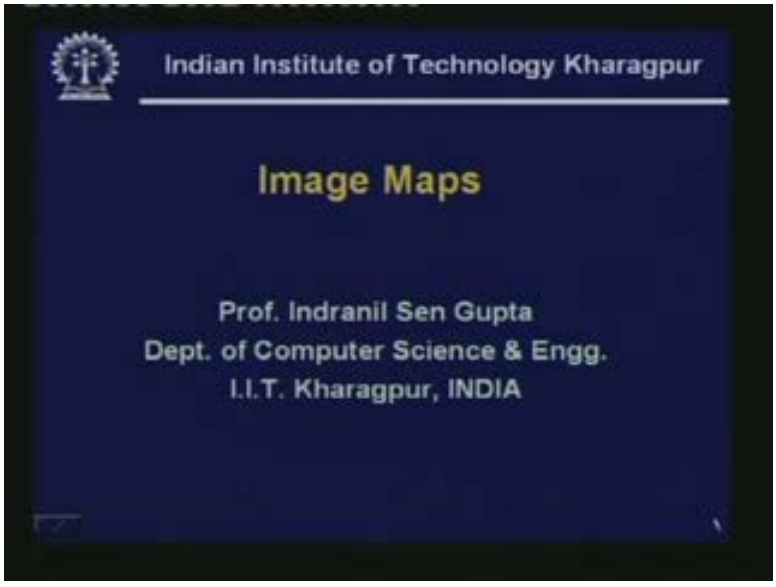
Internet Technology
Prof. Indranil Sengupta
Department of Computer Science and Engineering
Indian Institute of Technology, Kharagpur
Lecture No #18
Image Maps

If you recall, in our last lecture we are talking about html forms. Now using forms what we are able to do? We are able to create an environment through which two-way communication was possible between the web client which is the browser and the web server. So a form was displayed on the screen as part of an html page which a user can fill up and when the form was submitted the data that where filled up would be going all or would be transmitted to the web server where a particular program which is linked to that particular form which we had called as a CGI script or a CGI program that would start running.

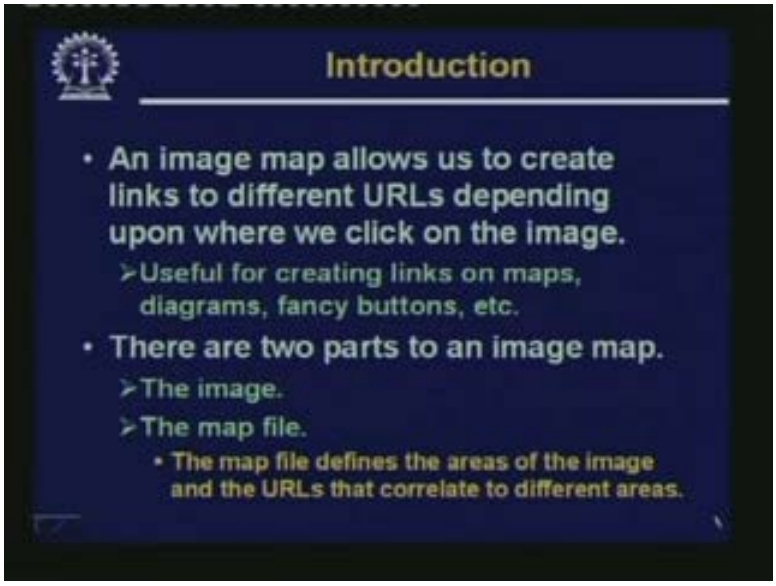
And the CGI program would take the form data that are filled up as an input and would do some processing. And whatever it generates as output would be coming back and shown on the screen of the browser. Now before going into how a CGI script can be created, the details of it. We would like to talk about another technology or another way in which we can interact with the web server. But not through textual, text boxes, submit button; but through some images by selecting some portions of images. There are some predefined or well defined rules that you can define on the different portions of the image. And depending on where you are clicking on that image you may choose to carry out certain operation.

(Refer Slide Time: 02:27)



So our topic of discussion today is something called image map which provides just that kinds of a capability.

(Refer Slide Time: 02:34)



Now let us see what is an image map? Basically an image map it is an image a graphics a jpeg or gif image which is displayed on the screen. It allows us to create links to different URLs depending upon where we click on the image. Now here I am giving a very simple example where this kind of capability may be required or may be useful or desirable. Suppose I want to develop an information system about our country; information about the different states of the country. So one alternative would be that I create an html page where there would be hyperlinks corresponding to all these states. And I click on the name of the state and I get some more detail about the particular state. As an alternative and as you can say, as a more user friendly way of doing, so what we can have is that the map of India may be displayed on the screen and I have the option of clicking on a particular state using the mouse. This is a classical example of an image map application.

Suppose I click on a region inside West Bengal, then I immediately go to the next page which is the page corresponding to West Bengal. So this is some kind of a hyperlink. But it is based on an image. The geometry of the region where I am clicking and which is taking me to somewhere else. This can be defined in a number of ways as we shall see shortly. So this image mapping allows us to create links to different URLs as I just mentioned. This is very useful for creating links or maps as I have just mentioned on some diagrams. I can have diagram where ever I click on the diagram the corresponding information can be linked with it. You can have very fancy buttons instead of simple looking buttons. You can have very graphical oriented very you can say colorful and some kind of a visually good looking buttons which you can also implement using image map. May be as part of the same image you can have all the navigation buttons.

So it is possible. Now when you are having an image map, if you think there are basically two things you need to decide upon. First of course the map itself which get displayed on the screen which is an image. The map is nothing but an image file. But associated with

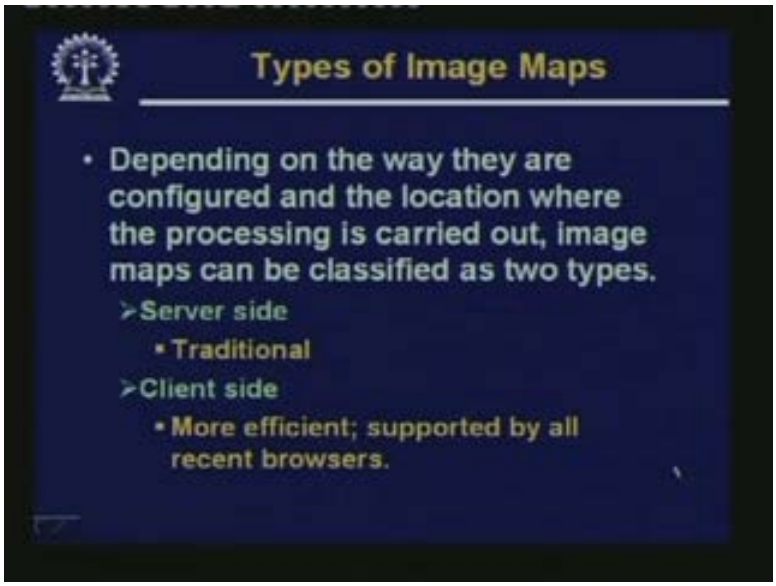
that image there has to be another file which is conventionally or traditionally called the map file. The map file actually tells you or defines the different areas of the images image and the corresponding URLs. Say, suppose you have you have image like this. You say that if you click on any point in this particular area, then you will be going to some particular URL, if you click somewhere here then you go somewhere else. So the map file will specify the definition of these areas and the corresponding URLs. If you click there where to go, there are a number of different ways of specifying these and we shall see this.

(Refer Slide Time: 06:16)

So in essence an image map is a single image that contains a number of clickable regions or hot spots. Hot spots are nothing but clickable regions. Now this is different from the case which we had talked about when we are discussing about html tables. We had said that if you have a big image the different pieces of image can be stored as a separate file and they can all be composed in the form of the table. So that, when the table is displayed as if you will see that the total image is getting displayed. And the different segment of the table can act as an image hyperlink to some particular URLs. But here the situation is different.

Here you have a single image and that single image is providing multiple links depending on where on the image you are clicking. So there can be a number of such hot spots or region. So when we click on a particular hot spot using the mouse we go to a new location which is defined by URL that is associated with the hot spot. We shall see how you can do this and as I mentioned that this mechanism requires the loading of only one image from the server. This therefore requires fewer server calls and also it is in general better looking as compared to several pieces of information which were brought and composed together. So this essentially is the idea behind image maps why we use it.

(Refer Slide Time: 08:08)



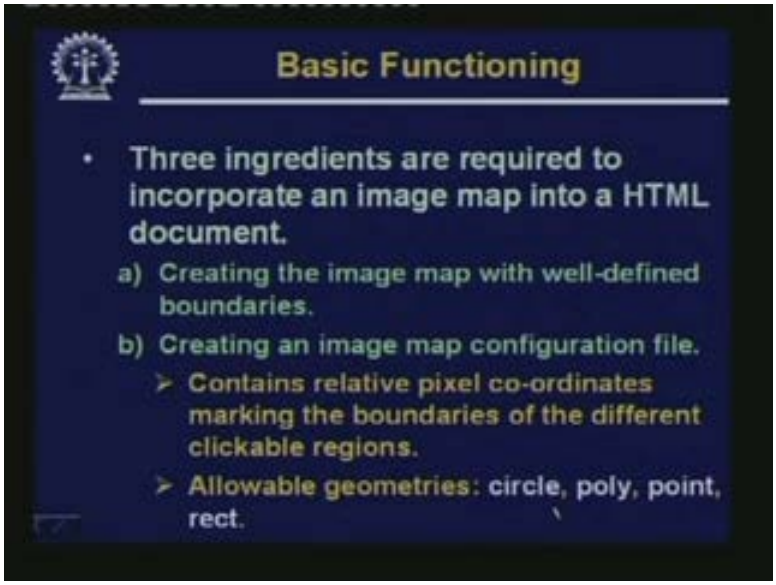
Well, let us see what are the different kinds of image map that you can have. There are broadly two types of image maps that you can have. And this classification depends on the way they are configured. Configured means how we specify the details about the map the regions and the corresponding URLs. And secondly, depending on where the actual processing is carried out. See actual processing is carried out means, on the map I am clicking using a mouse someone should decide that well, the place where I have clicked using the mouse corresponds to hotspot number one and so you should transfer to a particular URL, URL1 and the corresponding URL1 content should now come on my screen. So somewhere in the overall system this processing should be carried out.

