

QSocket: DNS

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IMPORTANT If you haven't yet read [Calling BSD Sockets from Swift](#), do that first.

DNS is pretty central to networking. When you connect to a service across the network, you usually start with a DNS name. In BSD Sockets you first resolve that name and then connect. This is one of the key problems with the API.

Apple APIs support connect-by-name semantics, which allows the networking stack to do a lot of work on your behalf. If you're using BSD Sockets in production code, you have to do all this work yourself. For more on this, see [Connect by name](#), [BSD Sockets best practices](#) and [DNS best practices](#) in TN3151 [Choosing the right networking API](#).

However, my test projects sometimes do need to resolve DNS names and so I've created a simple wrapper for this:

```
extension QSocketAddr {

    /// Resolves the specified DNS name and service to a list of IPv4 and IPv6
    /// addresses.
    ///
    /// Equivalent to the `getaddrinfo` BSD Sockets call.
    ///
    /// The list may contain redundant values. For example, when you resolve
    /// `localhost` you get back 4 addresses, two for IPv4 and two for IPv6.
    ///
    /// The list is in the same order as that returned by `getaddrinfo`.
    ///
    /// - Parameters:
    ///   - host: The DNS name (or IP address) to resolve.
    ///   - service: A service name, like `"echo"`, or a port number, like `"4"`.

    public static func resolving(host: String, service: String) throws -> [(address: String, port: UInt16)] {
        var addrList: UnsafeMutablePointer<addrinfo>? = nil
        let err = getaddrinfo(host, service, nil, &addrList)
        guard err == 0 else { throw NetDBError(code: err) }
        defer { freeaddrinfo(addrList) }
        guard let first = addrList else { return [] }
        return try sequence(first: first, next: { $0.pointee.ai_next })
            .compactMap { addr in
                guard
                    [AF_INET, AF_INET6].contains(addr.pointee.ai_family),
                    let sa = addr.pointee.ai_addr,
                    case let saLen = addr.pointee.ai_addrlen,
                    saLen != 0
                else { return nil }
                return try QSocketAddr.fromSocketAddr(sa: sa, saLen: saLen)
            }

        // There's no wrapper for `getnameinfo` because /much/ more obscure than
        // `getaddrinfo`. If you want to see an example of that, read the code for
        // `QSocketAddr.fromSocketAddr(sa:saLen:)`.
    }
}
```

In my test projects I usually just pull the first item off the list and connect to that.

IMPORTANT If you use BSD Sockets in production code, connecting to the first address is not sufficient. For compatibility with a wide range of network environments, implement the *Happy Eyeballs* algorithm. See TN3151 [Choosing the right networking API](#) for the details.

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Network

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