

# Towards on-line contesting

<http://cqcontest.ru>

Background, Technologies and more

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# Introduction

Online scoring server cqcontest.ru was launched on January 26, 2010. The server enables online receiving of intermediate contesting data. Launch of this server also gave opportunity to follow online via the Internet browser (by means of fairly simple tools) the contesting radio stations connected to the service. Intermediate technical results are tabulated and displayed as statistics, enabling online assessment of the contest presentations.

Functional design of the new server was preceded by preliminary analysis of the further launched American online scoring service. Having debated a matter in mind, the author has chosen the most appropriate way of the project implementation. Choosing adequate technology was also a rather heavy workload to deal with. Best practice of the American service, as well as its several technical details found their way into new online scoring server. To ensure full compatibility of these two online services American XML schema was applied. And the new scoring service was developed by means of up-to-date programming languages and technologies.

I would like to further dwell on key concepts of the online scoring server, its current application, and the future of online contesting expected on the ground of state-of-the-art information technologies being implemented into amateur radio.

# Part I.

## Online Server – Objectives, Tasks and Means

Wider objective of the online scoring server development was to provide online access to current intermediate contest results. Moreover, this objective had to be achieved with rather simple means, preferably without any additional software to be installed on the client's computer; plus enabling secure data exchange was also essential.

Having analyzed different ways forward, an appropriate variant was found, which combined user ease and comfort. Application of up-to-date IT-methods gave opportunity to achieve this task with adequate means, specifically by means of Web-technologies.

During the project implementation up-to-date Java and C# programming languages were chosen as basic ones, while main development tools were Oracle JDeveloper and Microsoft Visual Studio.

Basis of the online scoring server is a widely spread Web-applications server Apache Geronimo developed and supported by the well-known Apache Software Foundation. Earlier versions of the server employed Web-servlet container connective Tomcat and Derby database. The database is part of the Geronimo application package, which is a definite convenience due to the possibility of data file storage in one computer directory. This connective was topical for all versions of the 1.x server and approved itself as simple and reliable. The only inconvenience caused the fact that low-level data handling in tables missed a universal editor meeting certain criteria as well as functional limitedness of the Derby database.

As a result, in about a year and a half since the server was launched with the Tomcat+Derby connective a decision have been made to change the data storage and control platform for the more advanced one. Thus, the 2.0 server version emerged with a database of Oracle platform (widely proved to be one of the most reliable platforms).

Therefore, cqcontest.ru at the moment presents a complete solution on the ground of the Geronimo applications server and OracleXE database.

In the author's opinion, the main criteria of information system are its reliability and operation resistance. An open secret is the fact that Oracle technologies prove to be leading in the world for their reliability and implementation quality. And naturally, employment of these technologies in your own projects provides high level of reliability and quality of the applications developed. That is why Web-applications of the online scoring server are based on technologies of the world IT leader.

In the process of the online scoring server development special attention was paid to security issues of data storage and access. Means of a standard programming tool package give opportunity to ensure ultimate server data security with a modicum of effort. Moreover, the intended possibility to provide access to the server via https secure connection will certainly bring new perspectives of secure usage through highly protected data exchange between the server and the client.

Summing up the above mentioned, I would like to underline, that by this very moment all the originally stated objectives have been achieved, and the server has been steadily functioning for three years already.

## Part II.

### <http://cqcontest.ru> – Situation at the Moment

The main ideas which were implemented into the online scoring server [cqcontest.ru](http://cqcontest.ru) were taken from the author's wide twenty years practice as a Web-tools and fat clients programmer. Certainly, the role of earlier created American online scoring server, the authors of which kindly uploaded the XML schema on their resources – the description of server-client interactions by transporting data to server in XML format – also should be mentioned.

