



Quantel White Paper

Broadcast News:

How technology architecture
choices impact business

2030 – 23 – 023

April 2006

Broadcast news operations are living in a fast changing world.

News Directors are battling for ratings in a multi channel environment, where getting a compelling story on air ahead of rivals can significantly impact advertising revenue.

Engineering directors need to combine traditional video and IT workflows, to deal with all the new ingest *and* delivery possibilities – and run the station on a cost effective technical backbone.

News Journalists and Editors want to do their jobs with maximum creativity and minimum technical hassle, concentrating their effort on making great news.

Station General Managers want to do all this on ever tighter capital budgets and with maximum staff efficiencies.

Since tape based news operations started to be replaced by servers, there has been a pervasive idea that all disc based news technologies are broadly similar and therefore operational and business differences between different vendor technologies are not very significant.

In fact, the opposite is the case. Choosing the right technology architecture can make significant differences to real purchase costs, real running costs and the ability to deliver high value news content on time.

In this White Paper we will compare Quantel news technology architecture with other architectures on the market today. Quantel news systems start from as little as \$199k and can scale from very compact to very large. All Quantel systems include unique technologies that have direct business driven benefits for any news operation, whatever their size.

If you have any questions on this white paper, feel free to contact Norman.Rouse@quantel.com or John.Woodhouse@quantel.com. We would welcome discussion on any of the points raised.

Architecture fundamentals – ‘Prosumer’ versus ‘Total’ Solutions.

There are wrongly said to be two kinds of fundamental architectures choices.

At one extreme lies buying ‘off the shelf’ Prosumer PC, Mac or Unix based component systems from multiple vendors and integrating them yourself or via a third party.

This can have a strong superficial appeal – this is standard IT technology, the individual components may appear to be relatively inexpensive, the choice of components appears wide – but the practical day to day difficulties of ‘off the shelf’ prosumer purchases are often found after the purchase is made:

- Poor or no overall integration means poor workflow
- Poor workflow means higher staff overhead
- Stories can take longer than expected to get to air
- Stories are very difficult to reversion on any other edit seat in the system
- Highly complex media management means clogged disc arrays
- Prosumer level support proves inadequate for Broadcast 24/7 needs
- Software incompatibility between vendors occurs after version changes
- Real costs are higher than expected as additional purchases prove necessary when perceived workflow efficiencies don’t materialize.

Prosumer purchases can be very risky indeed. By their very nature, they are not intended for Broadcast work and the companies that make them typically have a Prosumer post sales support model. Prosumer technologies can have an important role to play in Broadcast News operations as low cost, point solutions but relying purely on them can be a false economy and risky.

At the other extreme lies the approach of a ‘Total Solution’.

A single vendor will offer to supply you almost everything from their own product line. This also can have a strong superficial appeal – the vendor may tell you ‘this is a low risk purchase – as all the systems come from us, we will take care of everything and everything will work perfectly together’.

In fact the ‘Total Solution’ approach is not what it seems. Typically the ‘Total Solution’ vendor has bought a number of companies then added their badge to it – they have not designed many of the systems. The weaknesses of ‘Total Solution’ purchases are many:

- You are forced to buy vendors system components, some of which may be poor
- You are discouraged from choosing ‘best in class’ OEM components
- Actual integration between system components proves to be poor:
 - Different user interfaces
 - Different code bases
 - Metadata compatibility issues
 - Slow real ‘time to air’

All these technology issues mean practical day to day engineering and operational headaches. More subtly, ‘Total Solution’ vendors are trying to create monopolies whereby customers are forced to make purchases on price, support and product criteria which are dictated by the vendor. In the long term this is bad for the customer and in practice also bad for the ‘Total Solution’ vendor. Recent Broadcast industry history has several well documented examples of ‘Total Solution’ vendors who grew cumbersome and lost their way.

Generation Q Broadcast News Architecture: The alternative to 'Prosumer' and 'Total' solutions

There is a third way that avoids the operational risks (and the significant hidden costs) of the Prosumer approach and the operational compromises (and lack of choice) of the Total Solution approach.

This offers a Broadcast News approach that allows you to combine the very best that IT can offer with best in class purpose built Quantel Broadcast News technology.