Now there are two alternatives. This processing can be done at the end of the web server or it can be done at the end of the browser itself; on the client side itself. So depending on these that how they are configured and where the processing is carried out. We can classify image maps as either the server side maps which are the traditional one which was the first one to come up. Subsequently something called client side image map was also introduced, we will see that the client side maps are more efficient in terms of the operations. They are not supported by some of the old browsers. But all recent browsers support the client side. So in the newer websites you will find that the image maps, if there are any they all use the client side maps.

(Refer Slide Time: 10:03)

So let us start by talking about server side image maps. Now, as the name implies a server side image map requires something to be stored on the server side. The image map is stored on the server some information is stored on the server.

(Refer Slide Time: 10:22)



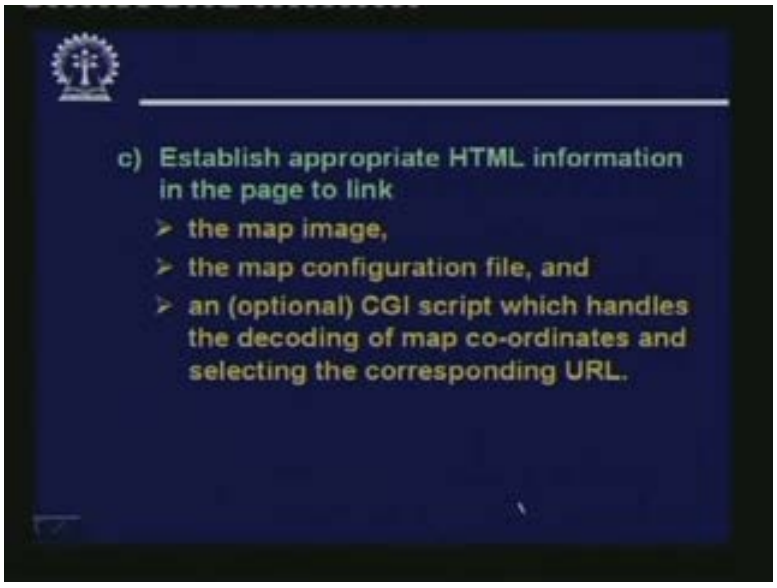
So let us see what are the basic ingredients that are required to implement such an image map. Now there is an html document that you are viewing from the html document. Somehow we are providing a link to an image map which is getting displayed as part of the html document. So basically we need a few things. First we must create the image map, before we are actually designing the system with well-defined boundaries. Because,

if we do not create the web the map the image map and do not know the exact co-ordinates of the boundaries. Then we cannot carry out any processing. If I say that the user has clicked the mouse on a co-ordinate 100 comma 50, what does that mean? Which region does it correspond to? This you can decide only if the exact co ordinates of the different regions or hot spots are known to you.

And this is known by some image editor program through which you are creating the image map. So this is the first step. You have to create the image map and you have to note down the exact coordinates. We will see that how we can define with respect to coordinates. So there has to be well defined boundaries of the regions. The second step is that once you know the exact geometry of the regions. Now you can create a map configuration file. Now the map configuration file will contain the relative pixel coordinates marking the boundaries of the different clickable regions. Relative pixel coordinate means the exact pixel co ordinate of the screen is not important. Say for example if you have a rectangle, then possibly the coordinates of the two opposite diagonals will be sufficient to specify the geometrical rectangle which is not require to specify the co ordinates of all the 4 vertices.

But when you are defining a polygon you may have to define the co ordinates of all the vertices. So it depends how you define. So this relative pixel coordinate is used because you are defining the co ordinates not with respect to the screen on which the image is displayed. But with respect to the image itself. Usually the top left corner of your image, the top left corner wherever you have that particular point is defined as the coordinate (0, 0). With respect to that, the other coordinates are defined. May be this will be the x axis. This will be y axis, that way it will be defined. And in the image map, we will see that the allowable geometries for the server side image mapping particular are circle, polygon, points, rectangle, these are the four kinds of geometrical shapes which you can define.

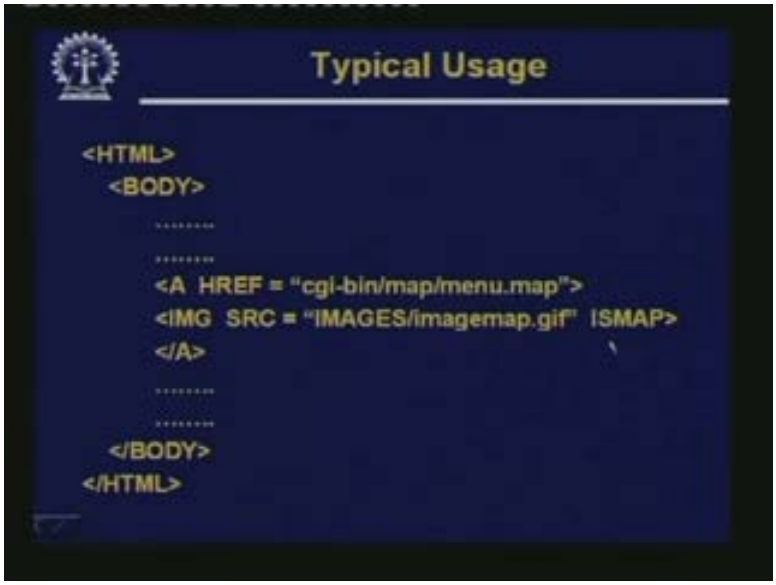
(Refer Slide Time: 13:46)



And thirdly, after we have defined the regions we have to establish appropriate html hyperlinks with each of the regions. And secondly you have put all the corresponding links to the page. Because ultimately this image map is displayed as part of an html page. So you have to tell that in html, how I can include such an image map. Secondly, I have to tell that for this image map where I can find the corresponding file, map configuration file. So all this things have to be clearly specified. So the map image map configuration file and also this is optional, it is not required for all cases.

Sometimes you may specify a CGI script program also. So when you click on the map, the CGI script program will start running and it will take as input the coordinate on the map where you have clicked. Depending on the coordinate you may want to do some processing that can be done by the CGI script. But if you do not want to do any special kind of processing, if you want to do just a jump to a particular URL, this you can specify in the map configuration itself and you do not need explicitly a CGI script. That is why CGI script is optional in this kind of cases.

(Refer Slide Time: 15:18)



Let us see a typical example. In html page, how we can include a server side image map? This is the skeleton of html file. First you have a line here. This is a hyperlink. This is the begin hyperlink and this is the end hyperlink. And at one attribute of this hyperlink specifies a URL. Now, in this case, this URL points to a file called menu dot map. Now this menu dot map is the map configuration file. This particular file contains information about the coordinate's geometrical shapes and the corresponding hyperlinks. So this menu dot map is the file where all the details about the regions and the corresponding URLs can be found. Well, within this hyperlink the body we have included an image. This is just like a normal image inclusion.

The only difference is that I have used an attribute called ISMAP. The attribute ISMAP is important here because if you do not use this attribute ISMAP, this will be like a

conventional clickable image. This image I can I can always make it hyperlinked just like this. But if we use this map this means two things. Number one, it means that the image that you are trying to load is a clickable map or an image map. And number two the hyperlink URL that we have specified that is not the URL of the web page you are trying to load. But rather it is the name of a map configuration file. These are the two things that are implied if the ISMAP attribute is present in this image tag specification. This is how you can include an image and the image map specification as part of the html file.

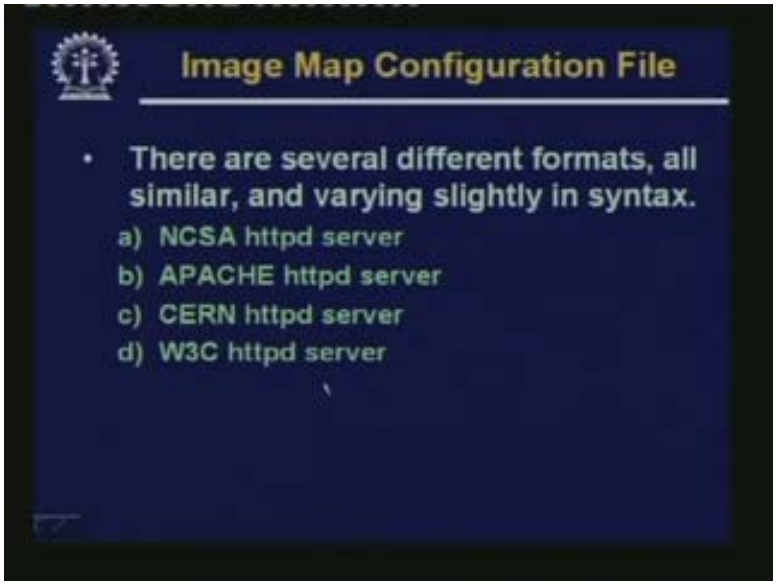
(Refer Slide Time: 17:44)

Now suppose, you have the image that I displayed. Now you click on a particular, suppose this is the image there are number of regions in the image, you click somewhere in a particular region. This is the region you have clicked. Now depending on where you click you are expected to go to a particular URL. So this acts so what similar to a form. And when you submit a form, some data that was filled up in the form would go to the web server. And the web server would forward it to the corresponding CGI script program. But here also something similar takes place. Whenever you click on an image map the corresponding x and y coordinates, the relative x and y coordinates of the image will be stored in some variables. And they will be sent to the web server exactly in the same way you sent form data name, value; name value pair, name equal to value name equal to value with an ampersand in between it will be sent like that. Now this server can do two things. The server can know that this is an image map coordinate.

