Shown is an example of a heterogeneous Matter network that includes protocol bridging elements. (Credit: Expressif Systems)

The group, which eventually became part of the Connectivity Standards Alliance (CSA), introduced the Matter 1.0 standard. The intent was to facilitate set up and control smart-home devices from any compliant manufacturer with a single, simplified, consistent set of steps, and quickly connect those devices to one or more applications and platforms. Since then, the Matter group's membership has expanded to include many of the world's major semiconductor makers, appliance and consumer electronics manufacturers, design groups, and even network service providers.

Matter Protocol: Under the Hood

One of Matter's key architectural strengths is that it treats networks as shared resources. In other words, it doesn't have any requirement for exclusive network ownership, or access. This enables users to build complex systems that overlay multiple Matter networks over the same set of constituent IP networks.

Another important contributor to its versatility is the use of addressing for its operational communication. The Matter standard contains mechanisms for resolving the node IDs and fabric IDs within the network it supports into various types of IPv6 addresses.

As a result, devices that support the Matter protocol can easily communicate with each other within and across network boundaries using existing technologies, including Bluetooth LE, Ethernet, Wi-Fi, and the Thread networking protocol. This makes it easy for Wi-Fi end devices, such as cameras, home appliances, and media players, as well as Wi-Fi 6 (plugged devices) products, to gain direct high-speed access to the internet.

For low-power, low speed applications, such as battery-operated sensors, locks, and switches, Matter can work with end devices that use the Thread wireless protocol to connect to a local mesh network. In this case, an Open Thread Border Router (OTBR) provides access to the cloud. In addition, devices known as Matter Bridges can be used to translate traffic between an OTBR and existing wireless networks such as Zigbee, Z-Wave mesh, and Bluetooth mesh.

Although it leverages the IPv6 protocol, Matter is able to operate in the absence of a globally routable IPv6 infrastructure, enabling deployment of networks that are disconnected or firewalled from the global internet. This also allows it to be used in environments where the internet service provider either doesn't support IPv6 on consumer premises or where the support proves otherwise limiting—for example, if the delegated prefix can't accommodate all of the networks and devices on premises.[2]

Commissioning a device into a Matter network is done via the Bluetooth LE (BLE) wireless protocol using a Matter controller, which can be a mobile device or a home hub (smart speaker, smart display, etc.). Most products are designed to be set up using smartphone applications invoked by either numeric or QR codes. Once commissioning is complete, the device communicates with other devices across its assigned network and BLE is no longer used.