

DISK Systems, s.r.o.



www.disk.cz

Ing. Petr Krkavec

IP Novinky z NAB 2024
SMPTE 2110 – NDI 6

SMPTE 2110

SMPTE 2110

Standard SMPTE 2110 byl vytvořen v roce 2017 organizací Society of Motion Picture and Television Engineers (SMPTE), která se zaměřuje na standardizaci technologií používaných v oblasti televize a filmu.

SMPTE 2110

SMPTE 2110 je standard pro přenos video, audio a datových signálů v produkci vysoké kvality pomocí IP sítí. Nahrazuje předchozí SMPTE 2022 standardy, které byly založeny na kompresi dat.

SMPTE 2110 umožňuje přenos nekomprimovaného signálu, což znamená, že kvalita signálu je výrazně vyšší než u komprimovaného signálu.

SMPTE 2110 se skládá ze tří částí:

1. systémová architektura a synchronizace,
2. přenos videa
3. přenos zvuku

Každá z částí je dále rozdělena do několika standardů:

- ST 2110-10 - Systémová architektura a synchronizace: esence, RTP, SDP a PTP
- ST 2110-20 - Přenos nekomprimovaného videa, založený na standardu SMPTE 2022-6
- ST 2110-21 - Řízení provozu a časování přenosu sítě
- ST 2110-22 - Přenos videa s konstantním datovým tokem s kompresí
- ST 2110-30 - Přenos zvuku založený na [AES67](#)
- ST 2110-31 - Přenos zvuku v AES3 formátu
- ST 2110-40 - Přenos vedlejších dat



Blackmagicdesign

BLACKMAGIC CLOUD



LIVE PRODUCTION

DAVINCI RESOLVE 19

Blackmagicdesign



DAVINCI RESOLVE

PROFESSIONAL EDITING

SMPTE-2110 IP

Blackmagicdesign

Blackmagicdesign

DISK RECORDERS

BLACKMAGIC IP VIDEO

SMPTE-2110 IP Video

Wide range of SMPTE-2110 IP video products with support for Ultra HD using 10G Ethernet. All models conform to the SMPTE ST-2110 standard for IP video, including PTP clocks and even MACS support.

From \$295

DISK RECORDERS

HyperDeck Studio

Blackmagic Design HyperDeck Studio is a professional-grade disk recorder for SMPTE-2110 IP video. It features 16 channels of 10G Ethernet input/output, 16 channels of 10G Ethernet input/output, and 16 channels of 10G Ethernet input/output.

DISK RECORDERS

HyperDeck Extreme

Blackmagic Design HyperDeck Extreme is a professional-grade disk recorder for SMPTE-2110 IP video. It features 16 channels of 10G Ethernet input/output, 16 channels of 10G Ethernet input/output, and 16 channels of 10G Ethernet input/output.

DAVINCI RESOLVE

10G Ethernet

Blackmagic Design DaVinci Resolve 10G Ethernet is a professional-grade video editor for SMPTE-2110 IP video. It features 16 channels of 10G Ethernet input/output, 16 channels of 10G Ethernet input/output, and 16 channels of 10G Ethernet input/output.

BLACKMAGIC

BLACKMAGIC IP VIDEO

Blackmagicdesign



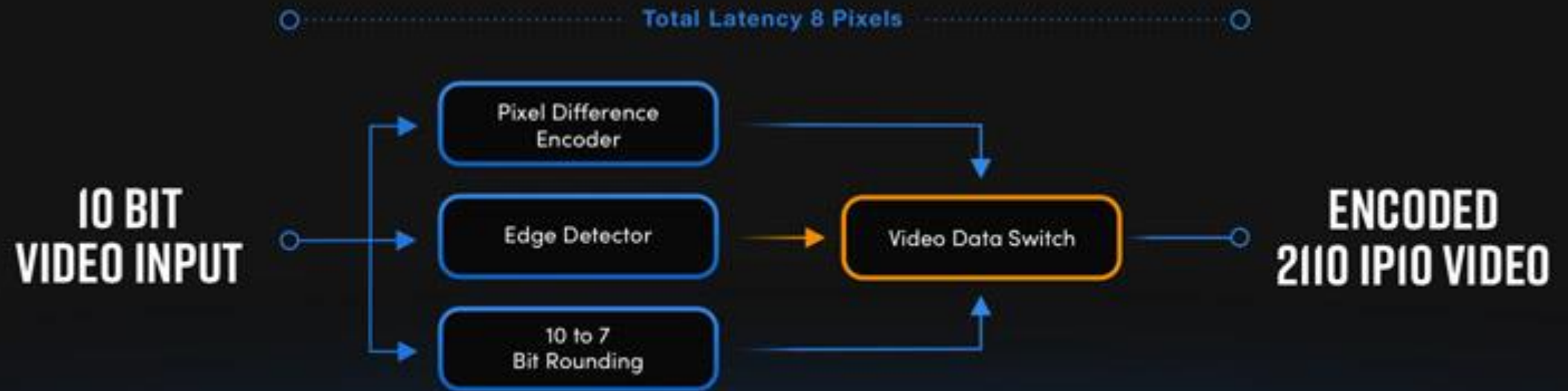
Přístup BMD k implementaci SMPTE 2110

- Jednoduchost použití pro ne IP zdatné uživatele
- Nízká cenová kategorie
- Dostatek převodníků pro integraci s HDMI a SDI workflow
- Vlastní Ethernet switch s integrovaným NMOS controlerem

Přístup BMD k implementaci SMPTE 2110

- Jednoduchost použití pro ne IP zdatné uživatele
- Nízká cenová kategorie
- Dostatek převodníků pro integraci s HDMI a SDI workflow
- Vlastní Ethernet switch s integrovaným NMOS controlerem
- **Vlastní kodek IP10 pro možnost transferu 12G skrze 10G porty**

