```solidity
// SPDX-License-Identifier: MIT
// OpenZeppelin Contracts (last updated v4.5.0) (proxy/ERC1967/ERC1967Upgrade.sol)

pragma solidity ^0.8.2;

import "../beacon/IBeacon.sol";
import "../../interfaces/draft-IERC1822.sol";
import "../../utils/Address.sol";
import "../../utils/StorageSlot.sol";

/**
 * @dev This abstract contract provides getters and event emitting update functions for
 * https://eips.ethereum.org/EIPS/eip-1967[EIP1967] slots.
 *
 * _Available since v4.1._
 *
 * @custom:oz-upgrades-unsafe-allow delegatecall
 */
abstract contract ERC1967Upgrade {
    // This is the keccak-256 hash of "eip1967.proxy.rollback" subtracted by 1
    bytes32 private constant _ROLLBACK_SLOT = 0x4910fdfa16fed3260ed0e7147f7cc6da11a60208b5b9406d12a635614ffd9143;

    /**
     * @dev Storage slot with the address of the current implementation.
     * This is the keccak-256 hash of "eip1967.proxy.implementation" subtracted by 1, and is
     * validated in the constructor.
     */
    bytes32 internal constant _IMPLEMENTATION_SLOT = 0x360894a13ba1a3210667c828492db98dca3e2076cc3735a920a3ca505d382bbc;

    /**
     * @dev Emitted when the implementation is upgraded.
     */
    event Upgraded(address indexed implementation);

    /**
     * @dev Returns the current implementation address.
     */
    function _getImplementation() internal view returns (address) {
        return StorageSlot.getAddressSlot(_IMPLEMENTATION_SLOT).value;
    }

    /**
     * @dev Stores a new address in the EIP1967 implementation slot.
     */
    function _setImplementation(address newImplementation) private {
        require(Address.isContract(newImplementation), "ERC1967: new implementation is not a contract");
        StorageSlot.getAddressSlot(_IMPLEMENTATION_SLOT).value = newImplementation;
    }

    /**
     * @dev Perform implementation upgrade
     *
     * Emits an {Upgraded} event.
     */
    function _upgradeTo(address newImplementation) internal {
        _setImplementation(newImplementation);
        emit Upgraded(newImplementation);
    }

    /**
     * @dev Perform implementation upgrade with additional setup call.
     *
     * Emits an {Upgraded} event.
     */
    function _upgradeToAndCall(
        address newImplementation,
        bytes memory data,
        bool forceCall
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```
69        ) internal {
70            _upgradeTo(newImplementation);
71            if (data.length > 0 || forceCall) {
72                Address.functionDelegateCall(newImplementation, data);
73            }
74        }
75
76        /**
77         * @dev Perform implementation upgrade with security checks for UUPS proxies, and
          additional setup call.
78         *
79         * Emits an {Upgraded} event.
80         */
81        function _upgradeToAndCallUUPS(
82            address newImplementation,
83            bytes memory data,
84            bool forceCall
85        ) internal {
86            // Upgrades from old implementations will perform a rollback test. This test
              requires the new
87            // implementation to upgrade back to the old, non-ERC1822 compliant,
              implementation. Removing
88            // this special case will break upgrade paths from old UUPS implementation to
              new ones.
89            if (StorageSlot.getBooleanSlot(_ROLLBACK_SLOT).value) {
90                _setImplementation(newImplementation);
91            } else {
92                try IERC1822Proxiable(newImplementation).proxiableUUID() returns (bytes32
                  slot) {
93                    require(slot == _IMPLEMENTATION_SLOT, "ERC1967Upgrade: unsupported
                      proxiableUUID");
94                } catch {
95                    revert("ERC1967Upgrade: new implementation is not UUPS");
96                }
97                _upgradeToAndCall(newImplementation, data, forceCall);
98            }
99        }
100
101       /**
102        * @dev Storage slot with the admin of the contract.
103        * This is the keccak-256 hash of "eip1967.proxy.admin" subtracted by 1, and is
104        * validated in the constructor.
105        */
106       bytes32 internal constant _ADMIN_SLOT =
          0xb53127684a568b3173ae13b9f8a6016e243e63b6e8ee1178d6a717850b5d6103;
107
108       /**
109        * @dev Emitted when the admin account has changed.
110        */
111       event AdminChanged(address previousAdmin, address newAdmin);
112
113       /**
114        * @dev Returns the current admin.
115        */
116       function _getAdmin() internal view returns (address) {
117           return StorageSlot.getAddressSlot(_ADMIN_SLOT).value;
118       }
119
120       /**
121        * @dev Stores a new address in the EIP1967 admin slot.
122        */
123       function _setAdmin(address newAdmin) private {
124           require(newAdmin != address(0), "ERC1967: new admin is the zero address");
125           StorageSlot.getAddressSlot(_ADMIN_SLOT).value = newAdmin;
126       }
127
128       /**
129        * @dev Changes the admin of the proxy.
130        *
131        * Emits an {AdminChanged} event.
132        */
133       function _changeAdmin(address newAdmin) internal {
134           emit AdminChanged(_getAdmin(), newAdmin);
```

```
135             _setAdmin(newAdmin);
136         }
137 
138         /**
139          * @dev The storage slot of the UpgradeableBeacon contract which defines the
             implementation for this proxy.
140          * This is bytes32(uint256(keccak256('eip1967.proxy.beacon')) - 1)) and is
             validated in the constructor.
141          */
142         bytes32 internal constant _BEACON_SLOT =
            0xa3f0ad74e5423aebfd80d3ef4346578335a9a72aeaee59ff6cb3582b35133d50;
143 
144         /**
145          * @dev Emitted when the beacon is upgraded.
146          */
147         event BeaconUpgraded(address indexed beacon);
148 
149         /**
150          * @dev Returns the current beacon.
151          */
152         function _getBeacon() internal view returns (address) {
153             return StorageSlot.getAddressSlot(_BEACON_SLOT).value;
154         }
155 
156         /**
157          * @dev Stores a new beacon in the EIP1967 beacon slot.
158          */
159         function _setBeacon(address newBeacon) private {
160             require(Address.isContract(newBeacon), "ERC1967: new beacon is not a contract"
                );
161             require(
162                 Address.isContract(IBeacon(newBeacon).implementation()),
163                 "ERC1967: beacon implementation is not a contract"
164             );
165             StorageSlot.getAddressSlot(_BEACON_SLOT).value = newBeacon;
166         }
167 
168         /**
169          * @dev Perform beacon upgrade with additional setup call. Note: This upgrades
             the address of the beacon, it does
170          * not upgrade the implementation contained in the beacon (see
             {UpgradeableBeacon-_setImplementation} for that).
171          *
172          * Emits a {BeaconUpgraded} event.
173          */
174         function _upgradeBeaconToAndCall(
175             address newBeacon,
176             bytes memory data,
177             bool forceCall
178         ) internal {
179             _setBeacon(newBeacon);
180             emit BeaconUpgraded(newBeacon);
181             if (data.length > 0 || forceCall) {
182                 Address.functionDelegateCall(IBeacon(newBeacon).implementation(), data);
183             }
184         }
185     }
186 
```