TECHNOLOGY FOR ARCHIVE AND DIGITAL TRANSFORMATION: DESIGN AND DELIVERY OF A NATIONAL ON-LINE TV ARCHIVE AND MEDIA ORCHESTRATION SOLUTION FOR RADIO TELEVISION MALAYSIA (RTM).

Ideal Systems was appointed by Media City Malaysia as the "Systems Integrator" to design and build a new highly automated TV archive for all of RTM's media content.

With a storage capacity of 20 Petabytes, The Alto online spinning disk archive from UK company DAC is the largest of its kind in the APAC region. RTM's national TV content is managed by the powerful Blue Lucy Media Services Integration Platform (BLAM) which Ideal Systems integrated for seamless automated workflows with RTM's production systems which include transcoders, content ingest systems, video routers, editing stations, traffic system, automation & playout, automated QC, and file-based audio processing. The digital archive is supported by an enterprise compute and network from Dell EMC using over twenty Dell network switches and sixty high-power computer servers. The system

supports over one hundred and fifty RTM users across Malaysia and is designed to be future expandable in terms of size and function including a clear pathway to adding enhanced AI functionality.

The Ideal Systems local integration team in Kuala Lumpur, Malaysia in conjunction with the UK based team at Blue Lucy Media used BLAM's API BLidgets to code the various integrations with multiple technology partners for highly automated unified archive operations for RTM users. These component systems of the solution include the following;

- **Capella Systems** – Transcoder System (Cambria)
- **Bluefish444 IngeSTore server** – Baseband Ingest System
- **Rascular Technology Ltd.** – Software Router Control
- **Disk Archive Corporation** (DAC) - Archive System (ALTO)
- **Adobe** – Editing System (Adobe Extension)
- **MSA Focus International Ltd** – Traffic System
- **Grass Valley** – ICE Morpheus Playout System
- **ROSS Video** – Video Router, Multiviewer and Signal processing Infrastructure
- **Vidcheck** – Automated QC System
- **Emotion Systems** – Automated File Based Audio Processing

The IT infrastructure powered by Dell EMC includes the following products

- PowerEdge for server,
- PowerScale for production storage,
- PowerSwitch for networking,
- UnityXT, for unified data storage,
- Precision Desktops for editing workstation.

The storage system for the archive is based on a product called ALTO from DAC, which has a unique architecture designed specifically to securely store large volumes of infrequently accessed storage such as Media Archives.

ALTO uses a core technology called Massive Array of Independent Disks (MAID) which is more efficient than the legacy Redundant Array of Independent Disks (RAID) technology. ALTO offers better protection than a RAID array by writing complete data files to multiple locations on different disks, allowing disks to be spun-down safely and offering the additional benefit of removable media. Only disks which are Reading or Writing are spinning therefore offering massive power reduction, consuming less than 240 Watts per PB as well as increasing disk lifetime so far by 15 years and counting. Lower power consumption requires less air conditioning loads and does not require any special environmental provisions for dust control or humidity control.

ALTO provides RTM with the security of physical removable media and the multi-user access and fast content restore of non-linear disk storage. There is no need for migration which is common in LTO archives, no compaction and no fragmentation that needs to ever be done. Alto does not use any propriety technology and uses Linux as its platform with the EXT 4 file system. This allows direct read from externalised disks with Windows, Mac and Linux Computers.

The ALTO Technology is equally applicable for any structured or unstructured data, adapted at the Application Layer for best-of-breed solutions. ALTO replaces outdated LTO Data Tape Libraries and replaces or complements Optical or Cloud offerings in open, standards-based systems with the lowest lifetime cost of ownership, superior performance, and outstanding environmental credentials and avoids expensive unmanaged cloud egress costs.

