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# **ORS TokenSale Solidity Smart Contracts**

***Release 2***

**Sicos et al.**

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## ORSTOKEN

```
1 pragma solidity 0.4.23;
2
3 import "../zeppelin-solidity/contracts/token/ERC20/CappedToken.sol";
4 import "../zeppelin-solidity/contracts/token/ERC20/PausableToken.sol";
5 import "../zeppelin-solidity/contracts/token/ERC20/StandardBurnableToken.sol";
6
7
8 /// @title ORSToken
9 /// @author Sicos et al.
10 contract ORSToken is CappedToken, StandardBurnableToken, PausableToken {
11
12     string public name = "ORS Token";
13     string public symbol = "ORS";
14     uint8 public decimals = 18;
15
16     /// @dev Constructor
17     /// @param _cap Maximum number of integral token units; total supply must never exceed this_
18     ↩limit constructor(uint _cap) public CappedToken(_cap) {
19         pause(); // Disable token trade
20     }
21
22 }
```

## ORSTOKENSALE

```
1  pragma solidity 0.4.23;
2
3  import "../ORSToken.sol";
4  import "../KYCBase.sol";
5  import "../eidoo-icoengine/contracts/ICOEngineInterface.sol";
6  import "../zeppelin-solidity/contracts/math/SafeMath.sol";
7  import "../zeppelin-solidity/contracts/ownership/Ownable.sol";
8
9
10 /// @title ORSTokenSale
11 /// @author Sicos et al.
12 contract ORSTokenSale is KYCBase, ICOEngineInterface, Ownable {
13
14     using SafeMath for uint;
15
16     // Maximum token amounts of each pool
17     uint constant public PRESALE_CAP = 250000000e18; // 250,000,000 e18
18     uint constant public MAINSALE_CAP = 500000000e18 - PRESALE_CAP; // 250,000,000 e18
19     uint constant public BONUS_CAP = 64460000e18; // 64,460,000 e18
20
21     // Granted token shares that will be minted upon finalization
22     uint constant public TEAM_SHARE = 83333333e18; // 83,333,333 e18
23     uint constant public ADVISORS_SHARE = 58333333e18; // 58,333,333 e18
24     uint constant public COMPANY_SHARE = 127206667e18; // 127,206,667 e18
25
26     // Remaining token amounts of each pool
27     uint public presaleRemaining = PRESALE_CAP;
28     uint public mainsaleRemaining = MAINSALE_CAP;
29     uint public bonusRemaining = BONUS_CAP;
30
31     // Beneficiaries of granted token shares
32     address public teamWallet;
33     address public advisorsWallet;
34     address public companyWallet;
35
36     ORSToken public token;
37
38     // Integral token units (10^-18 tokens) per wei
39     uint public rate;
40
41     // Mainsale period
42     uint public openingTime;
43     uint public closingTime;
44
45     // Ethereum address where invested funds will be transferred to
46     address public wallet;
47
48     // Purchases signed via Eidoo's platform will receive bonus tokens
49     address public eidooSigner;
```

```

50
51     bool public isFinalized = false;
52
53     /// @dev Log entry on rate changed
54     /// @param newRate New rate in integral token units per wei
55     event RateChanged(uint newRate);
56
57     /// @dev Log entry on token purchased
58     /// @param buyer Ethereum address of token purchaser
59     /// @param value Worth in wei of purchased token amount
60     /// @param tokens Number of integral token units
61     event TokenPurchased(address indexed buyer, uint value, uint tokens);
62
63     /// @dev Log entry on buyer refunded upon token purchase
64     /// @param buyer Ethereum address of token purchaser
65     /// @param value Worth of refund of wei
66     event BuyerRefunded(address indexed buyer, uint value);
67
68     /// @dev Log entry on finalized
69     event Finalized();
70
71     /// @dev Constructor
72     /// @param _token An ORSToken
73     /// @param _rate Rate in integral token units per wei
74     /// @param _openingTime Block (Unix) timestamp of mainsale start time
75     /// @param _closingTime Block (Unix) timestamp of mainsale latest end time
76     /// @param _wallet Ethereum account who will receive sent ether upon token purchase during ↵
77     ↵mainsale
78     /// @param _teamWallet Ethereum account of team who will receive team share upon finalization
79     /// @param _advisorsWallet Ethereum account of advisors who will receive advisors share upon ↵
80     ↵finalization
81     /// @param _companyWallet Ethereum account of company who will receive company share upon ↵
82     ↵finalization
83     /// @param _kycSigners List of KYC signers' Ethereum addresses
84     constructor(
85         ORSToken _token,
86         uint _rate,
87         uint _openingTime,
88         uint _closingTime,
89         address _wallet,
90         address _teamWallet,
91         address _advisorsWallet,
92         address _companyWallet,
93         address[] _kycSigners
94     )
95     {
96         public
97         KYCBase(_kycSigners)
98     {
99         require(_token != address(0x0));
100         require(_token.cap() == PRESALE_CAP + MAINSALE_CAP + BONUS_CAP + TEAM_SHARE + ADVISORS_
101         ↵SHARE + COMPANY_SHARE);
102         require(_rate > 0);
103         require(_openingTime > now && _closingTime > _openingTime);
104         require(_wallet != address(0x0));
105         require(_teamWallet != address(0x0) && _companyWallet != address(0x0) && _advisorsWallet !=
106         ↵address(0x0));
107         require(_kycSigners.length >= 2);
108
109         token = _token;
110         rate = _rate;
111         openingTime = _openingTime;
112         closingTime = _closingTime;
113         wallet = _wallet;

