Camera Training Center Breda The Netherlands

August 2016

XCU HD/4K IP Introduction

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Jan Paul Campman

- **Your Host for this session**
- *Training Manager*
- *Trainer*
- *Acceptance Engineer*
- *Demo specialist*
- *Web master*

- your guide for this **INTERACTIVE** session.
- **Welcome to the LDX Series WEB-Training**

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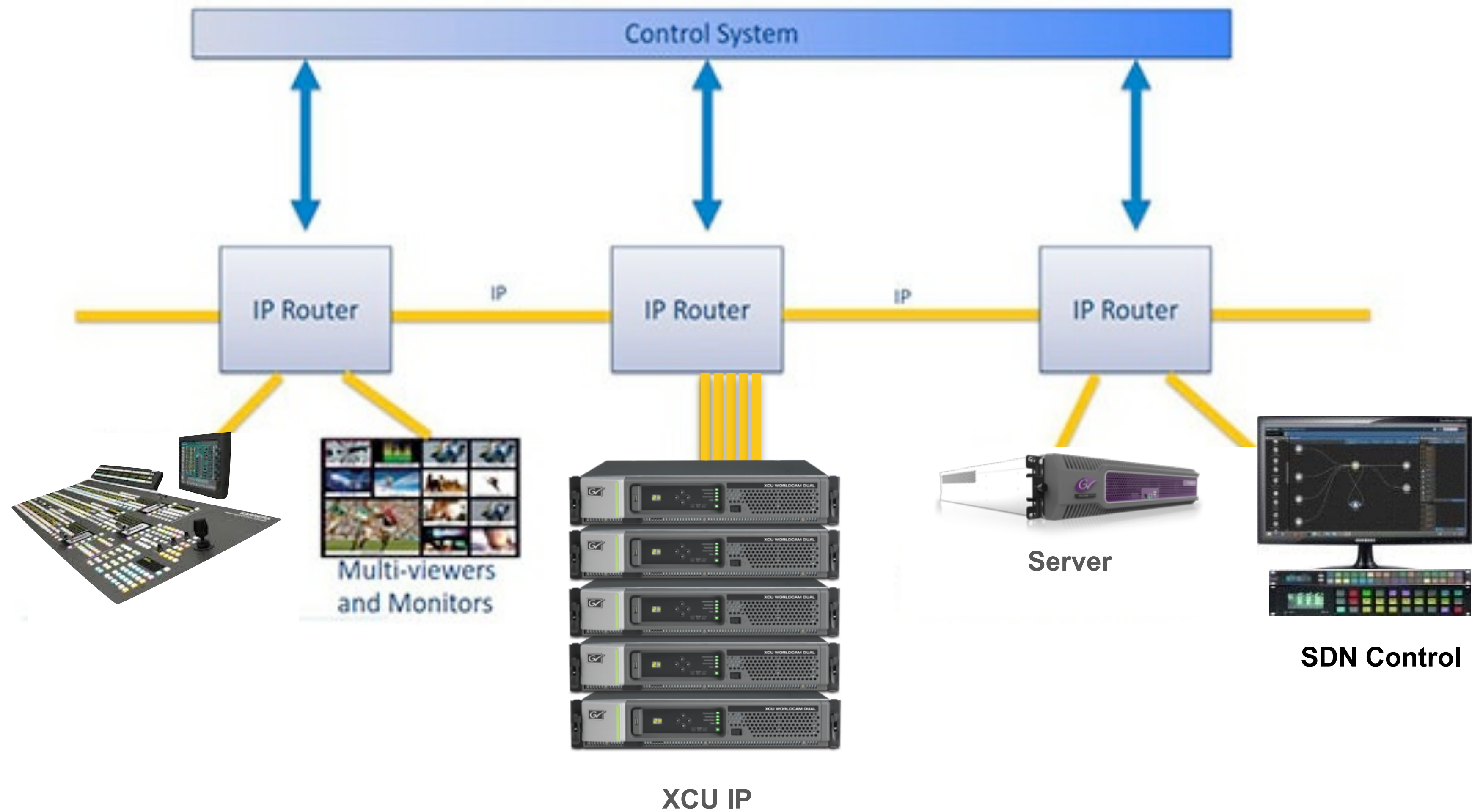
IP XCU 10G Fiber (basics)

This part gives you some more details about the

IP Connection between XCU and the world

In this session:

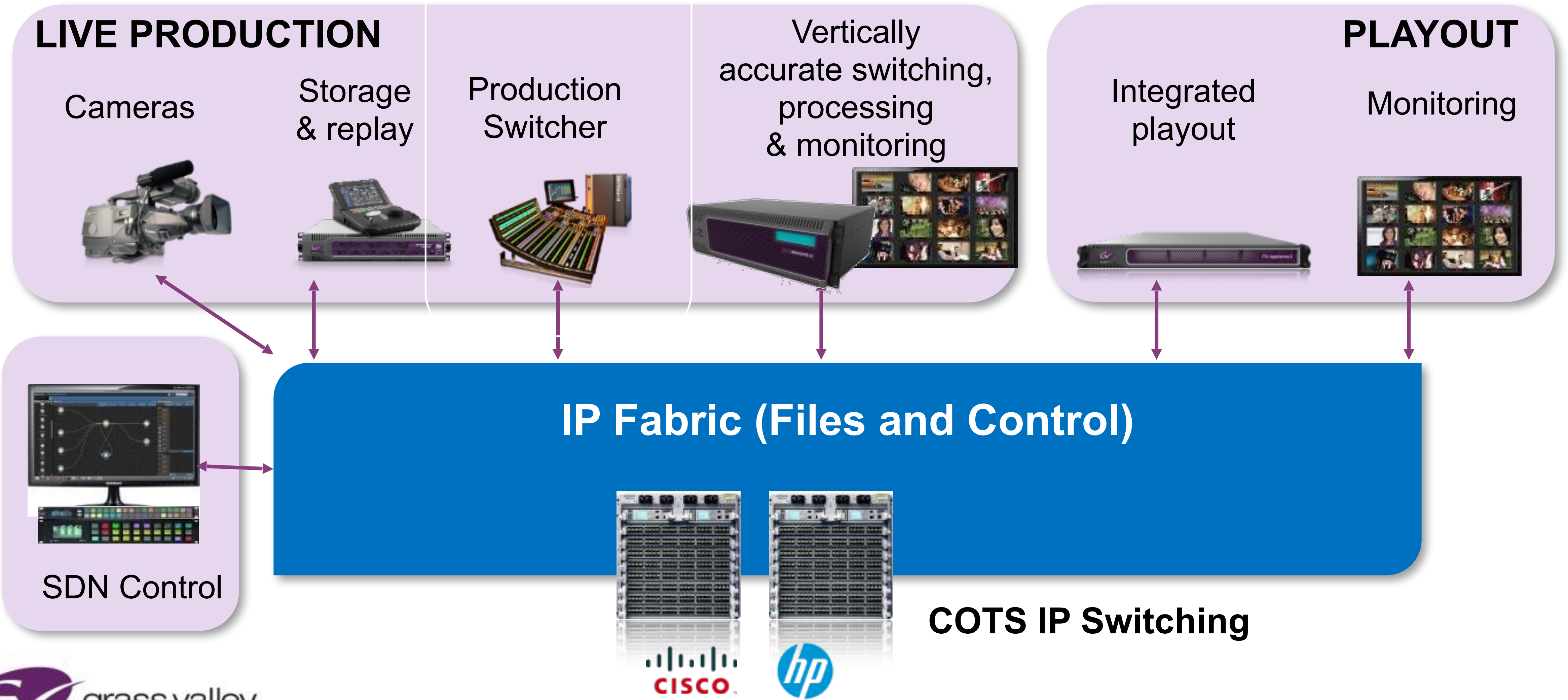- ✦ **IP XCU introduction**
- ✦ **XCU IP connections**
- ✦ **IP basics + test**
- ✦ **Settings with MCP450**

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Control System

IP Router — IP — IP Router — IP — IP Router

Multi-viewers and Monitors

XCU IP

Server

SDN Control

XCU HD/4K IP – Workflow overview

LIVE PRODUCTION

Cameras

Storage & replay

Production Switcher

Vertically accurate switching, processing & monitoring

PLAYOUT

Integrated playout

Monitoring

SDN Control

IP Fabric (Files and Control)

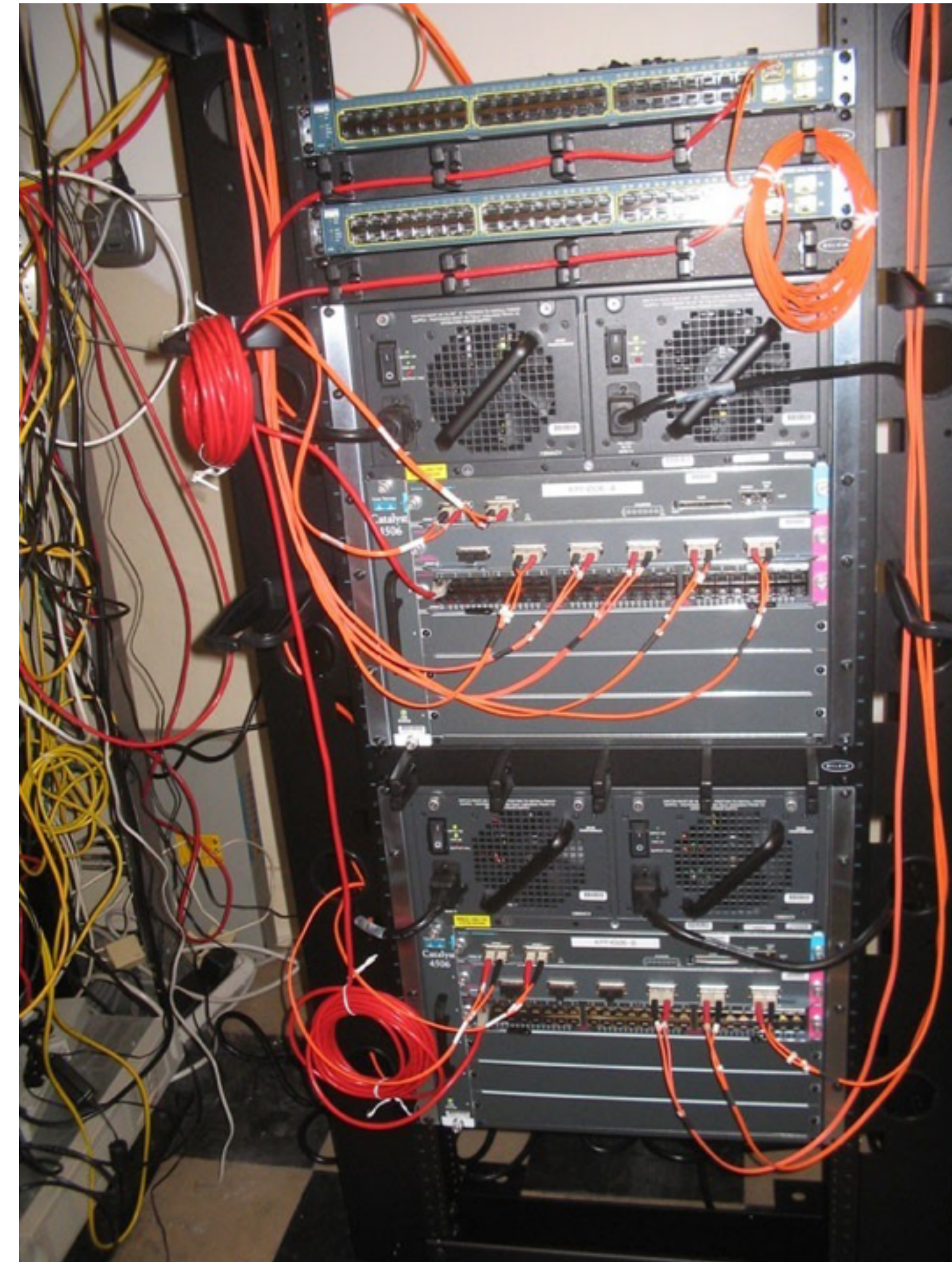**COTS IP Switching**

CISCO

hp

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IP delivers *more flexible, more streamlined & scalable* live production infrastructures – ready for 4K / UHD and beyond
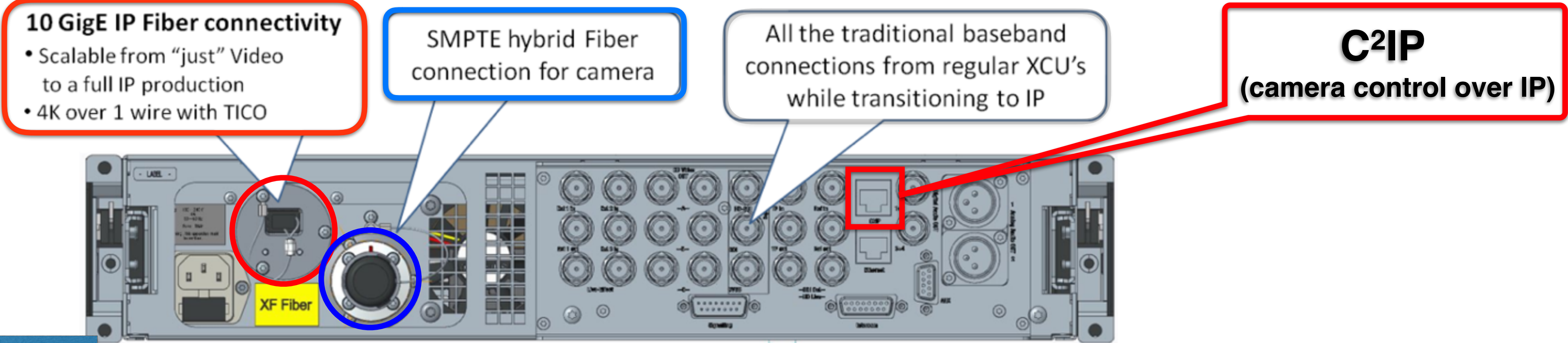
# The End Result: Dramatic Reduction in Cabling

Before IP

After IP

XCU HD/4K IP – Connectivity

10 GigE IP Fiber connectivity
- Scalable from "just" Video to a full IP production
- 4K over 1 wire with TICO

SMPTE hybrid Fiber connection for camera

All the traditional baseband connections from regular XCU's while transitioning to IP

C²IP
(camera control over IP)

