aQ Broadcast: Video Server (aVS) and Broadcast Engine (QuBE): System Examples & Block Diagrams

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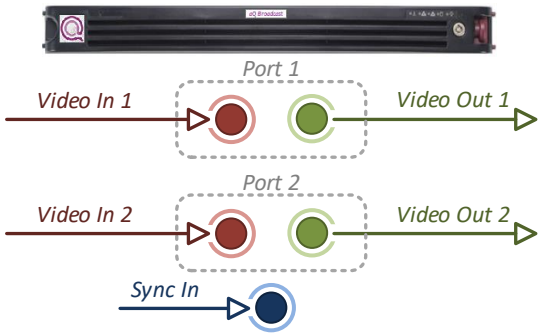
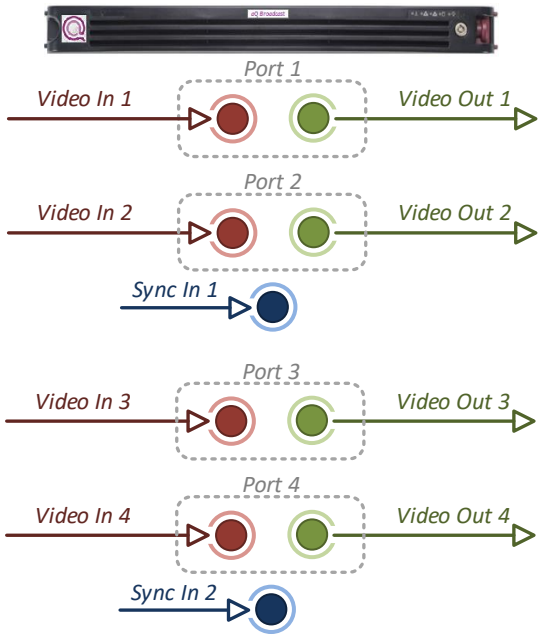
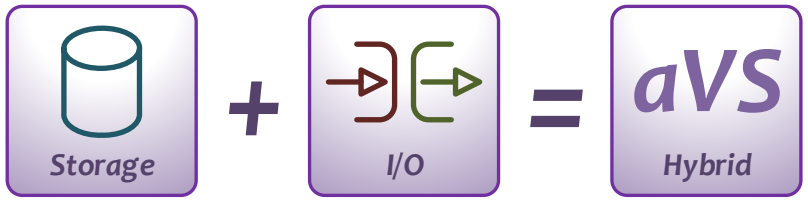
Entry-Level (EL) Hybrid aVS
(for example, 2 TB internal storage / two bi-directional SDI ports within a single 1U chassis)



Mid-Range (MR) Hybrid aVS
(for example, 3 TB internal storage / four bi-directional SDI ports within a single 1U chassis)





*A Hybrid aVS provides local **Storage** and inputs/outputs (**I/O**) within a single chassis. The physical size, storage capacity and the number and type of I/O ports are all flexible. A 1U chassis can provide two or four ports with typically 2 / 3 / 6 TB internal storage. A 2U chassis can provide four, six or eight ports, with typically 5 / 10 / 15 / 20 TB internal storage. Larger systems, with more storage or a higher port count, can be built by combining individual Store and Port units into composite systems.*

The input and output connections are normally provided as SDI with embedded audio on standard BNC connectors, but an option for the 2U chassis includes analogue video and audio connections. Ports are normally bi-directional – their individual operation can be switched immediately between recording and playback – but in some cases might be individually specified as an input or an output. One sync (genlock) input is provided per pair of ports, supporting black-burst in SD and tri-sync in HD formats.

The Storage is accessible over the network as a standard SAMBA/SMB share and optionally via FTP. The media volume is always protected against drive failure – software RAID for the EL version and a hardware RAID card providing full RAID-5 in the MR version. The Linux operating system is stored separately, normally on a pair of mirrored drives. The MR version has a dual redundant power supply.

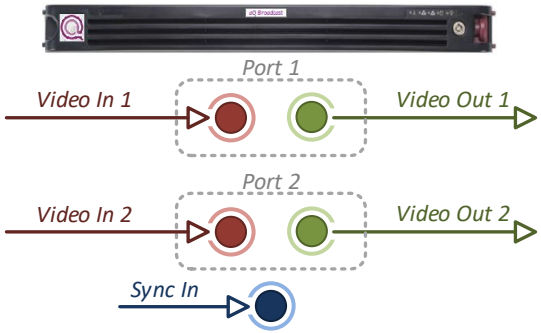
Each aVS runs its own local, configurable user interface (GUI), offering full control over all operational and administrative aspects of the system. The same functionality is also remotely, from any networked PC, using the Flexible Media Controller (FMC) Windows application, or any generic device (Mac, iOS, Android, etc.) which supports connection to a VNC server.

In some cases, Hybrid units can support additional functionality, such as sub-clip, trim, transcode, upload, stream, proxy-view, etc.

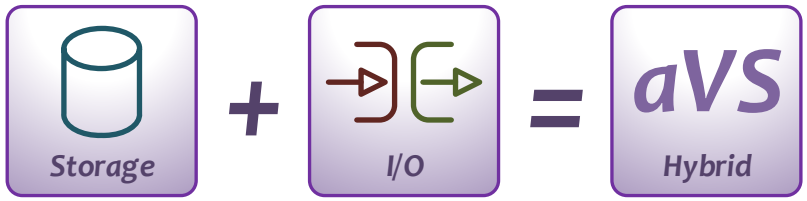
aQ Broadcast system examples – aVS Hybrids

Legacy VTR
(**disadvantages**: large, heavy, complex mechanical components, little or no internal storage, single channel only, cost & maintenance of physical media)

Hybrid aVS
(for example, 2 TB internal storage / two bi-directional SDI ports within a single 1U chassis)



(**advantages**: smaller, few moving parts, disk-based storage, options for media processing and multiple channels within one unit – enabling simultaneous records or review of content during recording)



aQ Broadcast

*A Hybrid aVS provides local **Storage** and inputs/outputs (**I/O**) within a single chassis. The exact configuration – physical size, storage capacity and the number and type of I/O ports – is extremely flexible.*

The input and output connections are normally provided as SDI with embedded audio, but there is an option for analogue video and audio connections. Ports are normally bi-directional – their individual operation can be switched immediately between recording and playback, including E-to-E support. A sync (genlock) input is provided.

The Storage is accessible over the network as a standard SAMBA/SMB share and optionally via FTP. This allows recorded content to be moved directly out to an edit workstation, or completed packages to be transferred onto the server for playout.

Each aVS runs its own local, configurable user interface (GUI), offering full control over all operational and administrative aspects of the system. The same functionality is also remotely, from any networked PC, using the Flexible Media Controller (FMC) Windows application, or any generic device (Mac, iOS, Android, etc.) which supports connection to a VNC server. In addition, remote control from external third-party systems Is possible using standard protocols, including VDCP, AMP and Sony P2/P9, typically via IP or serial connections.

In some cases, Hybrid units can also support additional functionality, such as mark, sub-clip, trim, convert, transcode, upload, stream, etc.

eVTR

- Recorder
- Scheduled Recording
- Looped Recording
- Continuous Recording
- Time-lapse Recording
- Player
- Playlist Playout
- Sequenced Playout
- Remote Control
- VDCP / AMP
- Serial P2/P9

aQ Broadcast system examples:
aVS Hybrid used in eVTR application

Scripting, Newsroom, Video Server, Studio Production, Signal Processing, Media Management & Transmission Broadcast Solutions

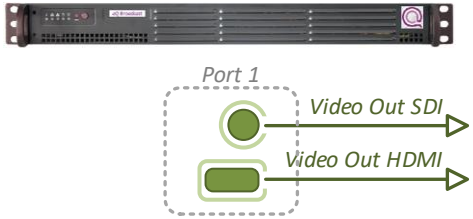
Platform example – 'shoebox' form factor

The aVS firmware can run on any of our standard hardware platforms, normally in a rack chassis. However for the Prompt Server application an alternative is the 'shoebox' configuration. This hardware version is less powerful than the corresponding rack units, but is more cost effective and might sit on the desk or floor, rather than within a rack. It is intended to run without a GUI - configuration and operation will be carried out remotely from networked Windows workstations running the FMC GUI application. Dimensions: 196mm (W) x 83.3mm (H) x 245mm (D) (7.72in x 3.28in x 9.65in). Volume: 4 litres. Supplied with a 110-240V Universal 80W AC Adapter with standard IEC connector. The I/O card for LPS Prompt Server functionality provides parallel SDI and HDMI outputs, but is not shown here.

Platform example – 1U, short-depth form factor

1U, 437 x 249 x 43 mm, DVI & HDMI monitor output (no VGA), two 1GigE NICs, four USB, one RS232 serial port

LPS Prompt Server
(for example, one output within a single 1U chassis)



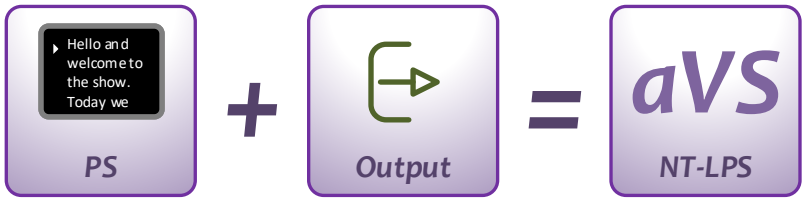
The aQ LPS Prompt Server, for use as part of a QNet / QNews system (including a QSeries DBServer), is intended as a fully-integrated hardware solution for prompting.

The LPS Prompt Server, typically a 1U short-depth chassis or a desktop 'shoebox', is a self-contained unit which provides prompting video output. It runs aQ's standard Linux-based firmware (common across the aVS video server and QuBE broadcast engine platforms), and is controlled from the QSeries prompter PC across the network. The benefits of this approach are that the script is still available for the presenter in the event of a PC or network problem, that different workstations can take control of the unit at different times, and that the box can be installed in a central location.

The server provides an identical video output on SDI and HDMI connections: either or both may be used. If a composite video prompter feed is required, an SDI-to-Composite converter will be required. No sync/genlock input is present on the standard version, although it is available as a factory option at additional cost.

The LPS can be monitored and managed from any networked PC using the standard FMC (control) and RSMP (administration) utilities (which can also run locally on the 1U platform). The prompt output can be viewed via any FMC session, not just from the prompter PC. From the prompt operator's perspective, use of an LPS is exactly the same as for an Autocue/QTV/Vitec QBox. All recent scroll controls (with the exception of the hybrid multi-button) are supported, connected either directly to the LPS or indirectly to the prompter PC.

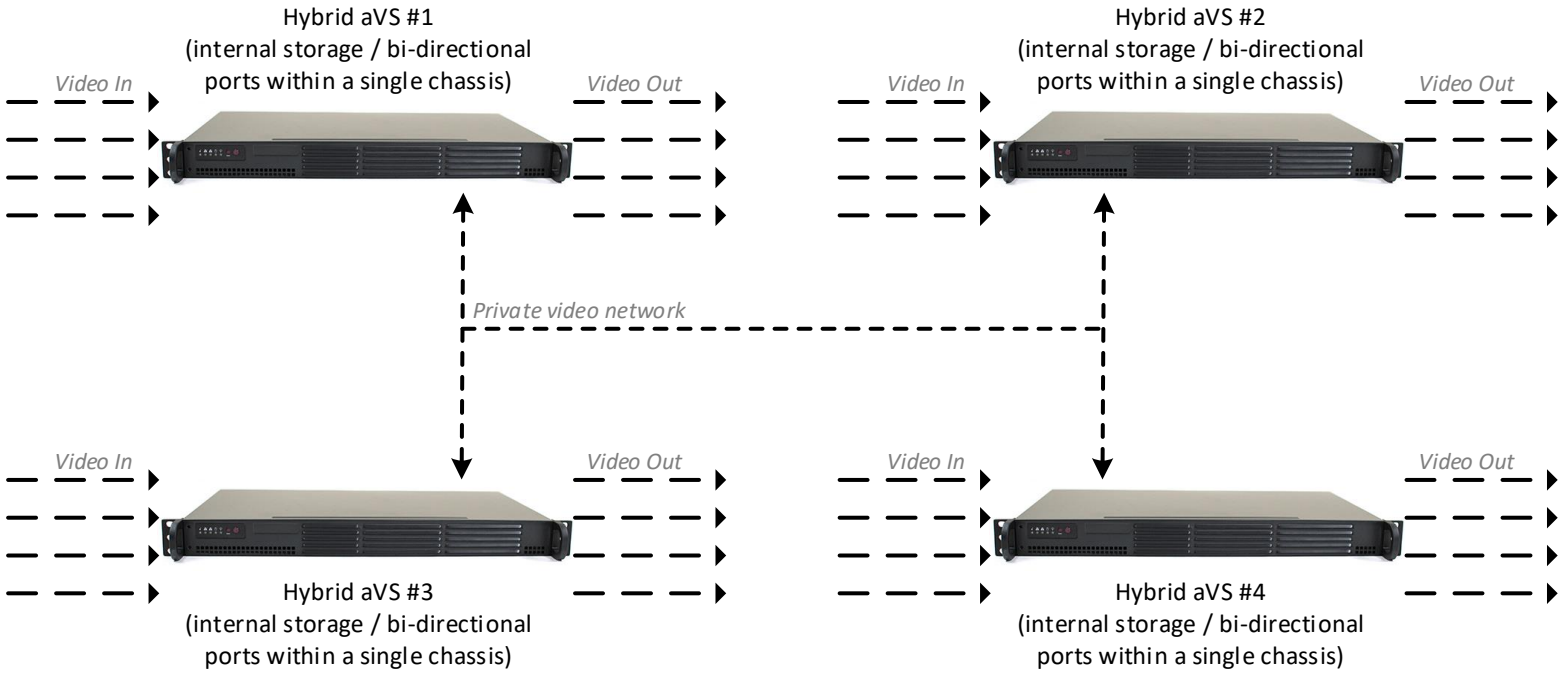
The LPS already offers extra functionality, for instance additional countdown overlays, and can be easily extended to support other new features as required. A further benefit is that, subject to appropriate hardware, the Prompt Server process can run alongside other functionality – enabling, for instance, a single unit to act both as a video server and a Prompt Server.



(Prompt Server)

LPS

aQ Broadcast system examples:
LPS used in teleprompter application



In this configuration, ports will normally play content from their own local storage, under local control from their own GUI (or via remote control, e.g. using VDCP from a switcher). But with correct configuration, the overall system can offer a great deal of flexibility:

- any port can record content into the storage on any unit
- any port can play back content from the storage on any unit
- any GUI can take control of any port on any unit
- any GUI can view and manage media stored on any unit
- any GUI can initiate a direct transfer of media between any two units – e.g. to copy a clip from one server to another

A Hybrid aVS provides storage and I/O within a single chassis. Size, capacity and the number of ports is flexible. A 1U chassis can provide two or four ports with typically 2 / 3 / 6 TB internal storage. A 2U chassis can provide four or six ports, with typically 5 / 10/ 15 / 20 TB internal storage.

Input/output connections are normally SDI with embedded audio, but an option for the 2U chassis includes analogue video and audio connections. All ports are bi-directional – their individual operation can be switched immediately between recording and playback.

The Storage is accessible over the network as a standard SAMBA/SMB share and optionally via FTP.

In some cases, Hybrid units can support additional functionality, such as sub-clip, trim, transcoding, upload, stream, etc.

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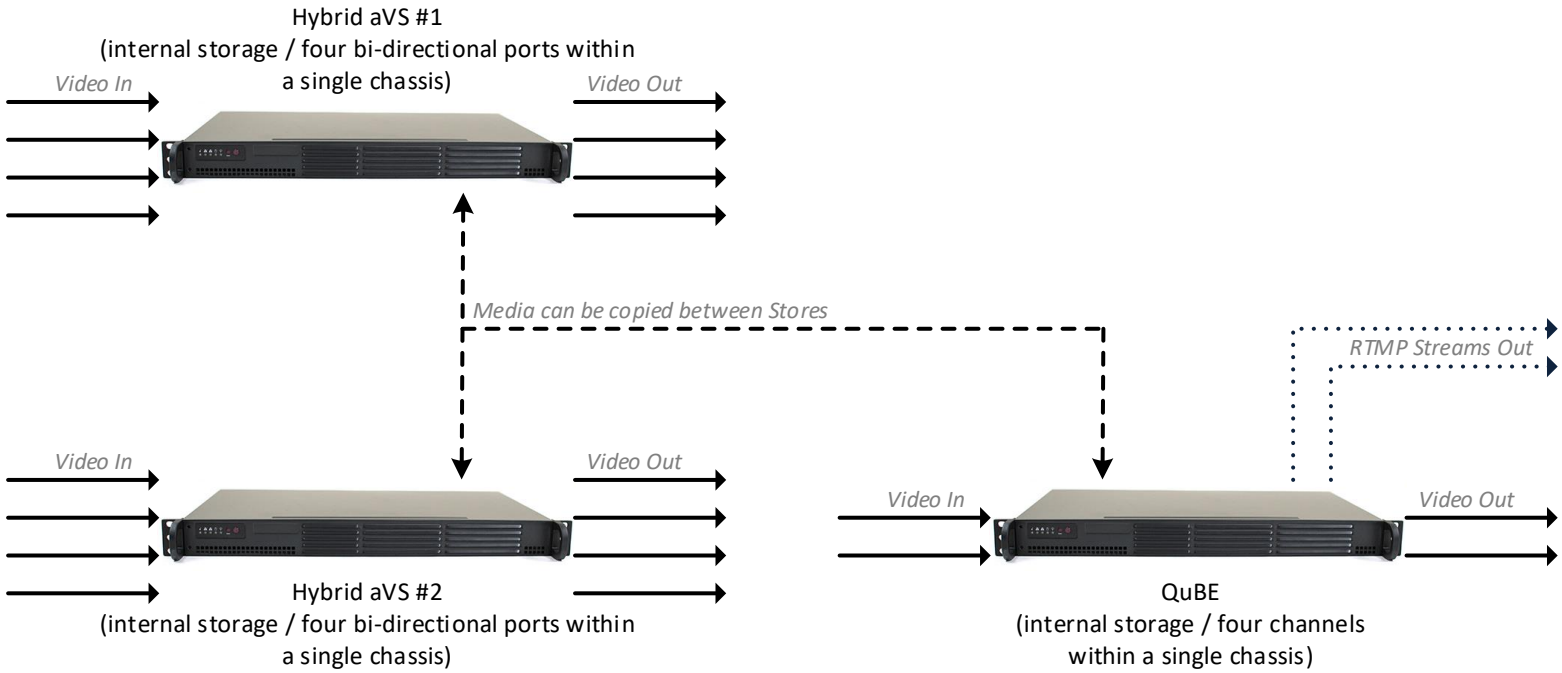
aQ Broadcast system examples – multiple aVS Hybrid units		
NH	10 Jun '16	v1



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Input/output connections are normally SDI with embedded audio, but an option for the 2U chassis includes analogue video and audio connections. All ports are bi-directional – their individual operation can be switched immediately between recording and playback.

The Storage is accessible over the network as a standard SAMBA/SMB share and optionally via FTP.

In some cases, Hybrid units can support additional functionality, such as sub-clip, trim, transcoding, upload, stream, etc.

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aQ Broadcast system examples – multiple aVS Hybrid/QuBE units		
NH	18 Jan '17	v1

A Hybrid aVS provides storage and I/O within a single chassis. Size, capacity and the number of ports is flexible. A 1U chassis can provide two or four ports with typically 2 / 3 / 6 TB internal storage. A 2U chassis can provide four or six ports, with typically 5 / 10 / 15 / 20 TB internal storage.

Input/output connections are normally SDI with embedded audio, but an option for the 2U chassis includes analogue video and audio connections. All ports are bi-directional – their individual operation can be switched immediately between recording and playback.

The Storage is accessible over the network as a standard SAMBA/SMB share and optionally via FTP.

Four-Port Hybrid aVS
(internal storage (e.g. 6 TB) & ports within a single chassis)

Video In

Port 1
Port 2
Port 3
Port 4

In this configuration, all ports are bi-directional, and can be switched immediately between record and playback. For this application, Ports 1 & 2 are used for player outputs, 3 is a recorder input and 4 is a generic player output. Other configurations are equally possible.

Video Out

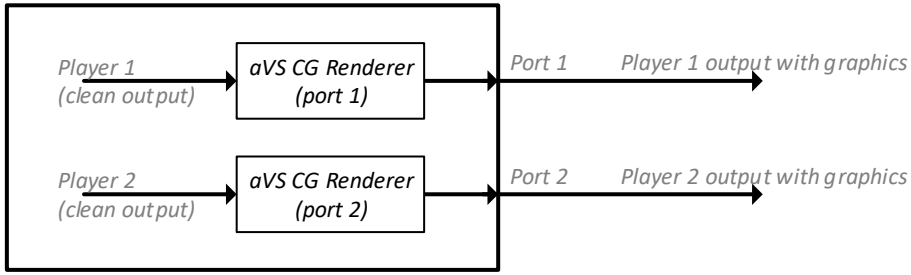
Port 1
Port 2
Port 3
Port 4

In this case, ports 1 & 2 are used as players within the aVS for clip playback, under control of the QSeries Automation Control Centre (ACC) software, which provides playout management based upon clip information entered within the QNews run down, or remotely from a third-party system.

Each player has its own downstream graphics renderer, allowing graphics to be embedded over the clean player output. Note that these renderers are independent, although they can be linked together, so that graphics appear on the video output, regardless of which player is currently active.

These graphic elements, particularly lower-third straps, can be controlled from the ACC, based on automation events entered by the journalists within their scripts.

Note that the disadvantage with this approach is that graphics are only applied over content (i.e. video clips) being played through an internal player. It is not possible to apply graphics over a live source, for instance, using this approach.



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aQ Broadcast system – 4-port aVS Hybrid example, port-based graphics		
NH	21 Jun '17	v1

A Hybrid aVS provides storage and I/O within a single chassis. Size, capacity and the number of ports is flexible. A 1U chassis can provide two or four ports with typically 2 / 3 / 6 TB internal storage. A 2U chassis can provide four or six ports, with typically 5 / 10 / 15 / 20 TB internal storage.

Input/output connections are normally SDI with embedded audio, but an option for the 2U chassis includes analogue video and audio connections. All ports are bi-directional – their individual operation can be switched immediately between recording and playback.

The Storage is accessible over the network as a standard SAMBA/SMB share and optionally via FTP.

Four-Port Hybrid aVS
(internal storage (e.g. 6 TB) & ports within a single chassis)

Video In

Port 1
Port 2
Port 3
Port 4

In this configuration, all ports are bi-directional, and can be switched immediately between record and playback. For this application, Ports 1 & 2 are used for player outputs, 3 is the graphics input and 4 is the graphics output

Video Out

Port 1
Port 2
Port 3
Port 4

Playback under control of ACC, based on QNews running order, or entirely remotely (e.g. via OverDrive)

Players
Port 1
Port 2

Switcher Out *Port 3*

aVS CG Renderer

Internal recorder – can record clean feed (before graphics) or with embedded graphics, or both

Port 4 *Program Output*

In this case, ports 1 & 2 are used as outputs from the aVS for clip playback, under control of the QSeries Automation Control Centre (ACC) software, which provides playout management based upon clip information entered within the QNews run down, or remotely from a third-party system. Ports 3 & 4 are used together as a 'through-CG' device, allowing graphics (e.g. lower-third captions, clock, logo, ticker, sidebar, etc.) to be applied on top of the switcher output. These graphic elements, particularly lower-third straps, can also be controlled from the ACC, based on automation events entered by the journalists within their scripts.
The internal routing capability of the aVS means that it is possible to record the incoming clean feed (pre-graphics) and/or the combined graphics output without requiring external cabling or a separate port.

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aQ Broadcast system – 4-port aVS Hybrid example with graphics		
NH	21 Jun '17	v1

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Input/output connections are normally SDI with embedded audio, but an option for the 2U chassis includes analogue video and audio connections. All ports are bi-directional – their individual operation can be switched immediately between recording and playback.

The Storage is accessible over the network as a standard SAMBA/SMB share and optionally via FTP.

Six-Port Hybrid aVS
(internal storage & ports within a single chassis)

Video In

Port 1
Port 2
Port 3
Port 4

In this configuration, ports 1 & 2 are bi-directional, and can be switched immediately between record and playback. Ports 3 & 4 are fixed inputs and Ports 5 & 6 are fixed outputs.

Video Out

Port 1
Port 2
Port 5
Port 6

Playback under control of ACC, based on QNews running order, or entirely remotely (e.g. via OverDrive)

Players

Port 1
Port 2

Switcher Out → *Port 4* → *aVS CG Renderer* → *Port 6* → *Program Output*

Internal recorder – can record clean feed (before graphics) or with embedded graphics, or both

In this case, ports 1 & 2 are used as outputs from the aVS for clip playback, under control of the QSeries Automation Control Centre (ACC) software, which provides playout management based upon clip information entered within the QNews run down, or remotely from a third-party system. Ports 4 & 6 are used together as a 'through-CG' device, allowing graphics (e.g. lower-third captions, clock, logo, ticker, sidebar, etc.) to be applied on top of the switcher output. These graphic elements, particularly lower-third straps, can also be controlled from the ACC, based on automation events entered by the journalists within their scripts.
The internal routing capability of the aVS means that it is possible to record the incoming clean feed (pre-graphics) and/or the combined graphics output without requiring external cabling or a separate port.
In this example, ports 3 (input) and 5 (output) are still available for use as required.

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aQ Broadcast system – 6-port aVS Hybrid example with graphics		
NH	21 Jun '17	v1

aVS Store node
(internal storage but no I/O ports)

An aVS Store node provides dedicated storage. Size and capacity is flexible, but will typically be 2 – 4U, and from 5 TB to many hundreds of TB. All units have redundant PSUs and storage is always provided based on hardware RAID configurations.

The Storage is accessible over the network as a standard SAMBA/SMB share and optionally via FTP. Standard units provide multiple 1GigE network connections, but an option for dual 10GigE connections is available.

In most cases, Store nodes can support additional functionality, such as sub-clip, trim, transcoding, upload, stream, etc. Proxy viewing is also available in various forms.

Media content

aVS Port node #1
(bi-directional ports but no internal storage)

Video In *Video Out*

aVS Port node #2
(bi-directional ports but no internal storage)

Video In *Video Out*

aVS Port node #3
(bi-directional ports but no internal storage)

Video In *Video Out*

An aVS Port node provides dedicated I/O, typically two or four ports in a 1U chassis with redundant PSU. Input/output connections are normally SDI with embedded audio, but an option for the 2U chassis includes analogue video and audio connections. All ports are bi-directional – their individual operation can be switched immediately between recording and playback. Alpha channel support is available as an option, with two ports configurable as linked key+fill or as independent connections.

aVS Port nodes are connected to an aVS Store node via a private network link. Port and Store nodes can be connected in any combination – multiple Ports -> one Store, one Port -> multiple Stores or multiple Ports -> multiple Stores. Any port can record content to, or playback content from, any Store.

Video I/O Connections (example):

Ref	In 1	Out 1	In 2	Out 2	*Top card*
Ref	In 1	Out 1	In 2	Out 2	*Bottom card*

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aQ Broadcast system examples – Store and Port node configuration		
NH	10 Jun '16	v1

aVS Store node - (internal storage but no I/O ports) [4U / 10G NIC]

72 TB would provide storage for approx. **2,400** hours XDCAM50 content. **108 TB** would provide approx. **3,600** hours. Proportionally greater storage capacity should be available for XDCAM35 content

An aVS Store node provides dedicated storage. Size and capacity is flexible, but will typically be 2 – 4U, and from 5 TB to many hundreds of TB. All units have redundant PSUs and storage is always provided based on hardware RAID configurations.

The Storage is accessible over the network as a standard SAMBA/SMB share and optionally via FTP. Standard units provide multiple 1GigE network connections, but an option for dual 10GigE connections is available.

In most cases, Store nodes can support additional functionality, such as sub-clip, trim, transcoding, upload, stream, etc. Proxy viewing is also available in various forms.

Media content

aVS Port node #1 (4 ports, 3 in + spare in/out)
(bi-directional channels but no internal storage)
[supplied with spare I/O card fitted]

Video In — *1 (In)*
2 (In)
3 (In)
Spare (In) **OR** *Spare (Out)* — *Video Out*

aVS Port node #2 (4 ports, 3 in + spare in/out)
(bi-directional channels but no internal storage)
[supplied with spare I/O card fitted]

Video In — *4 (In)*
5 (In)
6 (In)
Spare (In) **OR** *Spare (Out)* — *Video Out*

An aVS Port node provides dedicated I/O, typically two or four ports in a 1U chassis with redundant PSU. Input/output connections are normally SDI with embedded audio. Different port configurations are possible based on factory configuration: ports can be bi-directional – so that their individual operation can be switched immediately between recording and playback – or individual ports can be fixed as an input or an output ***(as in this case)***

aVS Port nodes are connected to an aVS Store node via a private network link. Port and Store nodes can be connected in any combination – multiple Ports -> one Store, one Port -> multiple Stores or multiple Ports -> multiple Stores. Any port can record content to, or playback content from, any Store.