BMD IP10 codec 12G bit/s to 8,5 Gbit/s



Blackmagic IP10 Codec
Simple Codec Detects Edges and Reduces Bit Depth

SMPTE 2110

BMD ekosystém

SMPTE 2110 kamery



10 Gb port na těle kamery



10 Gb port na CCU



SMPTE 2110 konvertory

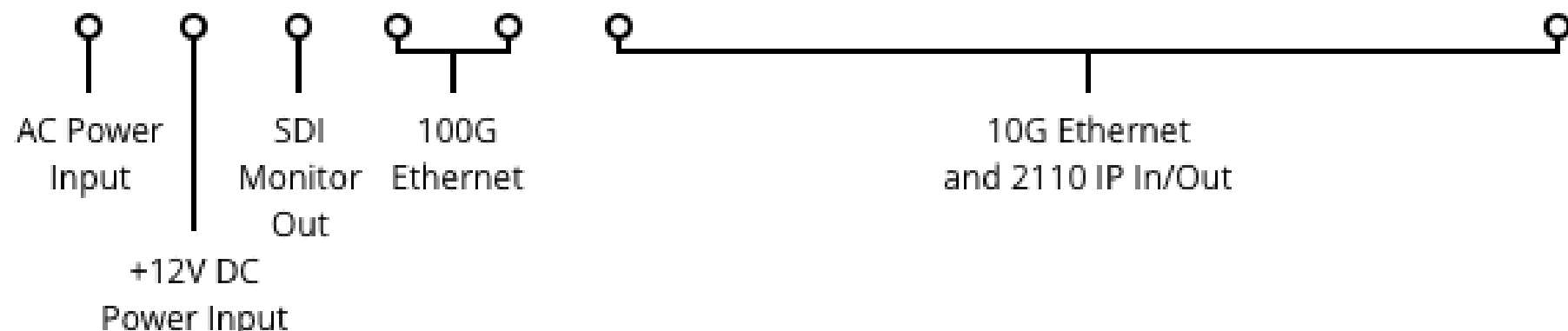
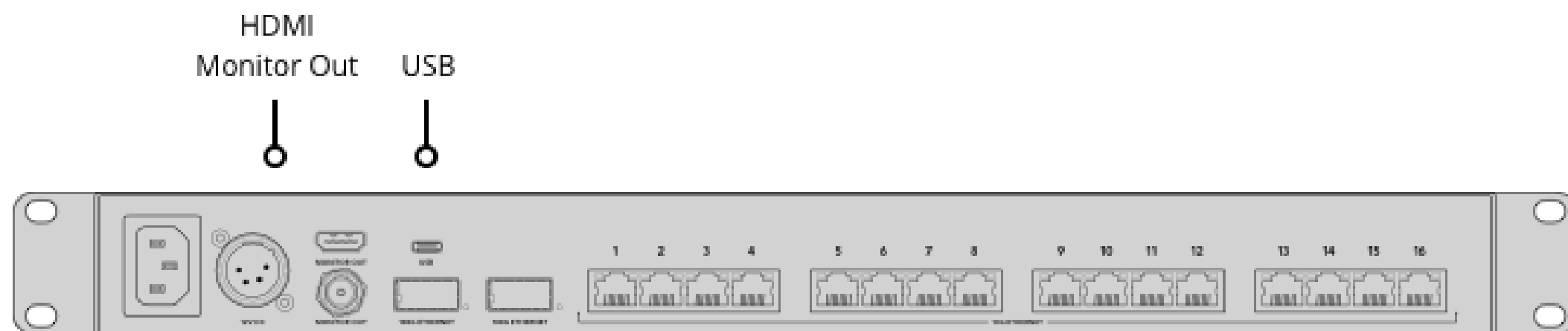
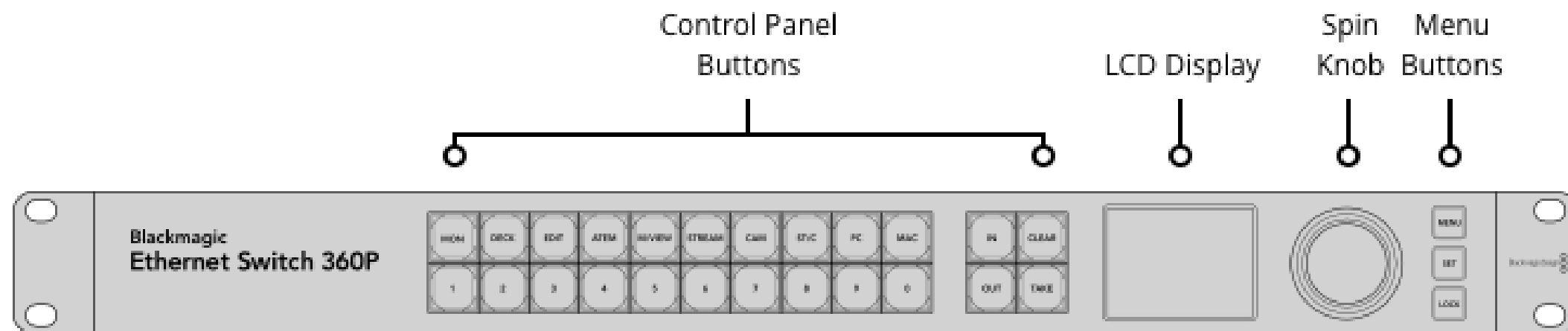




