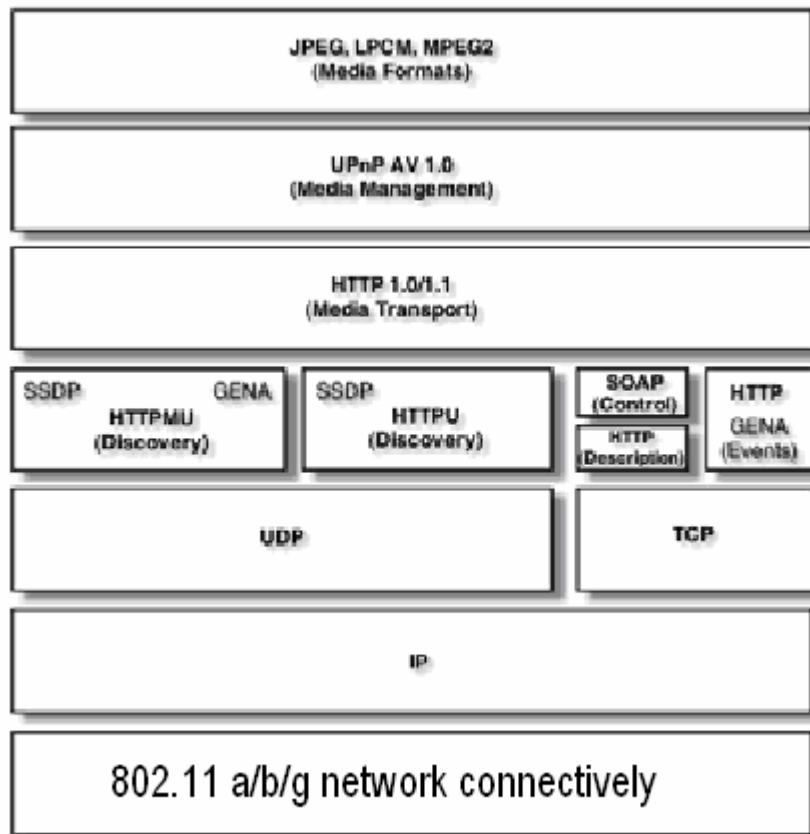


Work principle

. Mobile Digital Media Player (DMA201) contains: Media Formats, Media Transport, Media Management, Content Directory, Connection Manager, AV Transport, Device Discovery and control, Discovery, Device Description, Service Description, Control and Network Stack.

The following graphic shows the functional components:



Media Formats describe how digital content is encoded and formatted for each of the three classes of media: image, audio, and AV.

Media Transport defines how content moves across the network. DLNA devices that send or receive any media content to/from the network must support HTTP 1.1

Media management enables devices and applications to identify, manage, and distribute digital media content across network devices.

The **Content Directory** service provides a mechanism for each content server on the network to provide a uniform directory of all its available content to any interested devices on the network.

Every content server must have an instance of this service.

The **Connection Manager** service determines how the digital media content can be transferred between two devices on the network. Each device that sends or receives content must implement the Connection Manager service.

The **AV transport** service enables control over the "playback" of audio and video streams including the ability to Stop, Pause, Seek, etc.

Device discovery and control enables a device on the home network to discover the presence and capabilities of other devices on the network and collaborate with these devices in a uniform and consistent manner.

Device **discovery** is the first step in UPnP networking. When a new device is added to a network, the UPnP discovery protocol (SSDP) allows the device to advertise its services to all control points on the network via a multicast. Similarly, when a new control point is added to the network, SSDP allows the control point to search for devices of interest using a multicast. Thus, by listening to the standard multicast address, control points and devices can be made aware of new services being offered on the network and respond to service requests.

A UPnP **device description** includes vendor-specific manufacturer information like the model name and number, serial number, manufacturer name, URLs to vendor-specific Web sites, and a URL for presentation. For each service included in the device, the device description lists the service type, name, a URL for a service description, a URL for control, and a URL for eventing. A device description also includes a description of all embedded devices.

A UPnP **service description** includes a list of commands, or actions, the service responds to, and parameters, or arguments, for each action. A service description also includes a list of variables.

Once the device and its service descriptions are retrieved, a **control** point can ask those services to invoke actions and the control point can poll those services for the values of their state variables.

The basis for UPnP Networking (and thus DLNA) is the TCP/IP v4 protocol. Every device must implement a DHCP client, and search for a DHCP server when first connected to the network.