Speaker 1

Today is session number eight of our development on Creature Platform Guided Learning and we will continue to work with server side features and functionality. So today we will focus on the web services, making our own classes at creation server side and make it work at the web service, write C Sharp code and practice with calling of web services from Creature client side and from third party applications. So today is quite big plan. I hope we will have enough time for this. So possibly we will spend a bit more than two hours. I will try to squeeze it into our today's session. So what about web services and why we need it? In general, web services are server side items that we can easily call from client side with the help of HTTP queries.

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So when you look at your network tab, for example, when you open any record page, you see plenty of different web service requests, different HTTP calls that were executed from server side. So from client side to the server side with different request body with different responses and in general all our website operation is set of different queries, different HTTP requests and then getting some responses at client side. Creature has a lot of embedded out of the box web services. Some of them are system web services, some of them are developed at configuration. And we can create our own web services if necessary. So we can do some certain functionality. And it will be much more efficient than to do the same functionality at client side. Because client side is less safe, it's less powerful. Not so fast as server side.

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So client side definitely is not the place where you would like to perform some sensitive data operations or calculations. So server side is a very natural place to do some complicated business logic like doing some calculations, data processing, file processing and so on. So web services can be created in configuration and if you're interested you can look at existing examples. If you search for C Sharp sources that contain the word service in their name or title condition is contains. Okay, you will see a lot of examples. You can randomly select any item and you will see some C code inside. So the reason why we have so many web services is need to have and to run different functionality at server side.

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Usually it's written in C Sharp and today I plan to explain how you can create your own web service, how you can make it run and how it can be useful for you. So we have a lot of existing examples, but the most important you need to remember that web service is a special piece of functionality that was specially designed to be called from client side. And this piece of functionality usually has no own user interface. It can only be called with the help Of HTTP queries like this, you can see examples of HTTP query. Here you can see request URL request method type, you can see some payload which means data parameters, you can see some response and so on.

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So in general web service is something that we can call from client side which works at server side, usually gets some argument data, usually returns some result data and also makes some useful work etc. Side and that's why we need it. So it's a very common functionality to use to run different business logic. We have a lot of standard based platform web services like web services to get data like this one. This web service is called data service. We have a lot of other web services like file API services, like system setting services and a lot of other services. So probably hundreds of them. And also creation configuration offers us possibility to build our own web service to provide our own server side functionality that can be called from client side. And it doesn't matter which kind of client side you are using.

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Is it a freedom user interface or if it's a classic UI so you can use web services? Absolutely the same because server side is on the single item and requests and payload and response data will be parsed and will be processed absolutely the same way. So we will study how to make our own web services. I also want to mention that web service can be used with a third party applications. So this is a tool of other system may call some functionality at creation ask and may probably transfer some arguments and then get some results. So we will study how to do this and before we continue I recommend you a couple of very useful examples. As you can see, we have plenty of examples here in base configuration.

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If you randomly select then you probably will face unnecessary complex examples which will be hard to use it for training purpose for your study. So that's why I recommend you to use couple of very useful and simple examples. First one is a cryptographic service located in CRT base package. So it's a base platform item and it will be found in any creatio system. So you can find it at any environment, you can open it to see its code. So physically this is a C sharp source code item piece of code written in C and then to be compiled inside of a package or inside of an application. By the way, it's interesting, CRT base seems to be a package that is not compiled as separate assembly. Yes.

Speaker 1

So it means that contents of this package will be compiled in all terasoft configuration sln and you will have terse of configuration DLL as A result. Okay, so this is a simple C Sharp code as I told you at the beginning, just expected but that creation developer has some experience in C, in JavaScript and also in SQL scripting. So here your C Sharp knowledge will be requested to be important. So physically what we have here we have a class which is declared in the C sharp module. We have set of usings and also namespace decoration. There is a tradition to put your custom classes into terrasoft configuration namespace but you can also make your own namespace and put your logic there. So it will work absolutely the same.

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We use set of standard base platform and system namespaces that are necessary to declare our class to use some of functions that we need inside of it. And mainly all these stuff is made possible thanks to system service model namespace and I need to say that creatio uses. NET framework backed tools to create web services based on WCF Windows Communication foundation web services. So there are several conditions how we can make such a WCF web service. We have to declare a class. In our case it's recommended, strongly recommended to inherit it from base service. I will explain it a bit later why this is so recommended. But generally you have to create a class and decorate it with a special C sharp attribute, service contract attribute and ASP NET compatibility requirements attribute.

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And then inside of this class you should make at least one method to turn it into endpoint something that we can call and this endpoint must be decorated method. This method must be decorated with operation contract attribute and some additional web invoke attribute. All such rules how to make it were delivered from WCF so it was not invented by creative developers. We just used WCF based approach for making creation web services. So when we have such class decorated with attributes, when you have at least one method decorated with corresponding attributes, when we compile our package or when we compile our full creation solution system will make DLL based on it and also it will host so it will register endpoints and it will host our web service at our website.

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So after compilation this web service will be fully operational and it will be ready for calls that will be done from client side. It could be done from creation client side or even from third party applications client side. We will demonstrate how you can use it. So I will show you so the main reason why we need web services is to make some functionality that can be easily called from client side of creature page or from client side of third party application. So we can also use it for integration purpose. Okay, let's look Closer how in general it works, we can create at least one method decorated with attributes, and it makes sense to organize some kind of attributes that will be passed into this method and get some results back.

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Also we will have some business logic functionality that also can include access to database, operating with some files, running other web services and so on. So we can use some useful method body. But in general you should expect that web service method can get some optional parameters, can return some results. If your data type of arguments and results if display the type is simple and standard like string, decimal, integer, guid or boolean or something like this, which is very easy for creation, to decode, to parse, then you need no additional settings and the system will be capable to run such a service and you will be able to transfer such relatively simple parameters as arguments or get result data.

Speaker 1

But it can happen that you will need more complicated arguments like structures like instance of classes, objects and so on, and you may need to return some complex responses and complex result data. As example, you can see when we run some query at our creation list page, you see some request and response which usually includes a lot of properties, a lot of different values. Definitely for such complicated request body, we need some classes and we need to organize it in more or less structured way. And also response usually includes a lot of additional subordinate properties, values and so on. So it's also important to have a corresponding data types. So in case if you transport as arguments or get as results complex data arguments, you need some additional classes to let WCF know how to de serialize of arguments and serialize of results.

Speaker 1

Why I'm saying about serializing because server side will be a dll, a library with a runtime code which will be capable to operate with some data with a certain data type. When client side calls a web service, it usually packs so parses, maybe encodes your arguments into a string. Here you can see an example of a big JSON string. So when server side receives such string, it must know how to convert the string into an instance of a class. And this procedure is called deserialization or deserializing, which means getting a string and then convert it into a class instance. This deserializing should be done according to some class information, and that's why we need definition of the class which was used to transfer this data.