SMPTE 2110 konvertory

SMPTE 2110 Ethernet switch





Blackmagic Ethernet Switch 360P

Blackmagicdesign

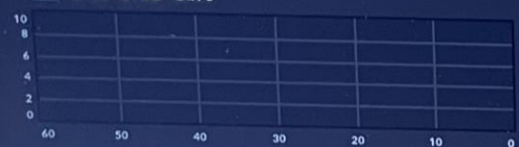
1 100G 0.00 0.00 Gb/s



2 100G 0.00 0.00 Gb/s



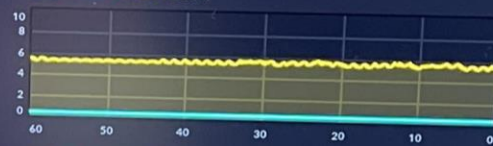
1 0.00 0.00 Gb/s



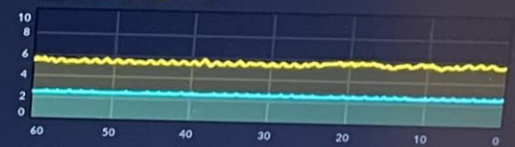
2 5.20 2.23 Gb/s



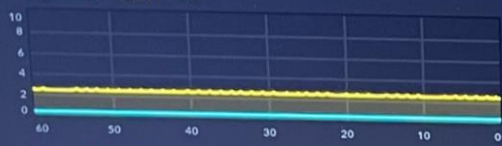
3 0.00 5.20 Gb/s



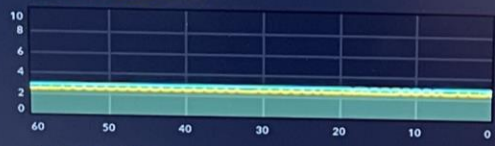
4 2.23 5.62 Gb/s



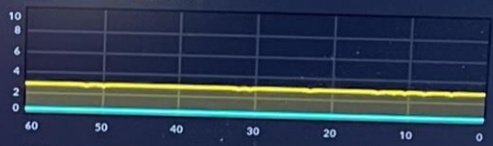
5 0.00 2.29 Gb/s



6 2.69 2.23 Gb/s



7 0.00 2.64 Gb/s



8 0.00 0.00 Gb/s



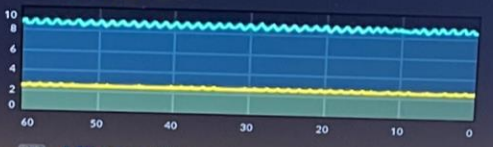
9 0.00 2.23 Gb/s



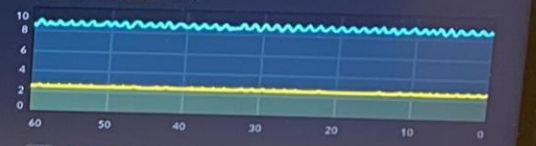
10 0.00 0.00 Gb/s



11 8.62 2.29 Gb/s



12 8.62 2.23 Gb/s



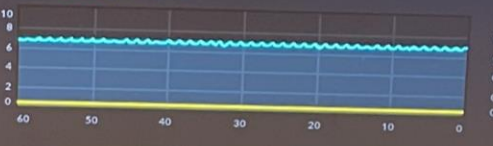
13 0.00 0.00 Gb/s



14 0.00 0.00 Gb/s



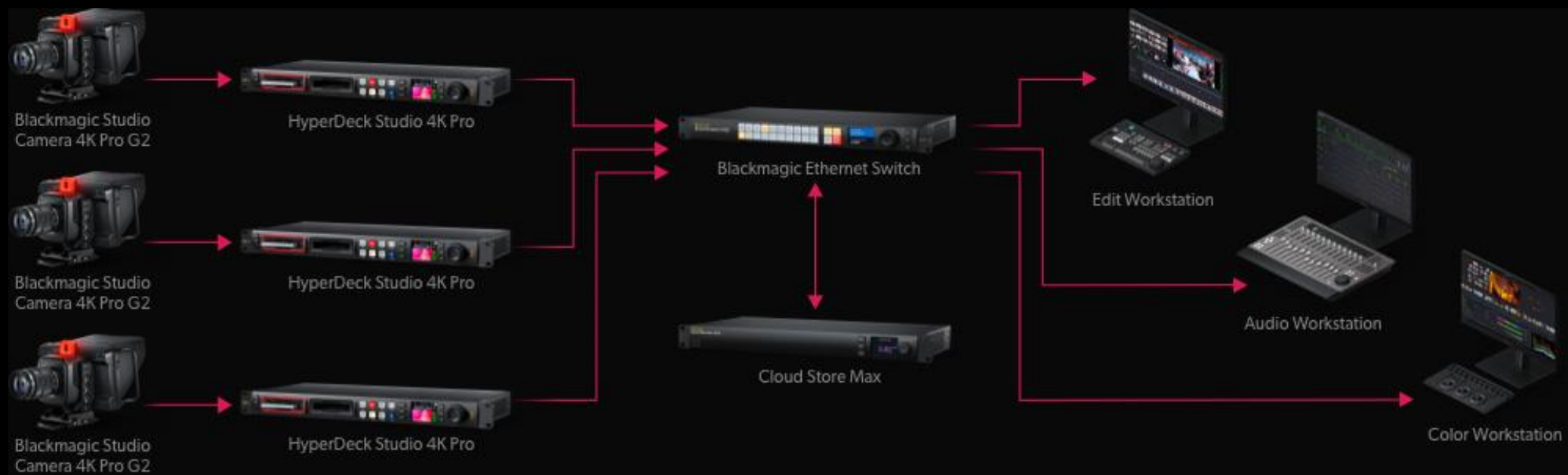
15 6.70 0.00 Gb/s



16 0.00 0.00 Gb/s



SAMSUNG



SmartView 4k G3 SMPTE 2110 monitor



Audio monitor SMPTE 2110





Bonjour Explorer

Nodes

Type to filter..

	Studio Camera 4K Pro 10.0.0.25:8120
	3x3G 10.0.0.40:80
	Audio Mon 10.0.0.11:8090
	ATEM 2 10.0.0.72:8090
	Monitor 1 10.0.0.111:8090
	Presentation PC 10.0.0.20:8090
	ATEM 1 10.0.0.71:8090
	Monitor HDMI 10.0.0.241:8090

Devices

Type to filter..

	Camera HDMI
	Camera 1
	Deck 3G 3
	Deck 3G 2
	Deck 3G 1
	Audio Mon
	Monitor 1
	Presentation PC
	ATEM 2
	ATEM 1
	Monitor HDMI

Senders

Type to filter..

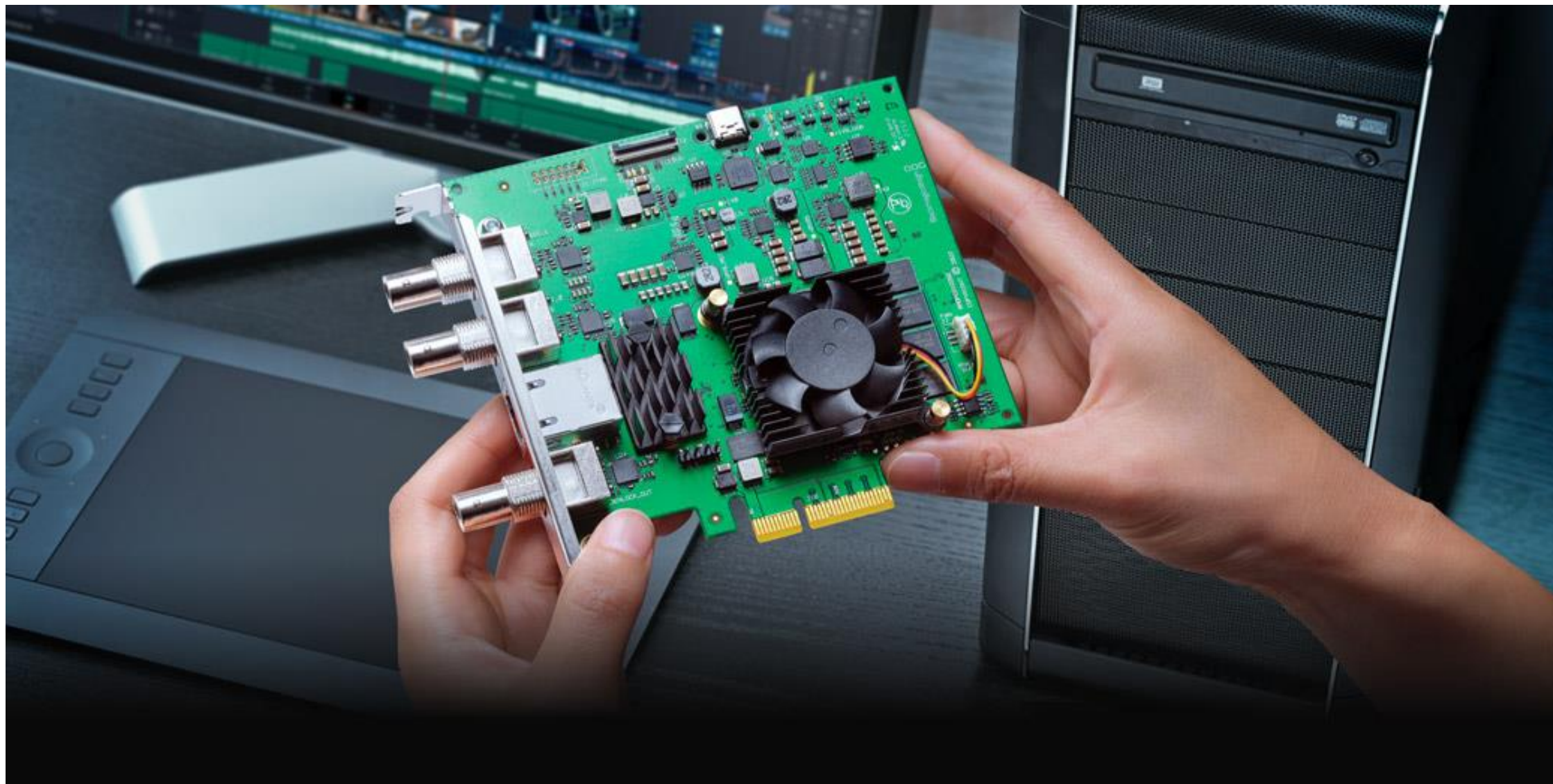
	Camera 1 Source: Camera 1/Ancillary
	Camera 1 Source: Camera 1/Audio
	Camera 1 Source: Camera 1
	Deck 3G 3 Source: Deck 3G 3/Ancillary
	Deck 3G 1 Source: Deck 3G 1/Ancillary
	Deck 3G 3 Source: Deck 3G 3/Audio
	Deck 3G 1 Source: Deck 3G 1/Audio
	Deck 3G 3 Source: Deck 3G 3
	Deck 3G 2 Source: Deck 3G 2/Ancillary
	Deck 3G 2 Source: Deck 3G 2/Audio
	Deck 3G 1 Source: Deck 3G 1
	Presentation PC Source: Presentation PC/Ancillary
	Presentation PC Source: Presentation PC/Audio
	Presentation PC Source: Presentation PC