So let me consult the image map file and find out that this coordinate corresponds to which hyperlink. So if I know the hyperlink I can fetch the page from there and I can forward it back. So after you click on this region of the image, the thing that is transferred to the server is like this. Suppose the URL of the server http myserver.com, if you look at the previous slide so here menu dot map was the name of the file. So actually menu dot map will come. Well, this menu dot map shows that it is under the root directory. But if it is under CGI bin extra so all those things would have come here cgi bin. And if there are

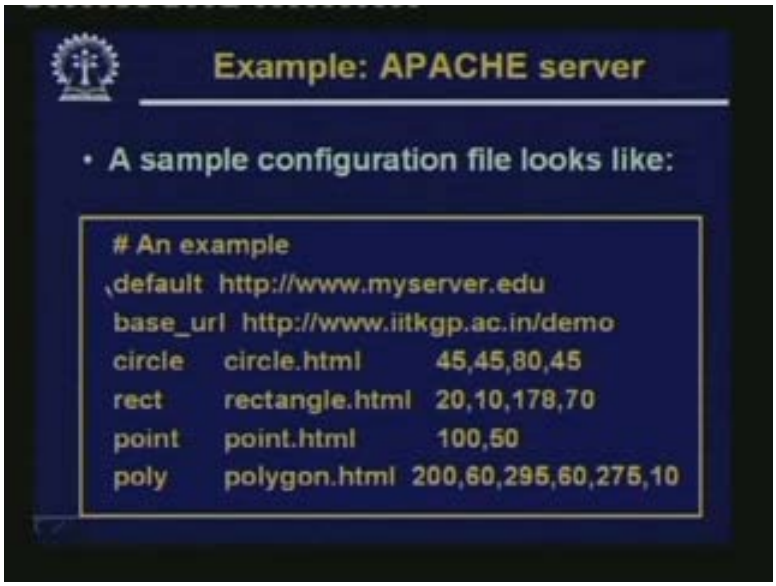
any other subject maps, all this things would come here. So the exact path name the map configuration file and just like the get method of form submission, there will be a question mark followed by the data x and y. So the values of the x and y coordinate would follow the question mark like in a get form submission exactly the same syntax. This x and y are the coordinates of the point where you have clicked.

(Refer Slide Time: 20:26)



Now with respect to server image map server side image maps, there are several slightly different formats depending on which web server you are using. Syntax is slightly different. But the essential idea is the same. The way you create the files are the same. So these are four very popularly used servers we will give the example on the apache server means how we can do the configuration.

(Refer Slide Time: 20:57)



So this is an example for an apache server. Let us have a look at this. This is the map configuration file. Say I give the name of this file as mymap dot map something. Typically the map files are given an extension dot map. There were a few things you need to understand here. The first line starts with a hash symbol which means it is a comment. Now you can introduce as many comments as you want in this file forget the first the line which fall the default line we will come back to this. Forget also the third line for the time being. Let us look at the last four lines. The last four lines give us a demonstration of the four different kinds of geometrical shapes that you can use. Circle. This is the name of the shape or the type of the shape. This is followed by the name of a URL where you want to go when you click on this particular region. And this defines the geometry of the circle.

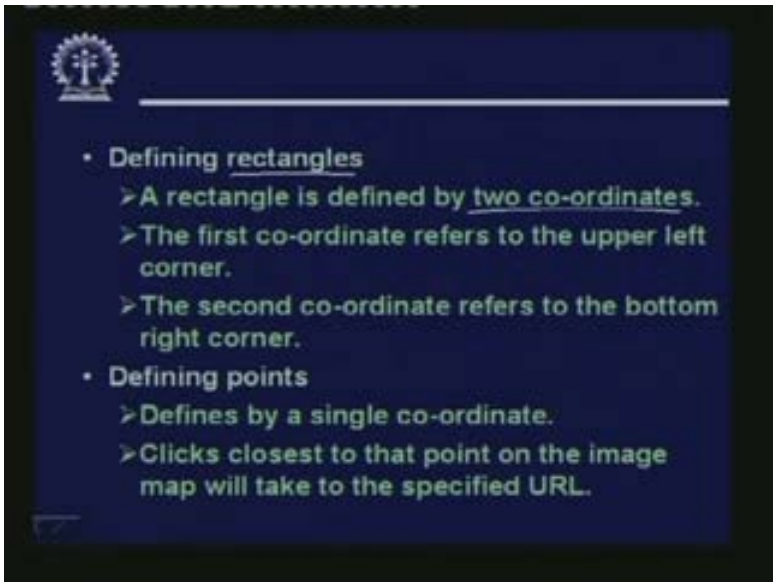
The first coordinate (45, 45) is the coordinate of the center (80,45) is the coordinate of some point on the circumference. We will see the details later. Similarly the next line tells you that it is a rectangular shape. This, the URL can be anything just for convenience I have given the same name rectangle dot html and this, the coordinate. The first coordinate (20, 10) is the coordinate of the top left corner (178,70) is the coordinate of the bottom right corner. Well you can also define a point followed by a URL a point will obviously have a single coordinate. Point means whenever you click in the close vicinity of a point. Because you cannot click exactly on a point because a point is a pixel very small point. So when you click in the close vicinity of the point which is closer than any other region surround, then we will select that point and you go to the corresponding URL.

And the last line specifies that you define a polygon. This is the URL and for a polygon we have define the co ordinates of all the vertices. So here you see that there are three vertices which means, these are triangle we are defining. Now there are a few things. Now when you are defining a configuration file like this. The URL if you click on a

region you are going to a URL. The URL may be on the local machine may be on some other machine. So this apache says that the URL should get absolute URL you have to give the complete path name. Relative path name is not allowed, but in the example you see that we have, where we here, we apparently given the relative path name so many circle.html, rectangle.html and so on. The base URL command which I have given here this gives you the prefix of the absolute attribute. That means when I give circle.html, this means actually http www.iitkgp.ac.in slash demo slash circle dot html.

So instead of writing the same thing four times, I can define it at the beginning as base URL and by default in all the other URLs I am giving that will be prep ended at the beginning. This is a way of a short cut. Now you imagine that you have an image you have defined certain regions of the image and you have defined a hyperlink corresponding to it. An URL corresponding to it. And it is not mandatory for you that you must assign each and every area of the image to some hyperlink. So there may be some areas which are not linked. Now if someone clicks on such an area which is not part of region or hotspot, then what happens? Then you go to the URL specified by the default specification. Default means when you are clicking on some place which is not part of a hot spot then where do oh where do you want to go?

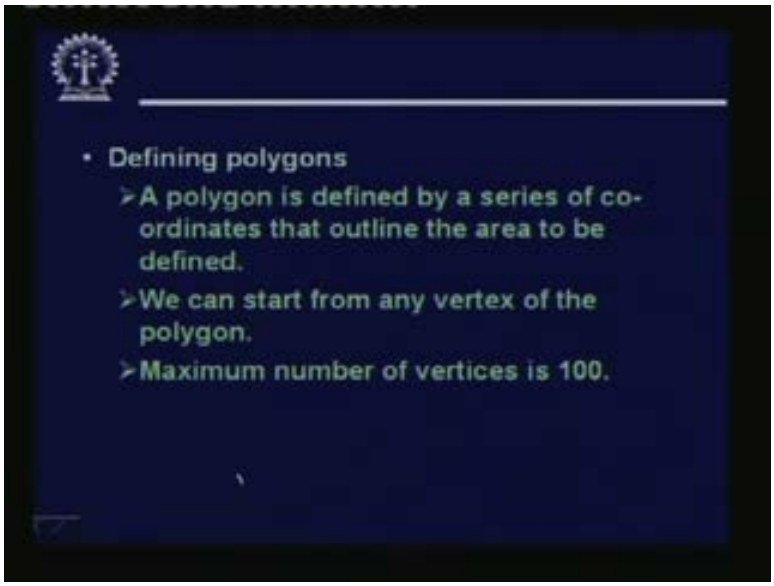
(Refer Slide Time: 25:56)



So let us see the different options in a little detail. When you are defining the default as in the first line. This is typically the first line in the map file. This defines the URL to which the users will be taken. If they click on an undefined area of the image. Undefined area means, an area which is not being assigned to a URL in the map configuration file. Similarly I had said when you are defining a circle; you specify two different coordinates to define the geometry of the circle. Your first is of course the center of the circle and the second one is a point on the circumference. This can be any point on the circumference. This can be, this, you can also have this point and so on. So far, for defining a circle you need two different coordinates. Center and any point on the circumference. Rectangles

again need two coordinates. The first one is the upper left corner. As I had mentioned, the second one is the bottom right corner. For defining points, points are referred to as single coordinate. And as I said that when you click closest to that point on the image map as compared to any other region in the vicinity. This will take you to the specified URL.

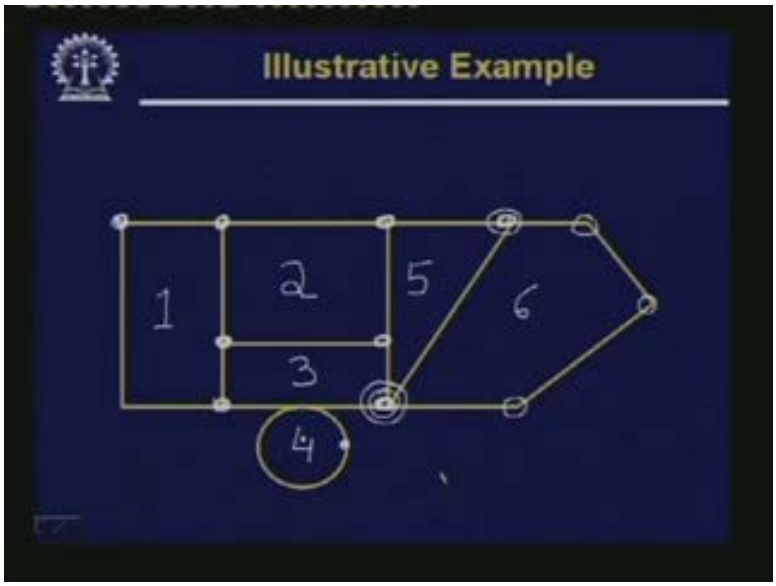
(Refer Slide Time: 27:36)



And regarding polygon as I said you can define any kind of polygon. You can have a polygon like this. You can have a polygon like this also. So here there are 1, 2, 3, 4 and 5 vertices. So as many vertices are there you have to specify so many coordinates in order. So actually, when you specify a polygon, you have to specify in order the coordinates. And you are free to choose this starting point. You can choose you can start from any one of the vertices and you traverse the other vertices following the edges. And the only restriction is that in a polygon the maximum number of vertices you can define is 100. Now here, let me tell you about one thing that in a map not all regions will be a regular geometric shape like what we have mentioned circle, rectangle, polygon.

Let us come back to that example I had given for India map. Suppose we have to define the region for the state of Bihar, there are so many zig zag boundaries of the state of Bihar. This we cannot define by circle. This you cannot define by a polygon. But we can approximate it by a polygon. We can define many points on the boundary of the state and we can join them as straight lines. This is an approximation of the actual shape we approximate it by a polygon with many vertices. This is how we typically model complex shapes in an image map.

