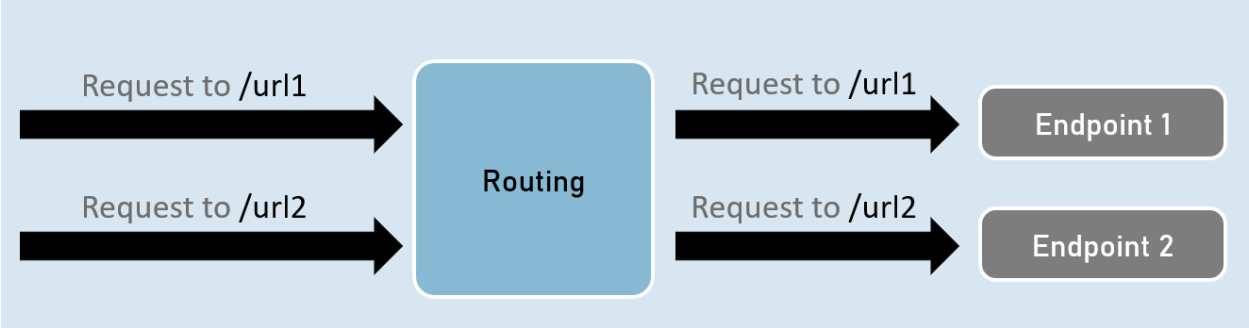
Introduction to Routing
Routing is a process of matching incoming HTTP requests by checking the HTTP method and url; and then invoking corresponding endpoints.



Routing - UseRouting and UseEndPoints
UseRouting( )

```
app.UseRouting();
```

Enables routing and selects an appropriate end point based on the url path and HTTP method.

UseEndPoints( )

```
app.UseEndPoints(endpoints =>
{
endpoints.Map(…);
endpoints.MapGet(…);
endpoints.MapPost(…);
);
```

Executes the appropriate endpoint based on the endpoint selected by the above UseRouting() method.

Map, MapGet, MapPost
endpoints.Map( )

```
endpoints.Map("path", async (HttpContext context) =>
{
//code
});
```

Executes the endpoint when a HTTP request's url path begins with the specified path.

endpoints.MapGet( )

```
endpoints.MapGet("path", async (HttpContext context) =>
```

```
{
//code
});
```

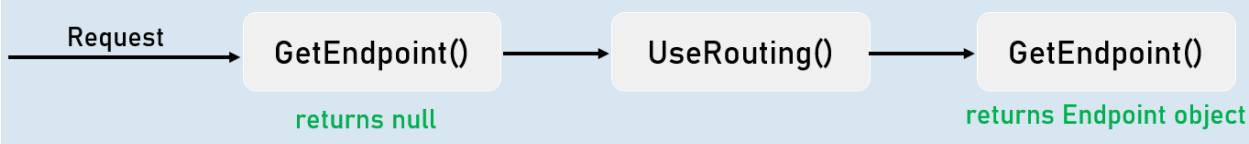
Executes the endpoint when a HTTP GET request's url path begins with the specified path.

endpoints.MapPost( )

```
endpoints.MapPost("path", async (HttpContext context) =>
{
//code
});
```

Executes the endpoint when a HTTP POST request's url path begins with the specified path.

GetEndpoint( )



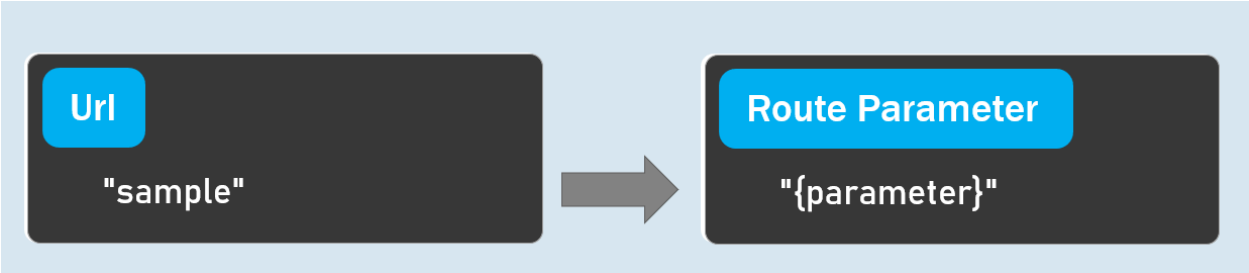

```
context.GetEndpoint();
```

Returns an instance of Microsoft.AspNetCore.Http.Endpoint type, which represents an endpoint.

