10 years

NETGEAR®

AV

From skepticism
to standard

Chapter 1:

What we learned along the way

Ten years ago, you could clear a corner of a trade show booth just by saying “AV over IP.” Not because people weren’t interested (they were) but because the questions that followed were hard ones. Will it be reliable enough for live events? Who configures the network? What happens when something goes wrong at 8am before a keynote? The promise was obvious. The path from promise to practice was anything but.

NETGEAR AV was founded on a single conviction: to make the transition to AV over IP easier by removing the barriers that were keeping capable professionals from deploying it with confidence. AV professionals shouldn’t have to become network engineers to do their jobs. The network should serve the AV application, not the other way around.

That conviction has shaped everything we’ve built over the past decade. And looking back now, what strikes us most is how the conversation changed.

In 2016, the question was: can AV over IP actually work? By 2020, it was: how do we get our IT department on board? Today, we’re hearing something different entirely. As Ryan from MMG put it: “The conversations we’re having are with people going not ‘I don’t know what AV over IP is,’ but ‘how do I do it and what’s the best way for me?’” That shift from skepticism to implementation is what ten years of collective work looks like.

Partners and industry observers across every vertical are seeing the same evolution. Stijn Ooms, Senior Director of Product Strategy at Crestron, describes the transformation clearly: “Today, the vast majority of AV installations include AV over IP, even in small deployments. Before COVID, this was reserved for massive corporate headquarters. Now it’s the default because the network solves problems that hardware alone never could: instant scalability, flexibility, remote management, continuous improvement through software updates.” Aurora’s Patty Wanzer frames it in equally direct terms: “AV over IP has moved from ‘if’ to ‘how.’”

And that shift did not happen by accident – it was engineered, intentional. It took specific innovations that removed real barriers. It took partnerships with more than 580 AV and broadcast manufacturers who trusted us enough to build profiles, certify configurations, and stake their reputations on joint deployments. It took thousands of integrators who pushed back when something didn’t work and told us exactly what needed to change. And it took a growing commitment to education because no switch, however well-designed, can substitute for understanding.

This whitepaper traces that journey. We’ll cover the hardware breakthroughs that eliminated network bottlenecks, the software innovations that reduced configuration time from days to minutes, the management tools that made large-scale deployment manageable, and the ecosystem of partners and training that made it all stick.

The AV industry has fundamentally changed. We’re proud to have played a part in that - and we’re just getting started.

Chapter 2:
Why purpose-built switches changed everything

Around 2015, AV integrators attempting to deploy AV over IP faced a problem. The switches available to them were designed for IT environments where traffic patterns are irregular and where latency and dropped packets are merely an inconvenience. AV over IP has none of those luxuries. Video streams demand consistent, sustained bandwidth. Audio synchronization requires microsecond-level timing precision. And when a CEO clicks present or a director calls for camera two, there is no room for failure.

The result was predictable. Integrators working with generic IT switches found that systems that performed well in testing would degrade under real-world load. Inter-switch links became chokepoints as deployments scaled beyond a handful of endpoints. Multicast traffic, which is essential for AV over IP, would flood network segments, overwhelming connected devices. And when something went wrong, the troubleshooting process required IT expertise that most AV professionals neither had nor should have been expected to develop.

The industry needed infrastructure designed for the specific demands of AV, not adapted from infrastructure designed for something else.

The M4300 breakthrough

In 2016, the NETGEAR M4300 series arrived as the first switch built from the ground up for professional AV applications. Rather than adding AV features to an existing IT platform, the M4300 was designed around the actual traffic patterns, timing requirements, and usability needs of AV deployments.

The immediate practical difference was in the out-of-the-box experience. The M4300 arrived pre-configured for multicast video traffic, initially targeting the emerging SDVoE standard that NETGEAR helped found. An integrator could connect AV devices and see results without first navigating IGMP snooping configurations or the complexity of VLAN setup. Built-in Quality of Service templates ensured AV streams received priority treatment. IEEE 1588 Precision Time Protocol support was optimized specifically for AV applications, providing the synchronization accuracy that audio and video distribution demands.

