BLUSTREAM MULTICAST

Network Switch Set-up Guides

Deployment of Multiple LAN Switches within a System

User Guide

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Introduction

When a multi-switch deployment is required for geographically larger Multicast systems, where perhaps buildings are connected via fibre links, or systems with a large number of Blustream Multicast devices (usually over 51); there are considerations that need to be made when it comes to system design.

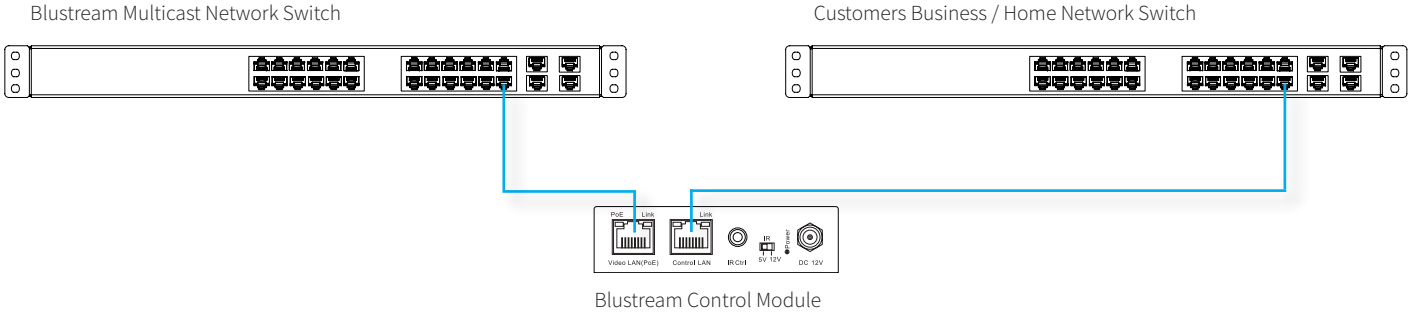
There have been very successful, large scale, mutli-switch deployments using the Blustream Multicast platform. Such as the Winter Games in South Korea, where a 100 x 800 system was deployed over a distance of 82km. Therefore Blustream can be confident that Multicast can be deployed successfully in more typical commercial and residential applications.

Single Switch System Architecture

When using Blustream Multicast HDMI over IP devices, best practice is to keep them to a dedicated network switch (or switches). This keeps the HDMI over IP network traffic from slowing down other devices, were they to be used alongside other networkd equipment on a single switch architecture. This way, performance is maintained for both the Blustream Multicast system, and the main network devices (3rd party integration, WiFi etc).

When all that is required for the Blustream Multicast system is a single switch (as per diagram below), deployment is very straightforward. All of the Blustream Multicast devices are connected to the dedicated single switch, and a single connection made from this switch, to the control module of choice for the system. The same control module (such as the ACM200, IP Bridge or CM100) is then separately connected to the main network.

Within a single switch system architecture, the switch will manage the ‘stream’ being sent in and out of each switch port. Assuming the choice of switch is capable of routing a maximum of 1Gb in and out of each port there is no need to consider the aggregation of mulitple streams passing through the switch.



Blustream Control Module

PoE Budget

Be mindful of PoE budget within switches. Blustream Multicast devices use between 6W - 9W of power. A switch may not have enough PoE budget (enough power) to allow a Blustream Multicast device to be used on every port of the switch.

It is less likely these days with most switches featuring PoE plus as standard, with a bigger amount of power available per port straight away and therefore larger PoE budgets overall within switches.

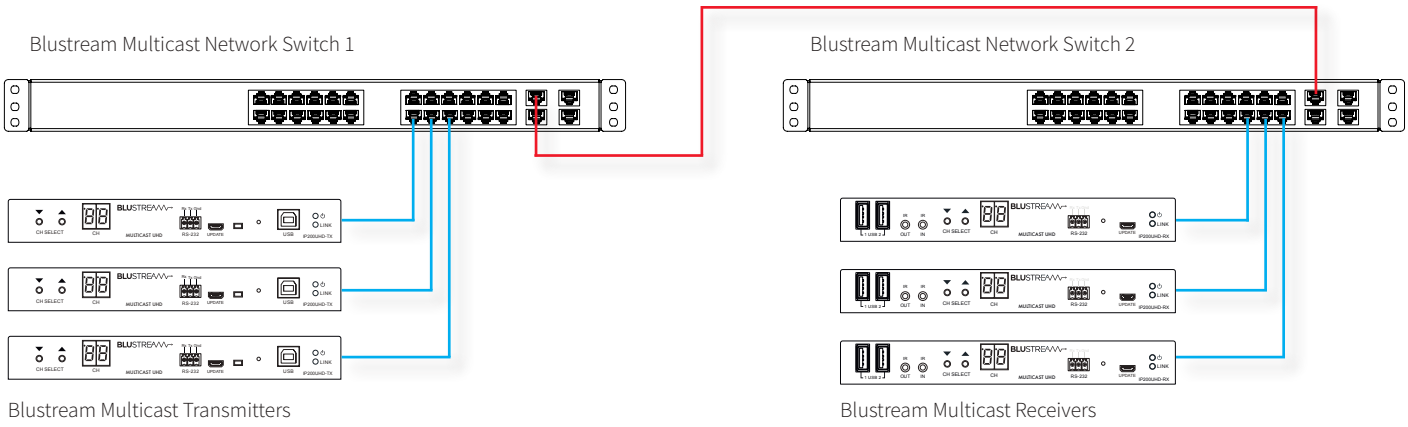
Aggregation of Data for Multicast Streams

