

## Proxy

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# Contents

|          |  |          |
|----------|--|----------|
| <b>1</b> | <b>Namespace Index</b>                           | <b>1</b> |
| 1.1      | Namespace List . . . . .                         | 1        |
| <b>2</b> | <b>Hierarchical Index</b>                        | <b>3</b> |
| 2.1      | Class Hierarchy . . . . .                        | 3        |
| <b>3</b> | <b>Class Index</b>                               | <b>5</b> |
| 3.1      | Class List . . . . .                             | 5        |
| <b>4</b> | <b>Namespace Documentation</b>                   | <b>7</b> |
| 4.1      | Package Proxy . . . . .                          | 7        |
| <b>5</b> | <b>Class Documentation</b>                       | <b>9</b> |
| 5.1      | Proxy.Client Class Reference . . . . .           | 9        |
| 5.2      | Proxy.Configuration Class Reference . . . . .    | 9        |
| 5.2.1    | Detailed Description . . . . .                   | 9        |
| 5.2.2    | Constructor & Destructor Documentation . . . . . | 10       |
| 5.2.2.1  | Configuration . . . . .                          | 10       |
| 5.2.3    | Member Function Documentation . . . . .          | 10       |
| 5.2.3.1  | loadConfiguration . . . . .                      | 10       |
| 5.3      | Proxy.Constants Class Reference . . . . .        | 10       |
| 5.3.1    | Detailed Description . . . . .                   | 11       |
| 5.4      | Proxy.Form1 Class Reference . . . . .            | 11       |
| 5.4.1    | Detailed Description . . . . .                   | 12       |
| 5.4.2    | Constructor & Destructor Documentation . . . . . | 12       |
| 5.4.2.1  | Form1 . . . . .                                  | 12       |
| 5.4.3    | Member Function Documentation . . . . .          | 12       |
| 5.4.3.1  | disableConnectElectionAuthorityButton . . . . .  | 12       |
| 5.4.3.2  | Dispose . . . . .                                | 12       |
| 5.5      | Proxy.Logs Class Reference . . . . .             | 12       |
| 5.5.1    | Detailed Description . . . . .                   | 13       |
| 5.5.2    | Constructor & Destructor Documentation . . . . . | 13       |
| 5.5.2.1  | Logs . . . . .                                   | 13       |

|          |   |    |
|----------|---|----|
| 5.5.3    | Member Function Documentation               | 13 |
| 5.5.3.1  | addLog                                      | 13 |
| 5.6      | Proxy.ParserClient Class Reference          | 13 |
| 5.6.1    | Detailed Description                        | 13 |
| 5.6.2    | Constructor & Destructor Documentation      | 13 |
| 5.6.2.1  | ParserClient                                | 13 |
| 5.6.3    | Member Function Documentation               | 14 |
| 5.6.3.1  | parseMessageFromClient                      | 14 |
| 5.7      | Proxy.ParserEA Class Reference              | 14 |
| 5.7.1    | Detailed Description                        | 14 |
| 5.7.2    | Constructor & Destructor Documentation      | 14 |
| 5.7.2.1  | ParserEA                                    | 14 |
| 5.7.3    | Member Function Documentation               | 14 |
| 5.7.3.1  | parseMessageFromEA                          | 14 |
| 5.8      | Proxy.Proxy Class Reference                 | 15 |
| 5.8.1    | Detailed Description                        | 15 |
| 5.8.2    | Constructor & Destructor Documentation      | 15 |
| 5.8.2.1  | Proxy                                       | 15 |
| 5.8.3    | Member Function Documentation               | 16 |
| 5.8.3.1  | connectSRandSL                              | 16 |
| 5.8.3.2  | disableConnectElectionAuthorityButton       | 16 |
| 5.8.3.3  | generateSR                                  | 16 |
| 5.8.3.4  | generateYesNoPosition                       | 16 |
| 5.8.3.5  | saveSignedBallot                            | 16 |
| 5.8.3.6  | saveVote                                    | 16 |
| 5.8.3.7  | sendSLandSR                                 | 16 |
| 5.9      | Proxy.ProxyBallot Class Reference           | 17 |
| 5.9.1    | Detailed Description                        | 17 |
| 5.9.2    | Constructor & Destructor Documentation      | 17 |
| 5.9.2.1  | ProxyBallot                                 | 17 |
| 5.9.3    | Member Function Documentation               | 17 |
| 5.9.3.1  | generateAndSplitBallotMatrix                | 17 |
| 5.9.3.2  | prepareDataToSend                           | 17 |
| 5.9.3.3  | unblindSignedData                           | 18 |
| 5.10     | Proxy.SerialNumberGenerator Class Reference | 18 |
| 5.10.1   | Detailed Description                        | 18 |
| 5.10.2   | Member Function Documentation               | 18 |
| 5.10.2.1 | generateListOfSerialNumber                  | 18 |
| 5.10.2.2 | getInstance                                 | 19 |
| 5.10.2.3 | getNextSr                                   | 19 |

