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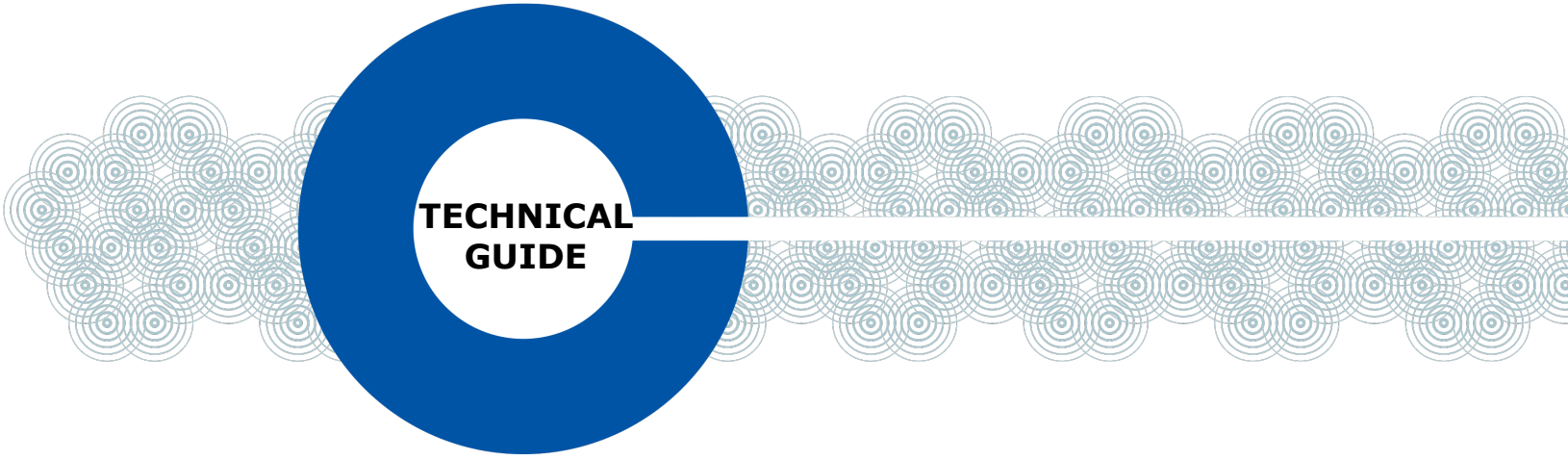
AN HME COMPANY



IP Network Guidance:
HelixNet Digital Partyline

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Introduction

HelixNet Digital Partyline

The HelixNet Digital Partyline system offers a tremendous amount of flexibility and performance to broadcast and live productions requiring partyline communications. HelixNet Digital Network Partyline System delivers all the features and functions of industry-standard analog partyline systems along with digital audio clarity over 24 channels and IP connectivity via Powerline or networked Power-over-Ethernet (PoE). HelixNet operates over any standard single, twisted-pair, shielded cable (like microphone cable) using our Powerline technology. As this paper will explain, it can also be interconnected over standard IT network infrastructures via IP/LAN.

HelixNet Network Guidance

This guide provides specifications, best practices and guidance for the integration of HelixNet into existing or new ethernet networks. Several of the terms used in this paper are technical in nature, please see the glossary at the end of the document for explanations and definitions.

HelixNet Components

HelixNet systems consist of a system host, such as an Arcadia Central Station or the HelixNet HMS-4X Main Station, and endpoints which are either intercom interface ports (e.g. 2-Wire or Arcadia HelixNet Enabled Channel) or an intercom user stations (e.g. beltpack).

HelixNet Architecture

HelixNet is built on Clear-Com's patented I.V.Core, decentralized network mixing system. The HelixNet system host is a central configuration point and a network router (I.V. Router) for audio streams and does not mix audio. All HelixNet system components connect on a network. HelixNet endpoints (I.V. Client) transmit their audio streams to the central network router (I.V. Router) and receive individual audio streams for mixing to the output of the interface port or the users headset.

HelixNet Digital Partyline

In Figure 1 (below) teams in separate studios (A and B) can communicate with an outside broadcasting truck on the same digital partyline system over their existing IP network. With cabling integration possibilities in either XLR or CAT5/6, HelixNet becomes a flexible solution in multiple scenarios.

- Live Production
- Performing Arts and Theatre
- House of Worship
- Theme Park Ride Communications (Figure 2)

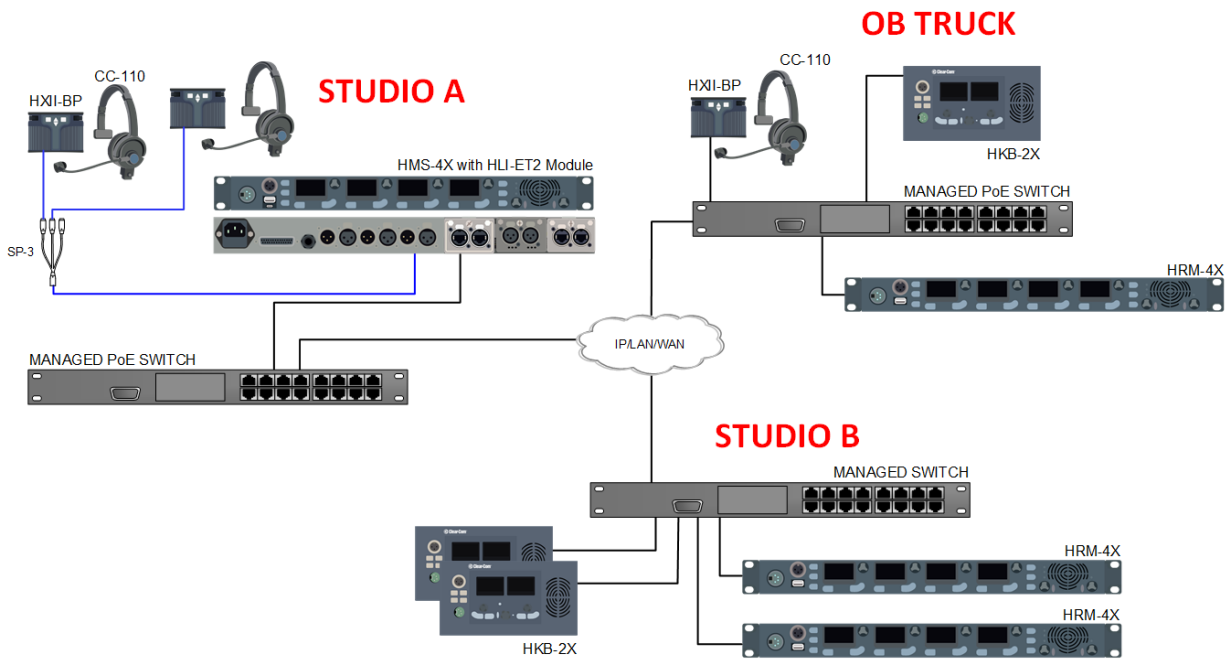


Figure 1

HelixNet Cold Standby Backup

Because of its IP capability, HelixNet is an excellent solution for intercom communication for Theme Park Rides as shown in Figure 2 (below). A Park's Network Operations Center houses sets of either Arcadia Central Station or HelixNet HMS-4X Main Stations system hosts per ride – one hosting the HelixNet system, the second a

cold standby redundant backup with an identical configuration. The primary unit connects to a local switch, the local switch then connects to a second PoE switch at the ride. HelixNet User Stations (Speaker Stations and Beltpacks) are placed at strategic positions within the ride to connect operators and provide a safe experience for the customer. In case of a system host failure the network connection can be switched over to the cold standby unit and all User Stations will reconnect to the new system host.