That particular scheme was chosen to provide full compatibility with the American analogue, although at first several possible variants of format data transport from client to server were considered. Finally, the main role played the fact that some clients (those current by the moment of the server [cqcontest.ru](http://cqcontest.ru) development) had been supporting online send of scoring data (for instance, N1MM, WT, TR4W etc.), having the realized functional of interaction with the server under the above-mentioned XML schema. According to these ideas, the scheme providing full compatibility with the American site was taken as the basic format for client-server data communication.

Apart from using single standard of data communication, the other extremely important factor was providing the interaction with online scoring server for as many clients as possible. It is commonly known that the functional of some clients' programs does not allow providing the interaction with the server by its own means, without using additional intermediate software. For example, there is no such solution in any of the most famous contest-loggers WinTest, where it is necessary to use the exterior programs for data communication with the online scoring server. Such program is a kind of a buffer between the client and the server and it plays the role of interagent, executing some additional functions, not having been implemented in the original client, for example, providing connection with the server and passing data file to it.

In the author's point of view, absence of data exchange with online scoring server in the original client is one of the barriers in the way of mass using of online opportunities. The other barrier is the lack of coordination in buffer software and its certain limits in compatibility with different operation systems.

From the above reasoning the author came to a decision to create his own buffer program with maximum functionality, user friendly interface and, as far as possible, minimum settings. Not least important in the choice of programming software technology was the providing of program's compatibility with maximum quantity of different

operation systems and minimum programming costs. It naturally led to C# as the most suitable programming language for this aim.

As a result, buffer program unipost.exe was created, release 4.2 at the moment. It is not necessary to go deep into principles of the program in operation, for the detailed description of the client-server interaction is given on the “Help” page of on-line scoring server and the settings are not at all difficult. I would just like to add, that at this moment the support of all main clients – WinTest, MixW and Writelog – is implemented.

# Part III.

## Future of on-line contesting

Be objective in the views of the future - quite a challenge, because every man has his own version of events. To present what will be the service of online contesting in the future, of course it would be nice to have the views of the participants, who are active in contests and has a view of the possible options. In my view, in order to be sufficiently objective can be made online survey or to interview as many people as we can. Maybe then we'll get the answer to this question.

For now I will present my own thoughts what I imagine an online contesting in the future. Visible changes will affect both sides - the Client and the Server.

### Client

***1. Functionality of data transmission "on the fly" from the Client side to the side of Server. In other words, when you enter a QSO to Client log located on the local computer, QSO data in real time sent to on-line contest server.***

#### Benefits

The actual data sent to the server immediately after the QSO entered. Everything is transparent.

#### Limitations

In case of a fall Internet on the Client side inability to send data to the Server.

#### What do we need to implement?

We need to implement the client side functionality to send data in real time to the contest server. Also, we need to implement functionality that saved all QSO data in the program buffer in case of a fall Internet, with the possibility of sending all of data from the program buffer to the Server when reconnect to the server. Additionally, we must provide information to the user about the error reason, and continuously monitor the state of Internet channel.

*In my opinion, no more changes need on the client side.*

## **Server**

### ***1. Receiving of each QSO data by online contest server***

#### Benefits

The actual data received by Server immediately after QSO entered on the Client side. Everything is transparent.

#### Limitations

In case of a fall Internet on the Server side inability to receive data from all the Clients.

#### What do we need to implement?

We need to implement a Server-side-added service, which provide receiving of data from the buffer of Client side in case if the Internet connection restored. We also need to inform the user about the recovery of the Internet channel.

#### Who have access to the service?

The System

## 2. Intermediate results of on-line participants in a tabular form

The screenshot shows a web browser window displaying the 'Welcome to on-line Contest Server' page. The page includes navigation links (Login, Registration, News, Mobile, etc.), a search bar, and a table of contest results. The table is filtered for contest '0202 CQ-WPX-RTTY' and shows results for two categories: MULTI-OP and SINGLE-OP. The table columns include Oper, Band, Pwr, Mode, Rank, Call, Score, QSO (Total, 160, 80, 40, 20, 15, 10), MULT (Total, Stat, Cty, Zone, Pfx), Date/Time, Src, Elapsed, and Club.