---

|              |  |           |
|--------------|--|-----------|
| 5.10.2.4     | <a href="#">getYesNoPosition</a>                           | 19        |
| 5.11         | <a href="#">Proxy.Server Class Reference</a>               | 19        |
| 5.11.1       | <a href="#">Detailed Description</a>                       | 20        |
| 5.11.2       | <a href="#">Constructor &amp; Destructor Documentation</a> | 20        |
| 5.11.2.1     | <a href="#">Server</a>                                     | 20        |
| 5.11.3       | <a href="#">Member Function Documentation</a>              | 20        |
| 5.11.3.1     | <a href="#">sendMessage</a>                                | 20        |
| 5.11.3.2     | <a href="#">startServer</a>                                | 20        |
| 5.11.3.3     | <a href="#">stopServer</a>                                 | 20        |
| <b>Index</b> |  | <b>21</b> |



# Chapter 1

## Namespace Index

### 1.1 Namespace List

Here is a list of all documented namespaces with brief descriptions:

|                                 |   |
|---------------------------------|---|
| <a href="#">Proxy</a> . . . . . | 7 |
|---------------------------------|---|





## Chapter 2

# Hierarchical Index

### 2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

|                                       |    |
|---------------------------------------|----|
| Proxy.Client . . . . .                | 9  |
| Proxy.Configuration . . . . .         | 9  |
| Proxy.Constants . . . . .             | 10 |
| Form                                  |    |
| Proxy.Form1 . . . . .                 | 11 |
| Proxy.Logs . . . . .                  | 12 |
| Proxy.ParserClient . . . . .          | 13 |
| Proxy.ParserEA . . . . .              | 14 |
| Proxy.Proxy . . . . .                 | 15 |
| Proxy.ProxyBallot . . . . .           | 17 |
| Proxy.SerialNumberGenerator . . . . . | 18 |
| Proxy.Server . . . . .                | 19 |



## Chapter 3

# Class Index

### 3.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

|   |    |
|---|----|
| <a href="#">Proxy.Client</a>  | 9  |
| <a href="#">Proxy.Configuration</a>   |    |
| <a href="#">Configuration</a> class - loads configuration from file and sets up proxy   | 9  |
| <a href="#">Proxy.Constants</a>   |    |
| <a href="#">Constants</a> used in proxy   | 10 |
| <a href="#">Proxy.Form1</a>   |    |
| graphical user interface  | 11 |
| <a href="#">Proxy.Logs</a>  |    |
| displays and collects logs from proxy's actions   | 12 |
| <a href="#">Proxy.ParserClient</a>  |    |
| parser for messages exchanged between proxy and voter/ea  | 13 |
| <a href="#">Proxy.ParserEA</a>  |    |
| parser message from EA  | 14 |
| <a href="#">Proxy.Proxy</a>   |    |
| <a href="#">Proxy</a> class - broker between EA and voter, generate SR and another part of voter ballot; is responsible ie. for blinding voter data | 15 |
| <a href="#">Proxy.ProxyBallot</a>   |    |
| proxy ballot - one ballot (represents one voter) with all serials, keys and data used in election   | 17 |
| <a href="#">Proxy.SerialNumberGenerator</a>   |    |
| Generates serial numbers used in EA   | 18 |
| <a href="#">Proxy.Server</a>  |    |
| server for proxy application  | 19 |