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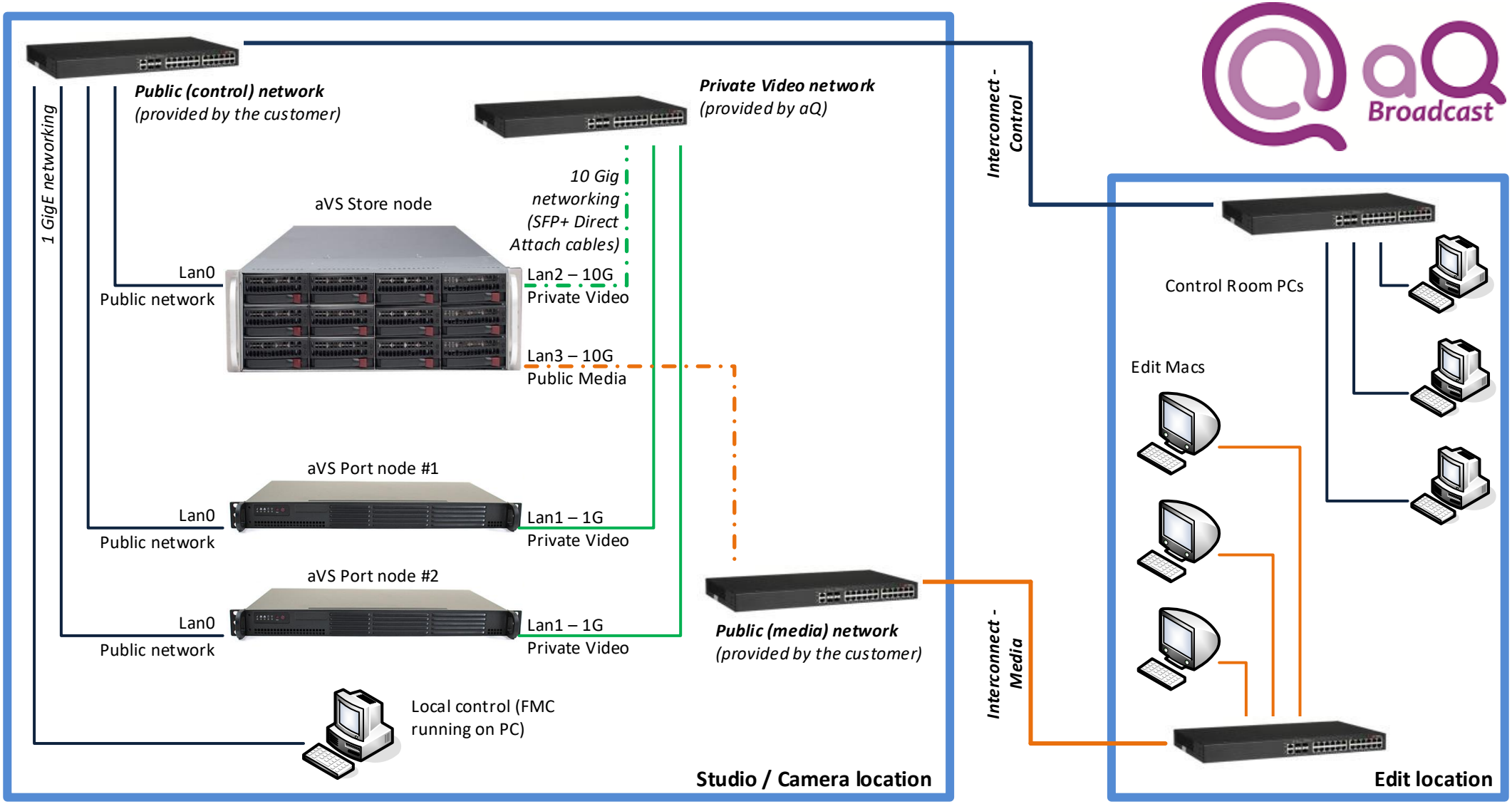
aQ Broadcast system examples – Store and Port node configuration		
NH	12 Dec '16	v1



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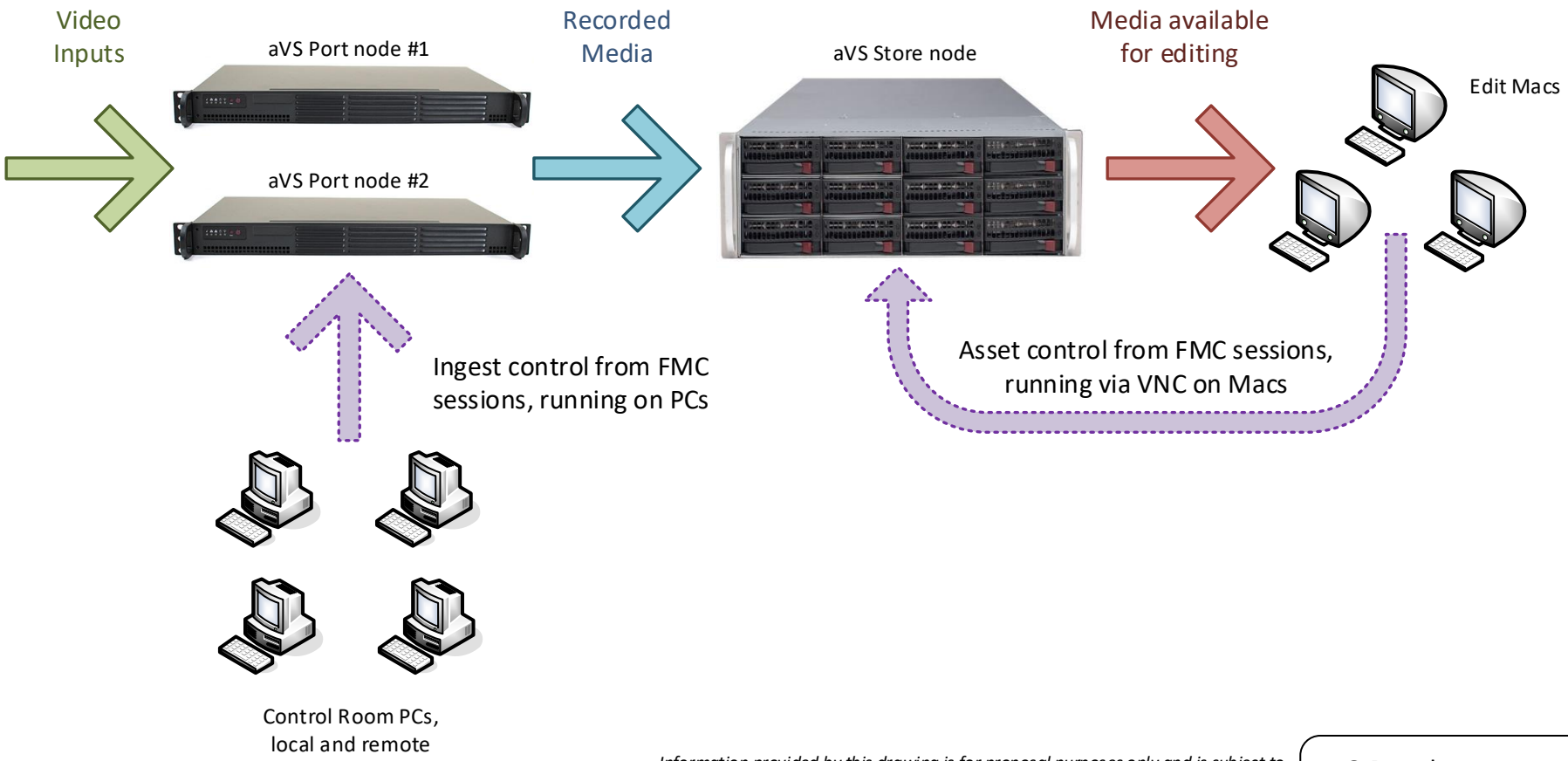
aQ Broadcast system examples – Store and Port networking example		
NH	10 Feb '17	v1



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aQ Broadcast system examples – Store and Port workflow example		
NH	10 Feb '17	v1

aVS Store node (e.g. 18 TB)
(internal storage but no I/O ports)

An aVS Store node provides dedicated storage. Size and capacity is flexible, but will typically be 2 – 4U, and from 5 TB to many hundreds of TB. All units have redundant PSUs and storage is always provided based on hardware RAID configurations.

The Storage is accessible over the network as a standard SAMBA/SMB share and optionally via FTP. Standard units provide multiple 1GigE network connections, but an option for dual 10GigE connections is available.

In most cases, Store nodes can support additional functionality, such as sub-clip, trim, transcoding, upload, stream, etc. Proxy viewing is also available in various forms.

Media content

aVS Port node #1 (6 ports, 2 in / 4 out)
(bi-directional ports but no internal storage)

Video In — *1 (In)*, *2 (In)*

3 (Out), *4 (Out)*, *5 (Out)*, *6 (Out)* — *Video Out*

aVS Port node #2 (6 ports, 2 in / 4 out)
(bi-directional ports but no internal storage)

Video In — *1 (In)*, *2 (In)*

3 (Out), *4 (Out)*, *5 (Out)*, *6 (Out)* — *Video Out*

An aVS Port node provides dedicated I/O, typically two or four ports in a 1U chassis with redundant PSU. Input/output connections are normally SDI with embedded audio. Different port configurations are possible based on factory configuration: ports can be bi-directional – so that their individual operation can be switched immediately between recording and playback – or individual ports can be fixed as an input or an output. Alpha channel support is available as an option, with two ports configurable as linked key+fill or as independent connections.

aVS Port nodes are connected to an aVS Store node via a private network link. Port and Store nodes can be connected in any combination – multiple Ports -> one Store, one Port -> multiple Stores or multiple Ports -> multiple Stores. Any port can record content to, or playback content from, any Store.

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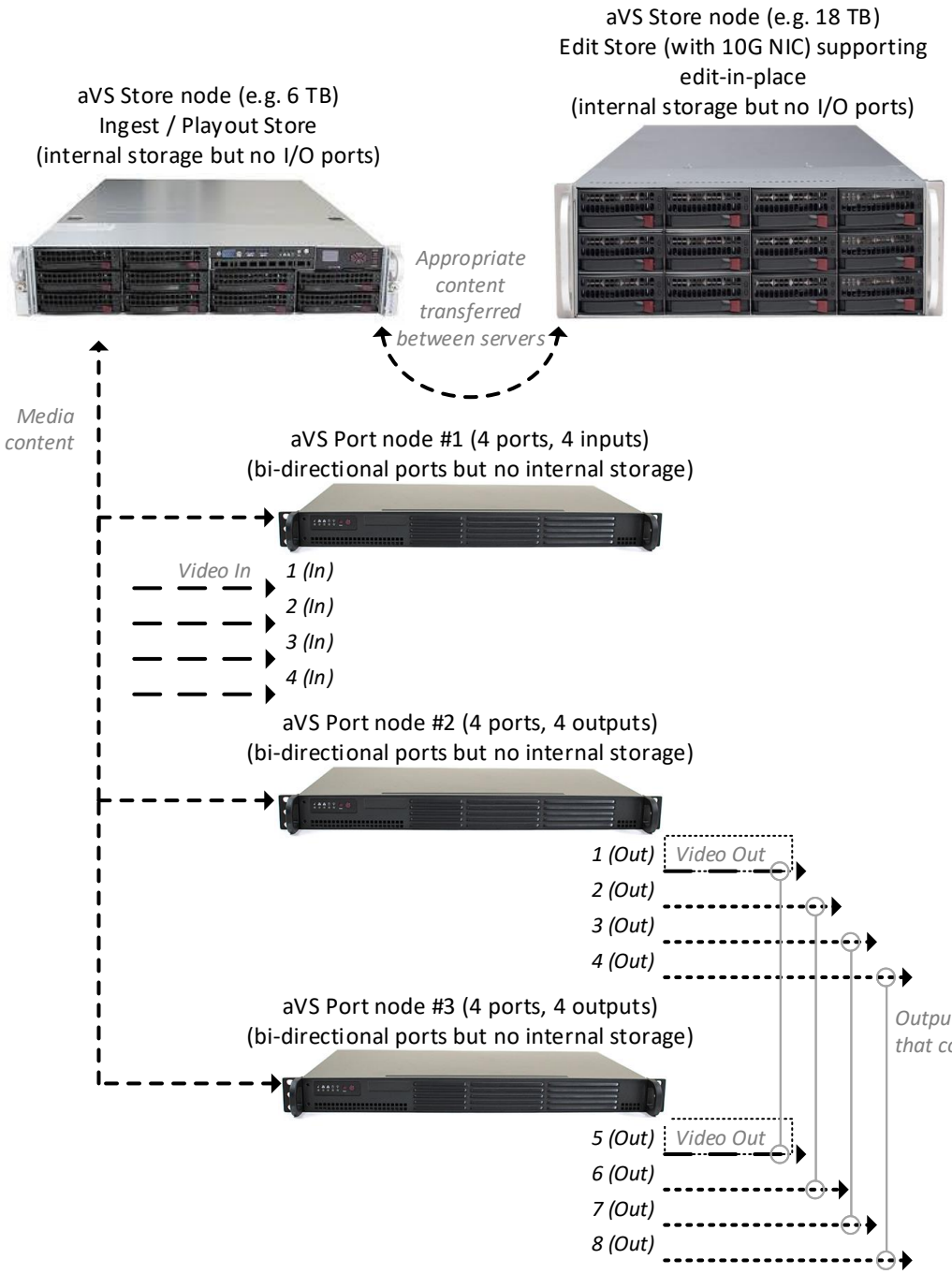
aQ Broadcast system examples – Store and Port node configuration		
NH	15 Nov '16	v1



An aVS Store node provides dedicated storage. Size and capacity is flexible, but will typically be 2 – 4U, and from 5 TB to many hundreds of TB. All units have redundant PSUs and storage is always provided based on hardware RAID configurations.

The Storage is accessible over the network as a standard SAMBA/SMB share and optionally via FTP. Standard units provide multiple 1GigE network connections, but an option for dual 10GigE connections is available.

In most cases, Store nodes can support additional functionality, such as sub-clip, trim, transcoding, upload, stream, etc. Proxy viewing is also available in various forms.

An aVS Port node provides dedicated I/O, typically two or four ports in a 1U chassis with redundant PSU. Input/output connections are normally SDI with embedded audio. Different port configurations are possible based on factory configuration: ports can be bi-directional – so that their individual operation can be switched immediately between recording and playback – or individual ports can be fixed as an input or an output. Alpha channel support is available as an option, with two ports configurable as linked key+fill or as independent connections.

aVS Port nodes are connected to an aVS Store node via a private network link. Port and Store nodes can be connected in any combination – multiple Ports -> one Store, one Port -> multiple Stores or multiple Ports -> multiple Stores. Any port can record content to, or playback content from, any Store.

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aQ Broadcast system examples – Store and Port node configuration		
NH	8 Dec '16	v1

aVS Store node (e.g. 72 TB)
(internal storage but no I/O ports)

An aVS Store node provides dedicated storage. Size and capacity is flexible, but will typically be 2 – 4U, and from 5 TB to many hundreds of TB. All units have redundant PSUs and storage is always provided based on hardware RAID configurations.

The Storage is accessible over the network as a standard SAMBA/SMB share and optionally via FTP. Standard units provide multiple 1GigE network connections, but an option for dual 10GigE connections is available.

In most cases, Store nodes can support additional functionality, such as sub-clip, trim, transcoding, upload, stream, etc. as options. Proxy viewing is also available in various forms.

Storage

Media content

aVS Port (v-pipe) node #1 (4 configurable ports, but no internal storage)

Video In — *1 (In)*, *2 (In)* — *3 (Out)*, *4 (Out)* — *Video Out*

I/O

aVS Port (v-pipe) node #2 (4 configurable ports, but no internal storage)

Video In — *1 (In)*, *2 (In)* — *3 (Out)*, *4 (Out)* — *Video Out*

An aVS Port node provides dedicated I/O, typically four ports in a 1U chassis with redundant PSU. Input/output connections are normally SDI with embedded audio. Different port configurations are possible based on factory configuration: in this case, individual ports can be configured as an input or an output.

aVS Port nodes are connected to an aVS Store node via a private network link. Port and Store nodes can be connected in any combination – multiple Ports -> one Store, one Port -> multiple Stores or multiple Ports -> multiple Stores. Any port can record content to, or playback content from, any Store. Units are illustrated as 2-in / 2-out, but any combination of inputs and outputs can be used.

Use of the 'v-pipe' configuration provide great flexibility – for instance, node #1 could be used for studio production (e.g. in conjunction with an ATEM switcher) and node #2 could be used for scheduled playout (e.g. SDI output plus parallel webstream feed) and ad-hoc media recording or playback.

It is possible to combine Storage and I/O functionality into a single physical chassis, but there are many benefits to using a split Store/Port approach, including additional resilience, easy expansion and flexible operation.

QSeries DBServer / prompt server
(provides QNews & prompting)

Combined QSeries DBServer / LPS Prompt Server provides script, rundown, teleprompting and automation control, in conjunction with local and remote clients running on networked PCs.

News

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aQ Broadcast system examples – Store and Production configuration		
NH	6 Apr '17	v1

Six-Port Hybrid aVS (#1)
(internal 18 TB storage & 6 ports
within a single chassis)

Six-Port Hybrid aVS (#2)
(internal 18 TB storage & 6 ports
within a single chassis)

A Hybrid aVS provides storage and I/O within a single chassis. Size, capacity and the number of ports is flexible. A 1U chassis can provide two or four ports with typically 2 / 3 / 6 TB internal storage. A 2U chassis can provide four or six ports, with typically 5 / 10 / 15 / 20 TB internal storage.

Input/output connections are normally SDI with embedded audio. Different port configurations are possible based on factory configuration: ports can be bi-directional – so that their individual operation can be switched immediately between recording and playback – or individual ports can be fixed as an input or an output.

The Storage is accessible over the network as a standard SAMBA/SMB share and optionally via FTP.

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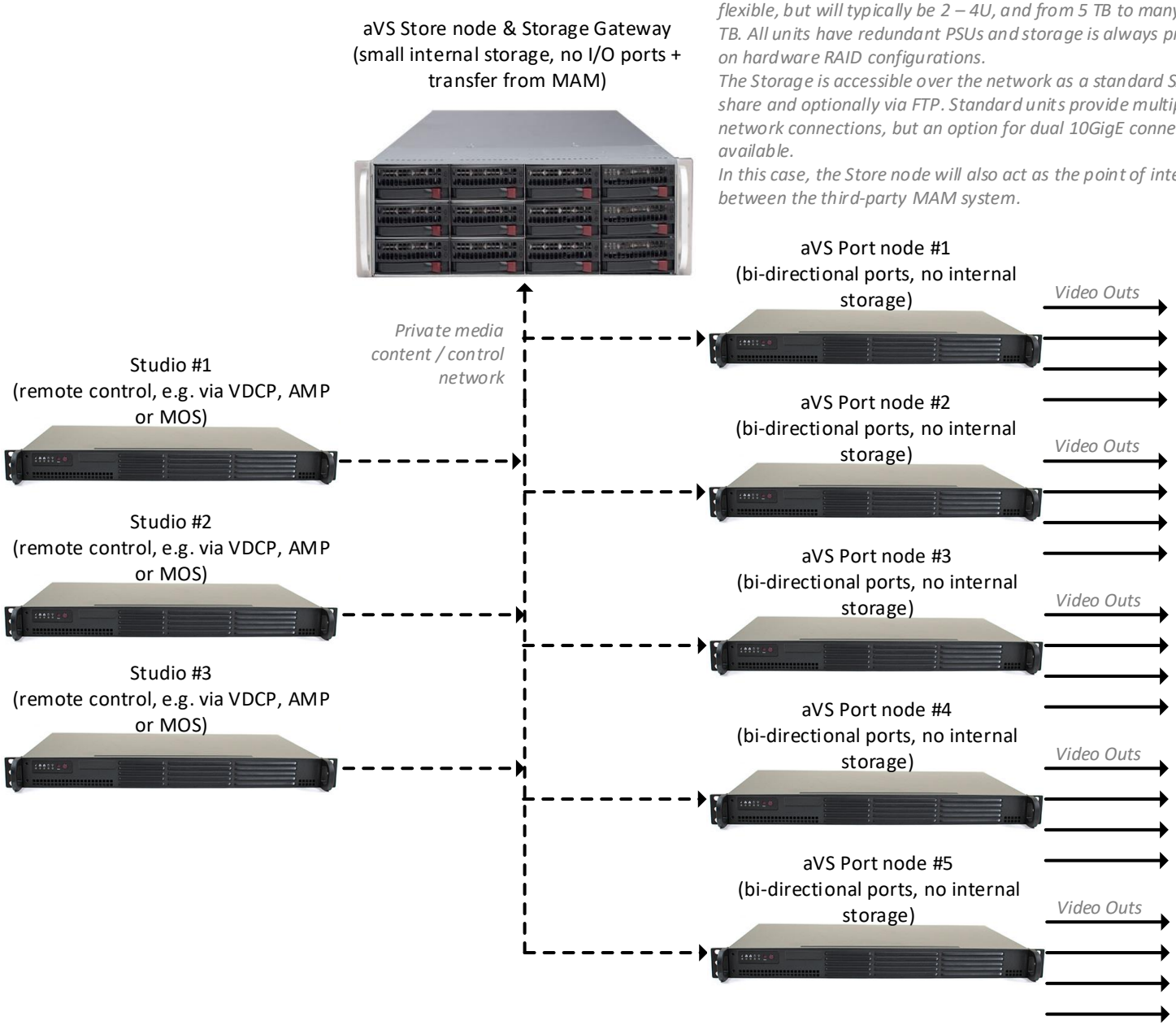
aQ Broadcast system – Two x 6-port aVS Hybrids example		
NH	15 Nov '16	v1

An aVS Store node provides dedicated storage. Size and capacity is flexible, but will typically be 2 – 4U, and from 5 TB to many hundreds of TB. All units have redundant PSUs and storage is always provided based on hardware RAID configurations.
The Storage is accessible over the network as a standard SAMBA/SMB share and optionally via FTP. Standard units provide multiple 1GigE network connections, but an option for dual 10GigE connections is available.
In this case, the Store node will also act as the point of interchange between the third-party MAM system.



An aVS Port node provides dedicated I/O, typically two or four ports in a 1U chassis with redundant PSU. Input/output connections are normally SDI with embedded audio, but an option for the 2U chassis includes analogue video and audio connections. All ports are bi-directional – their individual operation can be switched immediately between recording and playback. Alpha channel support is available as an option, with two ports configurable as linked key+fill or as independent connections.

aVS Port nodes are connected to an aVS Store node via a private network link. Port and Store nodes can be connected in any combination – multiple Ports -> one Store, one Port -> multiple Stores or multiple Ports -> multiple Stores. Any port can record content to, or playback content from, any Store.

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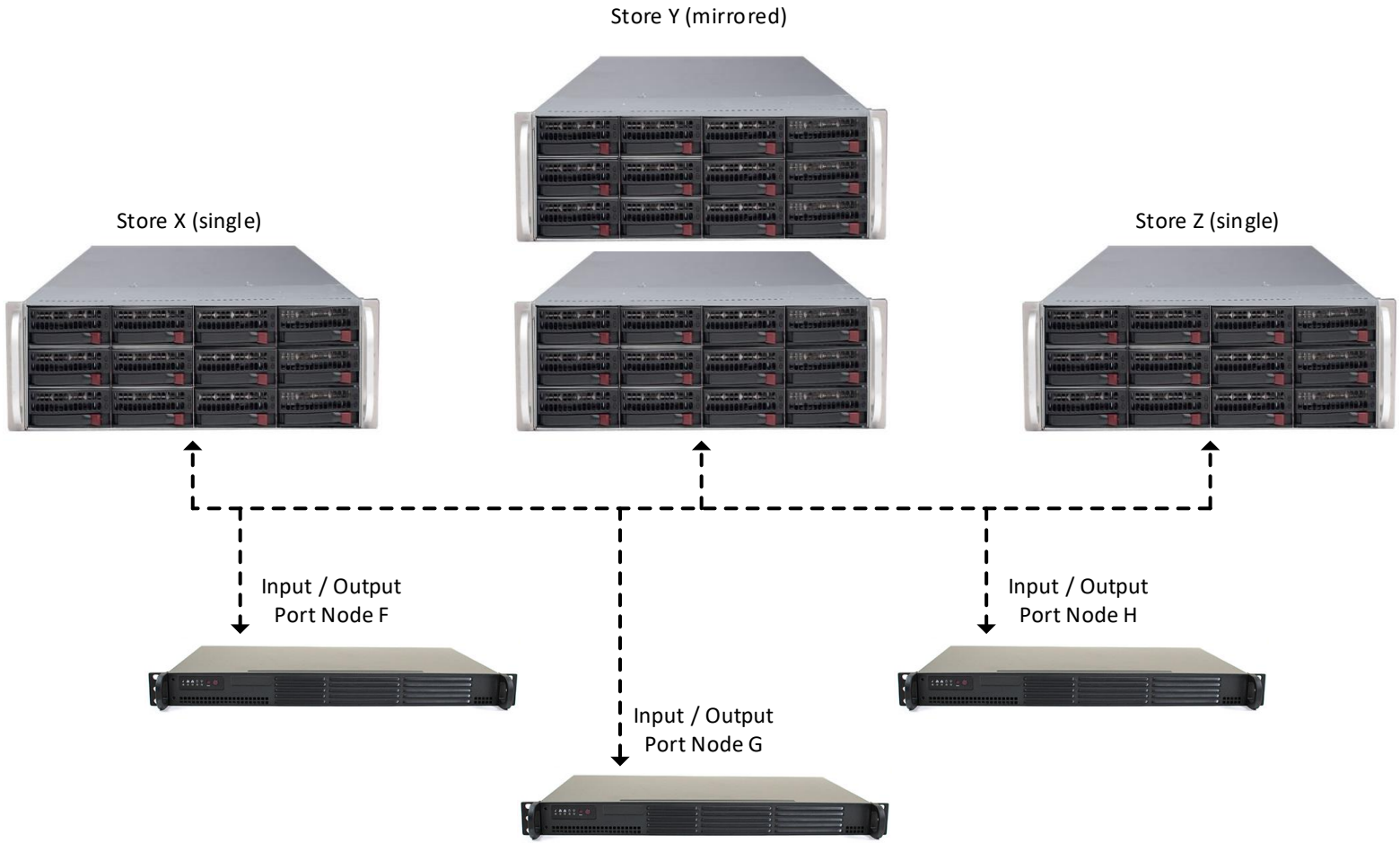
aQ Broadcast system options – large studio playout example		
NH	14 Jun '16	v1



Any Port Node can record content into any Store, and play back content from any Store. Port Nodes are typically available as 1U units with two or four bi-directional ports (SDI with embedded audio, plus genlock input). An option for key + fill output is available if required.

Stores are accessible on the network via standard SMB / SAMBA file sharing and via FTP. Stores can be configured as standalone or mirrored. Each Store is aware of other Stores on the network and automatically supports the direct movement of content between units – transferred point-to-point rather than via an intermediary workstation. Stores are typically available in capacities from 5 TB up to many hundreds of TB, in rack sizes from 2U upwards.

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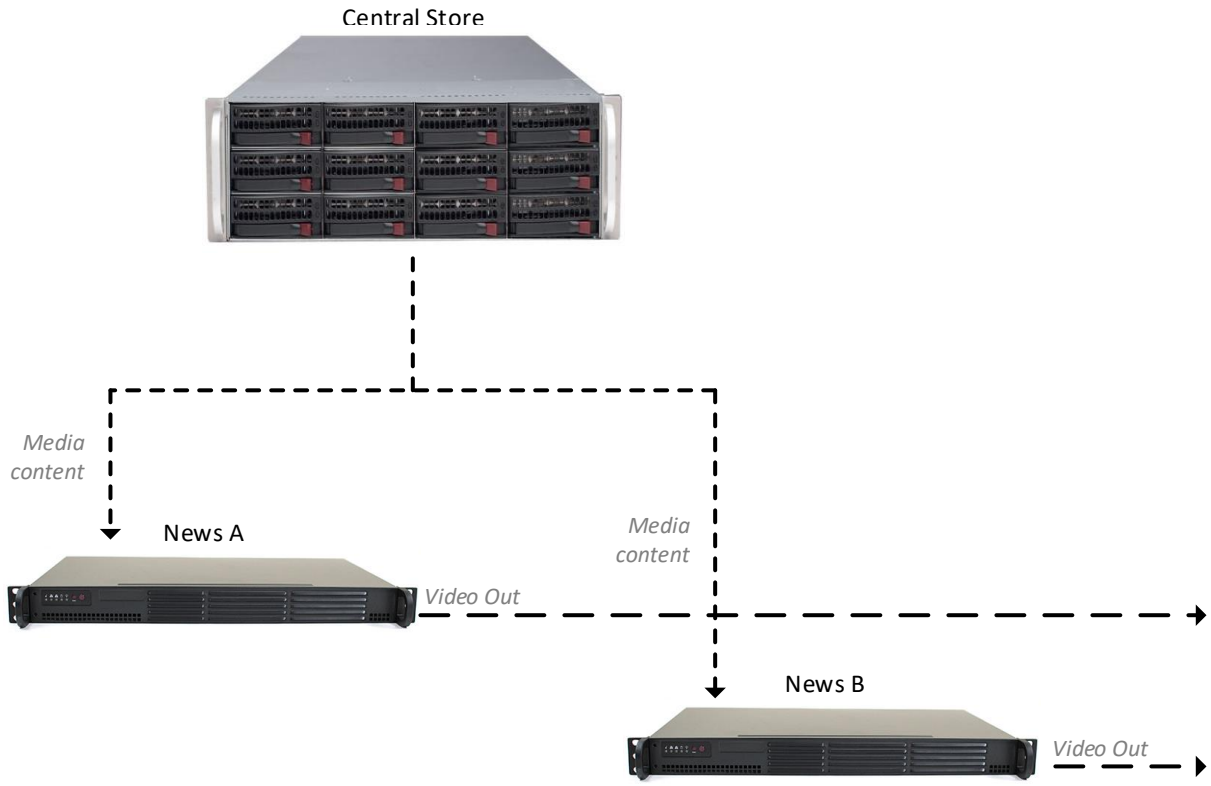
aQ Broadcast system examples – large network configuration		
NH	28 Jan 2016	v1



A single clip can be played out in parallel across both playout servers – all actions (e.g. load, cue, play, re-cue, etc.) will be automatically mirrored on both servers.

