location)
 - Output frequency: 50 / 60Hz (depending on location)
 - Nominal input voltage: 120V or 230V (depending on location)
 - Input frequency: 50 / 60Hz (depending on location)
- Mezzanine deployed in-room does not require a UPS.

Whiteboard Recommendations

- Minimal reflectivity is preferred to reduce the glare of displays or lighting
- Non-transparent whiteboard surfaces are preferred in order to provide a high contrast between the whiteboard surface and the marker color
- 16:9 aspect ratio (or similar)

Preferred Lighting

- Indirect lighting around a room's perimeter is preferred for optimal display viewing
- Even lighting over the whiteboard for enhanced image quality
- For optical tracking, avoid direct sunlight behind any tracking enabled displays

What hardware is included in a Mezzanine bill of materials?

Mezzanine can be tailored to meet the needs of both how teams work and the rooms in which they work. A Mezzanine room is comprised of the following types of equipment:

- Oblong Appliances
- Spatial Tracking
- Whiteboard Capture
- Peripherals (sold separately)

Oblong Appliances

COMPONENT	MANUFACTURER	DESCRIPTION	QUANTITY
Mezzanine Appliance	Oblong	The hub of the Mezzanine experience. Available in in-room and server room form factors.	1
Corkboard Appliance	Oblong	Extend your Mezzanine experience by adding more displays. Available in in-room and server room form factors.	1 (or more)
Perception Appliance	Oblong	Enable your room with gestural control using Oblong's Wands.	1

Spatial Tracking: Optical

COMPONENT	MANUFACTURER	DESCRIPTION	QUANTITY
Optical Wands	Oblong	A gestural control device used to control the Mezzanine Workspace.	Up to 2
Bluetooth LE Receiver	Oblong	A Bluetooth LE radio receiver used to communicate with the wands.	Up to 2
Tags	Oblong	Display mounted array of IR LEDs used to enable the gestural control of Mezzanine.	2 / display

Spatial Tracking: Ultrasonic

COMPONENT	MANUFACTURER	DESCRIPTION	QUANTITY
Ultrasonic Wands	Oblong	A gestural control device used to control the Mezzanine Workspace.	Up to 2
Base Receiver	Oblong	A radio receiver used to communicate with the wands. Available in 900MHz in the US and 2.4GHz outside of the US.	Up to 2
Emitters	Oblong	Ceiling mounted sensors used to enable the gestural control of Mezzanine.	1

Whiteboard Capture

COMPONENT	MANUFACTURER	DESCRIPTION	QUANTITY
Whiteboard Camera	Avigilon	An IP camera used to stream or capture an analog whiteboard surface	1

Peripherals

COMPONENT	MANUFACTURER	DESCRIPTION	QUANTITY
Displays	Various	Typical sizes range from 46" – 80"	Up to 6
PoE Network Switch	Various	8-port (minimum) PoE network switch in support of Mezzanine's Private Network	1
Video Teleconferencing	Cisco, Polycom, Lifesize	Standards-based VTC codec	1
Audio System	Various	Mixer / DSP	1
	Various	Amplifier	1
	Various	Speakers	2
Power Support	Various	Switched PDU	1
	Various	UPS: 1000W / 1440 VA	1

Connectivity

What type of interconnectivity is required for Mezzanine?

Spatial Tracking

Mezzanine features two spatial tracking options—optical and ultrasonic. Both tracking systems provide the same experience for the user—gestural control over their information. The choice of which technology is deployed is driven by the type work being performed and the characteristics of the room in which Mezzanine will be installed. Optical tracking uses display mounted sensors, making it a fit for most enterprise conference rooms. Ultrasonic tracking uses ceiling mounted sensors and is well suited for larger or more complex spaces.

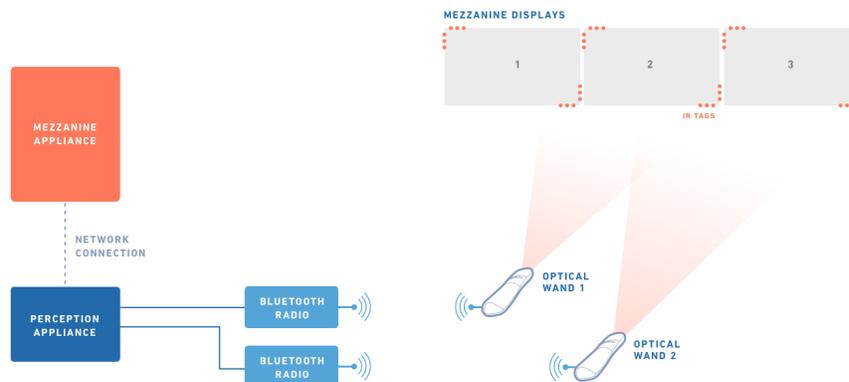
A closer look: Optical tracking

Oblong's optical tracking system is comprised of:

- An array of display mounted IR tags
- Bluetooth LE receivers
- Spatial wands
- Perception Appliance

Mezzanine enabled displays are equipped with an array of IR tags—ultra-thin LEDs mounted to a display's bezel—to provide a unique ID to each display. Oblong's wand views these tags and provides real-time position and orientation data to a Perception Appliance—Mezzanine's tracking hub—using a Bluetooth LE link to a connected Bluetooth receiver. Mezzanine and its Perception Appliance communicate with each other over Mezzanine's private network.