## Chapter 4

# Namespace Documentation

### 4.1 Package Proxy

#### Classes

- class [Client](#)
- class [Configuration](#)  
*[Configuration](#) class - loads configuration from file and sets up proxy*
- class [Constants](#)  
*[Constants](#) used in proxy*
- class **Extentions**  
*extention functions in program, used to more complicated operations*
- class [Form1](#)  
*graphical user interface*
- class [Logs](#)  
*displays and collects logs from proxy's actions*
- class [ParserClient](#)  
*parser for messages exchanged between proxy and voter/ea*
- class [ParserEA](#)  
*parser message from EA*
- class **Program**
- class [Proxy](#)  
*[Proxy](#) class - broker between EA and voter, generate SR and another part of voter ballot; is responsible ie. for blinding voter data*
- class [ProxyBallot](#)  
*proxy ballot - one ballot (represents one voter) with all serialns, keys and data used in election*
- class [SerialNumberGenerator](#)  
*Generates serial numbers used in EA*
- class [Server](#)  
*server for proxy application*



## Chapter 5

# Class Documentation

### 5.1 Proxy.Client Class Reference

#### Public Member Functions

- **Client** ([Logs](#) logs, [Proxy](#) proxy)
- bool **connect** (string ip, string port)
- void **disconnectFromElectionAuthority** (bool error=false)
- void **sendMessage** (string msg)

The documentation for this class was generated from the following file:

- Proxy/Proxy/Client.cs

### 5.2 Proxy.Configuration Class Reference

[Configuration](#) class - loads configuration from file and sets up proxy

#### Public Member Functions

- [Configuration](#) ([Logs](#) logs)  
*constructor*
- bool [loadConfiguration](#) (string path)  
*load configuration from path given by user*

#### Properties

- string **ProxyID** [get]
- string **ProxyPort** [get]
- string **ElectionAuthorityIP** [get]
- string **ElectionAuthorityPort** [get]
- int **NumOfVoters** [get]
- int **NumOfCandidates** [get]

#### 5.2.1 Detailed Description

[Configuration](#) class - loads configuration from file and sets up proxy

## 5.2.2 Constructor & Destructor Documentation

### 5.2.2.1 Proxy.Configuration.Configuration ( Logs logs ) [inline]

constructor

Parameters

|             |              |
|-------------|--------------|
| <i>logs</i> | log instance |
|-------------|--------------|

## 5.2.3 Member Function Documentation

### 5.2.3.1 bool Proxy.Configuration.loadConfiguration ( string path ) [inline]

load configuration from path given by user

Parameters

|             |                       |
|-------------|-----------------------|
| <i>path</i> | path to configuration |
|-------------|-----------------------|

Returns

loading end status

The documentation for this class was generated from the following file:

- Proxy/Proxy/Configuration.cs

## 5.3 Proxy.Constants Class Reference

[Constants](#) used in proxy

### Public Attributes

- const int **BALLOT\_SIZE** = 4
- const int **LOG\_INFO** = 0
- const int **LOG\_MESSAGE** = 1
- const int **LOG\_ERROR** = 2
- const string **ID** = "ID"
- const string **PROXY\_PORT** = "proxyPort"
- const string **ELECTION\_AUTHORITY\_IP** = "electionAuthorityIP"
- const string **ELECTION\_AUTHORITY\_PORT** = "electionAuthorityPort"
- const string **NUMBER\_OF\_VOTERS** = "numberOfVoters"
- const string **NUMBER\_OF\_CANDIDATES** = "numberOfCandidates"
- const string **CONFIGURATION\_LOADED\_FROM** = "Configuration loaded from file: "
- const string **LOCALHOST** = "localhost"
- const string **CONNECTION\_PASS** = "Proxy connected with Election Authority correctly"
- const string **CONNECTION\_FAILED** = "Proxy could not connect to Election Authority"
- const string **CONNECTION\_DISCONNECTED** = "Proxy disconnected from Election Authority"
- const string **CONNECTION\_DISCONNECTED\_ERROR** = "Error ocured during disconnecting [Proxy](#) from Election Authority"
- const string **PATH\_TO\_CONFIG** = @"Config\ElectionAuthority.xml"
- const string **SERVER\_STARTED\_CORRECTLY** = "Proxy started working correctly"
- const string **SERVER\_UNABLE\_TO\_START** = "Proxy unable to start working"
- const string **UNKNOWN** = "Unknown"



