

Elastic Network Interfaces

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An elastic network interface (referred to as a *network interface* in this documentation) is a virtual network interface that you can attach to an instance in a VPC. Network interfaces are available only for instances running in a VPC.

Note

Some AWS services create a network interface in your VPC to enable access to other resources and services, such as an AWS PrivateLink service or an Amazon ECS task. For more information, see the service-specific documentation.

A network interface can include the following attributes:

- A primary private IPv4 address
- One or more secondary private IPv4 addresses
- One Elastic IP address (IPv4) per private IPv4 address
- One public IPv4 address
- One or more IPv6 addresses
- One or more security groups
- A MAC address
- A source/destination check flag
- A description

You can create a network interface, attach it to an instance, detach it from an instance, and attach it to another instance. The attributes of a network interface follow it as it's attached or detached from an instance and reattached to another instance. When you move a network interface from one instance to another, network traffic is redirected to the new instance.

eth0 - default network interface of an instance - primary network interface

Every instance in a VPC has a default network interface, called the *primary network interface* (eth0). You cannot detach a primary network interface from an instance. You can create and attach additional network interfaces. The maximum number of network interfaces that you can use varies by instance type. For more information, see [IP Addresses Per Network Interface Per Instance Type](#).

Private IPv4 addresses for network interfaces

The primary network interface for an instance is assigned a primary private IPv4 address from the IPv4 address range of your VPC. You can assign additional private IPv4 addresses to a network interface.

Note that we can attach additional private IPv4 addresses to a network interface

Public IPv4 addresses for network interfaces

In a VPC, all subnets have a modifiable attribute that determines whether network interfaces created in that subnet (and therefore instances launched into that subnet) are assigned a public IPv4 address. For more information, see [IP Addressing Behavior for Your Subnet](#) in the *Amazon VPC User Guide*. The public IPv4 address is assigned from Amazon's pool of public IPv4 addresses. When you launch an instance, the IP address is assigned to the primary network interface (eth0) that's created.

Note that we can attach multiple addresses with a single network interface

IPv6 addresses for network interfaces

You can associate an IPv6 CIDR block with your VPC and subnet, and assign one or more IPv6 addresses from the subnet range to a network interface.

All subnets have a modifiable attribute that determines whether network interfaces created in that subnet (and therefore instances launched into that subnet) are automatically assigned an IPv6 address from the range of the subnet. For more information, see [IP Addressing Behavior for Your Subnet](#) in the *Amazon VPC User Guide*. When you launch an instance, the IPv6 address is assigned to the primary network interface (eth0) that's created.

IP Addresses Per Network Interface Per Instance Type

The following table lists the maximum number of network interfaces per instance type, and the maximum number of private IPv4 addresses and IPv6 addresses per network interface. The limit for IPv6 addresses is separate from the limit for private IPv4 addresses per network interface. Not all instance types support IPv6 addressing. Network interfaces, multiple private IPv4 addresses, and IPv6 addresses are only available for instances running in a VPC. For more information, see [Multiple IP Addresses](#). For more information about IPv6 in VPC, see [IP Addressing in Your VPC](#) in the *Amazon VPC User Guide*.

Instance Type	Maximum Network Interfaces	IPv4 Addresses per Interface	IPv6 Addresses per Interface
c1.medium	2	6	IPv6 not supported
c1.xlarge	4	15	IPv6 not supported
c3.large	3	10	10
c3.xlarge	4	15	15
c3.2xlarge	4	15	15
c3.4xlarge	8	30	30
c3.8xlarge	8	30	30
c4.large	3	10	10
c4.xlarge	4	15	15
c4.2xlarge	4	15	15
c4.4xlarge	8	30	30
c4.8xlarge	8	30	30
c5.large	3	10	10

hot attach, warm attach, cold attach

Best Practices for Configuring Network Interfaces

- You can attach a network interface to an instance when it's running (hot attach), when it's stopped (warm attach), or when the instance is being launched (cold attach).
- You can detach secondary (eth*N*) network interfaces when the instance is running or stopped. However, you can't detach the primary (eth0) interface.
- You can attach a network interface in one subnet to an instance in another subnet in the same VPC; however, both the network interface and the instance must reside in the same Availability Zone.
- When launching an instance from the CLI or API, you can specify the network interfaces to attach to the instance for both the primary (eth0) and additional network interfaces.
- Launching an Amazon Linux or Windows Server instance with multiple network interfaces automatically configures interfaces, private IPv4 addresses, and route tables on the operating system of the instance.
- A warm or hot attach of an additional network interface may require you to manually bring up the second interface, configure the private IPv4 address, and modify the route table accordingly. Instances running Amazon Linux or Windows Server automatically recognize the warm or hot attach and configure themselves.
- Attaching another network interface to an instance (for example, a NIC teaming configuration) cannot be used as a method to increase or double the network bandwidth to or from the dual-homed instance.
- If you attach two or more network interfaces from the same subnet to an instance, you may encounter networking issues such as asymmetric routing. If possible, use a secondary private IPv4 address on the primary network interface instead. For more information, see [Assigning a Secondary Private IPv4 Address](#).