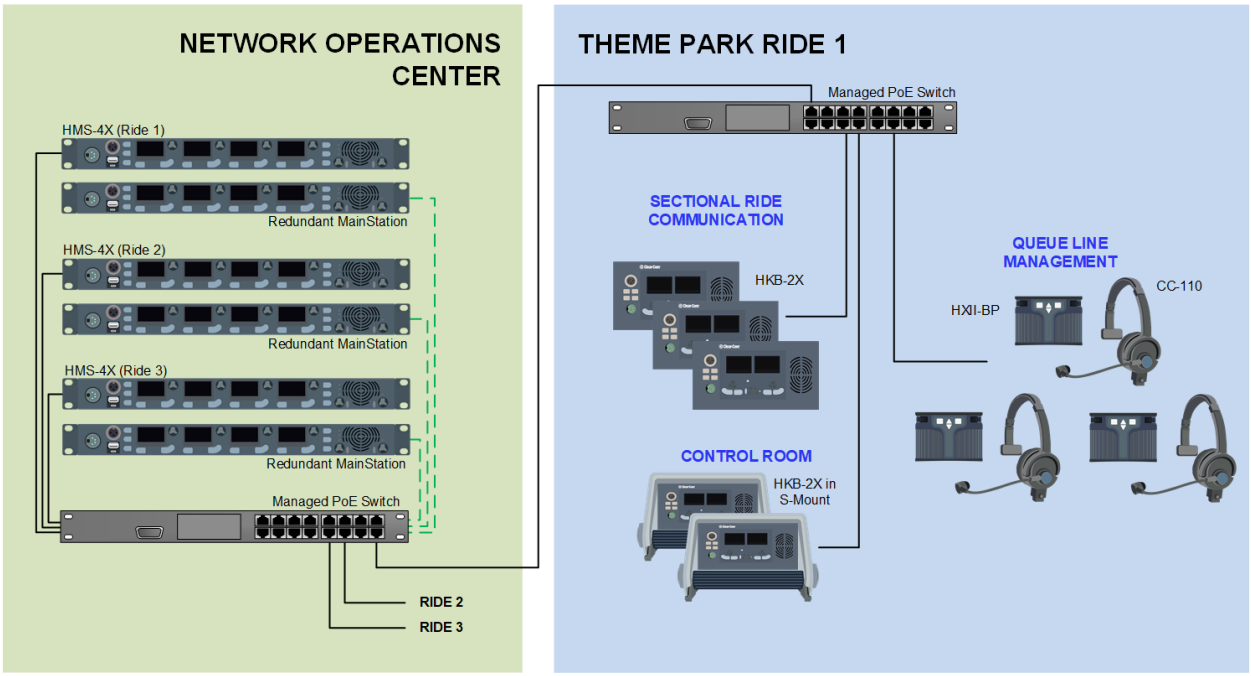


Figure 2

Network Topology

The HelixNet system host (Arcadia or HMS-4X), Remote Station, Speaker Station and Beltpack connect on a network. With the exception of the Arcadia, HelixNet uses exclusively 100Mb Network Interfaces for low power consumption. Devices are physically added to the network by connecting the RJ45 LAN port on the device to an Ethernet switch port using a shielded CAT5 or CAT6 cable. Remote Stations and Speaker Stations be powered using PoE Ethernet switches or a local power supply while the HXII-BP Beltpack can only be powered from a PoE Ethernet switch or injector.

HLI-ET2 Module

Arcadia connects directly to the Ethernet switch while the HMS-4X requires the HLI-ET2 2-port Ethernet module (pictured). The HLI-ET2 ports act as two normal switch ports allowing daisy chaining together, but they do not use Spanning Tree Protocol - connecting both ports to the same switch can cause redundant paths or loops which will cause a packet storm and severely degrade both networks.

Best practice would be to use one port to connect to the network switch, and the second port to daisy chain to other HelixNet or LQ devices.

HelixNet devices can be paired/linked together across subnets. On local networks they use the mDNS protocol to auto-discover each other and facilitate “Pairing By Name”.

If multicast DNS is not available on the network the HelixNet User Stations can alternatively be “Paired by IP” by entering the IP address of the system host (Arcadia or HMS-4X) from the front panel menu of the HelixNet User Station.

Figure 3 below shows a typical network topology with HelixNet endpoints connected directly to the HMS-4X mainstation, endpoints with a local power supply connected via a switch, and endpoints connected via a PoE switch.