Mezzanine: Optical Tracking



A closer look: Ultrasonic tracking

Oblong's ultrasonic tracking system is comprised of the following components:

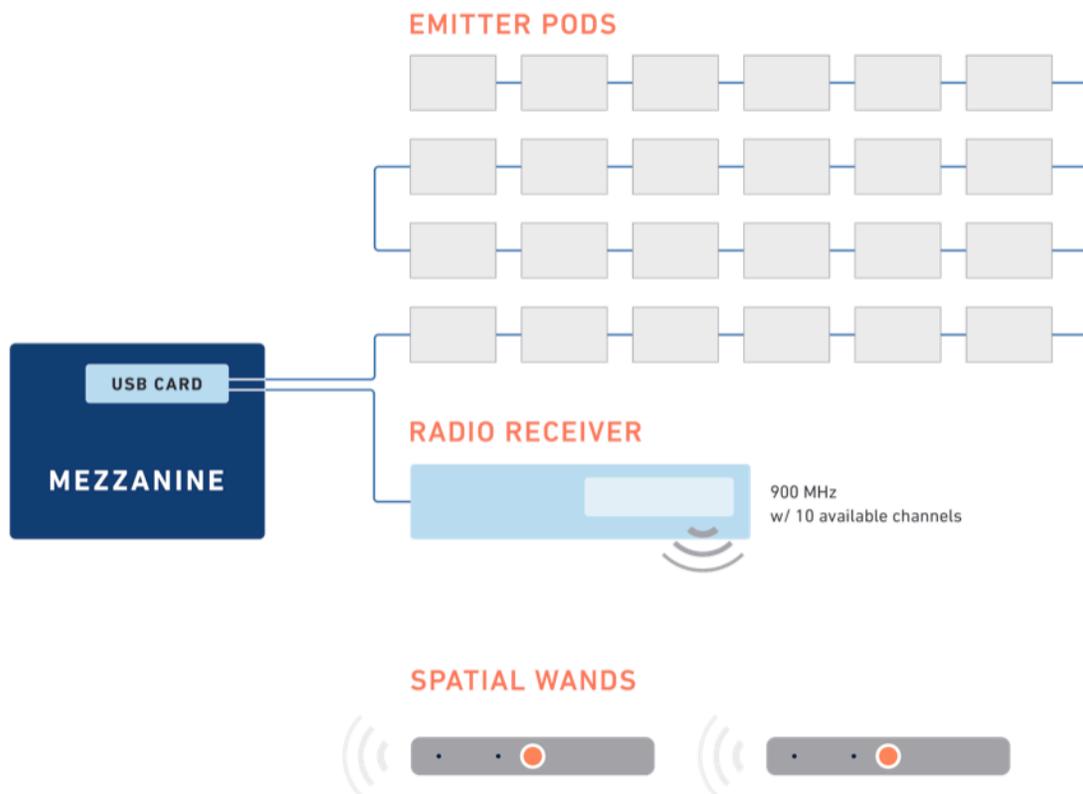
- An array of ceiling mounted ultrasonic emitters
- Base radio receiver(s)
- Spatial wands

An array of ultrasonic emitters is ceiling mounted and connected in series to create a tracking area of up to 7 x 7m, where a wand can be used to gesturally control Mezzanine. The ceiling mounted emitters can be installed to meet performance, maintenance, and aesthetic requirements:

- Mounted onto a finished ceiling with emitter bars
- Mounted onto T-bar of a drop ceiling using emitter pods
- Mounted architecturally into ceiling tiles or a ceiling structure

In the case of an architectural installation, Oblong may act as a design consultant to best integrate the tracking hardware into a ceiling design.

Each Mezzanine room comes equipped with a base radio receiver, which allows each wand to communicate its position and orientation in real-time directly to Mezzanine. This communication uses radio frequency at either 900MHz for Mezzanines deployed in the US or 2.4 GHz for deployments outside of the US. Both the ultrasonic emitter array and radio receiver(s) are connected to a USB interface card, which is housed within the Mezzanine appliance, via 10p10c cable.