Speaker 1

The same task will happen when server side already finished execution of a method and needs to return some data. So server side returned data also represents some class with some properties, and then it's necessary to serialize it back into a string because originally HTTP query will transport some string for you as result. So serializing and deserializing is important part of any web service call. And in case if your data is complex so system will fail to deserialize it without additional information, you should use special classes such as data classes. Let me show you another example. So let's remember first one is cryptographic service which I recommend you to look at as a very simple and very useful template for your own services. And one more, a bit more complicated data. No, no, no. Visa data service, we need to look at all packages.

Speaker 1

Visa data service web service is a good example of a web service which is designed to get some arguments and

return some results using complex data type. In this example, Request options is a complex argument that is provided as an argument for your method. So we need to find corresponding class somewhere here. This class is called request options and you can see that in case if you need to transfer complex data arguments, you must create such a data type such class for your data transfer and you must decorate it with data contract C sharp attribute for a class and data member C sharp attribute for all fields or properties that you plan to serialize that you plan actually to transport. So this is example of much more complicated arguments for your data transfer.

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And if you need it, so you have a lot of examples how to do this. You have samples in Creature, you can easily open it and find it. So don't forget about this Visa data service a bit more complicated example, so it will really work well for you. Why you need such examples? Because it's really hard to remember all necessary settings and implement it just by your memory in next example. So decorating a class with such attributes, decorating methods with such attributes, it's quite hard to remember. So I prefer when I need to create my own new web service, I prefer just to copy and paste some pieces from this example. It works well and it saves your time. So I think it's one of the most efficient ways to create your own web services.

Speaker 1

Now I will show you how to make our own web service. How to use Visual Studio for its development, to make it more efficient and to make possible development of complicated functionality with a powerful editor. So let's do our own example and also later I will show you how to run it from Creature side, from Freedom ui, from Classic UI and also from third party application like post one. Let's go to our Freedom UI package and our creation of a web service starts with making of a new C source code item. We can create it only from embedded editor. So we select our package add source code. When doing it makes sense to provide some good looking friendly name because this name will also appear at file system, it will travel to version control.

Speaker 1

So having this name well spelled is a good idea in general. So let's call it realty service and we can make the same title for this source code item saving our package no description and just apply. So as you already remember from yesterday example with handling object events, C source code item is just a big set. So it's just a code part of a C module and possibly you can also add some localizable strings into it. So we can put our code here if you work in cloud conditions or I just put some sample code if I work in my local environment. I have to save this item because we need to properly organize and make this item saved before running of Visual Studio to make our development. And now I need to explain you some business sense of it.

Speaker 1

So my plan is to create a web service that will work at server side and will be capable to calculate maximum price of reality objects filtering them by type and offering type. This is important because it's not good idea to mix apartments, houses, parkings and so on. And also it's a good idea to filter by offer type because it's definitely not correct to mix rentals and sales. So the business sense of my web service will be to do some database calculations to do some operation with database. And also it will work as a good example for you how you can use alternative ways to operate with data without use of object model. So let's move on. Here is our C item. Some dummy code is here. No localizable string so far. Okay, great.

Speaker 1

We can as you can see we have a star here which means not all the items were fully saved on disk. So let's do this. Download packages to file system. This usually is a safe action. It helps us to get all things right at the database. Now you still see this star. So sometimes you will get this star. But it's it doesn't show that something is really missing on your disk. So sometimes we have scenarios where this star doesn't disappear. But in general everything is okay with our data and all the stuff was saved on disk. Let me show you what you can see on disk now. So we go

to our app folder test of the web test of configuration pkg. Then we go to realty package folder schemas realty service. Now you will see some metadata files.

Speaker 1

I strongly recommend you not to modify Anything manually here and C sharp file which we will fill in now with the right good looking code. As usual I prefer to use local environment advantage and one of them is use of file system and use of external editors. So we can use Microsoft Visual Studio. I'm using Community Edition to operate with this code using external powerful editor. And previously we worked with realty events. Now we have one more item here, so possibly it will be updated quite soon. Now you see some realty service code and it's just not set properly. Okay, so let's do something here. As you remember from yesterday's session, here we have full support of intellisense autocomplete and you can put using system service model and so on.

Speaker 1

I already have an example which implements all this logic and that's why probably it makes sense to do it faster. So let me show you. Here is my example of code. It's too big to fit into one zoom message in chat. So we try to fix it in two messages. Okay, this one and another is this. Okay, good. So now if you want you can get it from chat message. So I will put it into my C sharp code when I develop using Visual Studio. Finally I must save my changes otherwise creation will not see it and will not include it into our compilation. What is inside here? This example was originally made based on cryptographic service example. So I copied this part from it. And of course we have our own name for the class. My class is named realty service.

Speaker 1

There is a tradition of creature developers to name classes which represent web services with the help of service suffix. So if you do something when you develop C sharp class for the service of it will be do something service. And it's quite common tradition. You may find a lot of examples in base product logic. So we made a class realty service and inherit it from special base service class. I need to tell you a couple of boring sentences about why we need to inherit from base service and generally the most important reason. So let's go and use Visual Studio tools to help us to understand what web service is. So we can click here you can see decompiled sources of base service class because its namespace is telesoft web common provided as a dll. So actually we don't have original services of this cloud.

Speaker 1

But thanks to decompilation features of Visual Studio we can see some code from it at least interface part of it. And it has a lot of useful things. And the most important I think is property that is named user connection. Let me show You a lot of libraries abstract class service. Yes, this one the most important property, user connection. So user connection is a reference to a class that keeps context of our current user session and current user connection to the database. As you remember, user connection is used always when you operate with the database and it's used in many other places where you have to provide some current user credentials data and the current user session information. So if you make your own web service without inheritance of base service, you have to get this user connection, for example from HTTP context yourself.

Speaker 1

Let me show you here you can see examples. So we have HTTP context usually like this, and this works only for. NET framework version. But also this code and this application may run in. NET core conditions in for example Linux operating system. So for Linux there is another way of getting user connection. And this base service class helps us to hide all this complexity of getting user connection reference and we just use it as a property. So you can see examples here. This property User connection is inherited from base service and you feel no troubles. So use of base service is strongly recommended, especially if you plan to make your solution that will be portable, so it will be transportable and compatible with. NET core version on Linux. So inheriting from base service is strongly

recommended. We have also other useful properties.

Speaker 1

But now you should remember that inheriting from base service helps to get user connection and helps to get it initialized properly. When your method started, your user connection property of your class will be already initialized. This is important also. Next, what you can see here is a strange interface named iReadonly session state. This makes sense only for Windows and doesn't makes any difference for Linux. And this is a marker interface, which means it has no methods, but it tells to the IIS that your web service has no code inside that changes session state variables. And if your code does not change such session state variables, it means that IIS can afford running your methods simultaneously utilizing multi thread support, utilizing multi core CPU and generally making your web service calls processed much faster.