XCU XF (10GigE) is available in 2 versions

* XCU Univers 4K BNC
* XCU Univers 4K over TICO

more details in LDX 86 native training session
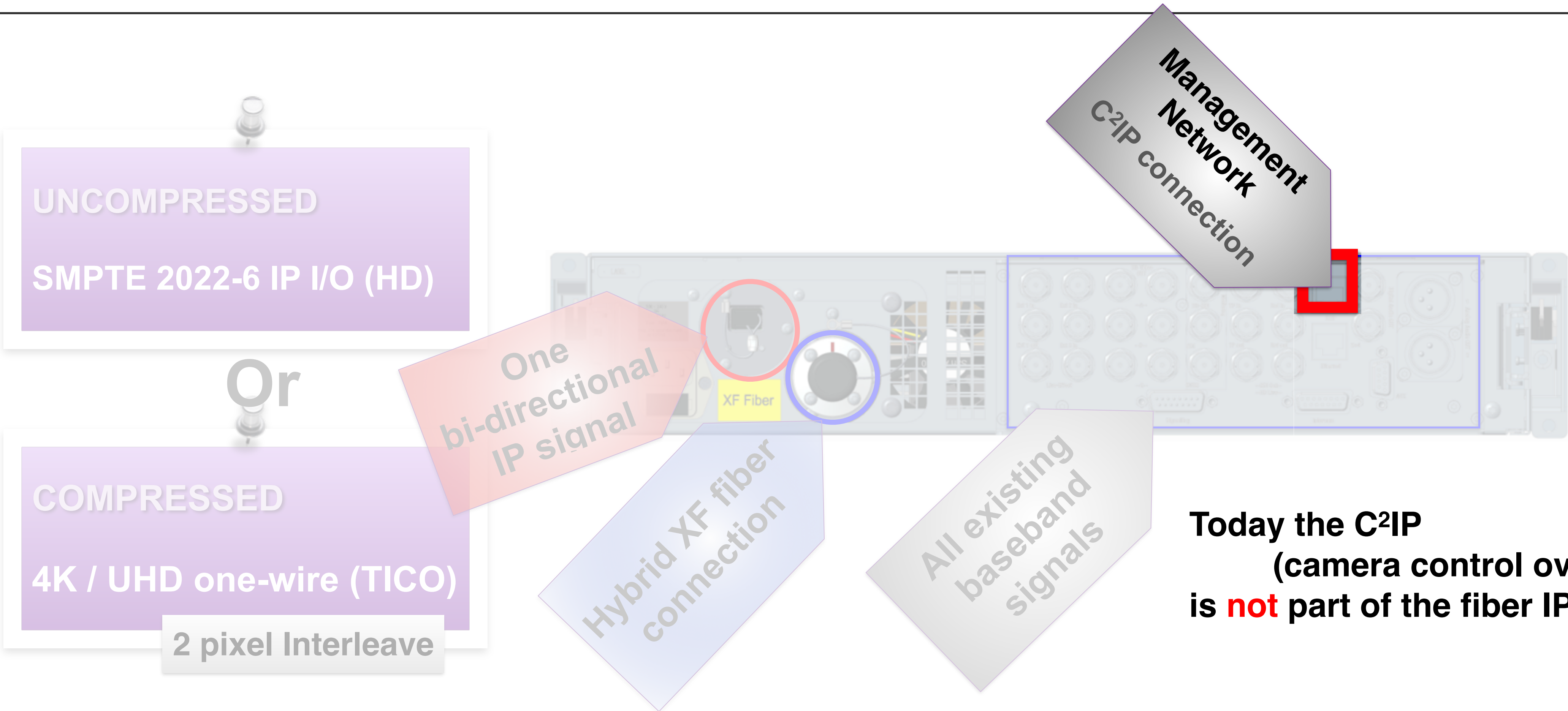
Capabilities – In addition to Baseband
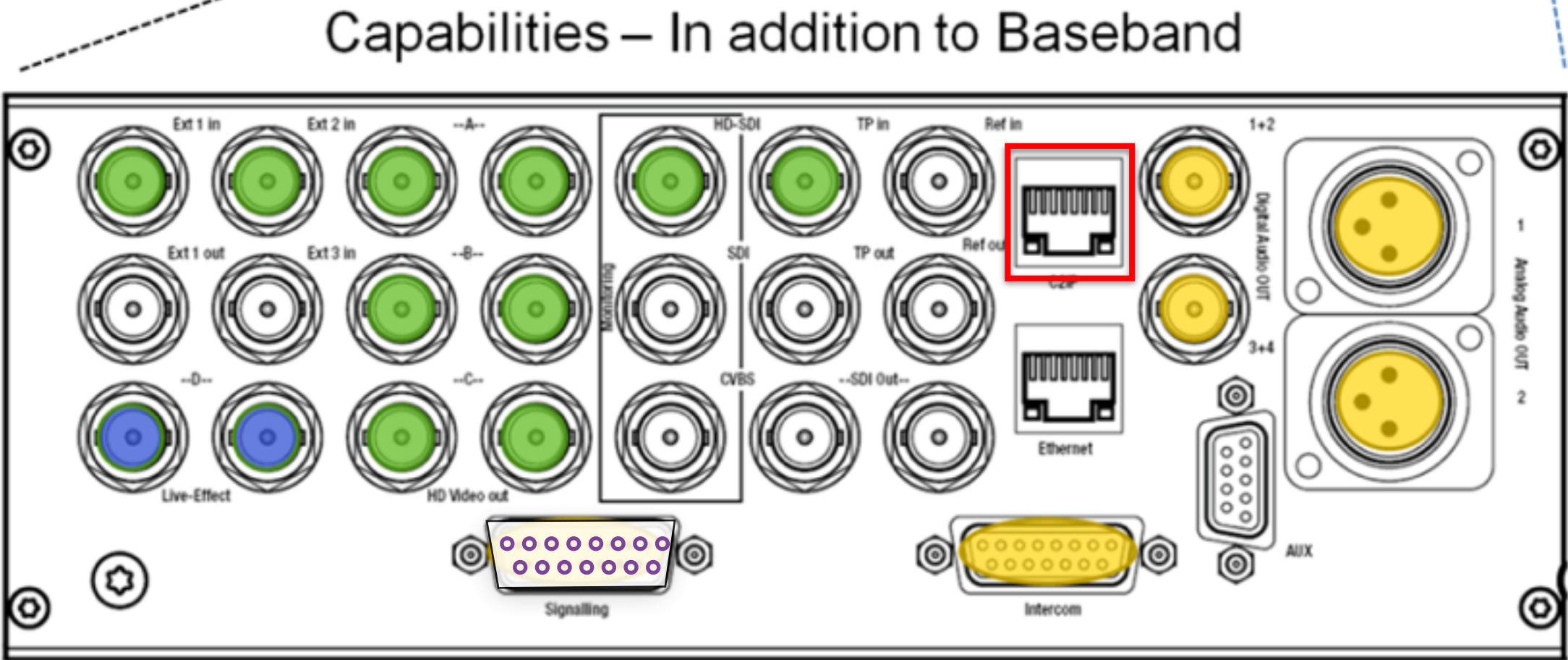
- 🟢 Available in IP
- 🟡 Available inside the SMPTE 2022-6
- 🔵 Available in 4K operation only

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IP

XCU HD/4K IP – Connectivity

Management Network
C²IP connection

UNCOMPRESSED

SMPTE 2022-6 IP I/O (HD)

Or

Media Network

One bi-directional IP signal

XF Fiber

COMPRESSED

4K / UHD one-wire (TICO)

2 pixel Interleave

Hybrid XF fiber connection

All existing baseband signals

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IP

Management Network C²IP connection

UNCOMPRESSED

SMPTE 2022-6 IP I/O (HD)

Or

COMPRESSED

4K / UHD one-wire (TICO)

2 pixel Interleave

One bi-directional IP signal

Hybrid XF fiber connection

All existing baseband signals

XF Fiber

Today the C²IP
(camera control over IP)
is not part of the fiber IP network

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IP

XCU IP – C²IP (*Management Network)* connection standard
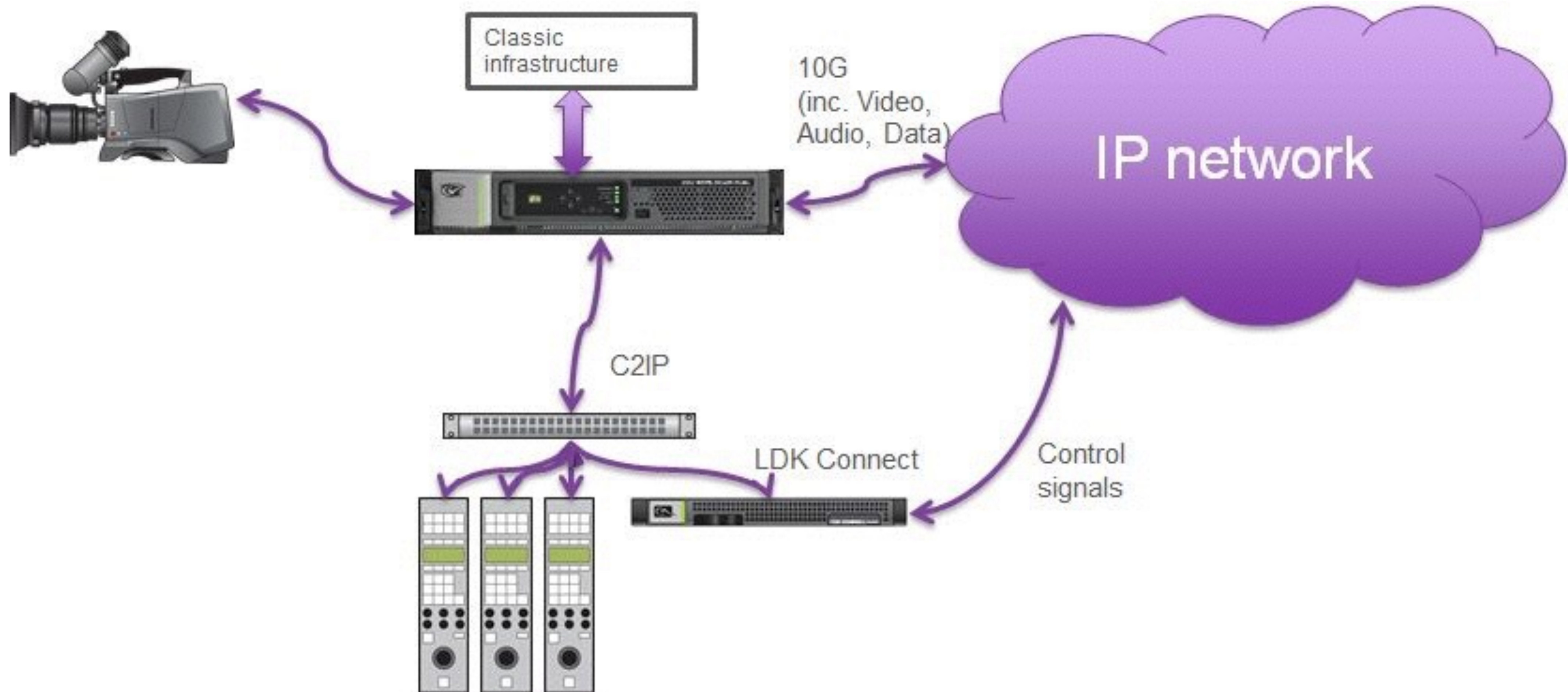
UNCOMPRESSED

SMPTE 2022-6 IP I/O (HD)

Or

COMPRESSED

4K / UHD one-wire (TICO)

2 pixel Interleave

One bi-directional IP signal

C²IP connection

XF Fiber

Hybrid XF fiber connection

All existing baseband signals

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IP
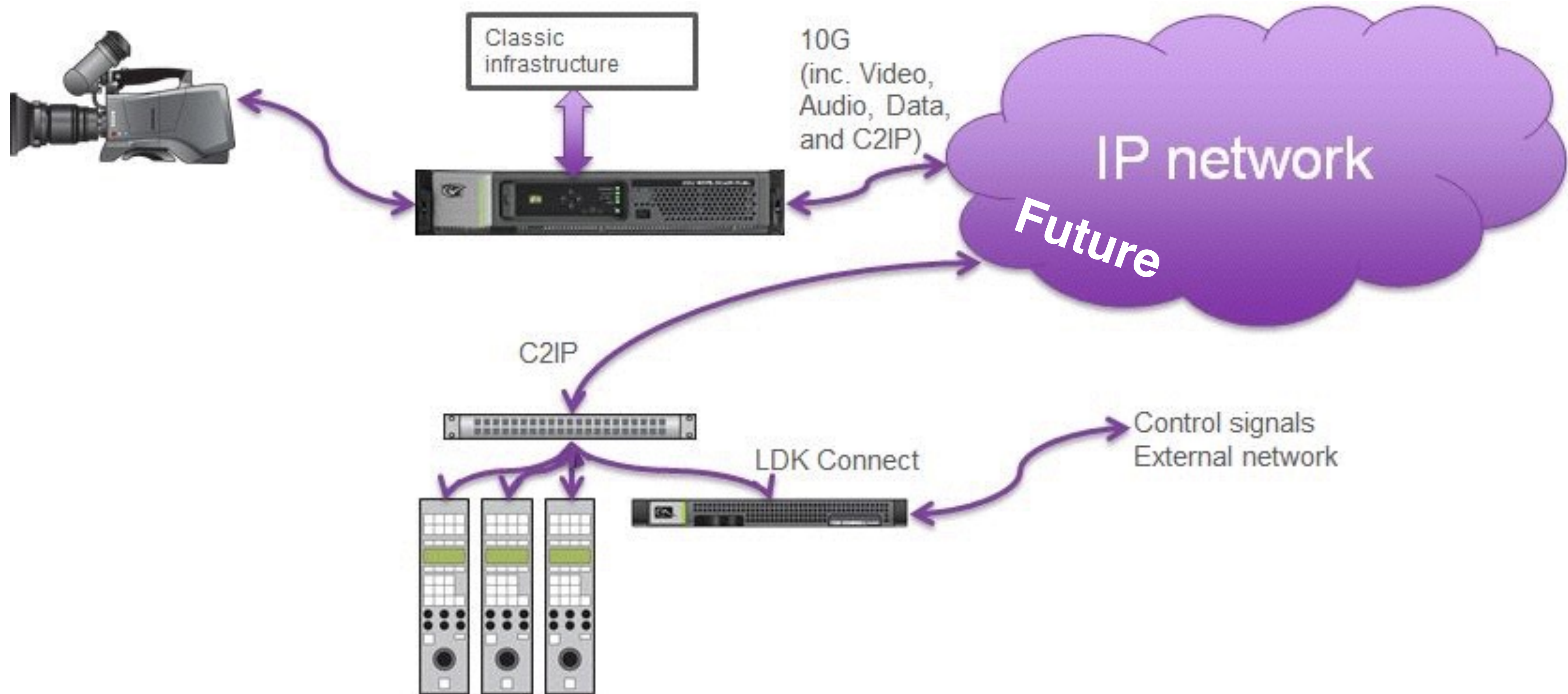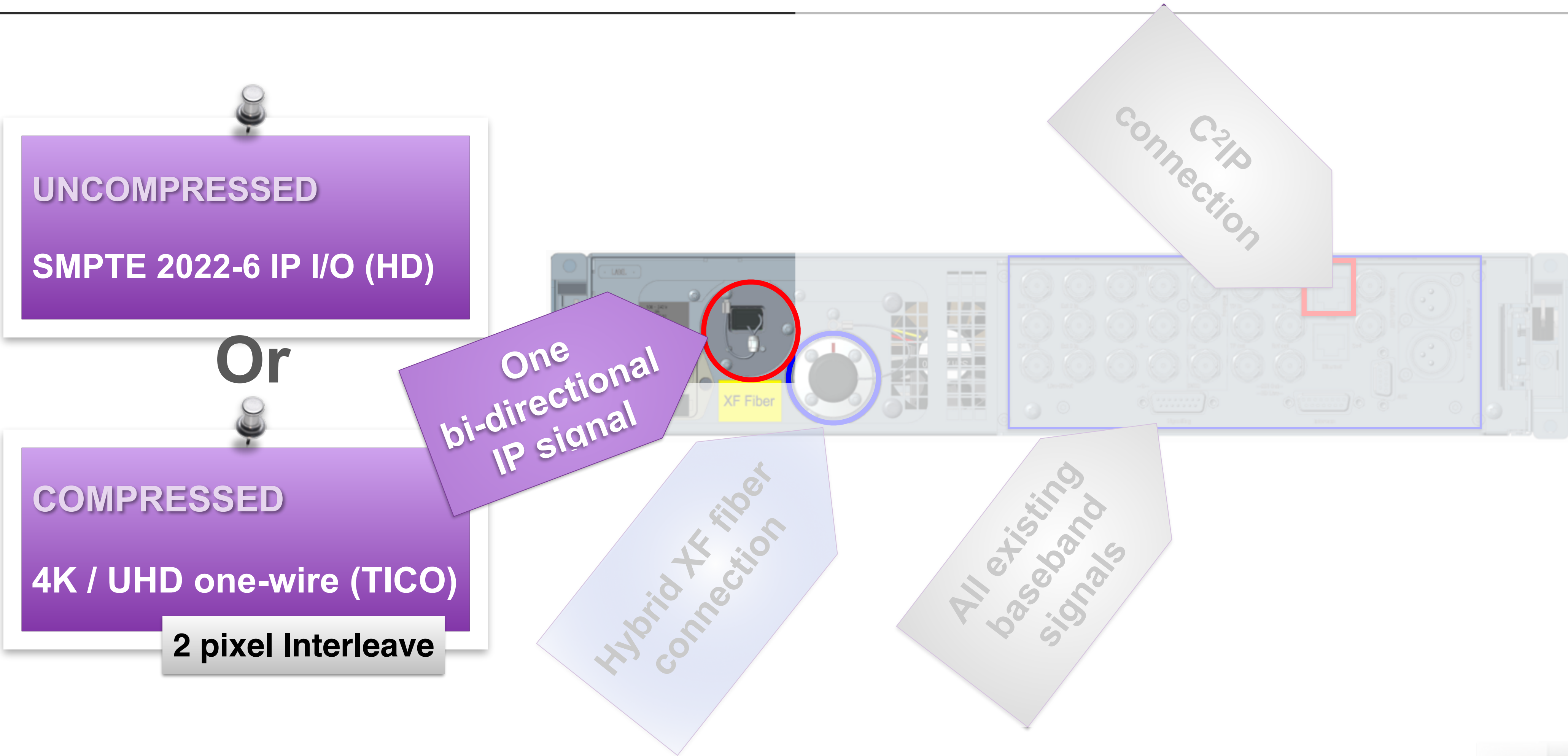
SMPTE 2022 standards

ST 2022-1:2007 "Forward Error Correction for Real-Time Video/Audio Transport Over IP Networks"
defines row/column FEC (Forward Error Correction) for IP video streams. Along with Section 2, this standard has been widely implemented. Row/Column FEC works by grouping IP video packets into logical rows and columns, and then appending one FEC packet to each row and each column. In the event that one packet is lost from a row or a column, the data in that packet can be perfectly recreated using the contents of the FEC packet in conjunction with the other packets in the row or column. This method works quite well, and allows the packet stream to survive lengthy bursts of lost packets.

