UDP

UDP (*User Datagram Protocol*) is a fast, lightweight internet protocol used for time-sensitive applications like video streaming and online gaming because it doesn't require a connection to be established first. While this makes it efficient, it also means that UDP is unreliable, does not guarantee packet delivery, and is more susceptible to data loss and attacks than protocols like TCP.

UDP broadcast is a method of sending a single UDP packet to a special broadcast address, which is then delivered to all devices on the local network. This is an efficient way to send data to multiple recipients without needing to know their individual IP addresses. Because UDP is a connectionless protocol, it is suitable for applications where some data loss is acceptable in exchange for faster, more efficient transmission.

Another great advantage of UDP broadcast in building automation systems is that it does not require *"knowing"* the IP addresses of the participating units; each sub-unit simply *"scatters"* measurements and messages across the network. Not every telegram reaches its destination, and many end up in places where they are not needed, but despite these inaccuracies, the information still gets through. The sub-units do not need to *"know"* the network; the data exchange is built up almost spontaneously.

UDP is often prohibited in many networks, especially industrial ones, because it can cause overload by flooding the network due to its properties. This issue can be avoided by reducing message transmission frequency to about 1–5 seconds. Building automation systems typically do not need high-speed (e.g., isosynchronous) data exchange.

UDP works well with DHCP (Dynamic Host Configuration Protocol) address allocation. It doesn't *"require"* precise knowledge of IP addresses like TCP/IP because it distributes information across the network almost like a shotgun; what it finds is what it sees. This protocol was really designed for simple, decentralized, and efficient IoT solutions.

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