The first items to consider when designing a multi-switch system will ultimately drive the choice of switch model made for the multi-switch deployment:

1. It is not necessary to use “stackable” switches with the Blustream Multicast system. Layer 3 Managed Network switches are perfectly well specified.
2. Consider the amount of bandwidth available on the switch/es uplink ports. These are the ports that connect (or link) one switch to another. Usually they take the form of an “SFP” port where a fibre module can be inserted to carry higher bandwidths than the standard RJ45 ports over greater distances. These ports will usually have 5Gb or 10Gb of bandwidth. We recommend choosing a switch model with a 10Gb bandwidth on it’s SFP ports and connecting the switches via fibre.

The uplink is the most important part of a multi-switch deployment. The first important point is that 0.9Gb should be used as a maximum figure for each Blustream Multicast transmitter in a system. A normal RJ45 copper connection on a switch will likely only have 1Gb of bandwidth and therefore will only carry one Multicast transmitter stream to a single Multicast receiver perfectly.

An important thing to note is that it is not true to say that all of the Transmitters’ streams will be sent between all the switches in a multi-switch deployment all of the time.



In the above example, if only **ONE** 4K UHD stream is required for all three of the Multicast Receivers, then a total max uplink between the two switches of 0.9Gb will be required. This is because there would be only one stream being transmitted from the Transmitter to all three Receivers. If however the Multicast Receivers are going to work independently (watching up to 3x different sources / Transmitters) then there will be up to **THREE** streams passing between Switch 1 and Switch 2, therefore the total aggregation will be a maximum of 2.7Gb (3 x 0.9Gb).

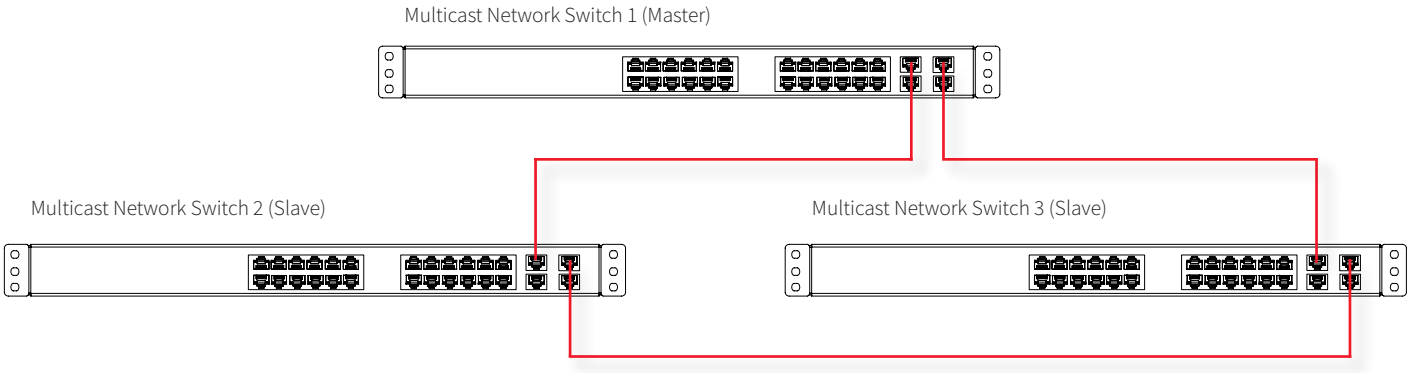
It is possible to reduce the data a Multicast Transmitter streams by lowering the resolution of the HDMI signal the transmitter is sending. 1080p resolutions will typically use a maximum of 0.5Gb, and therefore more of these streams will be able to transmit over a 10Gb link than streams at 4K using up to 0.9Gb. There are also options to reduce the bandwidth the transmitters output to fixed levels within the Blustream Multicast device web interfaces. When doing so, image quality may suffer and we recommend this only as a last resort.

With this in mind, it is important to first consider the resolution of the source devices being incorporated into the Multicast system, and how much bandwidth may be required across each switch uplink at any one time. What might be required is an amount of “load balancing”, where Multicast Transmitters are spread about the switches. This will minimise the amount of data that needs to be transferred across the uplinks at any one time. For example, if a satellite receiver is usually watched in only four zones of the system, make sure that this Transmitter is connected to the same switch as the Multicast Receivers for use in those zones. This keeps the data internal to the switch, and no uplink data is used.