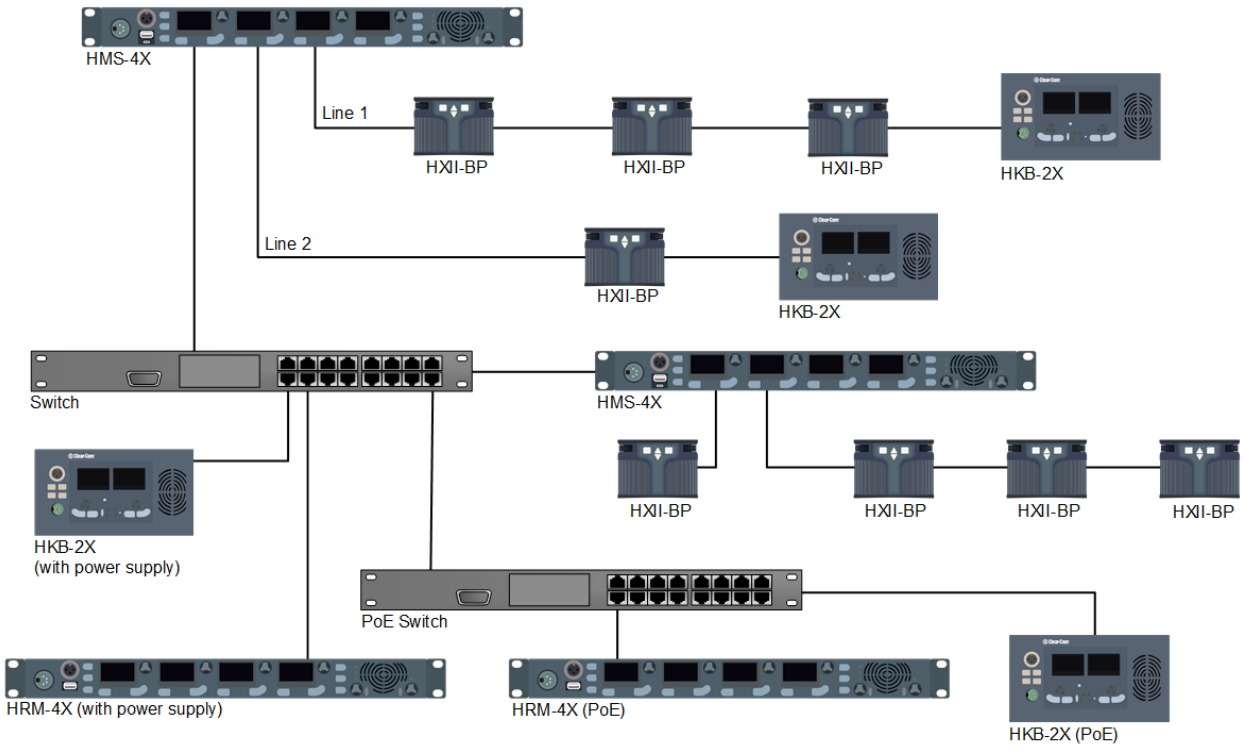


Figure 3

Connecting Across Routable Subnets

Company networks typically have multiple subnets or VLANs. IP routers are already configured to route IP traffic across those subnets. The Arcadia Central Station or HMS Main Station system host and Remote Station, Speaker Station and/or Beltpack must have their IP address, Subnet mask and Gateway configured properly (all automatically done when there is a DHCP server available on the network). If the Remote Station, Speaker Station and/or Beltpack is deployed on a different subnet, you will need to Pair to Station by entering the IP address of the Arcadia or HMS Main Station system host (Pair to Station by Name is not available in the Figure 4 example below). “Pair to Station by Name” is discussed later in this document.

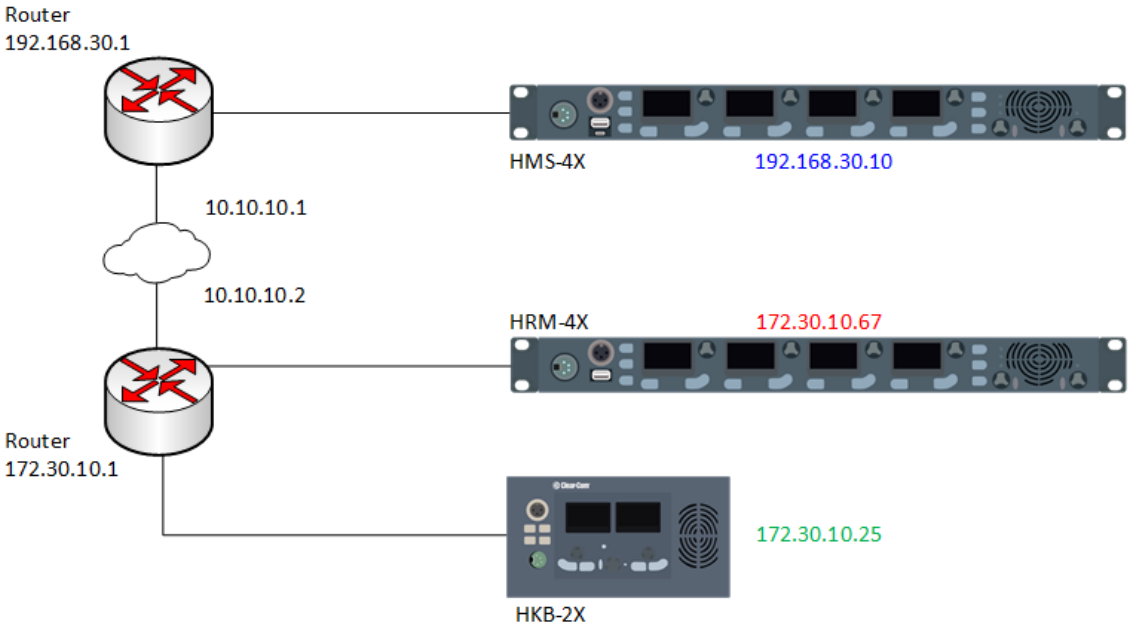


Figure 4

Arcadia or HMS Main Station Network Configuration:
IP Address: 192.168.30.10
Subnet Mask: 255.255.255.0
Gateway: 192.168.30.1

Remote Station Network Configuration:
IP Address: 172.30.10.67
Subnet Mask: 255.255.0.0
Gateway: 172.30.10.1
Pair to Station:192.168.30.10

Speaker Station Network Configuration:
IP Address: 172.30.10.25
Subnet Mask: 255.255.0.0
Gateway: 172.30.10.1
Pair to Station:192.168.30.10

Connecting Across Non-Routable Subnets

The second scenario occurs when an Arcadia Central Station or HMS Main Station system host is in a private/separate network, not directly reachable from where the Remote Station and/or Speaker Station is located. A reachable IP router/gateway, on the network where the Arcadia or HMS Main Station system host is located, must be configured to forward all the IP traffic for port 6001 TCP/UDP to the Arcadia or HMS system host (Figure 5):