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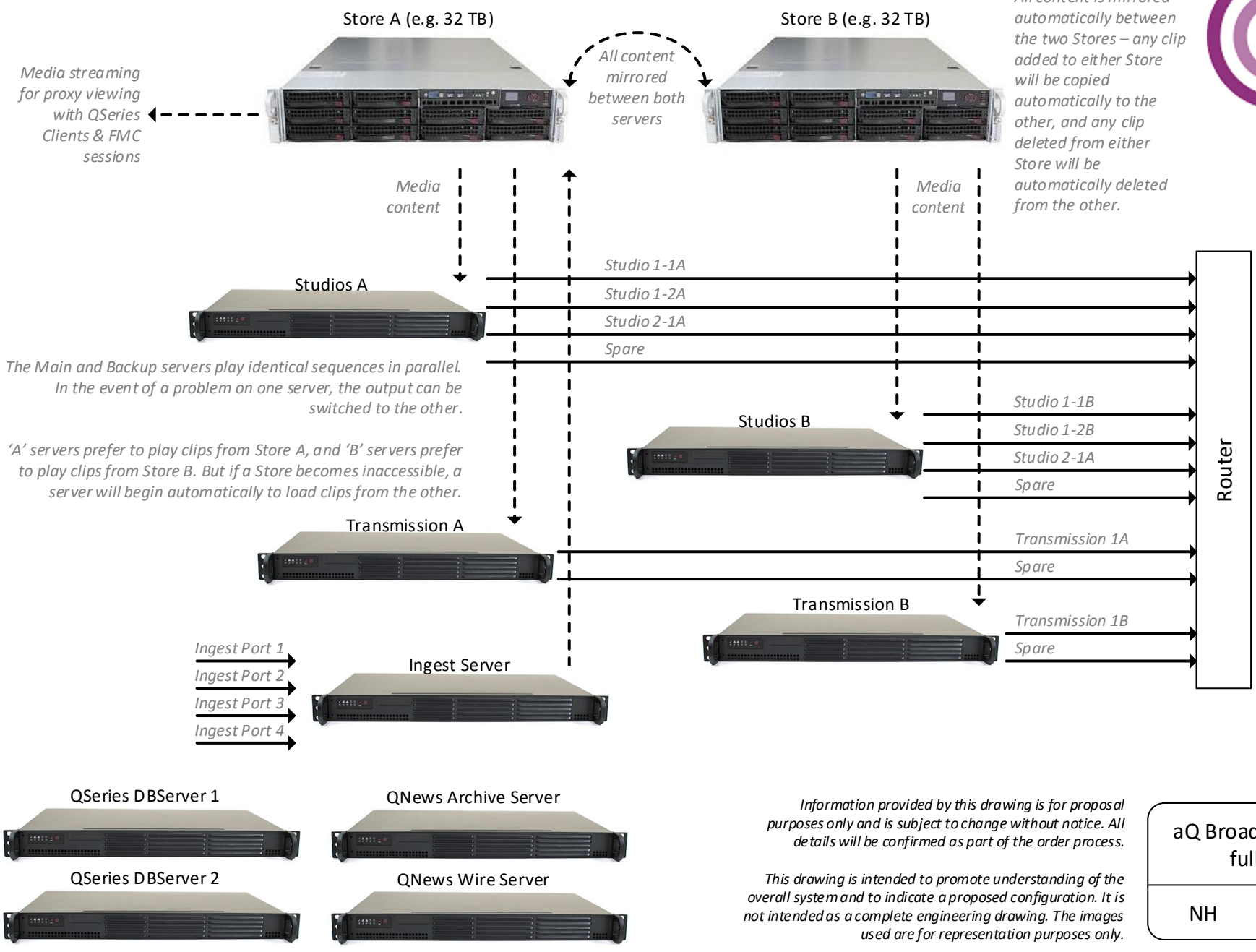
aQ Broadcast system examples – redundant news playout		
NH	28 Jan 2016	v1



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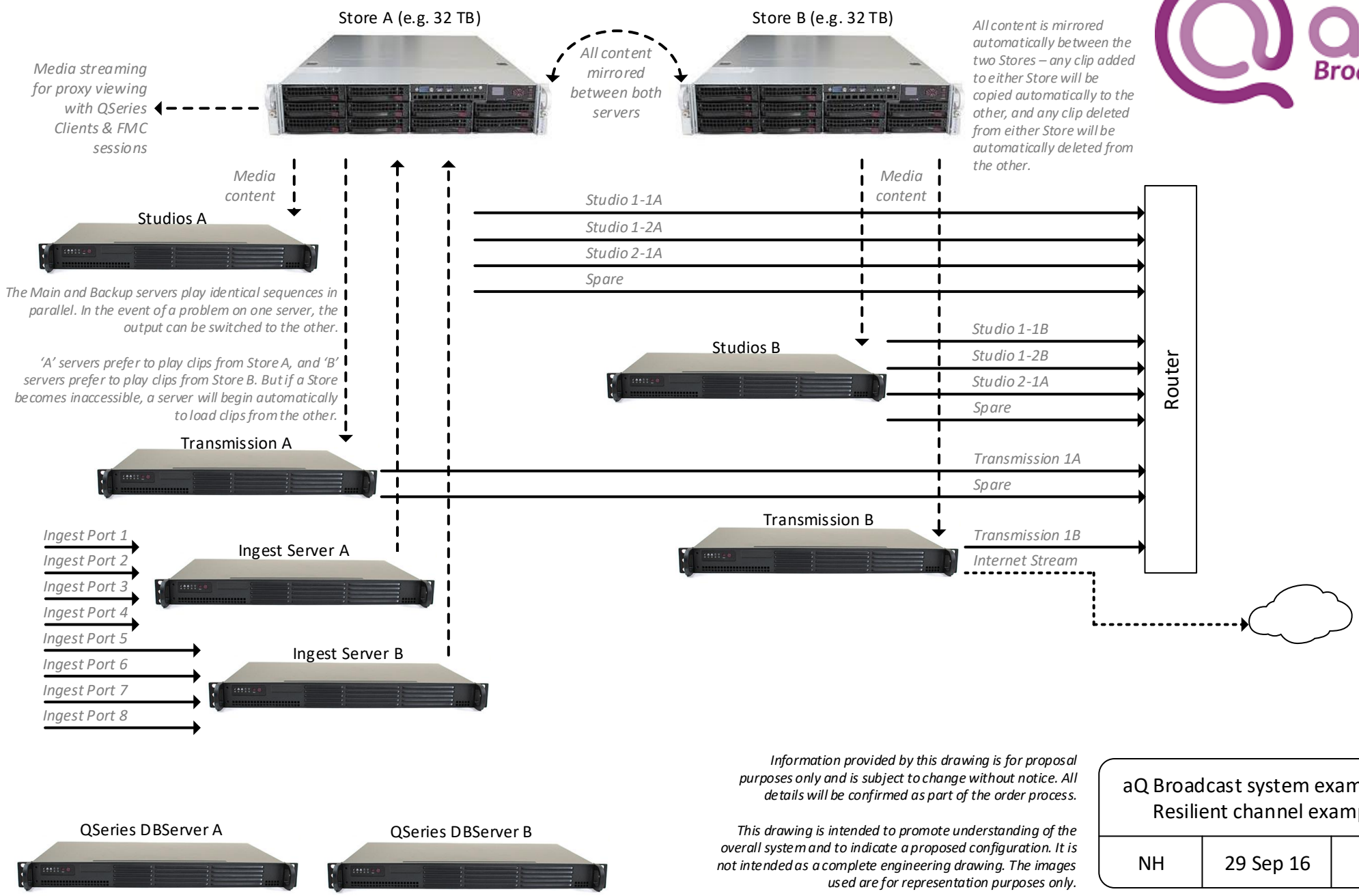
aQ Broadcast system examples – full channel example		
NH	17 Jul 2016	v1



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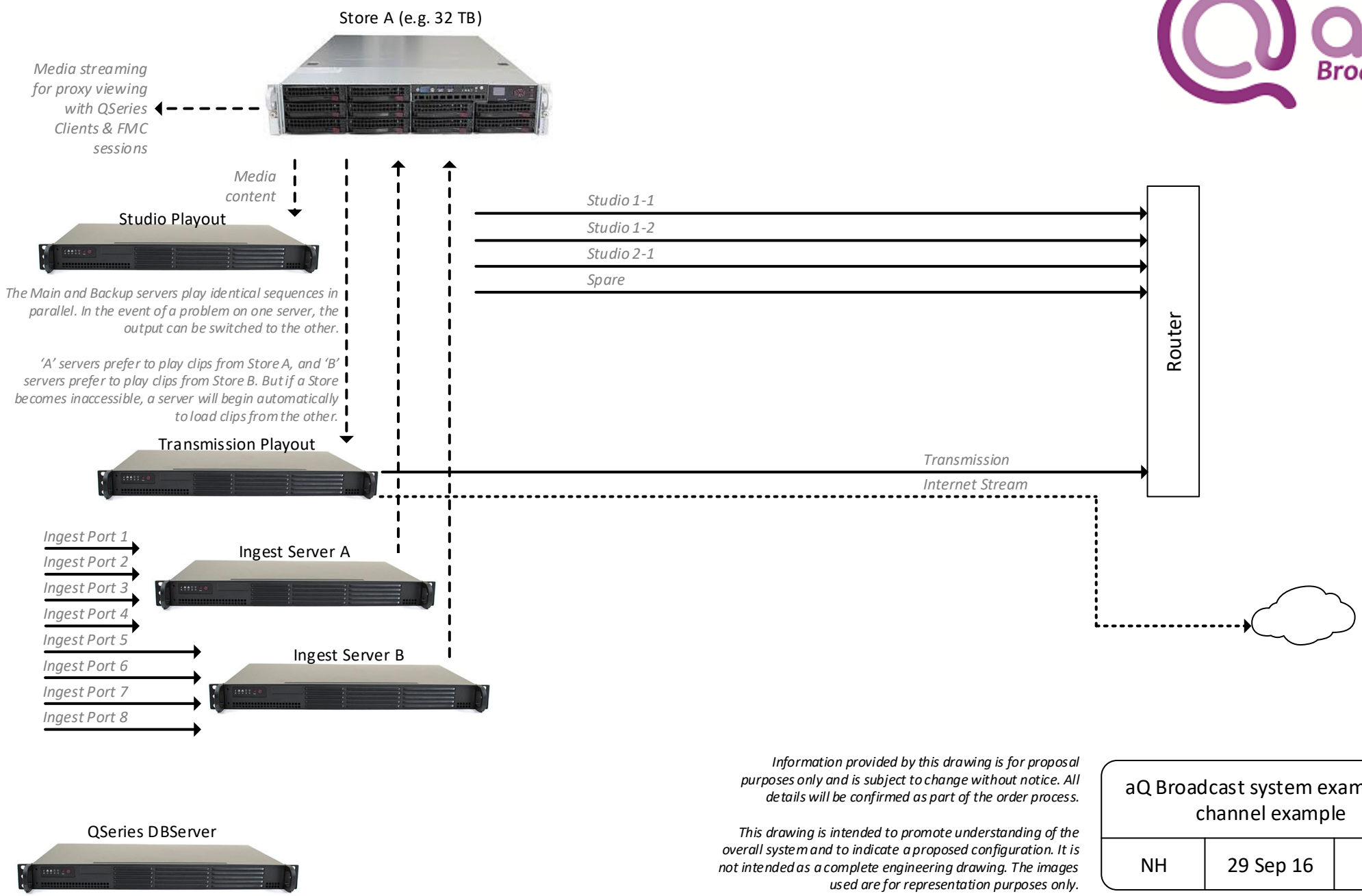
aQ Broadcast system examples – Resilient channel example		
NH	29 Sep 16	v1



Information provided by this drawing is for proposal purposes only and is subject to change without notice. All details will be confirmed as part of the order process.

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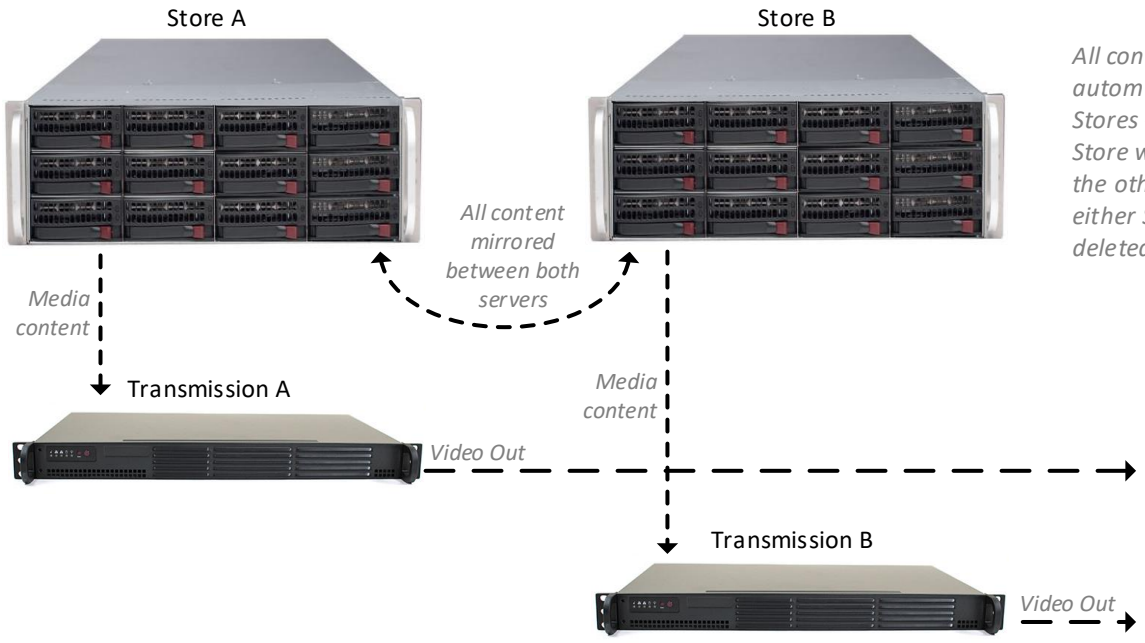
aQ Broadcast system examples – channel example		
NH	29 Sep 16	v1



All content is mirrored automatically between the two Stores – any clip added to either Store will be copied automatically to the other, and any clip deleted from either Store will be automatically deleted from the other.

Both Transmission (Tx) servers run completely independently from the same schedule. Any change in the schedule is updated automatically to both. If connection to the schedule is lost, each Tx server will continue from their cached list, re-syncing automatically when the connection is restored.

Transmission Server A prefers to play clips from Store A, and Transmission Server B prefers to play clips from Store B. But if a Store becomes inaccessible, a Transmission Server will begin to load clips from the other.

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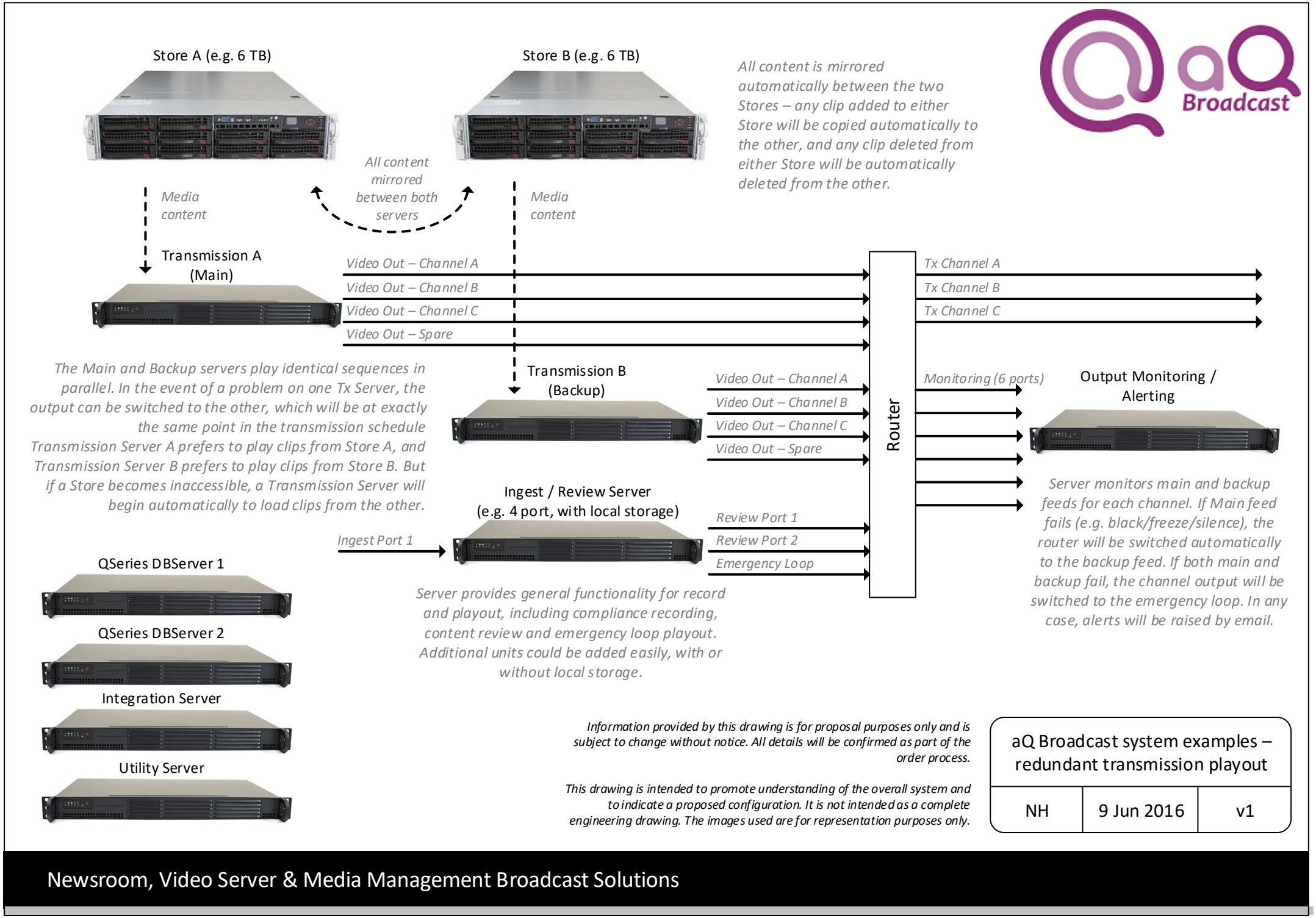
aQ Broadcast system examples – redundant transmission playout		
NH	30 Dec '16	v1


Store A (e.g. 6 TB)
Store B (e.g. 6 TB)
All content is mirrored automatically between the two Stores – any clip added to either Store will be copied automatically to the other, and any clip deleted from either Store will be automatically deleted from the other.
Media content
All content mirrored between both servers
Media content
Transmission A (Main)
Video Out – Channel A
Video Out – Channel B
Video Out – Channel C
Video Out – Spare
Tx Channel A
Tx Channel B
Tx Channel C
The Main and Backup servers play identical sequences in parallel. In the event of a problem on one Tx Server, the output can be switched to the other, which will be at exactly the same point in the transmission schedule Transmission Server A prefers to play clips from Store A, and Transmission Server B prefers to play clips from Store B. But if a Store becomes inaccessible, a Transmission Server will begin automatically to load clips from the other.
Transmission B (Backup)
Video Out – Channel A
Video Out – Channel B
Video Out – Channel C
Video Out – Spare
Router
Monitoring (6 ports)
Output Monitoring / Alerting
Server monitors main and backup feeds for each channel. If Main feed fails (e.g. black/freeze/silence), the router will be switched automatically to the backup feed. If both main and backup fail, the channel output will be switched to the emergency loop. In any case, alerts will be raised by email.
Ingest / Review Server (e.g. 4 port, with local storage)
Ingest Port 1
Review Port 1
Review Port 2
Emergency Loop
Server provides general functionality for record and playout, including compliance recording, content review and emergency loop playout. Additional units could be added easily, with or without local storage.
QSeries DBServer 1
QSeries DBServer 2
Integration Server
Utility Server
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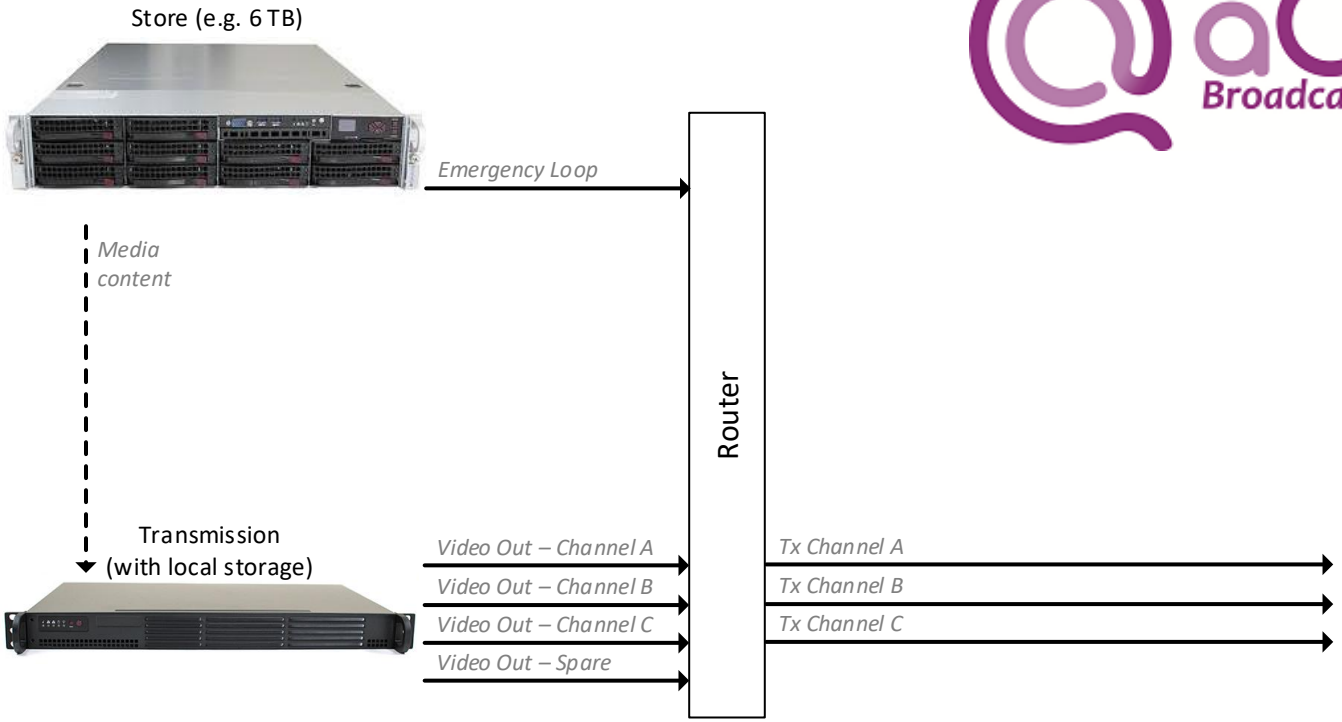
aQ Broadcast system examples – redundant transmission playout
NH
9 Jun 2016
v1
Newsroom, Video Server & Media Management Broadcast Solutions



QSeries DBServer

Utility Server

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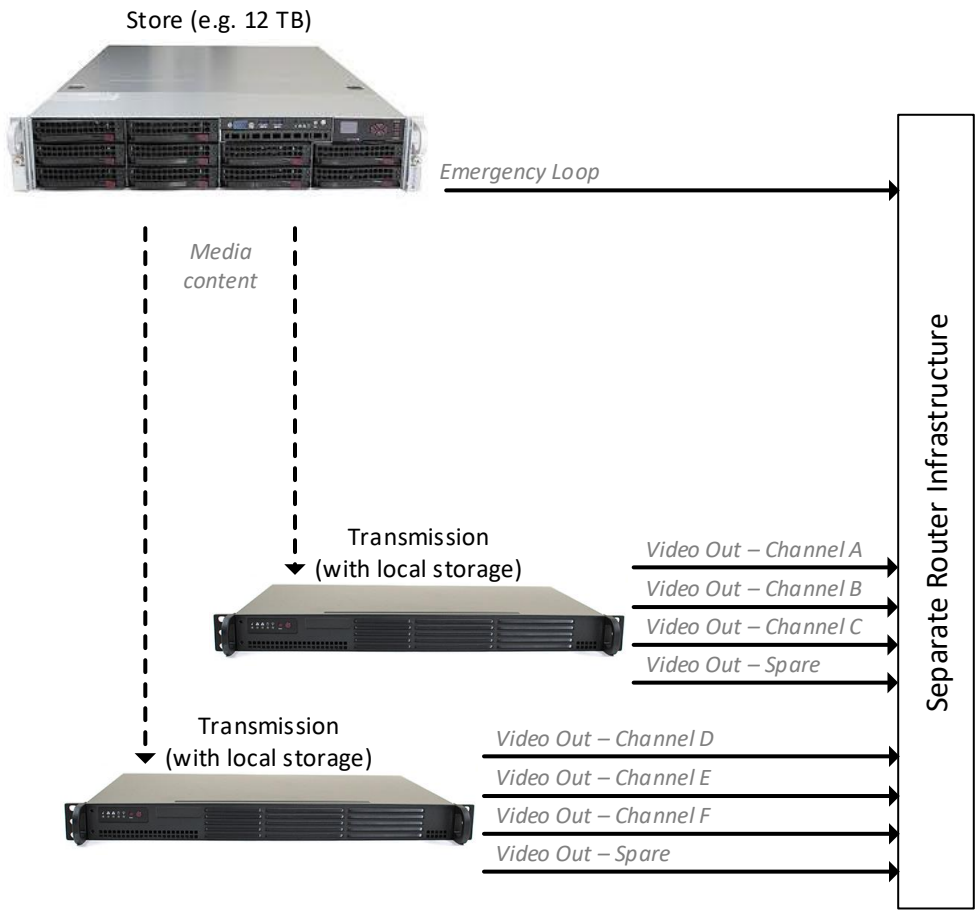
aQ Broadcast system examples – entry-level transmission playout		
NH	10 Jun 2016	v1



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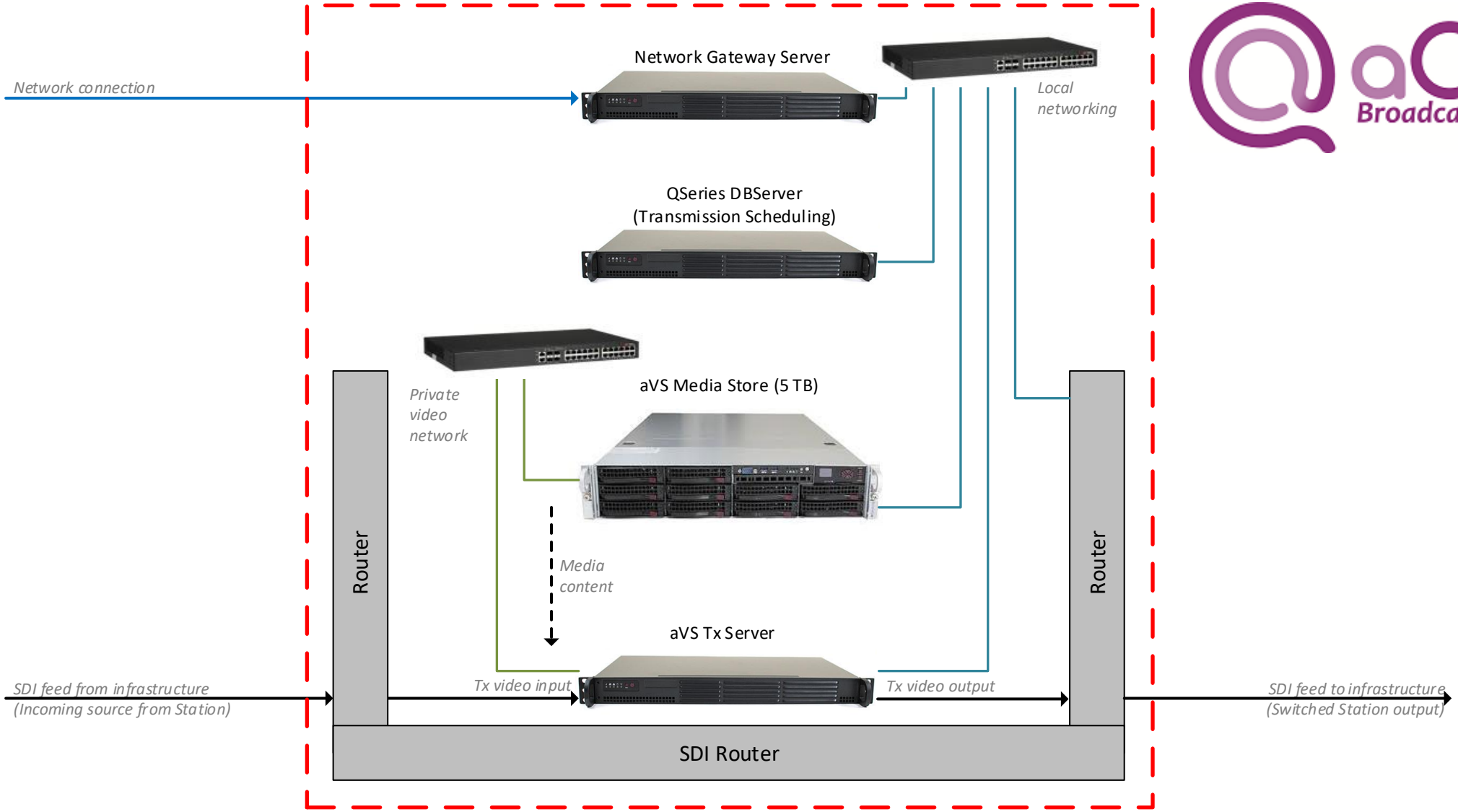
aQ Broadcast system examples – entry-level transmission playout		
NH	12 Jul 2016	v1



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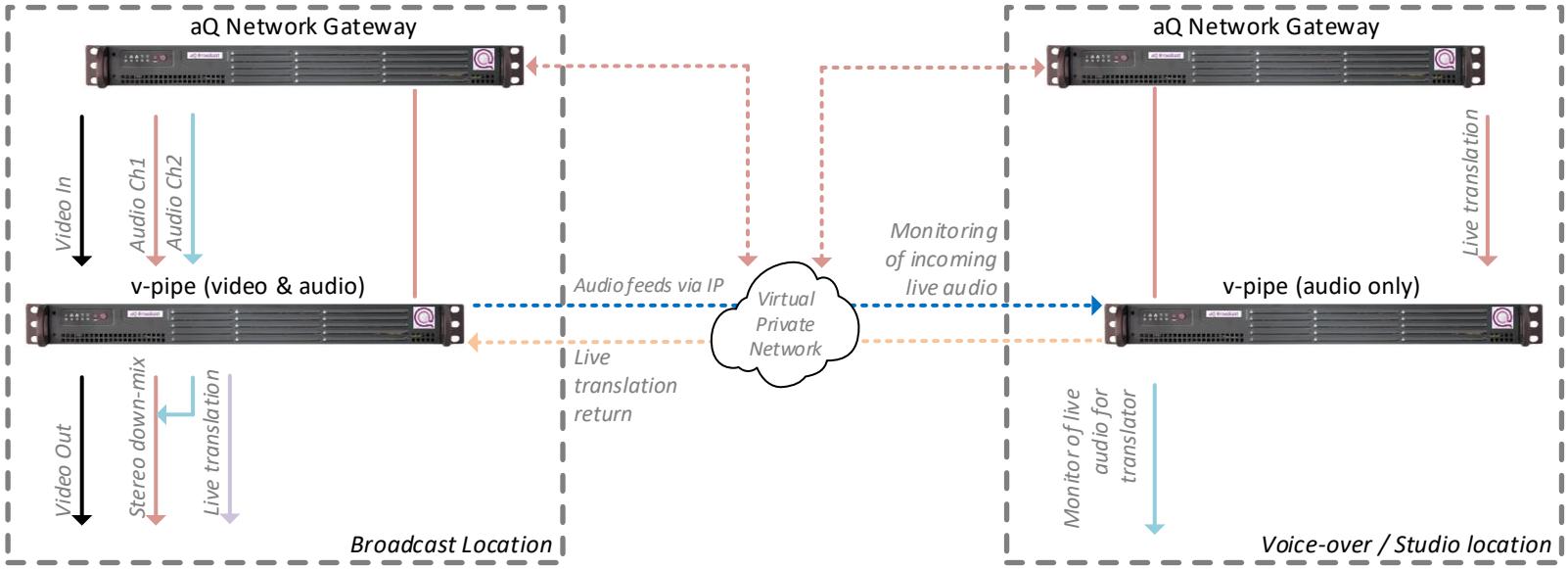
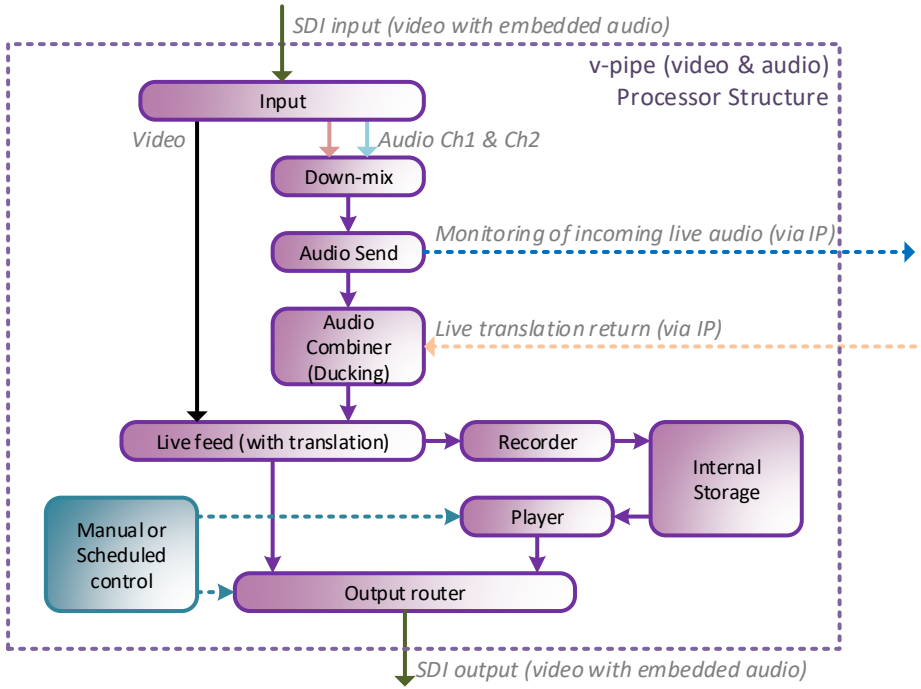
aQ Broadcast system examples – temporary transmission playout		
NH	3 Oct 2016	v1





