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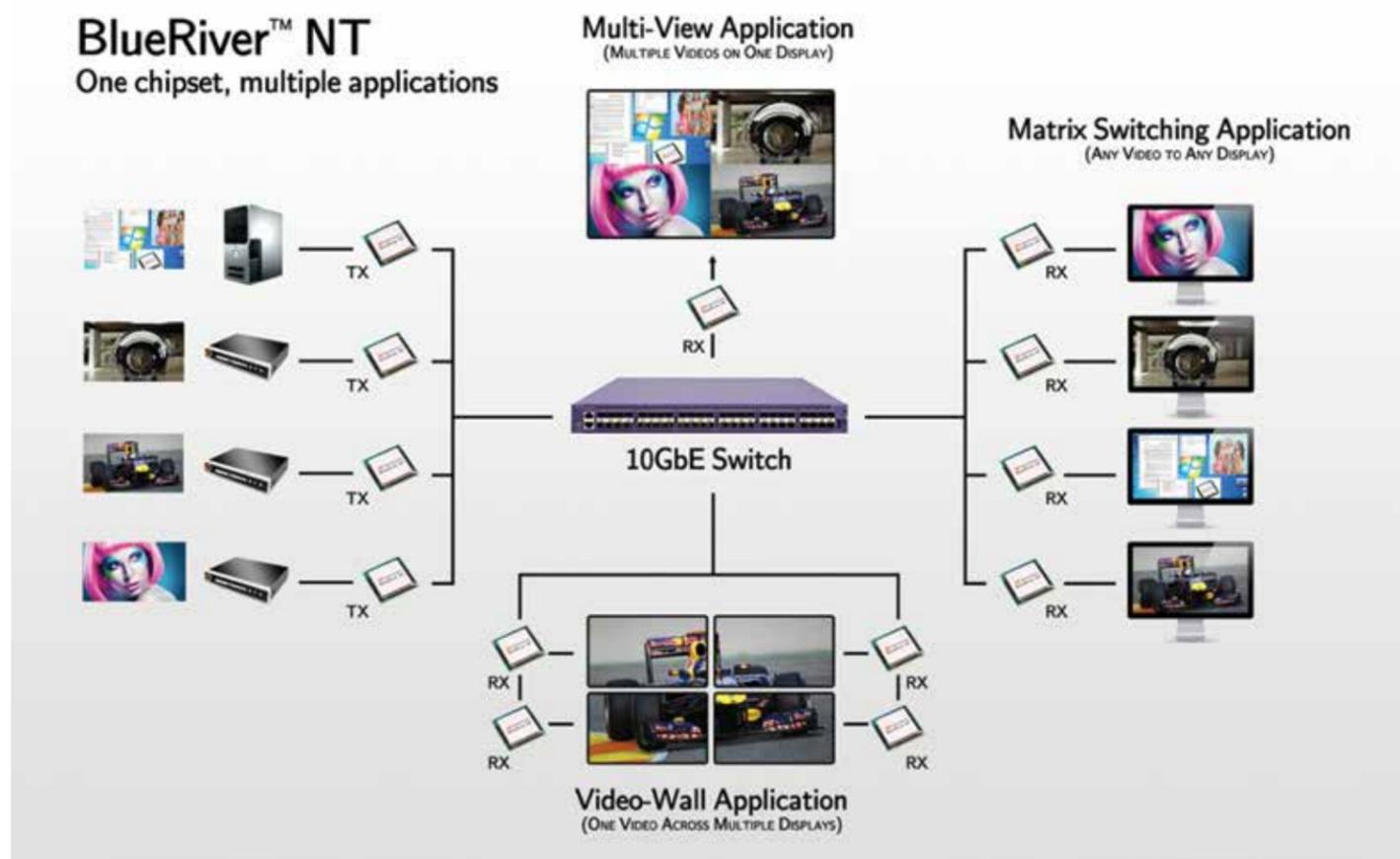
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# ~~HDBaseT~~

## HDBaseIP: The Way of the Future?

BlueRiver NT – another leap forward for AV kind

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**JUST A FEW YEARS AGO** I returned from the InfoComm show excited at having seen some prototypes of equipment built around the new, paradigm-shifting HDBaseT chipset from Valens. Designed to wring the maximum throughput from a category 5 UTP cable (about 11Gbps), this asymmetric approach to packing data allowed uncompressed HDMI data, bi-directional 100Mbps Ethernet, a range of serial control signals (EDID, USB2, RS-232, IR) plus 100VA of DC power to be carried 60m+ point-to-point by a single bog-standard, unshielded twisted-pair cable (blue string). Initially intended to extend the applications of HDMI (at that time still considered a limited transmission length domestic/residential data distribution format), HDBaseT has been grasped firmly with both

hands by the pro AV industry as a low-cost solution for point-to-point signal distribution and reticulation in applications ranging from digital signage, to video walls and collaboration spaces. HDBaseT has swept from prototype to recognition as an IEEE standard in less than half a decade. While it has not proved to be an AV industry panacea, HDBaseT has simplified many distribution problems and opened up whole new areas of AV product development.