For the solution management Ideal used Blue Lucy's flagship product, BLAM, a media and business system integration platform designed to meet the complex production and distribution needs of the multiplatform age – combining media management, workflow orchestration and operational task management in a single solution.
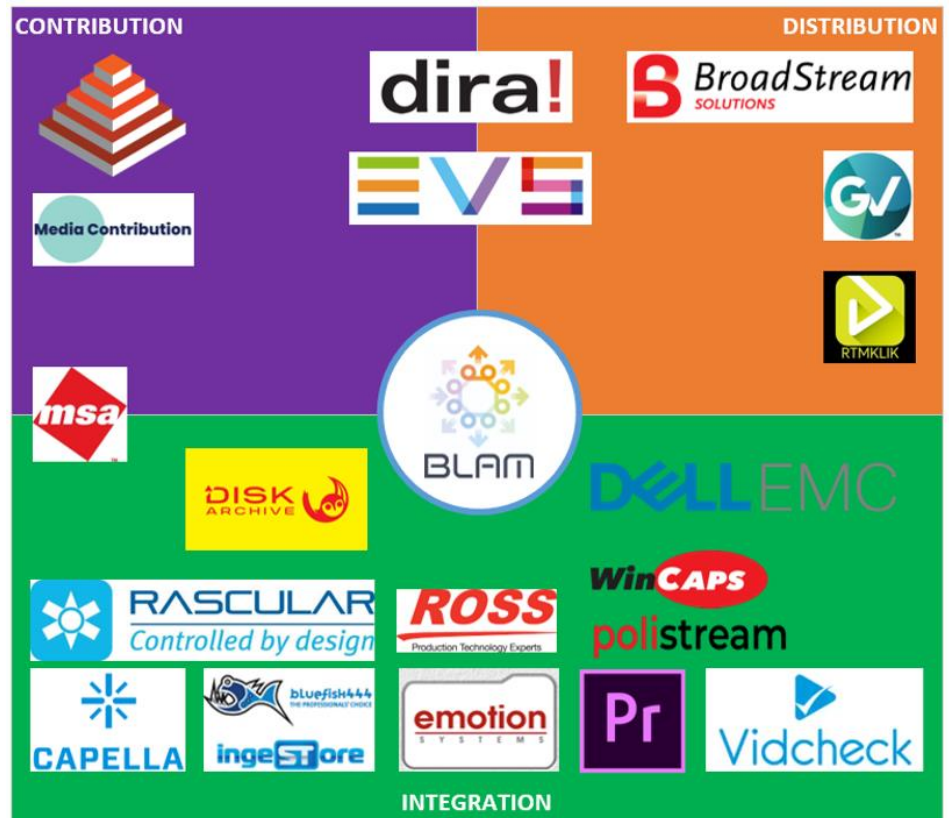

The workflows in the Archive System are designed based on Business Process Model and Notation (BPMN) these features offer flexibility to RTM users to enhance the workflow process as required based on changing needs and offers flexibility and reduce operational cost.

BLAM offers major benefits to RTM with its operationally focused solution including the creation of efficiency through automation including metadata management and search, media management, QC workflows, content logging & edit, task management and workorder management, workflow monitoring and builder, cost dashboard, user and multi-tenant access control & storage management among some of its features deployed.

BLAM's platform architecture and the company's constant development model means that new features and functions are made available frequently. The platform also features more than four hundred microservices,