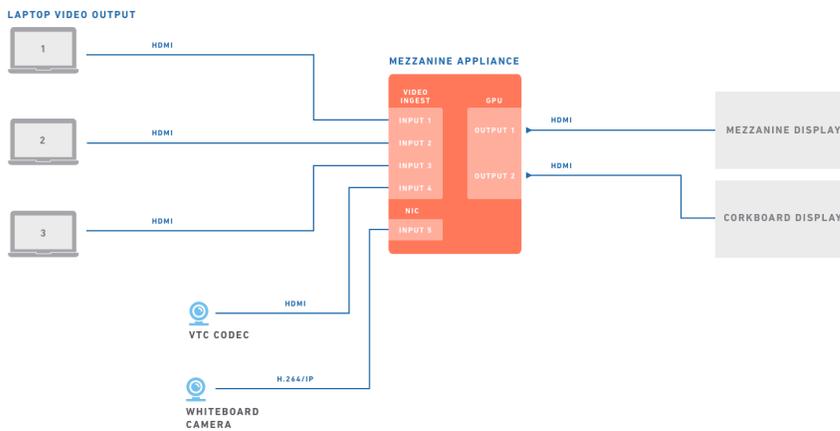
Video

Mezzanine enables multiple users to simultaneously connect and display their devices onto a flexible, digital workspace. Devices can be shared either using a video cable connection or a network connection to stream—wired or wirelessly—to Mezzanine. All options in Mezzanine’s product family can capture up to 10 unique video feeds simultaneously.

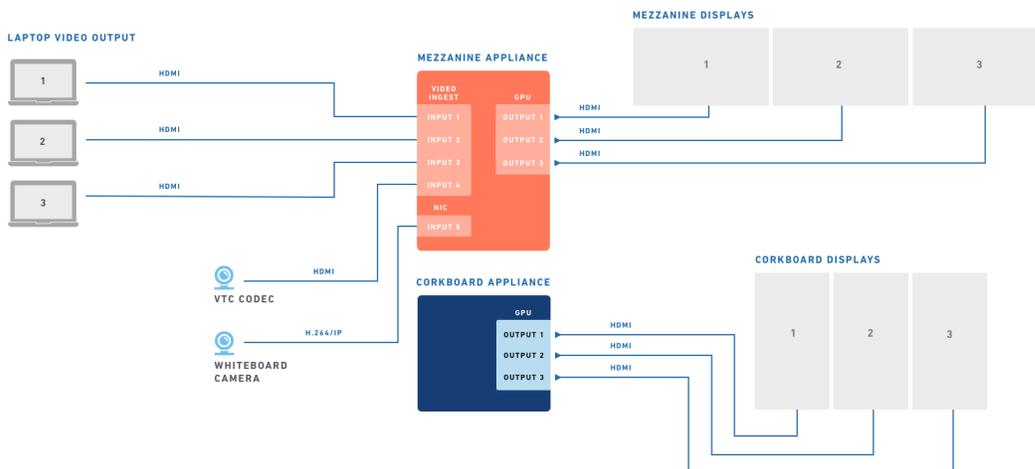
Mezzanine’s digital workspace can be used to share, move, scale, and arrange content across any connected displays. Mezzanine’s product family options allow you to deploy a tailored solution into any conference room in your enterprise.

See below for sample video flows for Mezzanine Teamwork and Mezzanine: In-Room.

Mezzanine Teamwork: Video Flow Diagram

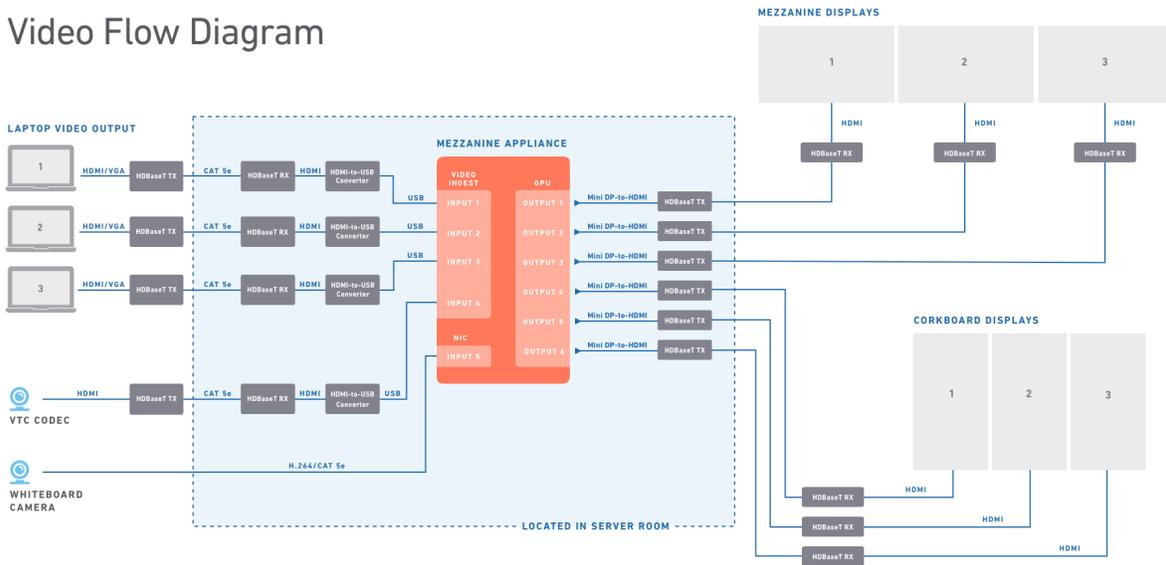


Mezzanine In-Room: Video Flow Diagram



When deploying Mezzanine into a server room, HDMI video extension may be required. Oblong recommends using HDBaseT transmitters and receivers to extend HDMI video signals over long distances. Video extension can be applied to both video input and video output. See below for a sample server room video flow.