Quantel Broadcast News architecture encompasses ingest, viewing, basic editing, craft editing, graphics and play out. Customers can choose the level of workstation platform and size of server to best fit their needs.

Quantel systems offer a 'best in class' solution with a wide choice of third party partners for everything from automation systems to effects plug ins:.



From a small regional station, to the largest 24 hour global news production centre, Generation Q Broadcast News technology scales by adding ports, storage, editing seats and toolset levels to fit any requirement.

The Quantel architecture is supported by four unique Broadcast News technologies that give practical day to day benefits in any News operation:

Software scalability

Common operational interface, toolset and metadata on all applications from PC based desktop browse to hardware accelerated craft editing and graphics.

Frame Magic™

Patented Quantel disc technology that dramatically cuts down unnecessary making managing and moving media.

Integrated Server Architecture

Get stories to air fast and avoid complex server workflow hassles.

Time Magic™

Work faster than real time to get high impact graphics and effects on air in seconds

Let's now look at each unique technology in detail.

Software Scalability

Quantel systems are designed around a single code base and single user interface that supports different levels of toolset and platforms, starting from Quantel software running on desktop PC's all the way up to ultra high performance Quantel hardware platforms



Fig1: The Quantel Broadcast News editing family

Quantel architecture offers major benefits:

- All Quantel systems are based around a single user interface, so anyone from a Journalist to a highly skilled craft editor or graphics designer can browse or edit on anything. Training costs and day to day operational issues are minimized.
- Quantel workstation metadata is 100% compatible between systems, so team working on stories is simple. Everything can, and does, talk to everything.
- Tools scales from low cost PC workstations, to ultra powerful Quantel hardware accelerated platforms which allow real time or even faster than real time workflows. The right system can be used on the right job.

Common User Interface

Software scalability means whatever the functionality, the interface is the same.

From basic picture browse, cut and voice-over toolsets for journalists' or producers' desktops, to fully featured layering, compositing & graphics for craft editors or designers, the applications all look and feel the same and the migration path is simple.

The same Quantel interface is available to third parties, as an Active-X plug-in, so even when browsing for example, an Archive, the same common user interface experience is achieved.

It's quick to learn and easy to use. That all means saving time and money on operations,



Fig2: Q Record, Q Play and Paintbox also share the Quantel common user interface

Frame Magic TM

In many News systems, the biggest unit of video is a clip. In Quantel news systems the biggest unit of video is a frame, not a clip. This is called Frame Magic™ and is a patented technology unique to Quantel. Frame Magic is a simple but brilliant idea. Imagine the situation of a normal server, without Frame Magic, which treats clips as clips, not as frames, having two original edits:

Clip 1



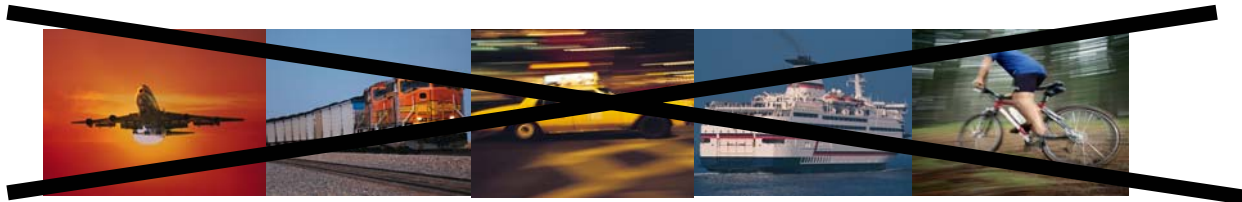
Clip 2

Now you make a new compilation which includes shots from both:



This is your completed Edited sequence

Now you need to free up some space so someone decides to delete your first clip.



When you play out your new completed sequence to air: you get this – nasty big holes:



So, this apparently minor technical difference has huge operational implications.

First, think about disc management. You need to free up some space, so you would like to delete some old stories. Supposing those old stories contain shots that you still want to keep? Some news systems allow you to delete the old story (accidentally destroying shots you want to keep). Other systems won't allow you to delete the old story (filling up your discs with rubbish) & then put you through the hassle of defragging & consolidation.

Quantel Frame Magic has none of these problems.