Receivers

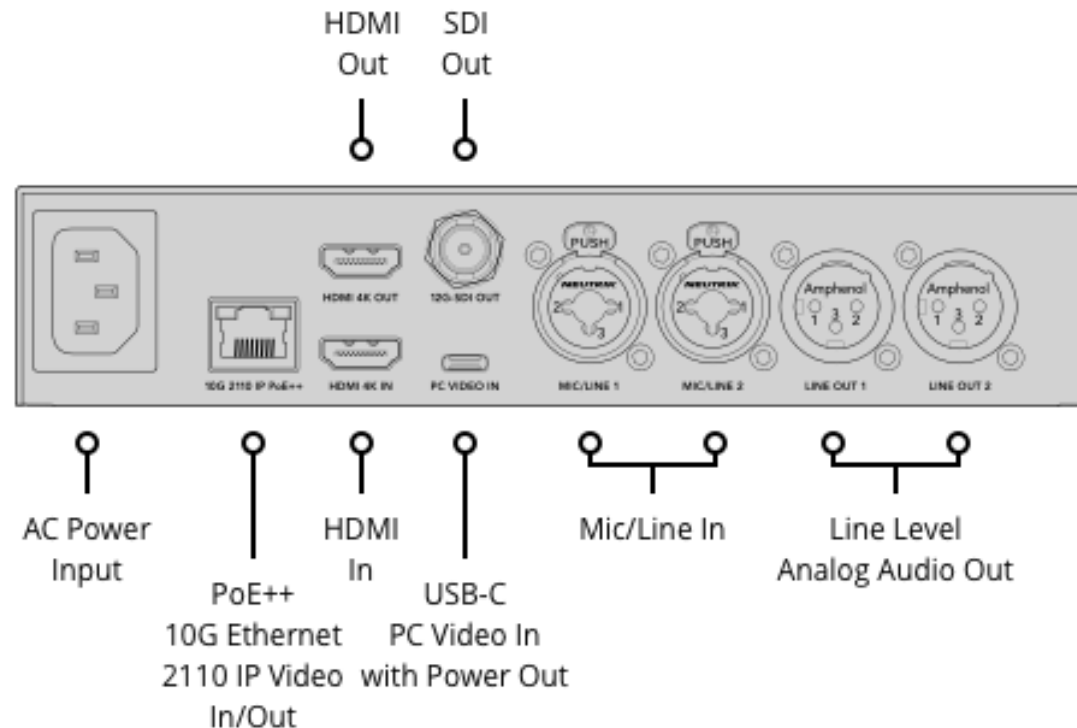
Type to filter..

	Camera LCD/Ancillary Source: ATEM 1/Ancillary
	Camera LCD/Audio Source: ATEM 1/Audio
	Camera HDMI/Ancillary urn:x-nmos:format:data
	Camera HDMI/Audio urn:x-nmos:format:audio
	Camera HDMI urn:x-nmos:format:video
	Camera LCD Source: ATEM 1
	Audio Mon Source: Camera 1
	Audio Mon/Ancillary Source: Camera 1/Ancillary
	Audio Mon/Audio Source: Camera 1/Audio
	Deck 3G 3/Audio urn:x-nmos:format:audio
	Deck 3G 1/Ancillary urn:x-nmos:format:data
	Deck 3G 2 urn:x-nmos:format:video
	Deck 3G 1/Audio urn:x-nmos:format:audio
	Deck 3G 2/Ancillary urn:x-nmos:format:data
	Deck 3G 2/Audio urn:x-nmos:format:audio

