TV to Become More Interactive With DiiVA

A DiiVA-enabled TV lets you access the Internet, control devices, play games and reduce cable usage

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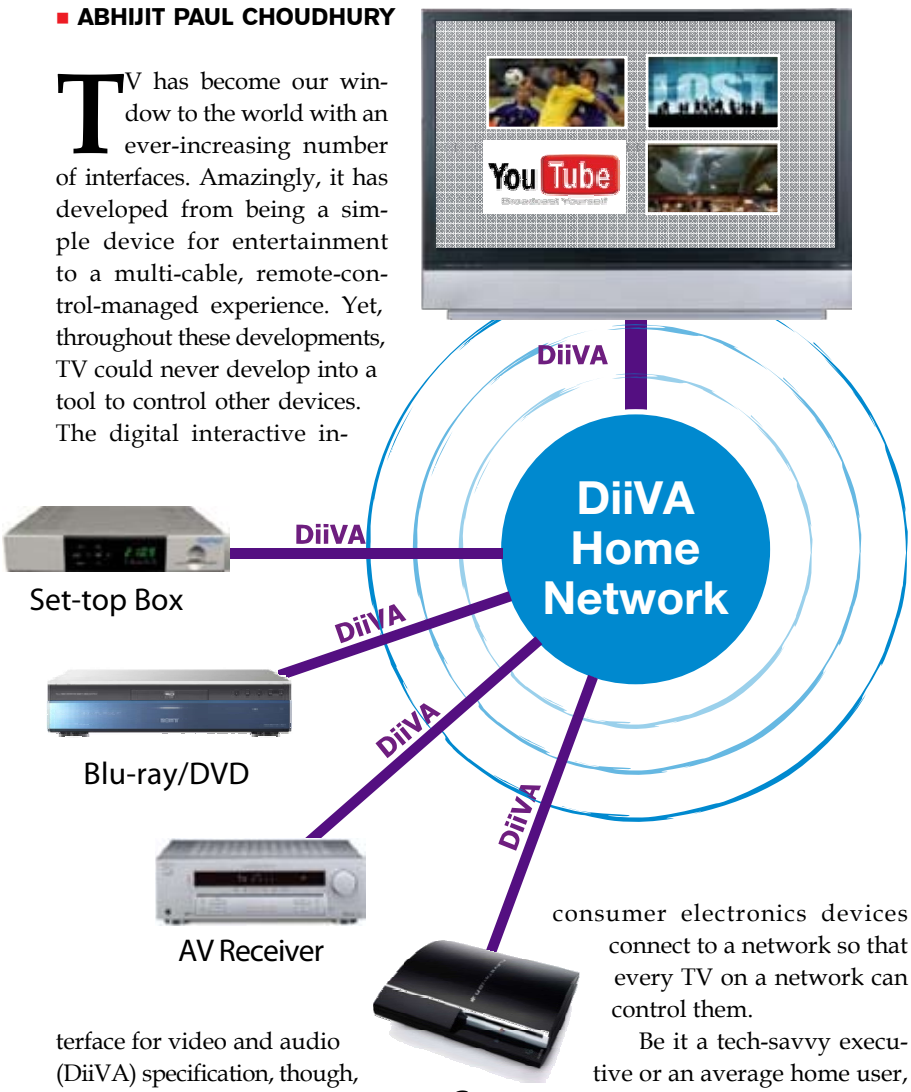
TV has become our window to the world with an ever-increasing number of interfaces. Amazingly, it has developed from being a simple device for entertainment to a multi-cable, remote-control-managed experience. Yet, throughout these developments, TV could never develop into a tool to control other devices. The digital interactive interface for video and audio (DiiVA) specification, though, gives TV a new definition.



With DiiVA specification 1.0, developed by a consortium of companies, one can access the Internet and control devices from any DiiVA-enabled TV, reduce cable usage and play games on the TV. In fact, the main aim of DiiVA is to make consumer electronics devices connect to a network so that every TV on a network can control them.

Be it a tech-savvy executive or an average home user, all need to integrate their electronics entertainment devices and digital appliances. This integration sometimes gets cumbersome and managing it becomes a serious issue. DiiVA—a new home multimedia networking interface standard that incorporates uncompressed video, multichannel audio, bidirectional data such as USB and Ethernet, commands and content protection—will be able to handle this challenge. It would rather simplify connection between devices, offer easy configuration and make user experience a simple and better one. In other words, DiiVA can be thought of as high-definition multimedia interface (HDMI), universal serial bus (USB) and Ethernet bundled together.

According to Manish Sharma, associate professor, IIT Delhi, "A good thing about DiiVA is its viability. Market leaders like Sharp, Panasonic, LG, Samsung, Media Tek, Agilent and many other firms are supporting this standard."

The consortium released the DiiVA 1.0 specification in April this year, but products that can use this interface will be available by 2010. This specification is open to companies developing consumer electronics products like TVs, set-top boxes, DVDs, Blu-ray players, AV receivers, PCs, gaming consoles and mobile devices enabling technology.

