BroadCtrl

We will discuss

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- BroadCtrl & Existing solutions
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  - Traffic Engineering
  - Switching of RTP streams
  - QOS & Metering Support
  - Forwarding Traffic to a Multicast group
- Features-P2
  - Full port configuration like port speed, VLan, trunk, bridge etc.
  - Interact with AMWA NMOS database.
  - Security - access security i.e. device authentication.
- Stordis Test LAB.
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Transition of SDI to IP

- **4K video –** Coax cables are not capable to carry UHD signals for long distances.
- **Scale and flexibility** - The greater the demand for content, the more urgent and important the need for networks to support it.
- **Cost-effective** and is based on common standards.
- It is the IP network that enables studios and control rooms to be **decoupled** so a control room can be used for multiple studios and a studio production can be managed from any number of control rooms.
- IP network enables equipment to be **shared** easily between production facilities.
- IP network enables **virtualization** of live productions, media transport and processing, is performed by software rather than hardware.
- IP network allows operators to **switch** between machines that are sometimes located a great distance away, from a single workstation using just one keyboard and mouse.

BroadCtrl & Existing solutions

There is no open source solution exists which addresses SDN Control issues for Broadcast and Media domain, Although there are some commercial solutions available like:

- BFE - KSC SILKNET – A proprietary solution.
- Nevion - VideoIPath Orchestration and SDN control – A proprietary solution works with specific HW.

These are proprietary solutions and are not focused towards open networking technologies.

Features-P1 Fault tolerance & Robustness of Streams

- **Multiple Fail-over Paths/Redundant Streams-** ONOS Intents framework can be utilized to deploy multiple intents for a specific stream beforehand.
- Auto switching among the Streams (intents) in case of failure.
- **HA of Controller –** HA clustering is supported in ONOS.
- **LAG support –** Configuration is not available in ONOS but LAG can be discovered a single logical port.

Features-P1 Traffic Engineering

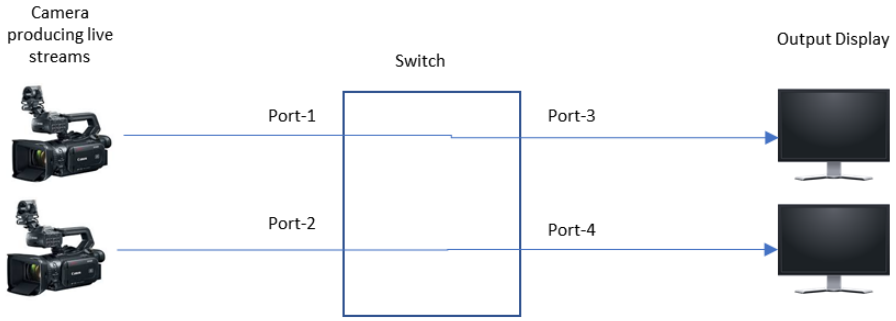
Controller should be able to identify following factors :

- Latency of a Link.
- Bandwidth available in real time of a Link.

If above factors are known, A mechanism can be defined which can pick up a path suitable for a specific traffic type. E.g. For a real time audio stream, latency of path is crucial than its bandwidth (for sure there should be minimum bandwidth available to carry voice stream), for a offline video play latency may not be crucial, for a file transfer high bandwidth can be important.

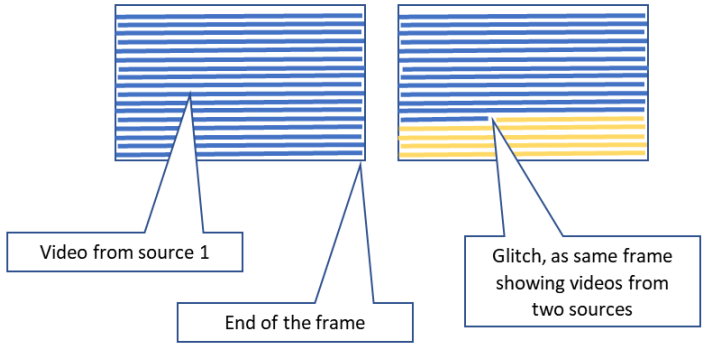
Features-P1 Switching of RTP streams

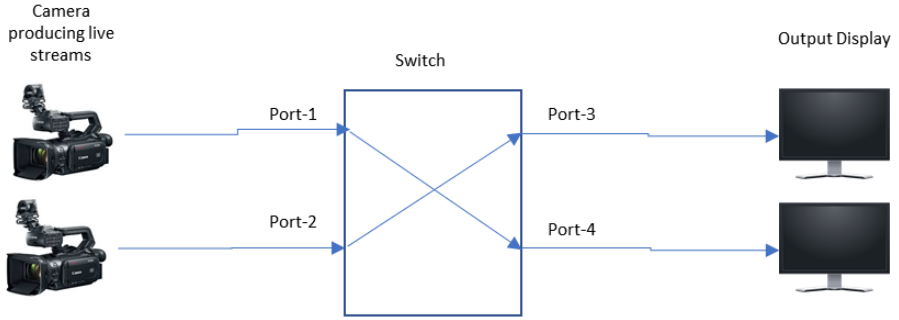
Seamless switching of RTP streams without any packet loss :



Flow Table

	Match	Action
1	In_port=1,src_port=1000	Output=3
2	In_port=1,src_port=1000	Output=4





Flow Table

	Match	Action
1	In_port=1,src_port=1000	Output=3
2	In_port=1,src_port=1000	Output=4
3	In_port=1,src_port=2000	Output=4
4	In_port=1,src_port=2000	Output=3

Features-P1 QOS & Metering Support

Controller should be able to allocate bandwidth on Ingress and egress packets on the basis of traffic type i.e. logging, live video, file saving, Traffic types are distinguished on the basis of Vlan generally.

ONOS have APIs for configuring QOS, Metering and Queues which can be extended to be exposed on REST.

Features-P1 Forwarding Traffic to a Multicast group

This is a plug & play feature where a host device (IP to SDI converter) when plugged in, starts receiving traffic automatically if it is already in a specific multicast group.

Controller should be able to learn the multicast group of plugged-in hosts and the port where it is plugged in and create flow rules accordingly so that the newly plugged-in device receive the traffic.

Features-P2

- Full port configuration like port speed, VLan, trunk, bridge etc.
- Security - access security i.e. device authentication.
- Interact with AMWA NMOS database.

Stordis Test LAB

All the necessary equipment to mock the topology are available in Stordis LAB as follows :

- Tofino and Broadcom based switches.
- SDI to IP and vice-versa converters.
- Video Playbacks, Cameras for Live Streams.
- Sync signal Generators.
- Packet analysers.
- PTP GM from Meinberg.

Time estimates for Features-P1

- Installing backup intents. (~15 man weeks)
- Seamless switching with no packet loss.(~20 man weeks)
- QOS & Metering. (~ 3 man weeks)
- Traffic Engineering.(~ 15 man weeks)
- Traffic Forwarding to a multicast group.(~10 man weeks)

Questions?