That instance contains two important properties: DisplayName, RequestDelegate.

Route Parameters
"{parameter}"

A route parameter can match with any value.



Default Route Parameters

"{parameter=default_value}"

A route parameter with default value matches with any value.

It also matches with empty value. In this case, the default value will be considered into the parameter.

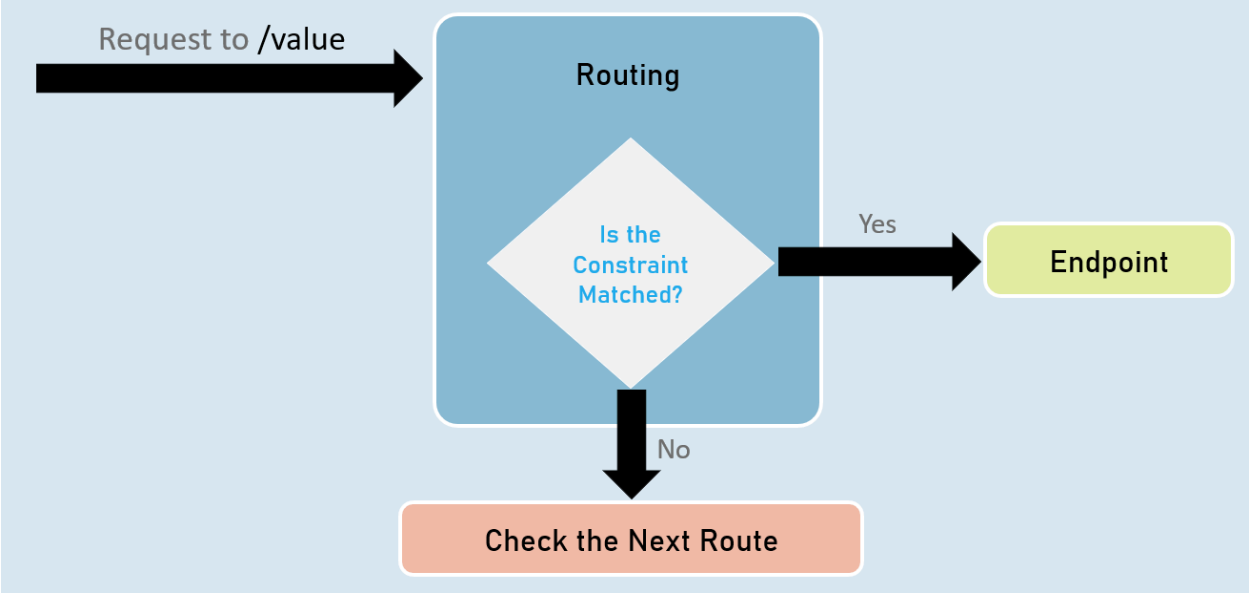
Optional Route Parameters

"{parameter?}"

"?" indicates an optional parameter.

That means, it matches with a value or empty value also.

Route Constraints



Route Parameter with Constraint:

"{parameter:constraint}"

A route parameter that has a constraint can match with a value that satisfies the given constraint.

Multiple Constraints

"{parameter:constraint1:constraint2}"

A route parameter can have more than one constraint, separated with colon (:).

int

Matches with any integer.

Eg: {id:int} matches with 123456789, -123456789

bool

Matches with true or false. Case-insensitive.

Eg: {active:bool} matches with true, false, TRUE, FALSE

datetime

Matches a valid DateTime value with formats "yyyy-MM-dd hh:mm:ss tt" and "MM/dd/yyyy hh:mm:ss tt".