CATEGORY				Rank	Call	Score	QSO							MULT					Date/Time	Src	Elapsed	Club	
Oper	Band	Pwr	Mode				Total	160	80	40	20	15	10	Total	Stat	Cty	Zone	Pfx					
MULTI-OP	ALL	HIGH	RTTY	1	VE1ABC	234	23													2013-01-29 09:38:09	P	0:01	
				2	JA5BCD	170	20													2013-01-29 09:39:16	P	0:00	
SINGLE-OP	ALL	HIGH	RTTY	1	KL7DDD	134	18													2013-01-29 09:37:34	P	0:02	
				2	UA8ABC	123	12													2013-01-29 09:37:00	P	0:02	

### Benefits

We have possibility of continuous monitoring the intermediate results of on-line participants.

### Limitations

No

### What do we need to implement?

We need to implement the server-side service, which displaying in tabular form the intermediate results of on-line participants. Optional - Display layout by bands only for the online participants and referees.

### Who have access to the service?

All users

### 3. Group service for the on-line participants



The screenshot shows a web browser window displaying the 'Welcome to on-line Contest Server' page. The page includes navigation links (Login, Registration, News, Mobile), a search bar, and a refresh button. A dropdown menu shows the current contest as '8104 CQ-160-CW'. Below this, a table lists participants with columns for Team, Country, Score, Participant Category, Rank, Call, Score, QSO Total, QSO counts (160, 80, 40, 20, 15, 10), MULT Total, Stat, City, Zone, Pfx, Elapsed time, and TV1/TV2 links. A video feed on the right shows a participant wearing a headset and working at a computer, with the call sign 'RC90' displayed above the video.

TEAM	Country	Score	PARTICIPANT Category	Rnk	Call	Score	Total	QSO	MULT	Elapsed	TV1	TV2								
							160	80	40	20	15	10	Total	Stat	City	Zone	Pfx			
European	Russia	193168	MULTI-OP 160M LOW CW	1	RA3Z	100000	1000												310:31	
			SINGLE-OP 160M HIGH CW	2	R7AC	93168	403	403					48	48					1268:57	
Asiatic	Russia	93000	MULTI-OP 160M HIGH CW	1	RC90	93000	123												310:44	<a href="#">link</a> <a href="#">link</a>

#### Benefits

The possibility of the team competition for members of certain groups, such as (for example) National Team Competition, DXCC group, etc.

#### Limitations

No

#### What do we need to implement?

We need to implement the server side added service, which provide an enhanced monitoring of intermediate results on-line participants groups.

#### Who have access to the service?

All users

#### **4. Enhanced visual monitoring service for on-line participants**

##### Benefits

Possibility of permanent extended monitoring the results of other online participants at contest server via a web-interface. Advanced monitoring involves the ability to view statistics and other reports to which access will be limited only to users who send their own data online. We can also optionally implement the ability of on-line view the current callsign in the log of any online participant, without specifying the frequency and other information (for example, in the only format: "time" and "callsign").

##### Limitations

No

##### What do we need to implement?

We need to implement the server-side-added service, providing an enhanced monitoring of intermediate results on-line participants.

##### Who have access to the service?

On-line participants, Referees

#### **5. Service on-line monitoring of signal levels according to the skimmers data for on-line participants**

##### Benefits

Possibility of permanent on-line monitoring the participants signals level, according to the skimmers data (without specifying frequency).

##### Limitations

No

##### What do we need to implement?

Necessary to implement on the Server side functional of the swap data from reversebeacon.net or any other skimmer service in real-time.

##### Who have access to the service?

On-line participants

## 6. Service Visual monitoring, for referees

The screenshot shows the 'Live Contest Score Server' web interface. At the top, there's a navigation bar with links for 'Логоут', 'Регистрация', and 'Новости'. The main header displays 'Вас приветствует Он-лайн Контест-сервер!' and the current time 'Tue, 29 Jan 2013 11:13:01 GMT'. Below this is a menu with options like 'WEB-Отправка', 'Вид', 'Отчеты / Час', 'Графики', 'Статистика', 'Кабрилло', 'Опции', 'Помощь', and 'Admin'. The interface includes two maps: 'E7DX' (left) and '9A1P' (right), both showing a world map with call sign markers. A central table lists contest results for 'E7DX Skimmer 9A1P'.