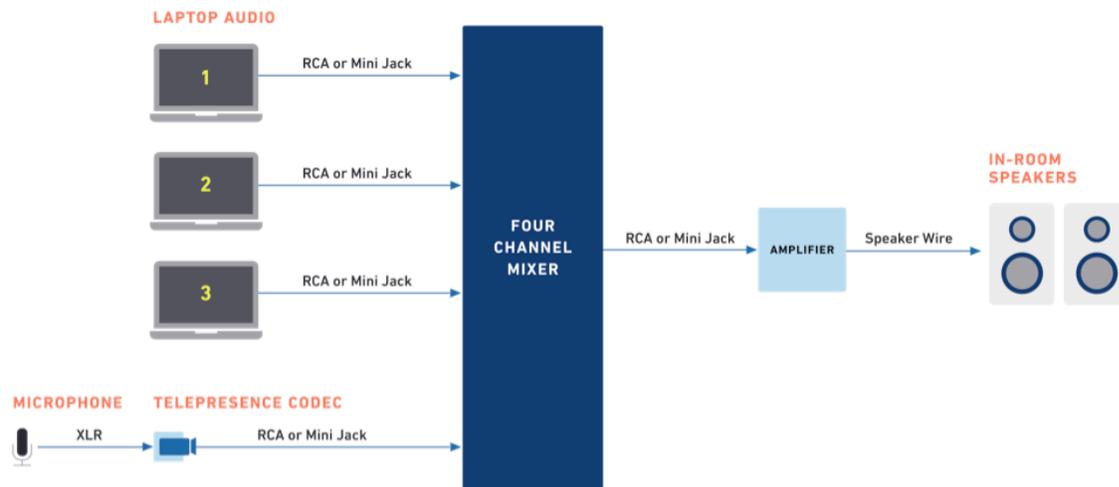
Mezzanine Server Room: Video Flow Diagram



Audio

Even though Mezzanine does not provide native audio support, an auxiliary audio solution can be easily added to supplement Mezzanine and its attached peripherals. Oblong recommends that audio is de-embedded from any input sources and sent as an input into either an audio mixer or DSP. For more sophisticated audio requirements, Oblong recommends contacting one of its certified AV partners for design and implementation. See below for a sample audio flow.

Mezzanine Audio Flow Diagram



Network

Mezzanine comes equipped with two networking interfaces used to connect:

- End user devices to Mezzanine across a LAN or WAN (Public)
- Mezzanine appliances and devices on a private Mezzanine-only network (Private)

Each of Mezzanine's product family members can be configured uniquely to suit a room environment and use case. The table below illustrates the networking differences between each of Mezzanine's options:

	MEZZANINE: SERVER ROOM ULTRASONIC	MEZZANINE: SERVER ROOM OPTICAL	MEZZANINE: IN-ROOM OPTICAL	MEZZANINE TEAMWORK: OPTICAL
Number of Ethernet Ports	2	2	1	1
PoE Network Switch	No	Yes	Yes	Yes

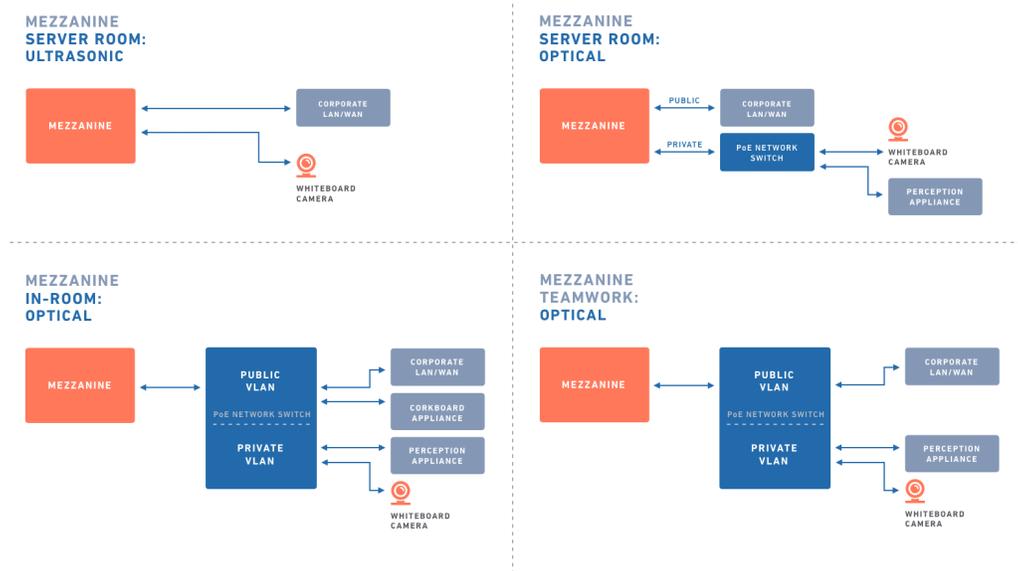


Figure: Mezzanine Network Configuration

Serial

Available in Mezzanine's Server Room form factor, Mezzanine can communicate with a videoconferencing codec using a serial interface. This connection enables Mezzanine to use a videoconferencing unit's API to connect and disconnect video calls in support of an Infopresence or Mezz-In session. Cisco and Polycom videoconferencing systems are supported.