ST 2022-2:2007 "Unidirectional Transport of Constant Bit Rate MPEG-2 Transport Streams on IP Networks"
specifies how constant bit rate compressed video signals that are encoded within MPEG-2 transport streams are encapsulated into IP packets. This standard covers the transport layer (RTP and UDP) as well as comments about timing and buffer sizes.

ST 2022-3:2010 "Unidirectional Transport of Variable Bit Rate MPEG-2 Transport Streams on IP Networks"
defines IP packets for variable bit-rate MPEG-2 TS streams that are constrained to have a constant bit rate between PCR messages (called piecewise-constant).

ST 2022-4:2011 "Unidirectional Transport of Non-Piecewise Constant Variable Bit Rate MPEG-2 Streams on IP Networks"
is similar to Section 3, except that it removes the constraint on bit rates.

ST 2022-5:2012 "Forward Error Correction for High Bit Rate Media Transport Over IP Networks"
expands on Section 1 to allow larger row/column FEC combinations to support signals with bit rates up to 3 Gbps and beyond. A minor revision to this standard is scheduled to be published in 2013 by SMPTE.

Current

ST 2022-6:2012 "Transport of High Bit Rate Media Signals over IP Networks (HBRMT)"
specifies a way to transport high bit-rate signals (including uncompressed 3 Gbps 1080p video) that are NOT encapsulated in MPEG-2 transport streams.

?

2022-7 (approval pending) "Seamless Protection Switching of SMPTE ST 2022 IP Datagrams"
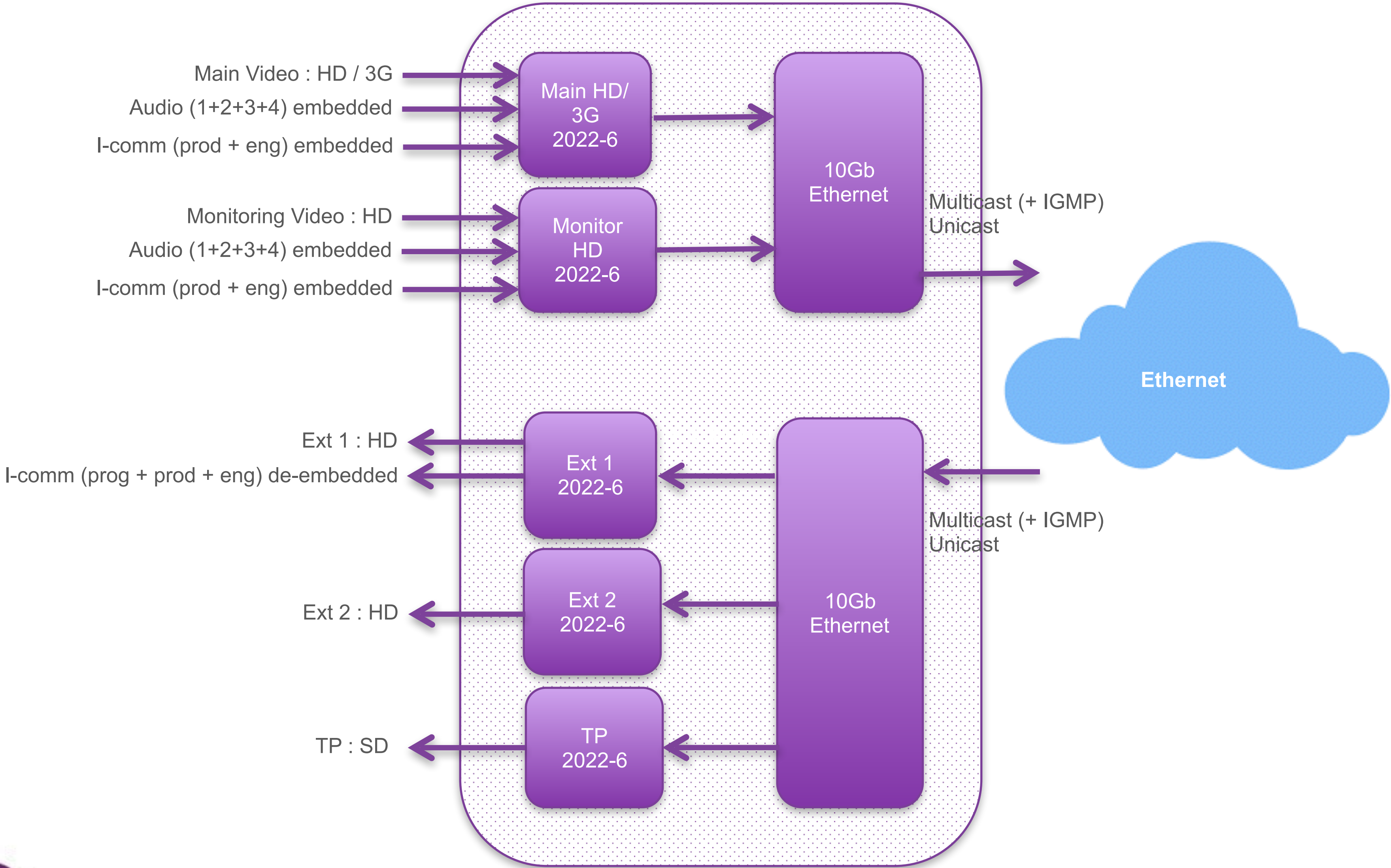describes a way to send two matching streams of packets from a source to a destination over different paths, and have the receiver switch automatically between them. This allows a perfect video signal to be reconstructed at the receiver as long as both paths do not fail simultaneously.
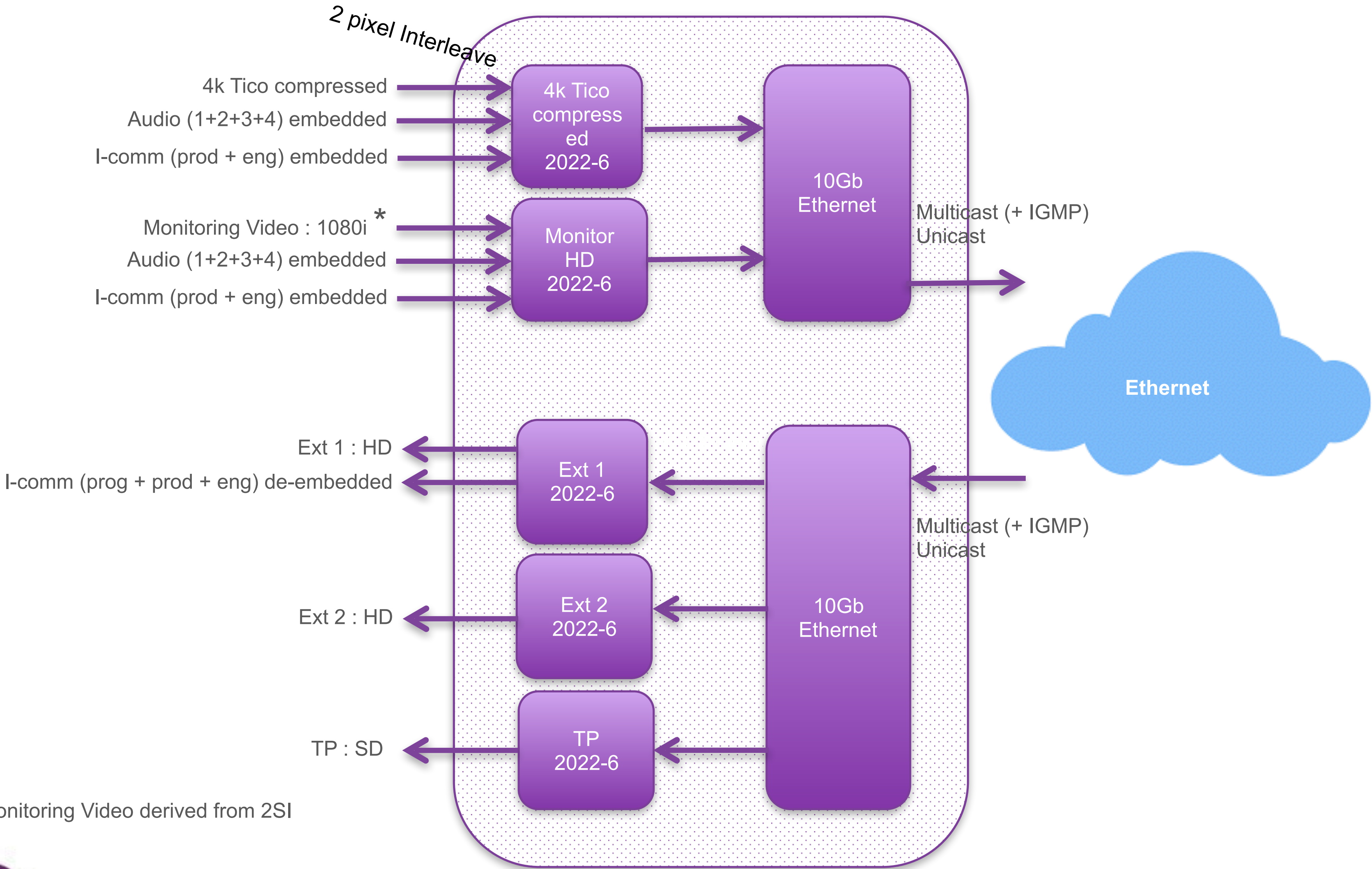
Main Video : HD / 3G

Audio (1+2+3+4) embedded

I-comm (prod + eng) embedded

Main HD/
3G
2022-6

Monitoring Video : HD

Audio (1+2+3+4) embedded

I-comm (prod + eng) embedded

Monitor
HD
2022-6

10Gb
Ethernet

Multicast (+ IGMP)
Unicast

Ethernet

Ext 1 : HD

I-comm (prog + prod + eng) de-embedded

Ext 1
2022-6

Multicast (+ IGMP)
Unicast

Ext 2 : HD

Ext 2
2022-6

10Gb
Ethernet

TP : SD

TP
2022-6

IP timing can be delayed / advanced with respect
to the main Gen-lock (BNC)

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IP

XCU IP – Streams (4K) TICO   Compressed

2 pixel Interleave

4k Tico compressed →
Audio (1+2+3+4) embedded →
I-comm (prod + eng) embedded →

4k Tico compressed 2022-6

Monitoring Video : 1080i * →
Audio (1+2+3+4) embedded →
I-comm (prod + eng) embedded →

Monitor HD 2022-6

10Gb Ethernet

Multicast (+ IGMP)
Unicast

Ethernet

Ext 1 : HD ←
I-comm (prog + prod + eng) de-embedded ←

Ext 1 2022-6

Multicast (+ IGMP)
Unicast

Ext 2 : HD ←

Ext 2 2022-6

10Gb Ethernet

TP : SD ←

TP 2022-6

* : 1080i Monitoring Video derived from 2SI

IP timing can be delayed / advanced with respect
to the main Gen-lock (BNC)

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IP

Available (IP based) System connections

ST 2022-6:2012   Cam -> XCU
XCU -> Cam

Hybrid fiber

BNC
and/or
IP

Hybrid fiber

Direct IP

Hybrid fiber

Single Mode fiber Only !

BNC
and/or
IP

ST 2022-6:2012   XCU -> Hub
Hub -> XCU

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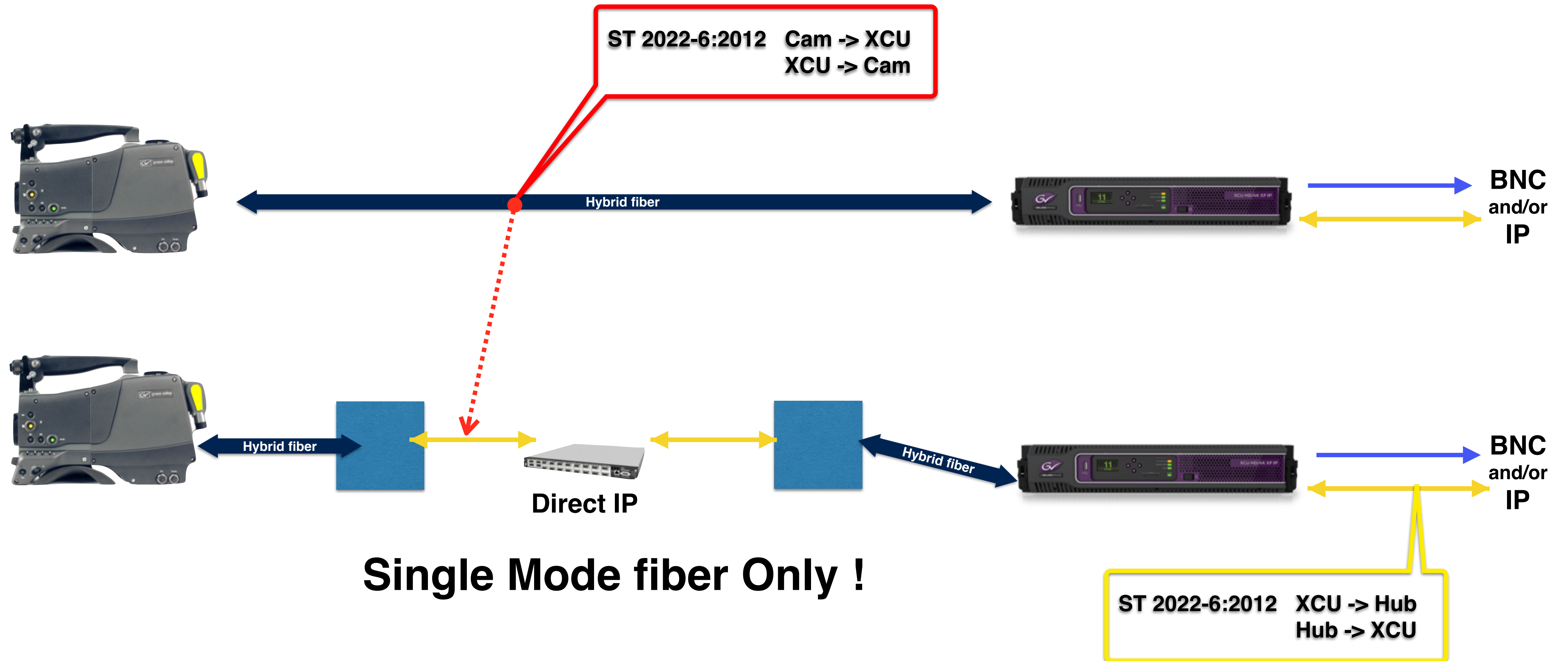
AIMS roadmap (Breaking it down)

XF Transmission

Hybrid Fiber cable inc. 2x single mode fiber

Fiber A
Fiber B

Camera

XCU

Audio (1+2+3+4) embedded
I-com (Prod. + Eng) embedded

I-com (Prog. + Prod. + Eng) embedded

Main Video 2022 5+6

Return 2022 5+6

Fiber A →

← Fiber B

10Gb IP →

← 10Gb IP

Analog Audio Stereo 24bits
Digital Audio Stereo 24bits
I-com Prod. Audio 16bits
I-com Eng. Audio 16bits
C2IP
Private Data
IP Trunk 10/100/1G

I-com Prog. Audio 16bits
I-com Prod. Audio 16bits
I-com Eng. Audio 16bits
C2IP
Private Data
IP Trunk 10/100/1G

Main ; 1 Channel SMPTE 2022-5+6   1080i50/59 = 1,8Gb   1080p50/59 = 3,4Gb
Return ; 1 Channel SMPTE 2022-5+6   1080i50/59 = 1,8Gb   1080i50/59 = 1,8Gb