List of Systems under BLAM Orchestration and Integration

(BLidgets), that connect production tools, business systems and consumer consumption platforms. This approach to integration means that **connectors for 3rd party systems** and services can be developed and deployed very quickly.
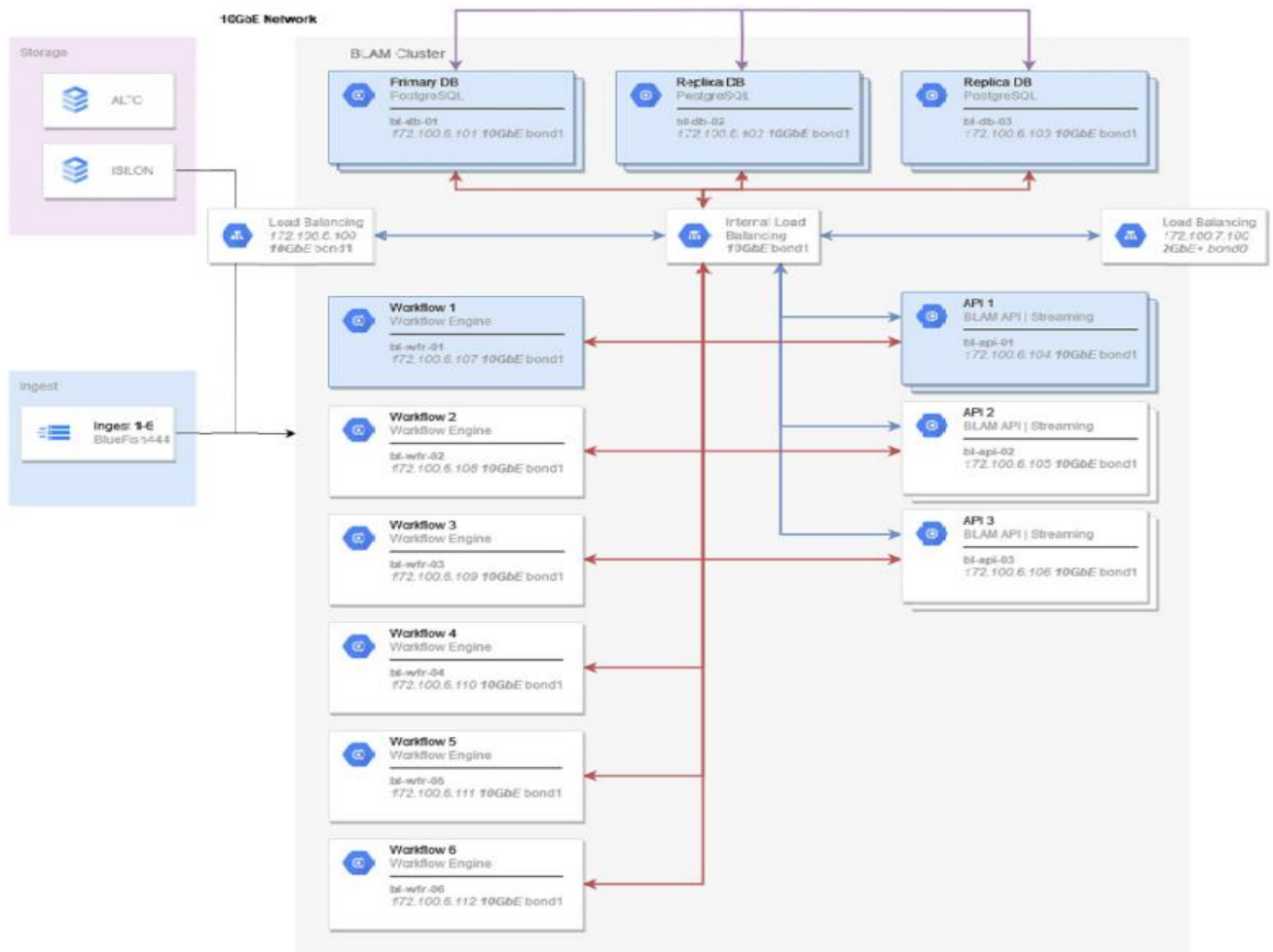
Ideal Systems has designed and deployed the entire BLAM and Alto Archive solution based on the latest technology elements including distributed microservices architectures, whereby BLAM capability is structured as a collection of loosely coupled services. The BLAM platform is underpinned by .NET core 7.0, the latest and fastest .NET framework from Microsoft which affords a truly cross-platform, open source, and common language run-time environment and affords long-term supportability, an excellent security model and is optimised for containerised deployments providing true enterprise-level robustness.

