The Atos Broadcast Network Control System+

Control is the key: how smart broadcasters make the digital revolution work for them

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Atos

Control is the key

Broadcasters are dealing with a perfect storm of market and technology-driven changes: the move to demand-led consumption, the proliferation of platforms and sources, fragmented audience tastes, managing ownership and rights for different uses, and increasingly complex advertising requirements.

There's also the need to create open environments in which systems and components from multiple vendors can interact with complete smoothness, at the highest speed to deliver excellent content where, when and how it is needed.

In the media industry, the ongoing move to IP changes everything -- and the key to being competitive, fast-moving and profitable in this challenging environment is staying in control. The Atos Broadcast Network Control System+ (BNCS+) gives broadcasters new levels of agility and speed, combined with intuitive touch screen and dashboard-based interfaces. The solution is vendor and technology agnostic and includes systems and content from virtually any source.

BNCS+ builds on open standards to manage the most complex, distributed broadcast environments, controlling systems and applications from multiple vendors.

This is a solution developed by broadcasters, for broadcasters, designed to handle the key challenges faced today and tomorrow by leading industry players. Developed in collaboration with some of the world's leading broadcasters, proven in action, continuously updated and rapidly evolving to stay ahead of the market -- this is the control solution the most ambitious and demanding broadcasters say they cannot do without.

Where is the broadcast industry going?

The broadcast and media industry is being transformed by a combination of market, social and technology-driven factors. Most of the big changes (demand-led consumption, viewing on multiple devices, online platforms as the preferred viewing options, the rise in citizen-provided material) were causing huge disruption a few years ago. Now all of this is old news. The previous world of established networks and broadcasters has been replaced by a landscape that we might call "dynamic,"or possibly "highly unpredictable" and even on occasion, chaotic.

If you are a serious broadcaster facing today's big challenges, what do you do to make sure you are fully competitive, fit to survive and also thrive in a very complex marketplace? You certainly need to become more agile in the way you operate, and better at monetizing content faster through sales. You also need to manage rights effectively, adopt targeted advertising, control costs and capitalize on opportunities when they arise.

This does not sound like the traditional broadcasting world -- because it is not. In the past decade, everything has changed, which means the way we manage and control media operations has to change as well. That's the reasoning behind the Atos BNCS+ solution, which builds on the original BNCS platform, but redesigned, reimagined and recreated for a new and continuously changing media world.

Atos has created BNCS+ by learning lessons from other industries such as building management and discrete manufacturing, in which proprietary systems have been largely replaced by standards-based components. In our industry we also need to invest in standardized systems wherever possible. Atos BNCS+ represents the natural next step forward, not just for large-scale traditional broadcasters, but even for the smallest of media companies, which can now access powerful systems that were previously beyond their reach.

In an unpredictable world, staying in control is key to long-term success. Control is exactly what BNCS+ gives you.

The big challenges

To survive and prosper in this new business and media context, broadcasters need to find effective solutions to their four biggest challenges.

1. How to reduce your costs

There is a need to fundamentally alter the cost base of businesses and keep driving for higher levels of efficiency. It's a not a one-off change: it means rethinking the core of your business model, from who you employ (and how many people) up to the technology you use. Traditional broadcasting always required specialized equipment, systems and people. In a world of increasingly capable standard technology, we need to create infrastructures that use as much COTS equipment and platforms as possible, enabling more efficient, agile working environments to be built for much lower cost.

That means using standard IP-based systems for providing secure, high-speed transmission and communication networks, and as much standardized equipment as possible for origination, storage, processing and interconnection between technology modules and systems.

Effective solutions will increasingly be built on open and common standards, so that systems are technology and vendor agnostic, enabling interoperability by default. This makes it possible to mix and match system components and use lower-cost modules and alternatives as and when they become available. It also transforms the way companies select and train their employees. Eventually, as processes become more standardized and less specialized, companies will spend less time training staff as they will already have a strong foundation of the skills and knowledge. As systems include more machine intelligence, the number of people required will also reduce.

2. Reducing downtime

Companies today are continually vying for consumer attention, so speed and quality have both become essential. A minor error from a service provider, for example by accidentally misrepresenting people or information, could prove costly by losing customers and advertising revenues or, in a worst-case scenario, might result in legal liabilities for the broadcaster.