- const string **DISCONNECTED\_NODE** = "Someone has been disconnected"
- const string **SR\_GEN\_SUCCESSFULLY** = "Serial numbers SR generated successfully"
- const int **NUMBER\_OF\_BITS\_SR** = 64
- const int **NUM\_OF\_CANDIDATES** = 5
- const string **SL\_TOKENS** = "SL\_TOKENS"
- const string **RECEIVED\_FROM\_EA** = "Date received from EA"
- const string **SR\_CONNECTED\_WITH\_SL** = "SR connected with serial numbers SL"
- const string **GET\_SL\_AND\_SR** = "GET\_SL\_AND\_SR"
- const string **SL\_AND\_SR** = "SL\_AND\_SR"
- const string **ERROR\_SEND\_SL\_AND\_SR** = "Unable to send SL and SR, because they are not ready"
- const string **SL\_RECEIVED\_SUCCESSFULLY** = "SL\_RECEIVED\_SUCCESSFULLY"
- const string **CONNECTION\_SUCCESSFUL** = "CONNECTION\_SUCCESSFUL"
- const string **VOTER\_CONNECTED** = "Voter connected successfully to [Proxy](#)"
- const string **CONNECTED** = "CONNECTED"
- const string **PROXY\_CONNECTED\_TO\_EA** = "Proxy connected successfully to EA"
- const string **SL\_RECEIVED** = "Proxy received SL from EA"
- const string **GET\_YES\_NO\_POSITION** = "GET\_YES\_NO\_POSITION"
- const string **YES\_NO\_POSITION\_GEN\_SUCCESSFULL** = "Yes and No position generated successfully"
- const string **YES\_NO\_POSITION** = "YES\_NO\_POSITION"
- const string **VOTE** = "VOTE"
- const string **VOTE\_RECEIVED** = "Vote received from voter with ID: "
- const string **BALLOT\_MATRIX\_GEN** = "Ballot matrix generated for voter with ID: "
- const string **BLIND\_PROXY\_BALLOT** = "BLIND\_PROXY\_BALLOT"
- const string **SIGNED\_PROXY\_BALLOT** = "SIGNED\_PROXY\_BALLOT"
- const string **SIGNED\_COLUMNS\_RECEIVED** = "Signed columns received from EA and saved."
- const string **SIGNED\_COLUMNS\_TOKEN** = "SIGNED\_COLUMNS\_TOKEN"
- const string **WRONG\_SIGNATURE** = "Wrong signature!"
- const string **CORRECT\_SIGNATURE** = "Correct signature!"
- const string **ALL\_COLUMNS\_UNBLINDED\_CORRECTLY** = "Correct signature! All columns unblinded correctly!"
- const string **UNBLINED\_BALLOT\_MATRIX** = "UNBLINED\_BALLOT\_MATRIX"

### Static Public Attributes

- static string **YES\_NO\_POSITION\_SAVED\_TO\_FILE** = @"YesNoPosition save to file Logs\yesNoPosition.txt"

#### 5.3.1 Detailed Description

[Constants](#) used in proxy

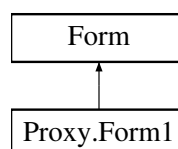
The documentation for this class was generated from the following file:

- Proxy/Proxy/Constants.cs

## 5.4 Proxy.Form1 Class Reference

graphical user interface

Inheritance diagram for Proxy.Form1:



## Public Member Functions

- [Form1](#) ()  
*constructor*
- void [disableConnectElectionAuthorityButton](#) ()  
*disable connection with Election Authority*

## Protected Member Functions

- override void [Dispose](#) (bool disposing)  
*Clean up any resources being used.*

### 5.4.1 Detailed Description

graphical user interface

### 5.4.2 Constructor & Destructor Documentation

#### 5.4.2.1 Proxy.Form1.Form1 ( ) [inline]

constructor

### 5.4.3 Member Function Documentation

#### 5.4.3.1 void Proxy.Form1.disableConnectElectionAuthorityButton ( ) [inline]

disable connection with Election Authority

#### 5.4.3.2 override void Proxy.Form1.Dispose ( bool *disposing* ) [inline], [protected]

Clean up any resources being used.