Blue Lucy has an open REST API supported with embedded documentation using Swagger and further documentation hosted at Blue Lucy CENTRAL. In addition, a full Software Development Kit (SDK) is available which allows developers to build microservices known as 'BLidgets' for the platform. Using the SDK is more powerful than simply calling the API, as it utilises the Blue Lucy Workflow Runner service to perform any 3rd party function or interaction. This has the potential to extend the useful functionality of the platform way beyond the usual media and broadcast systems to drive more business value for operators. BLAM also use Kubernetes for the deployment of the platform which supports the continuous service and delivery model, and BLAM platforms are updated automatically and with zero 'down-time'.
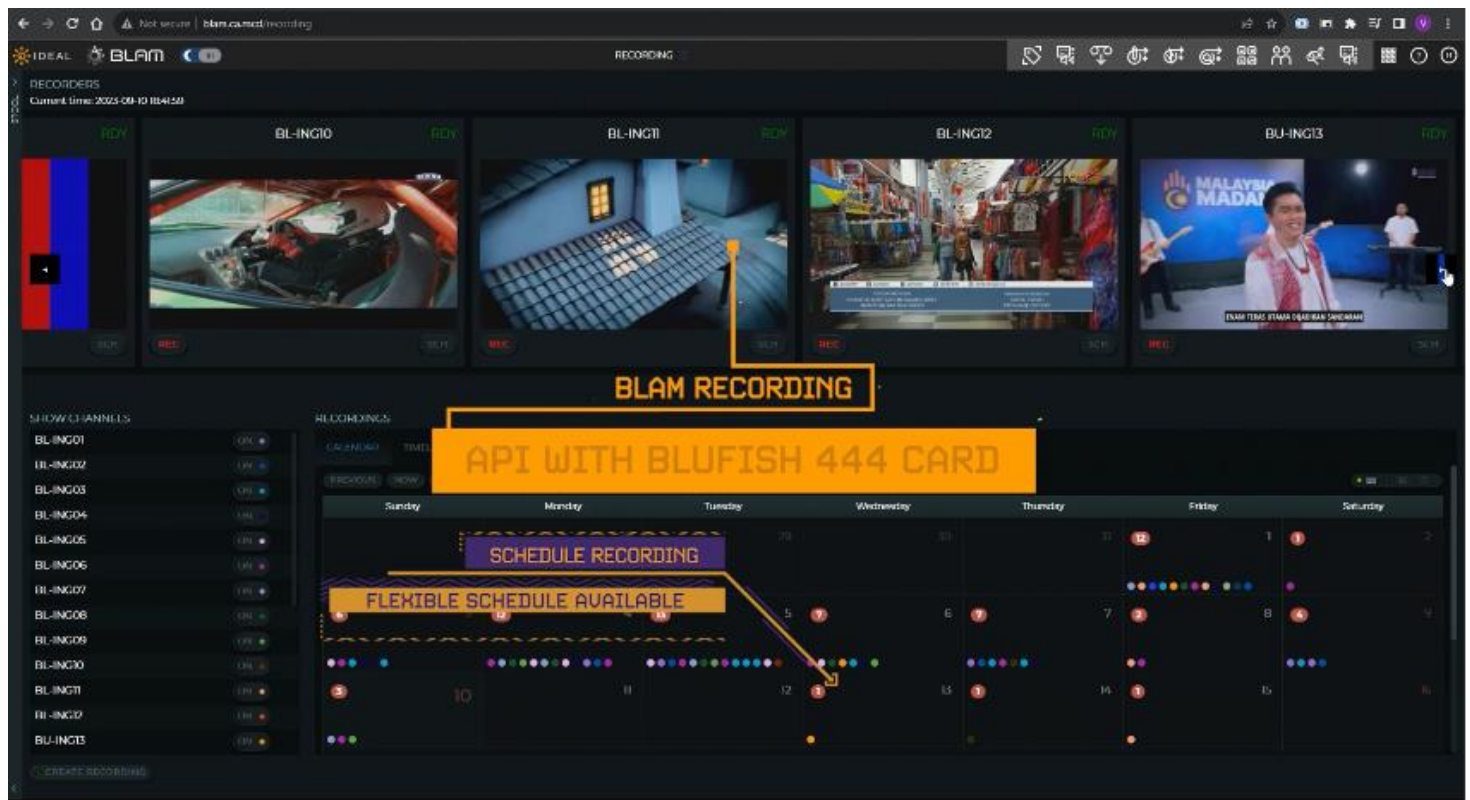

BLAM Architecture

As part of the deployment Ideal Systems designed and deployed 24-ports of linear baseband ingest based on the technology from Bluefish444 IngeSTore which was fully integrated with the BLAM platform via REST API.