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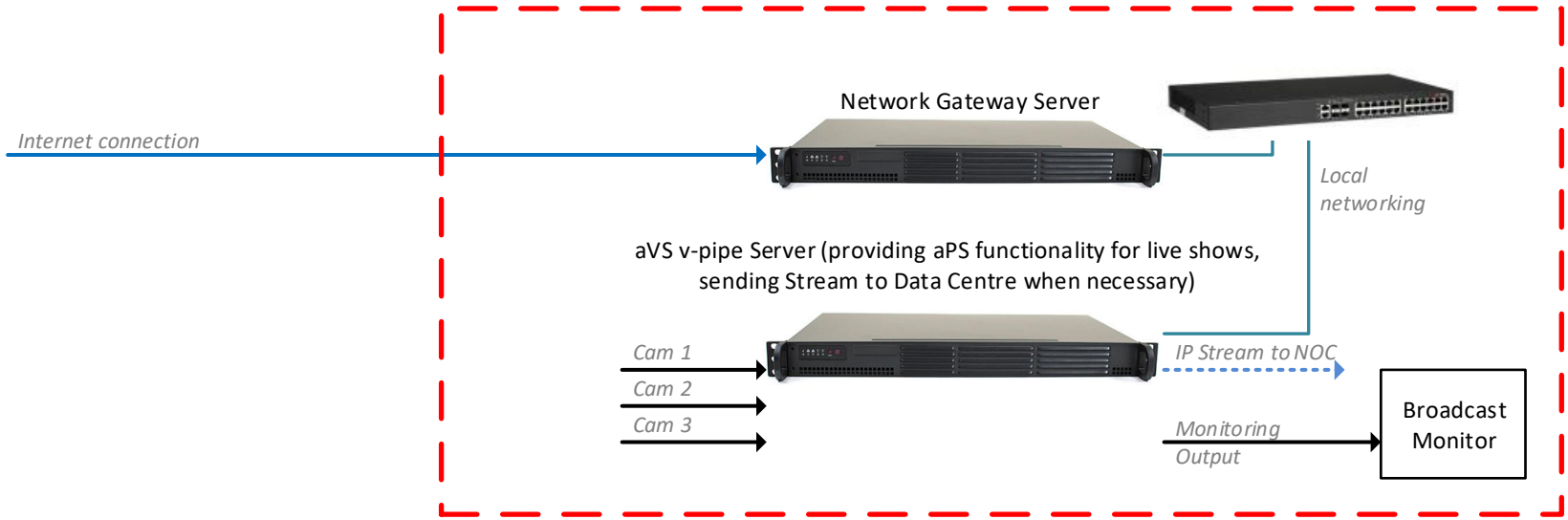
aQ Broadcast system examples – Cloud-based Remote Translation		
NH	9 Nov 2017	v1



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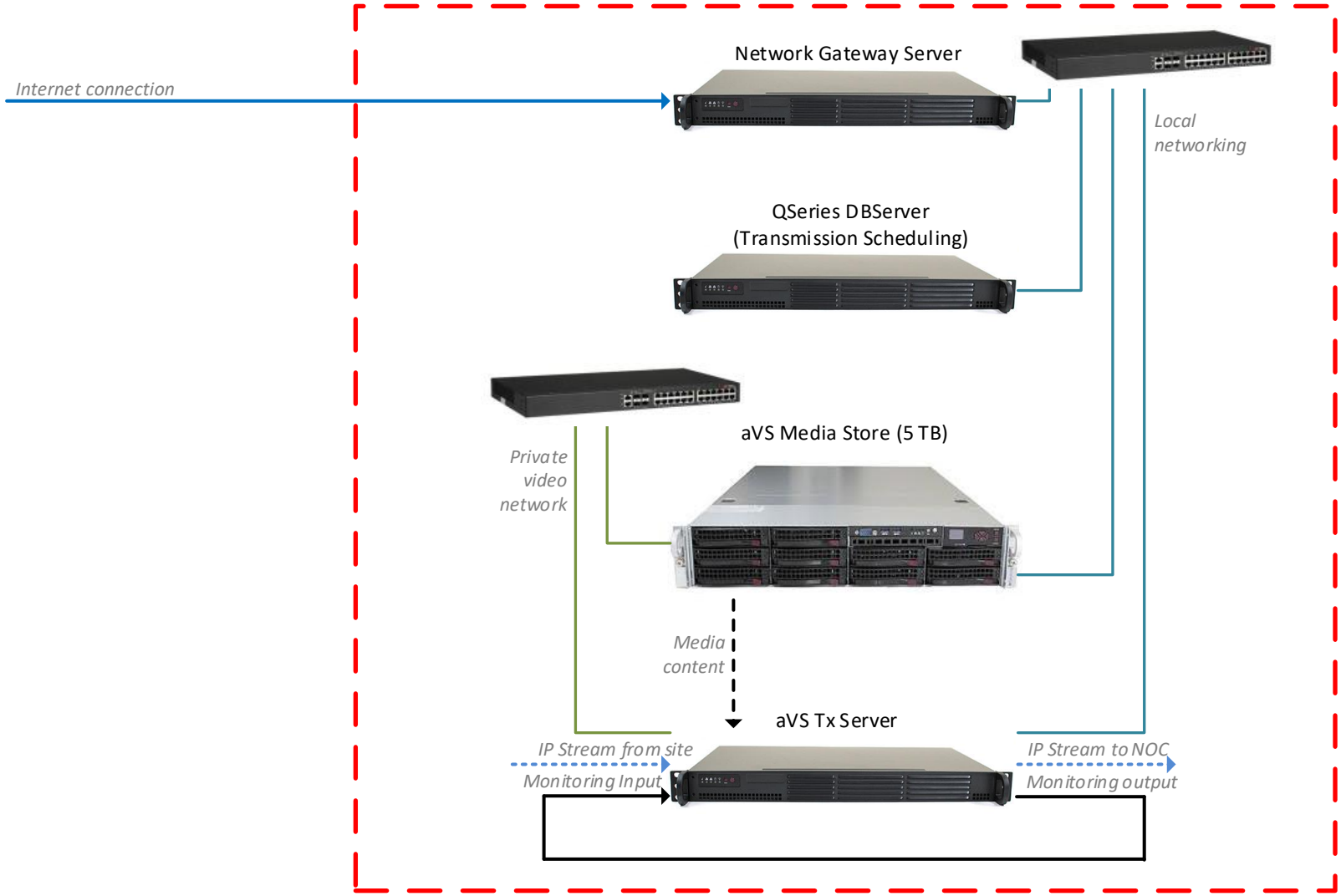
aQ Broadcast system examples – Cloud-Tx playout (Local Station)		
NH	11 Nov 2016	v1



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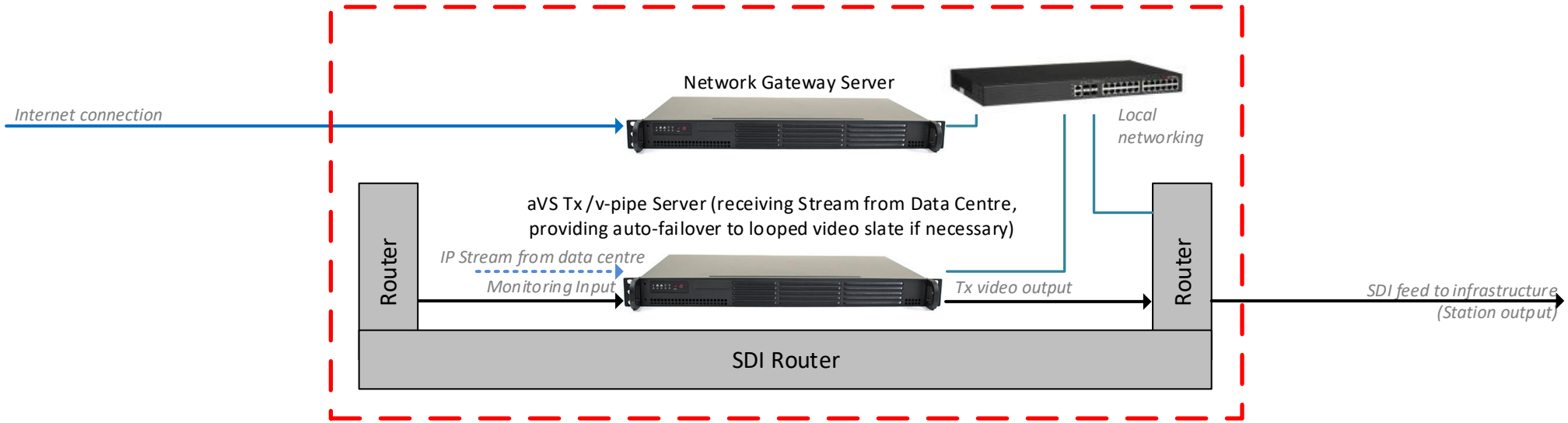
aQ Broadcast system examples – Cloud-Tx (Data Centre)		
NH	11 Nov 2016	v1



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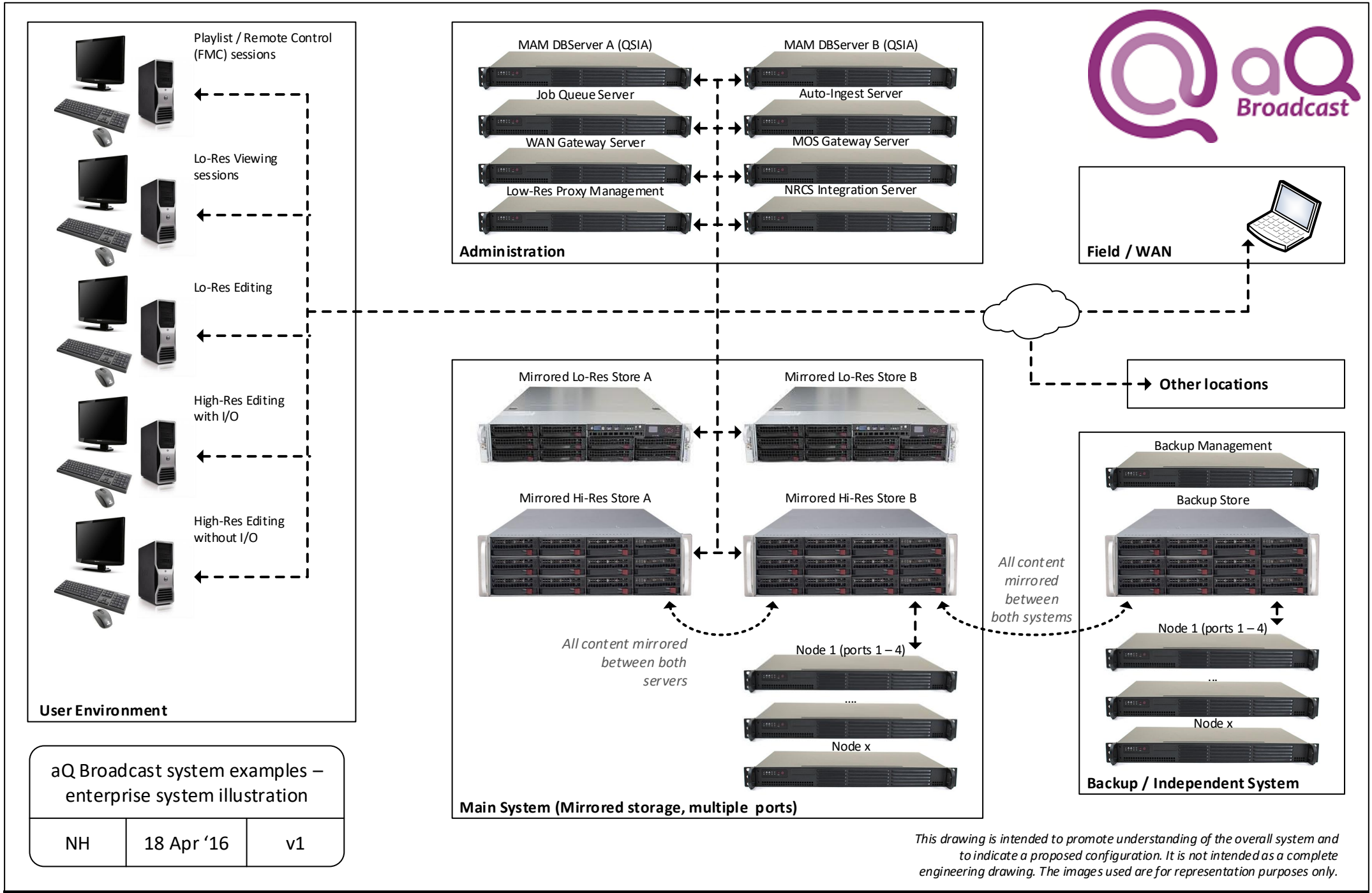
aQ Broadcast system examples – Cloud-Tx playout (NOC end)		
NH	11 Nov 2016	v1


Playlist / Remote Control (FMC) sessions
Lo-Res Viewing sessions
Lo-Res Editing
High-Res Editing with I/O
High-Res Editing without I/O
User Environment
MAM DBServer A (QSIA)
MAM DBServer B (QSIA)
Job Queue Server
Auto-Ingest Server
WAN Gateway Server
MOS Gateway Server
Low-Res Proxy Management
NRCS Integration Server
Administration
Field / WAN
Other locations
Mirrored Lo-Res Store A
Mirrored Lo-Res Store B
Mirrored Hi-Res Store A
Mirrored Hi-Res Store B
All content mirrored between both servers
Node 1 (ports 1 – 4)
....
Node x
Main System (Mirrored storage, multiple ports)
All content mirrored between both systems
Backup Management
Backup Store
Node 1 (ports 1 – 4)
...
Node x
Backup / Independent System
aQ Broadcast system examples – enterprise system illustration
NH
18 Apr '16
v1
This drawing is intended to promote understanding of the overall system and to indicate a proposed configuration. It is not intended as a complete engineering drawing. The images used are for representation purposes only.
Newsroom, Video Server & Media Management Broadcast Solutions

aVS Store Node

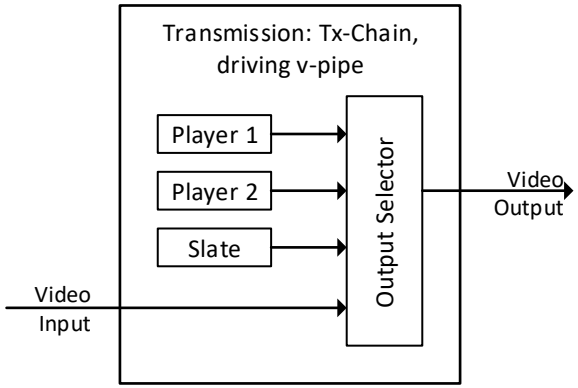
This configuration shows a standard Store / Port combination. For small systems, it is also possible to achieve the same functionality with a single Hybrid (Storage and I/O included within the same chassis).

Media content

aVS Port Node

Video In

Video Out



The standard Port node can be configured to run the 'video-pipeline' components, which includes virtual internal players, still stores and routers. This allows the single video output to be switched between a live input, a manual player, an image (e.g. station logo) and a player under control of the transmission sequence handling.

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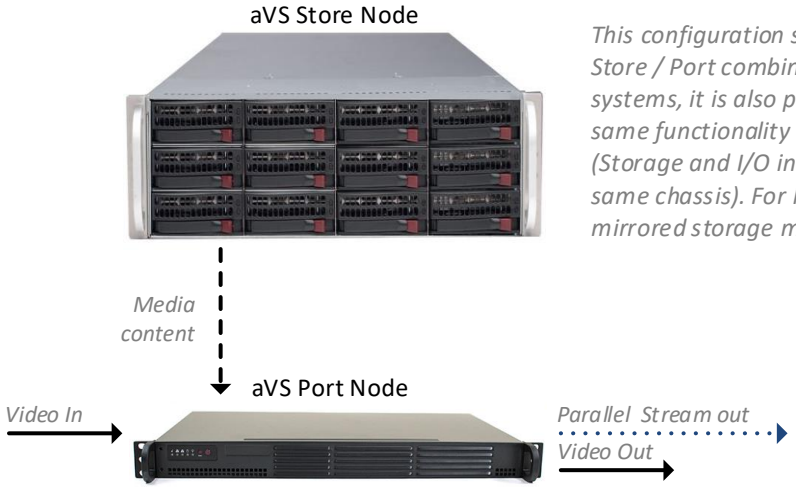
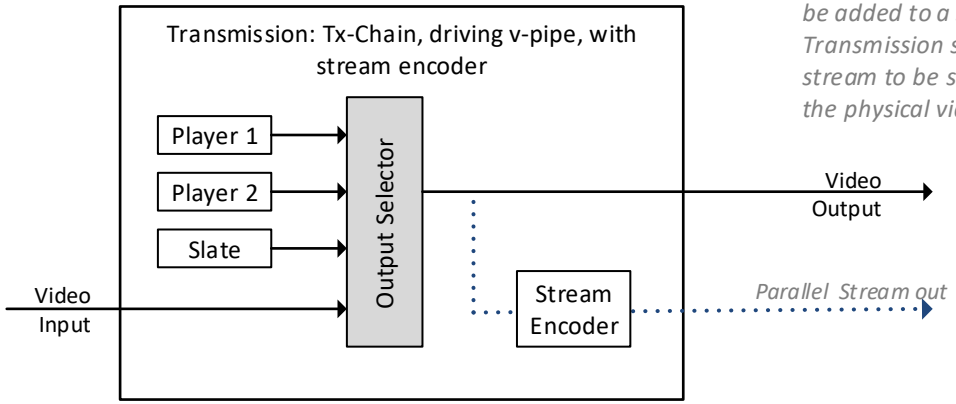
aQ Broadcast system examples – transmission playout (virtual player)		
NH	3 Feb '16	v1



This configuration shows a standard Store / Port combination. For small systems, it is also possible to achieve the same functionality with a single Hybrid (Storage and I/O included within the same chassis). For large systems, mirrored storage may be used instead.



A stream encoder component can be added to a standard Transmission server, allowing a stream to be sent in parallel with the physical video output

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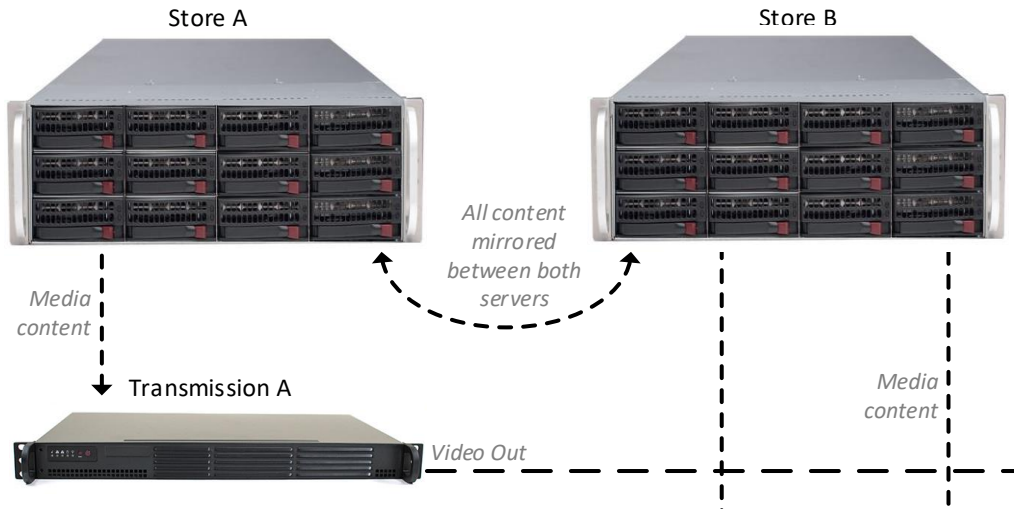
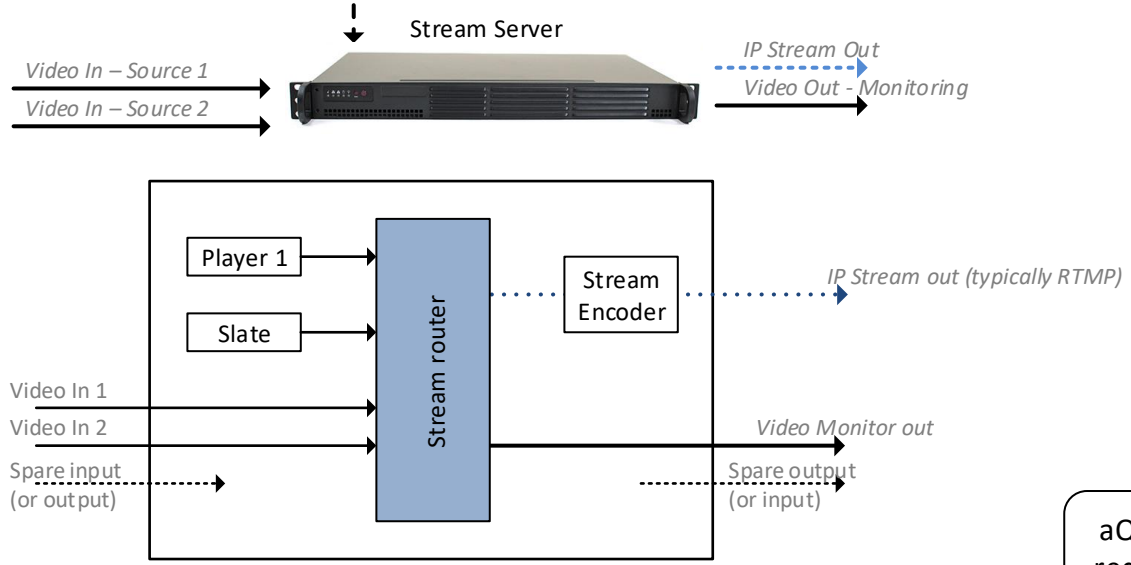
aQ Broadcast system examples – transmission (with streaming)		
NH	22 Mar '16	v1



All content is mirrored automatically between the two Stores – any clip added to either Store will be copied automatically to the other, and any clip deleted from either Store will be automatically deleted from the other.

Transmission Server A prefers to play clips from Store A, and Transmission Server B prefers to play clips from Store B. But if a Store becomes inaccessible, a Transmission Server will begin to load clips from the other.

Stream Server details:
** one video input could be fed by the studio output and another from a generic live source (e.g. a city-view cam) for instance.*
** one video output would provide video monitoring of the stream, for instance for display on the MCR video wall*
** flexible internal configuration, including one or more virtual players capable of playing back content from the mirrored storage and one or more still/logo images*
** the various internal and video sources would be switchable via the internal router, which would control both the output being streamed and the monitoring output.*
** the routing and internal clip playback would be controlled using the same Tx-Chain handling as the existing A and B servers, with the schedule originating either from QSeries or from a simpler Tx-Lite sequence list.*
** because this unit would have the same basic capability as the main Transmission servers, it could be immediately used as a spare in the event that either failed. It would essentially be a 'Transmission-C' server which could be set to play any schedule when required.*



Transmission: Tx-Chain, driving v-pipe, with stream encoder
(other configurations are possible)

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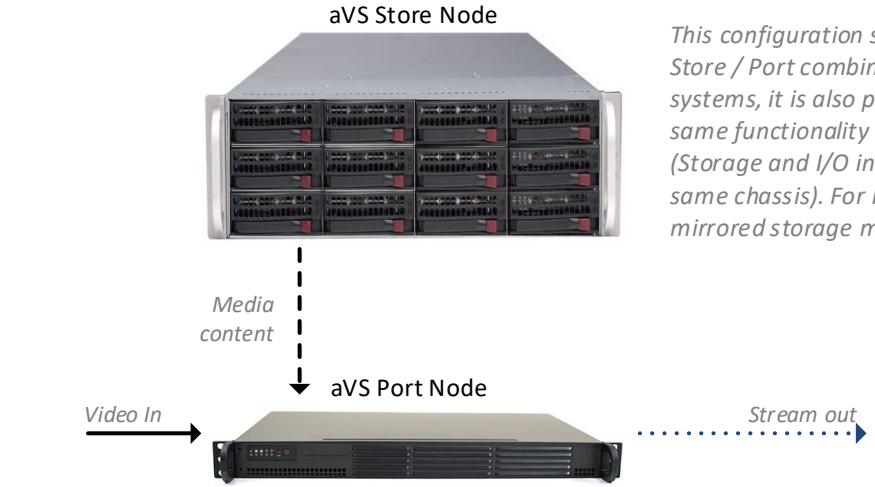
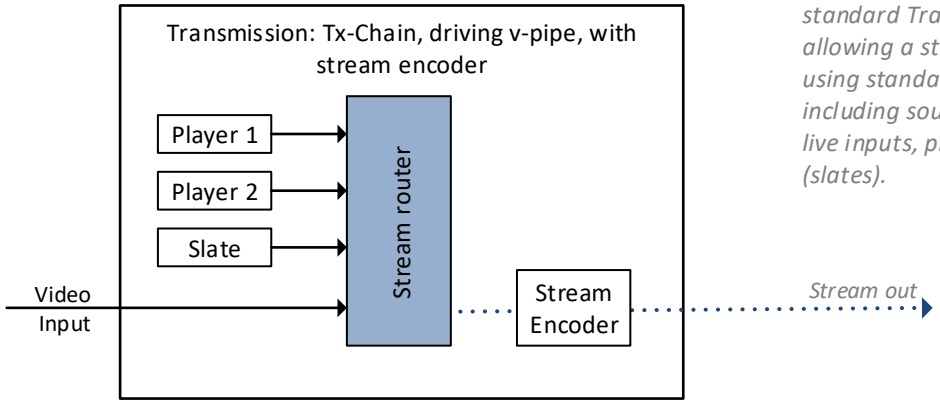
aQ Broadcast system examples – redundant transmission & stream		
NH	17 Jun '16	v1



This configuration shows a standard Store / Port combination. For small systems, it is also possible to achieve the same functionality with a single Hybrid (Storage and I/O included within the same chassis). For large systems, mirrored storage may be used instead.



A stream encoder component can be used as the single output from a standard Transmission server, allowing a stream to be controlled using standard scheduling controls, including source switching between live inputs, players and still images (slates).

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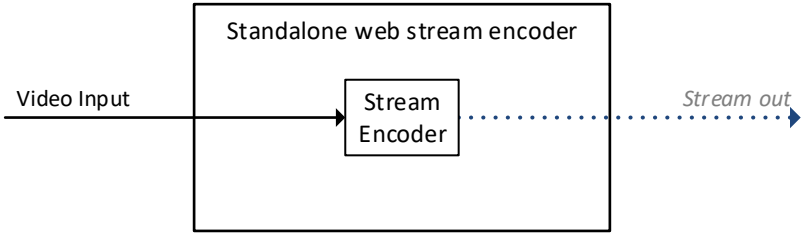
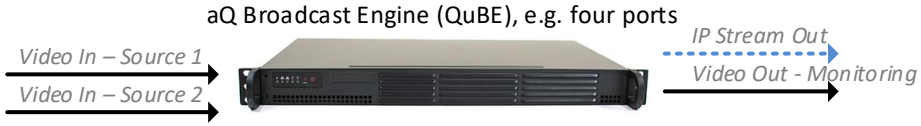
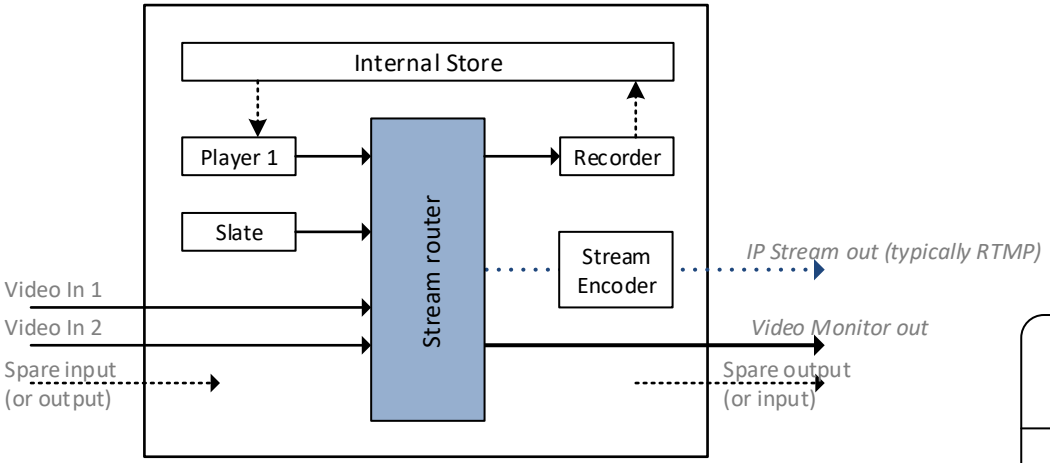
aQ Broadcast system examples – transmission (stream only)		
NH	22 Mar '16	v1

An aQ Broadcast Engine (QuBE) can be used as a simple, standalone web stream encoder, taking a video input and converting it to a web stream in RTMP format.



Alternatively, a larger QuBE could provide more elaborate functionality, for instance:
** one video input could be fed by the studio output and another from a generic live source, for example*
** one video output would provide video monitoring of the stream, for instance for display on a local video monitor*
** flexible internal configuration, including one or more virtual players capable of playing back content from the mirrored storage and one or more still/logo images*
** the various internal and video sources would be switchable via the internal router, which would control both the output being streamed and the monitoring output*
** graphics (e.g. captions or branding) could be added internally if required, reducing the requirement for external hardware*
** any internal source, or the main output, could be recorded back onto internal storage for subsequent playback or for editing purposes.*





QuBE internal structure: v-pipe with stream encoder (other configurations are possible)

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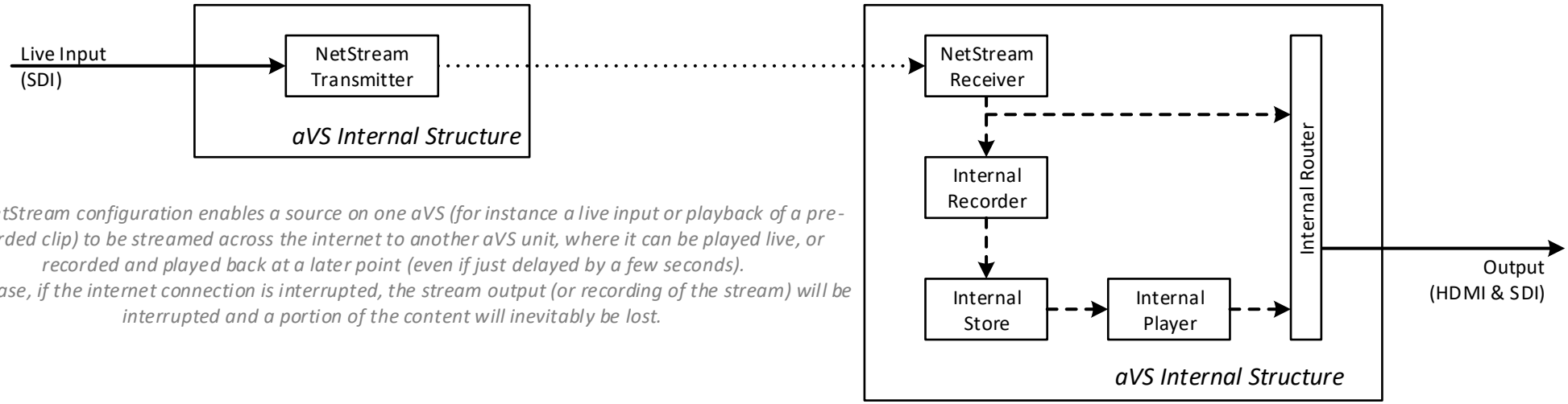
aQ Broadcast system examples – standalone Web Stream encoder		
NH	3 July '17	v1



The NetStream configuration enables a source on one aVS (for instance a live input or playback of a pre-recorded clip) to be streamed across the internet to another aVS unit, where it can be played live, or recorded and played back at a later point (even if just delayed by a few seconds).
In this case, if the internet connection is interrupted, the stream output (or recording of the stream) will be interrupted and a portion of the content will inevitably be lost.