Downtime has always existed in our industry, that's nothing new. As competition becomes more intense, however, the problems caused by errors are more visible and damaging. We believe the best strategy for reducing downtime is to design potential failure modes within the solution, wherever possible. That helps to minimize the impact of errors through comprehensive monitoring and control tooling, enabling faster service restoration.

BNCS+ makes it possible to create extremely intuitive user interfaces, which reduce the likelihood of manual errors. Companies can also embed customized warnings and fail-safe options to send alerts for manual intervention. No-one can prevent mistakes from happening altogether, but advanced systems can be proactive in tracking, identifying, flagging and reducing them.

3. Improved functionality

It is all about doing more for less, thanks to an advanced control system able to manage multiple systems and a very large number of devices in different locations. This makes it possible to implement actions across an entire system from one location, reducing the need to coordinate with different teams and (sometimes incompatible) hardware and software to get the results you want. To maximize the potential of better performance, lower costs and fewer errors, you need the ability to exercise centralized control over a complex broadcast environment, easily and fast.

4. Software-defined infrastructure

Companies are getting accustomed to using common standards and IP-based networking to build extended environments of complex systems. They can also virtualize the components, making it easier to integrate and manage all available production galleries, studios and cameras from a centralized control system. It no longer matters how distributed or complex the network becomes because BNCS+ allows companies to include different devices and manage every conceivable form of source material. Organizations can build a virtual model of the entire system, visualize it, understand what is happening in every part of the network and exercise fast, efficient control over it.

We draw two conclusions from all of this:

- Once companies move to common standards, primarily based on enterprise technology and IP distribution protocols, such as SMPTE 2110, they become more flexible, scalable and future-proofed. This new technology vision also reduces their costs, while making it exponentially easier for them to build and control complex broadcast output in a very agile yet cost-efficient way. This is a basic requirement for competitive advantage in our changing marketplace.
- It all comes back to the control system. In the modern broadcast environment, it's essential to have a system capable of integrating multiple platforms, systems, locations and equipment types, with maximum efficiency and ease of use.

The problems are becoming more evident, and so is the solution.

New technology priorities

We can see that the control system is the key to competitive performance in the changing world of broadcasting, so how do we specify the kind of system we need? Key factors include:

How to be vendor neutral

In the broadcast and media world, companies will need to interact with multiple players, whose investment priorities may be different, and with devices/systems made by a large number of different businesses, many of which come from a non-broadcast background. These systems have to be accessed, integrated, managed and used in the most efficient way possible. It is essential to know that control systems can incorporate all the rapidly changing options now available from the wider technology world and will stay relevant through continuous evolution. Making big bets on any single technology (or cluster of technologies) may not be a wise decision.

How to ensure very low latency

The key to effective control over widely distributed networks of assets, devices, locations, studios and personnel is the lowest possible message latency. You need to respond faster to stay on top of what is often a developing situation, and this eventually comes down to the architecture of the system you select. Is it based on a central server or a fully distributed network? Hosted on a cloud platform? In a private environment within that platform? Where does the processing take place? How much redundancy is built into the solution, to ensure 24/7/365 operation, all the time? What about the dependency of your control system on other systems? You need to be sure of how you ensure instant control across all assets contributing to your output at any one moment. This is not a broadcast decision: it is increasingly a computing/networking calculation.

How to maximize the potential of your people

Broadcasters do not need to be reminded that theirs is a people-driven business, and no matter how intelligent the technology may become, this will always depend on the judgement and decisions made by experienced human beings. Creativity is at the heart of broadcasting, and a control system has to enhance and support human creativity, not hinder it. The best control systems, therefore, are unobtrusive in the way they work. The closer they come to intuitive interfaces, the less the risk that they may delay, confuse or undermine the fast, effective decisions that people need to take. This is a collaborative environment, which welcomes and embraces everyone taking part in it. So it has to be easily recognizable, using common standards and interfaces, with minimum new routines to learn to participate. Is the control environment creatively welcoming? Well designed? Open and easy to understand? If not, you will need to think again.