Speaker 1

So in general, declaring of support of this interface costs you nothing because you have no methods to implement for it. But it tells IIS that it can process your web service calls with the fastest possible way. So in general it is a good result for high load conditions and for situations when you have performance issues at IIS because of multiple calls or the same service and not so fast processing inside of these calls and just for better performance. Okay, so I recommend you to use it. And if you are curious, you can also find how many times let's go and make some research. We look at all terrace of configuration folder and for the beginning we can search to find any not any all files that include service contract attributes.

Speaker 1

So now I'm searching through C files which include service contract attribute and I will find approximately 200 web services created out of the box in creatio based studio product. Okay, 157 files and possibly a bit more web services inside because one file may include more than one web service, but in general. Okay, so 157. Now let's search for I read only session state interface usage. So now we find only 54 places where this interface was used. In general it is recommended to be used for any windows based creation web service. And you see that each time when developers modify some code, when they improve existing web services, when they rewrite such code, reorganize it, refactor it, they usually add such interface declaring declaration into code and that why from time to time the number of such items is increasing from release to release.

Speaker 1

Okay, so this is only for better performance. What we have inside we have some method, but probably I have to start with this. This is a simple method which is just gets no argument, returns some string and is organized as a web service method because of operation contract attribute. So it tells to WCF that we have to turn this method into endpoint and register it at our website. And we have setting get HTTP method the easiest possible way to call a web service. So we will be able to run this web service from an browser address bar. The reason why we do this is to make sure that our service is normally hosted, is normally operational. So our compilation was successful and no troubles with server side. So this method is only to check availability of our class and our web service in general.

Speaker 1

You can create a lot of other methods in your class and some of them maybe will be decorated with operation contract. If method is decorated with operation contract it will turn into endpoint. If it's if you have just a single method which has no decoration, it means that it will be just a regular method that can be called by other methods, but not by HTTP query, not an endpoint which is registered at our web server. So as you can see, creating of web services in WCF is not so technically complex, especially if you understand how to write C sharp code. So in my example I have two methods.

Speaker 1

One of them is very easy get example so this is just an example of a method which will return us okay string and if it, if we get it means that our web service is present Normally compiled and fully operational, this method get max price by type id. So I decided to name this method like this will go to the database and search for realty records with corresponding type offer type and also I plan to make it more universal and to call my service from different sections. That's why I need to transfer my source table which I plan to use for my calculations. So for Freedom UI section my source table will be USR Realty and for classic UI example I will have USR realty Classic. So different source tables, but very similar columns, similar conditions and filters.

Speaker 1

And that's why I will use the same selection statement to work with different tables inside of my code. At the beginning it makes sense to make a very simple check of our arguments and if any of them is empty then we will return minus one. So we will do nothing. By the way, we return decimal result and we get three string arguments. So we use only standard data types, which means we will have no problems with serializing and deserializing and we do not need any additional data contract class in case if you have more complicated scenario, of course it makes sense to use data contract and so you may pass much more parameters properties and you can easily extend such structures.

Speaker 1

Okay, we have several arguments, we check it out if they are empty or not and then I will show you another approach to get data. Previously you probably remember we used entity schema query approach to get data. Let me show you business processes and calculate an average realty price. It was couple of days before and we used this code and we used entity schema query class to make data selection and then we processed it with for each statement and we used entity data model here because as a result we get collection of entity class instances where we have special columns with data values and we can get such values from each data row. So this approach with support of data model worked for us and it respected column names, it respected columns lookups and joins and access rights restrictions and so on.

Speaker 1

Now I will show you another approach to operate with data which will not use data model at all. So this is alternative approach to operate with data, but of course we need to know source table name. Here entity name is used as table name at the database. Of course we need to know exact column names and also for lookups you need to remember that at database Corresponding columns have id suffix, but @ your object level such columns have no ID suffix. Let me explain what I'm talking about. Let's go to objects, find our reality freedom UI object and let's Take a look at type column. Now all the columns will be loaded here. USR type this is a lookup column named USR type based on the reality type lookup. And we have a dropdown list here.

Speaker 1

And as you can see, no ID suffix at column code. But when you go to the database. Let's go and check our database D1 you can make filter for tables contains USR. Now we'll have just a little set of tables USR realty columns. Now you will see the type column as suffix id and you may also notice such suffix ID for offer type, for city, for country and even for created by ID and modified by id. So for any lookup column in your object here system creates corresponding GUID column at the database table. But let me show you. You see that at the database table it always adds ID to column name. So it's kind of creature architecture. It's not likely that it will be changed in future. So you may rely on it.

Speaker 1

And you should expect exactly the same data columns of your tables. And in general, when you operate with database like this, you must go to the database physically to see corresponding table, corresponding columns, just to make sure that all your columns that you work with are present and so they represent what you expect from them. Okay, my case I'm using direct database operation with select statement. It's also possible to use insert, update, delete and even stored procedure classes which will operate with the database directly without use of object model. And the best way how you can study how to use such classes is I think searching for existing examples. Let me show you how you can do this. You need to use some tool that will help you to find out files at file system. You can use Visual Studio code.

Speaker 1

You can use Visual Studio or Total Commander. Or in my case I'm using far manager tool inside of JSoft Web folder, maybe even inside of JSOP configuration. We can use search for all C files where we have for example new select class usage. We will find more than 200 of examples, maybe even 300 examples, almost 300 examples. And there are a lot of different so randomly selecting them a lot of different examples. How you can create such class instance, how you can set it up, how you can use it and finally get result data from it. Let's look at another random example, maybe not so perfect. Here you see creating of a select example from where it's possible to use hints. It's possible to use different operators like group by like having.

Speaker 1

And sometimes you will notice that use of direct database approach gives you More flexibility and more powerful tools than using just entity support and using entity schema clearer method. So depending on your task you can choose proper tool. And this select class works a bit faster because it doesn't include entity data model, it doesn't create corresponding instances for working with entities, and in general it consumes less memory. And I think it will work a bit faster than entity schema query. So we have a lot of examples of select class usage. I'd like you to see one of the best examples. I think this one it's I canonic iconic examples. So here you can create class instance. Then you already finish with settings and filters.

Speaker 1

And also it's important to mention you create class instance and then in order to set it up you use different methods like top method, column method, maybe many times from method makes to run it one time where method is equal method and a lot of others. So finally running such methods will configure your class to read corresponding columns from corresponding tables. You can use joins, you can use different conditions and types of filters. And finally you will have select class. You also have to turn it back to select type and then you can use it for data selection. Data selection must be performed in two steps. First you need to ensure DB connection physically.

Speaker 1

It means get one of the three database connection threads from thread pool from connection pool because connection to database is pooled and you have like set of available threads for it. Then you take it and this is DB executor reference and then you run your select statement with the chosen DB executor and finally you will get data reader. This data reader holds your data and offers you possibility to process it row by row. And you can run its read method to get next line of data. And you can use get column value method to collect corresponding result values from your result data collection row. In case if you have many rows you can use while or if statement or something else which will organize your cycle.