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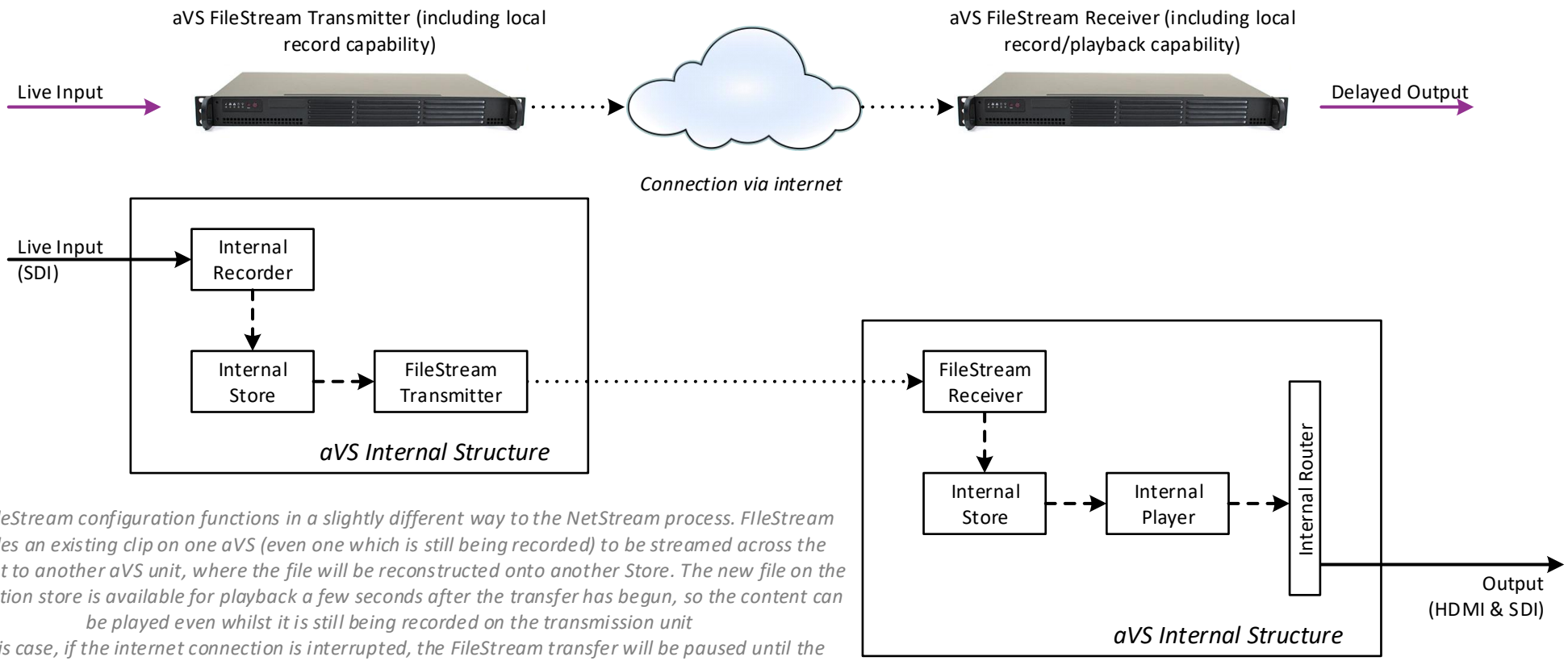
aQ Broadcast system examples – NetStream Configuration		
NH	3 Jul '17	v1



The FileStream configuration functions in a slightly different way to the NetStream process. FIleStream enables an existing clip on one aVS (even one which is still being recorded) to be streamed across the internet to another aVS unit, where the file will be reconstructed onto another Store. The new file on the destination store is available for playback a few seconds after the transfer has begun, so the content can be played even whilst it is still being recorded on the transmission unit

In this case, if the internet connection is interrupted, the FileStream transfer will be paused until the conection is re-established. This ensures that the file is transferred in its entirety, without any loss of data.

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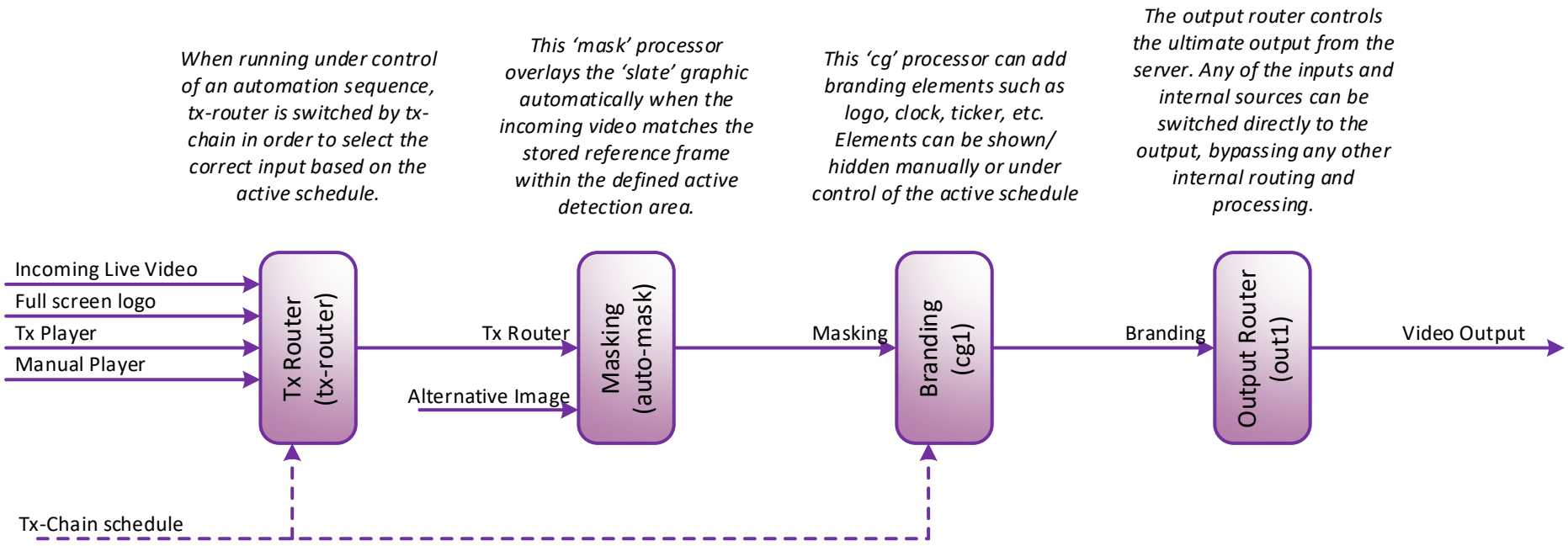
aQ Broadcast system examples – FileStream Configuration		
NH	3 Jul '17	v1



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aQ Broadcast system examples – Video Pipeline illustration		
NH	18 Apr '16	v1

Example of an aQ server configured in Video Pipeline (v-pipe) mode for Transmission / MCR use.

Media content will typically be stored on an associated aQ Storage Node.

Schedule will be managed by the Tx-Chain process, either generated locally or imported from an external traffic system.

When running under control of an automation sequence, the Tx Router is switched by Tx-Chain in order to select the correct input based on the active schedule.

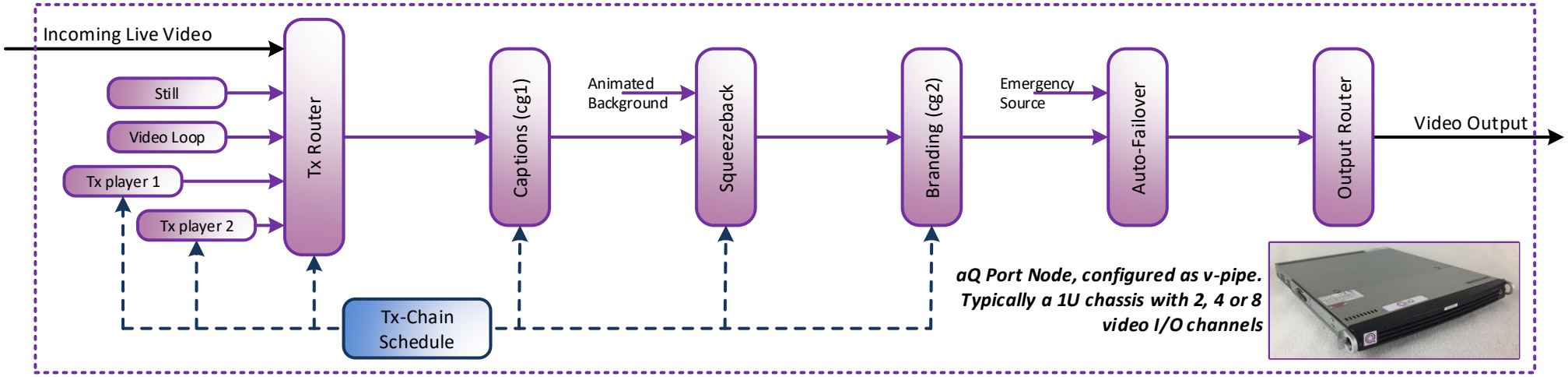
Captions (e.g. lower-thirds) can be inserted via the first cg processor, manually or under control of the Tx-Chain schedule.

The squeezeback processor can manipulate the size, shape or position of the output video. Any resulting gaps can be filled with an animated background.

The second cg processor can add branding elements such as logo, clock, ticker, etc. Elements can be managed manually or under Tx-Chain control.

The signal can be monitored for black, freeze, silence and input fault. If detected, the output will be switched to an alternative source, and restored when the fault clears.

This router controls the ultimate output from the server. Any input or source can be switched directly to the output, bypassing any other routing and processing.



aQ Port Node, configured as v-pipe. Typically a 1U chassis with 2, 4 or 8 video I/O channels

Input sources include live video, full screen still images, looping video and multiple clip players, which can be controlled manually or from the Tx-Chain. Media will typically be accessed from a separate Store node.

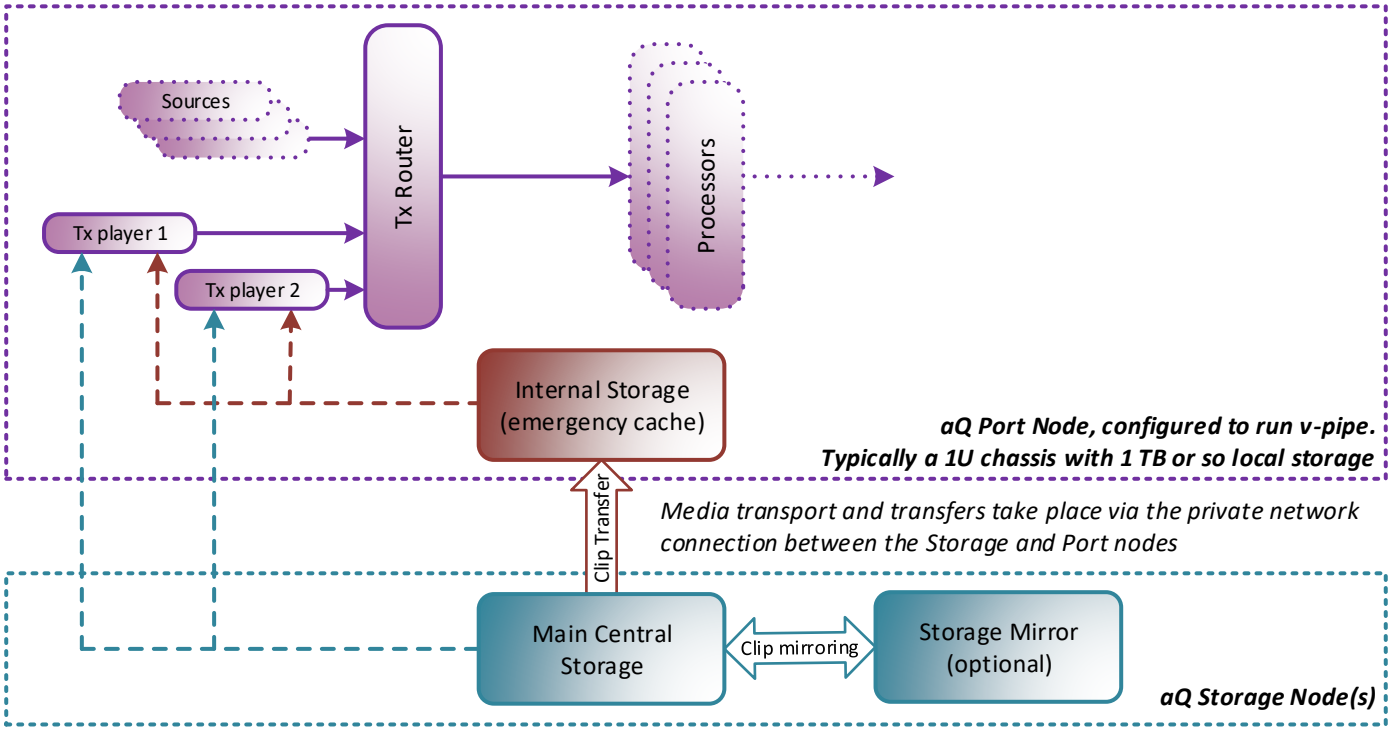
The Tx-Chain schedule controls all aspects of automated playout. The schedule may originate from an external system, either directly from traffic software or indirectly via QTx, or internally via a simple, standalone scheduler (Tx-Lite)

Each block shown above (cg1 & 2, squeezeback, auto-failover, etc.) is a processor within v-pipe. Other types of processor are available (including multi-viewer, auto-mask, audio-leveller, etc.). The number, type and arrangement of processors is flexible, allowing the v-pipe unit to be configured in different ways for different applications.

aQ Broadcast system examples – MCR/Transmission: Video Pipeline		
NH	20 Jan '17	v1

Example of aQ storage for Transmission / MCR use.

Media content will normally reside on a central aQ Storage Node and will be accessible by any media player.
Clips can be copied automatically or manually to the local cache, based on the upcoming schedule.



Players normally use content from the Main Storage. But in the case of planned maintenance or unexpected problems, clips can be played from the local internal storage instead.

Central storage can be provided by one or more Stores, where content can be mirrored automatically between stores.

aQ Storage is available in capacities from 2 TB to over 100 TB, always hardware RAID protected with redundant PSUs, in 2 – 4U.

Example of a Store node and a Port node installed at a customer site (front panels have been removed). This version of the Store provides 18 TB in 4U, with a 10 GigE NIC, and the Port node provides four I/O channels.

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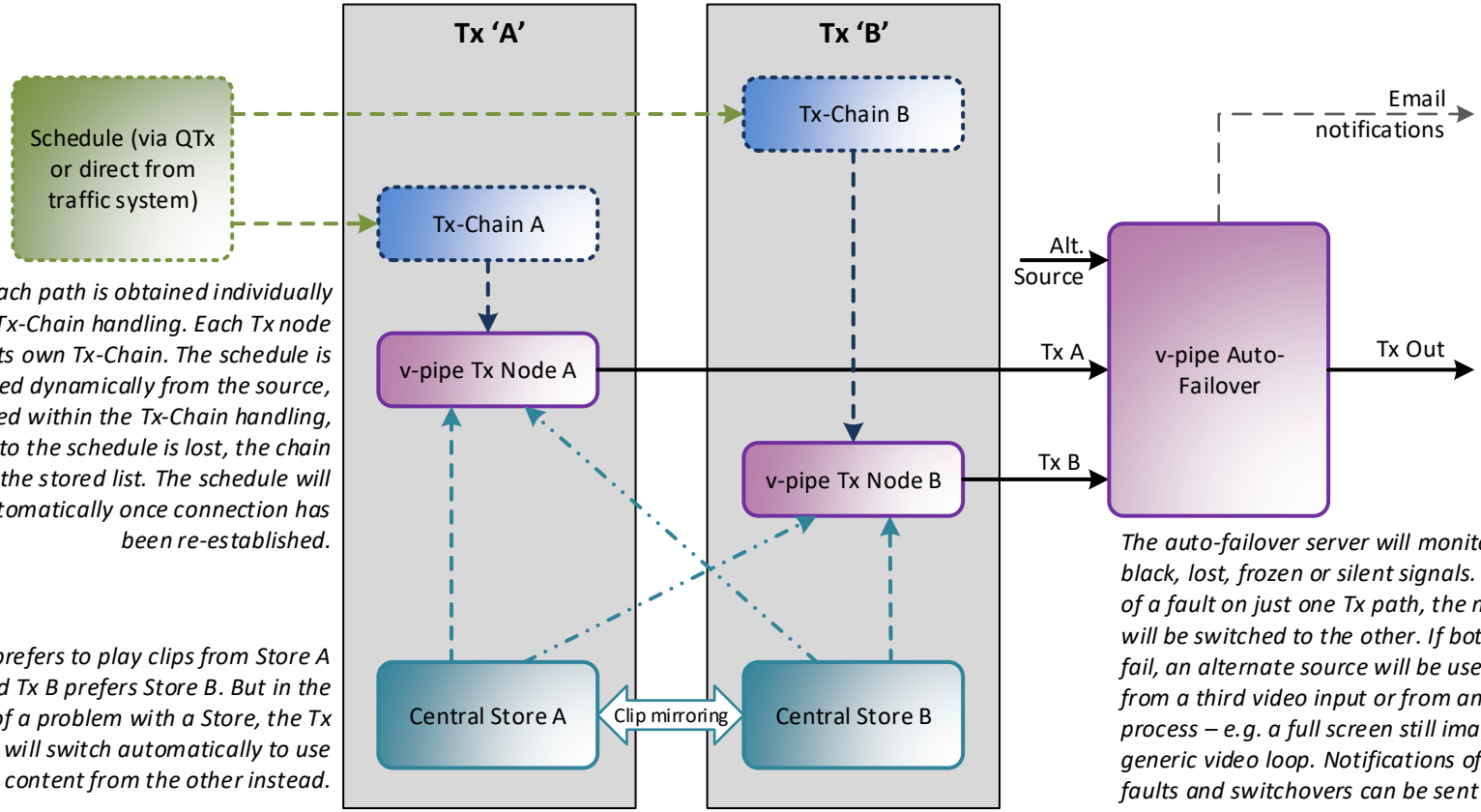
aQ Broadcast system examples – MCR/Transmission: Storage		
NH	20 Jan '17	v1

Example of aQ redundancy for Transmission / MCR use.

Use of separate Tx and Store nodes can provide two completely independent transmission paths for redundancy for one channel. A further downstream auto-failover server can switch automatically from one path to the other in the event of any failure.



The schedule for each path is obtained individually by the respective Tx-Chain handling. Each Tx node is driven from its own Tx-Chain. The schedule is normally updated dynamically from the source, but it is also cached within the Tx-Chain handling, and if connection to the schedule is lost, the chain will continue from the stored list. The schedule will be updated automatically once connection has been re-established.

Tx A prefers to play clips from Store A and Tx B prefers Store B. But in the event of a problem with a Store, the Tx node will switch automatically to use content from the other instead.

Stores are mirrored: any new clip on either server will be copied automatically to the other; any clip deleted from either server will be removed automatically from the other.

The auto-failover server will monitor inputs for black, lost, frozen or silent signals. In the event of a fault on just one Tx path, the main output will be switched to the other. If both Tx paths fail, an alternate source will be used, either from a third video input or from an internal process – e.g. a full screen still image or a generic video loop. Notifications of detected faults and switchovers can be sent out via email.

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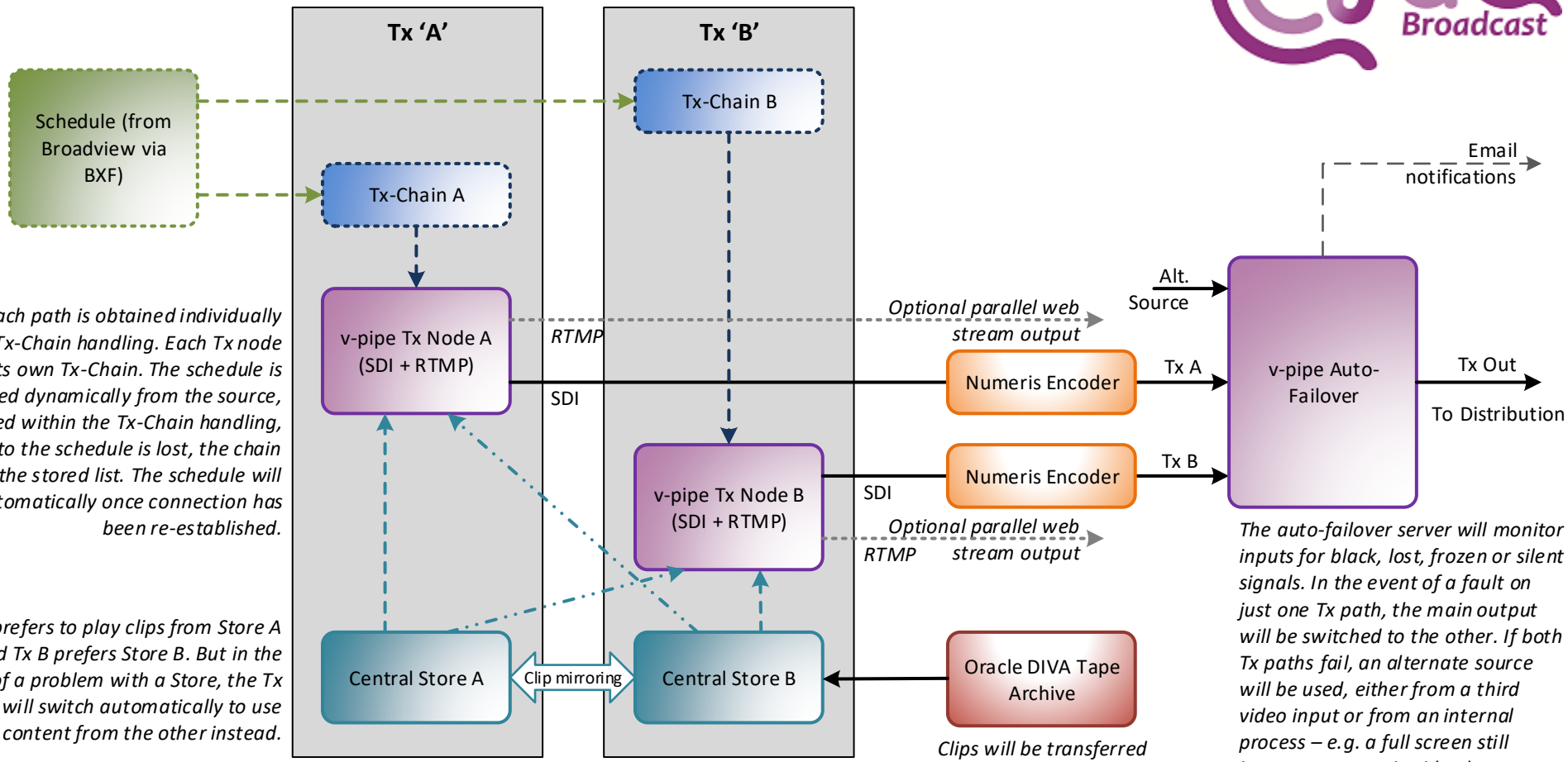
aQ Broadcast system examples – MCR/Transmission: Playout		
NH	20 Jan '17	v1

Example of aQ redundancy for Transmission / MCR use (Initial implementation, primarily SDI output).

Use of separate Tx and Store nodes can provide two completely independent transmission paths for redundancy for one channel. A further downstream auto-failover server can switch automatically from one path to the other in the event of any failure.



The schedule for each path is obtained individually by the respective Tx-Chain handling. Each Tx node is driven from its own Tx-Chain. The schedule is normally updated dynamically from the source, but it is also cached within the Tx-Chain handling, and if connection to the schedule is lost, the chain will continue from the stored list. The schedule will be updated automatically once connection has been re-established.

Tx A prefers to play clips from Store A and Tx B prefers Store B. But in the event of a problem with a Store, the Tx node will switch automatically to use content from the other instead.

Stores are mirrored: any new clip on either server will be copied automatically to the other; any clip deleted from either server will be removed automatically from the other.

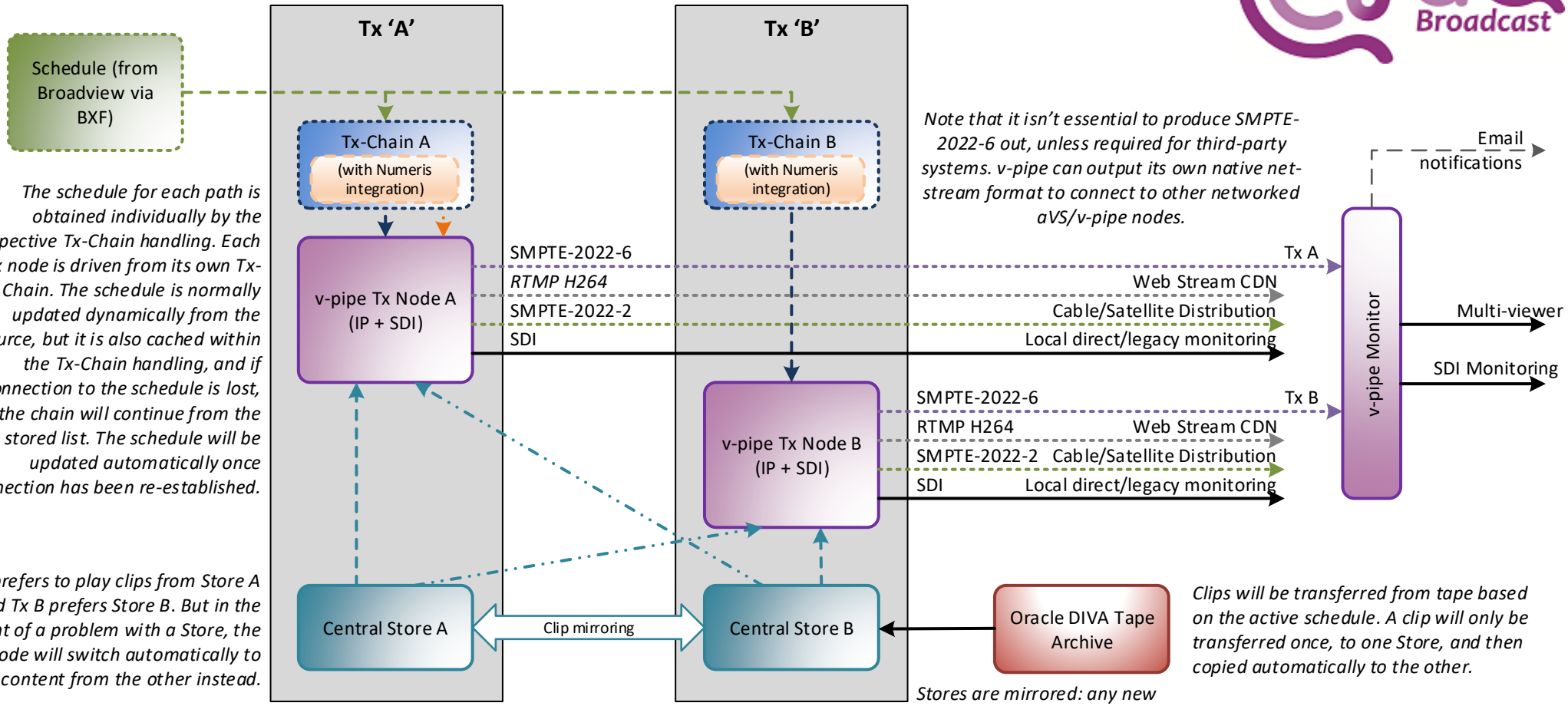
Clips will be transferred from tape based on the active schedule. A clip will only be transferred once, to one Store, and then copied automatically to the other.

The auto-failover server will monitor inputs for black, lost, frozen or silent signals. In the event of a fault on just one Tx path, the main output will be switched to the other. If both Tx paths fail, an alternate source will be used, either from a third video input or from an internal process – e.g. a full screen still image or a generic video loop. Notifications of detected faults and switchovers can be sent out via email.

aQ Broadcast system examples – MCR/Transmission: SDI Playout		
NH	16 May '17	v1

Example of aQ redundancy for Transmission / MCR use (Future configuration, with IP connectivity & Numeris integration).

Use of separate Tx and Store nodes can provide two completely independent transmission paths for redundancy for one channel.



The schedule for each path is obtained individually by the respective Tx-Chain handling. Each Tx node is driven from its own Tx-Chain. The schedule is normally updated dynamically from the source, but it is also cached within the Tx-Chain handling, and if connection to the schedule is lost, the chain will continue from the stored list. The schedule will be updated automatically once connection has been re-established.

Note that it isn't essential to produce SMPTE-2022-6 out, unless required for third-party systems. v-pipe can output its own native net-stream format to connect to other networked aVS/v-pipe nodes.

Tx A prefers to play clips from Store A and Tx B prefers Store B. But in the event of a problem with a Store, the Tx node will switch automatically to use content from the other instead.

Clips will be transferred from tape based on the active schedule. A clip will only be transferred once, to one Store, and then copied automatically to the other.

Stores are mirrored: any new clip on either server will be copied automatically to the other; any clip deleted from either server will be removed automatically from the other.

NOTE: There would be several options in relation to the migration from the initial implementation (primarily SDI) to the future configuration (full IP). These could include:
a) full replacement of each SDI node with an IP-enabled node
b) upgrade of each SDI node (e.g. by adding an IP I/O card)
c) providing a full SDI/IP node at initial installation, with IP outputs initially unused. This would involve greatest initial cost, but provide the easiest conversion path in the future.

aQ Broadcast system examples – MCR/Transmission: IP Playout		
NH	6 June '17	v1a

Example of aQ server hardware for Transmission / MCR use.

Indication of the server hardware required for independent redundant playout systems for three channels

1U aVS Utility Server 1

1U aVS Utility Server 2

A Utility server, running aVS firmware, can handle background functions such as transcodes, transfers and uploads.

1U v-pipe Tx Node 1-A

1U v-pipe Tx Node 1-B

1U v-pipe auto-failover 1

Channel 1

Two Tx nodes provide dual, redundant playout. Each runs their own Tx-Chain process.

The auto-failover server can switch between transmission paths in the event of a problem.

1U v-pipe Tx Node 2-A

1U v-pipe Tx Node 2-B

1U v-pipe auto-failover 2

Channel 2

Depending upon the precise requirement, it could be possible to run two channels (e.g. HD & SD) from a single pair of v-pipe nodes, each generating two different outputs (with different sets of graphics) from the same schedule. This would reduce the number of individual units required.

1U v-pipe Tx Node 3-A

1U v-pipe Tx Node 3-B

1U v-pipe auto-failover 3

Channel 3

4U Central Store A

Mirrored Stores provide redundant storage for all media across all channels. Capacity and capability of units will determine their physical size.