C2IP + Private Data + I-com + Analog Audio + Digital Audio = ~ 8Mb
IP Trunk = 0Mb (when not connected)
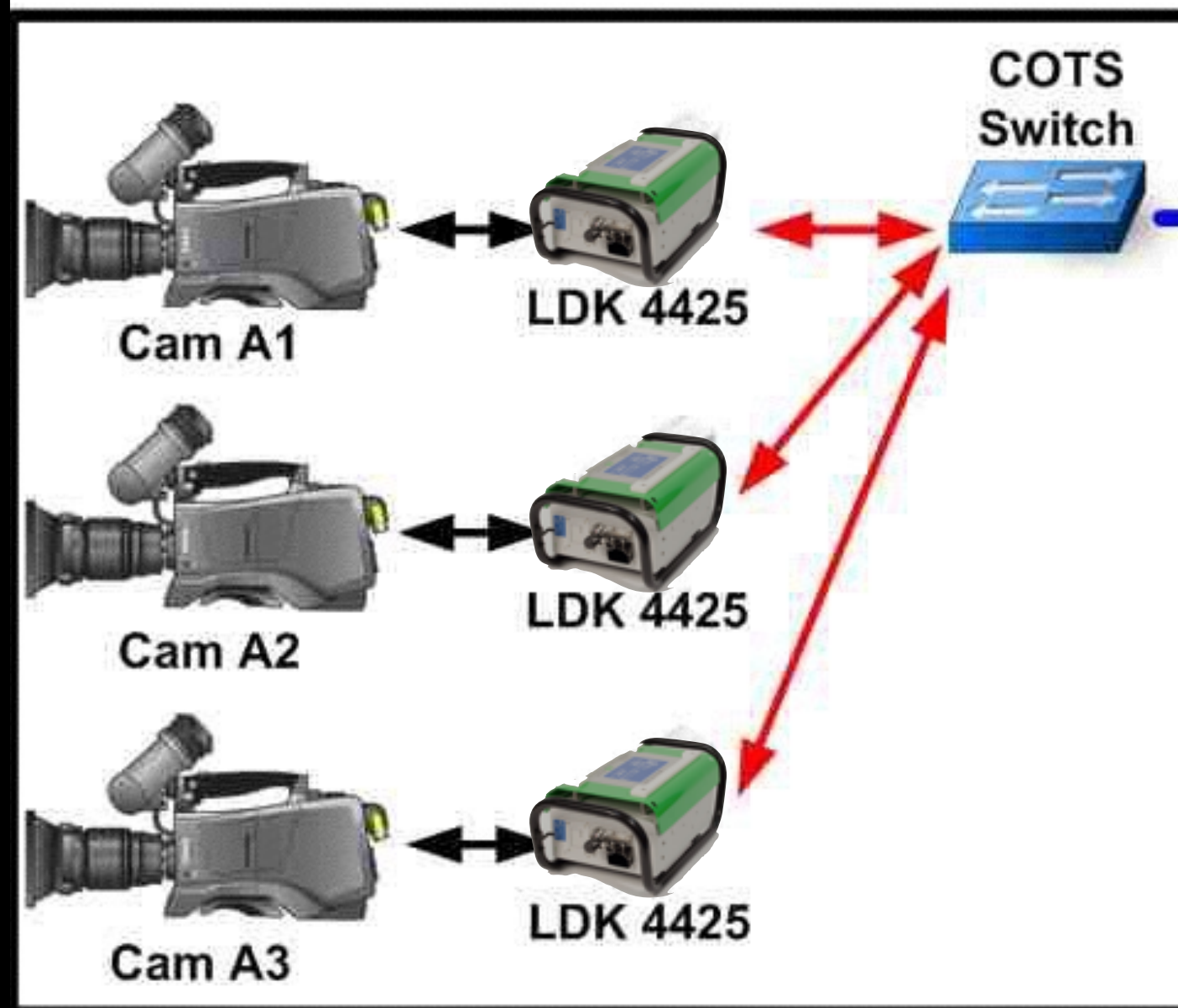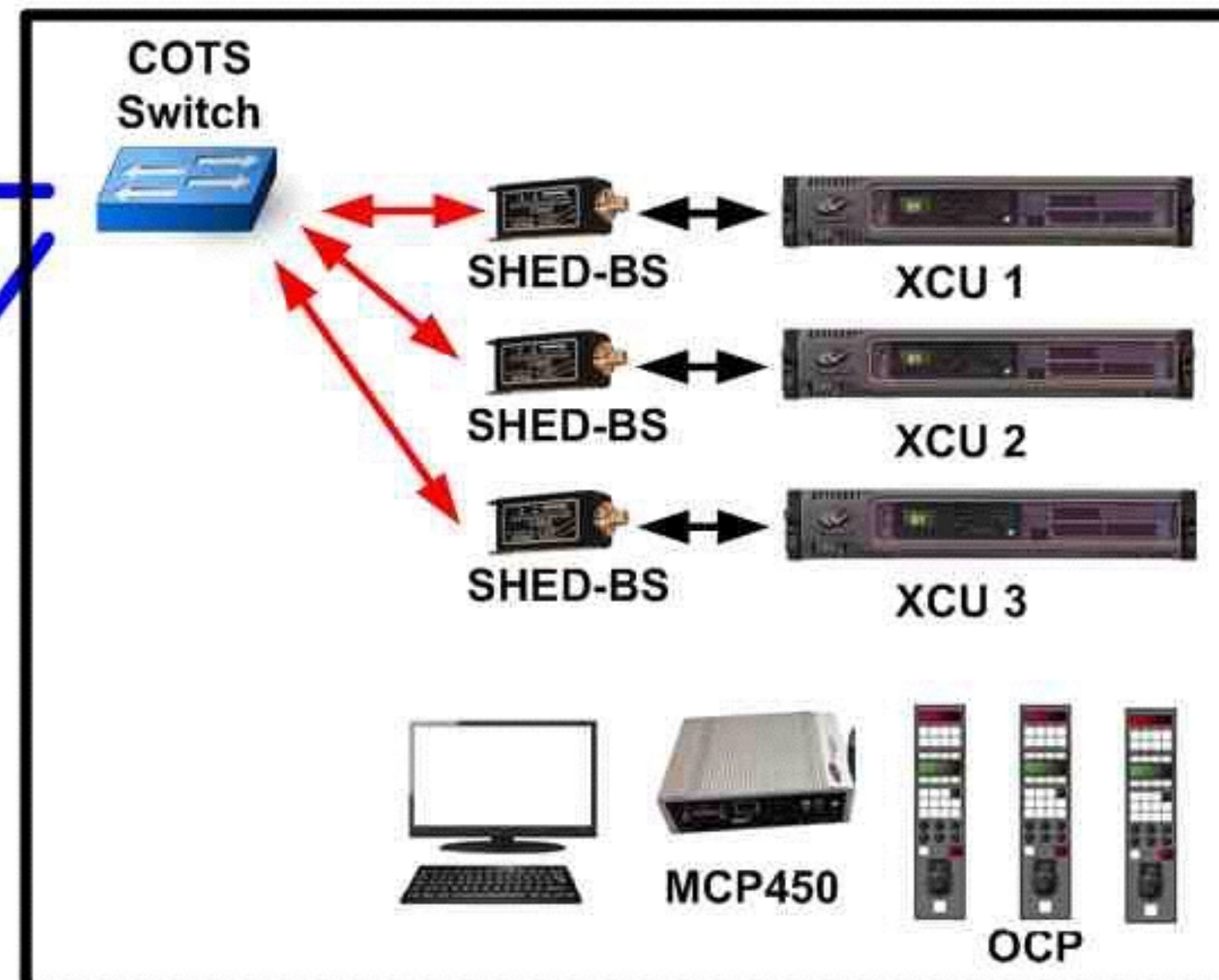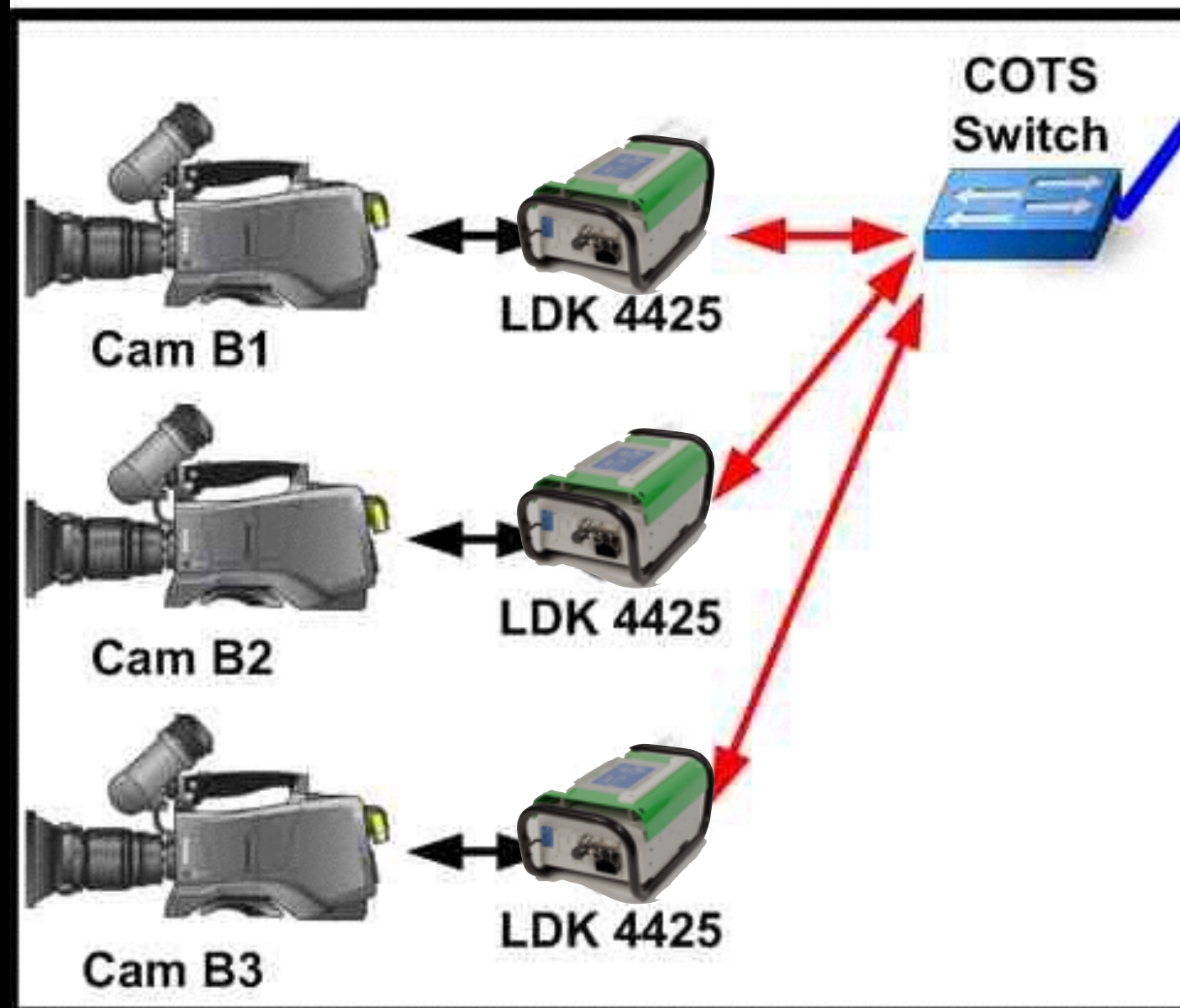
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XCU IP Direct (settings with MCP and XCU menu) for more details use application note

CamFour

Hybrid fiber

Direct IP

Local Power

Hybrid fiber

XCUFour

04
XF Direct IP
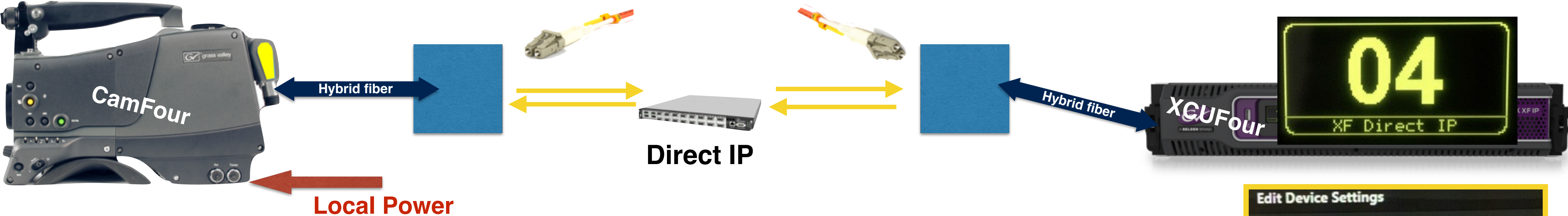
>Direct IP   Perpetual

License Needed

Active Licenses

Camera Menu

Security   >>
>XCU Conn   >>
Disable Camera Off
Lens   >>
Intercom   >>

Configuration

Camera Menu

>ConnectType   Direct IP
 XCU Name   XCUFour

XCU Conn

Camera Menu

Camera Connect

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Camera Connect: Company / Location

| XML Control | Monitoring | Configuration | System |

| Device Config | Nameserver | IP Media Settings | | IP Video In |

Camera System Devices

Name	Type	Model	Serial Nr	Alias	DeviceID	Package	Camera
Camera Head	?	037D6G	LDX86w	CamOne	v10.97		
Camera Head	LDX 80 W	02PA5U	CamXS	CamFour	v28.00		
Base Station	XCU IP	03FHR4	CamXS	XCUFour	v03.00	🟢 CamFour	
OCP	OCP400/10		CamXS	OCP 1	v28.00		
Camera Head	Ldk8000		LDK8000	Head	v21.00		
Base Station	XCU4200W		LDK8000	XCU	v11.00		
Camera Head	LDX 80 W	02PA5U	CamXS	CamFour	v28.00		
Base Station	XCU IP	03FHR4	CamXS	XCUFour	v03.00	🟢 CamFour	
OCP	OCP400/10		CamXS	OCP 1	v28.00		
Camera Head	Focus 70 L	03CZXF	Focus	03CZXF	v06.00		
Base Station	Focus BU		Focus		v03.00		
Base Station	XCU IP	03E2TC	System6	XCU06	v03.00	🔴	

Edit Device Settings

Devicetype:	Base Station
Name:	4
Alias:	CamXS
DeviceID:	XCUFour
Cam.ConnectType:	Direct IP
Cam.Name:	CamFour

Ok   Cancel

Pre Set

IP

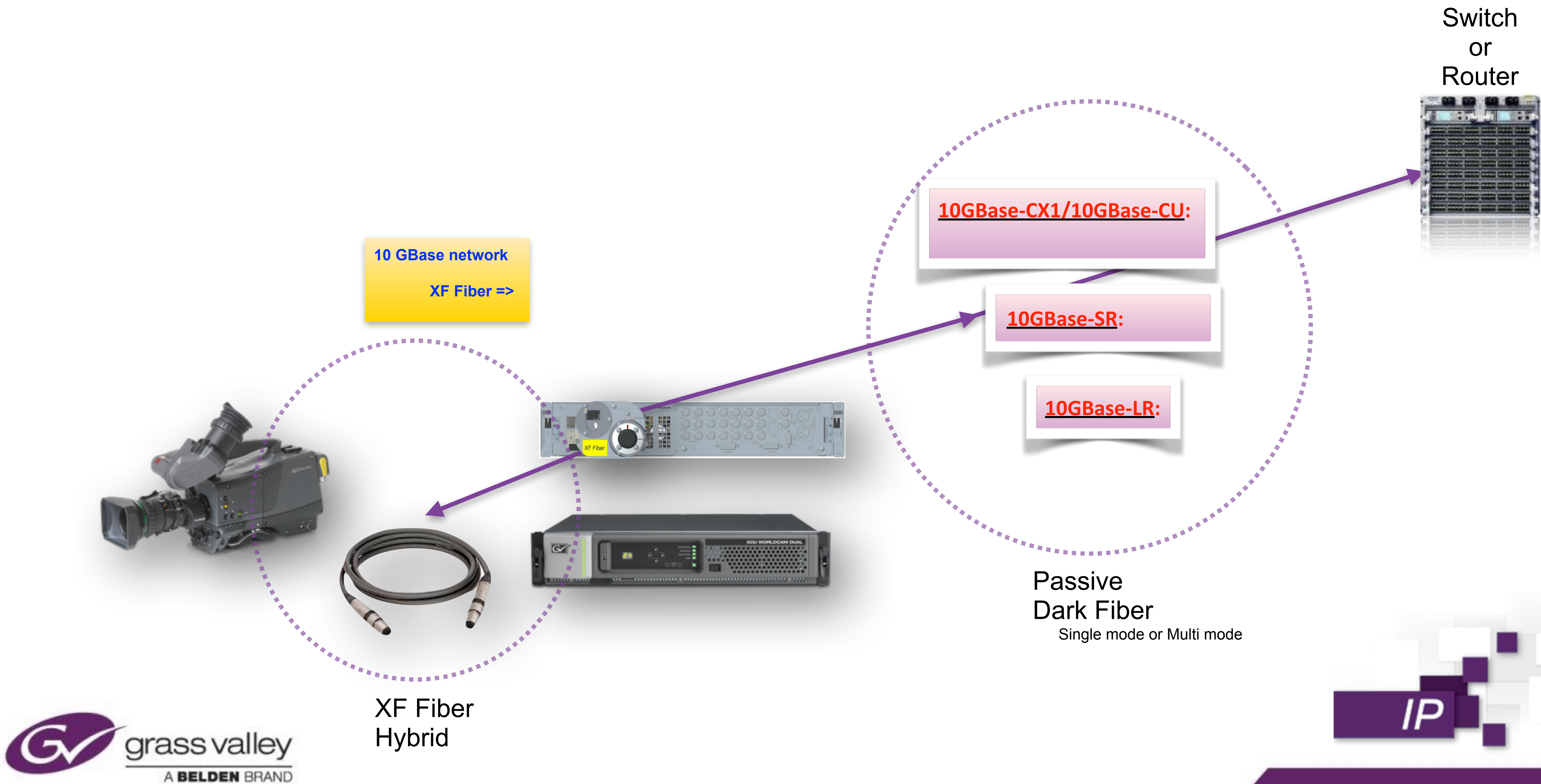grass valley
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IP XCU 10G Fiber (basics)