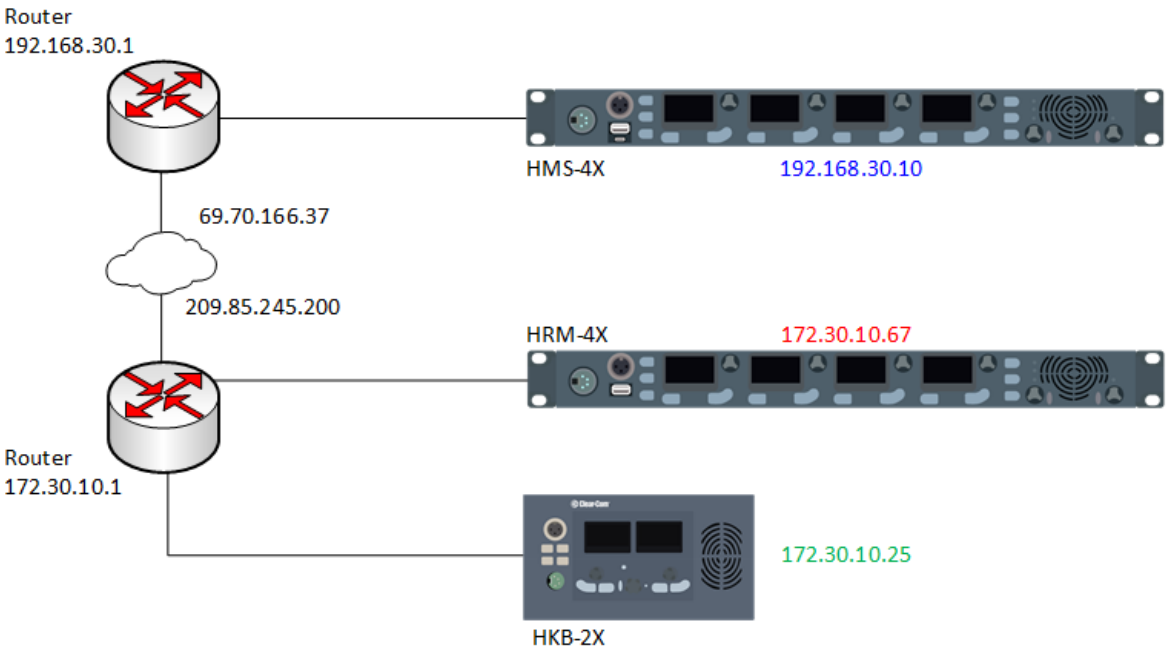


Figure 5

Arcadia or HMS Main Station Network Configuration:
IP Address: 192.168.30.10
Subnet Mask: 255.255.255.0
Gateway: 192.168.30.1

Here the Router on the Arcadia/HMS side must port-forward from 6001 TCP/UDP to 192.168.30.10:6001

Remote Station Network Configuration:
IP Address: 172.30.10.67
Subnet Mask: 255.255.0.0
Gateway: 172.30.10.1
Pair to Station: 69.70.166.37

Speaker Station Network Configuration:
IP Address: 172.30.10.25
Subnet Mask: 255.255.0.0
Gateway: 172.30.10.1
Pair to Station: 69.70.166.37

It should be noted that HelixNet HMS based systems and HelixNet User Stations reserve the 10.0.0.0/24 network for connecting HelixNet.

Firewall: TCP/UDP IP Ports

To support remote connectivity of HelixNet endpoints external to a LAN or WAN, port forwarding rules will be needed to achieve the required connectivity to the Arcadia or HMS system host that.

Listed below are the Port # and description of what the opened ports provide access to:

Unicast:

- Port 69 UDP – Firmware File Server (Optional)
- Port 80 HTML – System Configuration Browser Interface
- Port 123 UDP – Time Stamps for Service Logs (Optional)
- Port 655 TCP – HMS/LQ Link Group: Authentication (not for Arcadia)
- Port 655 UDP – HMS/LQ Link Group: Audio (not for Arcadia)
- Port 6001 TCP – HelixNet Endpoint: Authenticate, Update, Control, Reboot
- Port 6001 UDP – HelixNet Endpoint: Audio

Multicast:

- Port 5353 UDP–mDNS, Names, Discovery, Linking, Expansion
  Optional for device name pairing and linking
  Mandatory for HMS & Remote Station Front Panel Expansion Mode

Link-Group (HMS only)

To create a Link-Group with HMS-4X main stations and/or LQ interfaces, you must designate one unit as Link-Master in the Core Configuration Manager (CCM). The Core Configuration Manager (CCM) interface provides an intuitive software interface for HelixNet on any browser-enabled device. The CCM facilitates a quick and simple means of configuring any devices in a Link-Group, including role-based configuration of endpoints, save and restore, and live monitoring of all system components.

Link-Master serves two main purposes:

- It facilitates Link-Group membership.
  Link-Members connect to the Link-Master.
- It is the owner of the system configuration, the Link Group and Roles.
  Link Groups and Role configuration can only be changed if the Link-Master is available. The Link Group continues to operate normally in the absence of the Link-Master without the ability to make changes to the system.

Note: Clear-Com recommends that the IP address of the Link-Master is allocated statically. When allocated by DHCP, the IP address can change. If this happens the Link-Members will no longer be able to reach the Link-Master device, and Role information may not be available.

Note: Any HMS main station can be set to Link-Master or Link-Member. The default setting for HelixNet linking mode is Link Disabled.

HelixNet HMS main stations that are not identified as master will have the designation of Link-Member. Joining a device to a Link-Group requires that device to be set to Link-Member which will prompt the user to enter the IP address of the Link-Master or select it by name from the front panel. Once joined to the Link-Group, all connected endpoints will have access to the Link-Group's resources.

- Configuration and control of any HMS main station or LQ interface is possible through any other unit in the group except for network configuration.
- System configuration is both distributed and persisted within every Link-Group member for continued operation in the case of an absentee Link-Master.

HelixNet Pairing by Name

HelixNet Remote Stations, Speaker Stations and Beltpacks on the same subnet can pair to a system by name. The system uses mDNS to propagate HelixNet System Host (Arcadia or HMS-4X) and Remote Station (when configured as an expansion host) presence in a network. As a device populates it's mDNS entry, it specifies an ID, an IP address, a name and a list of services.

When configuration changes, the mDNS entry is updated and all devices connected "by name" will update and re-pair/link/expand as required.

NETWORK INSTALLATION

Managed Ethernet Switch

When connecting HelixNet to a managed network switch, ensure that the connection performs at a minimum of 100Mb full duplex.

If the system is using more than one switch, ensure that the bridge between the switches also operates at a minimum of 1Gb full duplex. When using a managed switch, the port connected to the HelixNet Main Station and User Stations should be set at 100Mb versus letting the port auto-negotiate.

Note: You do not need to set all ports to 100Mb, only the ones connected to the HMS-4X main station, Remote Station, Speaker Station and Beltpack. Arcadia LAN Ports should be automatically configured.

We recommend the following specifications when selecting a managed switch to use with HelixNet:

- 100/1000Base-T Layer 3 Managed Switch
- QoS support with the audio traffic prioritized over other data
- If Energy Efficient Ethernet is supported, ensure it is disabled
- SPF/Mini-GBIC support

If connecting two or more switches together, we recommend the bridge / link ports between the switches supports at least 1GB.

HelixNet tags relevant packets at DSCP=34, Assured Forwarding (AF41) beginning with version 4.2 and onwards. Previous versions used DSCP=46.

Unmanaged Ethernet Switch

Clear-Com strongly suggests using a managed switch. Unmanaged switches generally have lower specification processing and memory needed to ensure uninterrupted flow of audio across the network as well as being known to have several configuration features hardcoded, many of which can greatly hinder audio communication. Port speed, QoS and Energy Efficient Ethernet "Green" settings need to be configurable to successfully deploy an IP based HelixNet intercom system.

