

Audio-Visual entertainment solutions on superyachts

Now made better than ever thanks to Network based Technology

Yachts are like oases where owners or charter guests can retreat to, to relax and unwind with their loved ones. Today's superyachts feature an ever-increasing wealth of innovative technology and engineering refinement. Whether you would like to relax in the privacy of your own cinema on board and watch a movie in intimate company, throw a party at the main deck for your guests, entertain your children or comfortably control your environment with the press of a button, thanks to network based technology, you will now have a more sophisticated and amazing experience than ever. This new technology not only greatly benefits its end-users, but also the shipyards, integrators and crew that maintain, install and design the audio-visual (AV) solutions that run on it.

Challenges of traditional, fixed architecture AV solutions

Traditionally, AV solutions on yachts used only analog, 'fixed architecture', point to point wiring. Today, thanks to digital image and music, the experience of these solutions has greatly improved. Nevertheless, the wiring and the system design used for these AV installations, especially on most smaller superyachts, still largely remains fixed architecture, even though they include digital sources and equipment. That would work quite well, if we would still want to watch or to listen to a limited number of media sources in only a few cabins on our yacht.

However, today, our entertainment experience, and therefore our expectations, have greatly changed thanks to the internet and to our mobile devices. Wherever we are, we are used to being able to enjoy an ever-growing number of new media sources for image and sound, such as Netflix, Apple tv, Sky sports, Spottify, etc. The traditional fixed architecture that many integrators are still using, especially on smaller superyachts, is increasingly less suitable for these modern multi-cabin, multi-deck, multimedia solutions. The larger the system becomes, the more challenging these solutions turn out to be, as they are inflexible, error-prone, space consuming and expensive.

Inflexible

Implementing a complex multi-cabin AV system requires careful design, which, in case of point to point wiring, *must* be undertaken in advance. Adding or changing equipment, inputs or even features and functions later, is burdensome and expensive, unless the system was initially prepared for these changes. Unfortunately, designing to meet the needs of the initial project, as well as future proofing it for anticipated and un-anticipated changes, is very challenging and time consuming and cannot always be achieved.

For example, if the system unexpectedly needs new media sources after a while, such as tv channels from an additional country, and there is no space left anymore to add these on the matrix switch (the 'backbone' of the installation), then a new matrix must be added and will need quite a lot of physical space in the equipment rack. This space then still needs to be available.

Or, for instance, if a cabin is designated a different use than was originally planned, say it changes from children's cabin to VIP guest cabin or gym, it may need different features and functions, such as a higher maximum volume for music, or a different timbre, for example. But

functions and features in these installations are defined and limited by the devices used. The only way to add these, is to add or change equipment and run new cables, which, unfortunately, involves opening the walls or floors of the yacht or even changing custom built-in furniture.

Harder to deliver high quality sound and higher risk of system malfunction

Also, it is harder to achieve great sound quality with these point to point installations. Analog wires act as antennas, carrying low-voltage signals. As a result, high frequency noise can become audible. Ground loops, caused by interference of different devices, that are connected to each other, and each plugged in to different AC grounds, can introduce 'hum'. Long cables are coils, resistors and capacitors that attenuate and damp high frequencies. These effects combine to raise the noise floor of the system and make it harder to deliver high quality sound.

Moreover, when these kinds of installations age, other grounding issues typically arise sooner or later, that can heavily disturb the system or result in malfunction. There is no way to find out remotely what causes such an issue, and even on-site troubleshooting is cumbersome, because it involves physically disconnecting devices until the cause of the problem is finally determined.

Space consuming and expensive

On yachts, where space is always a very important issue, point to point installations use matrix switches and AV receivers, that take up a lot of space in the equipment racks and cabins. Additionally, they employ masses of bulky and heavy copper wires. These are not only expensive initially, but, as we have seen, when something needs to be changed, replaced or added, it needs to involve almost a 'refit' of the ship, where custom-built walls, floors and designer furniture may need to be removed, even just to access these cables or make space for new equipment.

Network based AV distribution – AV over IP

As we have seen, fixed architecture AV solutions are increasingly more unsuitable for the presently desired, ever growing and changing multi-cabin multimedia installations, but there is a new solution that matches the current reality much better.

Digital AV distribution networks, also known as AV over IP (network), largely address the challenges posed by fixed, point to point systems. Thanks to their great flexibility, AV over IP systems reduce implementation costs - saving time and money, even more so in the long run, while immediately providing better performance and scalability compared to fixed systems.