(Refer Slide Time: 29:22)

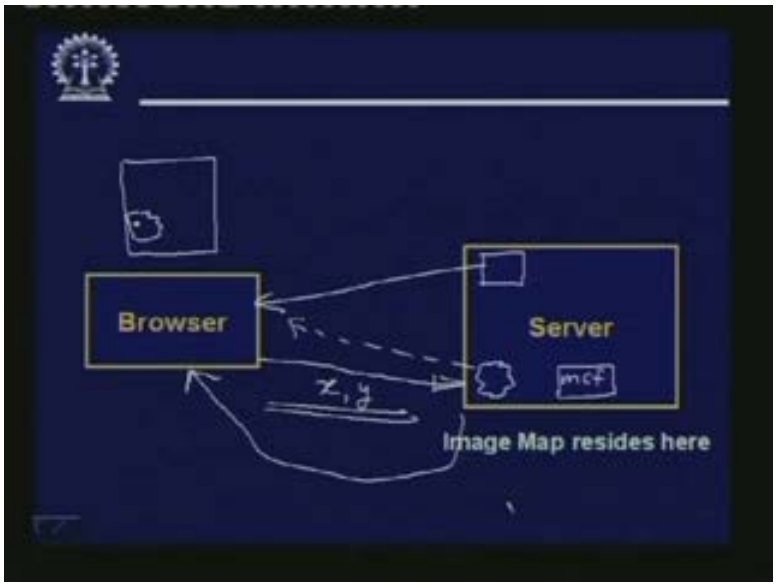


So a very small will illustrate that, suppose this is an image, there are so many regions I can define the individual regions. For example, this is region 1. This I can define by two coordinates. One is this coordinate; top left, bottom right. This is region 2. This again I can define by top left, bottom right. Say, this is region 3 this is also rectangle. This also I can define by top left, bottom right. Number 4 is the circle. Circle, I can define by a center and any point on the circumference. Region 5 is this triangle. This I can define by its three vertices 1, 2 and this 3. 6 is this polygon, I can start anywhere say I start here 1, 2, 3, 4 and 5. So once you know the coordinates creating the map file is easy. This is why I mentioned you must use a proper image editor program to create the map file at the beginning. Because once you create the map file you know exactly which coordinates are the points of your interest and you can directly create your map file knowing those coordinates. So this is why you need this.

(Refer Slide Time: 30:56)

Now this I have mentioned the purpose of base URL. This is explained here. I mentioned that for server side image script as it is supported by apache. For all the specified URLs, you need to specify the entire path. But however if the common prefix URL are the same then you can save the amount of typing by specifying the base URL command. You can specify a URL prefix and whatever you have given after that; that will come after a slash this slash this. So this URL is just a way for saving the amount of typing attribute. Because, in reality for a map file most of the hyperlinks would correspond to the same server pages which are resulting in the same server. So using this base URL you can save the amount of text you need to type.

(Refer Slide Time: 32:04)



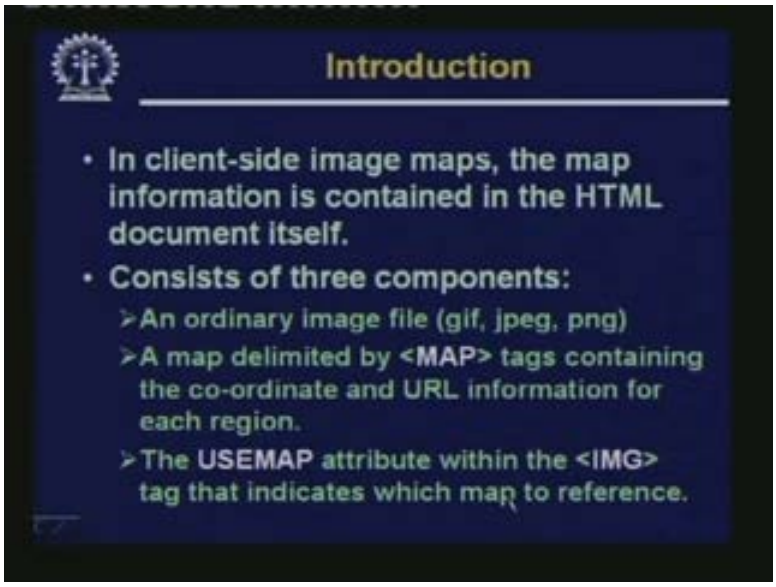
So just to summarize in a server side image map you have a browser which is a client, you have the server; the image map resides on the server. And you have html page that is also in the server browser fetches this html form. Html form contains a link to this image. So this also gets fetched. So now in the browser you have the page displayed with the image map. Now using the mouse you click on the image map. As soon as you click, then another request goes to the web server with the x and y coordinates. Now the server knows from the URL that is being sent which carries the x and y numbers that which map configuration file. There will be a map configuration file out here MCF. So the corresponding map configuration file would be consulted.

And the region that x, y corresponds to would be found out and the corresponding URL would be would be extracted from there. And once you know the URL, either the URL will be sent back to the browser or the server will fetch the URL and the new page will be sent back to the browser. This is how the whole thing works in general. This is how server side image map works where everything all the information is stored in the server side. So whenever you click on an image map you need to consult the map file which is stored on the server to find out which URL you need to fetch. You click somewhere else again you go the server and consult the map file and find out again. So for every click on the image map you need to go to the server and find out.

(Refer Slide Time: 34:22)

Now let us see that what are these client-side images maps which I had mentioned are supposed to be better the server side in terms of efficiency? Let us see.

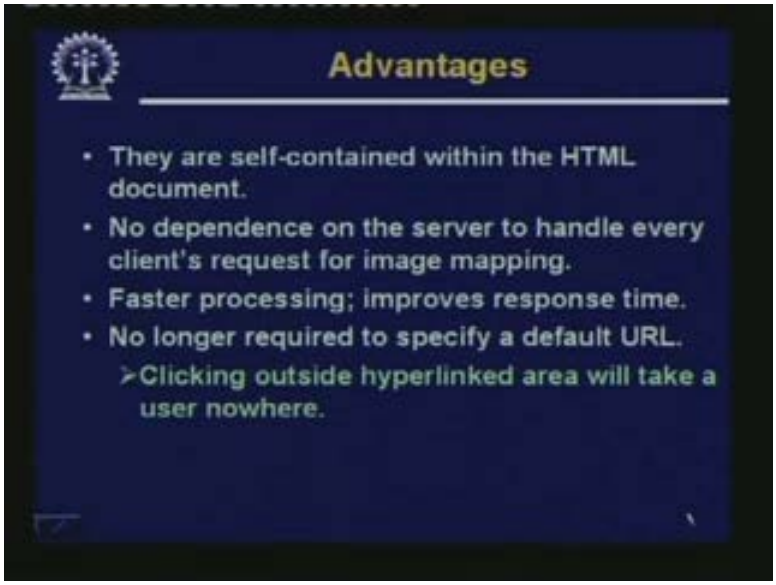
(Refer Slide Time: 34:32)



Now in client side image maps, as the name implies the image maps are stored on the client side. That means on the side of the browser, here the map information is not stored in a separate file on the browser, on the server. Rather it is part of the html file itself. When you fetch html file from the server, the map information come to the browser along with it. So it is contained in the html document itself. Now this map information consists of three things. Ffirst a link to an ordinary image file. This can be a gif file, a jpeg file or

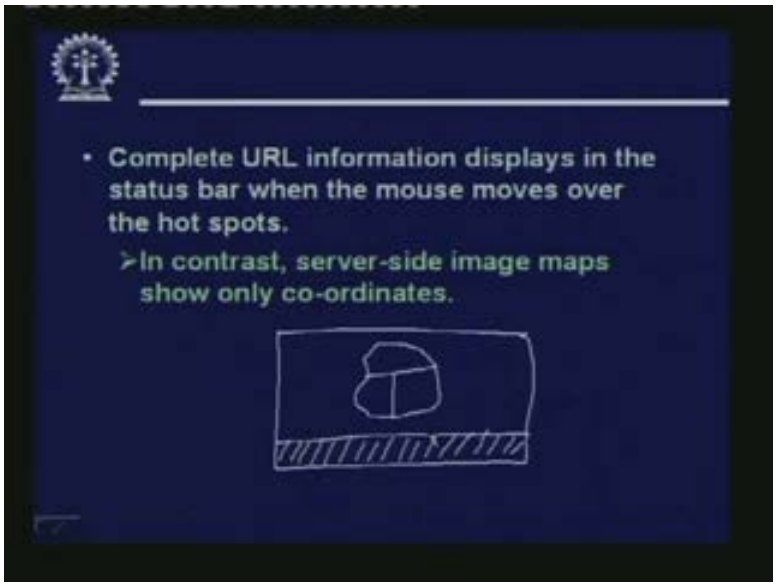
there is a new standard png, portable network graphics which is supposed to be the next generation image format of the internet. But it has not become popular as yet. So this might come up in the future. So these three image formats are supported. Then a map, you define the map use the map tags for that. A map delimited by map tags which contains similar to the server side image maps the coordinates and the URLs and you will see exactly how to do this. Third thing is that you use another attribute along with the img tag called usemap. This will tell you that this particular map description has to be associated with this particular image. Well, why this is required? This is required because in a particular html file, there is no guarantee that there will be a single map file. There can be 2 or 3 map files. There will be 2 and 3 corresponding images. So an image has to be linked to the corresponding map file. So the usemap attribute of an image inclusion tag specifies that which map-description should be associated with this particular image and this usemap also tells that this is a clickable image map; not a regular image.