Networking

What network configurations are required for a Mezzanine?

For each Mezzanine room, you will need to assign the Mezzanine appliance with:

- An IP address for a connection to your corporate network, LAN, or WAN
- A DNS A record to map a hostname to Mezzanine's IP address

Whenever possible, a static IP address or a MAC assigned DHCP IP address should be used to simplify the management of your Mezzanine.

In addition, ports may need to be opened to enable Mezzanine to communicate to other Mezzanines or connected devices. See *What ports does Mezzanine use to communicate?* for more information on which ports are required.

How do devices connect to a Mezzanine room?

Laptops and mobile devices can be used to control Mezzanine, view content shared within Mezzanine, and share video feeds into Mezzanine. For these devices to connect to Mezzanine, they need to either be on the same network as Mezzanine or be connected to a network, which is routable to Mezzanine's network.

What is Mezzanine's Networking Service Level Agreement (SLA)?

For an optimal Infopresence connection, the following network requirements are recommended:

- Bandwidth: Each Mezzanine room should be allocated 15 Mbps [upload and download]
- Network latency: Round-trip traffic routed between Mezzanines should be no more than 300 ms
- Jitter: Peak-to-peak delay variation (jitter) should be less than 10 ms
- Packet loss: Communication between Mezzanines should experience no more than 0.05% packet loss

What types of bandwidth configuration options are available?

Mezzanine's web-based admin tool enables a system administrator to configure the amount of bandwidth—both maximum and minimum—for individual video feeds, as well as the overall maximum bandwidth used by Mezzanine.

Based on available or allocated bandwidth, these controls allow for Mezzanine to be fine-tuned. On a high-performance network with ample bandwidth, Mezzanine can be configured to enable a significant number of high definition videos to be streamed simultaneously to other Mezzanines. Conversely, for bandwidth limited networks, Mezzanine can be configured to restrict the overall bandwidth consumption to meet the requirements of the network.

How many Mezzanine rooms can connect in a single session?

Mezzanine allows for up to four rooms to connect and share content simultaneously. When Mezzanine rooms are connected, their content is digitally interlocked, meaning that all Mezzanines are viewing and controlling the same content.

How can an Infopresence session's traffic be optimized via QoS?

Mezzanine traffic can be prioritized according to ports in the following order, from most important to least important:

- Plasma communication (TCPS: port 65456)
- Video streaming (UDP/SRTP: ports 20000-20050)

What if my network doesn't meet Mezzanine's network SLA requirements?

Mezzanine's admin app provides the ability to configure limits for incoming and outgoing bandwidth. These limits ensure that Mezzanine is provided with sufficient bandwidth to connect to other rooms for Infopresence and to ensure that your network isn't impacted by Mezzanine's bandwidth usage.

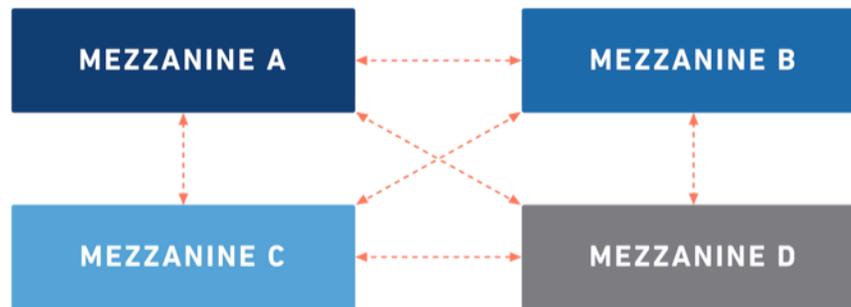
Streaming video is the biggest consumer of bandwidth during Infopresence sessions. If the amount of available bandwidth is less than the configured bandwidth limit, then fewer full motion videos will be allowed to stream simultaneously between Mezzanines. Specifically, once all available bandwidth has been utilized, the video feed which was interacted with least recently will begin to thumbnail—a frame of video will appear every 4 seconds. By forcing videos to thumbnail, bandwidth consumption is reduced while allowing some streaming videos to continue to transfer between Mezzanines.

For most office applications, such as Word, Excel, and PowerPoint, video thumbnailing does not affect an end user's experience. If multiple, simultaneous dynamic applications or videos are required, then additional bandwidth may be required.