Speaker 1

So while read returns you true, you can try to get some data and you can put it somewhere in order to analyze in future. So this tool is helpful to get data selection with many columns, as many data rows. And also you may notice some strange things here and here. Normally C code correctly operates with data allocates and releases memory

with the help of garbage collector. But here as you can see, developers do not trust into garbage collection. The reason is when you run ensuredb connection or when you run execute reader, some subordinate functions are executed which are implemented in visual C and they implemented as a non managed code. Simply speaking Attempt to get some data from the database, runs some code that is part of Microsoft SQL Server client software written in non managed way.

Speaker 1

And that's how that's why you need to handle memory yourself. So when this method was executed, some memory was allocated and in order to properly release it you need to dispose created class instance, you need to dispose the STB executor or you need to use special using operator which will do this dispose automatically when this code finishes its work. So you need to correctly dispose memory from ensuredb connection and also connect dispose memory after executing reader. If you will not follow such recommendations, your code will be compiled and working almost normally, but in high load conditions. Especially in high load conditions when there are many calls of the same logic in short period of time, you will notice so called memory leakage. This leakage will look like enormous memory consumption in your system resources.

Speaker 1

So now you see 1 gigabyte, so 900 megabyte it's more or less okay, but you may see much more memory up to all of your available virtual memory and one it will come to a certain limit. IIS will suddenly restart your website and you will not know why this happens. So it will be very unusual for you. And the reason is that non allocated so not disposed memory will be leaked and so you have no way how to fix it until you will make this using operator protection. So you may find a lot of examples where creature developers do exec ensure the connection and supporting it with using operators. This is mandatory. If you do not follow this you will have memory leakage. And this works well for selections of some number of columns and number of rows.

Speaker 1

But in my example you may notice that we don't have using protection, we just use execute scalar method which is a generic method and it accepts expected data type of our result. And execute scalar is useful in case if you plan to read only one data row and you expect to read only one column value there. So execute scalar returns you first row and first value of the first column that you select. In my case, running this aggregate function guarantees that I will have just one data row having only one column in my columns selection list is obvious and I will get only one column as a result. And that's why execute scalar is perfect for such scenarios. All necessary protection to using to use using for two methods for data selection is already performed inside of execute scour.

Speaker 1

You can try to see it would possible to decode scalar async probably no, but let's see, you see decompiled stuff DB executor you see using yes so first using is already used here ensure special DB executor then internal execute scanner sync probably here failover execute and somewhere so you probably may find another using here in this decompiled code. But you can just trust me that execute scalar performs all code correct operation with memory so you do not need to handle and to care here with additional protection. Finally it returns your expected data type value. In my case this is decimal and this is our maximum price from some records where type equals certain argument and offer type also equals to another certain argument. So this is quite simple data selection procedure which makes one single SQL query and runs our data selection.

Speaker 1

So my example here is not only how to organize your web service, but it's also how to operate with the database and how to use alternative data selection approach with some data that we expect to get and return. I try to make it simple without need to collect many data records with many data columns inside of it. If you want you can find more examples in these variation sources and make more complex calculations. This example just shows you general

approach and you can see we have user connection as argument thanks to base service class.

Speaker 1

We get this user connection as a property and this property is ready for use when at the moment when our method is called so WCF and our base service class makes all that is necessary to initialize user connection at the moment when our customer runs this HTTP post method. By the way, we used post because it's very common for creation. You may find that for example we can search for all sources where we have just get method information. We will find probably 50, 15 or 16 places including ours. So 15 base product places where a get method is used like this so you can see not so many. We have 150 plus examples and only 15 base product examples. And when we will search for the post example, you'll find more than 150 examples.

Speaker 1

Because this is very traditional, very typical, difficult to create for creation to use post. It offers us quite comfortable way to handle data. You can serialize almost anything as a post request body. So post request data, that's why it is so comfortable and also it's well protected. It's better protected with security settings. Again if we compare it with get, I will explain and you will see it later. So post is very typical and okay, when we finished we can just save it. All the code samples are available for you so we can save this code. As you remember, configuration must be performed inside of creation so our code is Ready we can just check that column are the same as we expect to get it. And let's go back to our app and select our package.

Speaker 1

We can also see our recent reality service item. It has all this code already, so it was loaded from the file system and we can compile it. Compiling package makes collection of all of its sources including automatically generated items and like process code. If process includes C sharp tasks and then it performs compilation of our CS proj C sharp project. So this one, this C sharp project will be compiled. We have several compilable stuff here. We have set of assemblies used in this project and that's why we can compile it normally without any error messages. And in general this compilation was quite fast. But in your case probably you will face some additional difficulties mainly caused by lack of assemblies, lack of some references or just incorrect code which operates with classes which were not mentioned in usings.

Speaker 1

So in my case compilation was successful. And in case if you have compilation error, you will see a big error page with information about lines of code, type of the error and you will be able to look at it. Even after you close this page, you will have a special button in this list compilation error. So developers tried their best to support you. And if you have some troubles, you will be able to look at the list of your troubles in order to fix it. So once our web service was successfully compiled, it is already hosted at our application server and we can easily check it out. So we can check with get example method that our service is present. Let me show you how we can do this. We can use our browser to run get HTTP queries easily.

Speaker 1

We need to get our browser URL copy go to separate tab paste. So this is my web server address including zero application alias. This zero is very important. Let me remind when we registered our application our website at creation at iis. So I have a structure of default website which uses port number 80. Then I register at my D1 Studio app this one. This is part of URL. And then we have zero application alias for main application part which is physically saved in chiras or the web folio. So this zero is very important. You will face it almost everywhere when you combine when you compose your URLs for creation. So this zero is pointing to main application part of creation platform. If you run creation on Linux, you will not see this 0 on Linux.

Speaker 1

In net core we have all the stuff placed in one root folder. So it's a bit different, but all creature configuration will work absolutely the same. So we have functions that Return main application URL and for Linux it also returns everything correctly. So don't worry if you write something and run it on Windows there is a very high chance but it will also normally work on Linux. Okay, so let's move on. We have this main web server part of URL including zero application alias. What's next? We have to use special word that is used for automatic registering of all our configuration endpoints. So this word is rest. Okay, rest. Then we have some standard how creatio registers all our endpoints and it uses class name. Let's go to studio find our class name copy paste so we use 0rest/reality service/method name.

Speaker 1

If you use URI template your method name may be different. I mean your code URI will be different. But in my case it's very simple. I will just use this get example method name. I'm lucky to have no arguments here so my query will be not so hard to do. I will copy this URL for you so you can also practice and check it out how it works and let's move on. Let's check also enabling browser developer console going to network tab clearing all the console. So let's see how it works. I press enter now you see that my get example was successful. 200 means successful execution. Here is my full request URL I have some request headers, I have some response parameters and here is you see my response JSON string returned some data. It looks like everything is okay.