Oper	Band	Pwr	Mode	Map 1	Map 2	Call	Score	QSO	160	80	40	20	15	10	MULT	Stat	Cty	Zone	Pfx	Time
MULTI-OP	160M	HIGH	CW	<input checked="" type="radio"/>	<input type="radio"/>	E7DX	1,546,479	1924	1924						127	43	84			37:07
				<input type="radio"/>	<input checked="" type="radio"/>	9A1P	1,317,084	1727	1727						123	44	79			37:08

### Benefits

Ability to continuous monitoring the complete results of the on-line participants (including all data of the QSO) via a web-interface in the real-time. As option - comparison service for the incoming data.

### Limitations

No

### What do we need to implement?

Necessary to implement server-side additional service that provides the ability to analyze incoming data.

### Who have access to the service?

Referees

## **7. Service Audio monitoring, for referees**

### Benefits

The possibility of permanent monitoring stations on the air, as at any time for any callsign the referee can know the operation frequency.

### Limitations

No

### What do we need to implement?

Necessary to implement server-side-added service, providing the possibility at any time and for any callsign or list of callsigns to know the operation frequency of the radiostation. And as an option - the service to automatically moving to the desired frequency for a monitoring purposes.

### Who have access to the service?

Referees

## **8. Service on-line monitoring of signal levels according to the skimmers data, for referees**

### Benefits

Possibility of permanent on-line monitoring by referees the participants signals level, according to the skimmers data (with specifying frequency).

### Limitations

No

### What do we need to implement?

Necessary to implement on the Server side functional of the swap data from reversebeacon.net or any other skimmer service in real-time. As an option - the online comparison service of level signals.

### Who have access to the service?

Referees

## 9. Map of Competitors, Skimmers, Signals Level and the TV broadcasting services



The screenshot shows a web browser window displaying an online contest server interface. The page title is "Welcome to on-line Contest Server". The interface includes a navigation menu with links for Login, Registration, News, and Mobile. The current contest is "0104 CQ-160-CW". The leaderboard shows the following data:

Oper	CATEGORY			Rank	Call	Score	QSO							MULT				Elapsed	TV1	TV2	
	Band	Pwr	Mode				Total	160	80	40	20	15	10	Total	Stat	Cty	Zone				Pfx
MULTI-OP	160M	HIGH	CW	1	RC90	93000	123												311:10	<a href="#">link</a>	<a href="#">link</a>
MULTI-OP	160M	LOW	CW	1	RA3Z	100000	1000												310:56		
SINGLE-OP	160M	HIGH	CW	1	R7AC	93168	403	403						48		48			1269:22		

On the right side of the interface, there is a video feed showing a participant wearing a headset and working at a computer. The video is titled "RC90" and has a "Justintv" watermark. The interface also includes a search bar, a refresh button, and a timer set to 1 minute.

### Benefits

Possibility of permanent viewing TV-broadcast of each on-line participant who is connected to the appropriate service (available from the list on the site).

### Limitations

No

### What do we need to implement?

Need to implement a server-side service TV-rebroadcasting and configuring by participants their own access to the TV-account on the online contest Server page.