By uniquely identifying each frame, you can never accidentally delete material you want to keep, you can always delete material you don't need & you never have to defrag or consolidate your Quantel system.

Secondly, think about when you have an incoming feed from a breaking news story that has to be on air quickly. Some news systems make wait until all the material is on the server. Other systems chop the media into sections – but you still have to wait for them, and the data management tools are working extra hard to make sure all the right sections of the original story remain in effect, together.

A few systems make you wait while the material's copied from one server to another. With Quantel Frame Magic technology, the material is ready to edit – or even to play out – as soon as you begin the ingest.

Thirdly, think about multiple server environments. With some systems, you may need to move whole clips between servers just to use some frames. All this takes time and disc space. Using Frame Magic you only need to transmit changed frames (these are called Delta Frames) between servers – a *huge* time and disc space saving.

Another consideration here is versioning. Top news stories have to be refreshed and updated as the day progresses. A top story may go through 15 or more re-edits, as new information arrives, old pictures are deleted, a new voice over is added, and so on.

Other systems will have separate copies of essentially the same content, so a 3 minute package is could be saved more than 15 times. What a waste of disk space and disk management!

Quantel Frame Magic, alongside the Integrated Server Architecture outlined below, takes care of all of this too. Every time a frame, any frame, is used it is counted. So one set of frames held on disk, used in as many edits or versions as you like. Easy.

Disc mirroring is a related issue. Without Frame Magic, protection of an edit requires protection of all source material. Some systems can do this automatically, but it could mean locking a large amount of storage in order to protect a short edit.

While some vendors argue that storage is cheap and they allow for this when specifying, that is no help if the system is full and you need to clear space quickly. Mirroring an entire array is one of the least efficient forms of protection.

Some vendors have made the somewhat puzzling claim that disc mirroring is a bonus because it offers fast recovery times. Generation Q systems are specifically built for the live Broadcast environment and do not need to use mirroring and have ultra fast recovery times.

The real reason for using mirroring is simply that the vendor concerned has not designed the server system for broadcast use and is trying to camouflage a recovery problem.

Frame Magic in summary means

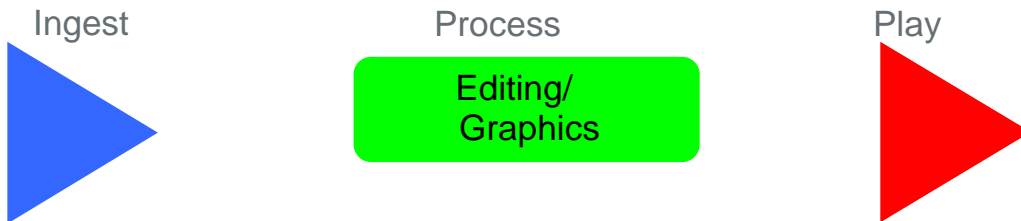
- No chance of deleting a clip you need
- No clogging up of discs with clips you don't need
- No clogging up of disks with copies of clips you don't need
- No need to buy more discs than you actually need
- Minimum network traffic moving clips
- No performance drops (some systems quote 20% performance drop during disk rebuild)

So, less cost, less database hassle, less risk of an expensive operational mistake and faster time to get material to air.