Speaker 1

So this is a very easy and quite practical way to check availability of your web service. For example, if you have compilation issue your web service will not be hosted at creation web server and your query like this will return you 404not found. So it will show you that there is no registered web service with this address. So in my case it looks good and it was get query which is very easy to get from your browser. But our main working query is a post query and we have to make a special steps to do this from our creation page let's make a five or seven minutes break. So just a quick. I hope to make it quick. I understand some of you have other plans after the finishing of the session.

Speaker 1

So let's make a 7 minutes coffee break and then we will move on with calls of our web service. We will make call of web service from creature page and also I will show you to make how to make it from Freedom UI page, from classic UI page and from third party applications. In case if you have questions please type in your chat and we'll answer so let's make a quick break right now. So today, now our task will be to call creature service from our client side page. How we can do this? You already probably guessed that we will have to write some code. Unfortunately we still don't have no code options to call a web service. Like we start a process for example. So possibly we will have something like this in future.

Speaker 1

And now we have to write some code at our creature client side in our browser JavaScript in our browser page JavaScript part. So let me show you. I already had all of the examples. It will not take too much time today. So I will show you how we can call the web service from creation client side. Of course we need to go to our page code. Let's go to edit page and then we can open its code. Also I can show you faster way to open source code and save and open it. Or you can go to client module. In my case it's a real T form page. You go to this right part, this actions three dot button. And then we have open source code action. I think it's more practical and faster than to do like this.

Speaker 1

But okay, I will recover closed page. This one go to front page. Okay, this one. Let me show you what we need first. So we need first some button that will start our code and then we will implement it. So that's why I recovered this page first. Let's go to our actions menu. We already have one item here, so we can create another one. Another

menu item. This menu item will include calculate max price and the action could be just some random action that we need temporary here because we will replace it with our own programmed method. Programmed handler. Let's use data, let's use icon. Let's do some. Some we can use some kind of things. Okay, let's take this one. So we will use it for calculations and element code. Okay, let's call it max price menu item and confirm.

Speaker 1

So and then we have to save this. Our menu item will appear in actions menu and then we go to its code part. So let's go to open source code. You can close this editor so not to accidentally resave anything. Let's search for our max price item. And as you can see, this is somewhere like number 116. So here we have our menu item in view config div area. And we will just remember this line 116 because we need it a bit later. So let's collapse view config div, your model configuration. Collapse everything. Now we will make one More handler in our code, so please be careful. I put comma and I plan to paste here an example of handler for my calculation Example of a web service call work from Freedom ui. Example run web service in Freedom ui.

Speaker 1

So this code will be quite big. I will copy it into parts for you. But first of all let's pay attention on the definition of our module. I copied it for you, so you'll be able to reproduce the same in this line where we define our module, we started to request one more additional module named Creature Dev Kit command. This module is kind of utility set of tools which includes a lot of useful things including HTTP service. So we requested this module to be created in our dependency modules list. So our require GS framework will first look at this array, find this array item, create its instance, return it as an argument when our factory function will be called. So we can call it SDK as we did it here, so we call it SDK here.

Speaker 1

And if you forget about line number one here, your next code samples will not work because you have no these utility modules. Okay, we have this SDK now and it's time to implement our handler for our menu item. I will copy and paste it in parts for you because Zoom has limitations on size of code that is possible. So size of chat messages. Okay, three parts. And then of course I will copy it fully into my handlers area here. Taking care about commas, taking care about syntax. If you do some kind of syntax mistakes like this, you will immediately see this parsing error. So please be careful, avoid such errors and provide correct indentation. Don't forget about any brace here. And now I have to explain how it will work. So this is one more handler in my handlers array.

Speaker 1

And this handler has its own request property. So it's like handler name. And you see, there is a tradition to name your own custom handlers with usr Prefix and base product handlers are usually provided with crt. Okay, we can name it as we wish. Then we have a handler implementation asynchronous function. So this function finally makes some useful code for us. And first of all we do some console output just to make sure that our button so our menu item normally worked. Then we have to compose some arguments to call our web service. And the main idea is we select a page which already has type value and offer type. So if we selected for example, apartments for sale, we have this type value and offer type. That's what we need to run our web service.

Speaker 1

So we plan to get type from our page, but when we operate with it, we will get an object in JavaScript. This object will include several properties and if we need ID of selected data record we will look at value property. If you need to look at display text of a lookup value like this apartment, you have to operate with display value property of this object obtained from a lookup column. I also need to make sure that I'm using correct names here. Let's go to view model config search for type and now we see this attribute name. I will collapse unnecessary parts so you will easily see what we have here. So we need to look here.

Speaker 1

Type represents this attribute name so I have to copy it, find my handler and paste it this one so PDS usr type and there is a unique name for this attribute. So that's how we will get with await operator we will get our type lookup value which represents an object and if this object is not empty so it includes something then we will try to get value property in case if it's empty we will keep it clear so we will not use it. The same with offer type. Let's go and find offer type attribute copy paste and we get offer type. If it's not empty we get its value. This is important to get corresponding arguments for type and for offer type that is required for our webshop.

Speaker 1

Now we will use our dev kit library in order to get HTTP client service out of it so we can ask SDK to create one and that's how we get this JavaScript class instance in our code. We have to combine and collect correct viewers URL for our web service. I'm using Terasoft base product client side JavaScript framework. It's a core framework, you cannot change it easily and it has some functions to provide web service. Base URL so we have this base URL then we combine path in order to get rest then class name then method name. By the way my method name is called where is my visual studio here My method main is called get max price by type id I have to fix it.

Speaker 1

I have to fix it in my code here get max price by type id so it was mistake because I renamed this method recently and finally my endpoint URL will be combination of the base URL/method name slash this rest like template part then class name then method name. Okay great, my endpoint is ready and here you can see some example of brick of my endpoint. I will name it better here something like this. Okay, now we have to prepare parameters and perform sending of an HTTP post query we have params. This is a JavaScript object with several properties and it's very important. Property names must match your web service method parameter names. Reality type ID here must match this offer type ID here must match this and entity name here matches with this.

Speaker 1

And also I have to fix my code because this one already changed its name so my object is named usr reality. Okay, this is important part and parameters will be passed as a part of our request HTTP request body. So parameters will be encoded into a stream and thanks to this SDK library it will be done by this method post method, not by us. So we just wait for getresponse running post method. If you need to run get method you will have a get instead of post here. Endpoint is a URL and params is a JavaScript object with parameters. Now you can see we have an asynchronous call here. It actually includes two parts. Sending a request, then waiting for some time and then getting response. So physically it may take some time, like 30 or 50 or hundreds of milliseconds.