How to achieve scalability and agility in your system

Broadcasting is increasingly migrating to platforms based on common standards and technologies. Being vendor-neutral is vital, but that is not the whole story. To stay relevant, you need the ability to include new components, functionality, vendor equipment and partners flexibly, without significant risk of disruption. The ability to scale and flex as required is not a 'nice to have' but a basic necessity. Some solutions are too close to proprietary platforms to make this possible. Building on open systems, using open standards and with openness to evolving technology and practices is fundamental.

How to keep your mission critical system fully secure

The closer broadcast systems move to enterprise technology, and the more they use public networks as the basis for transmission and connectivity, the more concerns there will be about security. When moving ahead with open standards and systems, you need to be very clear about the security protocols and defenses built into your control solution. It is about continuity and resilience. It is also about having systems for identifying bad actors and intruders in this uncertain operating environment. Broadcasters have to be extremely vigilant to prevent damaging mishaps.

A new vision

The original BNCS solution was built by broadcasters, for broadcasters. The system has always been structured around proprietary broadcast technology, with increasing evolution towards standard IT technology. BNCS+ approaches control systems from the other way round. We have built our new solution on IT foundations, utilizing technology from different industries, along with standard components wherever possible, to transform the levels of cost and agility built into the system.

In doing this, we have followed leading manufacturers and vendors in a growing range of other industries, all of them determined to abolish the old OT-IT divide (Operational Technology-Information Technology). By using a greater number of standard components, it is possible to transform ease of use, cost, flexibility and scalability. It also opens up what used to be very complex, specialized and costly solutions to smaller players in the market.

Transform to preserve

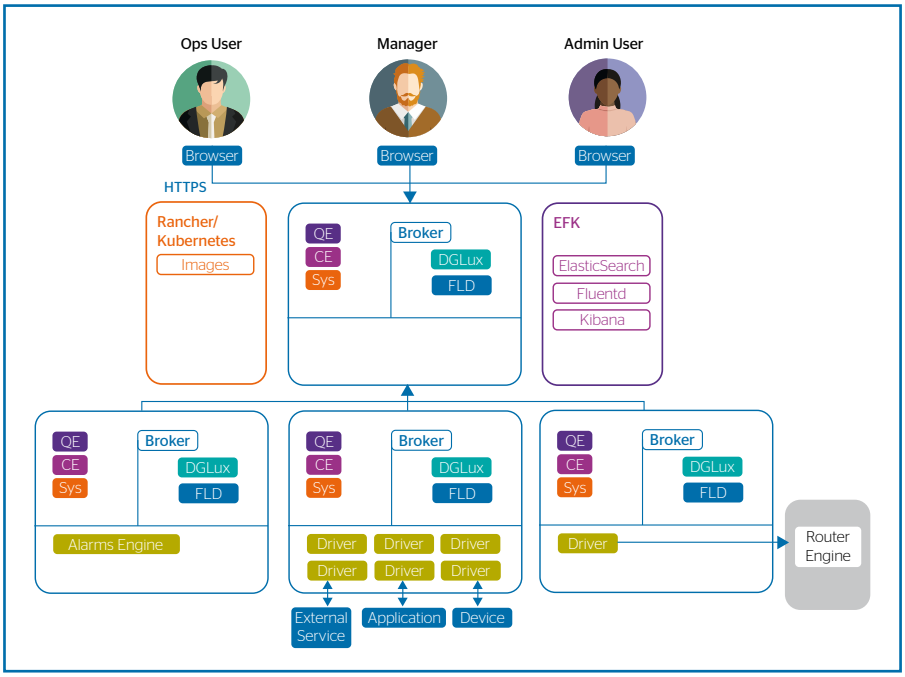
BNCS+ has gained a passionate following in the broadcast industry because it is resilient, intuitive and not so much a product as a toolkit. It is customizable and configurable in a way that few comparable solutions are in any industry. The solution's long history of successful operation also means we have built drivers and integration options for a huge number of requirements. Therefore, BNCS+ enables broadcasters to implement new technologies and vendor products more easily than any other options.

The new BNCS+ platform preserves all of these benefits, while also taking inspiration from IIoT and industrial control systems to put extra power, creative techniques and intuitive efficiency into the hands of media professionals at every level. Let's see how this works from the ground up.