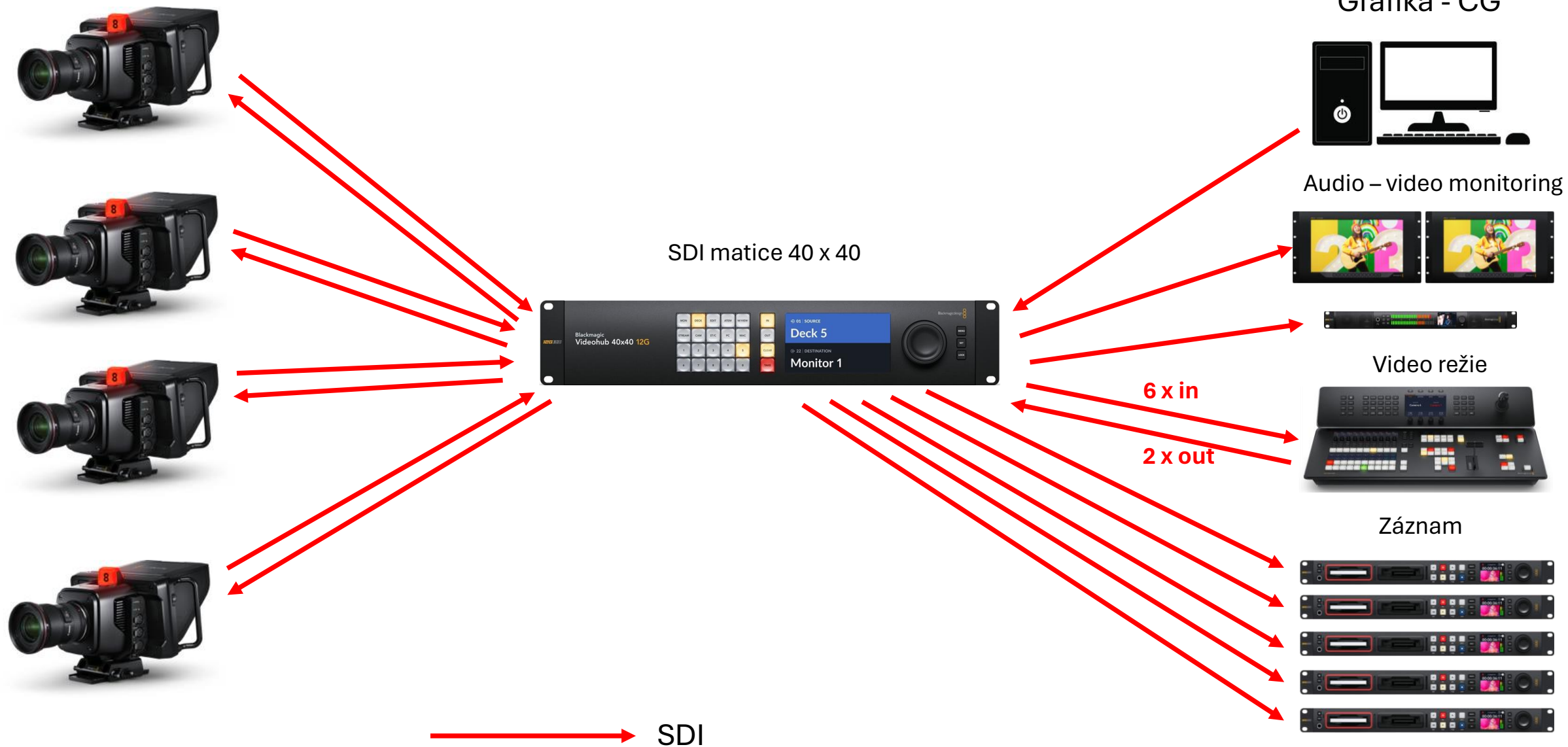
Decklink IP SMPTE 2110 PCI-X karty



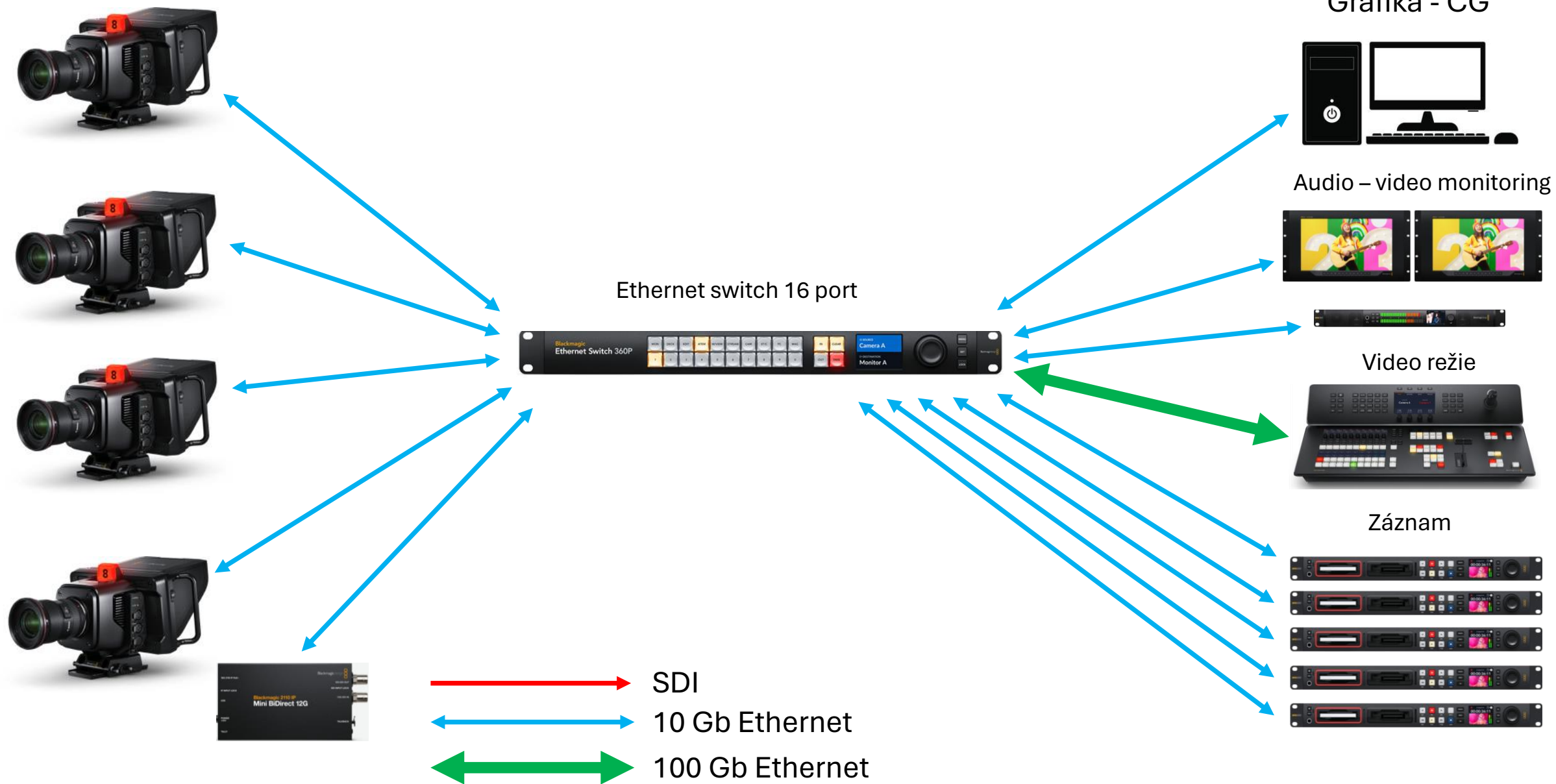
SMPTE 2110 Presentation Converter



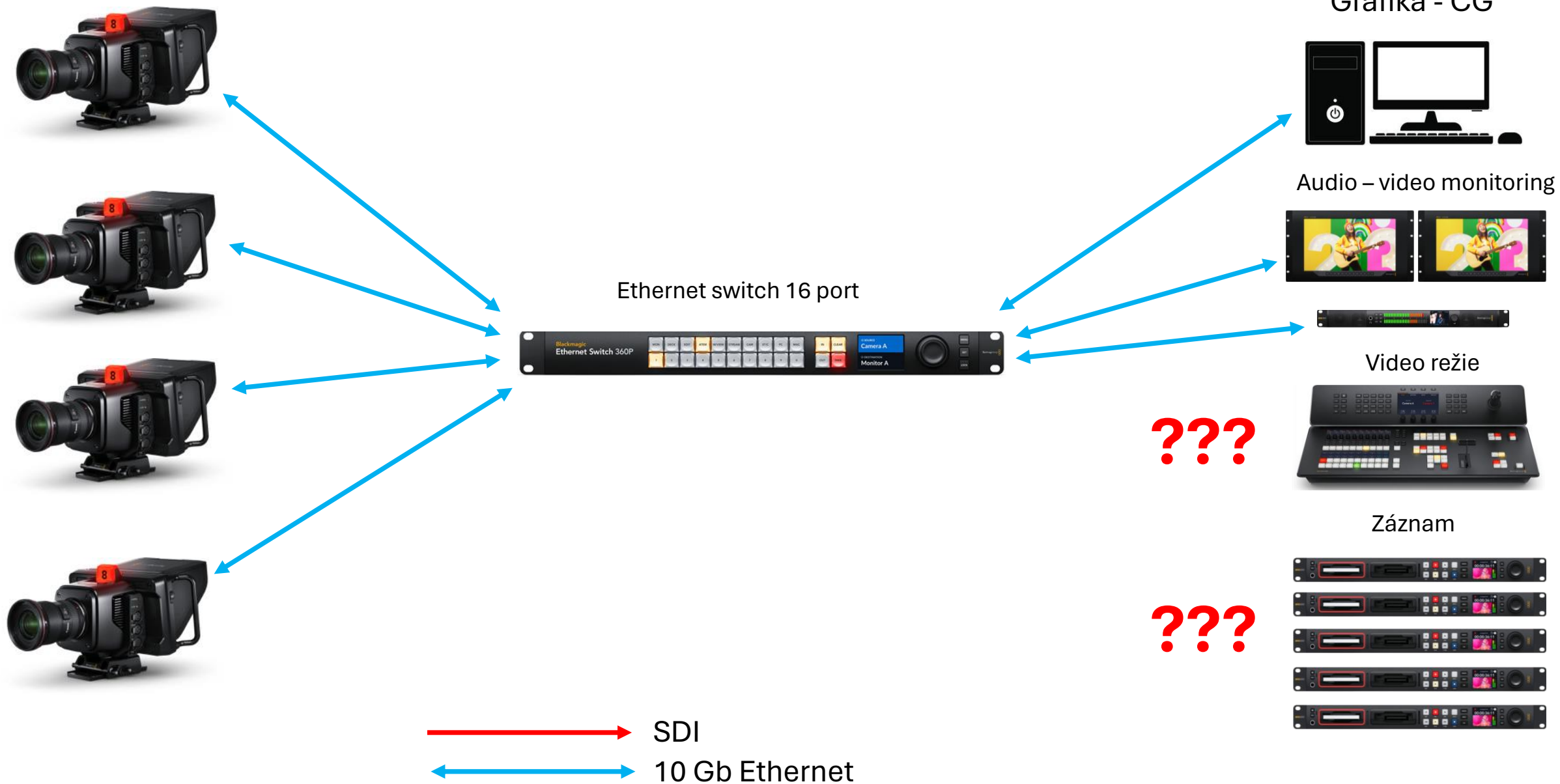
Tradiční SDI workflow



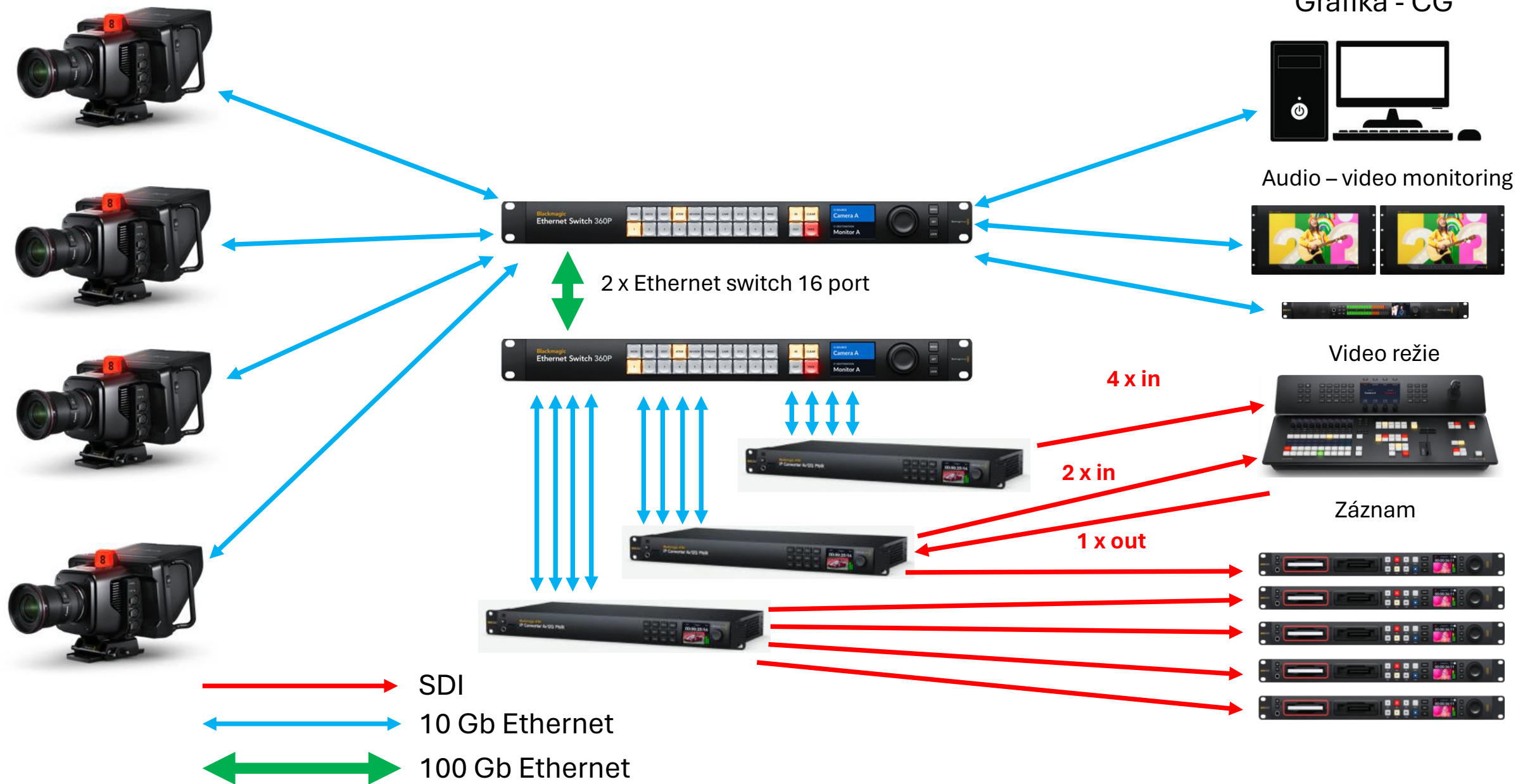
SMPTE 2021 workflow



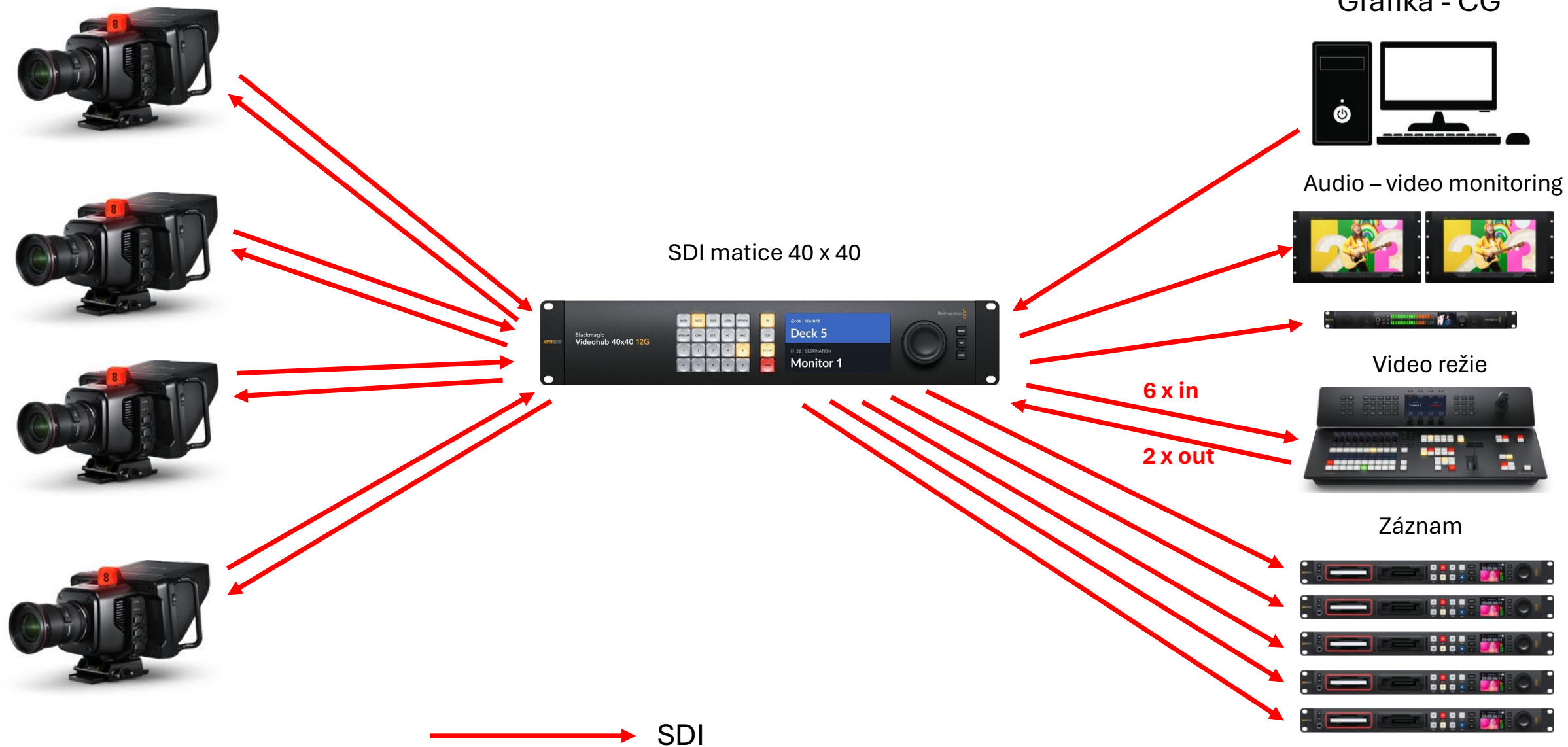
SMPTE 2021 workflow



SMPTE 2021 workflow



Tradiční SDI workflow



NDI

Network Device Interface

česky „*Rozhraní síťového zařízení*“

NDI je bezplatný softwarový standard zveřejněný společností NewTek v roce 2015, který umožňuje systémům, zařízením a aplikacím připojit se a komunikovat přes [IP](#) za účelem sdílení videa, zvuku a dat s minimální latency v 1Gb a 10Gb sítích.