Speaker 1

So you should understand that even if it looks like easy thing and line by line execution, physically it is asynchronous call which means we send request, then browser waits, then we get some response. Okay, we got response object which is a JavaScript object instance. We can look at its properties. This object will have a body property and then we'll have property name the same as our method name + result suffix get max price by type id result so this is our max price response and when we finish we just continue normal execution of potential other handlers with this typical return. So I had to make fixes in my video and such fixes were not down in the code in our chat. So please take care and modify this code accordingly to the video.

Speaker 1

If you plan to perform your own examples of the same then we have to save this carefully because if you have mistakes of course you will see it doesn't work. And also let's remember about our your request name and return

back to line number 115 or something like this. Let's go. Here we have our menu item, our action item and we have clicked event with the request name. Originally we set it to some random save request, but of course we will replace it with our own code. So I will highlight it in our chat. So don't forget about this. We need to organize running of our handler by manual changes in our diff view config diff array. This is responsible part, so please be careful. Please don't accidentally Remove any breakage, any comma or something like this. So please be careful.

Speaker 1

And then we can save it. Great. Everything saved correctly. We can close this editor. Probably can just close and open the page. So now we have apartment for sale. That will be argument and let's try to find our action calculating max price. Go to network and clear all previous history. So now let's check how it will work for us. It looks like status 200 means it was collected correctly. Web service runs and returns our maximum price for apartments for sale. Okay, let's see network tab details. This is our request properties. This is full URL was created correctly. We have some request headers, response headers. Our request payload physically was a string, but we can parse it into look at it a bit more comfortably. So here we have all the parameters that were sent as arguments.

Speaker 1

Then we have response with some number correctly calculated by our server side and returned and some timing information. Now you see it's quite fast execution. So it took only 31 milliseconds to run. It's very good speed. Okay, let's look at another example. We have a lot of apartments for maybe houses for sale. Let's search for random house and calculate max price. Now you see it's calculated correctly. We return the data. This is our max price returned by our system. And let's check out what was the paywall, what is the response? So here we have our response date. We can check it out if we go to our main list and sort by price. Yes, it looks like 99999 millions. Yes, it's okay. This is our max price according to current data. So it looks like correct calculation.

Speaker 1

So our Freedom UI page calculation worked well. In case if you have any questions, please ask. I'll be happy to answer. Now I want you to see the same call how it can be done in Classic ui. Some of you probably will do some Classic UI customizations. So you may need to know how to do some simple programming steps. In classic programming page, let's go to our edit page in Classic ui. But it turns because of our migration into Freedom UI page. So okay, we can try to temporary switch all our user interface into Classic ui. So use Freedom UI interface. Open it, turn off, save, close, log out, log in. Now we see background in Classic UI we go to classic section. We open edit page and it's also classic. Great.

Speaker 1

So now I will show you how to program some buttons in Classic ui. Go to view and open section wizard. So this is an alternative of what you get used to work with edit page in Freedom ui. So open Section wizard from this edit page will open as an editor for a button. Unfortunately you can't easily add a button using this page. So in Classic UI we have a lot of limitations according to controls used on the page and we will have to use code part for it. Okay, we can go to code part. Here we have Classic UI code. We need to look at default array and add one more button there. Adrian, question possibility of web service returns Is it possible to call a third party app that returns base 64 and how to handle? Yes.

Speaker 1

So in case if you want to call third party application from Creature. So Creature will initialize this call and do it. It's even possible to make it no code solution for this. We will study it a bit later. Probably tomorrow I will show you how to make integration with third party apps and how to call third party web services. This is a bit separate from our today topic because today we create our own web services and call it from client side. Third party web services is better to call from creature server side. So you will see it's quite comfortable. Okay, I'm trying to make a button in my Classic ui. So here you see diff array which represents set of items and each item looks like definition of one control

on the page. In my case I have name price area. Price area.

Speaker 1

You see this is area and somewhere here just nearby I plan to put some code for a button I need to steal some button definition from Academy. So so I will show you how you can find it. Go to guides. By the way, our training ladies will write next. So current 813 release highlights with a video that will be released in a week. So you will see some news and it will be so probably interesting for those who keep an eye on evolution of Creature tools capabilities. So now we go to development front. Oh no. Platform customization Classic UI page button examples So I will find some simple button to the page and I need to copy piece of code which represents button properties because it's really hard to remember them. So I just copy this part paste it into my code.

Speaker 1

Of course I will have to fix it. I will have to make it look correct. So comma is missing here. Here's my button definition and I. Oh, I have to exclude unnecessary stuff here. And yeah it looks like I have a lot of extra things copied. So this one is proper piece of code that I need to copy insert current name. So I will do it quite fast because probably you should not focus so Much on quisecure this will be just an example. So my parent name will be the same as for nearby fields because I want to put it nearby to area and values will include location and size settings in layout and here layout means position and size columns. So this is 012 column two for area. Here you see row two.

Speaker 1

Then I will have row three because I want to put it a bit below Parent name is the same button. We can call it Run web service button. It will be our button name button title button caption should be localizable string. This editor does not allow me to do this. Okay, red color always enabled so I will do it always enable it. I will have to rename this on run web service button click I will have to make a method for it and the localizable strings should be managed in its editor. Okay, so I will do it a bit later. This is our button. It will have a red color. It will have some caption item type name. Okay, I hope I have no. Now you will see this button representation here. Go back to section wizard and save.

Speaker 1

Probably it was not the best idea because I need to implement method for the button. I also need to make my in my classic package. I also need to make localizable string for the page. So let's make localizable string. I called my button action could be run service okay and try to save. Do we have any troubles with localizable strings? In previous versions we had okay, my button caption is okay, go to div in order to search for my new button here. I expect it to be present somewhere here and caption should be like this My button caption okay, great Method or click Run service button click. We have to implement in methods collection so usually you do it like this function and then we have some function body. Now I plan to get examples of running web service in client side.

Speaker 1

So here is my own run web service button click. Okay, and also I need to have a callback function here. So we have two methods and that will fix it. Okay, so when I need to do this is my method name. I use it for a button and method is in classic UI it's easier way to call some functionality because it just implements some function in your JavaScript object. We will get type column and get its value. If it's not empty, we'll get offer type and get its value. We'll compose parameters. Let's check our entity name. It's called reality Classic. Yes, looks good. And we can run our web service run our method name let's check this method name. Get Max Price by type ID. Okay, great.

Speaker 1

And we need to provide callback method to accept our result because in Classic UI we don't have so fancy stuff like

await. And so it's because of the tools used here. So your JavaScript of course will run Await normally. But the tool that we use to call service expects to get this callback function and parameters should be executed. By the way, this tool is called Service Helper and we must ask for this module Service Helper and get its reference here. So this is also an important part in Classic ui. This is my set of methods for you in Classic ui. And this is a divide or a button. Oh, probably I should care about index, but okay, so it was already saved Item type originally was button but when Section wizard saved it replaced with just a number.