Parameters

|                  |   |
|------------------|---|
| <i>disposing</i> | true if managed resources should be disposed; otherwise, false. |
|------------------|---|

The documentation for this class was generated from the following files:

- Proxy/Proxy/Form1.cs
- Proxy/Proxy/Form1.Designer.cs

## 5.5 Proxy.Logs Class Reference

displays and collects logs from proxy's actions

## Public Member Functions

- [Logs](#) (ListView logsListView)  
*constructor*
- void [addLog](#) (string log, bool time, int flag, bool anotherThread=false)  
*adds log*

### 5.5.1 Detailed Description

displays and collects logs from proxy's actions

### 5.5.2 Constructor & Destructor Documentation

#### 5.5.2.1 Proxy.Logs.Logs ( ListView *logsListView* ) [inline]

constructor

Parameters

|                     |                    |
|---------------------|--------------------|
| <i>logsListView</i> | list view for logs |
|---------------------|--------------------|

### 5.5.3 Member Function Documentation

#### 5.5.3.1 void Proxy.Logs.addLog ( string *log*, bool *time*, int *flag*, bool *anotherThread* = false ) [inline]

adds log

Parameters

|                      |                                  |
|----------------------|----------------------------------|
| <i>log</i>           | log message                      |
| <i>time</i>          | if print time                    |
| <i>flag</i>          | type of message (error, info...) |
| <i>anotherThread</i> | thread flag                      |

The documentation for this class was generated from the following file:

- Proxy/Proxy/Logs.cs

## 5.6 Proxy.ParserClient Class Reference

parser for messages exchanged between proxy and voter/ea

### Public Member Functions

- [ParserClient](#) (Logs *logs*, [Proxy](#) *proxy*)  
*constructor*
- void [parseMessageFromClient](#) (string *msg*)  
*parse recived message*

### 5.6.1 Detailed Description

parser for messages exchanged between proxy and voter/ea

### 5.6.2 Constructor & Destructor Documentation

#### 5.6.2.1 Proxy.ParserClient.ParserClient ( Logs *logs*, Proxy *proxy* ) [inline]

constructor

## Parameters

|              |                |
|--------------|----------------|
| <i>logs</i>  | logs instance  |
| <i>proxy</i> | proxy instance |

### 5.6.3 Member Function Documentation

#### 5.6.3.1 void Proxy.ParserClient.parseMessageFromClient ( string *msg* ) [inline]

parse recived message

## Parameters

|            |                 |
|------------|-----------------|
| <i>msg</i> | recived message |
|------------|-----------------|

The documentation for this class was generated from the following file:

- Proxy/Proxy/ParserClient.cs

## 5.7 Proxy.ParserEA Class Reference

parser message from EA

### Public Member Functions

- [ParserEA](#) ([Logs](#) logs, [Proxy](#) proxy)  
*constructor*
- void [parseMessageFromEA](#) (string msg)  
*parsing message from ea*

#### 5.7.1 Detailed Description

parser message from EA

#### 5.7.2 Constructor & Destructor Documentation

##### 5.7.2.1 Proxy.ParserEA.ParserEA ( Logs *logs*, Proxy *proxy* ) [inline]

constructor

## Parameters

|              |                |
|--------------|----------------|
| <i>logs</i>  | logs instance  |
| <i>proxy</i> | proxy instance |

### 5.7.3 Member Function Documentation

#### 5.7.3.1 void Proxy.ParserEA.parseMessageFromEA ( string *msg* ) [inline]

parsing message from ea

## Parameters

|            |         |
|------------|---------|
| <i>msg</i> | message |
|------------|---------|

The documentation for this class was generated from the following file:

- Proxy/Proxy/ParserEA.cs

## 5.8 Proxy.Proxy Class Reference

[Proxy](#) class - broker between EA and voter, generate SR and another part of voter ballot; is responsible ie. for blinding voter data

### Public Member Functions

- [Proxy](#) ([Logs](#) logs, [Configuration](#) conf, [Form1](#) form)  
*constructor*
- void [generateSR](#) ()  
*generates SR for voters connected to proxy*
- void [generateYesNoPosition](#) ()  
*generates random yes/no position at ballot*
- void [connectSRandSL](#) ()  
*connects SR and SL*
- void [sendSLAndSR](#) (string name)  
*sends SR and SL to voter*
- void [disableConnectElectionAuthorityButton](#) ()  
*disables EA connect button*
- void [saveVote](#) (string message)  
*send vote (to EA)*
- void [saveSignedBallot](#) (string message)  
*save singed ballot from EA*

### Properties

- [Server Server](#) [get]
- [Client Client](#) [get]
- Dictionary< BigInteger, List< List< BigInteger > > > [SerialNumberTokens](#) [get, set]

#### 5.8.1 Detailed Description

[Proxy](#) class - broker between EA and voter, generate SR and another part of voter ballot; is responsible ie. for blinding voter data

#### 5.8.2 Constructor & Destructor Documentation

##### 5.8.2.1 Proxy.Proxy.Proxy ( [Logs](#) logs, [Configuration](#) conf, [Form1](#) form ) [inline]

constructor

## Parameters

|             |                      |
|-------------|----------------------|
| <i>logs</i> | logs instance        |
| <i>conf</i> | laoded configuration |
| <i>form</i> | form application     |

## 5.8.3 Member Function Documentation

5.8.3.1 void Proxy.Proxy.connectSRandSL ( ) [inline]

connects SR and SL

5.8.3.2 void Proxy.Proxy.disableConnectElectionAuthorityButton ( ) [inline]

disables EA connect button

5.8.3.3 void Proxy.Proxy.generateSR ( ) [inline]

generates SR for voters connected to proxy

5.8.3.4 void Proxy.Proxy.generateYesNoPosition ( ) [inline]

generates random yes/no position at ballot

5.8.3.5 void Proxy.Proxy.saveSignedBallot ( string *message* ) [inline]

save singed ballot from EA

## Parameters

|                |               |
|----------------|---------------|
| <i>message</i> | signed ballot |
|----------------|---------------|

5.8.3.6 void Proxy.Proxy.saveVote ( string *message* ) [inline]

send vote (to EA)

## Parameters

|                |   |
|----------------|---|
| <i>message</i> | prepared message to send (message = 'name;first_row;second_row .....;last_row') |
|----------------|---|

5.8.3.7 void Proxy.Proxy.sendSLAndSR ( string *name* ) [inline]

sends SR and SL to voter

## Parameters

|             |          |
|-------------|----------|
| <i>name</i> | voter ID |
|-------------|----------|

The documentation for this class was generated from the following file:

- Proxy/Proxy/Proxy.cs

## 5.9 Proxy.ProxyBallot Class Reference

proxy ballot - one ballot (represents one voter) with all serialns, keys and data used in election

### Public Member Functions

- [ProxyBallot](#) ([Logs](#) logs, BigInteger SL, BigInteger SR)  
*constructor*
- BigInteger[] [prepareDataToSend](#) ()  
*prepares data to send*
- string[] [unblindSignedData](#) (BigInteger[] signedData)  
*unblind signed data (for one ballot)*
- void [generateAndSplitBallotMatrix](#) ()  
*generate ballot martix and split it (in column order)*

### Properties

- BigInteger **SL** [get]
- string **YesNoPos** [set]
- int[,] **Vote** [set]
- List< BigInteger > **SignedColumns** [get, set]
- int **ConfirmationColumn** [get, set]
- List< BigInteger > **TokensList** [get, set]
- List< BigInteger > **ExponentsList** [get, set]

#### 5.9.1 Detailed Description

proxy ballot - one ballot (represents one voter) with all serialns, keys and data used in election