What the M4300 proved, more than anything, was that AV-specific networking infrastructure was a prerequisite for reliable deployment at scale.

The real-world impact of that distinction is perhaps best illustrated by an experience that Alex Martin from Wyrestorm described. A well-known entertainment company had invested approximately £120,000/$160,500/€137,600 in a name-brand network chassis for an AV-over-IP installation since game development suites require sustained 10G video performance across multiple endpoints. The system worked statically but collapsed under live video load, dropping frames and losing streams. Engineers from the switch manufacturer eventually acknowledged the hardware simply couldn't do what it was being asked to do.

A NETGEAR switch on loan, at a fraction of the cost, solved the problem immediately. "We plugged it in and it just worked," Martin said. The integrator stopped hearing about the installation, which, in live deployments, is the best possible outcome.

That experience, where expensive enterprise hardware failed and purpose-built AV infrastructure succeeded, became a recurring pattern as the industry's understanding of AV-specific networking requirements matured.

Building a portfolio for every size

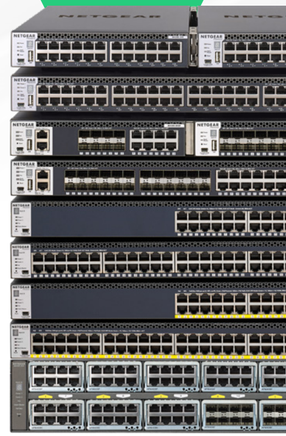
The M4300's success established a principle that shaped NETGEAR AV's entire subsequent development: AV-specific networking at every scale, not just at the high end.

Over the following years, the portfolio expanded to address the full range of professional AV deployment requirements. The M4250 series brought AV-optimized switching to small and medium installations with a simplified interface designed around AV workflows. The M4350 series addressed high-density requirements for larger installations. And the M4500 series extended the portfolio to enterprise-class deployments, providing non-blocking throughput up to 100G per port, making it capable of handling uncompressed 4K and 8K video streams for the most demanding broadcast and production environments.

The portfolio has continued to evolve in direct response to what integrators tell us they need. The 2026 additions to the M4350 series address the two challenges we hear most often from live production and large-scale broadcast environments: reliability of the physical connection under demanding conditions, and the bandwidth headroom required as video resolutions and stream counts continue to grow.

Across the portfolio, three engineering principles apply at every scale:

- Automated link aggregation. The Auto LAG feature automatically creates high-bandwidth, fault-tolerant connections between switches, eliminating the need to manually configure EtherChannel or Spanning Tree protocols.
- Intelligent traffic management. Advanced buffer management and traffic shaping ensure that even under peak load, AV streams maintain their timing and quality requirements.
- Non-blocking architecture. From 1G to 100G, every switch in the lineup provides non-blocking throughput, meaning every port can operate at full capacity simultaneously without performance degradation.



Chapter 3:
Making multicast work

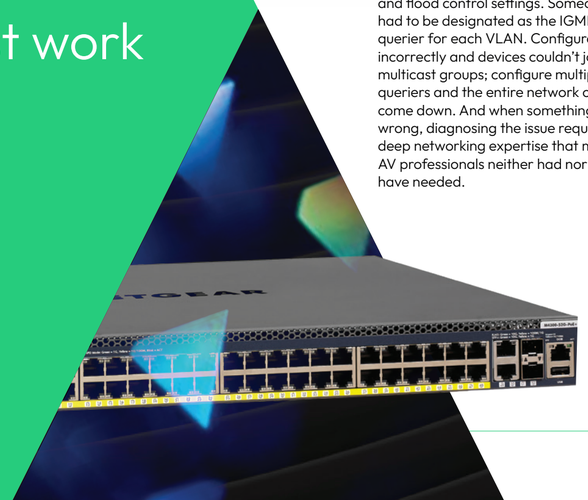
Ask any AV integrator who worked with early AV-over-IP systems about multicast configuration, and the reaction will be immediate and visceral. Multicast is the mechanism by which AV streams are efficiently distributed across a network, and it's essential for any deployment beyond point-to-point connections. It is also, without the right tools, one of the most technically demanding aspects of network administration.