If you have no other alternative, use an unmanaged switch where port speed is 100Mb, full duplex (port speed is 100Mb in and out). And ensure the unmanaged switch does **NOT** have Green Energy Efficient settings hard coded into the system.

Hubs

Hubs should not be used with HelixNet. HelixNet does not support Hubs all port transmission features.

Connecting HelixNet to Your Network

Integrating HelixNet into your network may need an IP addressing scheme defined with the help of your IT department. We recommend using a STATIC IP address for the HelixNet System Host (Arcadia or HMS-4X Main Station) and leaving all other HelixNet devices on DHCP. However, there are a few scenarios where DHCP may not be desirable.

- In a large HelixNet systems, a DHCP server may not assign addresses to devices fast enough for a network this size. In this case, it is better to utilize static IPs for each device or improve the DHCP server on the network.
- When a port on a Cisco switch starts up, there is a Spanning Tree Protocol (STP) exchange before IP traffic starts flowing properly. This exchange can take up to a minute to complete. In this situation HelixNet devices configured for DHCP addressing will sometimes timeout before receiving its initial IP address. They will retry and get a proper IP address a minute later, but our recommendation in this case is to either use static IP addresses or enabling PortFast on Cisco switches port.

If no DHCP server is found, the HelixNet System Host (Arcadia or HMS-4X Main Station) and all other HelixNet devices will revert to an unused link-local address in the 169.254.0.0/16 block - devices on this subnet block will then be discovered by the Main Station. If neither of these options are used, the Networking menu on the device allows you to disable DHCP and set static IP addresses.

Disable IGMP Snooping

IGMP snooping is a tool used to make network traffic more efficient. A switch with IGMP snooping enabled will typically only send data to nodes that have an existing relationship with the sender. Because IGMP snooping is covered by two overlapping standards, one from IEEE and one from IETF, implementation can vary depending on the manufacturer.

When connecting HelixNet equipment together, IGMP snooping should be disabled. With HelixNet, especially during discovery/linking, data needs to flow throughout the network so all HelixNet equipment (endpoints and devices) capture data they need. Additionally, if you experience a problem where HelixNet station names are disappearing from linking/pairing/expansion menus, it could be caused by the snooping feature. IGMP reportedly can also cause issues with Bonjour/mDNS and PTP.

Example: Some NetGear / Extreme switches have IGMP enabled by default. Ensure that ""block unregistered multicast"" is set to off. This is a scenario where IGMP snooping blocks traffic that must be allowed for mDNS and PTP.

HelixNet Audio Bandwidth

Bandwidth required is based around the Audio stream – there is additional data on the network, but it is not significant. Audio runs at 300kbps per audio stream. Figure 6 (below) shows a typical HelixNet system with four endpoints (HelixNet Devices) connecting to the HelixNet System Host (Arcadia or HMS-4X Main Station) over powerline, and three endpoints (HelixNet Devices) connecting to a switch, which in turn connect to the same HelixNet System Host.

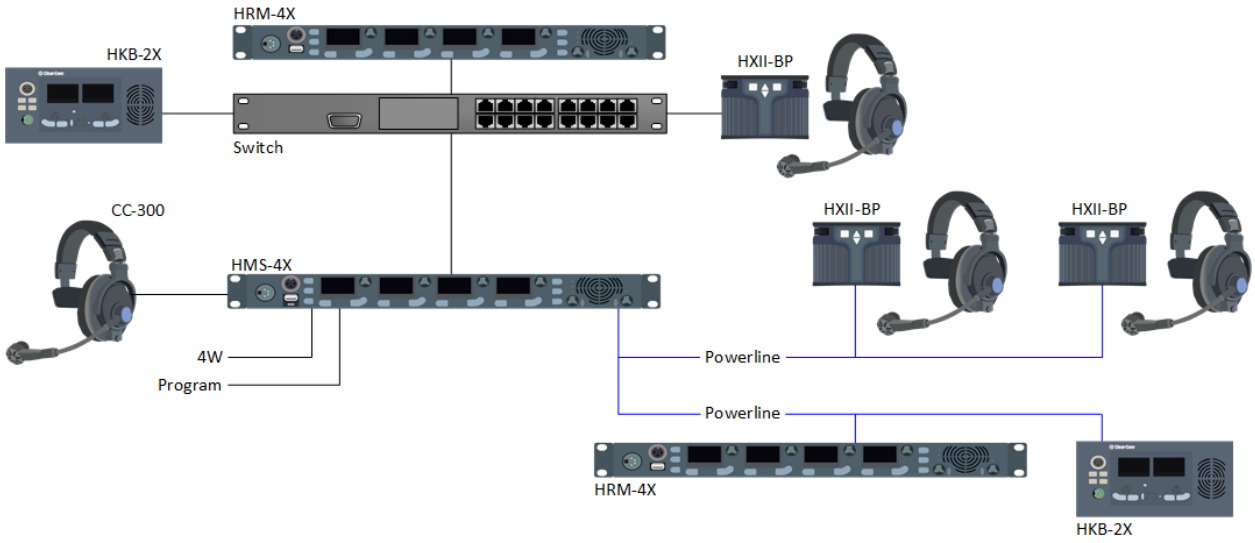


Figure 6

- HelixNet Device transmits at 300 kbps to the HelixNet System Host (Arcadia or HMS) when a user is talking.
- The audio source is sent only once to the HelixNet System Host (Arcadia or HMS). The HelixNet System Host then sends the audio stream point-to-point to each HelixNet Device that is currently listening to the source.
- Audio mixing is only performed at each HelixNet Device output.

- Talk pressed/latched = 300kbps is sent to HelixNet System Host (Arcadia/HMS).
- Each 2W/4W/PGM port when assigned = 300kbps is sent, internally or externally, to HelixNet System Host (Arcadia/HMS).
- PGM on a Remote Station if assigned = 300kbps for mic, 300kbps for PGM/SA
- No Talk or No Assignment = no audio is sent to HelixNet System Host (Arcadia/HMS).

Note: Enabling VOX (if available) on 2-wire or 4-wire port will significantly reduce the bandwidth as otherwise, audio will always be sent from the I/O source to any listener in the system. The same occurs for the distribution of Program Audio.

- Audio and Data sent will max out at 1.2Mbps per destination.
- Between HMS-4X main stations in a Link Group, each audio source is sent once, and only if a user is listening on the second HMS-4X main station or its connected endpoints.

Based on the bandwidth allocations noted, the HelixNet system in Figure 7 (below) will carry the talker's 300kbps to the HelixNet System Host (Arcadia or HMS-4X). One listener is on the Main Station, and the three end points receive 900kbps combined.