The BLAM Recording feature is not limited to controlling and monitoring the ingest function from the IngeSTore platform but is also capable of capturing the low-res preview from the IngeSTore API. It also offers ISO recording as well as Edit While Record functionality.
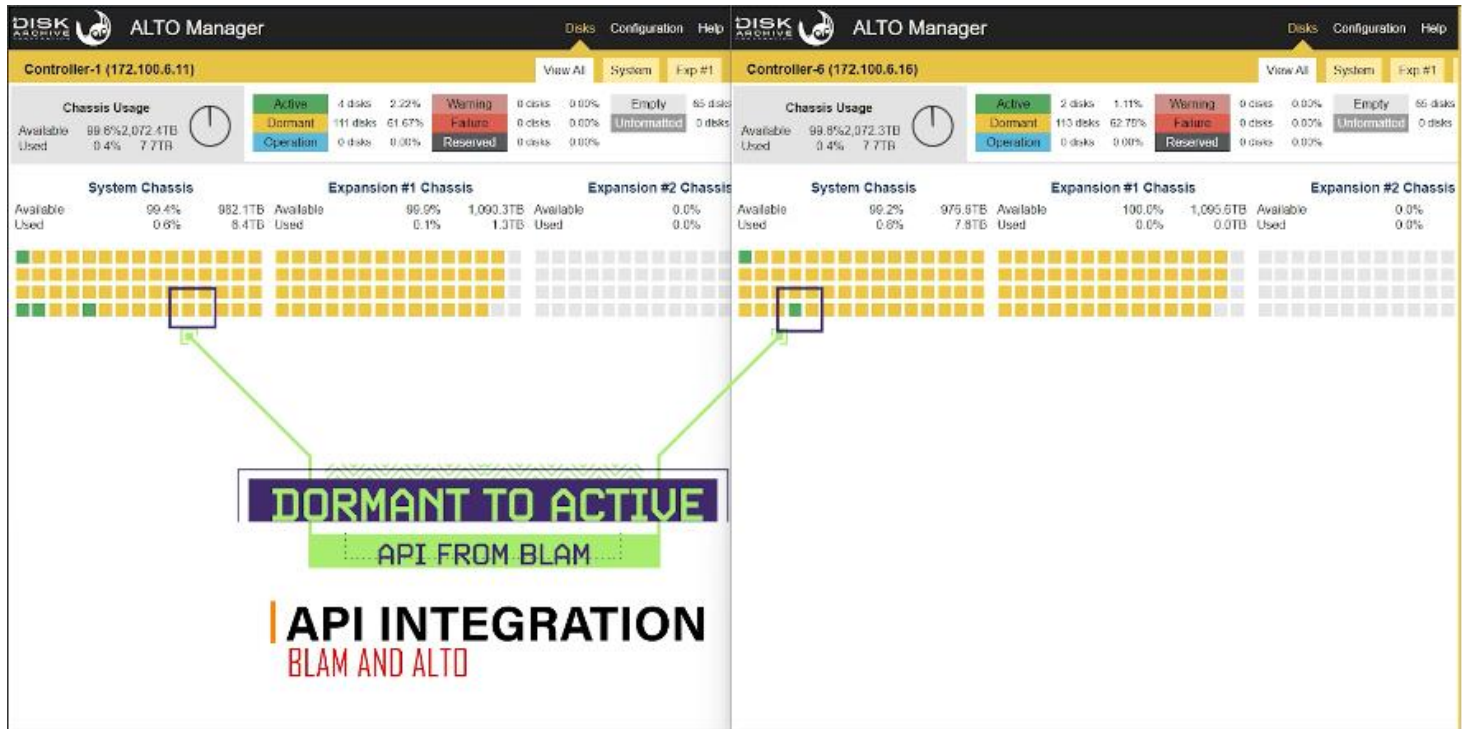

BLAM Recording integrated with Bluefish444 IngeSTore

These features have been used by RTM to capture and ingest simultaneous live events, especially for national and international events such as national elections, Asian Games 2023 and Le Tour de Langkawi 2023 with highly stable outcomes.