In a standard network environment, configuring multicast for AV applications meant manually setting IGMP snooping parameters on every switch in the network. Miss a single switch, and multicast streams would flood the network or disappear entirely. Each VLAN required its own multicast configuration, timing parameters, and flood control settings. Someone had to be designated as the IGMP querier for each VLAN. Configure it incorrectly and devices couldn't join multicast groups; configure multiple queriers and the entire network could come down. And when something went wrong, diagnosing the issue required deep networking expertise that most AV professionals neither had nor should have needed.

Ravenna is an AV-over-IP standard for professional audio transport, built on existing IT infrastructure rather than proprietary hardware. Andreas Hildebrand, one of its evangelists, described demonstrating the technology at IRT, Germany's Institute for Broadcasting Technology. The demo worked immediately. Fifty minutes later, IRT received a call from their IT department: the entire network was down. No one had configured multicast. The Ravenna streams had flooded every connected segment.

"That's what I love about the experience NETGEAR has built up," Andreas reflected. "Switches that are out-of-the-box already configured to support multicast in a proper way, not flooding multicast."

That out-of-the-box experience required a fundamental rethinking of how network infrastructure should handle AV traffic.



IGMP Plus: automation meets AV reality

NETGEAR's IGMP Plus technology represents a philosophical shift as much as a technical one. Rather than expecting AV professionals to master multicast networking, IGMP Plus makes the network intelligent enough to configure itself for AV applications.

Enable IGMP Plus - often already active within AV profile configurations - and the switch automatically handles querier designation, timing settings, group membership timeouts, and flood prevention across every VLAN. In multi-switch deployments, it ensures consistent multicast behavior across the entire topology and recovers automatically from network changes or device failures.

Generic multicast configurations struggle with flood prevention, the very problem that brought down the IRT network in Andreas's account. IGMP Plus includes algorithms specifically designed to prevent multicast floods while ensuring legitimate streams reach their intended destinations without delay. Unlike standard IGMP implementations, it can apply different optimization strategies per VLAN, ensuring audio and video each perform optimally regardless of their specific requirements.

The practical result was transformative for deployment economics. Systems could go live immediately after physical installation, rather than requiring days of network configuration and testing. Adding AV devices or extending existing systems became straightforward rather than requiring network redesign. And perhaps most significantly, the range of environments where AV over IP could be deployed reliably expanded as the requirement for specialized networking expertise was removed. This opened AV over IP to educational institutions, houses of worship, and smaller corporate environments where that expertise simply wasn't available.

Today, when an AV professional deploys an AV-over-IP system, they expect multicast to simply work. That expectation, which is unremarkable to anyone entering the industry now, represents one of the most significant shifts in the industry's maturity over the past decade.

Chapter 4:
Bridging two worlds with a dropdown menu

Deploying an AV-over-IP system has always meant bridging two professional worlds. The AV professional understands exactly what the system needs to do. The network engineer understands how to configure the infrastructure to do it. The translation between those two bodies of knowledge is where projects go wrong and where costs overrun. AV profiles didn't eliminate that gap, but they narrowed it significantly.

AV profiles were introduced in NETGEAR's M4250 series. The concept was straightforward: instead of requiring integrators to research and manually configure the dozens of network parameters required by each AV protocol, the switch would offer a profile menu. Select Dante, NDI, SDVoE, AES67 or any of the other supported protocols, and the switch automatically applies the appropriate QoS priorities, multicast parameters, PTP settings, and VLAN assignments. All those technical details previously required individual attention, but are now handled in a single operation.