Speaker 1

So it's a value of that enumeration item that we found in our article. So item type. This one turned to be a constant, which means five by the way, you can also study your client side framework. So you can just do terasoft. Then you see a lot of properties like item. Let's see how it looks like View item type. Sorry View item type. Then you see a list of approximately 30 different options here. So it means items available for Classic UI pages. In my case I used button. So looks like everything is ready. And this is how we use special utility module. It helps us with calling of web services. We have two steps, call service which means send request and provide response callback function. And when response will come, this callback function will be called.

Speaker 1

That's how we will do some console output and show us returned data. Okay, finally we can save it. In Classic UI we have to constantly think of browser cache. So we have to reload the page in order to fight with cache. Now we have houses for sale. Okay, let's make a copy cheaper one. So we have two houses for sale in our database in Classic ui. Let's open. Now you see a button. Okay. Okay, let's check how it works. And the web service is the same, but we have different tables to calculate. So let's try. Our call was successful. You see maximum price was calculated. And also you can see history. You see request URL 200 it was a post query. We have payload. This is our request body. And we have response. And also it's timing. Timing is quite fast. 21 milliseconds.

Speaker 1

So perfect time. Very good speed. Okay, great. We're almost done. And now we already practiced with Sending of queries from client side. But you may notice so we only worked with Creature client side. It's also possible to call same queries from third party apps. Let's go back to Freedom ui. We have better data there. System settings, put it on your interface, enable it, save, log out, log in. So I plan to show you how we can use third party app to perform such web service calls. As example, I will use Postman app. I already installed Postman app on my own and maybe you'll be interested also in some alternatives. Postman is a very helpful and useful and very like handy software. I have a collection of different tools which also work for the same purpose.

Speaker 1

Postman is on first position but we have Thunder client. You may use Advanced Rest client, Rest, Wet Insomnia and a lot of other names. The recent one was Mako Kuhn and Talent API Tester. Or you can use hard code old tools like Fiddler Swap UI or Wireshark. So it's up to you what to use. Postman is one of the best from them. And no, no, don't upgrade now. So I need to show you. Let's close all existing. Don't say close all tabs. Okay. Don't save. Okay. Here is Postman app which is designed to test. To test queries, to test web service requests. We can try to run it so we can create new post query and we can take all the parameters we need it. For example, let's make calculation of the most expensive apartment for sale. So we go there network.

Speaker 1

Try to run this button here. We can steal all necessary parameters. So this is our request URL. Okay, copy it, go to Postman, paste it here carefully. So this is our request URL. Great. This is a post query. Great. Body should be row JSON. Okay. And we will provide request body value, payload, view source so we can copy all of this and paste it into our Postman beautify a bit just to make it good looking view of what we're trying to do. And then we have originally no cookies and let's try to run this query. We will see what happens. Obviously creation server side will reject such

executions because it means that we are trying to run some business functionality without any credentials. So trying to run it anonymously of course. Course rejected and unauthorized error 401.

Speaker 1

Now you need to know that if you want to call Creature Services from third party apps, you have to pass authentication. Creature has different ways of authentication. Now let's go to our documentation about integration topics. We have authentication articles, basics and overview. So we have different authentication types. The most practical are forms authentication based on cookies or OAuth version 2 authentication based on application name or client name and client secret. I will show you forms authentication because it's out of the box and it doesn't require any other secret special settings. Any other preparation for my system? If interested how to make OAuth version 2 authentication, you can read corresponding articles. So here you will see all necessary data and I will show you forms authentication forms. Authentication is based on running a special web service. Let me show you examples and this one.

Speaker 1

No, no, no. I need to reference for our service. So we need to run special web service providing request body with our name and password. As a result, we will have set of authentication cookies. And such cookies will include necessary data that will work like a temporary ticket. So for us to operate with creature. So in order to run this business logic query, we must provide special cookies. Originally we don't have such cookies and we will get it with the help of authentication query. So let me show you how we get how we make authentication query. This should be a post query. According to the article, we must use our web server address, service model or service login. Okay, Copy this part here and then take our address without 0als because we work with root folder.

Speaker 1

So what we have here, this is our web server address. This is our root folder pass to our web service. Let me show you this. My is my web server folder service model O service. You see some definition of this web service class and some technical information from it. So this is in root part of our application. We have to provide body row JSON and we have to make this body with two properties. Okay, we can copy it from here. Username should be our name. We want to use and password like this. Okay. No special headers. Only body is required here. So let's try to run it. First of all, I would try to run with incorrect password. You will See error message. SO200 here, but error message code 1 invalid username or password. Okay.

Speaker 1

And obviously we will not get full set of cookies. So we are getting only just one temporary cookie, which is not enough, of course. Okay, let's provide correct value. Now you see 200, which is okay. No error messages in response. And four cookies obtained. Only four? It's strange. I expected five cookies here. Let me think. What is missing? Oh, it was missing USR name. Okay. It's not. Not so. Not so difficult. Okay, we have four cookies. Normally it's five cookies, but probably something changed. The most important are BPM CSRF and aspx auth. Okay, so we have some set of cookies which will be working as a temporary tickets. Such cookies will work not forever, it will work just within our user session inside of having such cookies we can run query using postman.

Speaker 1

In this query we already have set of cookies thanks to postman sharing cookies with the same sites. And then we can run our query. And it looks like we have one more error 403. But this time this error is not because of authentication. This is because of additional protection from CSRF attacks. If you have time you can find what is CSRF attack? It's a cross site request forgery special type of attack where a hacker may use current user session credentials and ask a user to run specific code which will turn into some change that was intended by hacker. So use of current user session in order to do some malicious functions across site request forgery. So we have special protection for it for this type of attacks.

Speaker 1

And in order to run post queries you have to make a header in post query named BPM CSRF and the value for this header must match the same cookie BPM csrf. So I take cookie value carefully put it to value of our BPM CSRF header and in this case my calculation is correct. Response is 200 and I have some response data. So now I successfully called creation method from third party app from my Postman application. That's how you can do this. And also you probably will be interested to know that this session initialized by Postman is not forever and it has sliding expiration. We have default timeout for user sessions. Let me show you. It's about some session data information. So we almost finished for today. And let's go to system settings, I can show you Timeout user session timeout.

Speaker 1

And you see original value was 60, which means 60 minutes 1 hour. I've already changed this timeout to 600 which means 10 hours. The maximum value here is 720 which means 12 hours and minimum value is 10, which means 10 minutes. So this is user session timeout. If you run any query within this timeout, then your session will be extended. So creature has sliding expiration of such cookies. And simply speaking, if you run queries too often, so often enough like every 10 minutes or every 20 minutes, you will have everlasting session. So your session will never die in practice. In real practice, such sessions will be finished if you do nothing for some time.