4U Central Store B

Note – RU sizes are indicative only: different configurations may require different chassis sizes

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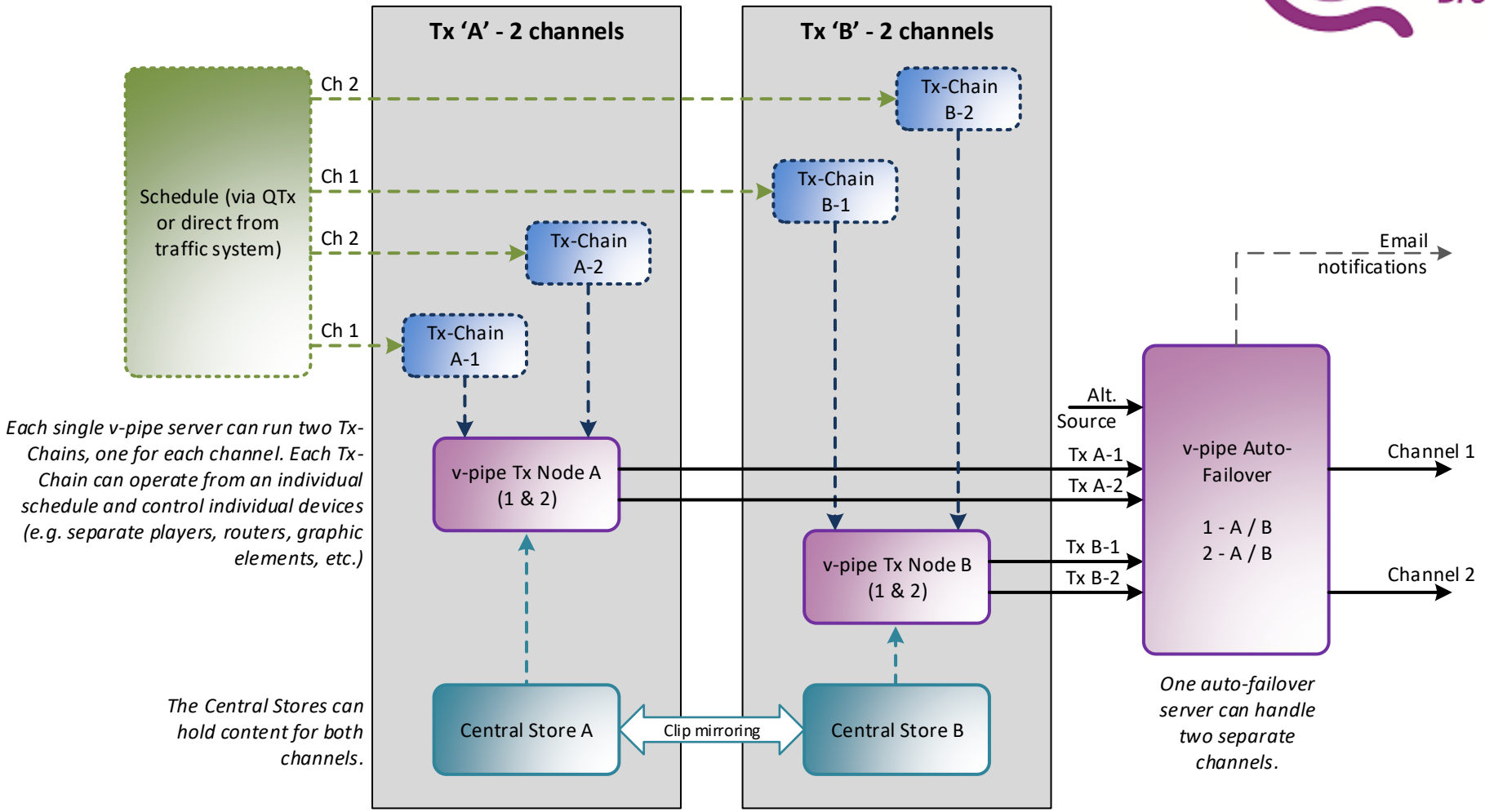
aQ Broadcast system examples – MCR/Transmission: Hardware		
NH	16 May '17	v1

Example of aQ redundancy for two channels for Transmission / MCR use.

Use of separate Tx and Store nodes can provide two completely independent transmission paths for two separate channels, using the same hardware as for one. Of course, the system could also be duplicated completely for additional resilience.



Each single v-pipe server can run two Tx-Chains, one for each channel. Each Tx-Chain can operate from an individual schedule and control individual devices (e.g. separate players, routers, graphic elements, etc.)

The Central Stores can hold content for both channels.

One auto-failover server can handle two separate channels.

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aQ Broadcast system examples – MCR/Transmission: Dual Playout		
NH	20 Jan '17	v1

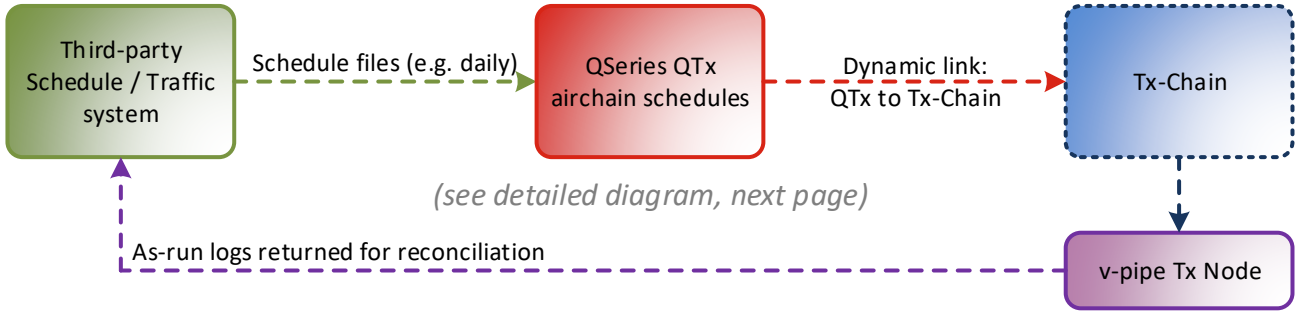
Example of aQ scheduling for Transmission / MCR use.

Schedules generated in external systems can be used by Tx-Chain for playout, either directly or indirectly via the QSeries QTx transmission automation software application. As-run logs can be returned for reconciliation.

QSeries (QTx) model - indirect schedule transfers with dynamic updates

The schedule from the external system is converted to linked 'airchains' within QTx. The length of each airchain is configurable, but might, for instance, be 8 hours, with three airchains per day. Each airchain can be updated from any QSeries Client application running on any networked PC, meaning that the scheduling team or the operational team can make further changes to transmission – if necessary, up to and including the next item.

Daily schedules are produced and managed within an external scheduling/traffic system. When appropriate (perhaps daily) a final schedule will be produced and exported to QTx.



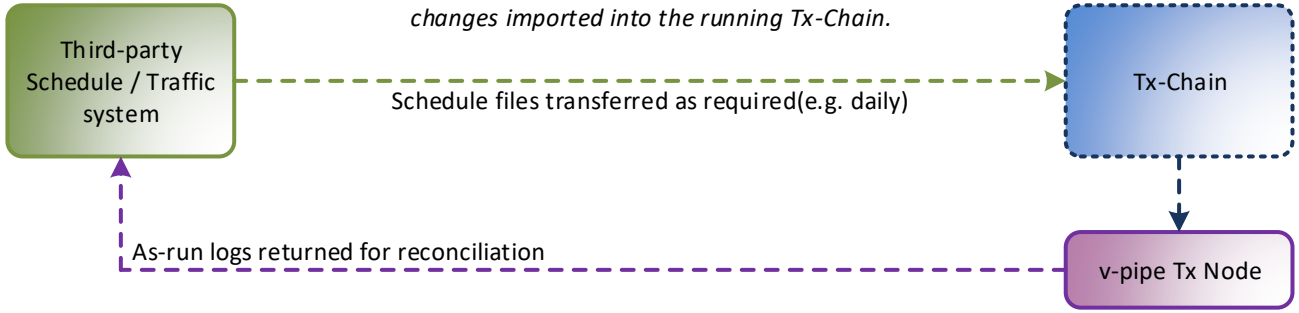
(see detailed diagram, next page)

Tx-Chain drives the Tx node based on schedules for clip, graphic, source and event occurrences originally obtained from the third-party system, but with dynamic/immediate updates where necessary from airchains managed by QTx.

ALTERNATIVELY

Direct model - schedule transfers/ updates directly into Tx-Chain

Schedules can be transferred directly to the Tx-Chain, without QTx being involved or required. This can provide a simpler implementation when regular updates to the transmission output are not regularly required. When changes are necessary, a schedule can be re-exported and changes imported into the running Tx-Chain.



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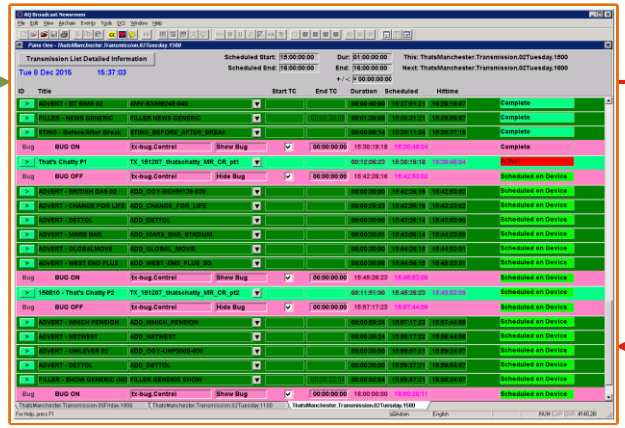
aQ Broadcast system examples – MCR/Transmission: Scheduling		
NH	20 Jan '17	v1

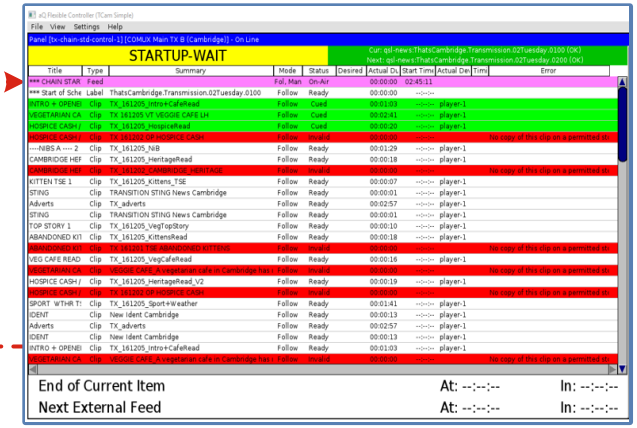
Example of aQ QTx scheduling for Transmission / MCR use.

QSeries QTx software can be used as a multi-user interface for management of the Tx-Chain schedules: multiple users can manipulate transmission schedules, with updates passed dynamically to v-pipe.


```
....
10000000 Item_01 C90010 00010000
10010000 Item_02 C90020 00050000
10060000 Item_03 C90030 00023000
10083000 Bump_04 B20001 00010000
10093000 Spot_05 S80010 00003000
10100000 Spot_06 S80020 00003000
10103000 Spot_07 S80030 00003000
10110000 Spot_08 S80040 00010000
10120000 Bump_09 B20002 00010000
10130000 Item_10 C90040 00053000
10180300 Item_11 C90050 00020000
....
```

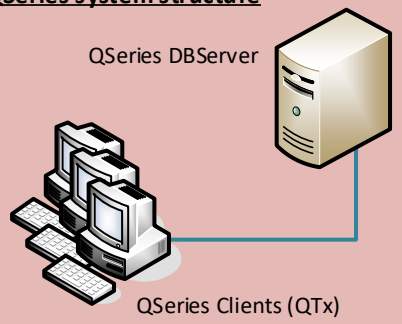
Daily schedules can be produced and managed within an external scheduling/traffic system. When appropriate (perhaps daily) a final schedule will be produced and exported to QTx.



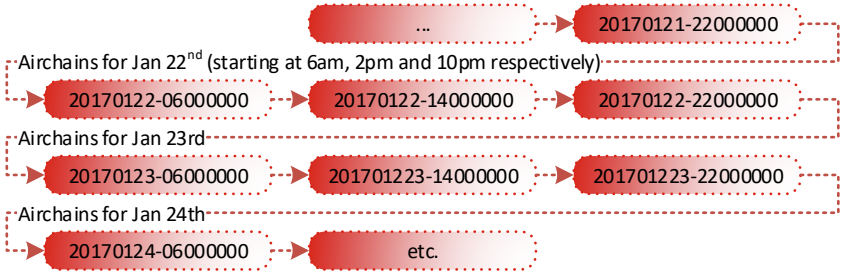


Tx-Chain drives the Tx node based on schedules for clip, graphic, source and event occurrences originally obtained from the third-party system, but with dynamic/immediate updates where necessary from airchains managed by QTx. The Tx-Chain status can be managed / monitored from any networked workstation using the FMC application and status from the current schedule is also available within the QTx Client.

QSeries system structure



QTx Clients (based on concurrent user licences), optionally including browse functionality running on PC workstations. Multiple users can work together on the schedules, with changes and status passed dynamically in both directions.

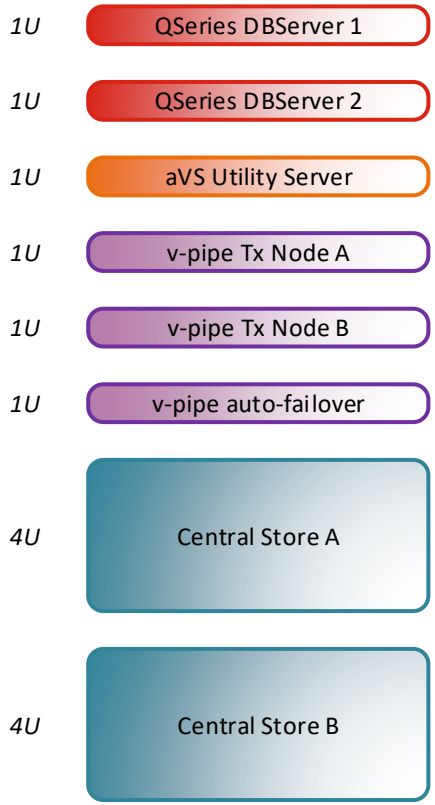


The schedule from the external system is converted to linked 'airchains' within QTx. The length of each airchain is configurable, but might, for instance, be 8 hours with three airchains per day. Each airchain can be updated from any QSeries Client application running on any networked PC, meaning that the scheduling team or the operational team can make changes to transmission – if necessary, up to and including the next item. Current status from the Tx-Chain is shown directly within the airchain, and any change to the list is reflected immediately in the playout schedule.

aQ Broadcast system examples – MCR/Transmission: QTx Scheduling		
NH	22 Jan '17	v1

Example of aQ server hardware for Transmission / MCR use.

Indication of the server hardware required for a redundant playout system using QTx.
In this configuration, 8 servers (two Windows, six Linux-based aVS) can provide full resilience for one channel.



QSeries can operate as a clustered pair of database servers, where all data and configuration is mirrored automatically between both servers. A single server can be used instead if desired.

A Utility server, running aVS firmware, can handle background functions such as transcodes, transfers and uploads.

Two Tx nodes provide dual, redundant playout. Each runs their own Tx-Chain process.

The auto-failover server can switch between transmission paths in the event of a problem.

Mirrored Stores provide redundant storage for all media. Capacity and capability of units will determine their physical size.

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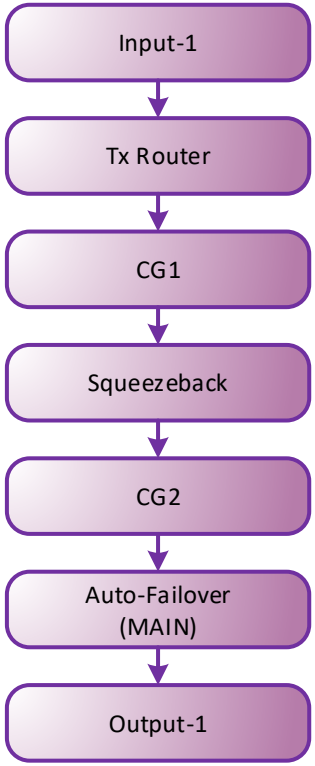
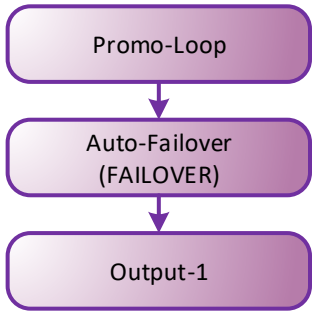
aQ Broadcast system examples – MCR/Transmission: Hardware		
NH	20 Jan '17	v1

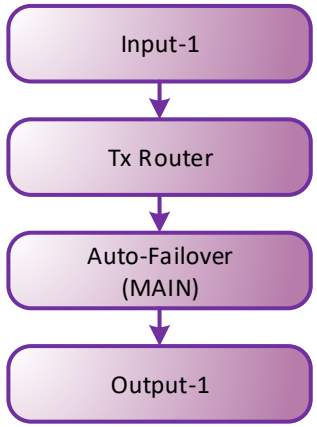
Example of routing within an aQ server configured in Video Pipeline (v-pipe) mode for Transmission / MCR use.



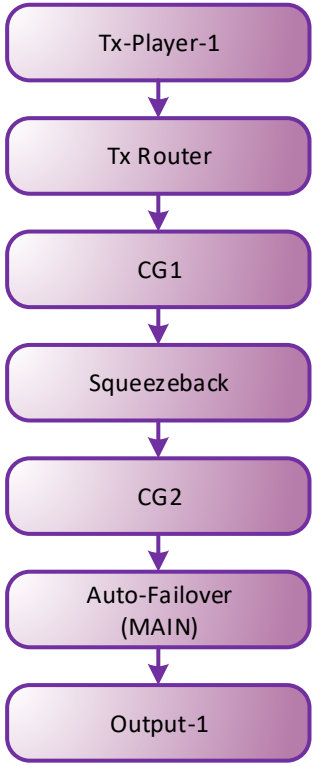
Normal operation – e.g. currently the live feed is on-air



Emergency operation – for instance, if the live input has frozen



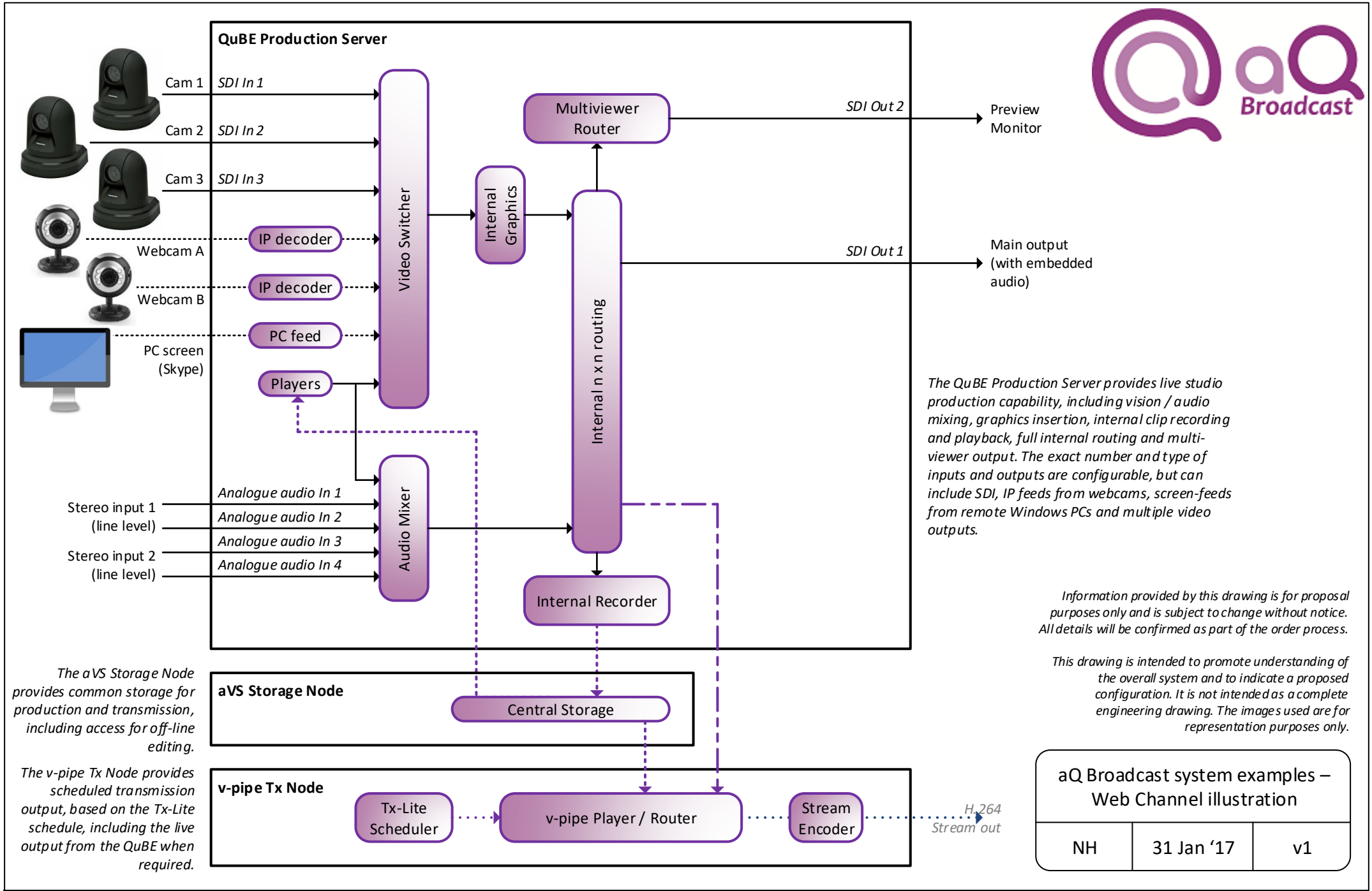
Bypassed operation – e.g. the graphics, branding and squeeze processors have been removed from the chain temporarily



Normal operation – e.g. currently the main transmission player is on-air

Each block shown here (cg1 & 2, squeezeback, auto-failover, etc.) is a processor within v-pipe. Other types of processor are available (including multi-viewer, auto-mask, audio-leveller, etc.). The number, type and arrangement of processors is flexible, allowing the v-pipe unit to be configured in different ways for different applications. The active routing can be altered, both manually by the operator and automatically by the system, in response to different live situations.

aQ Broadcast system examples – MCR/Transmission: Video Pipeline		
NH	10 Mar '17	v1


QuBE Production Server
Cam 1
SDI In 1
Cam 2
SDI In 2
Cam 3
SDI In 3
Webcam A
Webcam B
PC screen
(Skype)
IP decoder
IP decoder
PC feed
Players
Video Switcher
Internal Graphics
Multiviewer Router
Internal n x n routing
SDI Out 2
Preview Monitor
SDI Out 1
Main output
(with embedded audio)
Stereo input 1
(line level)
Stereo input 2
(line level)
Analogue audio In 1
Analogue audio In 2
Analogue audio In 3
Analogue audio In 4
Audio Mixer
Internal Recorder
The QuBE Production Server provides live studio production capability, including vision / audio mixing, graphics insertion, internal clip recording and playback, full internal routing and multi-viewer output. The exact number and type of inputs and outputs are configurable, but can include SDI, IP feeds from webcams, screen-feeds from remote Windows PCs and multiple video outputs.
Information provided by this drawing is for proposal purposes only and is subject to change without notice. All details will be confirmed as part of the order process.
This drawing is intended to promote understanding of the overall system and to indicate a proposed configuration. It is not intended as a complete engineering drawing. The images used are for representation purposes only.
The aVS Storage Node provides common storage for production and transmission, including access for off-line editing.
aVS Storage Node
Central Storage
The v-pipe Tx Node provides scheduled transmission output, based on the Tx-Lite schedule, including the live output from the QuBE when required.
v-pipe Tx Node
Tx-Lite Scheduler
v-pipe Player / Router
Stream Encoder
H.264
Stream out
aQ Broadcast system examples – Web Channel illustration
NH
31 Jan '17
v1
Newsroom, Video Server & Media Management Broadcast Solutions

Example of aQ server hardware for Web Channel use

Indication of the server hardware required for a complete production / transmission system

In this configuration, four servers (one Windows, three Linux-based aVS) can provide full capability for one channel.

Rack sizes are indicative and will depend on the exact hardware configuration selected

1U	PC (Skype)	*Windows PC provides platform for Skype communication*
1U	v-pipe Tx Node	*Tx node provides streamed playout, based on Tx-Lite schedule (including live inserts from the studio)*
3U	QuBE	*QuBE provides functionality for studio production, including mixing, graphics, clip playback, and internal recording.*
2U	aVS Central Store	*Central Store provides storage capacity for recording and playback purposes, including clip playback into the studio and sequenced playout for transmission*

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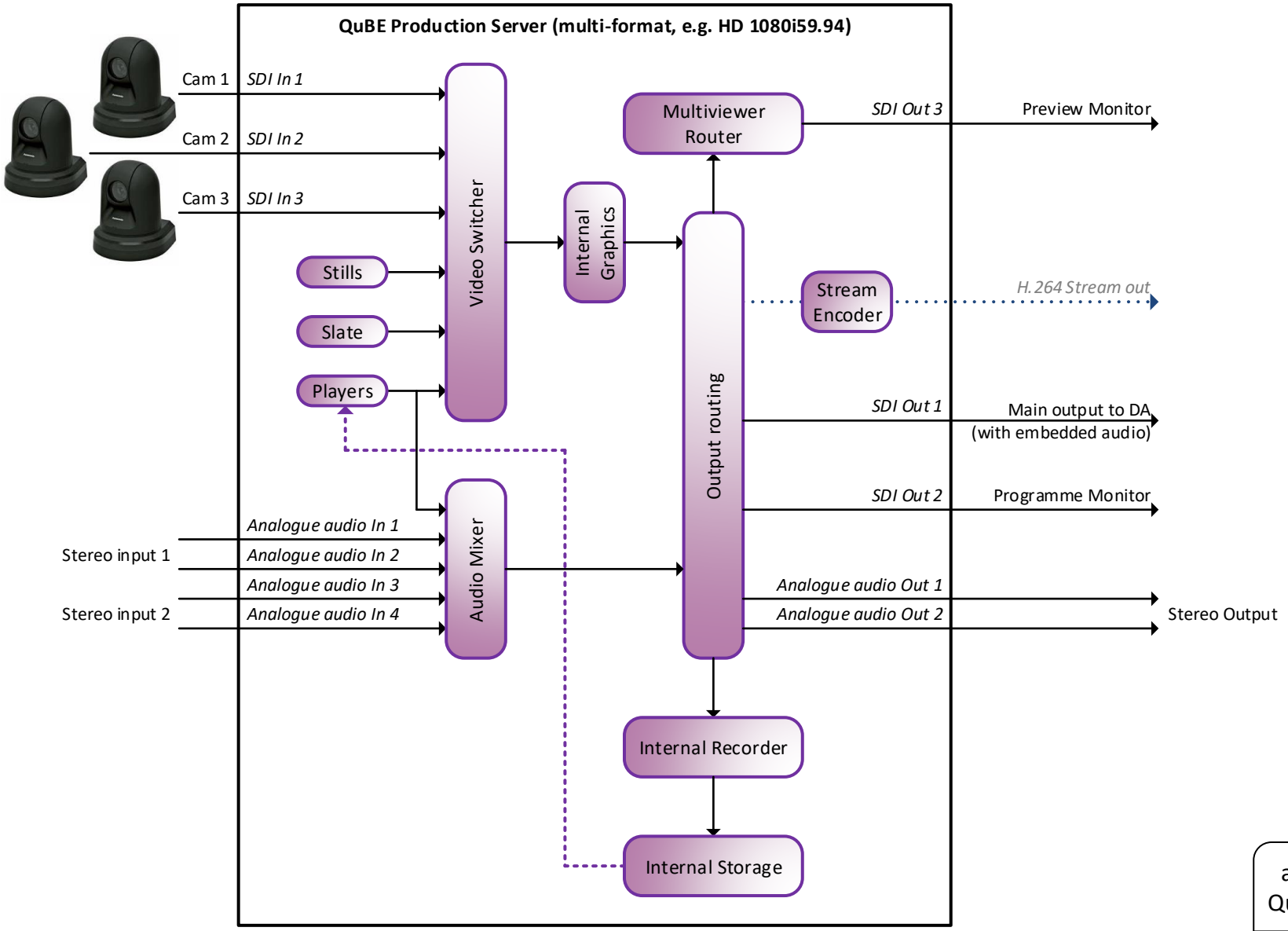
aQ Broadcast system examples – Web Channel: Hardware		
NH	31 Jan '17	v1



Information provided by this drawing is for proposal purposes only and is subject to change without notice. All details will be confirmed as part of the order process.

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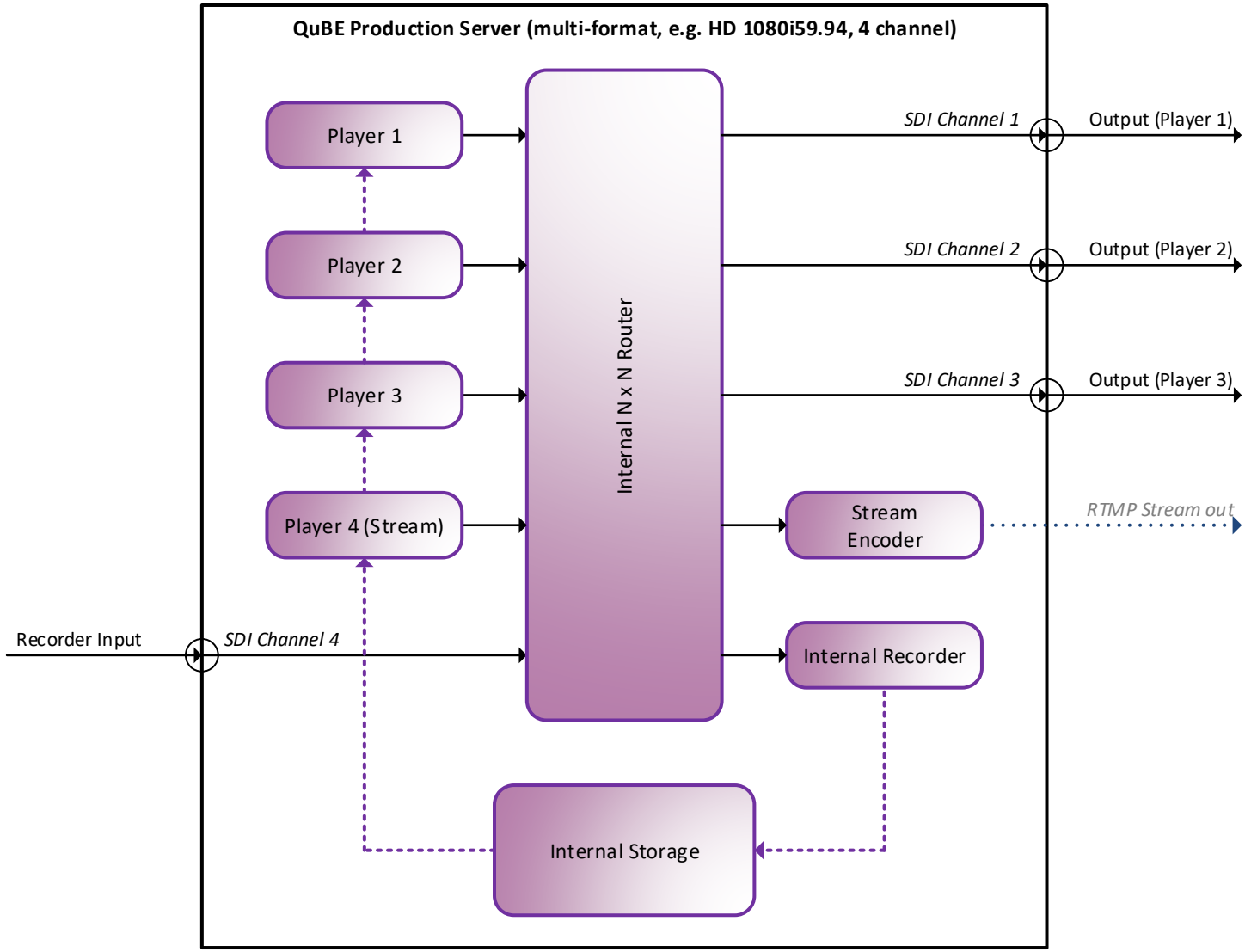
aQ Broadcast system examples – QuBE Production Server illustration		
NH	18 Nov '16	v1



Information provided by this drawing is for proposal purposes only and is subject to change without notice. All details will be confirmed as part of the order process.