While that looks simple on the surface, the profiles conceal genuine engineering depth. As Gus Marcondes, NETGEAR AV's trainer and a ten-year witness to the industry's evolution, explains: "What NETGEAR really did and keeps doing is listening to what the AV professionals were mostly struggling with." The profiles distil that listening into a single click, condensing the parameters, configurations, and requisites of each protocol into a single operation. And crucially, they do so through a visual interface, a deliberate choice rooted in the recognition that AV professionals think in terms of physical connections and signal flow, not command-line inputs on a black background.

Built with partners, not just for them

What made AV profiles genuinely trustworthy was the process by which they were developed. Each profile represents a collaboration between NETGEAR engineers and the manufacturers whose protocols it covers. Companies including Audinate (Dante), Crestron, Lightware, and many others worked directly with NETGEAR to ensure profiles accurately reflected optimal network configurations for their specific protocols, validated through real-world deployments rather than theoretical specifications.

That collaborative development process matters because the consequences of a misconfigured AV network are immediate and visible. Holger Wiesenberg from Audinate identified the balance that profiles need to strike: they remove complexity for professionals who need to deploy quickly and reliably, while the underlying knowledge still matters when something unexpected happens. "The presets are great as long as everything works," he says. "The danger is when people only think 'I don't have to know anything.'" It's a fair observation, and one that shaped NETGEAR AV's approach to education alongside profiles, ensuring that simplicity and understanding develop together.

For Anthony Berry from Genelec, who has spent twenty years watching AV-over-IP adoption evolve, the profiles address something deeper than configuration complexity: **"For many years I had to know exactly which settings each manufacturer needed and how they'd interact with others. It became quite daunting when I'd get onto a project with new products. Being able to have a profile that brings all of that together makes this super easy."**

The practical impact on deployment timelines was significant. What previously took days of configuration and testing could be accomplished in minutes. Robert Lingley from CTI, one of the largest AV integration firms, put a number on it: prior to using NETGEAR, configuring a port on a switch might take 45 to 50 minutes. With NETGEAR's AV-oriented approach, that time dropped to around 5 minutes. Across a project with dozens of switches and hundreds of ports, that difference compounds into a meaningful change in project economics and on-site time. "We probably wouldn't be doing as much AV over IP as we do if it wasn't for NETGEAR," Robert says, "because of the simplicity it brings to the table."

Chapter 5:
Managing at scale

The AV-over-IP success story of the early 2020s created its own management problem. As deployments grew larger and more complex with enterprise AV installations spanning dozens of switches, multiple wireless access points, routers, and hundreds of AV endpoints, the operational overhead of managing each device individually through separate interfaces became unsustainable. The tools that made individual deployments easier hadn't yet caught up with the demands of managing those deployments over time.

NETGEAR Engage was developed in direct response to that gap. As a free software platform, Engage automatically discovers all NETGEAR AV devices on a network and centralizes their management through a single interface. It extends the AV profile concept, which had proven so effective at the individual switch level, to network-wide deployment. An administrator can define a configuration template once and apply it consistently across multiple switches simultaneously, whether for a conference room installation, a campus audio distribution system, or a broadcast production environment.

And when it became clear that modern AV installations require more than switch management, Engage 2.0 was launched in late 2024 to do just that - because integrated control of switching, routing, and wireless infrastructure through a single platform reflects the reality of how AV networks are actually built and operated.

Engage 2.4: designing before you arrive

In 2026, NETGEAR introduced Engage 2.4 with a capability that addresses one of the most persistent pain points in professional AV deployment: the amount of time integrators spend on-site configuring infrastructure before they can begin the actual installation work.

Engage 2.4 introduces offline provisioning: the ability to design, configure, and test a complete network without any physical hardware present. Integrators can create virtual switches and access points, build entire network topologies, apply profiles, and validate configurations from their office, at home, or anywhere else. When they arrive on site, the network is already built. They export the configuration, connect the physical devices, and deploy. Configurations can be saved as reusable templates for similar installations, creating a library of proven setups that can be replicated consistently across projects.