Benefits for end users

DiiVA will bring along with it simplicity and scalability for the end users. Today, consumer electronics products can be connected to one another, but each has its own type of connectors, making the task troublesome. DiiVA specification tries to standardise the interface for consumer electronics products so that home networking becomes simple. Consumer electronics products have the functionality of two-way communication, hence DiiVA will give

DiiVA is superior to existing standards

Some of the reasons which make DiiVA better than the existing standards are better networking capability, better bulk data transfer and low-cost cables. Today's digital interfaces are point-to-point connections that are limited in their ability to be networked. DiiVA specification defines its own network and transports layer that is similar to what we find in Ethernet networks, but it provides point-to-multipoint connection. Hence it has the ability to connect multiple source devices to multiple displays and control various digital home appliances from a central TV.

Also, today's interfaces have bidirectional capability such as I^2C. But they lack in bandwidth and are very slow. For example, HDMI v1.3—the consumer electronics control (CEC) interface—operates at 1 kbps. Display port v1.1—the AUX channel—operates at 1 Mbps. But, DiiVA is far better than these, as it operates at a speed of 2 Gbps and enables high-speed bidirectional data channel.

Says Sharma, "Since DiiVA is wired and not wireless, it can even go for bandwidth of 20-30 Gbps. It can also transmit videos without any hassle. A data channel has been added to DiiVA specification, whereas the existing HDMI does not provide one. There is, therefore, problem in sending infomation along with video through HDMI."

DiiVA uses fewer cables than the existing standards and can send multiple protocols using the same wires. It uses only four differential pair cables, whereas HDMI contains 19 wires bundled in one cable.

them the option to interact with each other as it supports bidirectional data. DiiVA can also combine audio, video and data transfer into one, making the setup simpler between devices.

Says Sharma, "With DiiVA specification you can easily display data of your computer on your TV screen. Hence, TV will become a general-purpose screen, which can be used as a computer screen as well."

But, what about the millions of TV sets that are already in use by the consumers? Do they need a replacement in order to adopt this new DiiVA standard? According to Steve Yum, senior director of product planning, Synerchip, a US consumer electronics company, "In order to use DiiVA with existing TV sets, users can buy low-cost adaptors for both TV and source sides. These bridging products will make customer transition easy from existing interfaces to DiiVA."

Let's find out the challenges that were faced earlier which led to the development of DiiVA. As Yum says, "One of the obstacles which prevents TV from becoming an interactive device is the interface, which is primarily unidirectional, making TV a one-way communication device." Moreover, he says, "When standards like HDMI were created, they were not designed to handle video and data. There is no data communication channel from which a TV can send data back to the home network or to the Internet. DiiVA's goal is to simplify wiring so that a new home network can be established over a DiiVA connection that can allow video, audio and data to be sent over a single low-cost wire."

Technology that drives DiiVA

The core of DiiVA technology is a high-speed, serial I/O that runs at 4.5 Gbps per differential pair. The DiiVA cables comprise two parts. Lanes 1-3 are used for uncompressed video and lane 4 for hybrid channel. As Yum explains, "DiiVA shares the same cable structure as CAT6a network cables. Inside, there are four differential pairs, of which three are reserved for uncompressed video—the protocol tries to minimise the number of lanes. The fourth differential pair is used as the hybrid data link."

The maximum bandwidth that can be used for sending uncompressed video over 8B/10B encoded forward channel is 13.5 Gbps. It is also capable of handling video transmission beyond 1080p with deep colour and high refresh rates. The hybrid channel is capable of operating at a speed of 2 Gbps and can be divided into sub-channels

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that transport audio, control and bulk data. All sub-channels can operate simultaneously and DiiVA protocol includes error-checking routines to ensure against data loss.

Kurt Scherf, vice-president and principal analyst, Parks Associates, a market research firm that searches emerging consumer technologies, says, "The real benefit of DiiVA technology is the delivery of uncompressed and high-quality video across cables like CAT 6, which lowers the cost of installation."

DiiVA specification supports a maximum cable length of 25 metres from point to point. With the support of a repeater, the distance between the devices can be extended to 50 metres.

DiiVA will also support HDCP 2.0 and DTCP-IP content protection systems for uncompressed and compressed video streams, respectively. HDCP 2.0 content protection is used for uncompressed video and audio. Since content protection keys are sent as data packets over the hybrid channel, multiple content protection schemes can be supported within DiiVA. Hence, in future, if any other content protection is required, it can be implemented within DiiVA without the need to change the cable definition.

DiiVA interface is capable of handling power. Power can be sent through data lines of the DiiVA cable. The power delivery mechanism is called 'power over DiiVA' (PoD) and it is capable of sending power at 500 mA (2.5 watts) over two differential pairs. Since there are four differential pairs, a total of 5 watts of power can be sent. ●