One User Talking / Four Users Listening

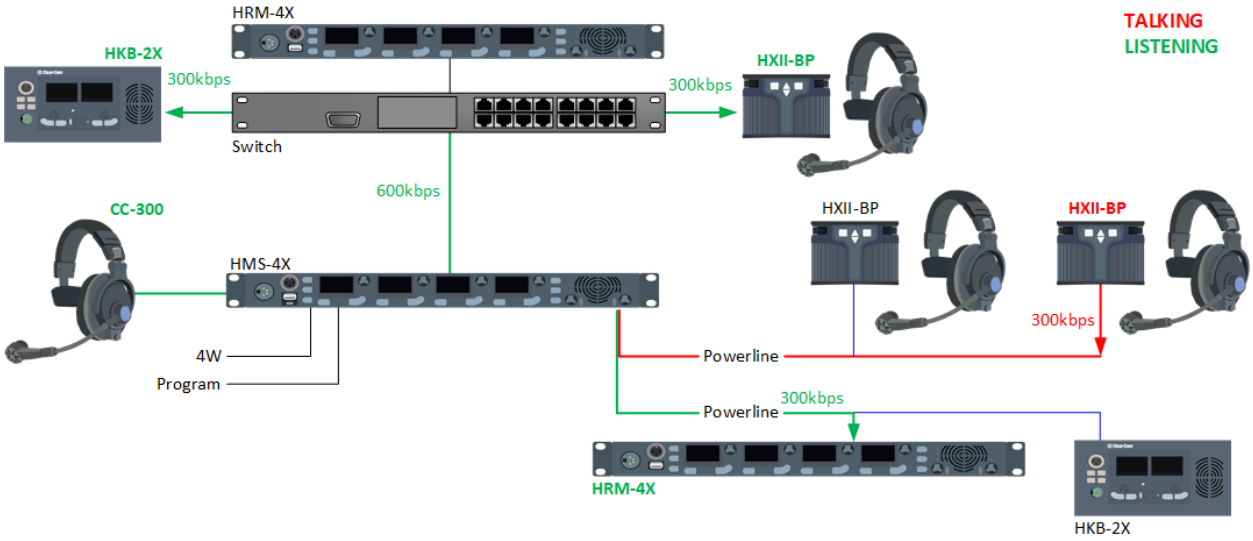


Figure 7

Figure 8 increases the number of talkers to two, on the same channel, with the same four endpoints listening.

Two Users Talking on Same Channel / Four Users Listening

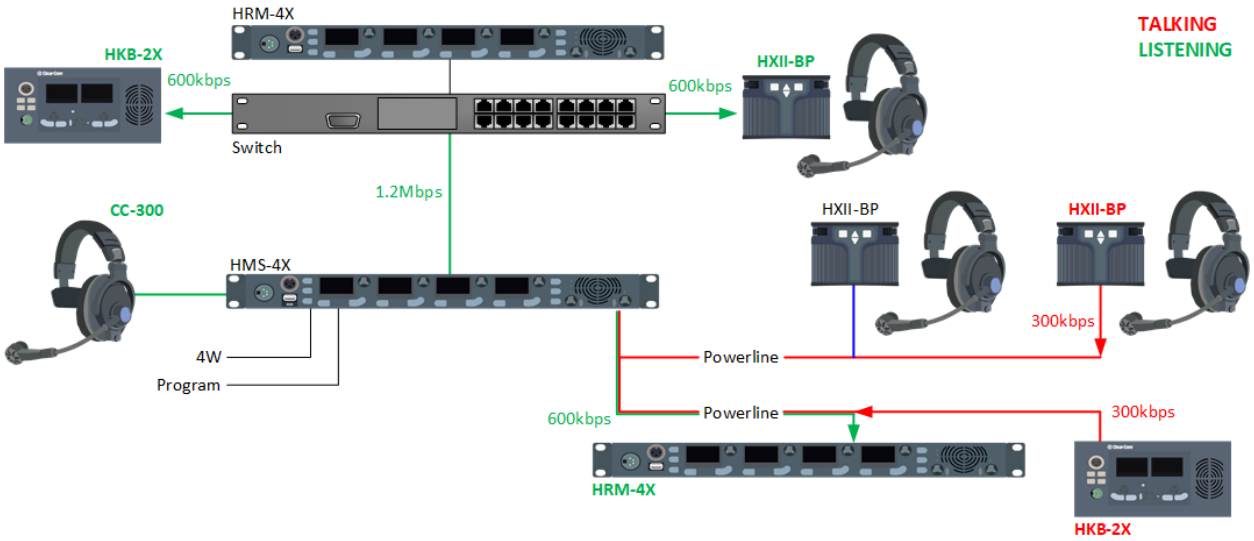


Figure 8

Examples

Workflow (worst-case scenarios where most or all talk keys are latched):

Theater: 1 HelixNet System Host (Arcadia or HMS), 20 Beltpacks, 8-10 channels. 1 Production channel, Beltpacks evenly distributed on other channels (3-4 persons per channel), all over IP (connected to a single 24 port switch)
Rehearsal: All Talk latched, many people listening to 2-3 persons talking at the same time.

Bandwidth usage:

- 300kbps from each Beltpack to switch
- 600-900kbps from switch to each Beltpack
- 20*300kbps = 6Mbps from switch to HelixNet System Host (Arcadia or HMS)
- 20*(600-900)=12-18Mbps from HelixNet System Host (Arcadia or HMS) to switch

Larger Theater: 3 linked HelixNet System Hosts (HMS), 39 Beltpacks evenly distributed over the 3 HelixNet System Hosts (HMS), 15 channels.
Rehearsal: All Talk latched, many people listening to 2-3 persons talking at the same time.

Bandwidth usage:

- 300kbps from each Beltpack to switch
- 600-900kbps from switch to each Beltpack
- From switch to each HelixNet System Host (HMS)
    - 13*300kbps = 3.9Mbps from switch to HMS-4X (for HXII-BP)
    - 2*13*300kbps = 7.8Mbps from switch to HMS-4X (for receiving 13 audio sources from each other to HMS-4X)
    - Total = 11.7Mbps
- From switch to each HelixNet System Host (HMS) to switch
    - 13*(600-900) = 7.8-11.7Mbps from Host to switch (for Beltpacks)
    - 2*13*300 kbps = 7.8Mbps from HMS-4X to switch (for sending 13 audio sources over to other two HMS-4X in the Link Group)
    - Total = 15.6 – 19.5Mbps

Up to 64 (to HMS) or 128 (to Arcadia) HelixNet endpoints (user station / interface port) can be connected over a network, making it important to understand and calculate the bandwidth needs for the HelixNet system and the overall capacity utilization of the HelixNet System Hosts.