Robert Hornbostel from Eos Lightmedia was mid-deployment on a 45-switch installation in Washington DC, when he identified exactly why offline provisioning matters in practice: "The offline provisioning is going to be really good for our deployments and our ability to standardize our process as we go forward." For a deployment that complex, the ability to build and validate the network configuration before a single device is racked is the difference between a controlled rollout and a series of on-site discoveries.

Sven Bauschke from Lang AG, whose facility runs NETGEAR infrastructure throughout and now offers official NETGEAR network workshops through their own training academy, described the cumulative impact simply: where configuring ten switches once meant hours of individual work, Engage reduces it to a single operation. Offline provisioning takes that further still as the entire configuration can be completed before the hardware even arrives on site.

Professional services: beyond the hardware

In 2025, NETGEAR extended its commitment to deployment success with the launch of comprehensive Professional Services. This move acknowledged that, as AV-over-IP deployments become more complex and mission-critical, customers and partners now expect guaranteed outcomes, not just great hardware.

NETGEAR's Professional Services portfolio covers the full deployment lifecycle: network design consulting and configuration assistance, on-site engineering support for critical installations where failure is not an option, technical training for local teams, and ongoing optimization services. For live events, broadcast operations, and critical enterprise installations, having NETGEAR expertise available on site significantly reduces risk, particularly for integrators managing multi-vendor environments where the interaction between AV equipment and network infrastructure requires deep familiarity with both.

Chapter 6:

An ecosystem larger than switches

The technical innovations described in earlier chapters, such as purpose-built hardware, automated multicast management, protocol-specific profiles and centralized network management each solved real problems. But technology alone doesn't transform an industry.

NETGEAR's approach has always been built on openness: supporting multiple protocols, collaborating with manufacturers across competing standards, and building infrastructure that doesn't lock integrators into a single ecosystem. In an industry where proprietary approaches remain common, where many manufacturers still require integrators to commit to their encoders, decoders, and control systems throughout an entire installation, that commitment to interoperability has been a meaningful differentiator.

It has also required genuine partnership. Over 580 certified AV and broadcast manufacturers and counting have worked with NETGEAR to ensure their products perform reliably on NETGEAR infrastructure through joint engineering, validated profiles, and ongoing collaboration as protocols evolve. The result is an ecosystem built on shared outcomes rather than vendor lock-in.

The result is a feedback loop in which on-the-ground experience from partners drives continuous improvement, while NETGEAR's networking expertise helps partners deliver more sophisticated solutions to their clients. The value of that ecosystem from a partner perspective is trust. Technical trust that the products will work together, as well as the confidence that comes from knowing the testing was rigorous. As Sven Bauschke from Lang AG described: "When a manufacturer is a certified NETGEAR partner, we know their products will work on our infrastructure. The testing has already been done. That's what the certification means." That confidence translates directly into integrators' ability to make reliable recommendations to their clients, and is what has contributed to the growth of AV-over-IP adoption across the industry.

The tipping point

Ten years of ecosystem building, infrastructure development, and education have produced a measurable shift in the industry's center of gravity. The question is no longer whether AV over IP works. That was settled years ago. The question is no longer whether IT departments will accept it. That battle has largely been won through a combination of demonstrated reliability, improved security capabilities, and successful joint deployments. The question now is implementation: how to do it well, at what scale, with which protocols, for which applications.

That shift is visible in conversations happening at trade shows, in distributor networks, and in the credentials integrators now pursue. Tim Albright of AV Nation, who has observed the industry's trajectory for years, accurately described the adoption curve: more manufacturers making AV-over-IP products, lower price points, and a professional community that has moved from curiosity to competence. Ben Spurgeon from Mastery AV put it simply: **"I think the change has happened and the future is inevitable."**

Multiple integrators and industry observers independently confirm the same observation, each from their own vantage point. That convergence of perspectives, from live events, higher education, broadcast, corporate AV, and distribution, reflects an industry that has reached genuine maturity.