Speaker 1

So in case if you plan to do some integration, of course first you will do authentication, then you Will do some integration steps and also you can check how it goes and you can check current user sessions. If you go to system users, find your user, go to access rules detail, then sort by start of the session. Now you see two different sessions initialized by our supervisor user. And one is browser based by our Chrome, another is made by Postman. Both sessions are active. Now you can close such sessions if you want. That's how you can track history of your users. And in general you can see this history also in database if you will do something like this sys user session.

Speaker 1

So if you do something like this in your database, you will see all user sessions created initialized by any user in your system. And you will see session end date, session start date. You can calculate how long your users were working, who worked and who did not work in your system. So this may be really helpful for you. And you see we have different session end methods. Session end means the way how system finished to your session. And we have like log out scenario, we have timeout scenario. And you see different stories here, different history. Okay, at the end of today's session, I wanted to mention that it's also possible to make your own web services which will not require authentication at all. Such web services are called anonymous services, but you should be very careful implementing them.

Speaker 1

Because anonymous web service is simply a back door or kind of place which could be utilized by anyone without any credentials. So potentially making it possible to do some kind of DDoS attack on your website. So generally it's not safe. You can read more data about anonymous web services at our documentation. So let me find it in backend web services examples Anonymous subservice so anonymous web service is similar to traditional one, but it has one difference in the code. You will have no user connection, but thanks to inheriting from base service you will have app connection. And also it's possible to get system user connection from it. So anyway, application has its own embedded system user session which is created actually by user who is specified into special system settings and the system operations. User System operations user system setting.

Speaker 1

By default it's supervisor, but you can change and this user will be used for this Background Started and created user session used only for system purpose and running anonymous services is also based on this approach. So if interested in running anonymous web services, here is the article. And the difference is that you have to check out do you have user connection or not? If not, you can take app connection system user connection instead and then you can do all the same operations as you planned.

Speaker 1

But in order to implement anonymous web service, you have to perform a lot of changes in file system, which is not a problem if you deploy your anonymous service at on site environment, where you have access to file system, but which will be a trouble if you deploy it in cloud conditions, because you simply cannot modify such files in cloud. You only can provide manual for support team and ask them, hey guys, please, I need to deploy anonymous web service at cloud environment. Could you help me and provide them all the necessary manuals for your web service to be deployed at cloud conditions. And as you can see, a lot of steps here. So it requires manual for support team, what exactly you plan to save, what file to modify.

Speaker 1

And you may know that we have already a lot of base product anonymous services. You can find it inner web config file. Let me show you Inner it means inside of terrasoftware web config search for allowed locations. And you'll be surprised how many anonymous web services we already have on board. More than 30 items that could be called without authentication. So you see, when you run anonymous web service, you should not provide any authentication cookies and it will work for you even without any authentication. But potentially this makes a threat for you, because anyone can run such queries and anyone can use such endpoints to make some kind of DOS attacks denial of service, running it too often. So please be careful with making your own anonymous services.

Speaker 1

And I will just show you a quick example of a web service which may work anonymously. The biggest difference is this. If you have user connection, you can just get it. If not, you can get it from app connection, system, user connection. That's how you use this user connection obtained with this code and can just copy it for you. So if you ever need it, you'll know what to do. And then you work with the same query, but using user connection obtained with this example. Okay, that's all for today. Thank you very much for your time. We already finished the questions with making our own web services, running it anonymously, making postman queries. And tomorrow we will continue with data exchange tools with integrations with coding of third party web services. So thank you for your time today.

Speaker 1

Dimitri, I have one question, if that's possible. Yes, yes, please. It is a bit off topic, but we have an opportunity where we can also leverage the business to business portal users. And we would actually like to apply row level security. Is that possible? No, sure. We already have cloud powerful security tools in creation. We just did not cover it because it's something that is described and discussed at Customization course. So we have roles, we have users. And you can see list of users here you can create your own users, you can provide different role permissions. So everything is just out of the box here. We do not need to program specially things for it. Is it what you asked before or something? And also not if they are not allowed to see each other's data or is it still?

Speaker 1

It's possible, but I would not recommend you to make such strict restrictions because your end users usually work as a team. And if one created a customer, someone else may need to look at it. But in general it's possible if you plan to implement couple of competitive teams or competitive users, so they should not see data from each other. It's

possible to implement with the help of default record level permissions. You can find it here and object permissions. Then you can select corresponding entity like real T. You can enable record level permissions. And it's possible to make situation when first user creates some record. And obviously first user can see this record, but other users will not be able to see this record. If necessary, you can do this only in case if users have single user privilege, administrators will see data anyway.

Speaker 1

So they will see all the data. Okay, that's clear. Let's try that. Thank you. Yes. And also Adrian was asking about business processes and call web service and to put our web service inside. Oh, in case if you run call web service. So it was designed to run third party web services. Let me show you. We had our own examples. And when you use call web service item, it is designed to run third party web services. We will study how to do this tomorrow. If you need to run your own service, you can write some code at client side. Or technically you can use code web service for your own web service. But in case, in this case you have to take care about all necessary things like authentication, passing cookies, passing parameters.

Speaker 1

And in my practice we had successful examples where two different creation systems were communicating with each other using no code call web service tool. So it's possible. And what's the difference between implementing a button handler and launching web service from business process? There is a big difference. Because core web service is designed to run third party systems, third party endpoints, you can use it for your own, but you will have to provide too many technical parameters so the same number of settings that you will do it from client side. Also I need to mention, which is not obvious, that when we run our web service methods for creature web service from client side, we did not care about authentication. The reason Was we already have all necessary cookies in our browser in client side. Let me show you.

Speaker 1

So let's look at our call again. Now you see this query, but if you look at headers part you will see that we have cookies. So this is our cookies parameter and such cookies were provided by our browser because we are running our creation page in a browser that was authenticated to work with this website. Browser supports all queries made from client side with cookies. And that's why our queries were executed without any error messages related to security. So we had cookies in our client side when we call any query. So for example, when you do some simple step like reward data, you see select query was performed. You see also cookie was passed from browser side and that's why we have no any issues with running the same query from the same page.

Speaker 1

If we will steal all this data and try to make it from another browser without cookies, of course it will fail. And it was shown by postman, we will have 401. So Adrian, is it clear what we're talking? Okay Adrian, thank you very much. Thanks all of you for today. Attention. We will see each other tomorrow. Tomorrow we will talk about integrations. I will show you examples of onboard protocols supported by Creation, odata and data service. You will see how you can use it for integration with third party apps. And also we will practice with scope of web service and we will do some calls to third party apps without programming using no code tools.

Speaker 1

At the end of tomorrow session I'm going to show you Clio tool, explain why you need it, how you can do some system maintenance with it and how you can organize delivery with help of Clio. So thank you for your time today and see you tomorrow. Please prepare questions because we will have Thursday and Friday sessions. You have chance to ask your questions related to development organizing or architecture of Croatia. I'll be happy to answer. So tomorrow we will work with integration tools and on Friday we will prepare for the developer action. Thank you very much for your time. See you tomorrow.