Note that these requirements apply for Infopresence connections only. For single room Mezzanine sessions, all traffic is contained within a LAN.

What network configurations are recommended to connect multiple Mezzanines?

Each Mezzanine participating in an Infopresence session connects to other Mezzanines through a peer-to-peer connection. In general, for Mezzanines to be able to communicate with one another, each system's IP address and traffic needs to be routable to the other Mezzanines connecting through Infopresence. The following network topology diagram illustrates the P2P connections made during a four-room Infopresence session.



While there are several ways that you can configure your network to enable Infopresence communication, here are three common options:

- Option 1: Since Mezzanine's protocols are not currently NAT-aware (Network Address Translation), each Mezzanine appliance must be on routable subnets to one another where NAT traversal is not required. The simplest way to accomplish this setup is to use a site-to-site VPN to route the appropriate subnets directly. For this configuration, it is acceptable if each Mezzanine is on a separate subnet, as long as they are all routable.
- Option 2: If an existing WAN is in place—either via a VPN or publicly—through which VLANs are maintained, all Mezzanines could be placed within a single subnet in a single VLAN.
- Option 3: The Mezzanine appliances can be placed directly on the Internet or in a DMZ area of your network. While Mezzanine does provide encryption for data being transmitted over the Internet, this method of connecting is not recommended for various system security reasons. The security reasons are not Mezzanine specific but would fall under best practices for system security.

Note: Traffic sent between Mezzanines and traffic sent between devices and Mezzanines should not traverse a NAT. For Mezzanines or devices connecting to the Mezz-In Cloud, traffic should traverse a NAT.

Security

What is Mezzanine's threat model?

Threats to Mezzanine can be organized along the following attack vectors:

- Physical
- Administrative Interface
- Client Communication
- Infopresence Sessions
- LDAP Communication

A combination of security features built into Mezzanine along with recommendations for mitigating these attack vectors result in creating a secure environment for your Mezzanine appliance. Let's take a look at each attack vector and see how threats can be mitigated.

PHYSICAL

ATTACK VECTOR	MITIGATION
Data stored on a Mezzanine can be compromised in cases of theft or tampering.	Mitigate by securing access to the appliance. Further mitigate by configuring Mezzanine, via the administrative interface, to enforce a lifespan on all user data. For certain hardware configurations, possible mitigation by enabling disk encryption.
Peripherals and the tracking system communicate with Mezzanine over wired connections.	Mitigate by securing access to the facility and by periodically examining equipment for signs of tampering.

ADMINISTRATIVE INTERFACE

ATTACK VECTOR	MITIGATION
Brute force attacks against weak passwords.	Mitigate by using strong passwords.

CLIENT COMMUNICATIONS

ATTACK VECTOR	MITIGATION
Rogue actor watching traffic in transit for confidential information.	Mitigated by using TLS for all connections.
Unauthorized user joins a Mezzanine using one of the client applications.	Mitigated by users in the Mezzanine room enabling the pass-phrase feature.
Rogue Mezzanine forges an authentic Mezzanine.	Mitigated by Mezzanine's insistence on valid and trusted certificates.
Rogue actor reverse engineers the proprietary Mezzanine protocol to connect as a client.	Mitigated partially by using TLS connections for all traffic, thus preventing sniffing of protocol packets. Further mitigate by network separation such that access to networks that can access Mezzanine requires authentication.

INFOPRESENCE SESSIONS

ATTACK VECTOR	MITIGATION
Unauthorized calling by genuine, external Mezzanine.	Mitigate via network separation.
Unauthorized calling by rogue external Mezzanines.	Mitigated by Mezzanine's insistence on valid and trusted certificates.
External DoS attacks against Mezzanines.	Mitigate via network separation.
Genuine Mezzanine users unwittingly call rogue Mezzanine.	Mitigated partially by requiring administrative access to add a Mezzanine as a potential collaborator. Mitigated against a man-in-the-middle spoofing a real Mezzanine by the insistence on valid and trusted certificates.
MITM manipulates RTCP traffic to manipulate video streams.	Mitigated by using SRTP.

MITM sniffs media streams in transit.	Mitigated by using SRTP.
Rogue DHCP server on the network when Mezzanine is configured to obtain an IP address via DHCP.	Mitigated by site admins configuring port security and DHCP snooping on their switch connecting Mezzanine to the network.

LDAP COMMUNICATIONS

ATTACK VECTOR	MITIGATION
Sniffing credentials from traffic in transit.	Mitigated by Mezzanine's insistence on TLS connections.
Rogue LDAP server on the network spoofing the configured server.	Mitigated by using a server certificate manually uploaded via the administration interface.

How does Mezzanine secure network traffic?

Mezzanine is designed to work securely out of the box. All Mezzanine traffic that leaves the private network – to another Mezzanine, a client or an LDAP server – is encrypted using TLS, by default. System administrators can configure Mezzanine to use certificates signed by Oblong. 4096-bit keys and strong cipher suites such as AES (256-bit) and ECDH are preferred everywhere, and null cipher downgrades are prohibited.