#### 5.9.2 Constructor & Destructor Documentation

5.9.2.1 `Proxy.ProxyBallot.ProxyBallot ( Logs logs, BigInteger SL, BigInteger SR )` [inline]

constructor

Parameters

|             |  |
|-------------|--|
| <i>logs</i> | log instance                                       |
| <i>SL</i>   | SL number which will connected to the proxy ballot |
| <i>SR</i>   | SR number which will connected to the proxy ballot |

#### 5.9.3 Member Function Documentation

5.9.3.1 `void Proxy.ProxyBallot.generateAndSplitBallotMatrix ( )` [inline]

generate ballot martix and split it (in column order)

5.9.3.2 `BigInteger[] Proxy.ProxyBallot.prepareDataToSend ( )` [inline]

prepares data to send

**Returns**

blinded columns

5.9.3.3 `string [] Proxy.ProxyBallot.unblindSignedData ( BigInteger[] signedData )` `[inline]`

unblind signed data (for one ballot)

**Parameters**

|                   |                             |
|-------------------|-----------------------------|
| <i>signedData</i> | signed data recived from EA |
|-------------------|-----------------------------|

**Returns**

unblinded data (columns)

The documentation for this class was generated from the following file:

- Proxy/Proxy/ProxyBallot.cs

## 5.10 Proxy.SerialNumberGenerator Class Reference

Generates serial numbers used in EA

**Public Member Functions**

- [SerialNumberGenerator getInstance \(\)](#)  
*gettins sng instance*
- [BigInteger getNextSr \(\)](#)  
*generate next SR*

**Static Public Member Functions**

- static List< BigInteger > [generateListOfSerialNumber](#) (int numberOfSerials, int numberOfBits)  
*generates list of serial numbers*
- static List< string > [getYesNoPosition](#) (int numberOfVoters, int numberOfCandidates)  
*get yes/no position at ballot*

### 5.10.1 Detailed Description

Generates serial numbers used in EA

### 5.10.2 Member Function Documentation

5.10.2.1 `static List<BigInteger> Proxy.SerialNumberGenerator.generateListOfSerialNumber ( int numberOfSerials, int numberOfBits )` `[inline]`, `[static]`

generates list of serial numbers



## Parameters

|                        |                             |
|------------------------|-----------------------------|
| <i>numberOfSerials</i> | quantity of serial numbers  |
| <i>numberOfBits</i>    | bit length of serial number |

## Returns

list of shuffled serial numbers

5.10.2.2 **SerialNumberGenerator** Proxy.SerialNumberGenerator.getInstance ( ) [inline]

gettins sng instance

## Returns

sng instance

5.10.2.3 **BigInteger** Proxy.SerialNumberGenerator.getNextSr ( ) [inline]

generate next SR

## Returns

SR

5.10.2.4 **static List<string>** Proxy.SerialNumberGenerator.getYesNoPosition ( int *numberOfVoters*, int *numberOfCandidates* ) [inline],[static]

get yes/no position at ballot

## Parameters

|                           |                        |
|---------------------------|------------------------|
| <i>numberOfVoters</i>     | quantity of voters     |
| <i>numberOfCandidates</i> | quantity of candidates |

## Returns

list of yes no positions

The documentation for this class was generated from the following file:

- Proxy/Proxy/SerialNumberGenerator.cs

## 5.11 Proxy.Server Class Reference

server for proxy application

## Public Member Functions

- [Server](#) (Logs logs, [Proxy](#) proxy)  
default constructor
- bool [startServer](#) (string port)

- starts a server*
- void [stopServer](#) ()  
*stop server*
- void [sendMessage](#) (string name, string msg)  
*send message to client*

## Properties

- Dictionary< TcpClient, string > **ClientSockets** [get]

### 5.11.1 Detailed Description

server for proxy application

### 5.11.2 Constructor & Destructor Documentation

#### 5.11.2.1 Proxy.Server.Server ( Logs logs, Proxy proxy ) [inline]

default constructor

Parameters

|              |   |
|--------------|---|
| <i>logs</i>  | display messages in logs console                |
| <i>proxy</i> | main logic of <a href="#">Proxy</a> application |

