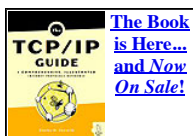


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TCP/IP Application Assignments and Server Port Number Ranges: Well-Known, Registered and Dynamic/Private Ports

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TCP/UDP Port Number Ranges

For this system to work well, universal agreement on port assignments is essential. Thus, this becomes another situation where a central authority is needed to manage a list of port assignments that everyone uses. For TCP/IP, it is the same authority responsible for the assignment and coordination of other centrally-managed numbers, including IP addresses, IP *Protocol* numbers and so forth: the [Internet Assigned Numbers Authority \(IANA\)](#).

As we have seen, there are 65,536 port numbers that can be used for processes. But there are also a fairly large number of TCP/IP applications, and the list grows every year. IANA needs to carefully manage the port number "address space" to ensure that port numbers are not wasted on protocols that won't be widely used, while also providing flexibility for organizations that need to make use of obscure applications. To this end, the full spectrum of TCP and UDP port numbers is divided into three ranges, as shown in [Table 144](#):

The existence of these ranges ensures that there will be universal agreement on how to access a server process for the most common TCP/IP protocols, while also allowing flexibility for special applications. Most of the TCP/IP applications and application protocols use numbers in the well-known port number range for their servers. These port numbers are not generally used for client processes, but there are some exceptions. For example, port 68 is reserved for a client using the [Bootstrap Protocol \(BOOTP\)](#) or [Dynamic Host Configuration Protocol \(DHCP\)](#).

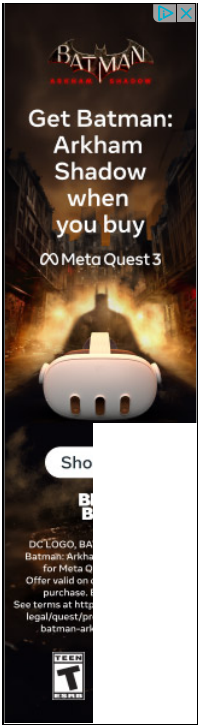
Table 144: TCP and UDP Port Number Ranges

Port Range Name	Port Number Range	Description
Well-Known (Privileged) Port Numbers	0 to 1,023	These port numbers are managed by IANA and reserved for only the most universal TCP/IP applications. The IANA assigns these port numbers only to protocols that have been standardized using the TCP/IP RFC process , that are in the process of being standardized, or that are likely to be standardized in the future. On most computers, these port numbers are used only by server processes run by system administrators or privileged users. These generally correspond to processes that implement key IP applications, such as Web servers, FTP servers and the like. For this reason, these are sometimes called <i>system port numbers</i> .
Registered (User) Port Numbers	1,024 to 49,151	There are many applications that need to use TCP/IP but are not specified in RFCs, or are not so universally used that they warrant a worldwide well-known port number. To ensure that these various applications do not conflict with each other, IANA uses the bulk of the overall port number range for registered port numbers. Anyone who creates a viable TCP/IP server application can request to reserve one of these port numbers, and if approved, the IANA will register that port number and assign it to the application. These port numbers are generally accessible by any user on a system and are therefore sometimes called <i>user port numbers</i> .
Private/Dynamic Port Numbers	49,152 to 65,535	These ports are neither reserved nor maintained by IANA. They can be used for any purpose without registration, so they are appropriate for a private protocol used only by a particular organization

Key Concept: Port numbers assignments are managed by IANA to ensure universal compatibility around the global Internet. The numbers

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