The most cutting-edge Archive technology is offered by ALTO from Disk Archive Corporation (DAC). ALTO combines outstanding performance with the lowest lifetime cost of ownership, high-availability, high-security enterprise-class archives and content libraries designed for film and television.

ALTO API integrated with BLAM Platform

Utilizing REST API integration with Alto, the BLAM platform manages the entire RTM archive process with high-throughput and high-bandwidth. Ideal Systems' real world benchmark tests have revealed the solution is currently enabled to Archive 10GB of media within around 130 seconds consistently; which is one of the fastest Archive solutions in the world and far superior to any Tape based LTO archive solution currently deployed.

ALTO Archive Job via REST API

The newly implemented Archive solution of 20PB Alto in RTM is the highest capacity On Premise Media based Archive in Malaysia and probably the largest online archive storage among broadcasters in South East Asia. The new solution offers improved efficiency and reliability, with flexible workflow and greater bandwidth.

Ideal also designed and deployed more than 200 workflows in the BLAM platform to orchestrate multiple workflows, including the media contribution from content suppliers, media processing workflows and to media distribution for main transmission located at the International Broadcast Centre (IBC) at RTM Angkasapuri. BLAM workflows also cover media distribution and sync for RTM's backup transmission as well as the Disaster Recovery Site (DRC) located 100KM away at RTM Seremban. BLAM is also being used for the distribution of content and metadata for RTM's various other properties including its Over the Top (OTT)offering known as, RTMKLIK which basically renders the OTT CMS solution as a passthrough. The entire RTM News both Radio and TV News content is being automatically Archived by BLAM as well via integration to DIRA and EVS systems. BLAM is also fully integrated with RTM's traffic solution from MSA Focus known as ForeTV via API. This integration offers metadata exchange both ways as well as continuous metadata updates throughout the day.

PLANNED FUTURE UPGRADES

Future planned upgrades include various AI based workflows for enhancing various workflows.
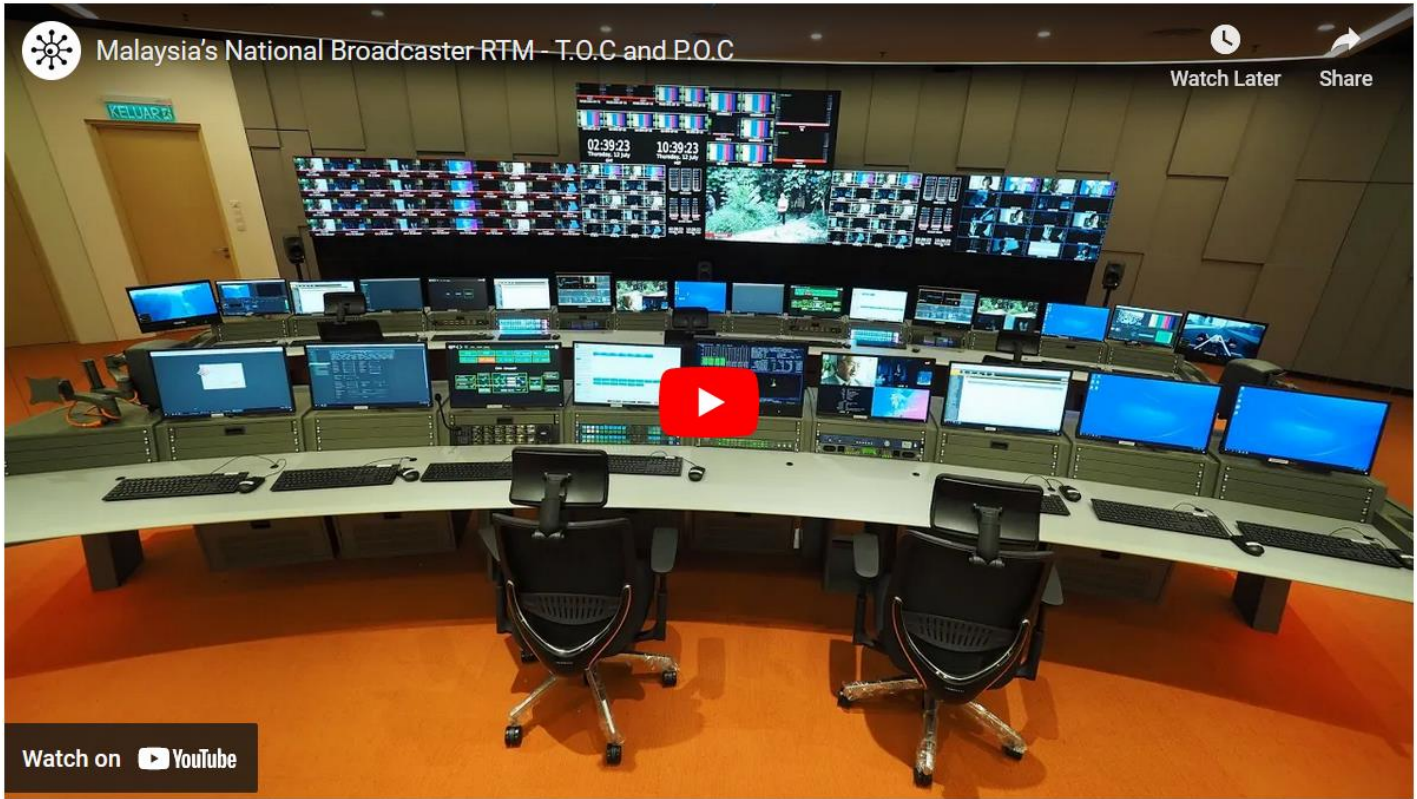
CLIENT TESTIMONIALS