### Who have access to the service?

All users

172.17.103.68:8995/maps/n x

172.17.103.68:8995/maps/map.jsp

**Welcome to on-line Contest Server**

SFI:122 A:7 K:2 - Excl Tue, 29 Jan 2013 09:56:37 GMT

© 2010-13 Team R4W Users On-line: 2 v3.03 supported by: IR4W, Web-Post, N1MM, Win-Test, MixW, 5MContest, Referee, AATest, QARTest, WriteLog search... Tue, 29 Jan 2013 09:55:45 GMT

Web-posting View Groups **Maps** Statistics Refereeing Arch & Test Options Help RU

Contest: **0104 CQ-160-CW** Ct-Oper: ~all values~ Ct-Band: ~all values~ Ct-Power: ~all values~ Ct-Mode: ~all values~ Refresh: 1 min

Visitors: total 1 1

CATEGORY				Rank	Call	Score	QSO					MULT				Elapsed	Mrk	
Oper	Band	Pwr	Mode				Total	160	80	40	20	15	10	Total	Stat			Cty
MULTI-OP	160M	HIGH	CW	1	RC9O	93000	123										310:49	<input checked="" type="checkbox"/>
MULTI-OP	160M	LOW	CW	1	RA3Z	100000	1000										310:36	<input checked="" type="checkbox"/>
SINGLE-OP	160M	HIGH	CW	1	R7AC	93168	403	403				48		48			1269:02	<input checked="" type="checkbox"/>

Карта Спутник

Google 5000 км 5000 мил. Условия использования

## 10. Post contest on-line service for uploading logs off-line participants

Check/Upload Cabrillo Log onto Server - Google Chrome

cqcontest.ru/uploadcbrservlet

Supported contests ... Cabrillo uploading start - stop Tue, 29 Jan 2013 11:10:26 GMT

MINITEST..... Wed, 30 Jan 2013 19:00:00 UTC - Wed, 30 Jan 2013 20:00:00 UTC

Cabrillo Log:  Файл не выбран

Uploading Results:

```
START-OF-LOG: 3.0
CREATED-BY: Win-Test 4.6.0
CONTEST: CQ-WW-CW [CONTEST is not accepted or uploading are out of allowed dates]
CALLSIGN: 8Q7DV
CATEGORY-OPERATOR: SINGLE-OP
CATEGORY-ASSISTED: NON-ASSISTED
CATEGORY-BAND: ALL
CATEGORY-POWER: HIGH
CATEGORY-MODE: CW
CATEGORY-TRANSMITTER: ONE
CATEGORY-OVERLAY:
CATEGORY-STATION: FIXED
CATEGORY-TIME:
CLAIMED-SCORE: 5782844
OPERATORS: 
```

### Benefits

The possibility of uploading Cabrillo log over web-form on-line at the site. Checking the log by server for possible systematic errors or errors of positioning data in a row «QSO:». Validation of filling the report header. User feedback on-line directly on the site, informing the user about bugs in real time.

### Limitations

No

### What do we need to implement?

Need to implement a server-side service for uploading logs off-line participants.

### Who have access to the service?

All users

## **11. The generalized service of raw results both on-line and off-line participants**

### Benefits

The ability to view on-line, directly on the site, claimed results of the both categories of participants who are competed on-line and off-line. Upload the logs after the competition for both categories. The displaying of raw results in the context of claimed categories. Optional - summary statistics.

### Limitations

No

### What do we need to implement?

Need to implement a server-side service view of raw results.

### Who have access to the service?

All users

## 12. Referee service of final results

Live Contest Score Server  
 cqcontest.ru/cabrillo/results.jsp  
 Вас приветствует Он-лайн Контест-сервер!  
 Hello, RW4VM, as ADMIN Users On-line: 14 v3.02 поддержка: IR4W, WEB-Post, N1MM, Win-Test, MixW, 5MContest, Referee, AATest, DARTest, WriteLog Tue, 29 Jan 2013 11:11:44 GMT

Конкурс: **MINITEST** Вид: [ ] Отчеты / Час: [ ] Графики: [ ] Статистика: [ ] Кабрилло: [ ] Опции: [ ] Помощь: [ ] City.dat (2110)

Contest: **MINITEST** Date: **2013-01-23** Callsign(s) (separated by comma): [ ] Search