NDI 6

HDR support

10+ BIT COLOR DEPTH SUPPORT

WAN Connectivity

HDR support

Higher contrast

Minimal color banding

Wide color gamut

Broad compatibility



10+ BIT COLOR DEPTH SUPPORT

Matching SDI quality

Alpha channel allowing for more nuanced

Precision of gradients, shading, and fine details

Expanded creative possibilities of professional-grade video editing



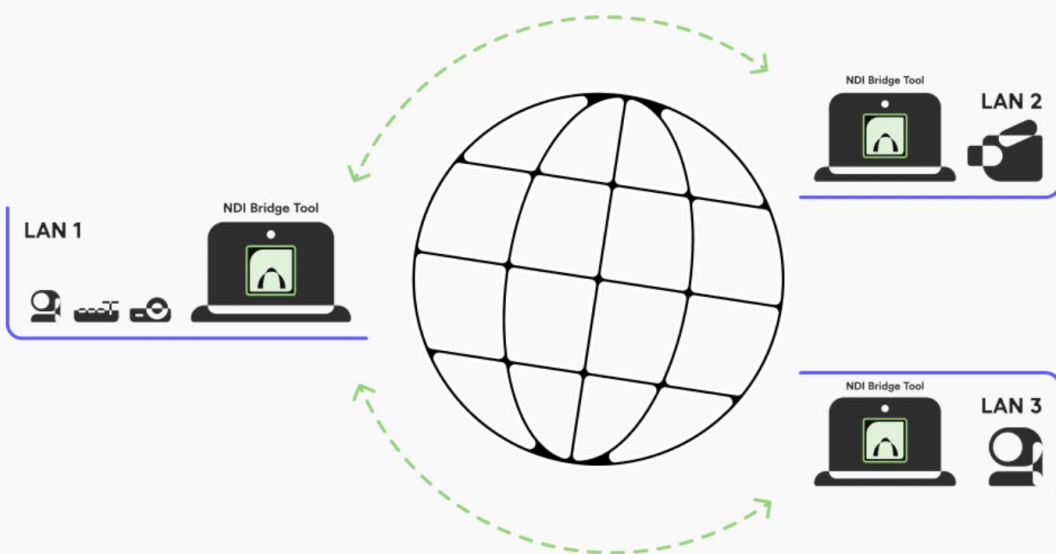
WAN Connectivity

Real-time collaboration over WAN

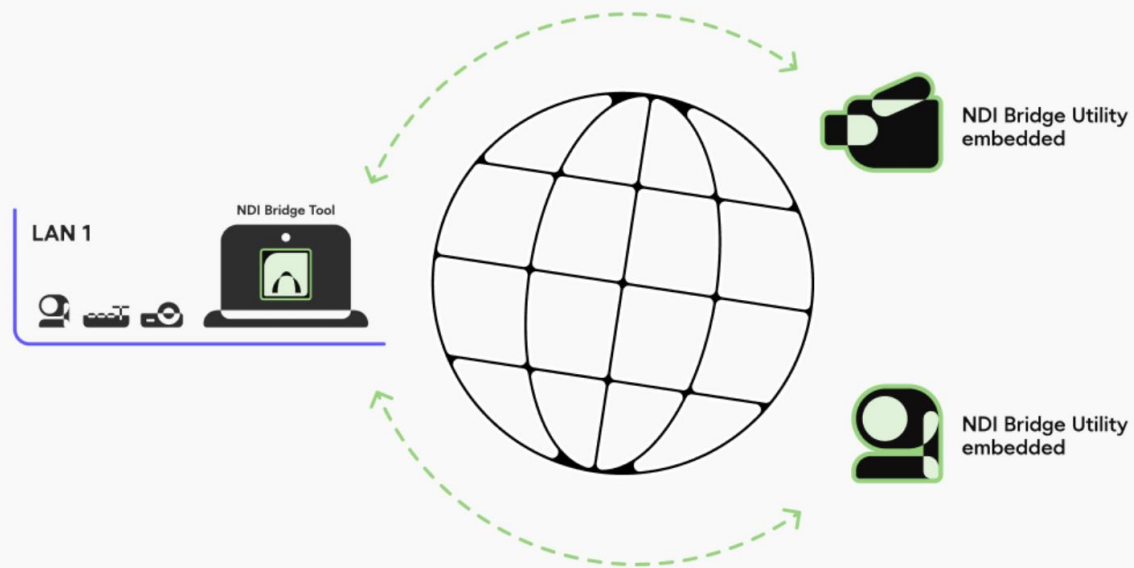
Encryption

embedded into cameras and converters

NDI 5



NDI 6



Telycam Explore SE

NDI bridge embedded



2024-04-08 11:33:21

PTZ Control

Camera Settings

IP Settings

Manage

Logout



Focus >>

Focus Mode Auto

Sensitivity high

Area Center

Video Encode>>

Audio Settings>>

SRT Settings>>

RTMP Settings>

RTP Multicast>>

NDI|HX3>

FreeD>>

Ethernet>>

Enable ☒

HX3 ☐

Device Name 4K UHD PTZ Video Camera

Channel Name HX-Stream-192.168.3.184

Multicast ☐

Multicast IP 239.255.0.0

Multicast Mask 255.255.0.0

Multicast TTL 1

Bridge ☒

Group Public

Discovery ☐

Bridge Name ws-bridge

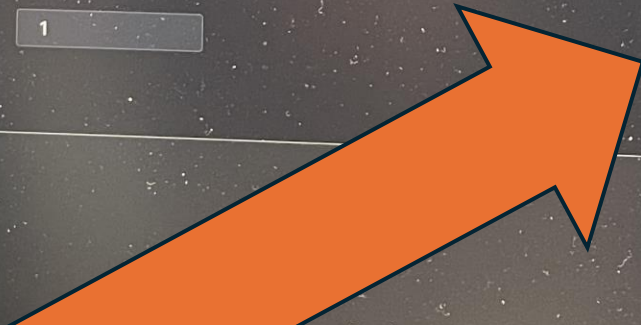
Server IP 217.198.139.35

Server Port 5990

Encryption Key 123456

Source

Save



Kiloview N50 / N60 converters

NDI bridge embedded



General Settings

NDI Settings

Network Settings

Record Settings

User Management

Area and Time

PTZ Settings

System Settings

Version Info

Discovery Server

Connect To Discovery Server

If you enable the connection to the discovery server, in the encoding mode, the NDI source (this device) will be registered to the discovery server; in the decoding mode, the NDI discovery will obtain the NDI source list from the discovery server. This is suitable for NDI use across network segments or your network does not support UDP multicast.

