

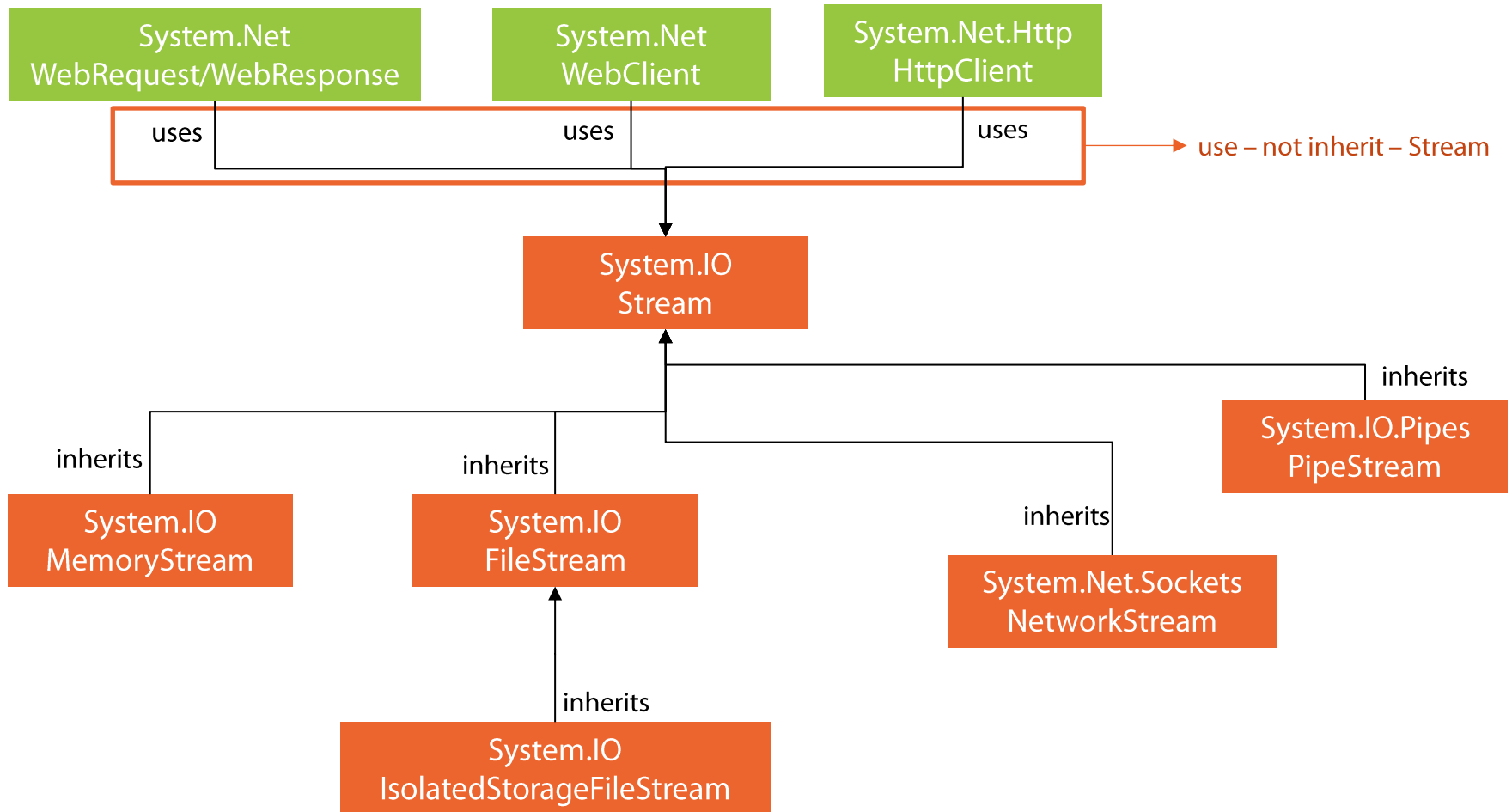
Web and Network Streams

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Web Streams



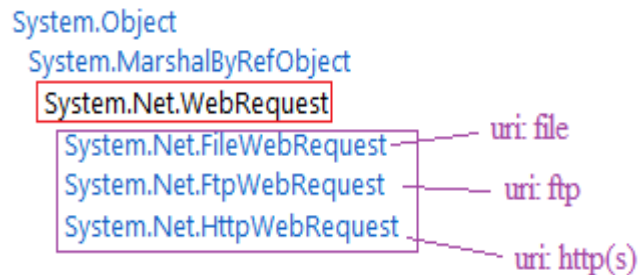
WebRequest and WebResponse

WebRequest

Abstract class for web requests to URIs

Independent of any specific protocol

Protocol-specific classes inherit WebRequest



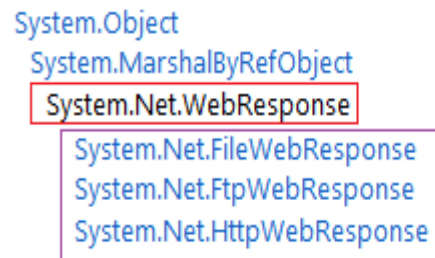
Applications can use `WebRequest` which determines the proper protocol using the URI

WebResponse

Abstract class for web responses to web requests

Independent of any specific protocol

Protocol-specific classes inherit WebResponse



Applications get `WebResponse` by calling `GetResponse` method of `WebRequest`

```
WebRequest request =  
    WebRequest.Create("http://mydomain/index.html");  
//some other code  
HttpWebResponse response =  
    (HttpWebResponse)request.GetResponse();
```

WebClient

- **WebRequest/WebResponse** provide low-level control over web requests/responses
- **System.Net.WebClient** provides common operations for simpler web requests
 - Internally uses WebRequest

HttpClient

- Part of .NET 4.5
- Base class for HTTP requests/responses for URI resources
- Internally uses HttpWebRequest
- HttpClient is the recommended approach
 - <http://blogs.msdn.com/b/henrikn/archive/2012/02/11/httpclient-is-here.aspx>
- HttpClient only supports asynchronous operations

Stream Support in WebRequest/WebResponse

- WebRequest and WebResponse support stream-based data uploads and downloads

```
HttpWebRequest request =  
    (HttpWebRequest)WebRequest.Create("http://domain/default.aspx");
```

```
Stream requestStream = request.GetRequestStream();
```

```
requestStream.Write(postByteArray, 0, postByteArray.Length);
```

```
WebResponse response =  
    request.GetResponse();
```

```
Stream responseStream = response.GetResponseStream();
```