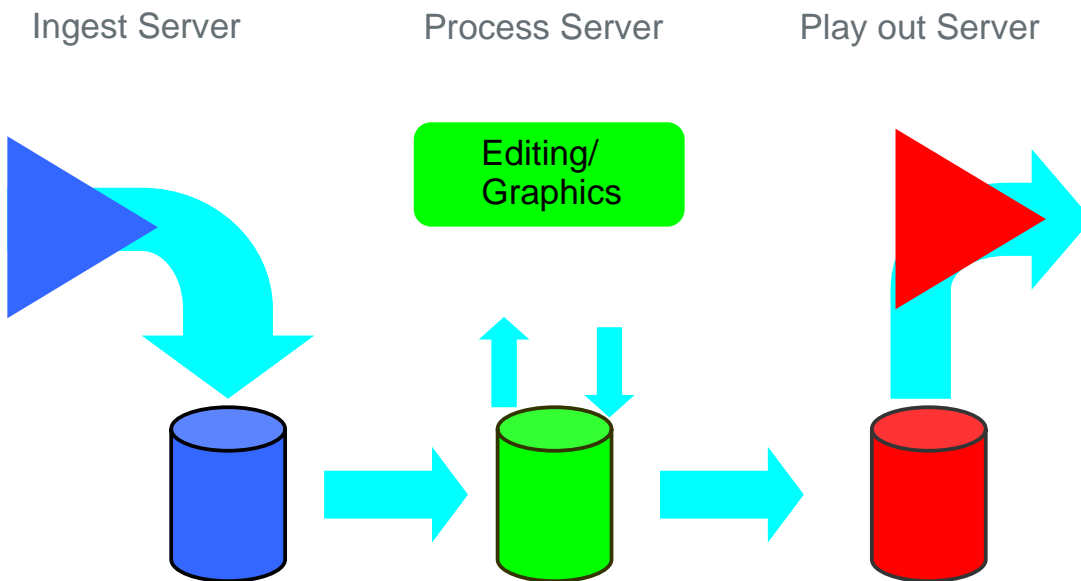
Integrated Server Architecture

In today's competitive News environment, getting a breaking story on air first is critical in winning ratings, especially if the story is told in a compelling way.

There are three logical stages in getting a breaking story on the air: ingesting the material, cutting the story (& adding any illustrative graphics & effects), playing out to air:



Some manufacturers take these logical stages & produce three corresponding devices: So the workflow diagram above gets translated literally into something like this:



If all this looks complex and slow – that is because it is. In practice you have to make, manage and move far more data than is really necessary.

This kind of architecture can struggle to provide a basic time shifting facility. i.e. to start a recording, then to mount the live clip and play it back after a controlled delay.

It relies on a team of different servers (or partitions within a server) to first ingest the material, then edit it, then transmit it.

In fact well designed server architecture doesn't need to be this complicated.

The Quantel environment uses a single Integrated Server Architecture, or ISA. You don't need to go through an ingest server, or ingest server partition or play out server.

Where some systems just cannot provide guaranteed timings for taking a finished edit to air, Quantel can use browse applications (sQ View for example) to cut out a subclip and have it cued as fast as the operational staff can press buttons. So, simple fast breaking stories can be on air in seconds.