This part gives you some more details about the

IP Connection between XCU and the world

In this session:

✦ **IP XCU introduction**
✦ **XCU IP connections**
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XCU HD/4K IP – Connections (Fiber or Coax)

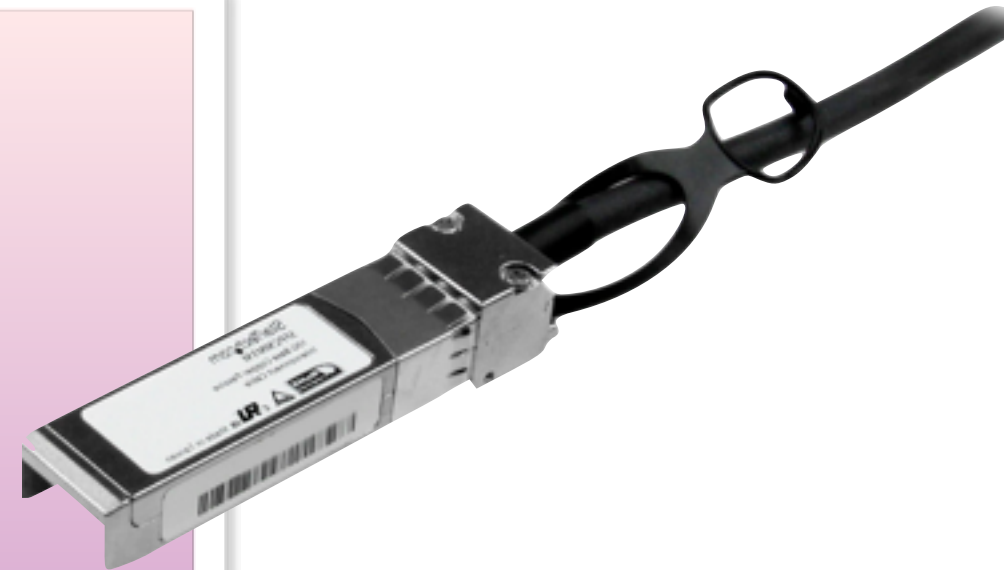Switch
or
Router

10GBase-CX1/10GBase-CU:

10 GBase network

XF Fiber =>

10GBase-SR:

10GBase-LR:

Passive
Dark Fiber

Single mode or Multi mode

XF Fiber
Hybrid

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IP

XCU HD/4K IP – Connections

10GBase-CX1/10GBase-CU:
Passive Copper cable with on both sides SFP+interface
Length max 7 meters (specified < 5m)
Details visible in I^{2}C (type,lenght)

Used for short connections
Used inside XCU (from Muxboard to Output)

10GBase-SR:
Multi-mode, 850 nm optische transceivers.
Two versions:

1   **SFP+ module**, placed in a SFP+ cage (in XCU) and then connect with LC fiber cables to
      Multimode transceiver in a switch
      Take Care! It important to use matching optical wavelengths
      OM3 recommend

2   **AOC: Active optical cable**.
       Here both Optical Receivers and Transceivers are integrated in a case assembly.
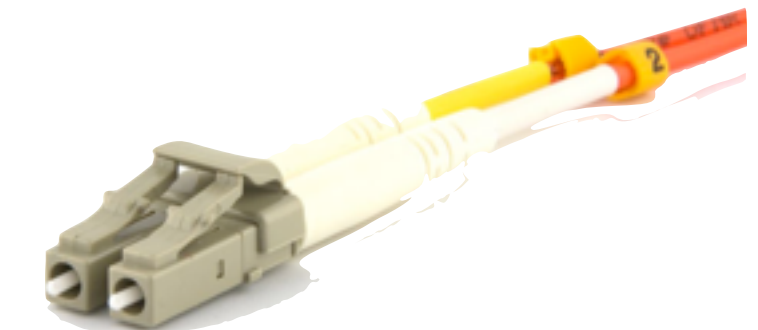
10GBase-LR:
Single-mode 1310nm optical transceivers also used in our LDX fiber transmission

IP
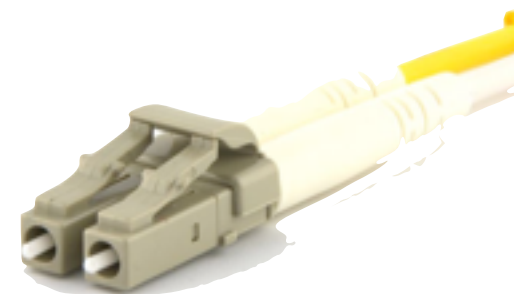
The structure of a typical single-mode fiber.

1. Core 8 μm diameter
2. Cladding 125 μm dia.
3. Buffer 250 μm dia.
4. Jacket 400 μm dia.
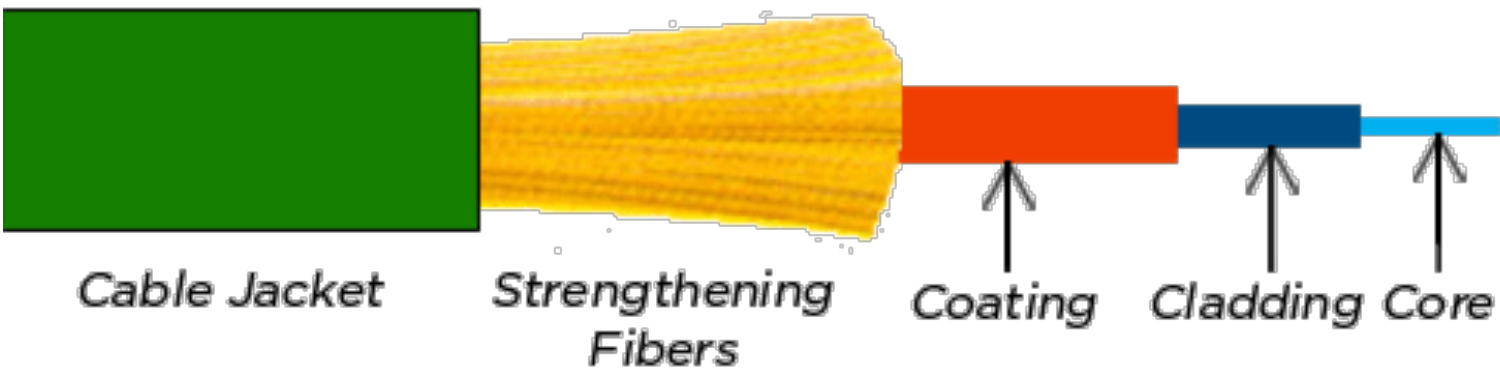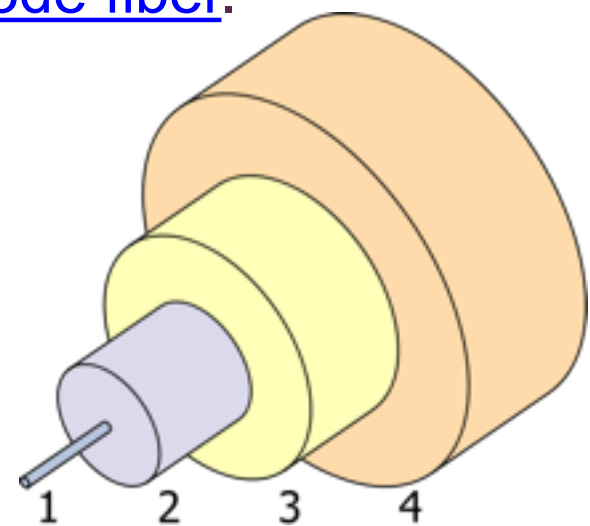
Multi-Mode Fiber

62.5 Micron
50 Micron
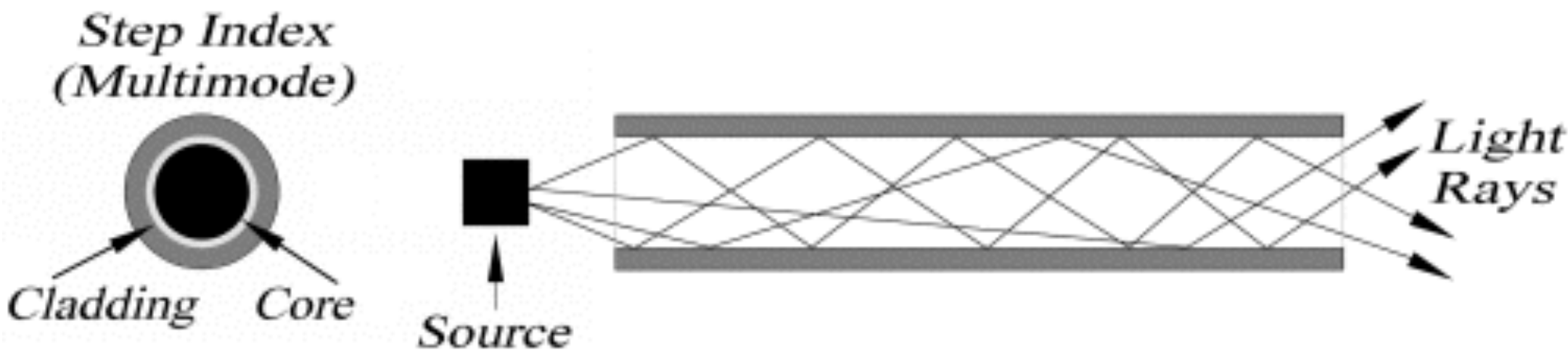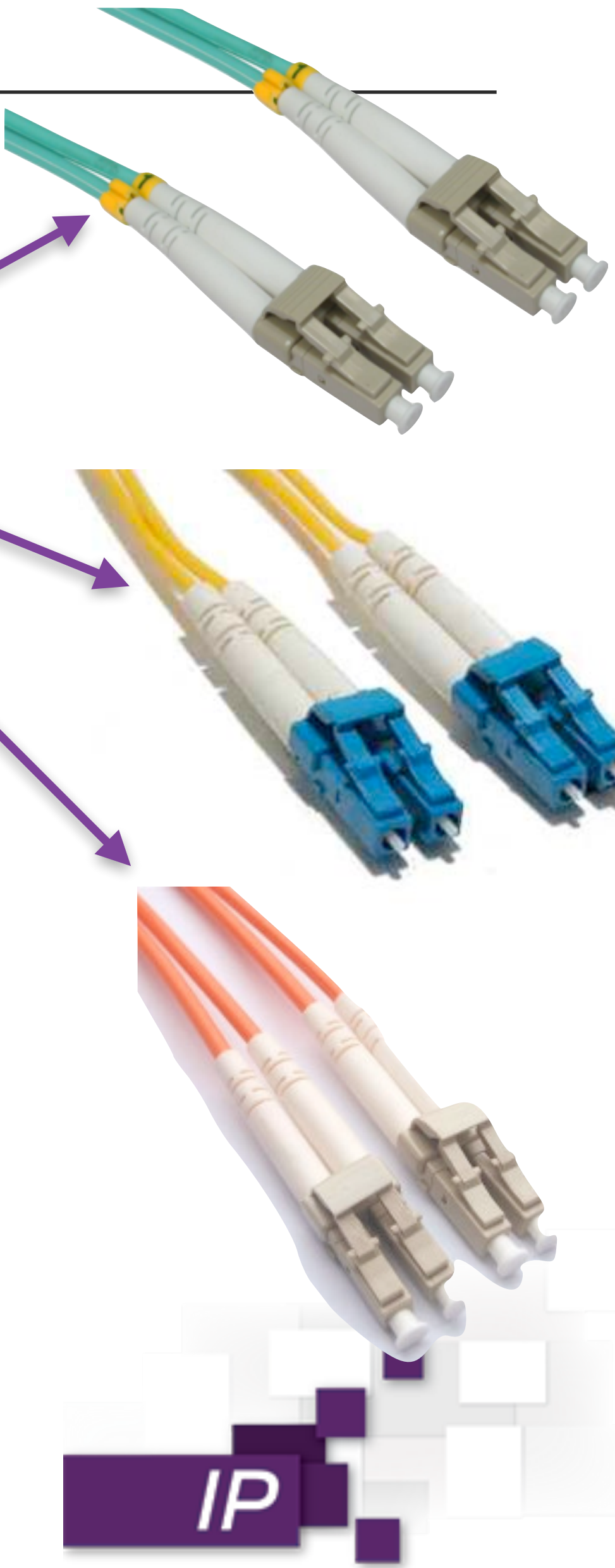
Single Mode Fiber

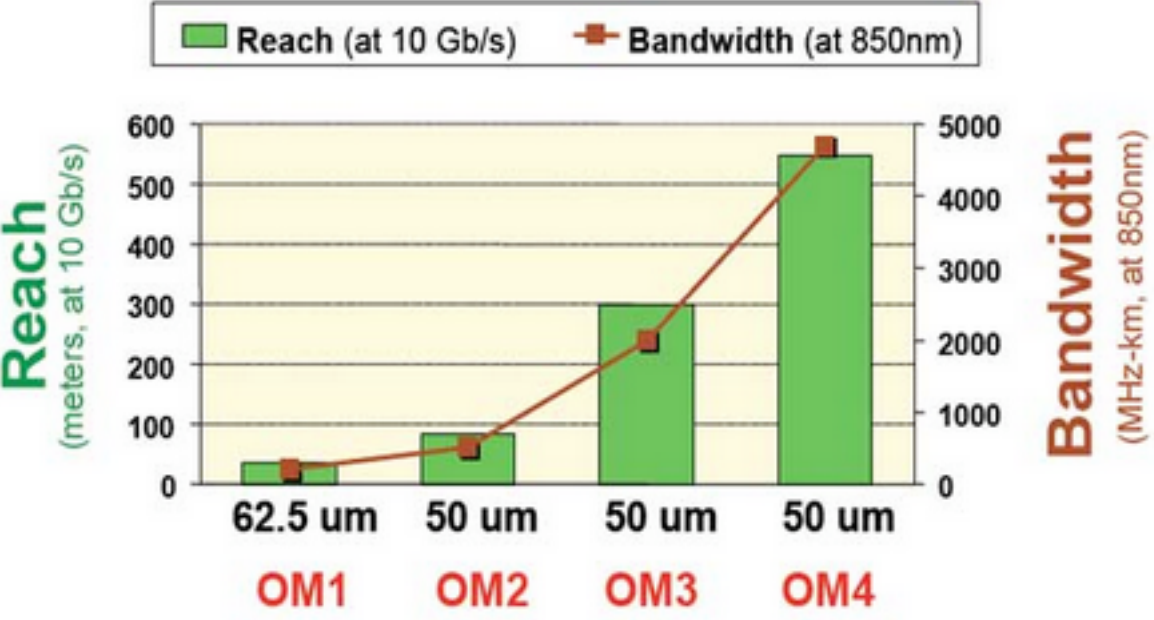**8 Micron**
The thickness of a human hair

Single Mode standard used in Camera to XCU connection

XCU HD/4K IP Cable Colors

Color	Type	Application (connections may by through patch panels)
Aqua	OM3 fiber	LAN/SAN device to device **MultiMode 850nm**
Yellow	Single Mode Fiber	LAN/SAN device to device over long distance **SingleMode 1310nm**
Orange	OM1 or OM2 fiber	LAN/SAN device to device **MultiMode 850nm**
Blue	Copper	LAN device to device
Green	Copper	KVM host to KVM switch, KVM switch to LAN switch, KVM switch to KVM switch
Yellow	Copper	Serial host to Terminal Server, Terminal Server to LAN switch
White	Copper	Power strip to LAN switch