System administrators can further control risk through any of the standard network separation techniques that limit which users and services are permitted to access a Mezzanine. For instance, only users on local Wi-Fi or Ethernet networks and a list of known collaborating Mezzanines need access in most situations.

What ports does Mezzanine use to communicate?

To enable all of Mezzanine's functionality, the following incoming ports should be opened. All other traffic can be safely filtered.

PORT(S)	PROTOCOL	APPLICATION
80	TCP / HTTP	HTTP redirects to 443 / HTTPS
161	UDP	SNMPv3
389	TCP	LDAP admin app
443	TCP / HTTPS	Client access, Infopresence sessions
636	TCP	LDAP secured by TLS
6783	TCP	Overlay Network Control (Mezz-In)
6783-6784	UDP	Overlay Network Data (Mezz-In)
8554	TCP	RTSP control interface
20000-20050	UDP / SRTP	Video streaming (Infopresence)
30000-30050	UDP / DTLS	Video streaming (Screencast)
40000-50000	TCP / UDP	Streaming media (Mezz-In)
65456	TCPS	Plasma communication

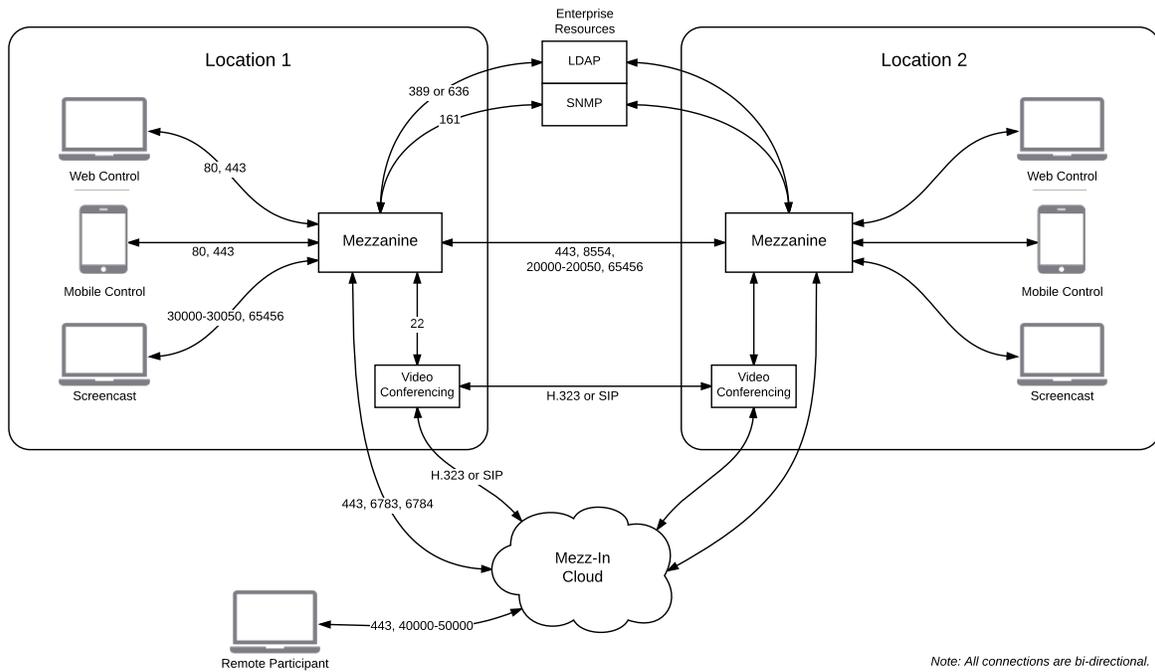


Figure: Mezzanine Network Architecture

How can users keep their meeting information private?

Mezzanine integrates with LDAP, Active Directory, or SAML 2.0, allowing users to sign in to Mezzanine using their enterprise username and password credentials. By signing in to Mezzanine, users can store their meeting information privately under their personal account.

In addition to storing information privately, users can initiate a “locked” session where only participants with a session’s passkey can view and interact with meeting content through a connected web browser and/or mobile device.

Enterprise Integration

What authentication services and protocols does Mezzanine use?

Mezzanine allows end users to sign in using a web browser or mobile device to store their meeting information privately on the Mezzanine appliance. Admins can sign in to the admin app to configure or maintain their Mezzanine. For both end users and admins, Mezzanine can be configured to integrate with enterprise standard authentication protocols and services.

USER TYPE	SAML 2.0	ACTIVE DIRECTORY	LDAP
End User	X	X	X
Administrator	X		

If SAML 2.0 is used for admin access, user groups can be configured via SAML 2.0 claims / assertions.

In these cases, user credentials are not stored on Mezzanine; instead, Mezzanine uses an encrypted connection with the authentication server to validate the username / password pair.