Eg: {id:datetime} matches with 2030-01-01%2011:59%20pm

Note: '%20' is equal to space.

decimal

Matches with a valid decimal value.

Eg: {price:decimal} matches with 49.99, -1, 0.01

long

Matches a valid long value.

Eg: {id:long} matches with 123456789, -123456789

guid

Matches with a valid Guid value (Globally Unique Identifier - A hexadecimal number that is universally unique).

Eg: {id:guid} matches with 123E4567-E89B-12D3-A456-426652340000

minlength(value)

Matches with a string that has at least specified number of characters.

Eg: {username:minlength(4)} matches with John, Allen, William

maxlength(value)

Matches with a string that has less than or equal to the specified number of characters.

Eg: {username:maxlength(7)} matches with John, Allen, William

length(min,max)

Matches with a string that has number of characters between given minimum and maximum length (both numbers including).

Eg: {username:length(4, 7)} matches with John, Allen, William

length(value)

Matches with a string that has exactly specified number of characters.

Eg: {tin:length(9)} matches with 987654321

min(value)

Matches with an integer value greater than or equal to the specified value.

Eg: {age:min(18)} matches with 18, 19, 100

max(value)

Matches with an integer value less than or equal to the specified value.

Eg: {age:max(100)} matches with -1, 1, 18, 100

range(min,max)

Matches with an integer value between the specified minimum and maximum values (both numbers including).

Eg: {age:range(18,100)} matches with 18, 19, 99, 100

alpha

Matches with a string that contains only alphabets (A-Z) and (a-z).

Eg: {username:alpha} matches with rick, william

regex(expression)

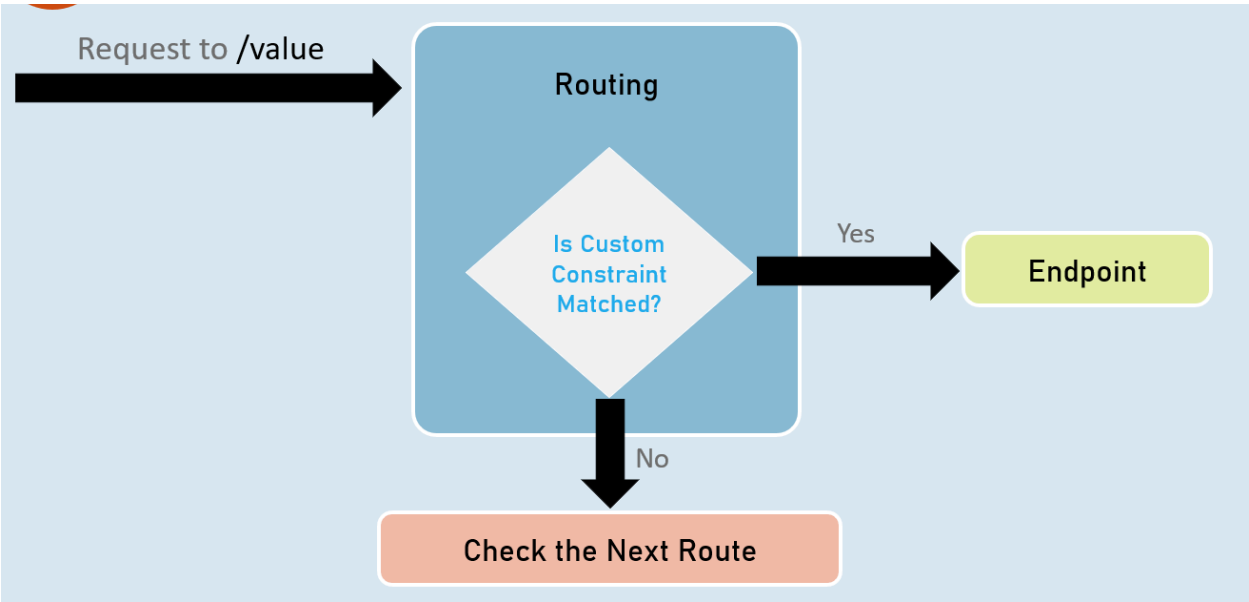
Matches with a string that matches with the specified regular expression.