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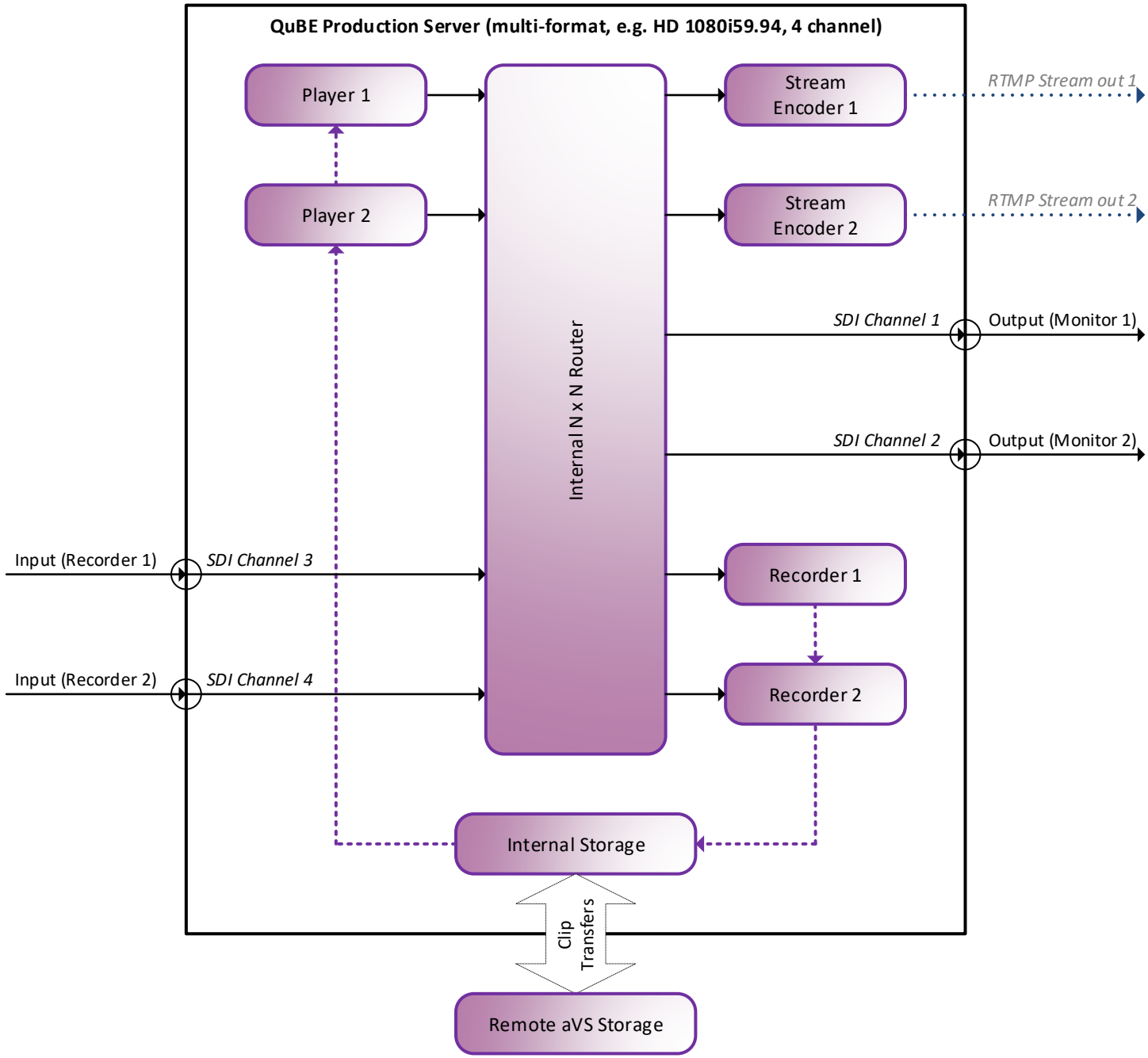
aQ Broadcast system examples – QuBE Production Server (hybrid #1)		
NH	18 Jan '17	v1



Information provided by this drawing is for proposal purposes only and is subject to change without notice. All details will be confirmed as part of the order process.

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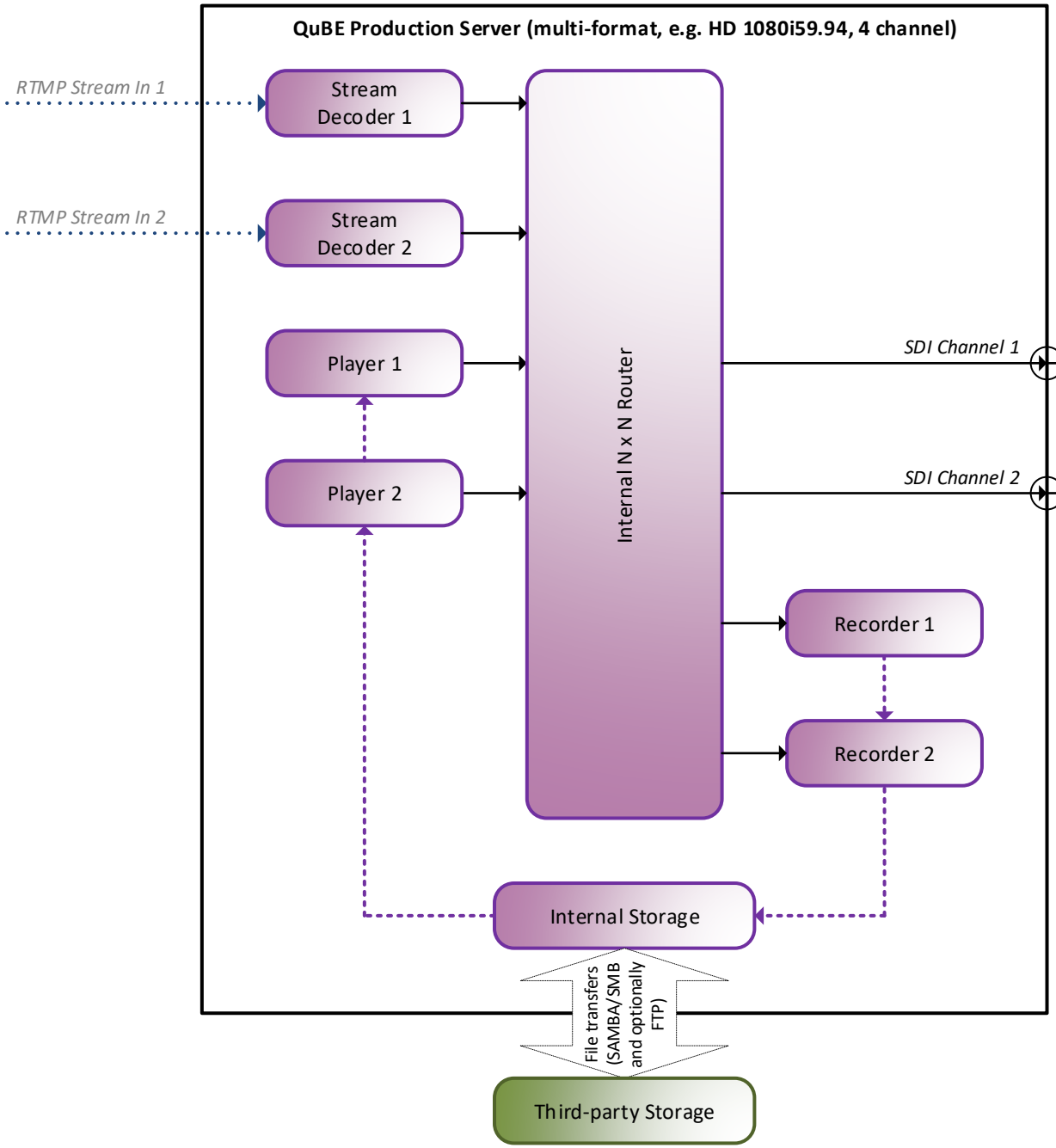
aQ Broadcast system examples – QuBE Production Server (hybrid #2)		
NH	18 Jan '17	v1



The type, number and arrangement of the internal 'v-pipe' processors (decoders, players, recorders, signal generators, stills, graphics, picture-in-picture, auto-mask, auto-failover, etc.) is flexible and configurable, dependent ultimately upon the resources of the hardware platform in use. This provides a very flexible approach for a wide range of applications.

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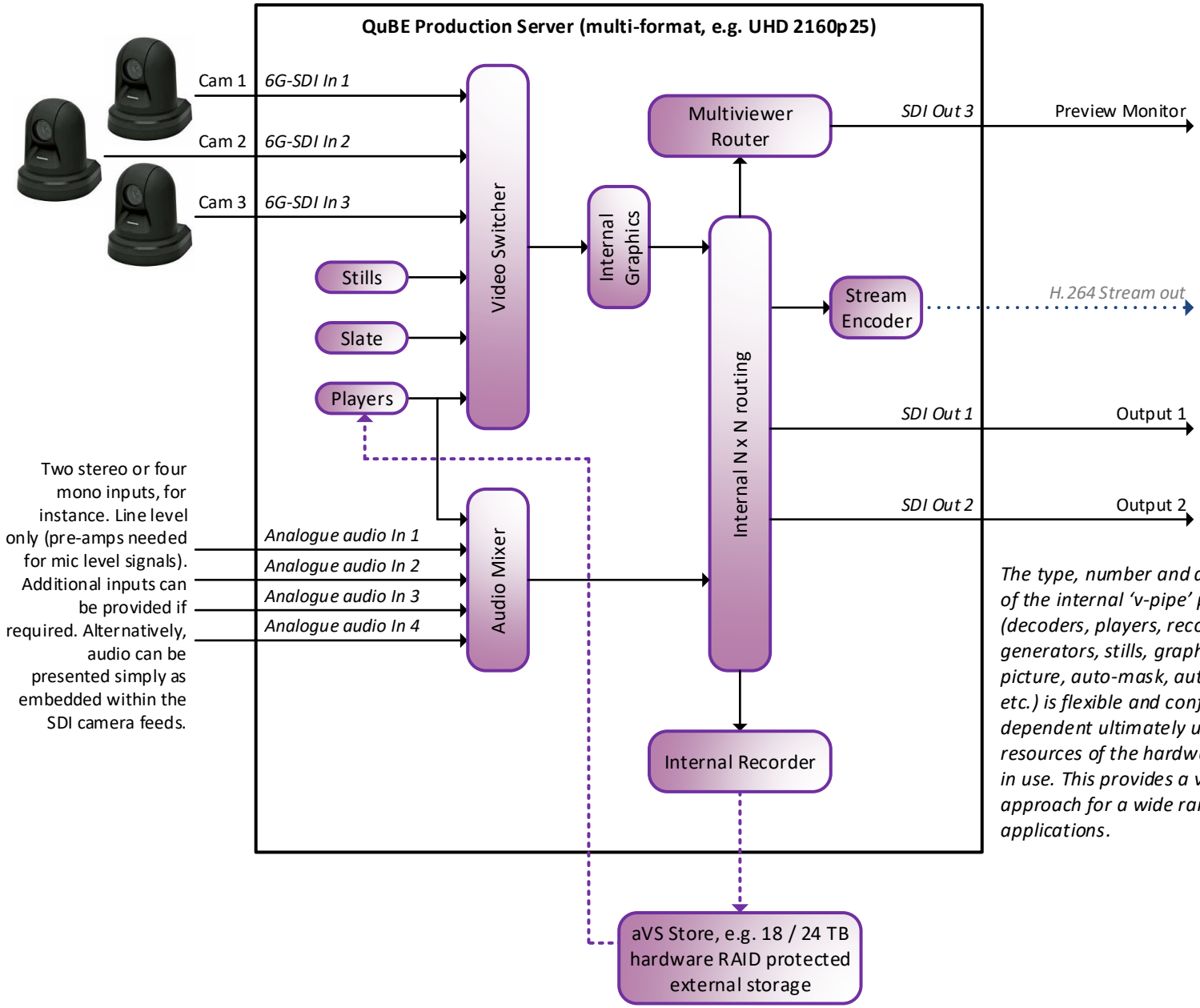
aQ Broadcast system examples – QuBE Production Server (hybrid #3)		
NH	28 Jan '17	v1



The type, number and arrangement of the internal 'v-pipe' processors (decoders, players, recorders, signal generators, stills, graphics, picture-in-picture, auto-mask, auto-failover, etc.) is flexible and configurable, dependent ultimately upon the resources of the hardware platform in use. This provides a very flexible approach for a wide range of applications.

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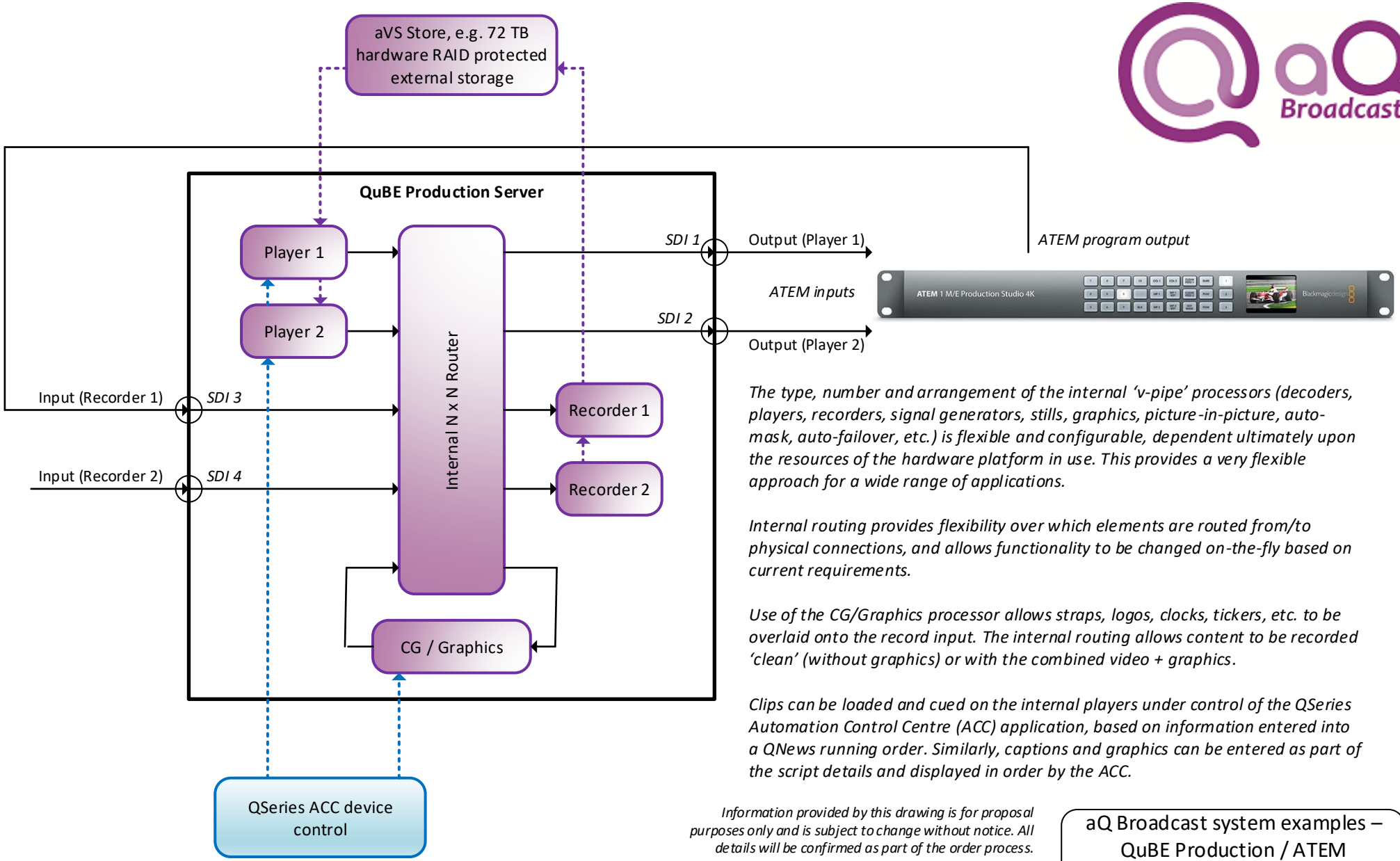
aQ Broadcast system examples – QuBE Production Server illustration		
NH	8 Feb '17	v1



The type, number and arrangement of the internal 'v-pipe' processors (decoders, players, recorders, signal generators, stills, graphics, picture-in-picture, auto-mask, auto-failover, etc.) is flexible and configurable, dependent ultimately upon the resources of the hardware platform in use. This provides a very flexible approach for a wide range of applications.

Internal routing provides flexibility over which elements are routed from/to physical connections, and allows functionality to be changed on-the-fly based on current requirements.

Use of the CG/Graphics processor allows straps, logos, clocks, tickers, etc. to be overlaid onto the record input. The internal routing allows content to be recorded 'clean' (without graphics) or with the combined video + graphics.

Clips can be loaded and cued on the internal players under control of the QSeries Automation Control Centre (ACC) application, based on information entered into a QNews running order. Similarly, captions and graphics can be entered as part of the script details and displayed in order by the ACC.

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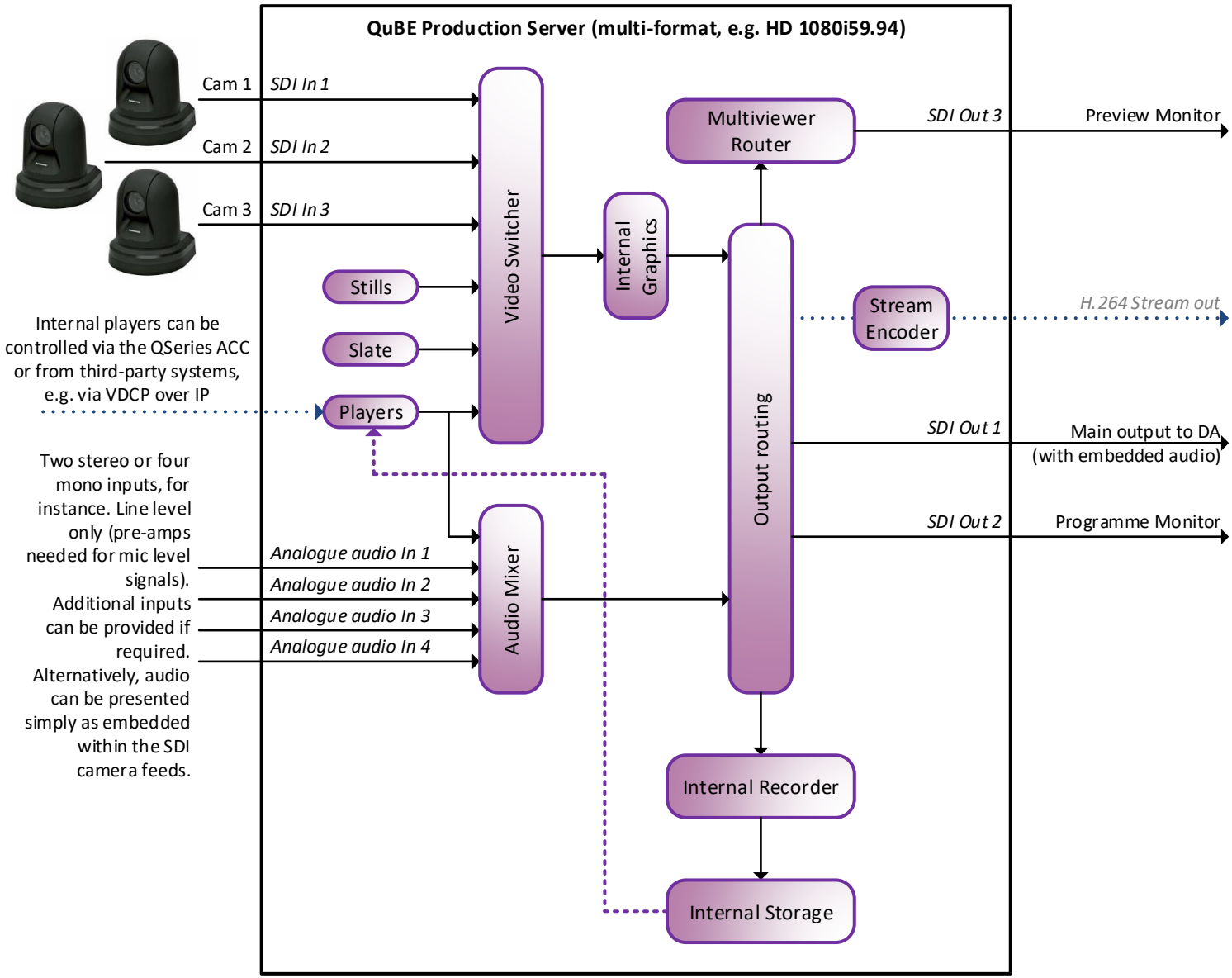
aQ Broadcast system examples – QuBE Production / ATEM illustration		
NH	6 Apr '17	v1



The type, number and arrangement of the internal 'v-pipe' processors (decoders, players, recorders, signal generators, stills, graphics, squeezeback, promo, picture-in-picture, auto-mask, auto-failover, etc.) is flexible and configurable, dependent ultimately upon the resources of the hardware platform in use. This provides a very flexible approach for a wide range of applications.

In this example, a QuBE has been configured as a 3-input, 3-output production system, including a multi-viewer output. Multiple internal clip players can be configured, alongside static stills and slate elements. Content can be recorded, stored and played back using the internal storage. Graphics can be inserted over any feed (live or internal) and multiple graphic renderers can be configured, each with multiple layers – for instance to allow standard lower-third captions and branding elements such as logo, clock, ticker, sidebar, etc. As an option, the program feed can be streamed (e.g. as RSMP) in parallel with the standard video SDI output.

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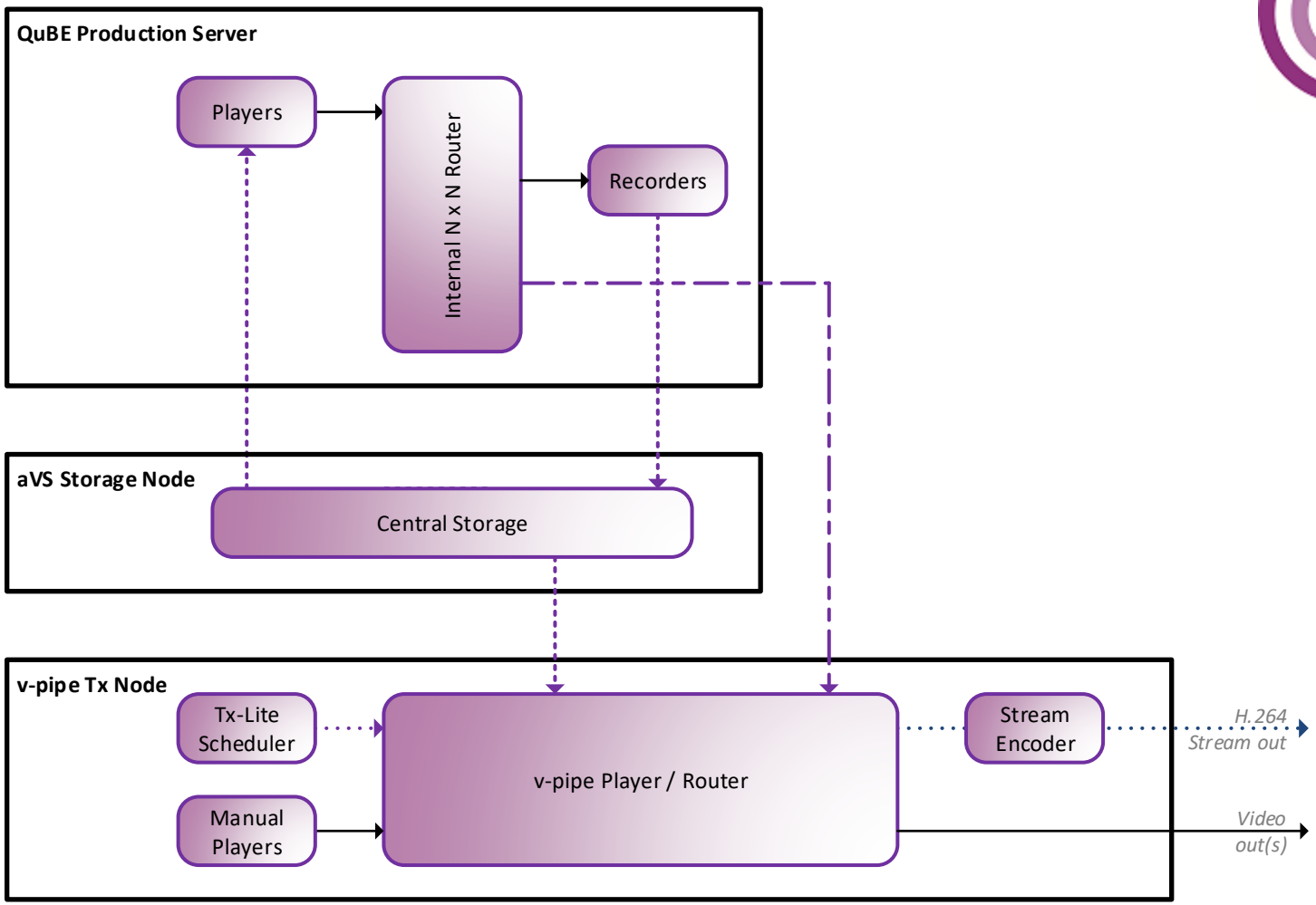
aQ Broadcast system examples – QuBE Production Server illustration		
NH	18 Nov '16	v1

The QuBE Production Server supports live studio production capability, including graphics insertion, internal clip recording and playback, full internal routing and multi-viewer output. The exact number and type of inputs and outputs are configurable.

The aVS Storage Node provides common storage for production and transmission, including access for off-line editing.

The v-pipe Tx Node provides scheduled transmission output, based on the Tx-Lite schedule, including a live output from the QuBE if required.



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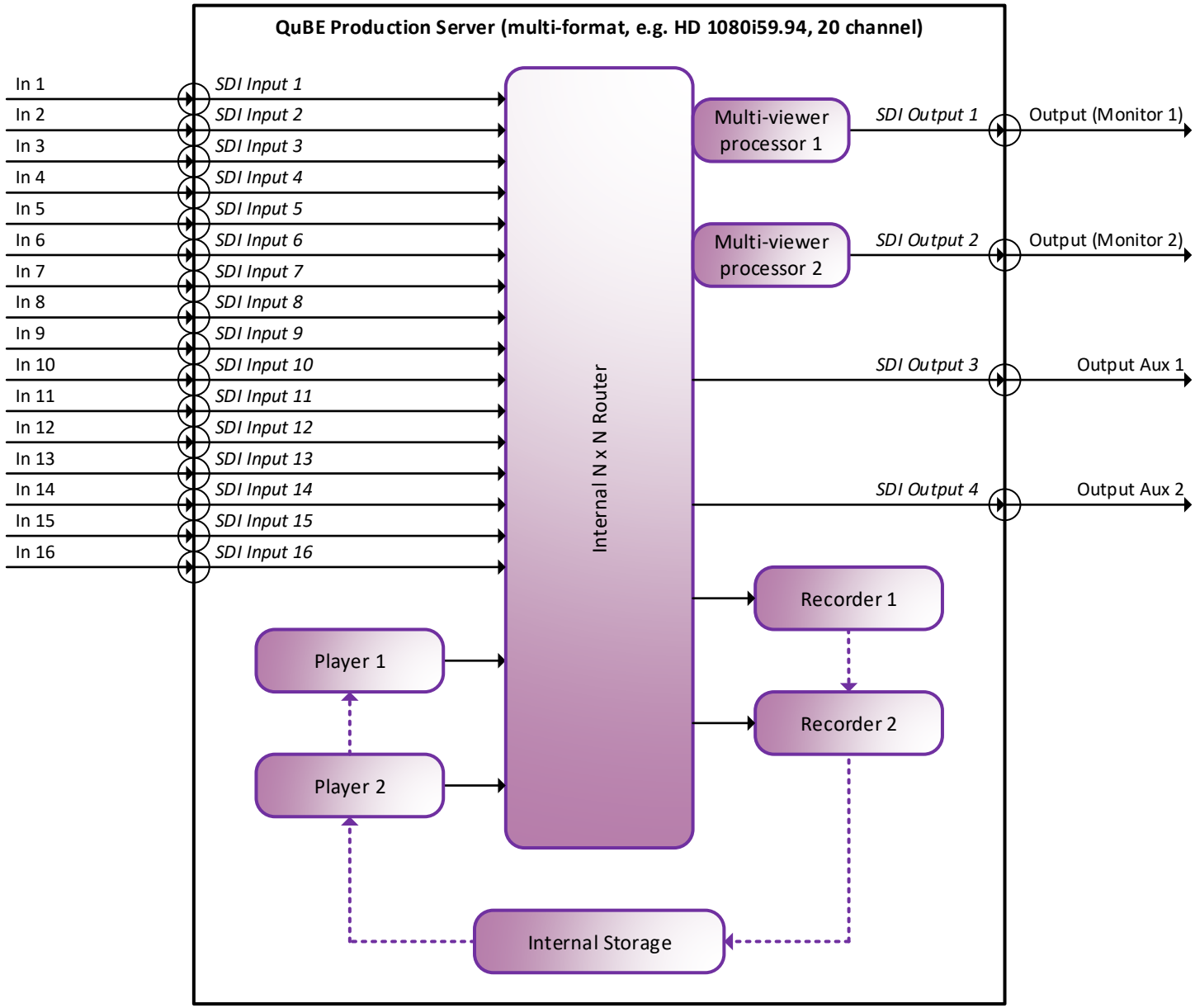
aQ Broadcast system examples – combined Store/QuBE/Tx example		
NH	6 Apr '17	v1



The type, number and arrangement of the internal 'v-pipe' processors (decoders, players, recorders, signal generators, stills, graphics, picture-in-picture, auto-mask, auto-failover, etc.) is flexible and configurable, dependent ultimately upon the resources of the hardware platform in use. This provides a very flexible approach for a wide range of applications.

In this example, a QuBE has been configured as a hybrid multi-viewer / recorder / player. 16 SDI inputs can be routed in any combination into either of two multi-viewer outputs. The layout of the multi-viewers can be configured independently (or ganged together), and the output position of each source can be controlled via the routing. Additional 'signal generator' components (e.g. clock, bars, logo, etc.) can be inserted, and each position includes an identifier caption and optional audio level bars.

In addition to the multi-viewer functionality, the configuration also includes multiple recorders, (allowing any input to be recorded to the internal storage), and multiple players (providing playback of any clip available on the internal storage via the two auxiliary SDI outputs).

aQ Broadcast system examples – QuBE - hybrid multiviewer		
NH	11 Feb '17	v1

aQ does not provide custom hardware interfaces: rather its software/firmware supports a wide range of standard panels provided by expert manufacturers. This allows customers to select the interface most appropriate for their requirements, based on cost, functionality and project application.
Some examples are provided below, but many other options are available.

aQ Broadcast

Simple 8-channel audio surface with motorised faders (Behringer)

Generic surface with motorised faders and LED labelled buttons (Behringer)

Four-channel surface (JLCooper)

Conventional Jog/Shuttle controller (JLCooper)

Slow Motion controller (JLCooper)

Simple 24-button desktop controller (X-keys)

80-button desktop controller (X-keys)

16- and 32-button rack strips (X-keys)

124-button keyboard with T-Bar (X-keys)

Alternative Jog/Shuttle controller (Contour Design)

Multi-button soft-pad controller (Novation)

Slimline fader / transport control (Korg)

Simple rotary controller (Griffin)

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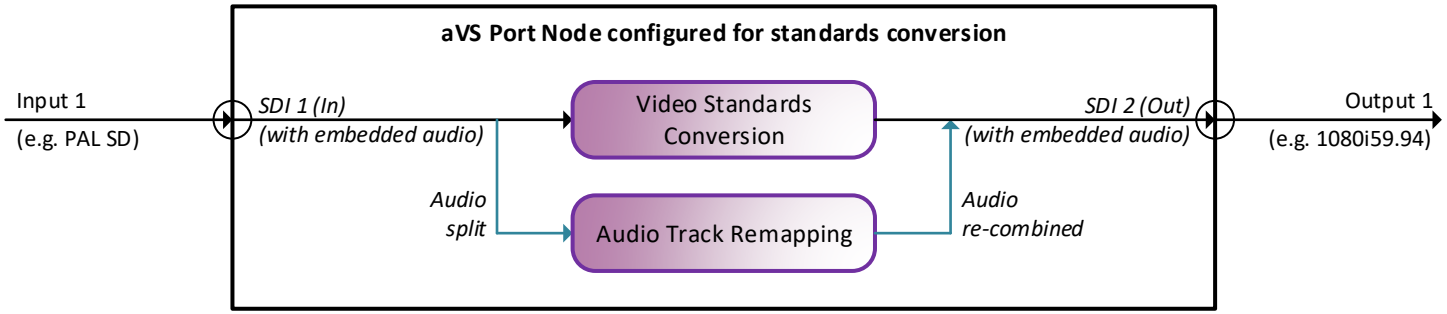
aQ Broadcast system examples – hardware panel illustrations		
NH	31 Jan '17	v2



Any aVS could be configured in different ways, depending upon hardware platform and project requirements. A Port node (i.e. without local storage) could provide single or multiple standards conversions. A Hybrid node (i.e. with local storage) could also provide additional functionality such as recording, playback, file transcoding, caption/graphic insertion, etc.