Reach and modal bandwidth

Reach & Bandwidth by MM Fiber Type

Reach (at 10 Gb/s)   Bandwidth (at 850nm)

Reach (meters, at 10 Gb/s)   Bandwidth (MHz-km, at 850nm)

62.5 um	50 um	50 um	50 um
OM1	OM2	OM3	OM4

IP

SFP+ modules *Small Form Factor*

Integrated I^{2}C functionality
with following details:
- **Type number**
- **Light indication (yes/no)**
- **Send and Receive power level**
- **Temperature**

Most SFP+ modules use transceivers with less then 1 Watt (Power level II)

SFP+ module maximum power consumption shall meet one of the following power classes:
Power Level I modules - Up to 1.0 W
Power Level II modules - Up to 1.5 W
Power Level III modules - Up to 2.0 W
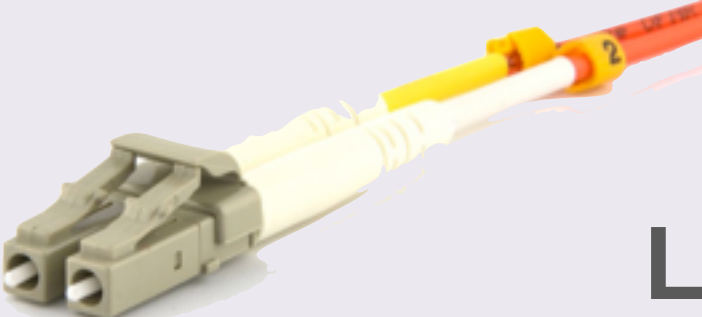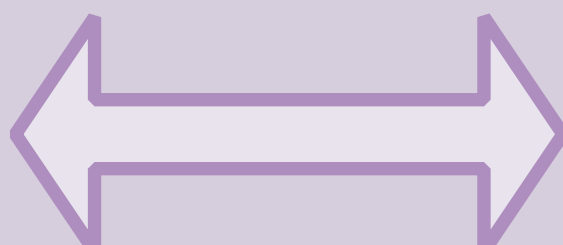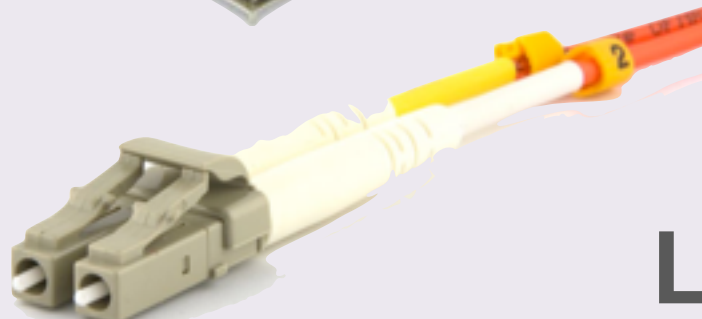
XCU HD/4K IP – Connections

	optical freq.	XCU inside SFP+ Case	Interface	Cable
Passive Copper	low power			SFP+
Fiber MultiMode SFP+ module	850nm		SFP+	LC
Fiber MultiMode Active Optical Case	850nm			AOC
Fiber SingleMode also in LDX fiber	1310nm (10km)		SFP+	LC

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IP

IP XCU 10G Fiber (basics)
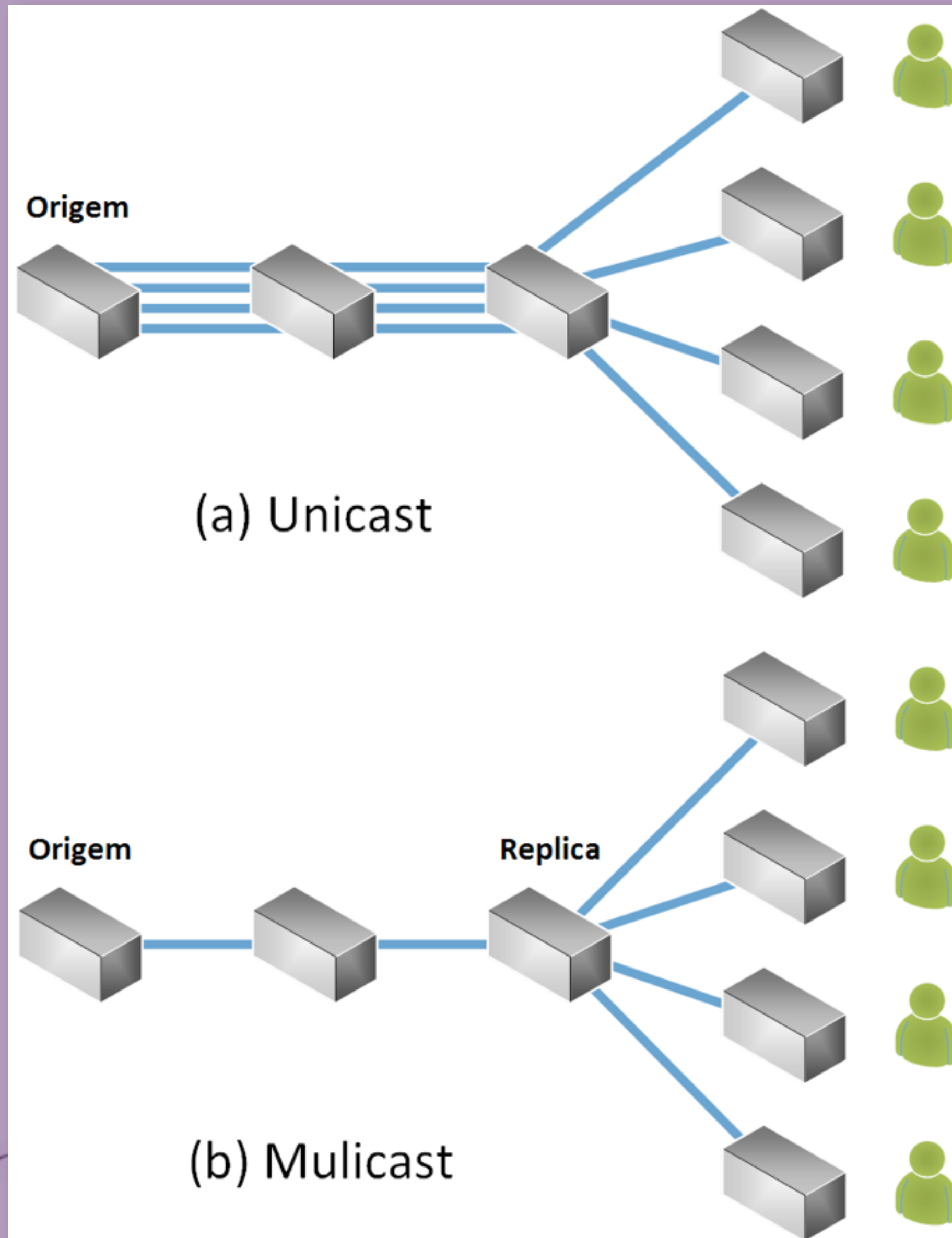
This part gives you some more details about the

IP Connection between XCU and the world

In this session:

✦ **IP XCU introduction**
✦ **XCU IP connections**
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✦ **Settings with MCP450**

(a) Unicast

(b) Mulicast

(a) Unicast is the term used to describe communication where a piece of information is sent from one point to another point.
In this case there is just one sender, and one receiver.

Broadcast is the term used to describe communication where a piece of information is sent from one point to all other points. In this case there is just one sender, but the information is sent to all connected receivers.

(b) Multicast is the term used to describe communication where a piece of information is sent from one or more points to a set of other points. In this case there is may be one or more senders, and the information is distributed to a set of receivers (there may be no receivers, or any other number of receivers).

IP
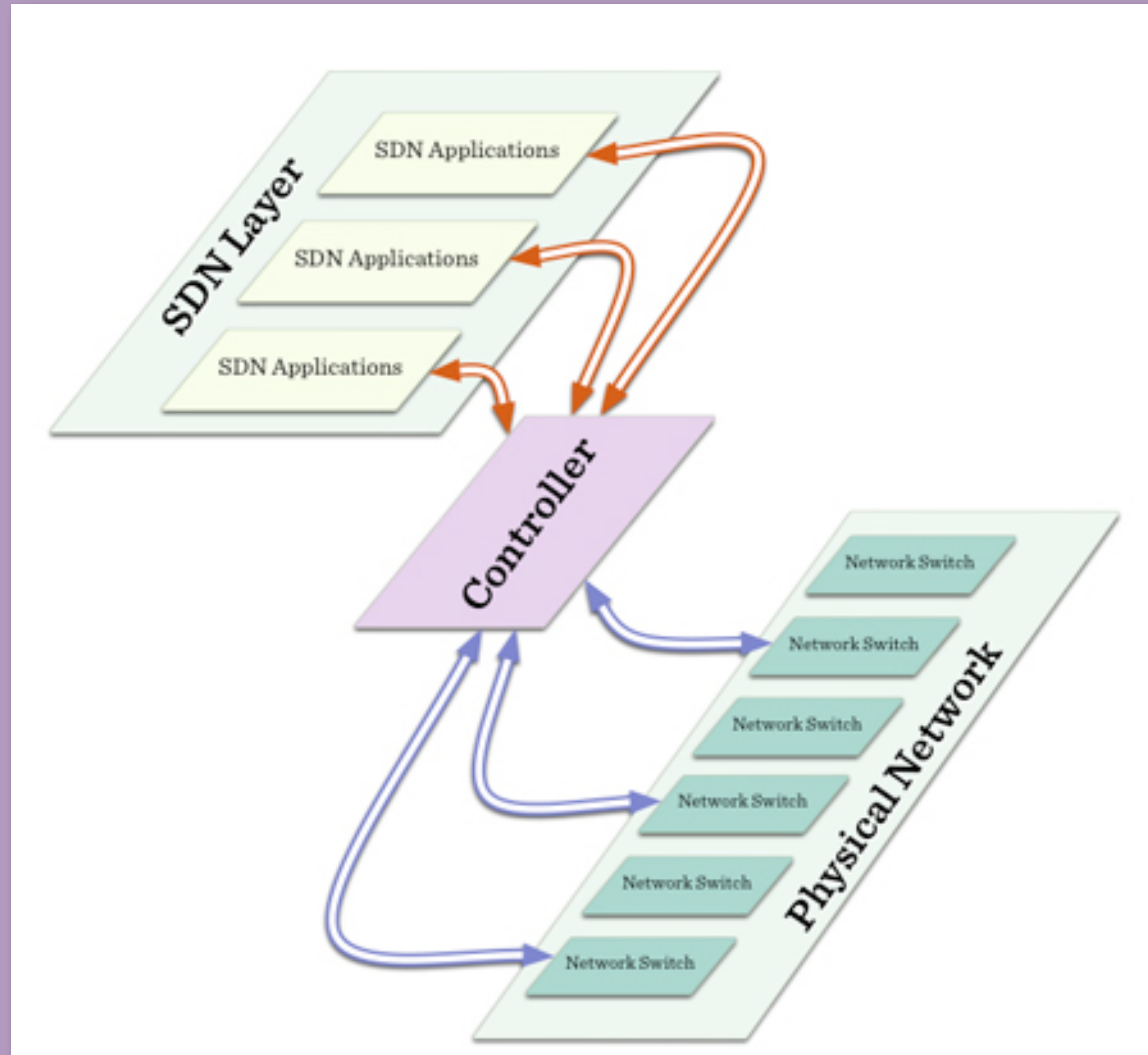
Software-defined networking (SDN)
is an approach to computer networking
that allows network administrators to
manage network services through
abstraction of higher-level functionality

not used this moment in GV products
Other option under development
More details later.

XCU HD/4K IP – Settings

With 2x IP XCU

< IP Stream >
package

This is an example
to test the system.
2x IP XCU needed.
All setting in
UNICAST

Main Video **10.11.5.54 port 1000**
Mon Video **10.11.5.54 port 1001**
Ext 1 **port 1000**
Ext 2 **port 1001**

IP adress **10.11.5.51**
SubnMask **255.255.252.0**
Default GW **10.11.5.1**

Main Video	Mon Video
10.11.5.54:1000	**10.11.5.54:1001**
10.11.5.51	

Ext 1	Ext 2	TP
port 1000	**port 1001**	**not used**
10.11.5.51		

XCU 51

Main Video **10.11.5.51 port 1000**
Mon Video **10.11.5.51 port 1001**
Ext 1 **port 1000**
Ext 2 **port 1001**
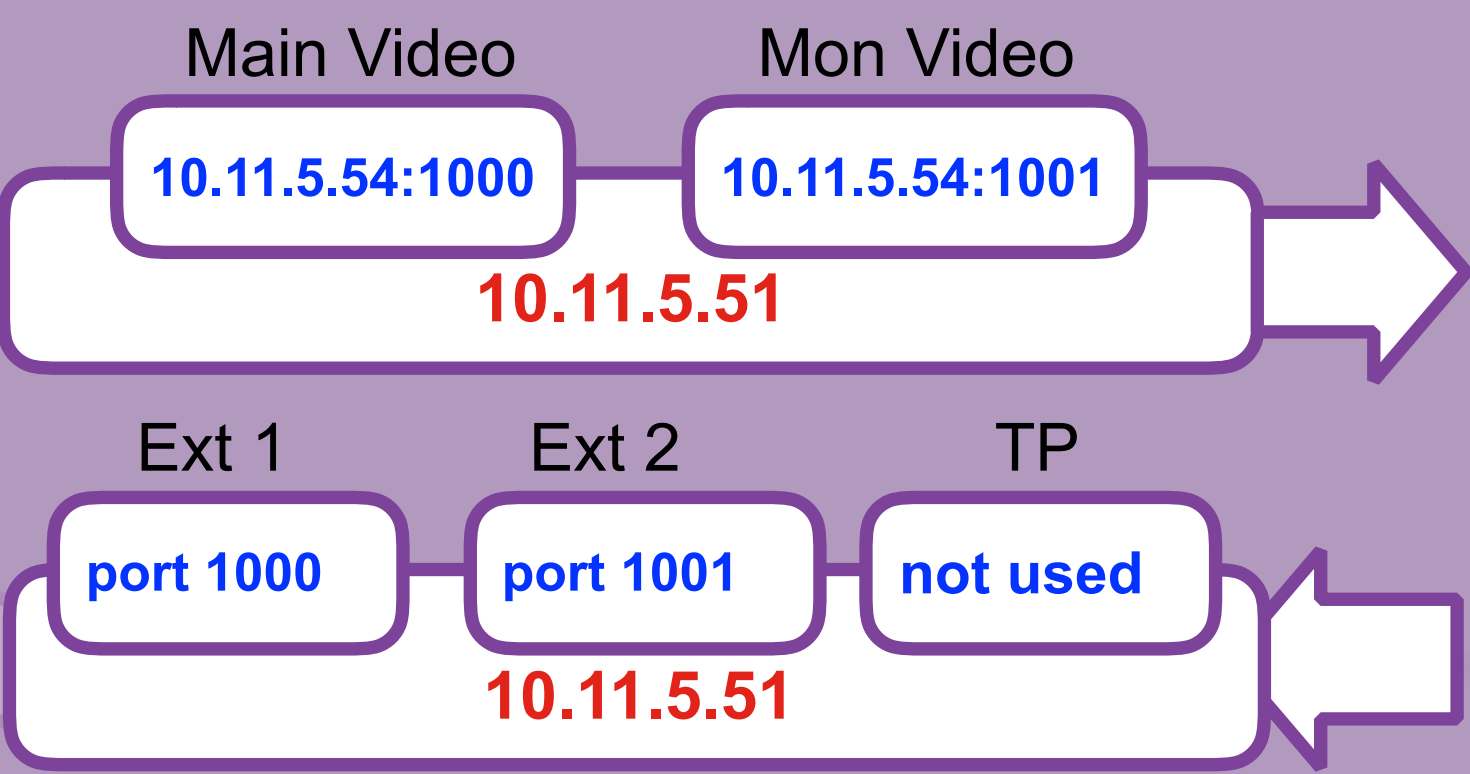
IP adress **10.11.5.54**
SubnMask **255.255.252.0**
Default GW **10.11.5.1**