The implementation of the project carried out by Ideal Systems is very impressive and has increased the productivity and operations of our section. The introduction to a high-quality archive and MAM system has enabled us to carry out tasks more efficiently.

The BPMN concept used has produced a very dynamic workflow and is very well suited to each process involved. This is a new and very beneficial experience. If there is a work process that changes at the department level, the original workflow can be changed without difficulty and then operate successfully.

I believe that the work process should not be static and cannot change. Changes are needed to meet current needs and this project has successfully realized it.

"Amiruddin bin Jemaat – Head of Ingestion and Quality Control Section of Production Operation Centre"

Malaysia's National Broadcaster RTM - T.O.C and P.O.C

Ideal Systems has been a trusted system integrator and partner for KL Media City since 2018 in RTM. This collaboration began with the Transmission Operation Centre, followed by Non-Linear Editing, and finally MAM & Archiving system.

The BLAM system is being introduced and offers significant advantages with many new features in BLAM.

In this project, a centralized archiving system was designed to integrate with media from TV Transmission, Studios Stock Shot, News Archiving, Library Management System, and soon, Radio Archiving system.

This efficient centralized archiving system allows RTM's internal production team from TV and Radio to easily access the materials they need across TV and radio directly through the BLAM system.

Ideal Systems expertise is also commendable. In addition to the advantages of the system itself, the collaboration with Ideal Systems over the past six (6) years has been very pleasant and has competent and proactive staff members who are always willing to discuss and provide ideas and solutions to address starting from system design until current operation issues.

"Amirah Jaafar Mad Ariff – Head of Support & System Solution"

APB+ ASIA-PACIFIC BROADCASTING AWARDS 2024

Digital Transformation - Malaysia
RADIO TELEVISION MALAYSIA (RTM), powered by IDEAL SYSTEMS (MALAYSIA) SDN BHD

The project won Asia-Pacific Broadcasting+ Awards in the Digital Transformation – Malaysia category and was featured on the Malaysia National News on Radio Televisyen Malaysia (RTM).

Ts. Amirah binti Jaafar, Engineer Interactive Digital Engineering Division at RTM, shares her view on the BLAM system and how it integrates with all the other systems in News, Studios, Non-linear editing, Library Management Systems as well as the Transmission Operation Centre. She emphasizes how these MAM and centralised archiving systems improve efficiency and save time compared to the previous system.