(Refer Slide Time: 30:02)



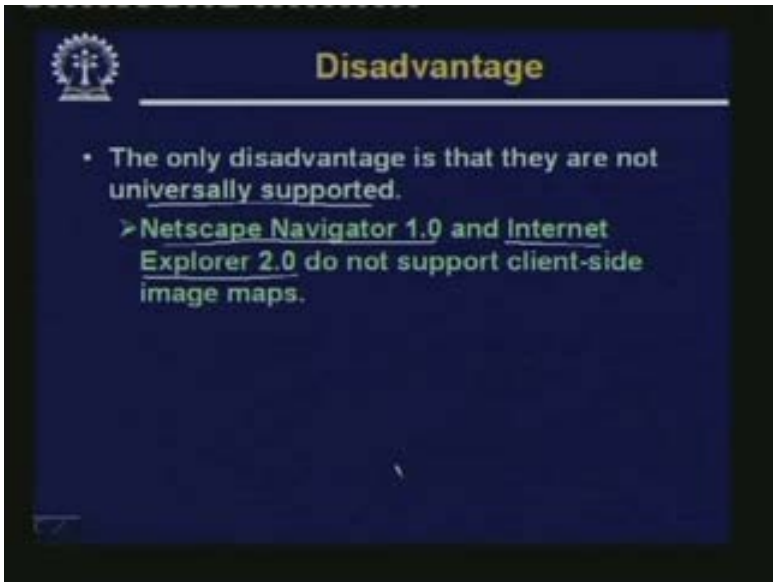
So advantages are obvious. First they are self-contained within the html document they are available in the browser itself. There is no dependence on the server to handle the client's requests. Because whenever you click on a place in the image, the information is available with the browser itself. So there is no need to go back to the server to find out. Alright, so this facilitates faster processing and improves the response time and since everything is done locally, there is no longer required to specify a default URL. Because if you click outside the hyperlink area nothing will happen. The image as it was seen on the screen will remain. But for a server side image map you may need to do some additional processing for that. But for client side you need not do anything for that specially.

(Refer Slide Time: 37:57)



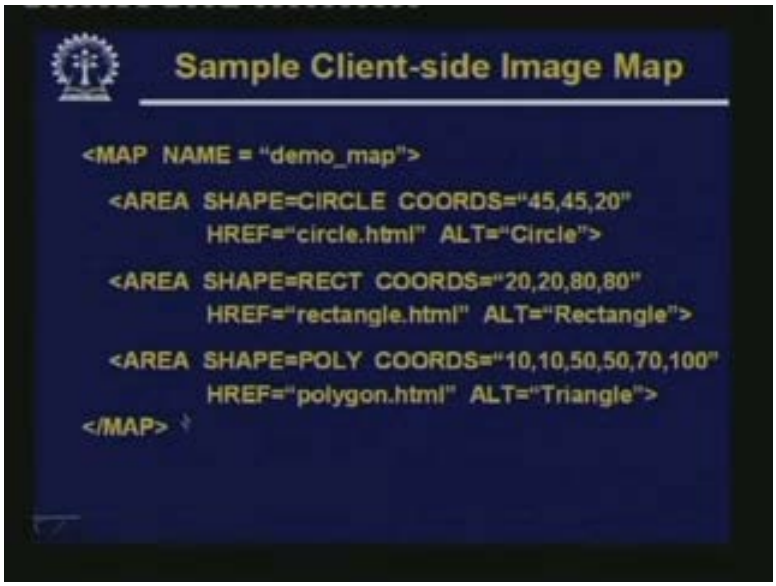
And there is another difference. Suppose this is your browser window. You that on the bottom there is something called a status bar, some information gets displayed there. Now in a client side image map, suppose you have a clickable image and you are moving your mouse on top of it. So as you move your mouse on top of it continuously, so there can be several regions. The URL corresponding to the region where you are moving the mouse that will continuously get displayed in the status bar. So if you move from here to here, the URL will change. So you can look at the status bar and you can understand that well if I click here, then I would go to this particular URL. I can see the URL there http something, but in a server side image map when you move the mouse over an image only the coordinates was visible in the status bar. Because URL is not available locally URL is known only at the server end. But we are looking at the coordinates I cannot understand anything meaning full. That is why a client map can give me more because at information about the URL where I am expected to go if I click alright.

(Refer Slide Time: 39:28)



The only disadvantage of client side image map is that they are not universally supported by all browsers. Of course most of the modern browsers support. In particular Netscape navigator version "1.0" and Internet Explorer version "2.0", they do not support client side maps. But the subsequent versions do support. So if you have a subsequent version, you need not worry about the compatibility issue, you can have client side maps. Now let us see how we can define client side map as part of the html page.

(Refer Slide Time: 40:10)

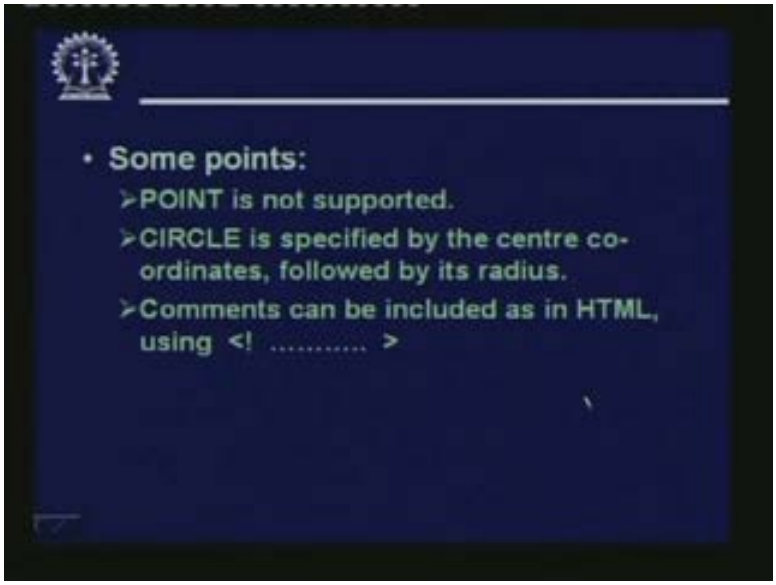


So a simple example. Well, here we are showing only the map description part of the html file. We shall see the complete html file later. This is just the map description file

which uses as I had mentioned the map tag with the map tag. There is an attribute which assigns a name to the map. This particular map as assigned a name called demo underscore map. Just one point to notice is that in plant side map the geometric point type is not supported. But circle, rectangle, polygon, these are supported. So this example illustrates all these three there is a tag area which defines the hot spots the attributes are shape which tells you what kind of shape it is circle, rect or poly. Coords gives you the coordinates. Now for a circle there is a small difference. Here there are three coordinates. Here there three numbers you can see.

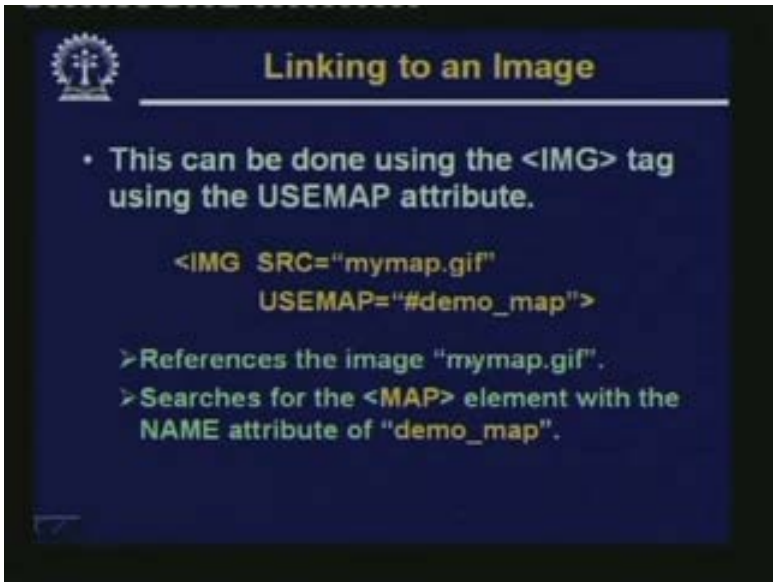
First two numbers as usual specifies the coordinate of the center, the last number 20. This is not a coordinate, but rather the radius. So the coordinate of the center and the radius this you specify when you define a circle. Then you specify the hyperlink where do go. Well you can define an alternate text. This is optional, that is when you move the mouse on top of that region, a text will popup showing that name circle or rectangle. This you can define or if you do not give this alternate description those would not come. Similarly for rectangle top, left, bottom, right URL and this alternate text for polygon again. Similarly, the coordinates of the vertices the URL and the alternate text. Now this is how I am defining the map and called it demo map. Now let us see how I can include the image.

(Refer Slide Time: 42:37)



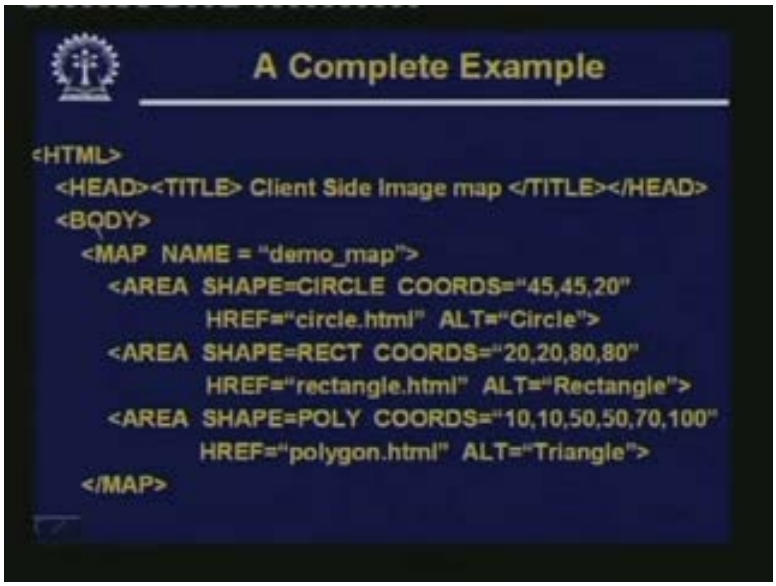
This I had mentioned point is not supported. Circle is specified and this is another point in the client side in between if I want to include a comment, it is just like html I can use the comment inclusion command less than exclamation sign and greater than.

(Refer Slide Time: 42:57)



Now when I am including an actual image as part of the html file, I can use the conventional img tag. I can specify the image which I want to load. But in this case I will use the attribute usemap which tells me two things. Number one, it tells me that this is an image map I am dealing with, not a regular image. And secondly it also tells you that which map this particular image associated with this map name is preceded by this hash symbol. So hash demo map will tell you that demo map is the name of the map description which is there in some place in the same html file which will correspond to this particular image map. So this will be referring to the image mymap.gif as I have said, this is will be since we have a name demo.map, it will be searching for a map element with the name attribute of demo map. This it will try to find out.