Endpoints are assigned to devices as follows:

- One (1) endpoint for Speaker Stations and Beltpacks
- Two (2) endpoints for HXII-BP-X5

  (binaural uses 2 ports)
- Two (2) endpoints for HMS

  (Mic/Headset/Loudspeaker is one, PGM is the other)
- One (1) endpoint per 2-wire/4-wire port

  (i.e. 2 endpoints per HelixNet module or 2-24 per LQ device)
- Three (3) endpoints for HRM

  (Mic/Headset/Loudspeaker is one, 4-wire PGM input is the second, 4-wire SA Out is the third). Note: Unassigning PGM and SA reduces the endpoint count to (1)

Utilizing more than 64 (on HMS systems) or 128 (on Arcadia systems) HelixNet endpoints may result in choppy audio and a sluggish system response. On IP connected endpoints, you will see the blinking “Paired” icon as audio packets are lost.

Powerline

Clear-Com's HelixNet Powerline is a unique connection method for Ethernet network connectivity and power between multiple devices on a line. Similarly to analog intercom Powerline connects over a shielded twisted pair microphone cables for long and robust cable connection with passive splitters and other distribution methods without any active distribution components and in many cases allows using existing cabling infrastructure.

Powerlines are available built into the HelixNet HMS-4X Main Station as well as using one or more of the HelixNet HXII-DPL Powerline Device which bridges a network port to a Powerline and can be used with either the Arcadia Central Station or the HelixNet HMX-4X Main Station connected to a network with the HLI-ET2 Ethernet module.

Powerline carries DC power and Ethernet network packages to and from HelixNet User Stations as modulated RF carriers in the MHz range, which are automatically configured and managed by the system. Due to the high frequencies continuous cable and connector shielding is important, especially when Powerlines are co-located.

On Powerline, the bandwidth available is shared between equipment on that line and is reduced the further you are from the HMS-4X or HXII-DPL Powerline port and capacitance increases (for bandwidth drop) with accumulated cable length and resistance (for voltage drops). Therefore, the use of low capacitance and low resistance cables is important with extended cable lengths and more devices on the line.

The number of bars of the powerline icon on HelixNet User Stations indicates how much bandwidth you have available. At two bars, or less, you may begin to experience choppy audio.

Clear-Com has developed a powerline calculator to but to also assist you in cable length and power limits. The calculator can be found here:

https://clearcom.com/DownloadCenter/technicaldocs/HelixNetCablingCalculator/index.html

System Latency

In general, depending on the number of devices on a network, users will experience some latency. The table below describes what you can expect over powerline or IP.

Specification	Value
Latency on Powerline	30-80ms (Depends on cable type and length, and how many devices are connected. The greater the number of devices, the greater the latency.)

Latency over IP Network	75-80ms Beltpack-to-Beltpack (Powerline) 30-35ms Beltpack-to-Beltpack (Ethernet) 40-60ms Beltpack-to-4Wire (Powerline) 30-35ms Beltpack-to-4Wire (Ethernet) 30-35ms HMS-to-HMS (linked transport of audio)
Bandwidth Used	300kbps per active Talker
IP Version	IPv4

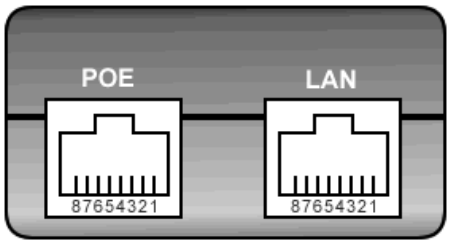
PoE Specification

We have designed all HelixNet devices to comply with the IEEE 802.3af-2003 PoE standard which states up to 15.4 W of DC power on each port. These devices require no more than 12.95W to operate. (15.4W delivered from the power source with some allowance for loss in the cable). Ensure the total wattage on the PoE switch can deliver to the total number of PoE devices connected. Most PoE switches SHARE the total wattage across all ports.

The following devices can be powered by PoE:

- HelixNet Remote station (HRM-4X)
- HelixNet Speaker station (HKB-2X)
- HelixNet II Beltpack (HXII-BP) - the HXII-BP only uses 4W of PoE power

This IEEE 802.3af standard RJ45 PoE pinout chart shows what pins carry power for the BP.



J1	J1 Pins		J2 Pins	J2
1	Data Pair 1	⟷	1 Data Pair 1	1
2	Data Pair 1	⟷	2 Data Pair 1	2
3	Data Pair 2	⟷	3 Data Pair 2	3
4	+ VDC		4 No Connection	4
5	+ VDC		5 No Connection	5
6	Data Pair 2	⟷	6 Data Pair 2	6
7	- VDC		7 No Connection	7
8	- VDC		8 No Connection	8

SUPPORT

Technical Questions

Try our Clear-Com Solution Finder knowledgebase of FAQs, resolutions to problems, and "How do I...?" Information was provided by expert Clear-Com product and technical teams and customers like you. Solution finder is located here: http://www.clearcom.com/support/clear-com-solution-finder

Find your regional Support Contact here: http://www.clearcom.com/contact/support-contacts

Technical, Service and Repair Issues

Or submit a question online, and a member of the Technical Support staff will respond within 24 hours:

http://www.clearcom.com/support/support-request

Technical Training

Clear-Com offers a wide range of training classes on communication technologies and product-specific operations. Training can be delivered at Clear-Com College (Alameda, CA - USA), Clear-Com Academy (Cambridge, UK), Clear-Com Think Academy (Carlsbad, CA - USA), or customized for delivery at your site with your equipment.

Additionally, training videos and webinars can be found on the Clear-Com website. - Webinar Recording Library and upcoming Training Sessions

You may also sign-up for Email Communications to be kept up to date on the latest Clear-Com Product and Feature Releases.

GLOSSARY

HelixNet Terms

Core Configuration Manager (CCM)

The Core Configuration Manager (CCM) interface provides an intuitive software utility for HelixNet on any browser-enabled platform. The CCM facilitates a quick and simple means of configuring any devices, including role-based configuration of user stations, save and restore, and live monitoring of all system components as appropriate to the product.

HelixNet System Host

HelixNet System Host is a device that supports a system of HelixNet Endpoints. At the time of writing the Arcadia Central Station and the HelixNet HMS-4X Main Station are HelixNet System Host options.

Endpoint

A point in the system where networked audio data streams can be delivered and consumed. An endpoint may be an intercom user station (e.g. Beltpack) or an interface port (e.g. HLI-4W2).

User Station

Intercom user station is a device or application that an end user uses to access the intercom system to communicate with other users on the system. Intercom user stations are available in various formfactors, such as beltpacks, flush mount speaker

stations, surface mount desktop intercom stations, rackmount, wireless beltpacks and software clients on computers and portable devices.

Interface

Intercom interface is an audio port which can be used as inputs and/or outputs for the intercom system and optionally assigned to a certain function. Intercom Interfaces can additionally be used to bridge to other Intercom systems.

Intercom interface can be of various formats depending what it needs to connect to such as line level audio, networked audio, telephone lines and more.