Building a new concept

A simplified form of the BNCS+ structure is shown in the diagram below. BNCS+ is a fully distributed system with no single point of failure and provides exceptional scalability. This ensures that the solution is extremely resilient by design so that mission-critical real-time operations stay on-air at all times. The user can launch one or more drivers for equipment, depending on the level of business continuity required. The system ensures only one of the drivers is for primary control, with the others as secondary, so they continue to monitor the current parameter status, providing automatic hot-swappable replacements. Further refinements can be added within drivers to influence this behavior, according to specific equipment characteristics.

BNCS+ architecture consists of a core system that deals with messaging and provides useful tools. Above this core are three main layers: panels, drivers and rules. The panels layer integrates control of multiple devices onto a single or group of touchscreen dashboards. Each of these is crafted by abstracting the functions from the controlled devices and combining them as appropriate onto a single panel. Each panel is also customized to suit the needs of the particular operation they are supporting.



Simplicity through visualization

The solution uses visualization technology to provide a simple, combined view of the broadcast systems, while drivers turn actions into requests that devices can understand. A rules-based approach then enables users to capture both simple and complex logic, which allows for the automation of activities and detection of alarm states. Middleware modules, known as "automatics," collate and issue commands as the result of system data or user action. This allows users to perform complex actions requiring many system commands, all with a press of a single button. They can also provide automatic failover and alleviate predictable or repetitive tasks.

Virtualization, cloud and edge devices

The entire system can be containerized for easy virtualization and is both highly secure and exceptionally resilient. The solution is designed to make the best and most logical use of available platforms. It is optimized for on-premise operation, but some activities, such as archiving, asset storage and retrieval, and some less sensitive management operations can be safely and cost-efficiently hosted in the cloud. At the same time, an edge device can be used to mediate automatically between operations managed on-premise, with less sensitive activities managed from a virtual datacenter hosted on the public cloud.

A locally stored file repository enables restart with the previous configuration in the event of system error to ensure there are no interruptions in service. This arrangement allows updates to be tested and installed incrementally and when operationally convenient avoiding the need for 'system downtime.' Commands and status messages are multi-cast to ensure real-time performance and scalability.

In the architecture, we have a distributed system, with the ability to scale automatically across on-premises operations and cloud-based hosting infrastructures as required. The solutions include tools that enable users to be as ambitious as they want, or to use standard tools at a lower cost. The solution interface is entirely mobile, enabling user interfaces to be run equally from a well-equipped control center or a smart device in the field. This provides superior quality control for every media company, large or small, located anywhere in the world. Examples of our new approach to functionality are given below.

Embrace new options

Like a standard industrial control system, BNCS+ is optimized for detection and management of new components and devices. In the proprietary world, you need to specify what devices can be added, but BNCS+ dynamically searches for all compatible devices and enables them to be incorporated rapidly. The architecture enables rapid and easy use of vendor devices via APIs. In many cases, suitable device drivers already exist, while others can be rapidly developed by Atos as required. Use of APIs is the key to rapid interfacing with multiple vendor devices and ensures that the entire solution remains open to new developments. Once written, the new driver will then be available for all BNCS+ users for every instance of the device in question. It is automatic and immediate. There are no physical changes, no specialized programming: it all happens at the software level.

Intuitive control

We have taken a decisive step into the world of web protocols, so the user interfaces are now built utilizing HTML5, rather than being tied to a desktop application. An optimized graphical editor and client match the performance to the existing Windows-based user interface to ensure the use of a web browser does not impact on responsiveness or speed. The user interface also allows for low to no code logic in panels and incorporates a drag and drop data flow. Developers can drag logical blocks and also use backend logic flows (automatics) as permanent backend functions. It is possible to build reliable automatics using such tools like C#.

Media companies can now create highly customized GUIs using standard web-development methods. This is likely to prove a real breakthrough for smaller companies as they will find it much easier, faster and less costly to build their GUIs, even without specialized in-house skills. Companies that do have web development skills will be able to create highly sophisticated interfaces more efficiently than ever.