Education as infrastructure

If purpose-built switches were the hardware foundation of AV over IP's adoption, education has been the human foundation. The technical barriers to deployment have been significantly lowered over the past decade, but they have not been eliminated. AV professionals still need to understand what is happening behind the profiles and presets, both to troubleshoot when things go wrong and to earn the credibility with IT departments that makes integrated deployments possible.

NETGEAR Academy was launched to address that need directly and has grown into something much bigger than simply a manufacturer's training program. With content spanning AV over IP, enterprise networking, wireless, and cybersecurity, the Academy now hosts courses from over a dozen NETGEAR partners, making it a cross-industry educational resource rather than a product-specific curriculum. With ongoing contributions from partners, NETGEAR Academy continues to expand as a free resource focused on the blended skill sets required of the modern AV professional.

"I am seeing a convergence of skills", explains Gus Marcondes, head of training at NETGEAR Enterprise. **"The same person who used to think only about the gain structure of a microphone, or the loudness of a speaker, now needs to know the IP address, the DHCP server, and the subnet mask."** The professionals who embrace that expansion are the ones building the industry's next decade.

Conclusion:

The work continues

Ten years ago, AV over IP was an experiment. Five years ago, it was a trend. Today, it is the foundation on which professional AV is built.

The transition didn't follow a straight line. There were expensive learning experiences, frustrated integrators, and IT departments that slammed the door before the conversation could begin. There were protocols that competed where they should have collaborated, and deployments that failed because the infrastructure wasn't ready for what was being asked of it. The story of AV over IP's maturation is one of specific problems being identified and solved, one by one, by a community that was committed to making it work.

NETGEAR AV's role in that story has been to build the infrastructure that makes the rest possible: hardware purpose-built for AV traffic patterns, software that removes complexity without removing capability, management tools that scale with the ambition of the people using them, and a partnership ecosystem that ensures no integrator has to figure it out alone.

What comes next is already visible in the conversations happening at the boardroom level. Richard Jonker, VP, Business Development at NETGEAR Enterprise, describes the shift in terms that extend well beyond networking: "The next few years will mark a decisive shift from isolated, hardware-focused room systems to organization-wide digital experience platforms." A meeting room is no longer a box with equipment. It has become a digital infrastructure that scales across portfolios, integrates with enterprise IT systems, and continuously improves through software updates. We have watched this pattern across multiple technology sectors: telephony moving to VoIP, storage migrating to the cloud, and security surveillance systems going IP-native. The organizations that embrace transformation early compound their competitive advantage. AV is at precisely this inflection point now.

Broadcast-quality expectations are extending to every vertical. Corporations want town halls that look like network productions. Universities are designing classrooms as content studios. The elevation of expectations means that "good enough" no longer exists as a category. At the same time, AV systems are shifting from passive infrastructure to active participants: generating data about space utilization, meeting effectiveness, and participation patterns. When you can demonstrate that specific AV investments improved meeting outcomes by measurable percentages, you are having a fundamentally different conversation, one that reaches from the CIO to the CFO and CEO. AI capabilities that today seem premium will become baseline expectations. The most competitive organizations, and the integrators who serve them, will be those that embrace this transformation rather than resist it.

The path forward requires the same collaborative approach that defined the past decade. Integrators pairing AV strengths with specialized AV-over-IP, cloud management, and network expertise will move faster and deliver solutions that remain effective for years. Enterprises treating AV as connected digital infrastructure will meet user expectations more effectively and attract talent more successfully. As IT consolidation demonstrated over three decades: get big, get niche, or get out. AV is following the same path. And those who have built their foundations on open, interoperable infrastructure are best positioned for what comes next.

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NETGEAR, Inc
408.907.8000
3553 N. 1st St.
San Jose, California 95134

Tel: 866-480-2112 Option 2
www.netgear.com/av

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