Server Status ☐ OFF* Server Address

Apply

NDI Bridge

NDI Bridge ☒ ON Join a Remote NDI BridgeSource to Share * Bridge Name

This is required

* Server IP Address

This is required

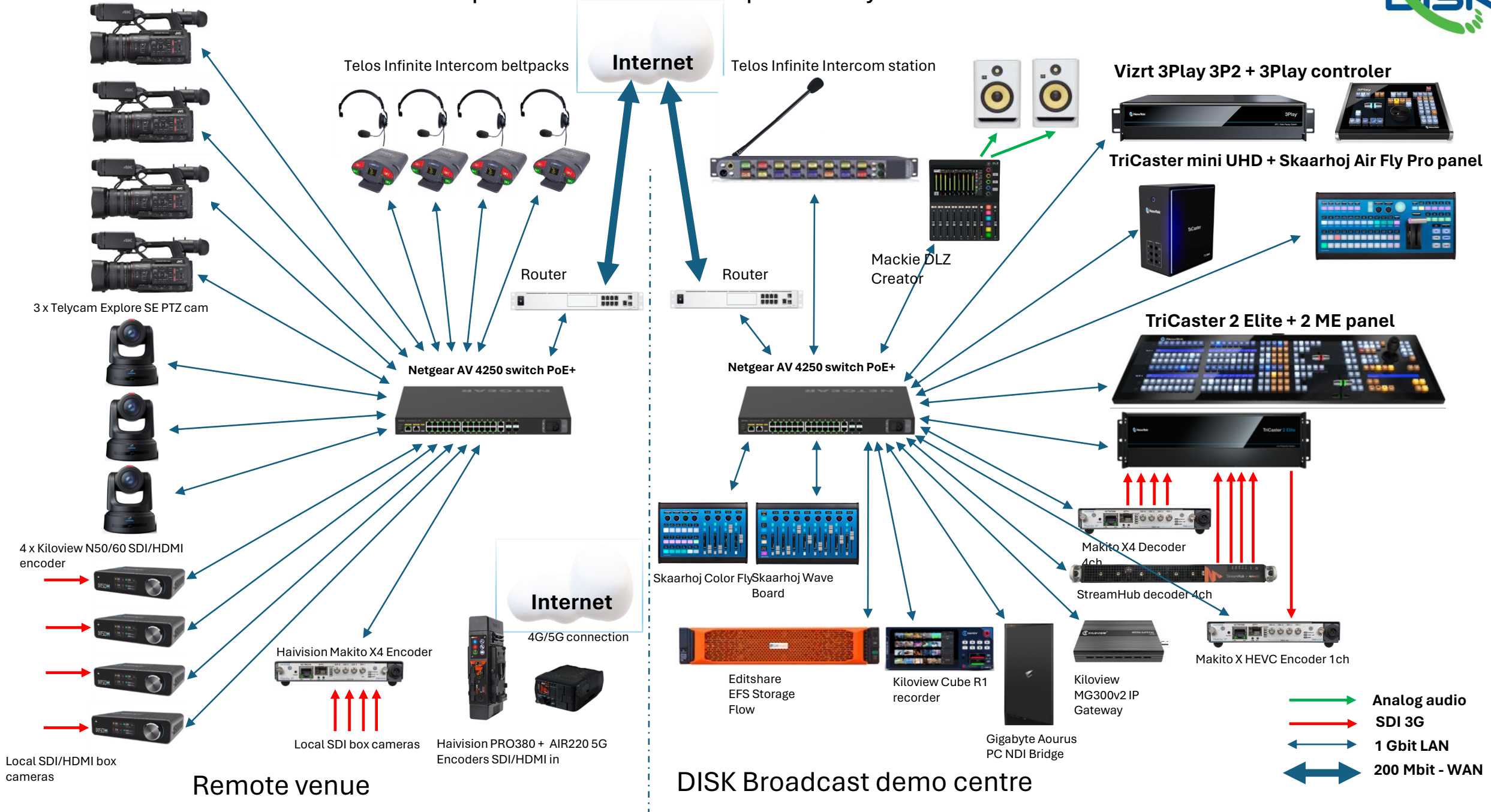
* Server Port Encryption Key

Apply



4x JVC GY-HC550EN cam

Remote production demo setup - DISK Systems Showroom

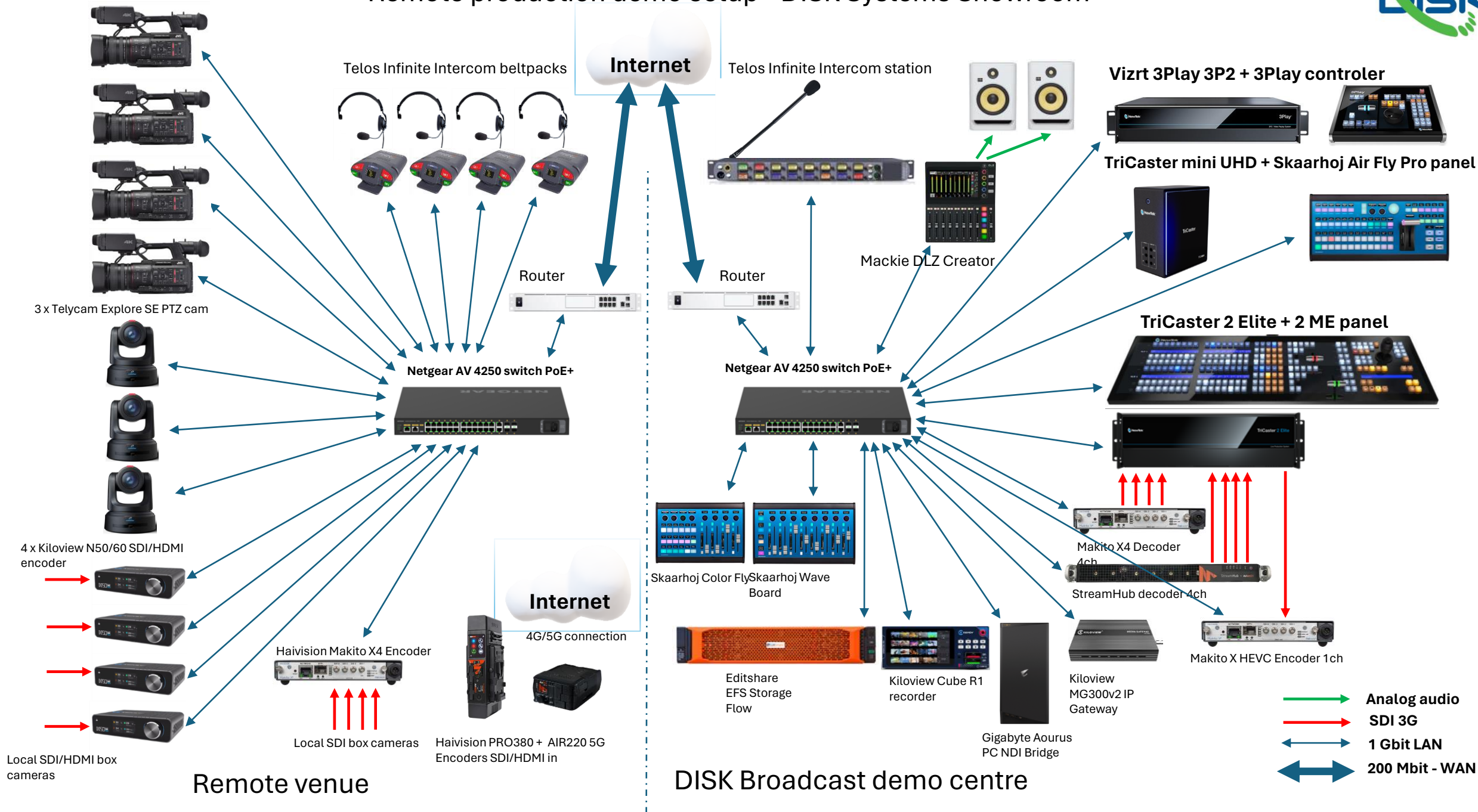






4x JVC GY-HC550EN cam

Remote production demo setup - DISK Systems Showroom



DISK Systems, s.r.o.



www.disk.cz

Ing. Petr Krkavec