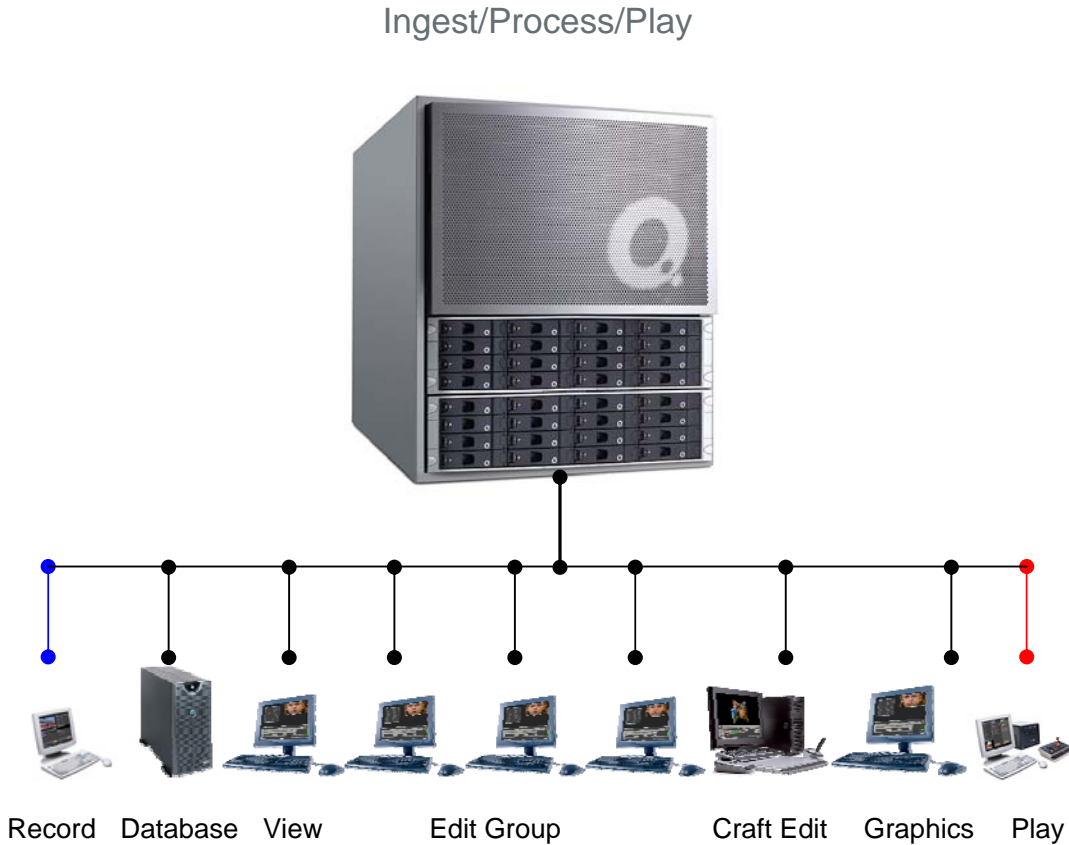


Fig3: Integrated Server Architecture: Basic concept.

If it is a more complex story that needs some illustrative effects or graphics, Quantel has yet another unique technology that will get your story on air fast – Time Magic™.

Time Magic™

Telling a story with a cuts only edit sometimes isn't enough. When you need effects fast you need fast machines and there is nothing faster in news craft editing than Quantel eQ and nothing faster in close to air news graphics than Quantel Paintbox.

By using both PC and Quantel dedicated hardware technology on Quantel craft editing and graphics systems, all the software richness, connectivity and flexibility of the PC environment is there but without the performance restrictions.

eQ and Paintbox can easily go well beyond real time foreground processing and comfortably beat other manufactures processing performance.



Fig4: Combining PC and dedicated hardware delivers faster than real time performance

But now eQ and Paintbox have become faster still. By adding a whole new Quantel hardware sub - system to the eQ or Paintbox chassis, background rendering is supported.

This means the editor or graphic designer can be working on two parts of the same story (or even two separate stories) simultaneously. Anything from simple camera white balancing, through car number plate concealment all the way up to the most complex effects can be executed at amazing speeds.

No other news technology offers Time Magic™. Remember that all rendering is taking place inside the eQ or Paintbox chassis which means the operator can intuitively work with the Time Magic tools. This is not a render farm or 'remote processing' approach which requires manual operator intervention, tying up networking resources and purchase of an external system.

Time Magic™ takes the waiting out of rendering, massively reducing time to air (great for late breaking stories) but also massively reducing operational 'dead time' when staff are sitting around waiting for rendering to finish (great for day to day operational efficiency).

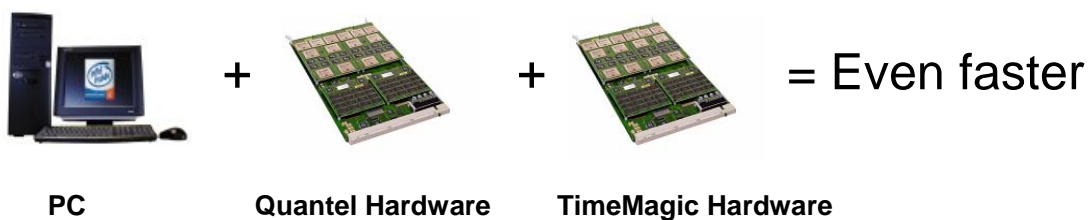


Fig4: Combining PC and multiple hardware processors delivers Time Magic™

Summary

The Quantel approach to Broadcast News is unique and offers practical day to day benefits for any news operation. News directors get rating grabbing material to air ahead of competitors. Engineering staff get 'best in class' solutions which blend the most appropriate technologies for the job. Operational staff get the tools they need, on easy to learn and easy to operate systems. Management get workflow and operational efficiencies that translate straight to the bottom line.

This white paper has only told part of the Generation Q Broadcast News story. There is far more to tell. If you would like to find out more about how News operations like yours are using Quantel systems – or find out more about the systems themselves, please feel free to contact either of us direct.

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If you would rather speak to a local Quantel representative, please go to <http://www.quantel.com/tv> and look under 'About Us' for local contact details.