```

```

108     teamWallet = _teamWallet;
109     advisorsWallet = _advisorsWallet;
110     companyWallet = _companyWallet;
111
112     eidooSigner = _kycSigners[0];
113 }
114
115 /// @dev Set rate, i.e. adjust to changes of fiat/ether exchange rates
116 /// @param newRate Rate in integral token units per wei
117 function setRate(uint newRate) public onlyOwner {
118     require(newRate > 0);
119
120     if (newRate != rate) {
121         rate = newRate;
122
123         emit RateChanged(newRate);
124     }
125 }
126
127 /// @dev Distribute presold tokens and bonus tokens to investors
128 /// @param investors List of investors' Ethereum addresses
129 /// @param tokens List of integral token amounts each investors will receive
130 /// @param bonuses List of integral bonus token amounts each investor will receive
131 function distributePresale(address[] investors, uint[] tokens, uint[] bonuses) public onlyOwner
132 ↪{
133     require(ended() && !isFinalized);
134     require(tokens.length == investors.length && bonuses.length == investors.length);
135
136     for (uint i = 0; i < investors.length; ++i) {
137         presaleRemaining = presaleRemaining.sub(tokens[i]);
138         bonusRemaining = bonusRemaining.sub(bonuses[i]);
139
140         token.mint(investors[i], tokens[i].add(bonuses[i]));
141     }
142
143     /// @dev Finalize, i.e. end token minting phase and enable token trading
144     function finalize() public onlyOwner {
145         require(ended() && !isFinalized);
146         require(presaleRemaining == 0);
147
148         // Distribute granted token shares
149         token.mint(teamWallet, TEAM_SHARE);
150         token.mint(advisorsWallet, ADVISORS_SHARE);
151         token.mint(companyWallet, COMPANY_SHARE);
152
153         // There shouldn't be any remaining presale tokens
154         // Remaining mainsale tokens will be lost (i.e. not minted)
155         // Remaining bonus tokens will be minted for the benefit of company
156         if (bonusRemaining > 0) {
157             token.mint(companyWallet, bonusRemaining);
158             bonusRemaining = 0;
159         }
160
161         // Enable token trade
162         token.finishMinting();
163         token.unpause();
164
165         isFinalized = true;
166
167         emit Finalized();
168     }
169 }