### 5.11.3 Member Function Documentation

#### 5.11.3.1 void Proxy.Server.sendMessage ( string name, string msg ) [inline]

send message to client

Parameters

|             |               |
|-------------|---------------|
| <i>name</i> | client's name |
| <i>msg</i>  | message       |

#### 5.11.3.2 bool Proxy.Server.startServer ( string port ) [inline]

starts a server

Parameters

|             |   |
|-------------|---|
| <i>port</i> | number of port on which server is running |
|-------------|---|

Returns

true when server started successfully

#### 5.11.3.3 void Proxy.Server.stopServer ( ) [inline]

stop server

The documentation for this class was generated from the following file:

- Proxy/Proxy/Server.cs

# Index

- addLog
  - Proxy::Logs, 13
- Configuration
  - Proxy::Configuration, 10
- connectSRandSL
  - Proxy::Proxy, 16
- disableConnectElectionAuthorityButton
  - Proxy::Form1, 12
  - Proxy::Proxy, 16
- Dispose
  - Proxy::Form1, 12
- Form1
  - Proxy::Form1, 12
- generateAndSplitBallotMatrix
  - Proxy::ProxyBallot, 17
- generateListOfSerialNumber
  - Proxy::SerialNumberGenerator, 18
- generateSR
  - Proxy::Proxy, 16
- generateYesNoPosition
  - Proxy::Proxy, 16
- getInstance
  - Proxy::SerialNumberGenerator, 19
- getNextSr
  - Proxy::SerialNumberGenerator, 19
- getYesNoPosition
  - Proxy::SerialNumberGenerator, 19
- loadConfiguration
  - Proxy::Configuration, 10
- Logs
  - Proxy::Logs, 13
- parseMessageFromClient
  - Proxy::ParserClient, 14
- parseMessageFromEA
  - Proxy::ParserEA, 14
- ParserClient
  - Proxy::ParserClient, 13
- ParserEA
  - Proxy::ParserEA, 14
- prepareDataToSend
  - Proxy::ProxyBallot, 17
- Proxy, 7
  - Proxy::Proxy, 15
- Proxy.Client, 9
- Proxy.Configuration, 9
- Proxy.Constants, 10
- Proxy.Form1, 11
- Proxy.Logs, 12
- Proxy.ParserClient, 13
- Proxy.ParserEA, 14
- Proxy.Proxy, 15
- Proxy.ProxyBallot, 17
- Proxy.SerialNumberGenerator, 18
- Proxy.Server, 19
- Proxy::Configuration
  - Configuration, 10
  - loadConfiguration, 10
- Proxy::Form1
  - disableConnectElectionAuthorityButton, 12
  - Dispose, 12
  - Form1, 12
- Proxy::Logs
  - addLog, 13
  - Logs, 13
- Proxy::ParserClient
  - parseMessageFromClient, 14
  - ParserClient, 13
- Proxy::ParserEA
  - parseMessageFromEA, 14
  - ParserEA, 14
- Proxy::Proxy
  - connectSRandSL, 16
  - disableConnectElectionAuthorityButton, 16
  - generateSR, 16
  - generateYesNoPosition, 16
  - Proxy, 15
  - saveSignedBallot, 16
  - saveVote, 16
  - sendSLandSR, 16
- Proxy::ProxyBallot
  - generateAndSplitBallotMatrix, 17
  - prepareDataToSend, 17
  - ProxyBallot, 17
  - unblindSignedData, 18
- Proxy::SerialNumberGenerator
  - generateListOfSerialNumber, 18
  - getInstance, 19
  - getNextSr, 19
  - getYesNoPosition, 19
- Proxy::Server
  - sendMessage, 20
  - Server, 20
  - startServer, 20
  - stopServer, 20

ProxyBallot  
    Proxy::ProxyBallot, [17](#)

saveSignedBallot  
    Proxy::Proxy, [16](#)

saveVote  
    Proxy::Proxy, [16](#)

sendMessage  
    Proxy::Server, [20](#)

sendSLAndSR  
    Proxy::Proxy, [16](#)

Server  
    Proxy::Server, [20](#)

startServer  
    Proxy::Server, [20](#)

stopServer  
    Proxy::Server, [20](#)

unblindSignedData  
    Proxy::ProxyBallot, [18](#)