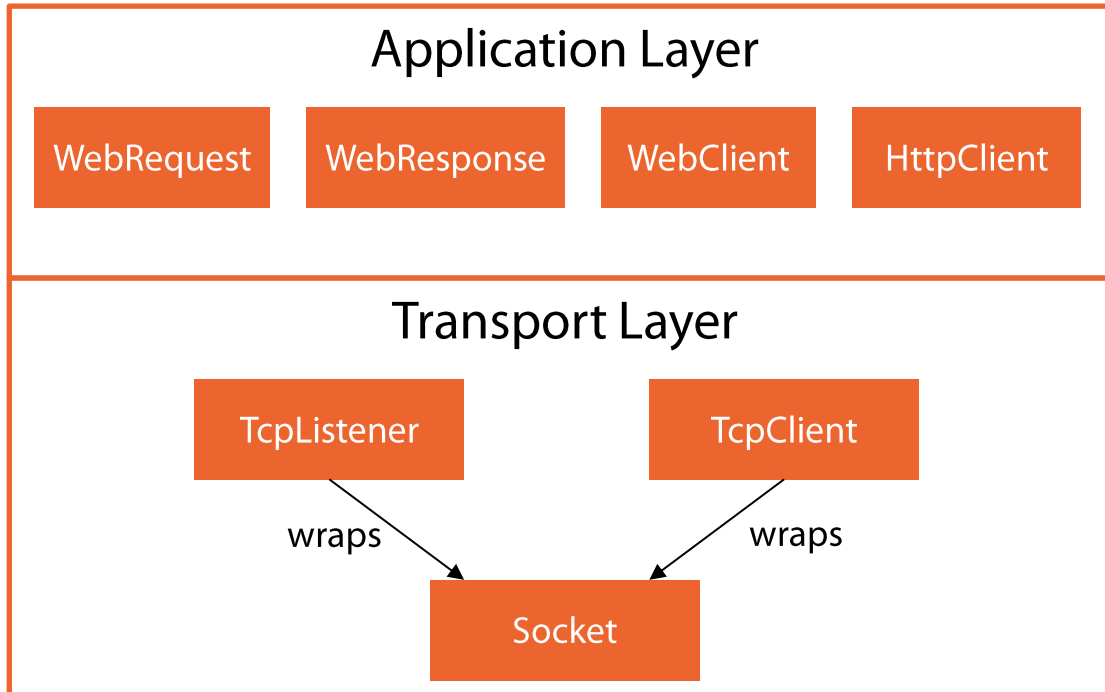
Stream Support in WebClient

- **WebClient provides choices to work with strings, byte arrays, files, or streams**
- **Not every functionality is possible using streams**
 - WebClient does not support reading a POST response using stream
- **Stream support in WebClient**
 - OpenRead: opens a readable stream for data downloaded from a resource
 - OpenWrite: opens a stream for writing data to the specified resource

Stream Support in HttpClient

- **Part of .NET 4.5**
- **Internally uses HttpWebRequest (can be changed)**
- **Only supports asynchronous operations**

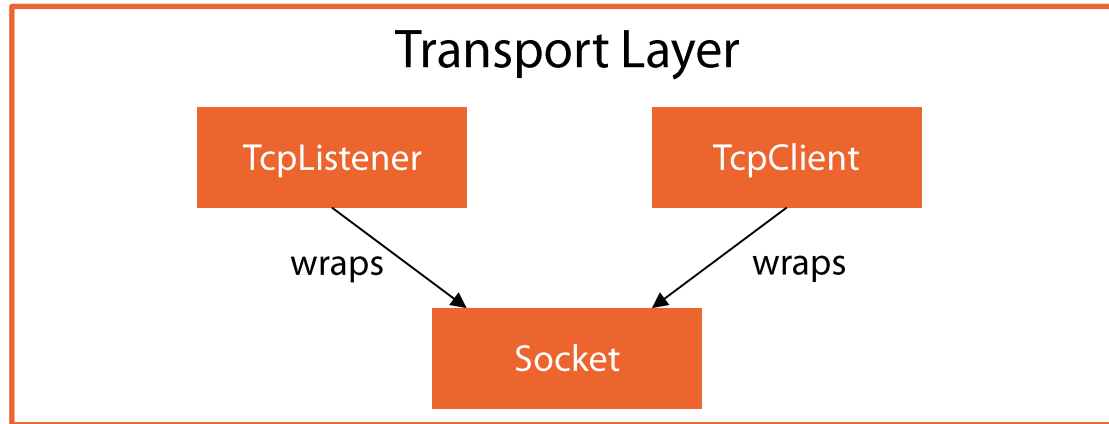
Network I/O



Greater flexibility
(Slightly) Better performance
More details to handle

- **Communication with Transport Layer might be blocked**

Sockets



- **Socket is an endpoint for interprocess communication over a network**
- **System.Net.Sockets namespace**
 - Socket
 - TcpListener
 - TcpClient

NetworkStream

- Unseekable stream
- Has a Socket object as its backing store
- Allows interprocess communication in a streamed manner
- Supports connection-oriented protocols such as TCP/IP
 - UDP is not supported

Summary

- **Classes used for web requests/responses:**
 - WebRequest/WebResponse
 - WebClient
 - HttpClient
- **Web classes use and not implement Stream**
- **NetworkStream:**
 - Socket backing store
 - Allows interprocess communication