

JavaScript: how to calculate the number of available IP addresses in a subnet

In the context of computer networks, dividing an IP network into smaller sub-networks, or subnetting, is a fundamental practice for effectively managing the allocation of IP addresses and improving the security and efficiency of the network. A crucial aspect of this practice is calculating the number of available IP addresses in a subnet. In this article, we will explore how to implement this functionality using JavaScript, providing a script that can be easily integrated or modified for various network management purposes.

Before diving into the code, it's important to understand some basics of subnetting. An IP address is made up of two parts: the network identifier and the host identifier. The subnet mask, often expressed in CIDR notation as /24, determines how the IP address is divided.

The formula for calculating the number of IP addresses in a subnet is:

$$\text{Number of addresses} = 2^{(32 - \text{mask length})}$$

This number includes the network address and broadcast address, which cannot be used for individual devices.

Here is an example of a JavaScript function that calculates the number of usable IP addresses in a subnet given the CIDR notation:

```
function calcIPAddresses(cidr) {  
    // Extract mask length from CIDR notation  
    const maskLength = parseInt(cidr.split('/')[1],
```

```
10);

    // Calculate the total number of addresses in
the subnet
    const totalAddresses = Math.pow(2, 32 -
maskLength);

    // Subtract 2 to exclude network and broadcast
address
    return totalAddresses - 2;
}
```

To use this function, you can simply pass the CIDR notation of the subnet of interest:

```
console.log(calcIPAddresses("192.168.1.0/24")); //
Output: 254
console.log(calcIPAddresses("192.168.1.0/30")); //
Output: 2
```

In conclusion, calculating the number of available IP addresses in a subnet is essential for planning and managing networks. Implementing this functionality in JavaScript allows developers and network administrators to easily integrate this capability into their custom tools and dashboards.