Arcadia Central Station

The Arcadia Central Station supports FreeSpeak wireless, HelixNet wired and various interfaces to form a unified, easy to use intercom system.

HelixNet Main Station - HMS-4X (Available for HCS system deployments)

The HelixNet Main Station is a 1RU digital partyline main station is a system host and up to 12 or 24 partyline channels and a 4-channel intercom user station. A single Main Station can support up to 20 digital beltpacks using the main stations two powerline ports and supports up to 3 interface modules.

Internet / Network Terms

HelixNet Remote Station – HXII-RM & HRM-4X

The HelixNet Remote Station is a 4-channel 1RU digital partyline headset and speaker Remote Station that connects to HelixNet System Host using a network or Powerline connection. The HelixNet Remote Station can be locally powered via an external power supply or third-party Power-over-Ethernet (PoE) power source.

HelixNet Speaker Station – HXII-KB & HKB-2X

The HelixNet Speaker Station is a 4-channel (using a shift page), flush mount digital partyline headset and Speaker Station that connects to a HelixNet System Host using a network or Powerline connection. The HelixNet Speaker Station can be locally powered via an external power supply or third-party Power-over-Ethernet (PoE) power source.

HelixNet Beltpack - HXII-BP

The HelixNet HXII-BP Beltpack is a rugged and ergonomically designed 2-channel digital partyline beltpack. A beltpack can have access to two of any system channels over a network or Powerline connectivity. The HelixNet beltpack can be powered by Power-over-Ethernet (PoE).

HelixNet Beltpack – HBP-2X (Legacy)

The HelixNet HBP-2X Beltpack is a rugged and ergonomically designed 2-channel digital partyline beltpack. A beltpack can have access to two of any system channels over Powerline connectivity.

HelixNet Powerline Device – HXII-DPL

The HelixNet HXII-DPL Powerline Device bridges a network connection to a XLR powerline, enabling up to 7 HelixNet Beltpacks, or power equivalent assortment of Remote and Speaker Stations, to be connected of the same line using passive splits and existing cabling infrastructure.

Powerline

Powerline is a connectivity method allowing Ethernet to be carried on the Powerline via 3-pin shielded XLR cable, providing devices on the line with power and network connection. The Powerline can be passively split, daisy-chained and otherwise distributed over traditional XLR infrastructure to provide various installation options.

I.V. Core - Distributed Network Mixing System

The Instant Voice I.V. Core is a distributed mixing system on an ethernet network. The I.V. Core consists of a central I.V. Router and I.V. Clients which are implemented in a HelixNet System Host and HelixNet Endpoints respectively. The I.V. Client transmits its audio input in an audio stream to the I.V. Router which forwards the stream to all I.V. Clients who are listening to it. This is repeated for every single input and output in the system delivering a highly flexible and elastic intercom system.

HLI-ET2

The HLI-ET2 is an Ethernet LAN network interface module for the HMS-4X main station that enables a dual LAN interface to link to other HMS-4X main stations, connect to remote stations, speaker stations, beltpacks and LQ Series devices.

HCS Industrial Intercom

The HCS Industrial Intercom System provides a high-capacity single channel partyline intercom to IKB/HRI-12 intercom stations with handsets and point-to-point and point-to-multipoint audible and visual call signaling with caller identification.

The HCS system is based on an architecture similar to HelixNet and uses the HelixNet HMS-4X Main Station, yet is not compatible with other HelixNet Devices or workflows.

Bandwidth

Bandwidth is also defined as the amount of data that can be transmitted in a fixed amount of time. For digital devices, the bandwidth is usually expressed in bits per second (bps) or bytes per second and expresses the amount of data required. For analog devices, the indicated bandwidth of the audio is expressed in cycles per second, or Hertz (Hz).

DHCP

DHCP is controlled by a DHCP server that dynamically distributes network configuration parameters, such as IP addresses, for interfaces and services

Gateway

A default gateway in computer networking is the node that is assumed to know how to forward packets on to other networks

Hub

Hubs are commonly used to connect segments of a LAN. A hub contains multiple ports. When a packet arrives at one port, it is copied to the other ports so that all segments of the LAN can see all packets.

Managed / Unmanaged Switch

A managed switch can be configured to prioritize LAN traffic so the most important information gets through. An unmanaged switch on the other hand behaves like a “plug and play” device. It cannot be configured and simply allows the devices to communicate with one another.

mDNS

multicast Domain Name System (mDNS) resolves host names to IP addresses within small networks that do not include a local name server.

Powerline

A communication method that uses electrical wiring to simultaneously carry both data and electric power using similar cabling and topologies used for analog intercom.

Power over Ethernet (PoE)

This allows a single ethernet cable to provide both a data connection and electric power to devices such as wireless access points, IP cameras, and VoIP phones.

Quality of Service (QoS)

QoS is a feature of routers and switches which prioritizes traffic so that more important traffic can pass first. The result is a performance improvement for critical network traffic. QoS equipment is useful with VoIP phones or in LANs with high volumes of local traffic.

Router

A router is a device that joins networks together and routes traffic between them. A router will have at least two network cards (NICs), one physically connected to one network and the other physically connected to another network.

Spanning Tree Protocol (STP)

A network protocol that builds a logical loop-free topology for Ethernet networks. The basic function of STP is to prevent bridge loops and the broadcast radiation that results from them.

Static IP

A static IP address is an IP address that was manually configured for a device, versus one that was assigned via a DHCP server. It's called static because it doesn't change.

Subnet

A subnetwork or subnet is a logical subdivision of an IP network. The practice of dividing a network into two or more networks is called subnetting.

TCP

TCP (Transmission Control Protocol) is a standard that defines how to establish and maintain a network conversation via which application programs can exchange data. TCP works with the Internet Protocol (IP), which defines how computers send packets of data to each other

UDP

(User Datagram Protocol) is an alternative communications protocol to Transmission Control Protocol (TCP) used primarily for establishing low-latency and loss tolerating connections between applications on the Internet.

About Clear-Com

Clear-Com, an HME company, is a trusted global provider of professional real-time communications solutions and services since 1968. We innovate market proven technologies that link people together through wired and wireless systems.

Clear-Com was first to market portable wired and wireless intercom systems for live performances. Since then, our history of technological advancements and innovations has delivered significant improvements to the way people collaborate in professional settings where real-time communication matters. For the markets we serve -- broadcast, live performance, live events, sports, military, aerospace and government -- our communication products have consistently met the demands for high quality audio, reliability, scalability and low latency, while addressing communication requirements of varying size and complexity. Our reputation in the industry is not only based on our product achievements, but also on our consistent level of customer engagement and dedication to delivering the right solutions for specialized applications, with the expertise to make it work. Around the globe and across markets, Clear-Com's innovations and solutions have received numerous awards and recognitions for ingenuity and impact to customers.

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