(Refer Slide Time: 44:12)

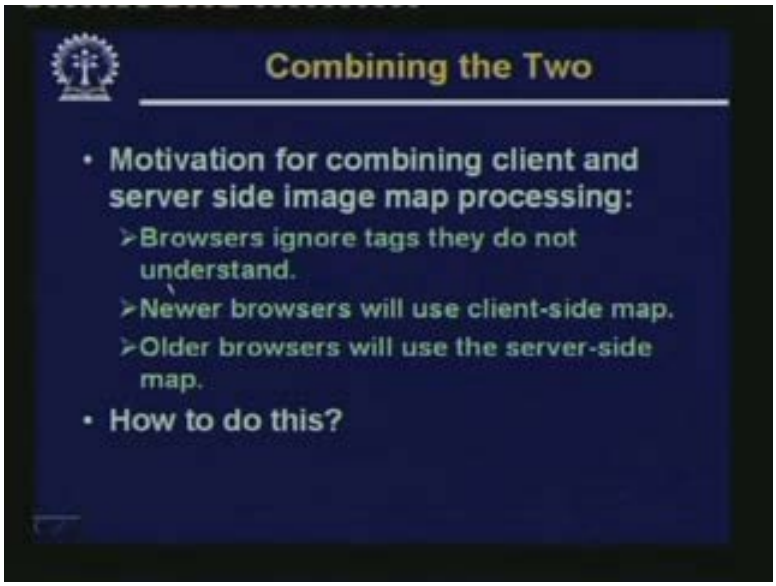


Now, the complete example looks like this where it starts with html, head, body, that same map description as I had shown earlier same thing. So this map description would be there, somewhere as part of the html file.

(Refer Slide Time: 44:32)

Then, I can have this image inclusion command and this USEMAP. Well, I have not shown any text you can have. In addition to this you can have as much text you want. But this is how you can have the html file where you can have the map description and the image include it.

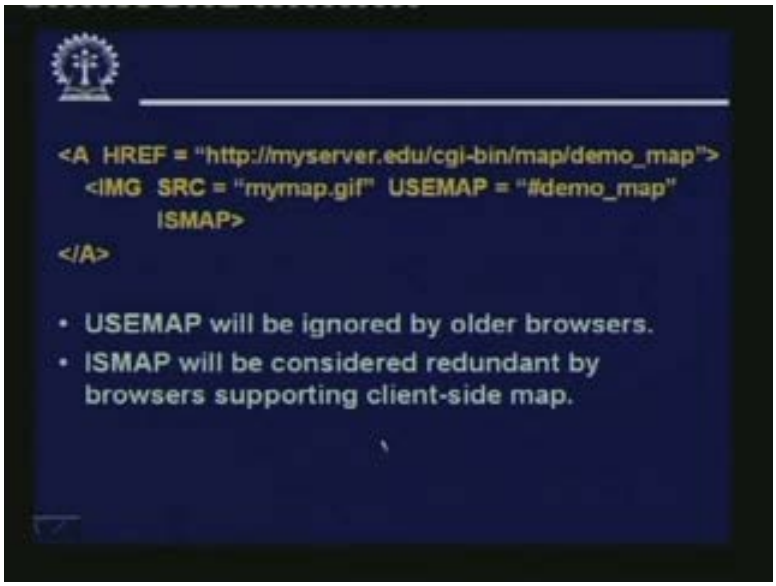
(Refer Slide Time: 44:50)



Now there is one issue. As I mentioned that the client side maps are better, but some older browsers do not support it. May be some of the browsers which are non-proprietary they also do not support it. Suppose today I want to design a website and I want to design a web page which would be compatible to everything. See if some browser does not have support for a particular feature, some proper error message should at least appear. So that the user knows that I am trying to trying to access something which this particular version of browser cannot support.

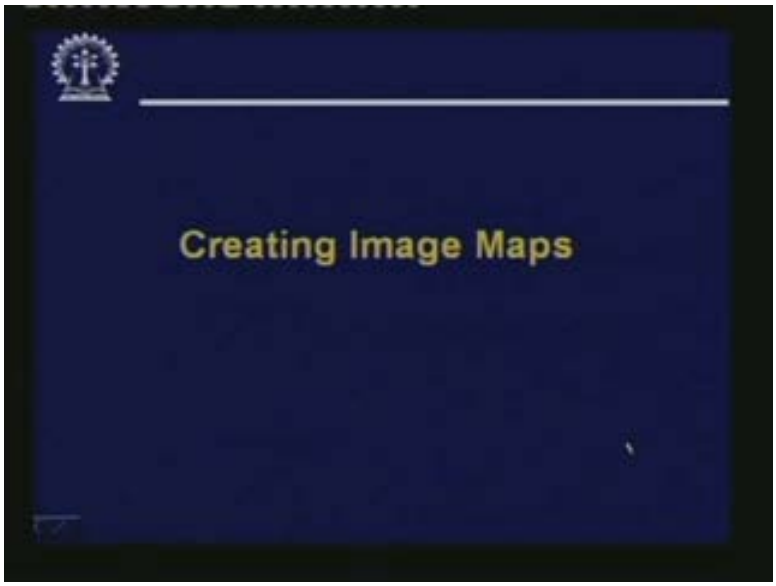
Let us see how we can do this. We can do this by combining both client and server side maps the motivation I have just mentioned, motivation that there are few things that are, that we are trying to exploit browser if they encounter an unknown tag they simply ignore. This is one point we are trying to trying to exploit because older browsers will simply ignore the map tag because they do not understand what is map. Newer browsers which use client side map older browsers will use the server side map. But the question is how we can do this? Let us see how we can do this. You can do this by a specification like this in the html file. Let us see what this means.

(Refer Slide Time: 46:22)



This is an anchor tag. We have given a hyperlink, these points to a map file just like server side map in the img. I have included the image, but I have included both USEMAP and ISMAP. USEMAP is used for client side ISMAP is used for server side. Now if it is an older browser the older browser cannot understand USEMAP. But it can understand ISMAP it can understand the rest. So, older browsers will treat this as if this is something corresponding to a server side image map. But the newer browsers when it finds it USEMAP description, it will know that this demo map description is there somewhere in the same file. So it will ignore the remaining part of this. It will simply take this particular file take this map and proceed accordingly. So if you have a description like this, then you can have compatibility across all browsers. And if the browser supports you can have client side if not you can have server side.

(Refer Slide Time: 47:57)

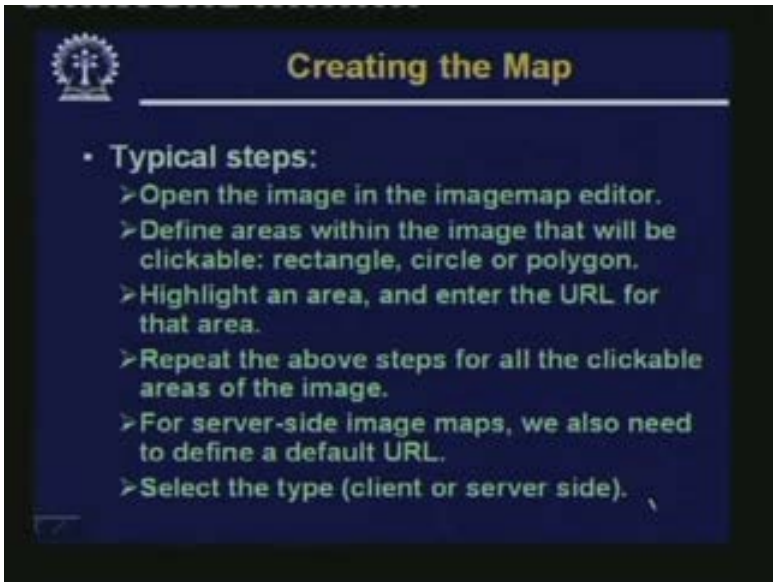


Now there is a small point relating to the creation of image maps. How we can do this?

(Refer Slide Time: 48:07)

Normally, image maps are created using some proper image editing tool. Some of the popular tools using which you can create image maps are map edit. Macromedia Dreamweaver, adobe, Golive and there are many others. Now whatever tool you use, the basic steps you need to follow while creating the map are more or less the same. Let us try to see that what are the steps involved.

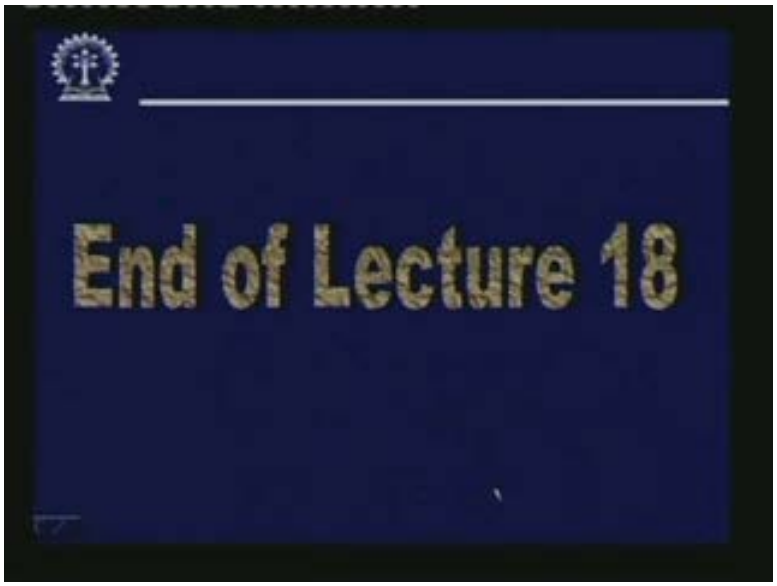
(Refer Slide Time: 48:44)



First of course, the image that you want to make a map image you have to open it in the image map editor. See, image map editor is slightly different from an image editor. Because an image map editor allows you to define the allowed hotspots or regions on an image. It can also allow you to specify the hyperlinks associated with it. The image map file can get automatically created, if the editors are poor sited. So after opening the file you can define the different areas. Now areas as you know, if it is a client side area the only allowable areas are rectangle circle or polygon. So this image map editor will also have only these three options of defining a rectangle, a circle or a polygon. So, on that image you can define accordingly that what kind of geometry you are trying to put. Now once suppose this is your image and you have defined a polygon like this, a triangle.