Data asset management

BNCS+ uses the same kind of approach as public streaming services to manage data assets and individual devices, using indexable and searchable metadata, which is published by all such assets. The BNCS+ query engine discovers and tracks metadata around connected devices and systems and provides a rich search service for finding datapoints. Atos has utilized its experience of working with other industries to design the query engine. It optimizes system response by using algorithms similar to those used in sat nav programming and critical systems in power generation and provides faster results. In other words, data point discovery and search can be a real-time activity now, and it is also extremely resilient. We use peer-to-peer management, so there is no need for a large server farm and no single point of failure.

Messaging, data and other tools

Many current broadcast systems are built around platforms that are unique to the industry, but BNCS+ employs an open standard message bus already successfully used in multiple other industries. Operating at the data level, we have built upon these open platforms which can utilize analytics to visualize emerging trends, provide detailed insights on performance and even implement machine learning and artificial intelligence as management tools.

All these functions are accessed via an intuitive interface, which has the flexibility you would expect from any other web-based controls. This connects the interface to the security systems for alerts and insights and the active directory for user accounts which then connect to the core administrative systems, including billing, financial management and procurement.

This is the final key advantage of a modern, web-enabled, distributed architecture. It abolishes the sharp divide that used to exist between proprietary and standard IT environments. It is not necessary to "translate" between them or establish different disciplines or invest in completely separate technologies. There is now a single, virtualized and interconnected environment, in which the user defines the rules, builds the processes, interfaces and routines that meet their needs. For the first time, we can put the full power of large-scale broadcasting into the hands of the entire industry. This is an important new step in a rapid evolutionary process.

Conclusion

Broadcast technology is on the cusp of moving away from its old heritage of highly specialized proprietary systems, operated by carefully selected and trained personnel, with a strong industry focus. They are increasingly moving into the world of general-purpose technology, in which public networks and platforms are used as the basis for highly flexible, scalable and adaptive solutions.

This offers broadcasters significant advantages in terms of cost, openness, agility, ability to mix and match across a world of available technologies, while also creating challenges in terms of security, specialized functionality and system integrity. It is essential to understand the positive and negative implications of this historical shift and ensure that control systems have the robust design and flexibility needed to deliver the advantages without potential penalties.

Delivering the benefits

Atos has developed BNCS+ for the fluid, agile multimedia communication world that we now all inhabit. It uses non-proprietary, standards-based technologies to enable broadcast and media companies of every size and shape to gain maximum benefit from unlocking the potential of new technology. In particular, it offers these three benefits:

Cost reduction, management and control

BNCS+ makes it possible to centralize control over an extensive area, eliminating the need for subsidiary centers. This reduces overhead and headcount, without in any way compromising responsiveness and quality of output. The ability to use increasingly cost-effective technology platforms also frees broadcasters from the high fixed development costs of specialized hardware. Control systems are now software-based, so investment in hardware goes down, and the whole cost base of the organization improves.

Quality of content and delivery

BNCS+ offers a level of control that is unprecedented in the broadcast industry. It will reduce errors through automation, intuitive interfaces and 'natural' routines (less training, fewer mistakes). The IP-based system is also better at accepting inputs from non-broadcast platforms, which helps in improving the user experience, no matter what device they are using for accessing content.

Flexibility, agility, responsiveness and speed

BNCS+ helps broadcasters move into a world of vendor-neutral, technology-agnostic operations, in which suitable hardware and software components can be slotted into the system without disruption, at low risk, with minimum preparation time, yet without compromising security. We have seen other industries move in the same direction and gaining great benefits in terms of speed and cost. The broadcast and media industry is moving along the same path. We can unlock the benefits faster through BNCS+.

So what next?

The functionality of BNCS+ is operational now and can be experienced through workshops, online seminars and hands-on exploration. Engineers, software developers, content producers and reporters in the field can experience the power of the new broadcasting reality BNCS+ can offer. Contact us today.

You can learn more about BNCS+ here.

White Paper

About Atos

Atos is a global leader in digital transformation with 110,000 employees in 73 countries and annual revenue of € 12 billion. European number one in Cloud, Cybersecurity and High-Performance Computing, the Group provides end-to-end Orchestrated Hybrid Cloud, Big Data, Business Applications and Digital Workplace solutions. The Group is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and operates under the brands Atos, Atos|Syntel, and Unify. Atos is a SE (Societas Europaea), listed on the CAC40 Paris stock index.

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