If enterprise authentication services and protocols are not used, Mezzanine offers a local LDAP server, which resides on the Mezzanine appliance. In this case, user credentials are stored in an industry standard encrypted format by the local LDAP server. The local LDAP server option enables user accounts to be created by a system administrator in a case-by-case basis for each Mezzanine.

How does Mezzanine integrate with my existing videoconferencing infrastructure?

Room-based videoconferencing equipment can be integrated into Mezzanine by sharing the video output from the videoconferencing codec into Mezzanine as a live stream. This video feed becomes a flexible, scalable window on Mezzanine's workspace.

Video calling does not route through Mezzanine's Infopresence connection; instead, video calls are connected using the existing video and networking infrastructure, meaning that P2P, multi-site, or hardware/software bridged calls can still be made without any modification.

In addition, Mezzanine offers special functionality for Cisco, Polycom, and Lifesize room-based systems. By configuring Mezzanine to communicate with those room-based systems through a serial* or SSH connection, video calls can be automatically connected and disconnected for Infopresence sessions.

**Serial connection available on the Mezzanine Server appliance only.*

How can I monitor the health and performance of Mezzanine?

Mezzanine makes core system statistics available through Simple Network Management Protocol (SNMP). Read-only information for Mezzanine's CPU, memory, disk storage, and network interfaces is made available for SNMP monitoring software to poll or trap. Since Mezzanine requires all communication to be encrypted, SNMPv3 is required.

Maintenance

What daily maintenance is required for Mezzanine?

The Mezzanine appliance does not require any daily maintenance. Both the software and appliance are designed for always on, 24/7 operations.

In-room devices, such as spatial wands and mobile devices, require daily charging to ensure the devices have sufficient power for the following workday. The wands are designed to run for an entire business day. They contain rechargeable batteries that last up to 10 hours when fully charged. In addition, the wands have a battery preservation feature, which powers off the wands after 30 minutes of inactivity.

If power reduction initiatives are in place at your organization, the displays may be required to be powered on / off on a daily basis.

What periodic maintenance is required for Mezzanine?

Periodically, software upgrades should be applied to Mezzanine to obtain the latest features, software improvements, and security enhancements. Aside from software upgrades, no additional periodic maintenance is required.

If anomalous behavior is occurring with your Mezzanine, please file a support request by logging at ticket in the Mezzanine Customer Portal (<https://support.oblong.com>).

Oblong is always looking to improve the Mezzanine experience. If you would like to help us provide a better Mezzanine experience for your coworkers, you can export usage logs from the web-based admin tool and email them to Oblong at mezz-usage@oblong.com.

How are software upgrades provided?

If your Mezzanine is covered by an active maintenance contract, you will have access to a Mezzanine software upgrades. These upgrades can be accessed through the Mezzanine Customer Portal (<https://support.oblong.com>). Software upgrades include new Mezzanine features, Mezzanine bug fixes, operating system improvements and upgrades, and patches to security vulnerabilities.

Software upgrades can be applied through Mezzanine's web-based admin panel.

Are security patches available?

Yes, as part of the Mezzanine's software upgrade cycle, security patches are provided. These upgrades patch any critical vulnerabilities identified in the operating system or in any software packages used by Mezzanine.

Support

What type of support is included in a Mezzanine maintenance contract?

An active maintenance contract provides you with the following support items:

- Software updates, as they become available
- Assistance through the Mezzanine Customer Portal (<https://support.oblong.com>) with respect to the use of the software and hardware, including:
 - Clarification of functions and features of the software and hardware
 - User and administrator documentation
 - Guidance in the operation of the software and hardware
- Error verification, analysis, and correction

In addition, Oblong will provide you with a Technical Account Manager (TAM). Your TAM is focused on helping you make effective use of your Mezzanine by:

- Providing user and admin training
- Consulting on use case best practices
- Assisting with the installation of software updates
- Collecting product feedback

Where can I find more information about Mezzanine support?

The Mezzanine Customer Portal (<https://support.oblong.com>) is a great first resource for training and support related information. In addition, your Technical Account Manager and Sales Executive are available to assist when needed.

Deployment Checklist

To prepare for your upcoming Mezzanine deployment, the following list contains items that are normally performed between the date of purchase and the first day the system will be available for use:

- Oblong and/or an AV partner performs a final site survey to assess site readiness
- Oblong and/or an AV partner provides room modification recommendations, if required
- If room modifications are required, your company performs any required room enhancements
- Your company configures your network for Mezzanine:
 - Assign a static IP address or MAC assigned DHCP address
 - Assign a hostname
 - Open required ports for Mezzanine communication
 - Configure for network connectivity between Mezzanine rooms
- Your company gathers SAML 2.0, LDAP, or Active Directory server information required to connect Mezzanine to your company's authentication servers.
- Oblong and/or an AV partner performs the Mezzanine installation, normally 4-5 days in length
- Oblong and/or an AV partner provides training for your IT staff and end users
- Your company assigns a room owner(s) or admin(s)
- Oblong assigns the room owner(s) or admin(s) with a support account, providing access to submit support requests and download training materials