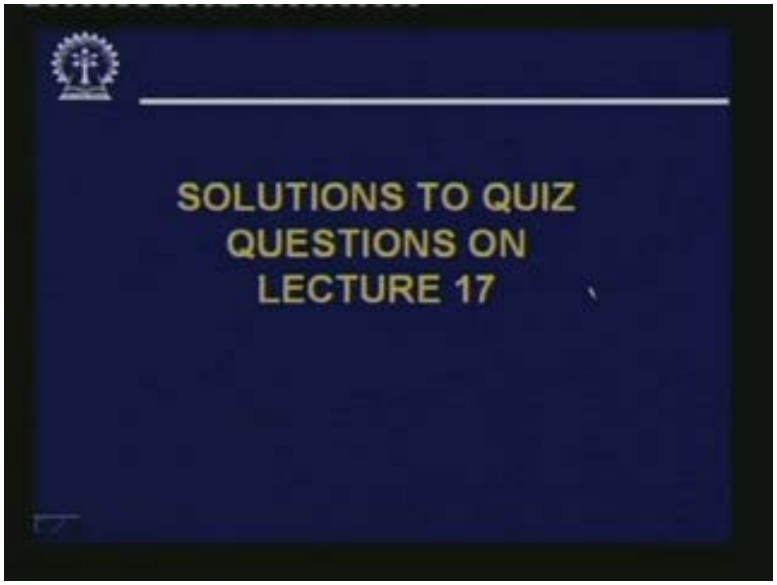
Now once you have defined a triangle and once you have selected this area, you can enter the URL for that particular area. So you define the URL corresponding to this polygon and you do this for all other region. Suppose I have a circle here I have a rectangle here you repeat this process. That means you define an area on the image you specify a URL after selecting that. So in this process you repeat for all the clickable areas you want to define or create on the image. If it is a server side image, you also need to define a default URL if you need to. This also most image map editors allow you to then of course you will have to select the type of the image map client or server side. Because the way the map file will be generated the syntax is slightly different in the two cases.

(Refer Slide Time: 51:05)



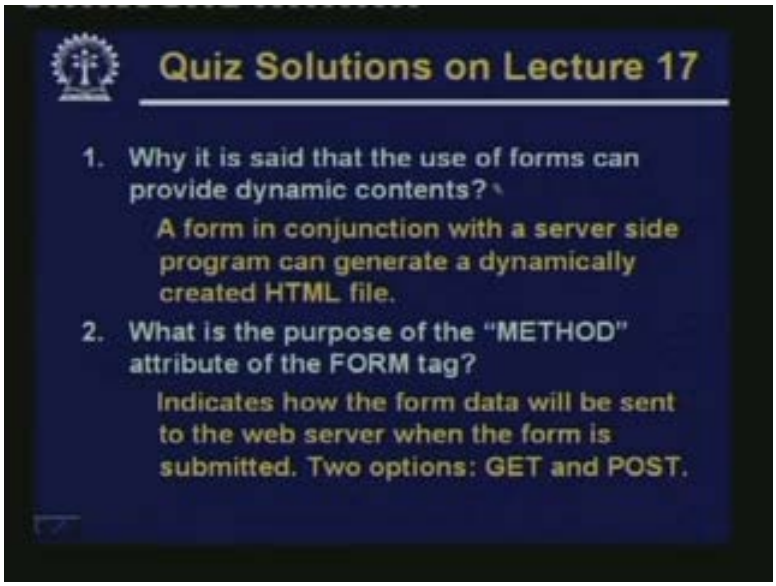
So with this we come to the end of the discussion on image maps. Now before going into our next discussion which we will start in our next lecture that will be on CGI scripts, how do you form data? How this coordinate data can be handled on the server side?

(Refer Slide Time: 51:26)



Let us quickly go through the solutions to the questions of the previous lecture.

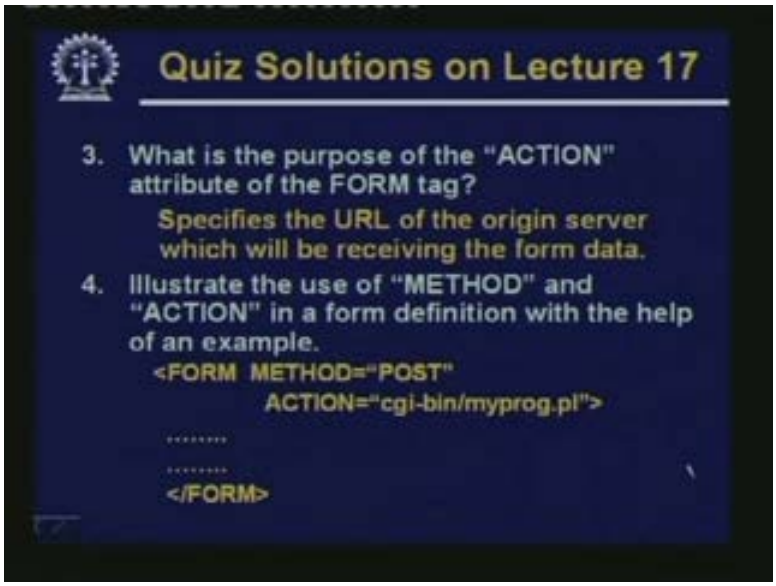
(Refer Slide Time: 51:32)



First question was why it is said that the use of forms can provide dynamic contents?
See, dynamic means something which is not residing statically and if somewhere. So a form in conjunction with a server side program like a CGI script can generate a dynamically created html file. Like the example of the search engine that we had seen in the last class depending on the request you are giving the page that is coming to you is created accordingly.

What is the purpose of the method attribute of the form tag?
This indicates how the form data will be sent to the web server when the form is submitted. And as you know that, this attribute can have two values GET and POST.

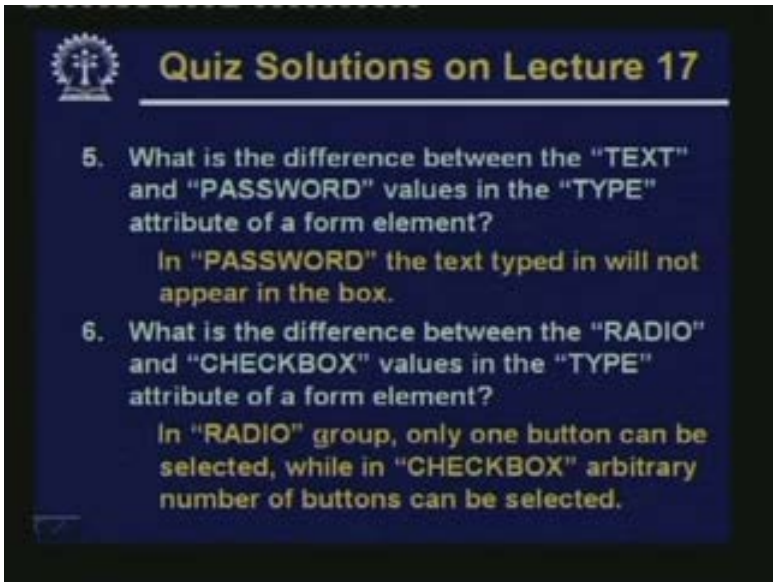
(Refer Slide Time: 52:26)



What is the purpose of the action attribute?
Well action attribute actually specifies the URL of the origin server which will be receiving the form data. Actually this points to the CGI script. The URL means a particular program which is pointing to on the origin server which will be executing and the data on the form will be taken as input by that program.

Illustrate the use of method and action in a form definition with the help of an example.
Now this example we had seen earlier also that two attributes the method specifies the type, action specifies the URL of the CGI script. So after that the description of the form can be given.

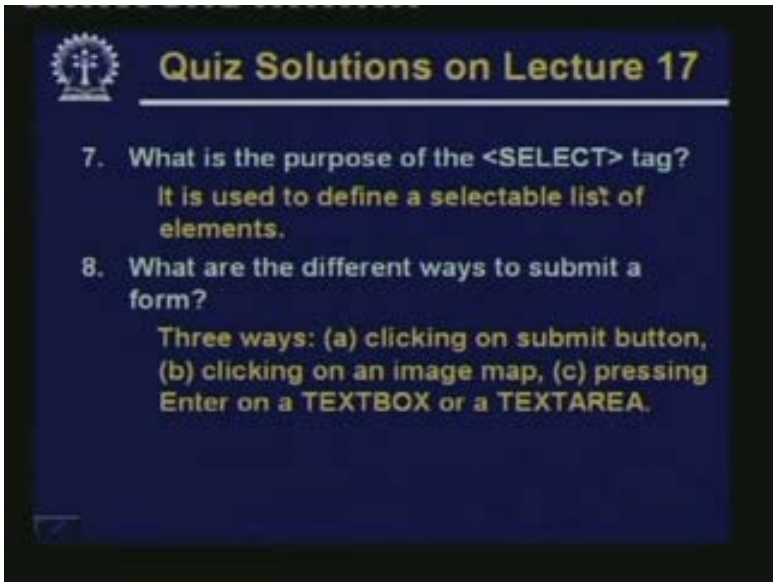
(Refer Slide Time: 53:19)



What is the difference between the TEXT and PASSWORD values in the type attribute of a form element?
Both generate a text box kind of a thing. But in PASSWORD whatever you type will not appear in the box, they will be hidden.

What is the difference between radio and check box values in the type attribute?
The basic difference is in the radio group only one button of the group can be selected. But in check box you can select as many numbers of buttons you can at the same time.

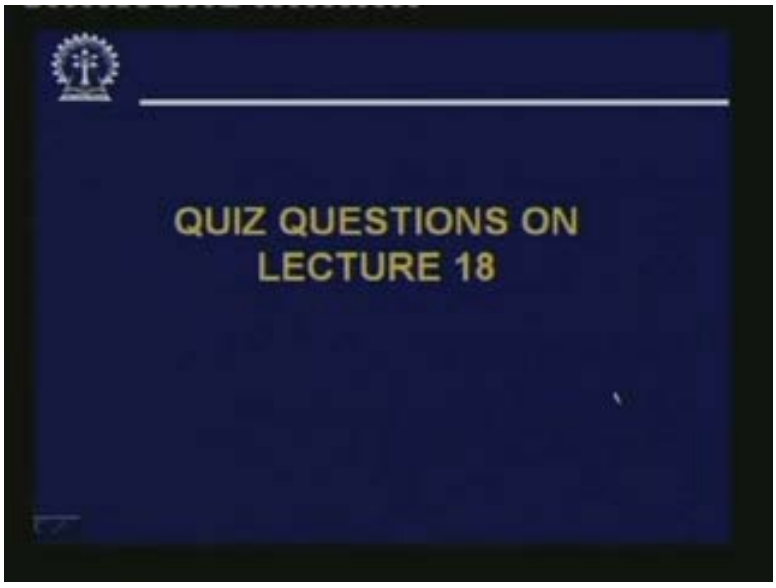
(Refer Slide Time: 53:54)



What is the purpose of the select tag?
This is used to define a selectable list of elements.