Eg 1: {age:regex(^[0-9]{2}$)} matches with any two-digit number, such as 10, 11, 98, 99

Eg 2: {age:regex(^\d{3}-\d{3}$)} matches with any three-digit number, then hyphen, and then three-digit number, such as 123-456

Custom Route Constraint Classes
Custom Route Constraint Class

```
public class ClassName : IRouteConstraint
{
 public bool Match(HttpContext? HttpContext, IRouter? route,
string routeKey, RouteValueDictionary values, RouteDirection
routeDirection)
 {
   //return true or false
 }
}
builder.Services.AddRouting(options =>
{
 options.ConstraintMap.Add("name", typeof(ClassName));
}); //adding the custom constraint to routing
```



Endpoint Selection Order
Top is highest precedence (will be evaluated first)

1: URL template with more segments.

Eg: "a/b/c/d" is higher than "a/b/c".

2: URL template with literal text has more precedence than a parameter segment.

Eg: "a/b" is higher than "a/{parameter}".

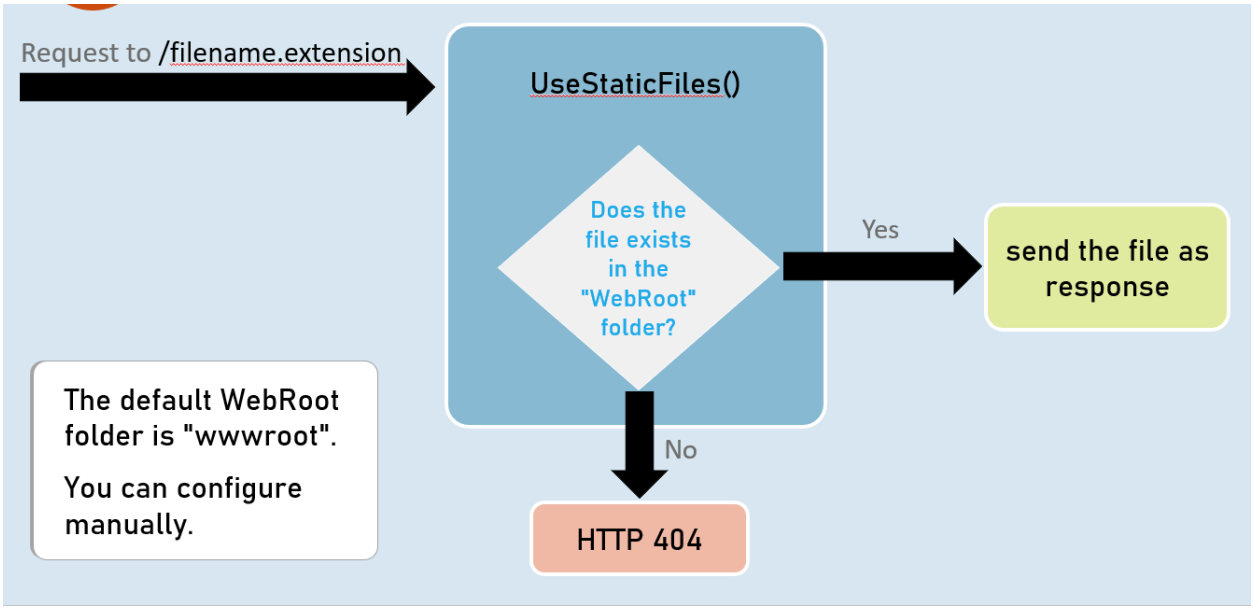
3: URL template that has a parameter segment with constraints has more precedence than a parameter segment without constraints.

Eg: "a/b:int" is higher than "a/b".

4: Catch-all parameters (**).

Eg: "a/{b}" is higher than "a/**".

WebRoot


Request to /filename.extension
UseStaticFiles()
Does the file exists in the "WebRoot" folder?
Yes
send the file as response
No
HTTP 404
The default WebRoot folder is "wwwroot".
You can configure manually.