Of course, when we are on board, we would like to feel at home and we would equally like to enjoy the most complete entertainment experience possible in every cabin and on each deck. It is now easier than ever to play our favourite video and music content wherever we like on a yacht, thanks to network based solutions. These solutions do not only provide us with the most sophisticated, top quality user-experience available today, but they also make system design, installation and maintenance much easier.

AV over IP - highly flexible, scalable, future-proof and time-saving

The main advantage of AV over IP is its flexibility. For example, functions and features, such as volume control, source-zone switches, cabin on-off, equalization, room correction, loudness functions, automatic signal detection of (mobile) devices, smoothness when turning devices on and off, filters and crossovers, etc. are not anymore defined and limited by the devices used, but are all determined in a DSP (Digital Signal Processor) and can be changed or added in the software at any time.

This does not only help us to avoid a 'refit' of the yacht if we would like to change a feature, but it also gives us around 80% more choice of features and functions for all devices, allowing us to make the user experience substantially more sophisticated. For example, providing automatic optimized viewing and acoustics settings for different seating positions in the same cabin or on the same deck.

Indeed, thanks to this flexibility, the AV over IP system does not need to be future-proofed anymore against anything that may or may not change. This saves a lot of time, allowing the designer to focus on what the system is meant to do and on how it does it, for example, by customizing the high-performance audio feature set to delight its users.

Another great time and money saver is that the DSP can be programmed remotely. No need any more to go on board the yacht and disturb the owners to try and squeeze a big and heavy matrix switch in, or to run new cables each time a function, feature or input needs to be changed or added. With our user-friendly AV over IP software, features and functions for any cabin or deck can be changed with just a few clicks from the installer's office.

Top quality

And there are even more reasons why AV over IP provides us with the best user experience available today. The audio input signals, if not already in the digital domain, can be pre-amplified and converted to digital as close as possible to the actual source. Furthermore, there is no more damping of the signal, as is the case with long analog cables. The result is not just a much cleaner audio signal with a much lower noise floor, but nothing less than broadcast audio quality, accompanied, of course, with the best image quality available today; 4K and its related feature set.

More bandwidth - less space

Also, whilst providing more bandwidth, all bulky and heavy wires are replaced, in the AV over IP system, by one single lightweight fiberoptic cable, that can carry all the required inputs and outputs as digital data. A physical matrix switch is not needed anymore, the matrix is programmed into the DSP. AV receivers are replaced by MCP's (Multi Channel Processors), which are about a sixth smaller in size. This saves at least 60% of space in the equipment rack and about 95% of weight for wiring, leaving more space for things that are enjoyable. Thanks to this, smaller yachts and even regatta yachts, where weight is of key importance, can now enjoy the best multi-cabin AV system currently available without doing large concessions on space or weight.

Easy and remote troubleshooting

Finally, although this single fiberoptic network cable is way more robust and reliable than the analog wires used traditionally, and therefore the chances of malfunction are significantly

lower, if there would ever be any defect, the technical crew on board can conveniently log into the system and search where exactly an error occurs. Or they can ask the installer for remote assistance. Both these options make any problems much easier to resolve and less time consuming than would be the case with fixed systems.

In summary

Traditional fixed architecture AV solutions still dominate installations on many smaller superyachts, even though for current multi-cabin, multimedia solutions they are known to be inflexible, error-prone, space consuming and expensive. Fortunately, there is a much better alternative on the market that largely resolves these issues. End-clients, crew, installers and shipyards are now able to choose a much more user friendly, sophisticated, time and money saving option and get the highest quality AV as well as the maximum flexibility: network-based AV distribution.

Genesis Technologies Marine can help

Genesis Technologies Marine, with over 20 years of exclusive specialization in AV and its control, was one of the pioneers of AV over IP solutions, and has meanwhile built a rich experience of successfully supervising their first implementations on several of the largest private superyachts. We supply not only hardware and software that is user-friendly and built on the best sounding platforms in the industry, but also bespoke system design, training and service. 'For professionals by professionals.'

Every day we partner with our all-round expert integrators and shipyards and work closely together with their development teams at joint solutions and projects. We do this with a lot of dedication, enthusiasm and confidence.

For professionals by professionals

If you, too, are looking to make the switch from fixed architecture to AV over IP, you have found the right partner with Genesis. Our solutions are tailored not only to the wishes of the end client, but also to those of the professionals that we partner up with.

Hand in hand with our partners we will continue to shape the future of the marine audio-visual market with innovative solutions that will deeply please and impress their end-users.