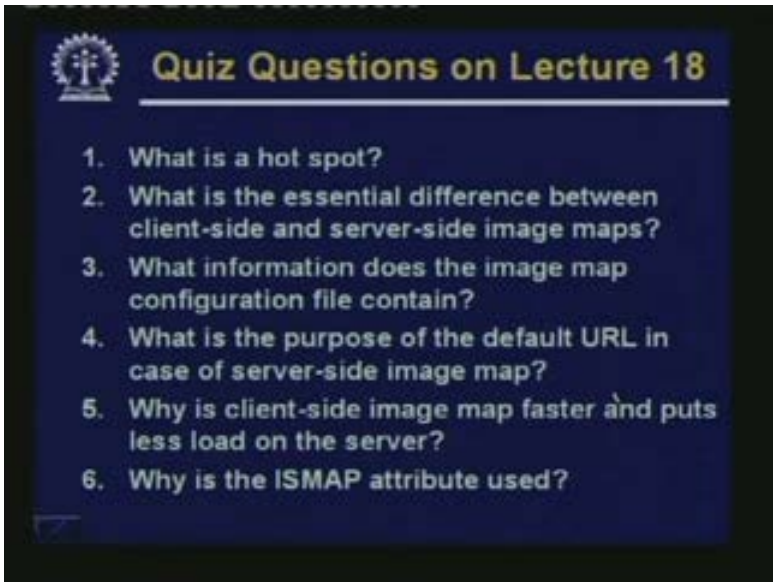
What are the different ways to submit a form?
There are broadly three ways clicking on the submit button, clicking on an image map or pressing the enter key on a text box or a text area.

(Refer Slide Time: 54:17)



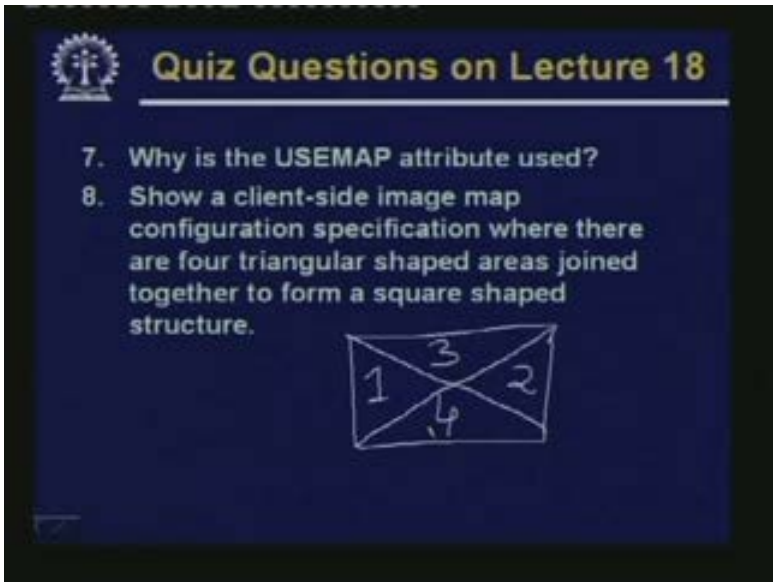
Now let us come to the questions from today's lecture.

(Refer Slide Time: 54:21)



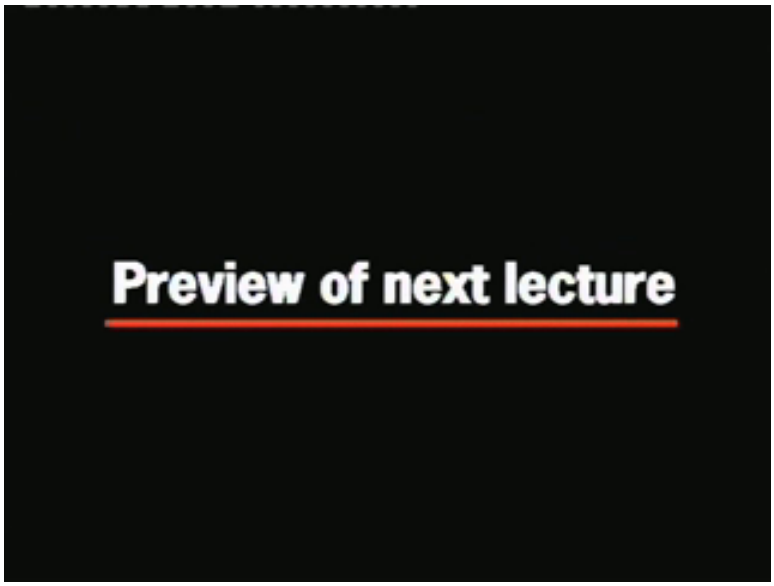
What is a hot spot?
What is the essential difference between client side and server side image maps?
What information does the image map configuration file contain?
What is the purpose of the default URL in case of server side image map?
Why is client-side image map faster and puts less load on the server?
Why is the ISMAP attribute used?

(Refer Slide Time: 54:50)



Why is the USEMAP attribute used?
Show a client side image map configuration specification where there are four triangular shaped areas joined together to form a square shaped structure. Means, this shape is like this. There is a square there are four triangular shaped structures 1, 2, 3 and 4, you give this specification for this. So with this we come to the end of today's lecture. Thank you.

(Refer Slide Time: 55:29)



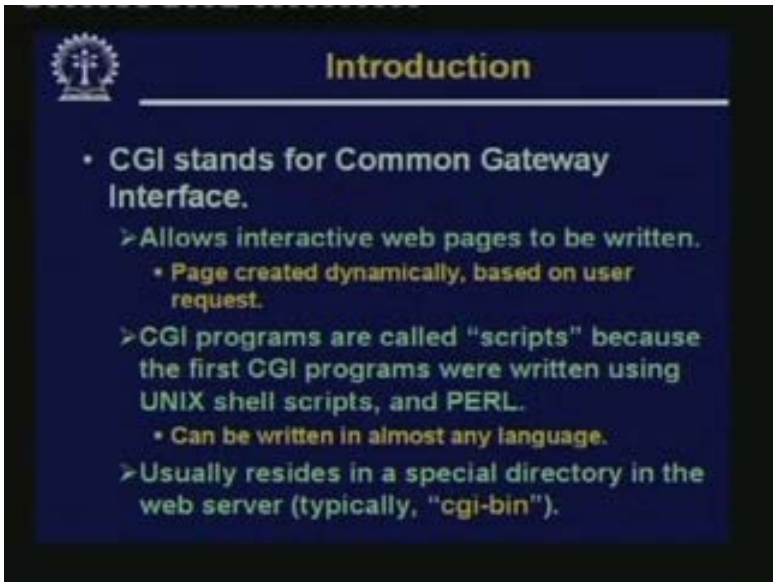
(Refer Slide Time: 55:30)

In this lecture, we would be talking about CGI scripts.

(Refer Slide Time: 55:42)

Now we had been talking about the necessity for having CGI scripts. The necessity of having some kind of processing capability on the side of the web server. So that some kind of processing can be done at that end. We gave some typical examples that of submitting a form data. And the data going on the server side and some processing taking place on that side before the results coming back. So in this lecture we would talk about the basic technology behind CGI scripts. How we can write a CGI script program and what are the different things we need to remember when we are trying to write such a program.

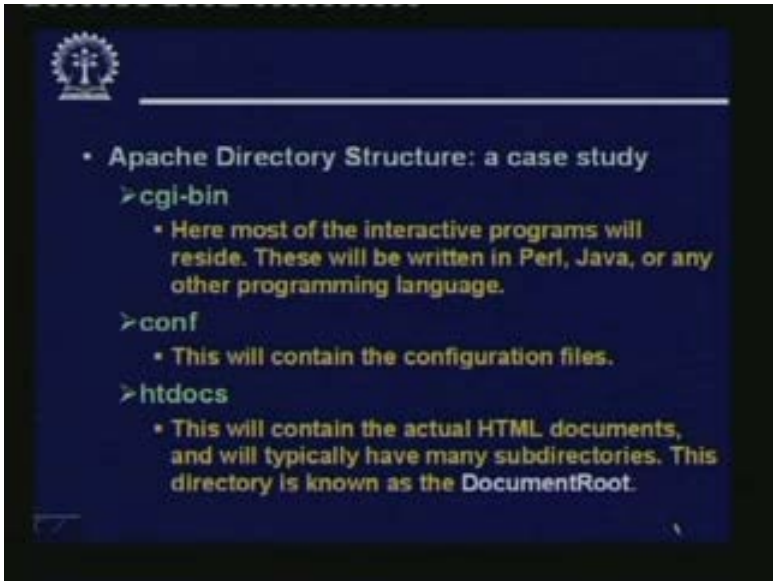
(Refer Slide Time: 56:30)



The first thing is CGI is an acronym. CGI stands for Common Gateway Interface. CGI stands for Common Gateway Interface. Now in CGI we can do a few things. Now using CGI, we can create interactive webpages. We can also provide two way interaction and dynamic web page creation using CGI. Pages can be created dynamically. Of course this will be based on what the user wants. And one thing you may be thinking that the CGI's are nothing but some programs which are running on the side of the server. Why are they called scripts? They are called scripts due to traditional reasons. Traditional reason means that the first CGI programs that were written they were written using UNIX shell scripts or Perl scripts. So for those of you who are not familiar with UNIX shell scripts let me tell you.

UNIX shell scripts provide us with a very powerful string handling capability. It is a very small and simple language using which you can combine the UNIX commands in a very powerful way and you can do certain things in a very efficient way and repetitively. So UNIX shell scripts and Perl scripts were used to write the first CGI programs. But in actuality, CGI programs can be written in almost any language: C, Java, C++, anything. Depending on the server you are using CGI scripts or CGI programs will be residing in some special directory. Typically a directory called CGI bin is created under which these CGI script programs are stored.

(Refer Slide Time: 58:45)



Now, let us talk of a very popularly used web server program apache. Now in apache, see apache is a web server which is freely available on the net.