### CANS & CANTS OF HDBASET

Squeezing so much data down an ordinary UTP cable, doesn't really leave room for much else, which limits HDBaseT to a single signal set between two directly-connected points, and while it can transport 4K video, it tops out at

about 30 frames per second (fps), which is pretty much all most of us are likely to need for some time to come.

The more recent versions of the HDBaseT chipset have made it much easier for OEMs to access all the signal types embedded in the data stream, which makes designing gear around it cheaper and faster to bring to market. They also allowed signal replication over a local buss and thus enabled the development of devices with multiple outputs, which has led to a deluge of multiple-output HDBaseT devices and switch matrices.

What HDBaseT *hasn't* done is take AV the next important step down the long road of AV/IT convergence. Sure it uses the same cable types as Ethernet, which makes it easier to install into existing IT infrastructure, and cheaper all round

because it uses inexpensive commodity UTP, but it's really not much more converged with IT than the long video coax and audio cables we've used for decades.

### HDBASEIP

While we have been moving audio and video over TCP/IP networks for a long time now, the applications have been restricted to relatively low resolution images, at relatively low refresh rates and quite often with some fairly aggressive compression applied too. We've also had to live with IP's slightly treacherous 'best effort' delivery and lack of determinacy. Getting uncompressed, very high definition (4K) video at frame rates exceeding 25fps across an IP network with its packetisation and header overheads is pushing at the boundaries of what information theory says is possible.

AptoVision, a company formed in Montreal, Canada by a group of former Matrox employees, has been working on the problem of getting stable high definition video to move across a TCP/IP network for a while now. It started out by developing a synchronous low-latency FPGA-based chipset that allows video sources and sinks to accurately reclock the frame synchs across a 10Gbps Ethernet network with zero frame latency and jitter, and a genlocking capability. This enables the distribution of very high definition video across a standard 10GbE network using the commercial off-the-shelf (OTS) 10Gb fibre, twisted-pair cable and switches available from any IT supplier. While this meets the need for stable networked video, it was only a partial solution for the distribution of AV over IP.

BlueRiver NT which was released by AptoVision at ISE in February, is a further development of this chipset. It takes the whole process of AV signal distribution into a new realm.

In an AV sense, BlueRiver NT can best be summed up as the networked version of HDBaseT in the way it channels the whole gamut of audiovisual signal types over a 10GbE network.

Included in the suite of signals handled by the BlueRiver NT chipset are:

- Pass-through extension, transmission and switching of uncompressed HDMI/DVI digital video, including all 3D modes, at all resolutions up to Ultra-HD (4K) at 30fps (4K at 60fps currently uses 4:2:0 subsampling). Plug 'n' play with no EDID learning requirements. HDMI 2.0 and DVI 2.0 compliant HDCP.
- HDMI multi-channel digital audio and audio return channel, including up to 32 channels of LPCM, Dolby Digital/Plus/EX, Dolby True HD, DTS, DTS-96/24, DTS-EX DSD, DTS High Res, DTS-HD Master, plus two analogue channels each, 24-bits at 48kHz.
- Stereo Audio: analogue and digital (S/PDIF/TOSLink)
- HDMI Ethernet Channel (HEAC) at 10/100/1Gbps
- Bidirectional RS-232 (at baud rates up to 115,200)
- Bidirectional IR (infrared)
- USB 2.0 (up to 480 Mb/s)
- Custom OEM data (using generic data interface)

Signal range over a 10GbE network is 100m over Cat5e/6 UTP; 1km over multimode fibre (50µm/62.5, 850nm), and up to 30km over single mode fibre (9µm, 1310nm).

### SEALED WITH A THUD

Suddenly AV and IT converge with a resounding thud. The Ethernet network, with its decades of R&D, equipment development, commodity pricing, short product cycles, ready availability, packet-sniffing and low level monitoring and

analysis tools, and plentiful supplies of skilled techs and administrators, can finally become the backbone for AV systems. More than ever, AV is now about the acquisition and display of audiovisual information and less about the transport mechanism between devices. We've always been happy to hook in to the existing electrical grid to power our projects. BlueRiver NT is the dawn of the age where we can just hook in to the existing data grid to carry our data between the specialised audiovisual endpoints.

The importance of the development of the BlueRiver NT chipset has not been lost on equipment manufacturers, many of whom are currently developing products to exploit its capabilities. The technology has been winning awards for innovation at trade shows, while prototypes of gear using the chipset were on display (mostly under the counter) at ISE in February. There's no doubt that many more will be around at the US InfoComm show in June. Aurora Multimedia is already using its trademarked term *IPBaseT* to describe its range of Ethernet-based distribution products based on the chipset. The name does have a catchy ring to it. My tip for AV systems designers is to start looking around for a good source of well-priced and reliable 10GbE switches, because you're likely to be using them by the pallet-load before too long. 🐣

### MORE INFO

AptoVision: [www.aptovision.com](http://www.aptovision.com)