```

```

170 // false if the ico is not started, true if the ico is started and running, true if the ico is_
↳completed
171 /// @dev Started (as required by Eidoo's ICOEngineInterface)
172 /// @return True iff mainsale start has passed
173 function started() public view returns (bool) {
174     return now >= openingTime;
175 }
176
177 // false if the ico is not started, false if the ico is started and running, true if the ico is_
↳completed
178 /// @dev Ended (as required by Eidoo's ICOEngineInterface)
179 /// @return True iff mainsale is finished
180 function ended() public view returns (bool) {
181     return now > closingTime || mainsaleRemaining < rate;
182 }
183
184 // time stamp of the starting time of the ico, must return 0 if it depends on the block number
185 /// @dev Start time (as required by Eidoo's ICOEngineInterface)
186 /// @return Block (Unix) timestamp of mainsale start time
187 function startTime() public view returns (uint) {
188     return openingTime;
189 }
190
191 // time stamp of the ending time of the ico, must retrun 0 if it depends on the block number
192 /// @dev End time (as required by Eidoo's ICOEngineInterface)
193 /// @return Block (Unix) timestamp of mainsale latest end time
194 function endTime() public view returns (uint) {
195     return closingTime;
196 }
197
198 // returns the total number of the tokens available for the sale, must not change when the ico_
↳is started
199 /// @dev Total amount of tokens initially available for purchase during mainsale (excluding_
↳bonus tokens)
200 /// @return Integral token units
201 function totalTokens() public view returns (uint) {
202     return MAINSALE_CAP;
203 }
204
205 // returns the number of the tokens available for the ico. At the moment that the ico starts it_
↳must be
206 // equal to totalTokens(), then it will decrease. It is used to calculate the percentage of_
↳sold tokens as
207 // remainingTokens() / totalTokens()
208 /// @dev Remaining amount of tokens available for purchase during mainsale (excluding bonus_
↳tokens)
209 /// @return Integral token units
210 function remainingTokens() public view returns (uint) {
211     return mainsaleRemaining;
212 }
213
214 // return the price as number of tokens released for each ether
215 /// @dev Price (as required by Eidoo's ICOEngineInterface); actually the inverse of a "price"
216 /// @return Rate in integral token units per wei
217 function price() public view returns (uint) {
218     return rate;
219 }
220
221 /// @dev Release purchased tokens to buyers during mainsale (as required by Eidoo's_
↳ICOEngineInterface)
222 /// @param buyer Ethereum address of purchaser
223 /// @param signer Ethereum address of signer
224 /// @return Always true, failures will be indicated by transaction reversal

```

```

225     function releaseTokensTo(address buyer, address signer) internal returns (bool) {
226         require(started() && !ended());
227
228         uint value = msg.value;
229         uint refund = 0;
230
231         uint tokens = value.mul(rate);
232         uint bonus = 0;
233
234         // (Last) buyer whose purchase would exceed available mainsale tokens will be partially_
↪ refunded
235         if (tokens > mainsaleRemaining) {
236             uint valueOfRemaining = mainsaleRemaining.div(rate);
237
238             refund = value.sub(valueOfRemaining);
239             value = valueOfRemaining;
240             tokens = mainsaleRemaining;
241             // Note:
242             // To be 100% accurate the buyer should receive only a token amount that corresponds to_
↪ valueOfRemaining,
243             // i.e. tokens = valueOfRemaining.mul(rate), because of mainsaleRemaining may not be a_
↪ multiple of rate
244             // (due to regular adaption to the ether/fiat exchange rate).
245             // Nevertheless, we deliver all mainsaleRemaining tokens as the worth of these_
↪ additional tokens at time
246             // of purchase is less than a wei and the gas costs of a correct solution, i.e._
↪ calculate value * rate
247             // again, would exceed this by several orders of magnitude.
248         }
249
250         // Purchases signed via Eidoo's platform will receive additional 5% bonus tokens
251         if (signer == eidooSigner) {
252             bonus = tokens.div(20);
253         }
254
255         mainsaleRemaining = mainsaleRemaining.sub(tokens);
256         bonusRemaining = bonusRemaining.sub(bonus);
257
258         token.mint(buyer, tokens.add(bonus));
259         wallet.transfer(value);
260         if (refund > 0) {
261             buyer.transfer(refund);
262
263             emit BuyerRefunded(buyer, refund);
264         }
265
266         emit TokenPurchased(buyer, value, tokens.add(bonus));
267
268         return true;
269     }
270
271 }

```