Main Video	Mon Video
10.11.5.51:1000	**10.11.5.51:1001**
10.11.5.54	

Ext 1	Ext 2	TP
port 1000	**port 1001**	**not used**
10.11.5.54		

XCU 54

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IP

See setup with MCP 450 on next pages

MCP

K-frame

Main	M5
Mon	M6
Ext 1	M5
Ext 2	M6

Main	M7
Mon	M8
Ext 1	M7
Ext 2	M8

Main
Mon
Ext 1
Ext 2

XCU HD/4K XF IP 04

Main
Mon
Ext 1
Ext 2

XCU HD/4K XF IP 06
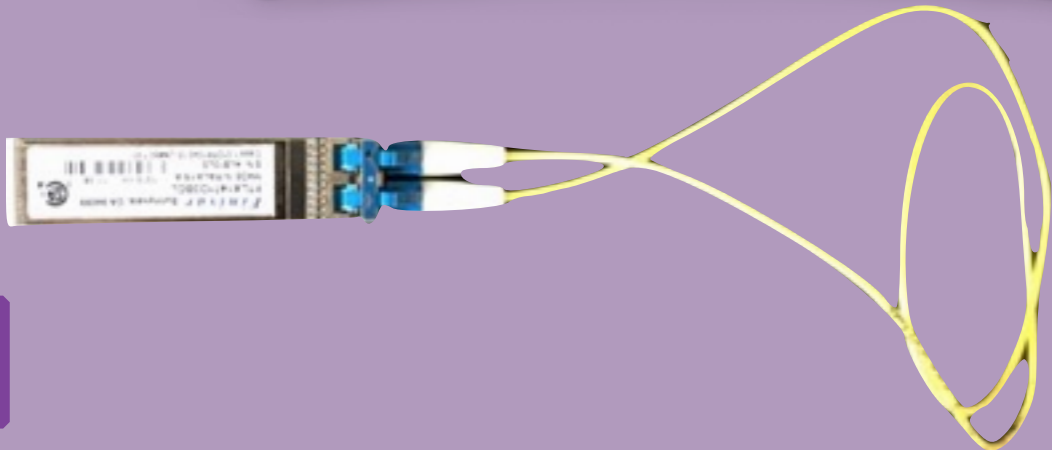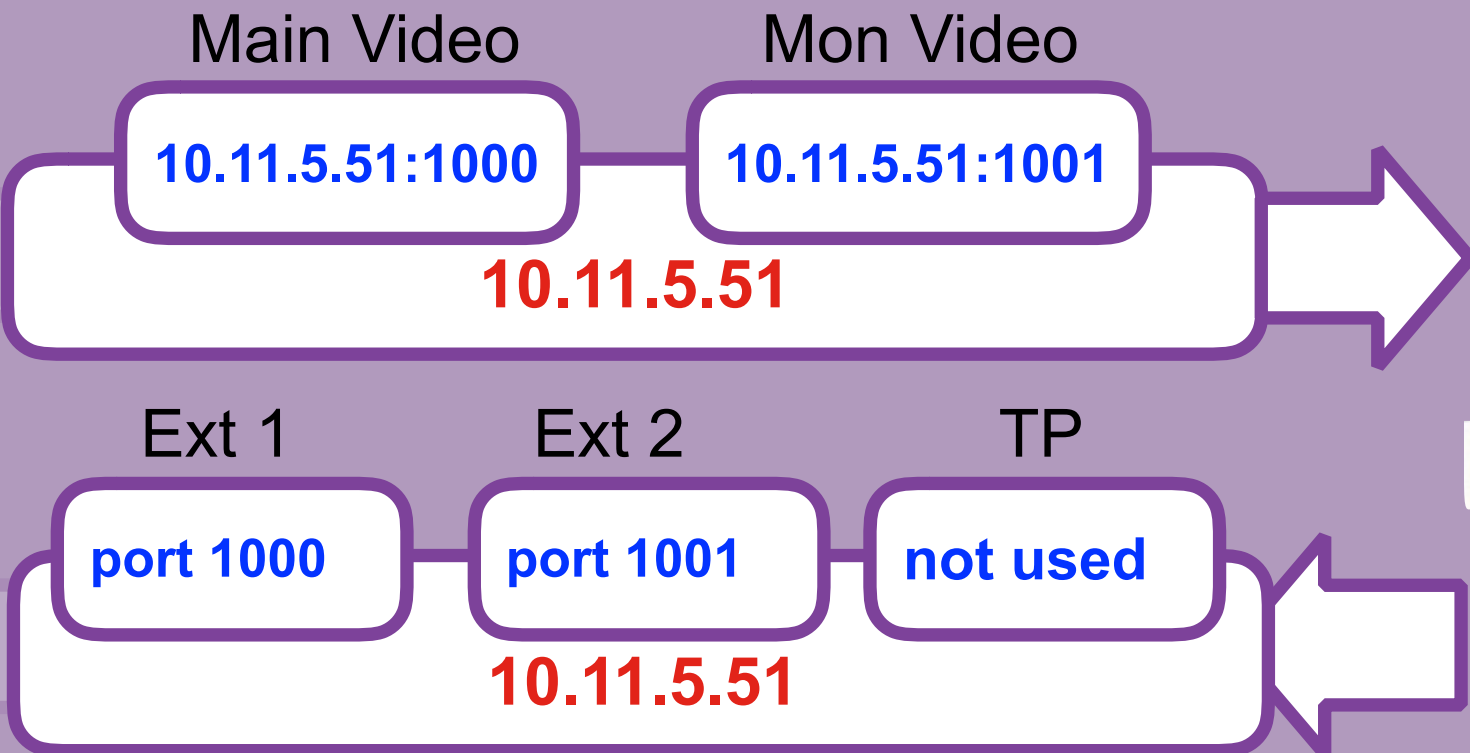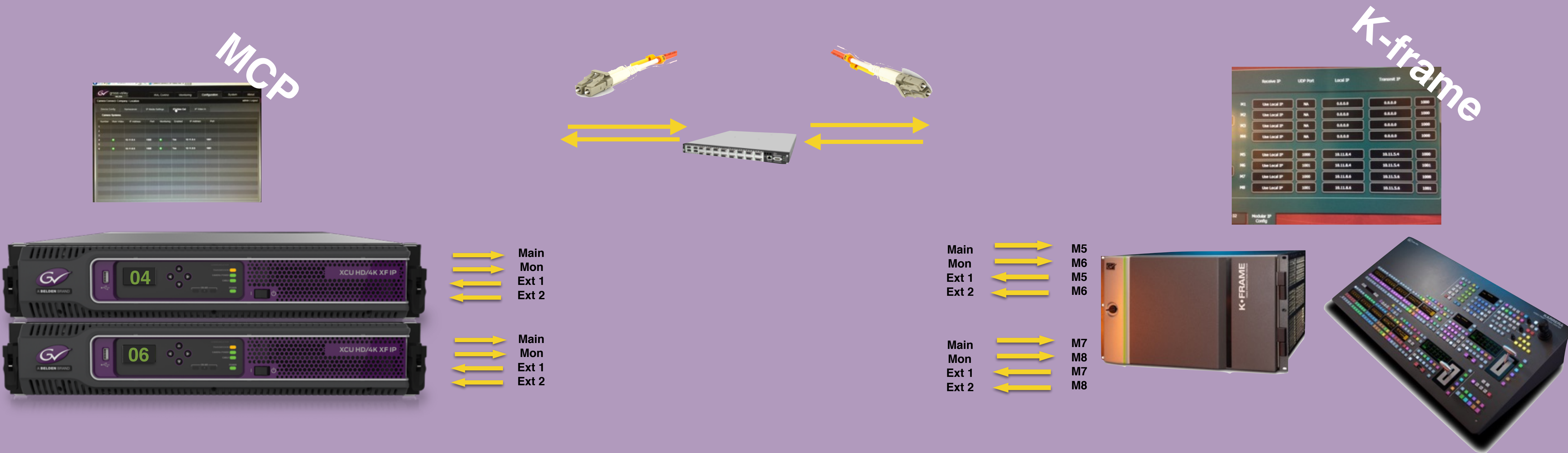
next page – IP settings for 2 cameras (4,6)

All IP UniCast

10.11.**5**.1   XCU
10.11.**7**.1   Summit
10.11.**8**.1   Kframe

fiber link

INPUTS XCU IP / OUTPUTS XCU IP

INPUTS XCU IP	OUTPUTS XCU IP
	Cam 4 Main Video
	Cam 4 Mon Video
Cam 4 Ext 1	
Cam 4 Ext 2	
	Cam 6 Main Video
	Cam 6 Mon Video
Cam 6 Ext 1	
Cam 6 Ext 2	

MCP 450 Camera connect

Default GateWay	Sent IP	port
10.11.5.1	10.11.8.4	1000
10.11.5.1	10.11.8.4	1001
auto	auto	1000
auto	auto	1001
10.11.5.1	10.11.8.6	1000
10.11.5.1	10.11.8.6	1001
auto	auto	1000
auto	auto	1001

INPUTS KFRAME / OUTPUTS KFRAME — Modulair I/O / Config I/O Kframe

	Local IP	Recieve IP	port
M5 (IP)	10.11.8.1	10.11.8.4	1000
M6 (IP)	10.11.8.1	10.11.8.4	1001
your choise	10.11.8.1	10.11.5.4	1000
your choise	10.11.8.1	10.11.5.4	1001
M7 (IP)	10.11.8.1	10.11.8.6	1000
M8 (IP)	10.11.8.1	10.11.8.6	1001
your choise	10.11.8.1	10.11.5.6	1000
your choise	10.11.8.1	10.11.5.6	1001

OUTPUTS Summit / Summit Channel settings

OUTPUTS Summit	Local IP	Vid OUT IP
Sum Channel 3	10.11.7.1	10.11.7.9
Sum Channel 3	10.11.7.1	10.11.7.10
Sum Channel 4	10.11.7.1	10.11.7.11
Sum Channel 4	10.11.7.1	10.11.7.12

	Recieve IP	port
M9 (IP)	10.11.7.9	47873
M10 (IP)	10.11.7.10	47873
M11 (IP)	10.11.7.11	47873
M12 (IP)	10.11.7.12	47873

Camera Connect (MCP450)

Config I/O Kframe

	Receive IP	UDP Port	Local IP	Transmit IP	UDP Port
M5	10.11.8.4	1000	10.11.8.1	10.11.5.4	1000
M6	10.11.8.4	1001	10.11.8.1	10.11.5.4	1001
M7	10.11.8.6	1000	10.11.8.1	10.11.5.6	1000
M8	10.11.8.6	1001	10.11.8.1	10.11.5.6	1001
M9	10.11.7.9	47873	10.11.8.1	0.0.0.0	1000
M10	10.11.7.10	47873	10.11.8.1	0.0.0.0	1000
M11	10.11.7.11	47873	10.11.8.1	0.0.0.0	
M12	10.11.7.12	47873	10.11.8.1	0.0.0.0	

K-frame

MCP 450 Camera Connect CONFIGURATION settings

MCP

XML Control — Monitoring — Configuration — System

Camera Connect: Company / Location

Device Config | Nameserver | IP Media Settings | IP Video Out | IP Video In

Camera Systems (IP Media Settings)

Number	IP Address	Subnet Mask	Default Gateway	Link
1				
2				
3				
4	10.11.5.4	255.255.0.0	10.11.5.1	●
5				
6	10.11.5.6	255.255.0.0	10.11.5.1	●

Camera Systems (IP Video Out)

Number	Main Video	IP Address	Port	Monitoring	Enabled	IP Address	Port
1							
2							
3							
4	●	10.11.8.4	1000	●	Yes	10.11.8.4	1001
5							
6	●	10.11.8.6	1000	●	Yes	10.11.8.6	1001

Camera Systems (IP Video In)

Number	Ext 1	Port	Multicast	Ext 2	Port	Multicast	TP	Port	Multicast
1									
2									
3									
4	●	1000	No	●	1001	No	●	20004	No
5									
6	●	1000	No	●	1001	No	●	20004	No

Summit Channel setting menu

Summit

Export... / Import... / Restore

System / Channel / Ganging / GPI / Panel / Remote / Security

Live network streaming: No
Stream bitrate: 1 Mbps

Recorder Setup:
Video input format: 1080i
Compression format: MPEG
Long GOP: No (I-frame only)
Chroma format: 4:2:2
Recording data rate: 25 Mb/s

10GigE Setup:
Local IP Address (Base): 10.11.7.1
MAC Address: 00-60-09-02-0F-11

Audio Input Tags:
<Add Tag...>

Data Track Input:
Record ancillary data: Yes

Video Output:
Video output format: 1080i (1920x1080)
Aspect ratio conversion: Bar
Still-play mode: Field (interpolated)
Motion smoothing: Off
Test mode (colorbars + tone): Off
10GigE Output 1: On
Remote IP Address 1: 10.11.7.9
10GigE Output 2: On
Remote IP Address 2: 10.11.7.10
Video Output Timing:

OK / Cancel

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Timing – IP settings (not for 4K)

BNC Out
master

Shift *MainVideo*   **Pixels**   **Only +**
                         Lines

0

IP Out
follow master

MainOut IP

0

5ms (5000us) + / -
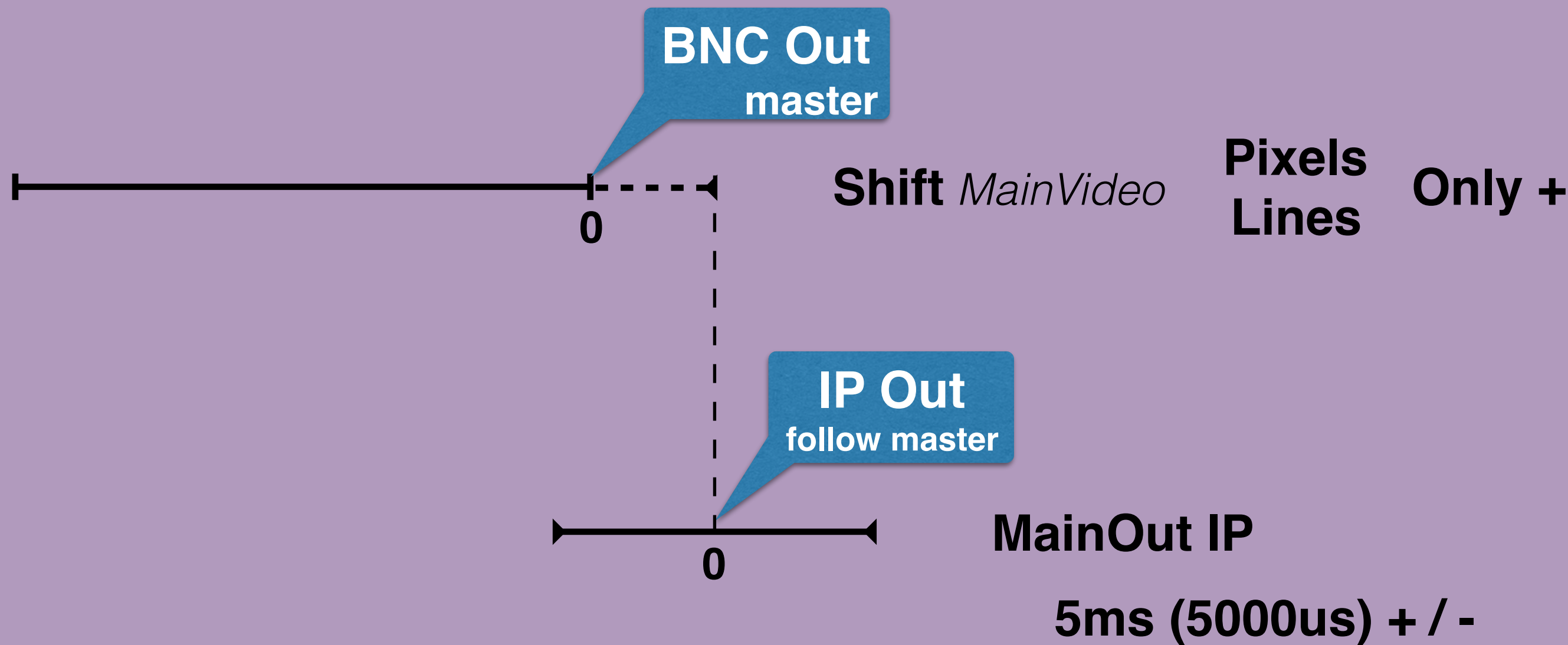
H Phase   50
MainOut IP   0US
►Shift   ►►