Stacking Multiple Switches

When stacking switches it is important to understand the settings within the individual switches in order to install multiple network switches into a larger network. With most switch manufacturers, only the “Master” switch will manage the multicast routing, with all other switches being set as “Slave” units. Please consult your network switch provider to fully understand the configuration required to successfully implement a multi-switch installation.

When stacking more than 2 switches, where only a single (10Gb) uplink is required, the recommended architecture for connections would be as follows:



Whilst it is not necessary to have a link between slave switches 2 and 3 as shown above, this will act as a back-up loop ensuring that should one of the other uplinks fail, then the multicast streams can take an alternative route to provide the streams to their intended destination - regardless of where the individual Transmitter and Receivers are located.

Should an uplink of more than 10Gb be required then multiple SFP ports can be linked and run in parallel giving increased data connectivity capabilities. Where required, it may be wise to consider the locations of the Blustream Multicast Transmitter units to help spread the load required between switches (load-balancing).

Please note: integrating a back-up as outlined above would always be recommended, however it is important to consider the signal aggregation required should a ‘back-up’ be required to ensure a smooth flow of data between all switches based on the port locations of the Blustream Multicast Transmitters.

Blustream is always here to help with switch specification and system layout. Make sure to always speak to your authorised distributor, or a member of the Blustream Technical Support team for assistance before deploying a multi-switch system.

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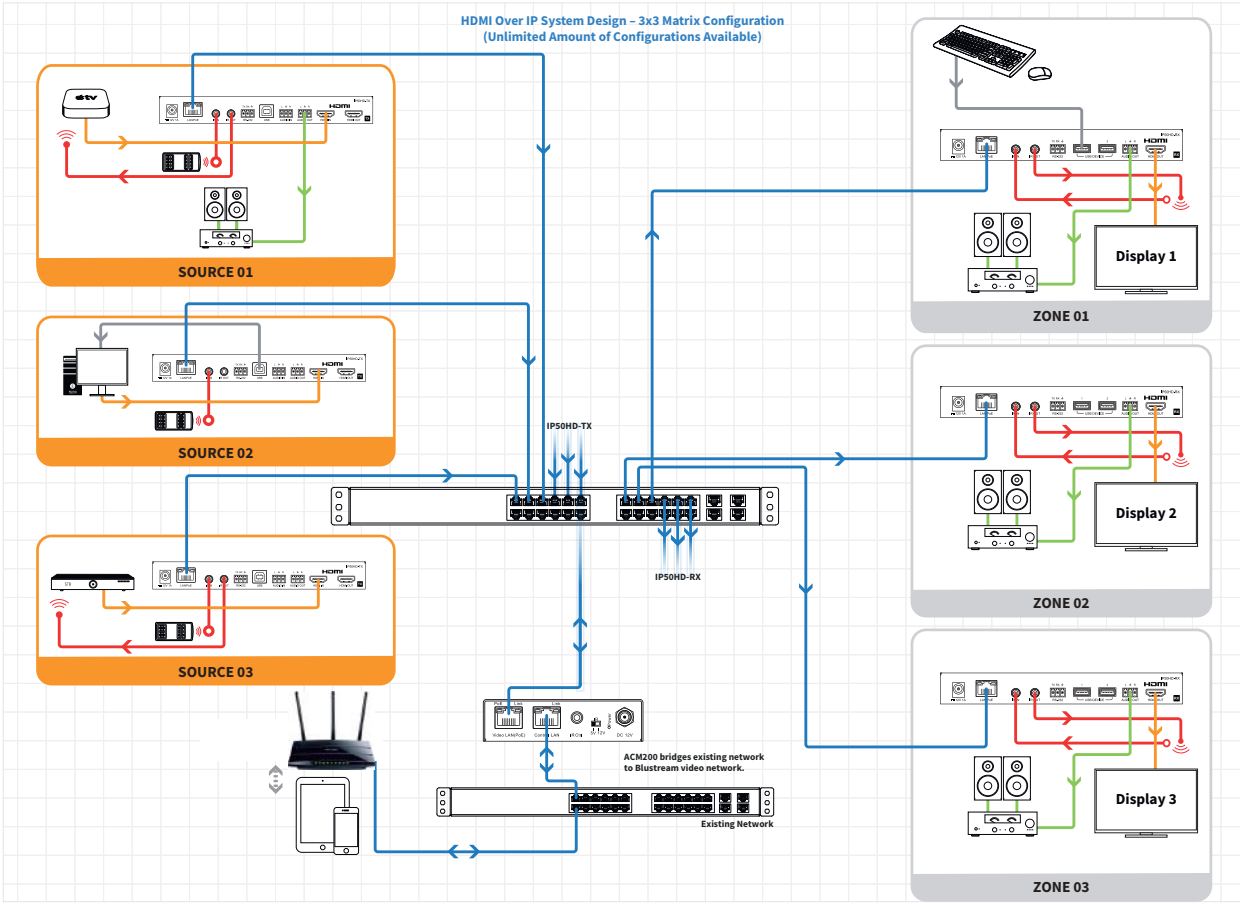
Example Schematic

IP50HD-TX/RX



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