RESULTS OF ON-LINE REFEREEING			Total participants: 61									
Oper	Pwr	Sign	Declared by User		Re-counted by Server			Confirmed by Server				
			QSO	Score	Points	Mults	Score	Points	Mults	Score	% cfm	
SINGLE-OP	HIGH	UA5C	168	9576	168	57	9576	163	56	9128	95	
SINGLE-OP	HIGH	UX7IA	167	10020	167	60	10020	155	58	8990	90	
SINGLE-OP	HIGH	UZ8I	141	8319	141	59	8319	133	55	7315	88	
SINGLE-OP	HIGH	R7AW	128	7040	128	55	7040	124	54	6696	95	
SINGLE-OP	HIGH	UA4AQL	130	6890	130	53	6890	128	52	6656	97	
SINGLE-OP	HIGH	RZ3BW	131	6804	131	54	7074	124	52	6448	91	
SINGLE-OP	HIGH	EW8DX	132	7260	132	55	7260	123	52	6396	88	
SINGLE-OP	HIGH	UT8IO	127	7493	127	59	7493	116	54	6264	84	
SINGLE-OP	HIGH	UA4AAC	133	6650	133	50	6650	128	48	6144	92	
SINGLE-OP	HIGH	EU1AI	106	5406	106	51	5406	99	47	4653	86	
SINGLE-OP	HIGH	RW4LC	93	4371	93	47	4371	89	45	4005	92	

### Benefits

The ability to view claimed QSO of each contest participant. Referee scoring mark. Online refereeing and publication of the final results. Providing access to the web-page of the final results to all users of the service.

### Limitations

No

### What do we need to implement?

Need to implement a server-side service of referee review and the functionality of creating the final results.

### Who have access to the service?

Referees

# Part IV.

## Technical implementation

### Clients

The client part of the project is implemented by the authors of client programs. In my view, any problems there should not be, the algorithm of implementation is very simple. To an existing service of sending summary data on-line we need to add just the ability to send the data separately for each QSO in real time mode.

### Server

To implement the server part of the project there are various solutions. Depending on the objectives sought to determine the web-platform, storage platform, technology and programming language. As I mentioned in my speech earlier, the server of on-line scoring is currently a bundle of Geronimo + Oracle and the main programming language is Java. The project is built on technology J5EE (Java Platform, Enterprise Edition). J5EE technology alone is industrial and mainly used in high-performance projects that require reliability, scalability and flexibility.

However, it must be mentioned that there is a definite shortage of software developers who know the J5EE technology. In addition, there are certain difficulties with placing software solutions based on it on the servers of Internet providers in Russian segment. Also note that the payment for hosting the site based on a platform of Geronimo is slightly higher than in other cases.

All this, together bring questions about the feasibility of further extend the functionality of the system in case of a possible move to the team development. However, this does not mean momentary and complete rejection of the platform already used in the project, should once again carefully weigh all the "pros" and "cons", before making such a life-changing decision for the project.

Alternatively, one could also offer a project on a bundle of PHP + MySQL. Benefits of this implementation I see a few:

1. A large number of service providers to provide hosting services built on PHP + MySQL
2. A cheap Web-hosting
3. Necessary and sufficient functionality of PHP + MySQL
4. Simplicity of the PHP language
5. The large range of experts who know that technology
6. The ability to recruit a team of qualified developers able to render assistance in a joint project

# Conclusion

I think now it is impossible to provide our present and future life without the World Wide Web. Our life is becoming more rapid and therefore the end users have a desire and need for more rapid providing of information. In my opinion the future is for the web information systems that providing information to the user in real time.

Initially, when developing server cqcontest.ru was started, task was to convey to the user information in the mode of near real-time. The way in which the server is running at the moment, can say with full confidence that we are about on the half way to the final goal. And the final goal will be achieved when the server starts to receive, process, display and analyze the results of clients upon entering each QSO in the log on the Client side. And also referee can make some decisions during the contest time. That's when we can say with certainty that all our dreams about on-line contesting are already realized.

But there is still a lot of work...