Timing

CAM   Fiber
4   11dB

►Pixels   0
 Lines   0

Shift

CAM   Fiber
4   11dB

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Timing – IP settings

IP Timing

A separate delay is available for the main video signal from the camera to the IP Media Network to allow the receiver of the stream to align the incoming IP stream to the reference video.
A built-in, fixed delay aligns the IP streams roughly to reference input for each frame rate but a custom delay allows to align the received IP stream at the destination node.
Go the `INSTALL > TIMING` menu and use the `MAINOUT IP` function to set the delay between -5000 µs and +5000 µs. Below is a schematic diagram of the timing and delay chains in the XCU:
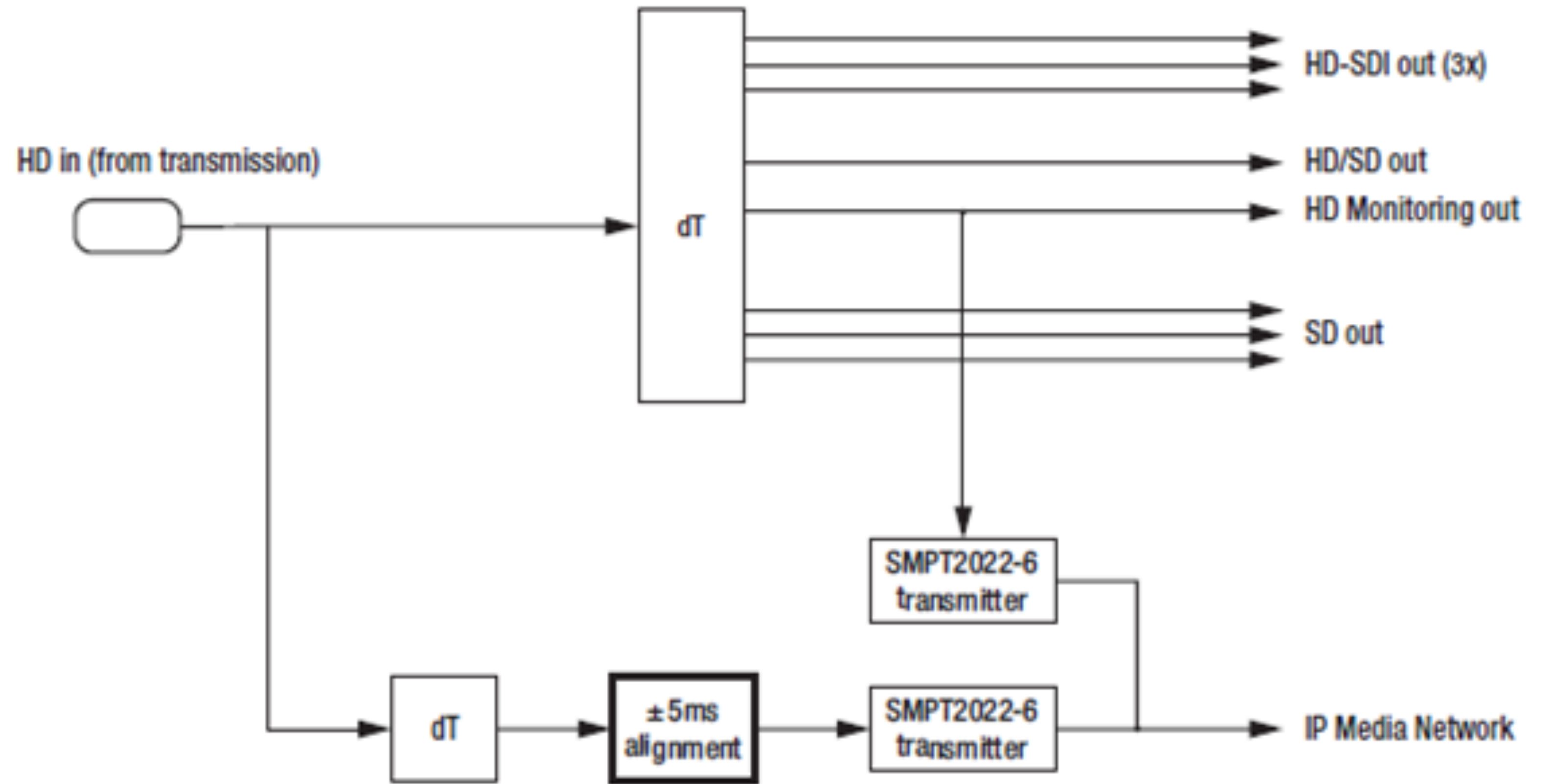
IP XCU 10G Fiber (basics)

This part gives you some more details about the

IP Connection between XCU and the world

In this session:

✦ **IP XCU introduction**

✦ **XCU IP connections**

✦ **IP basics + test**

✦ **Settings with MCP450**
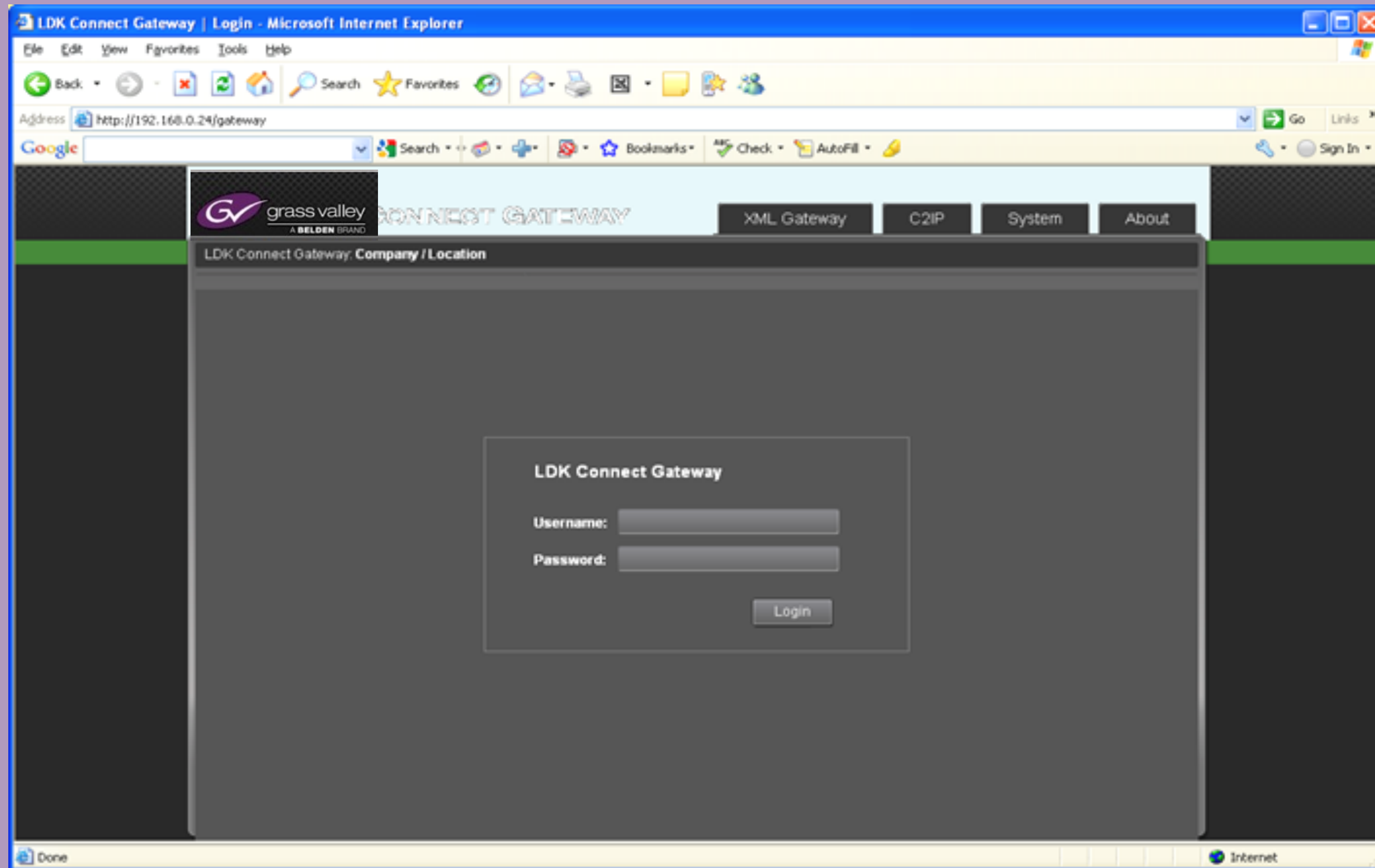
XCU HD/4K IP – Settings with MCP 450

Camera 51 details

Configuration Main IP adress

Optical link OK but it is still possible to have the wrong TX or RX SFP+ modules

WARNING!

Optical link OK STEP 1

IP Range defined by GV for cameras
UniCast   10.11.5.x
MultiCast   224.1.0.x

XCU HD/4K IP – Settings with MCP 450

XCU HD/4K IP – Settings with MCP 450

Camera 51 details

IP Ext 1,2 OK STEP 3

Configuration Poort settings

TP not available

IP Range defined by GV for cameras
UniCast   10.11.5.x
MultiCast   224.1.0.x

IP XCU 10G Fiber (basics)

This part gives you some more details about the

IP Connection between XCU and the world

In this session:

✦ **IP XCU introduction**

✦ **XCU IP connections**

✦ **IP basics + test**

✦ **Settings with Menu XCU**

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```
Video                    ▶▶
Monitoring               ▶▶
Audio/Intercom          ▶▶▶
▶Install                 ▶▶
 Security                ▶▶

Root
```

```
▶Camera                  ▶▶
 Alias            032TZU
 Device ID        032TZU
 Timing                 ▶▶▶
 Time/Date              ▶▶▶

Install
```

```
▶ConnectType        Cable
 Name                 ---
 Number                51
```

Cable is Standard
Network is (DutchView)

Standard (Cable)

Video ▶▶
Monitoring ▶▶
Audio/Intercom ▶▶
▶Install ▶▶
Security ▶▶

Root

▶Camera ▶▶
ALias 032TZU
Device ID 032TZU
Timing ▶▶
Time/Date ▶▶

Install

▶ConnectType Cable
Name ---
Number 51
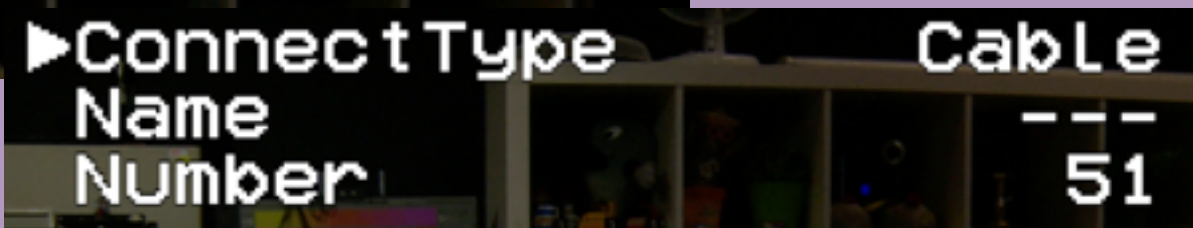
Cable is Standard
Network is (DutchView)

DutchView (Network)

Video ▶▶
Monitoring ▶▶
Audio/Intercom ▶▶
▶Install ▶▶
Security ▶▶

Root

Signalling Input ▶▶
Signalling Outp. ▶▶
C2IP Network ▶▶
▶Media Network ▶▶
AFD

Install

▶Local IP ▶▶
Video Out IP ▶▶
Video In IP ▶▶

Media Network

Step 1

▶Subnet Mask 16
Loc IP digit 1 10
Loc IP digit 2 11
Loc IP digit 3 5
Loc IP digit 4 51
Gw IP digit 1 10
Gw IP digit 2 11
Gw IP digit 3 5
▶Gw IP digit 4 1

Local IP

XCU HD/4K IP – Settings with Menu XCU

Video ▶▶
Monitoring ▶▶
Audio/Intercom ▶▶
▶Install ▶▶
Security ▶▶

Root

Signalling Input ▶▶
Signalling Outp. ▶▶
C2IP Network ▶▶
▶Media Network ▶▶
AFD

Install

Local IP ▶▶
▶Video Out IP ▶▶
Video In IP

Media Network

▶Main Video ▶▶
Monitoring Video ▶▶

Video Out IP

▶Rem IP digit 1   10
Rem IP digit 2   11
Rem IP digit 3   5
Rem IP digit 4   54
Rem PortNr   1000

Main Video

Step 2

Main Video

Monitoring Video

IP

XCU HD/4K IP – Settings with Menu XCU

Step 2

Main Video

Monitoring Video

Step 3

Video
Monitoring
Audio/Intercom
▶Install
Security

Root

Signalling Input
Signalling Outp.
C2IP Network
▶Media Network
AFD

Install

Local IP
Video Out IP
▶Video In IP

Media Network

▶Ext1 (RX0)
Ext2 (RX1)
TP (RX2)

Video In IP

▶PortNr   1000
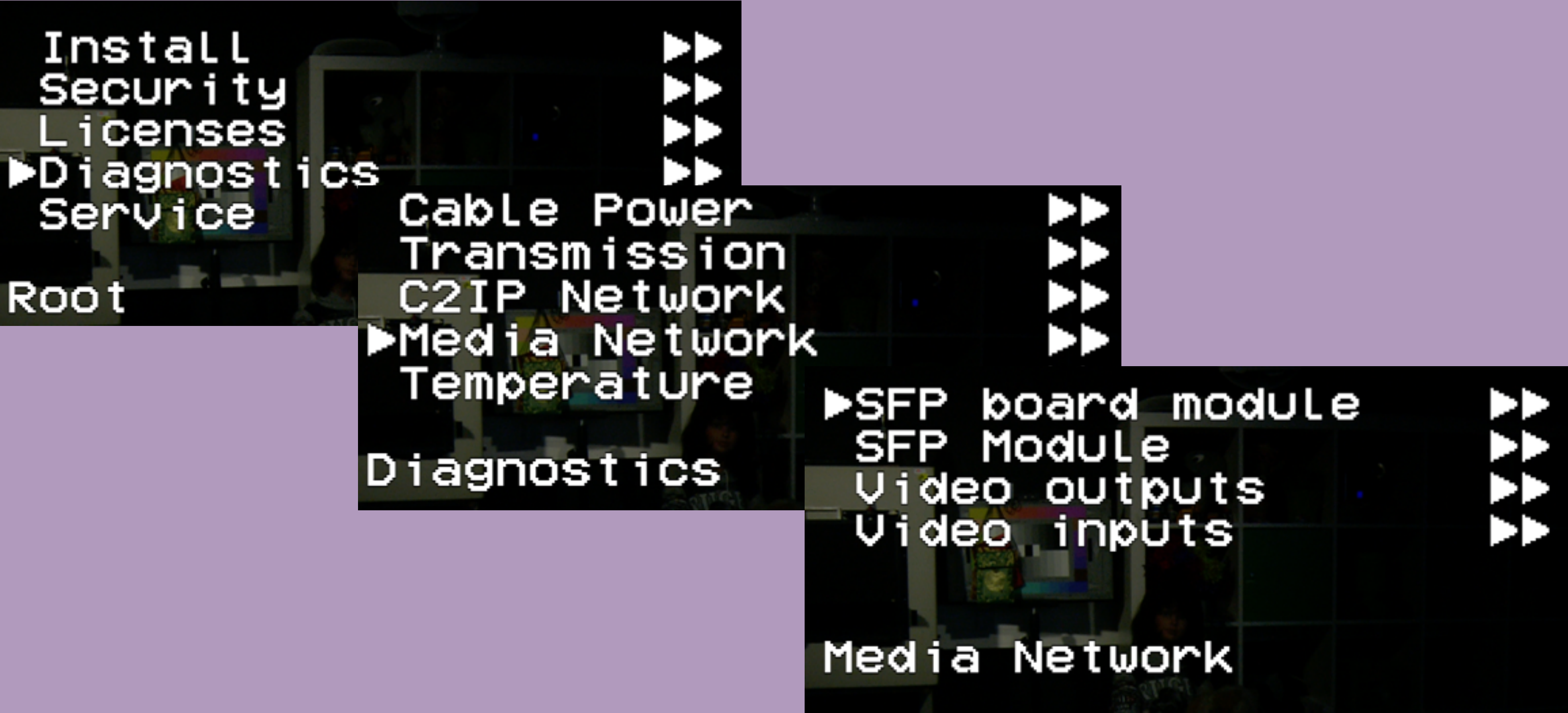MultiCast   Yes
MultiCast IP

Ext1 (RX0)

▶IP digit 1   224
IP digit 2   1
IP digit 3   0
IP digit 4   111

MultiCast IP

Ext 1 Video

Ext 2 Video

TP

Details FSP modules

Details Video In/Out

Thank You

Video over IP
Seamless 2K or 4K (TICO) over IP

Mixed operation
Use every technology to its full potential

Matching
Creating the best possible story without distractions

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