Platform example – 'shoebox' form factor





The aVS firmware can run on any of our standard hardware platforms, normally in a rack chassis. However for this application an alternative would be our 'shoebox' configuration. This hardware version is less powerful than the corresponding rack units, but is more cost effective and might sit on the desk or floor, rather than within a rack. It is intended to run without a GUI - configuration and operation will be carried out remotely from networked Windows workstations running the FMC GUI application. Dimensions: 196mm (W) x 83.3mm (H) x 245mm (D) (7.72in x 3.28in x 9.65in). Volume: 4 litres. Supplied with a 110-240V Universal 80W AC Adapter with standard IEC connector. The I/O card will vary according to application, configuration and project requirement – the specific card shown provides four ports, each individually configurable as an input or an output, plus a genlock input.

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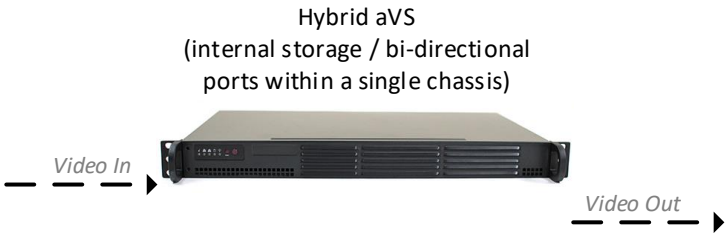
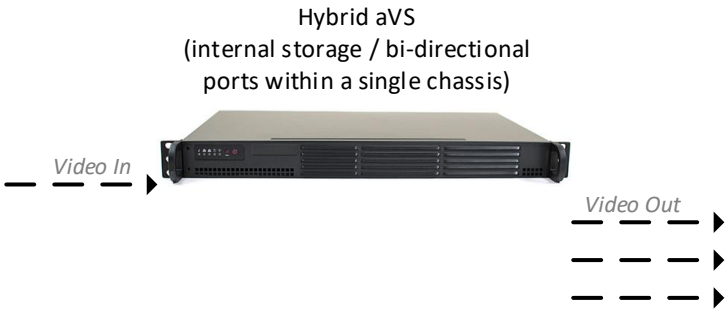
aQ Broadcast system examples – aVS standards conversion & audio remapping		
NH	23 Feb '17	v1



Simple delay application – e.g. profanity delay for live shows.

The incoming live video is buffered for a set period (e.g. 5 seconds) and then emitted from the video output. In the event of a problem, the audio may be muted on the output or replaced with a generic looped track, or both the video and audio can be replaced.



Multiple delay application – e.g. station output delayed for different time-zones

The incoming live video is buffered for a set period and then emitted from each video output after a set period. For instance, one output could provide a delay of one hour, a second output could provide a two-hour delay and another output could provide a three-hour delay.

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aQ Broadcast system examples – standalone aVS Delay units		
NH	3 Feb '16	v1

Hybrid aVS
(3 TB internal storage / 2 bi-directional ports within a single 1U chassis)

Hybrid aVS
(36 TB internal storage / 2 bi-directional ports within a single 2U chassis)

The censorship workflow operates as follows:

1) There will be a live video input, which will be recorded as the 'raw' version of the session.

2) There will be a censored video output, which will normally operate about 30 minutes behind real time (but could be less, see below). This will show all uncensored material from the raw recording. Censored material will not be shown on this output.

3) An operator will monitor the live input for 'non-parliamentary conduct'. If something happens that needs to be censored, the operator will use the raw recording to mark a portion which is not to be shown (or included anywhere else).

4) The will be a 'censored' recording, which will contain all raw footage that has not been censored. Where content is censored, the raw footage will play continuously around it - i.e. there will not be a 'hole' left, rather the last raw frame before the censored portion will run directly into the first raw frame after the censored portion.

5) Similarly, the censored output will show all raw footage that has not been censored. Again, where content is censored, the raw footage will play continuously around it - i.e. there will not be a 'hole' left, rather the last raw frame before the censored portion will run directly into the first raw frame after the censored portion. This may mean that the effective delay on the censored output reduces - an initial 30 minute delay will be reduced to 20 minutes if 10 minutes of content is censored. If the amount of censored content removed exceeds the delay (e.g. 35 minutes has been censored and the delay is only 30 minutes) then the output can show an alternative output - e.g. video and audio from a clip which is looping in the background, similar to profanity delay handling.

6) To summarise, the censored output is effectively playing back the censored recording, and the censored recording is being generated on-the-fly from the raw recording, with marked portions being removed.

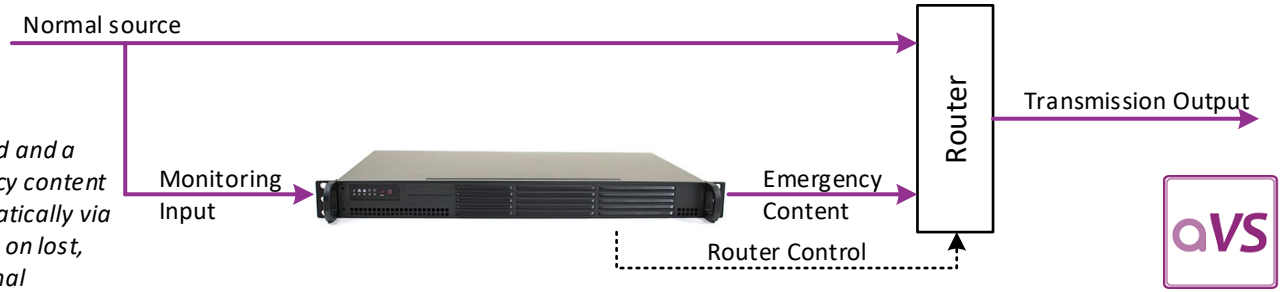
The smaller unit will allow recordings for a few days to be stored locally. The larger unit will allow recordings to be stored for around 90 days (both raw and censored versions).

aQ Broadcast system examples – aVS for censorship application		
NH	11 May ‘16	v1

Option 1

Server is operated manually, and the router switchover to the emergency content is triggered by hand

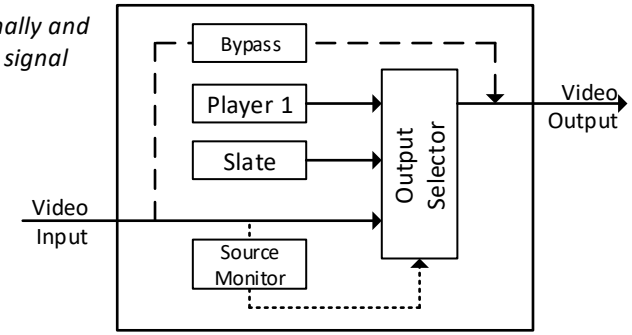
Option 2



Source is monitored and a switch to emergency content is triggered automatically via the external router on lost, black or frozen signal

Option 3

Source is monitored and a switch to emergency content is triggered internally and automatically on lost, black or frozen signal



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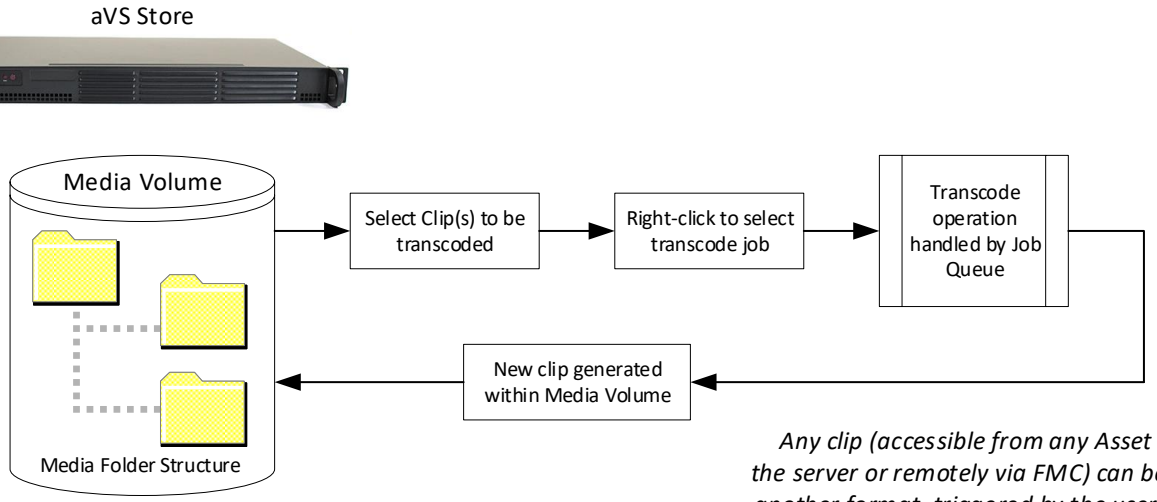
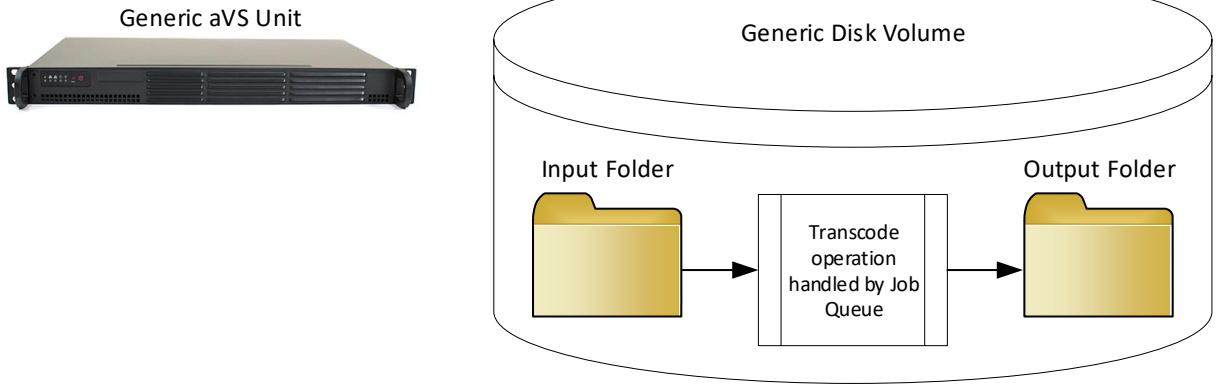
aQ Broadcast system examples – Disaster Recovery options		
NH	3 Apr '16	v2

Asset Transcoding (media volume handling)



Any clip (accessible from any Asset List – locally on the server or remotely via FMC) can be transcoded to another format, triggered by the user from the right-click context menu.

File Transcoding (watch-folder handling)



Generic transcode handling is provided by watch-folder monitoring: any clip in any supported format dropped into the Input Folder will be transcoded automatically to the configured format. The new clip will be placed in the Output Folder and the original clip will be deleted.

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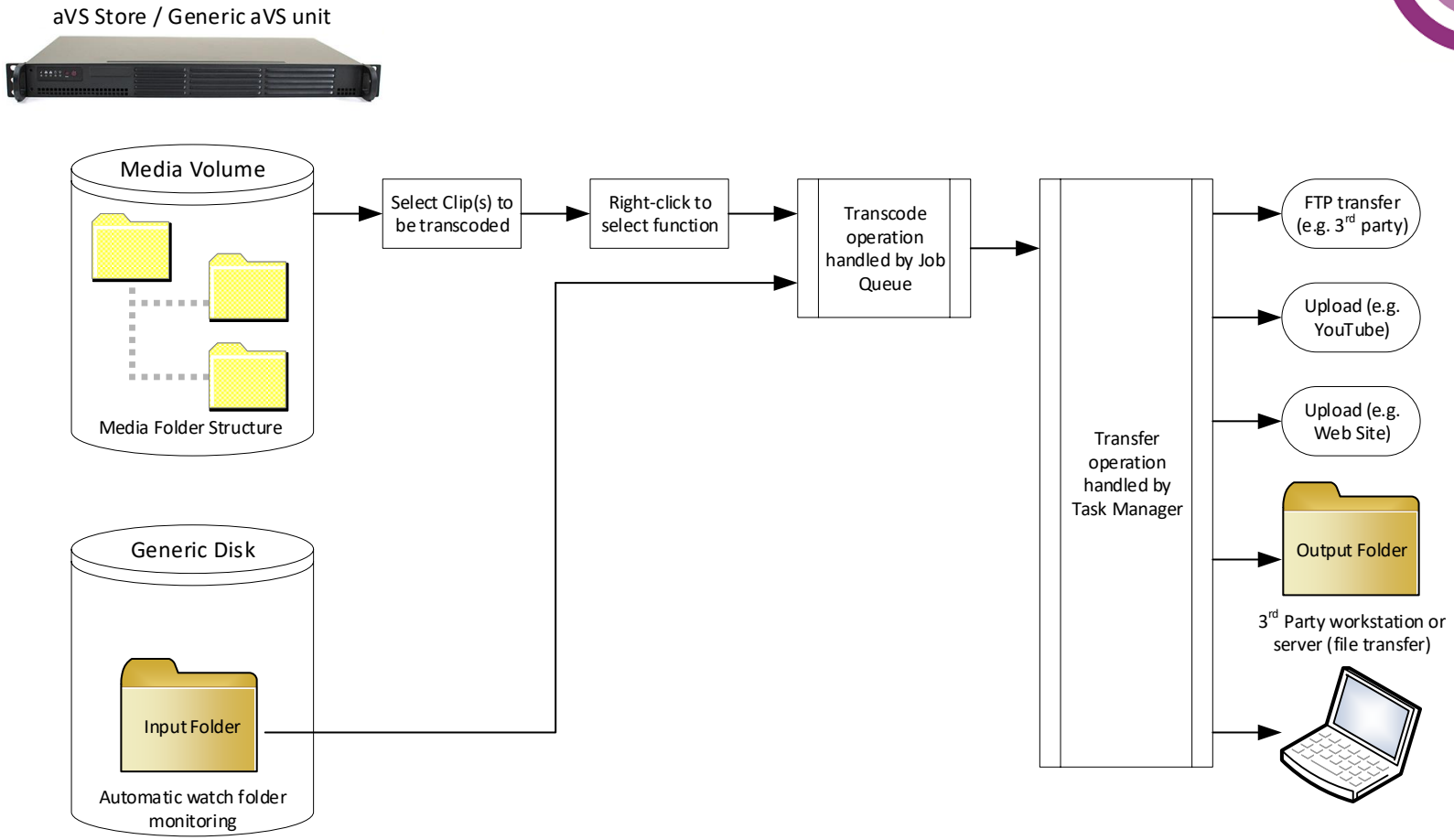
aQ Broadcast system examples – File & Asset Transcoding		
NH	3 Apr '16	v1

‘Send-To’ Handling (Transfer with optional transcode)



‘Send-To’ handling provides transfer to a variety of sources using a specified format. Existing media can be selected from the Media Volume (via any Asset list) or generic clips can be dropped into a watch-folder to be processed automatically. The items are transcoded to the required format (if necessary) and are then transferred to the specified destination, using the selected mechanism.

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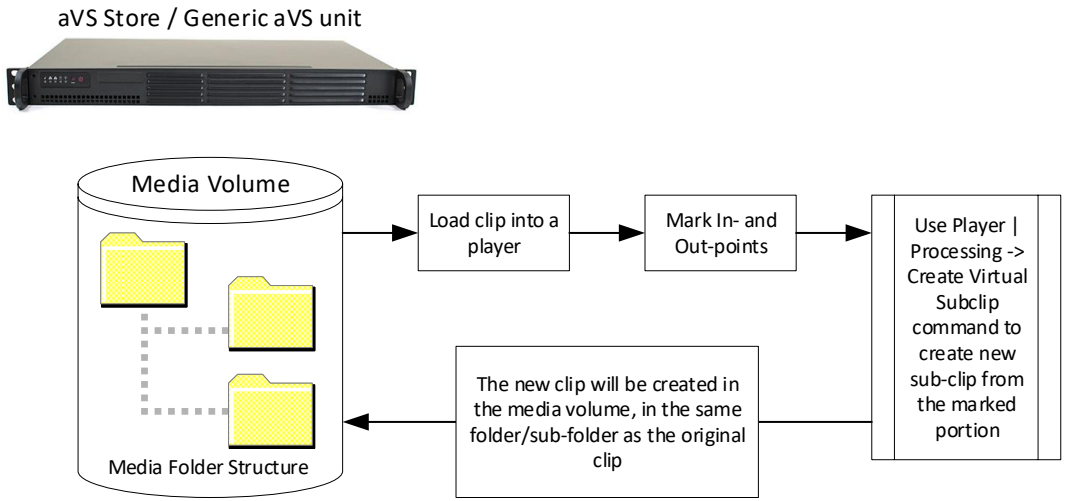
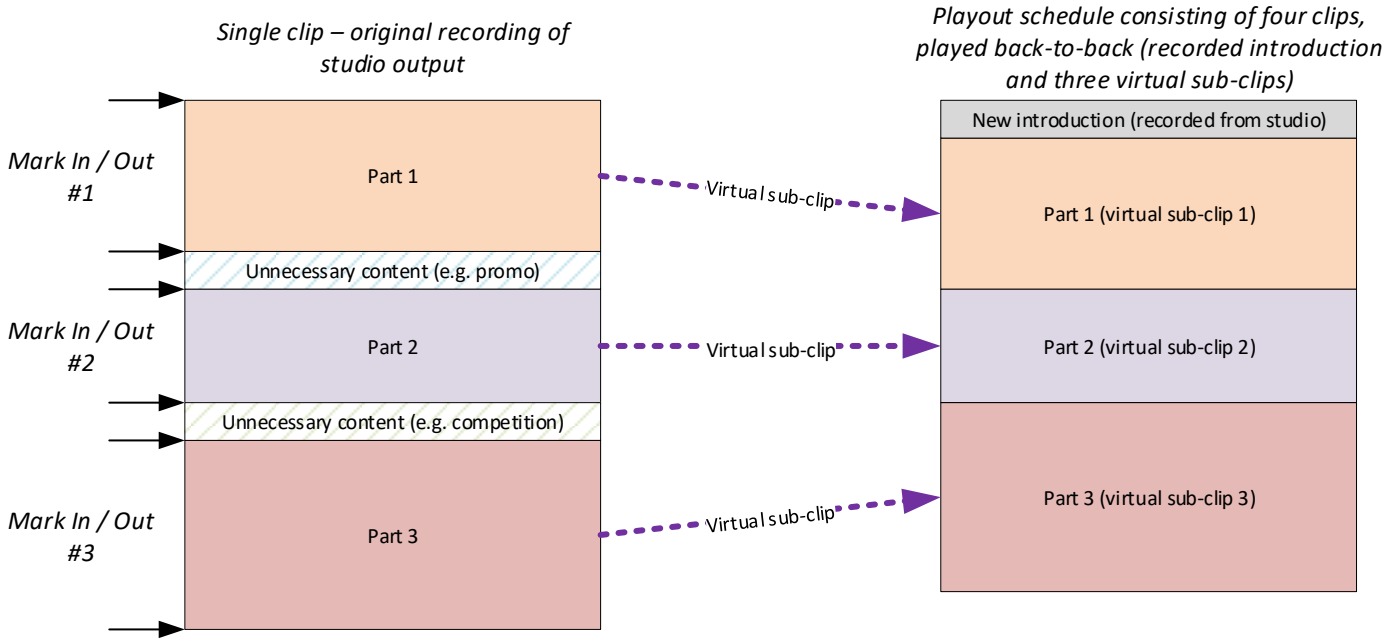
aQ Broadcast system examples – ‘Send-To’ Functions		
NH	3 Apr ‘16	v1

Virtual Sub-Clip Handling



Example of possible use:



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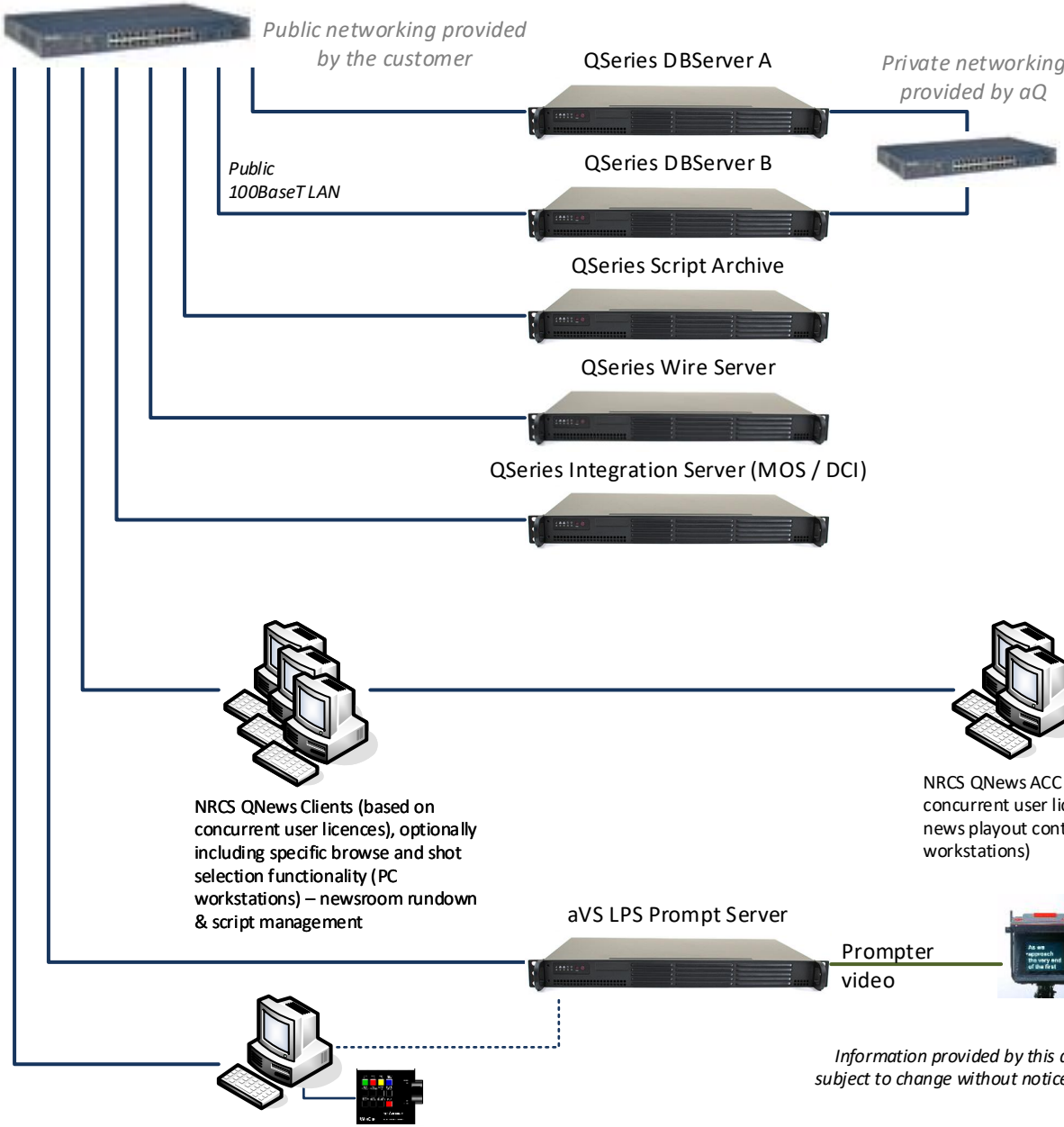
aQ Broadcast system examples – Virtual Sub-Clip Handling		
NH	1 Feb '17	v1



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aQ Broadcast system examples – QSeries system illustration		
NH	30 Dec '16	v1

Newsroom, Video Server & Media Management Broadcast Solutions

Public networking provided by the customer

Public 100BaseT LAN

QSeries DBServer (software only)

Server hardware provided by customer or aQ, but not currently included in the bundle, pending clarification of the project requirements.

Clip List Integration

Mid-Range (MR) Hybrid aVS

(for example, 12 TB internal storage [approx. 400 hr XDCAM50 content], four bi-directional SDI ports within a single 1U chassis, with redundant PSU)

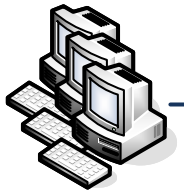
Input 1
Input 2
Input 3
Input 4

Each port individually configurable as an input or an output, and can be switched on-on-the-fly between record and playback operation. (SDI with embedded audio)

Output 1
Output 2
Output 3
Output 4

Device Control Integration

PC workstations provided by the customer



NRCS QNews Clients (based on concurrent user licences), optionally including browse functionality (PC workstations) – newsroom rundown & script management

aVS FMC Client (based on concurrent user licences), providing server remote control (PC workstations)

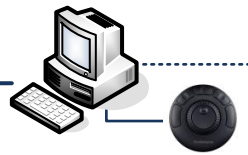
Optional button box / tally integration

NRCS QNews ACC Client (based on concurrent user licences), providing news playout control (PC workstations)

aVS LPS Prompt Server (option)

Prompter video

Prompter on-camera unit(s) provided by the customer



NRCS QNews Prompter Client software (PC workstations) – prompter control, based on newsroom scripting

The Prompt Server and controller are not currently included in the bundle, pending clarification of project requirements

Information provided by this drawing is for proposal purposes only and is subject to change without notice. All details will be confirmed as part of the order process.

This drawing is intended to promote understanding of the overall system and to indicate a proposed configuration. It is not intended as a complete engineering drawing. The images used are for representation purposes only.

Bundle includes:
- Mid-range aVS, 12 TB storage (RAID-5 protected) in 1U, redundant PSU, with four bi-directional SDI ports.
- One FMC licence (provides remote control over the aVS, in addition to the local console and newsroom interface)
- Bundled QSeries NRCS system, including
  - 10 concurrent QNews user software licences
  - Single DBServer software licence (a second mirrored/clustered DBServer licence would be available as an option)
  - News playout Automation Control Centre (ACC) software (provides play-back control over the aVS ports, based on information entered into the news scripts and running orders)
  - Clip list integration with the aVS (so that newsroom users can select appropriate media based on content within the server)
  - Device control integration with the aVS, allowing transport control over server ports from the ACC
  - Integrated proxy viewing – enables the newsroom users to preview content directly from their QNews client application
  - Integrated tele-prompter software functionality (requires appropriate hardware, e.g. LPS Prompt Server, for connection to an on-camera unit)
- aVS Hardware return-to-base warranty for one year
- Software technical support and all applicable software/firmware upgrades for one year

aQ Broadcast system examples – QSeries system illustration		
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Public
100BaseT LAN

QSeries DBServer

Journalist / Producer PC workstations (based on concurrent QNews NRCS client licences) providing newsroom rundown and script management

Director playout control PC workstations (based on concurrent Automation Control Centre, ACC, licences) providing news playout control

MCR Transmission control PC workstations (based on concurrent QTx licences) providing transmission scheduling and operation

aVS LPS Prompt Server

Prompter video

Prompter control PC workstation, providing prompting control based on newsroom scripts and rundowns

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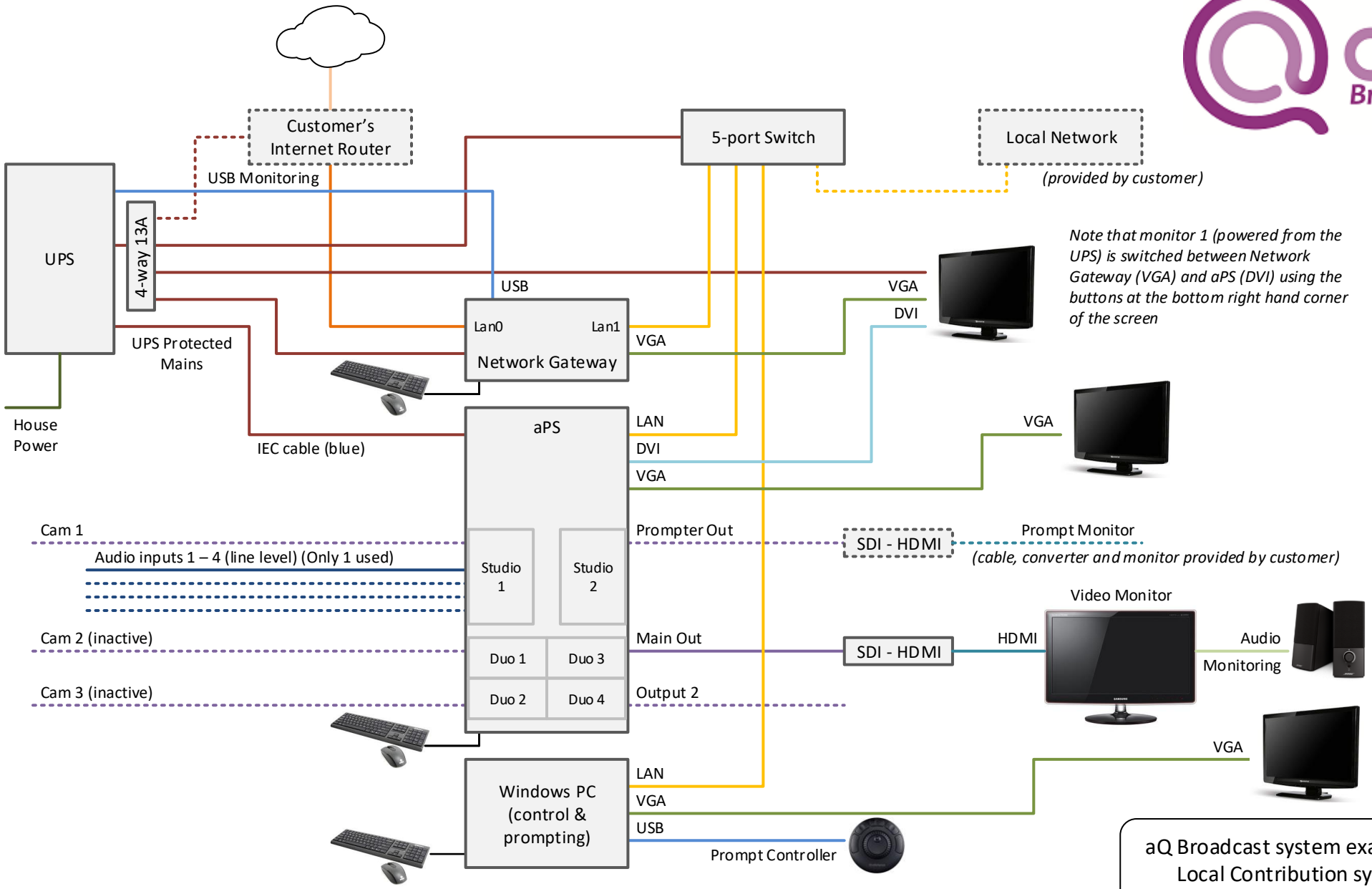

Note that monitor 1 (powered from the UPS) is switched between Network Gateway (VGA) and aPS (DVI) using the buttons at the bottom right hand corner of the screen

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aQ Broadcast system examples – Local Contribution system		
NH	7 July '17	v1a