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## FusionAuth-SAMLv2 0.2.3 Message Forging

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Unauthenticated users can send forged messages to the FusionAuth to bypass authentication, impersonate other users or gain arbitrary roles. The SAML message can be send to the application without a signature even if this is required. The impact depends on individual applications that implement fusionauth-samlv2. Version 0.2.3 is vulnerable.

 tags | exploit, arbitrary
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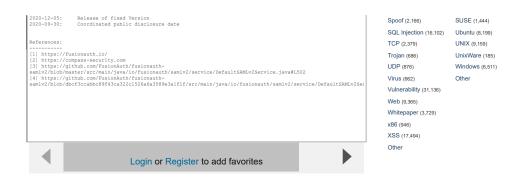
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<pre># https://www.compass-security.com/research/advisories/ #</pre>		
# Product: SAML v2.0 bindings in Java using JAXB		
# Vendor: FusionAuth # CSNC ID: CSNC-2020-002		
# CVE ID: CVE-2020-12676 # Subject: Signature Exclusion Attack		
# Risk: High # Effect: Remotely exploitable		
<pre># Author: Felix Sieges <felix.sieges@compass-security.com> # Date: 2020-09-30</felix.sieges@compass-security.com></pre>		
Introduction:		
FusionAuth [1] provides authentication, authorization, and user management for any app. SMML v2.0 bindings in Java using JANB are a library used to integrate SMML Authentication with Java Applications. Compass Security [2] identified a vulnerability that allows remote attackers to forge messages and bypass authentication via a SMML assertion that lacks a Signature element, aka a "Signature exclusion attack".		
Affected:		
Vulnerable: fusionauth-samlv2 0.2.3		
Not vulnerable:		
fusionauth-samiv2 0.2.4		
Not tested: No other version was tested, but it is believed for the older versions to be vulnerable as well.		
Technical Description		
Unauthenticated users can send forged messages to the FusionAuth to bypass		
Authentication, impersonate other users or gain arbitrary roles. The SAML Message can be send to the Application without a signature even if this is required. The impact depends on individual applications that implement fusionauth-samuly.		
The code which is responsible to verify the signature is called from the parseResponse function [3]. The function checks whether a signature must be verified and if so the function verifysingnuture is called to do signature verification checks.		
https://github.com/FusionAuth/fusionauth-		
public AuthenticationResponse parseResponse(String encodedResponse, boolean verifySignature, PublicKey key) throws SAMLException {		
AuthenticationResponse response = new AuthenticationResponse(); byte(] decodedResponse = Base64.getMimeDecode().decode(encodedResponse); response.rawResponse = new String(decodedResponse).StandardCharsets.UTF_8);		
Document document = parseFromBytes(decodedResponse); if (verifySignature) ( verifySignature(document, key);		
'		
In the function verifySignature [4] the SAML message is parsed after validation that a signature is attached to the message. If no signatures exist the function just returns. Hence the parseReponse method assumes that the signature is valid and the SAML message will be processed further.		
<pre>private void verifySignature(Document document, Key key) throws SAMLException {     // Fix the IDs in the entire document per the suggestions at     http://stackoverflow.com/questions/17331187/xml-dig-sig-error-after-upgrade-to-java7u25     fixIDs document.gebenol.ps</pre>		
NodeList nl = document.getElementsByTagNameNS(XMLSignature.XMLNS, "Signature"); if (nl.getLength() == 0) {    return; }		
<pre>for (int i = 0; i &lt; nl.getLength(); i++) {     DOWValidateContext validateContext = new DOWValidateContext(key, nl.item(i));     XMLSignatureFactory factory = XMLSignatureFactory.getInstance("DOM");</pre>		
<pre>try {    XMCSignature signature = factory.unmarshalXMCSignature(validateContext);    boolean valid = signature.validate(validateContext);    if (tvalid) {</pre>		
throw new SAMLException("Invalid SAML v2.0 authentication response. The signature is invalid."); }		
] catch (MarshalException e) { throw new SAMLException ("Onable to verify XML signature in the SAML v2.0 authentication response because we couldn't unmarshall the XML Signature element", e); ) catch (XMLSignatureException e) [		
throw new SAMLException("Unable to verify XML signature in the SAML v2.0 authentication response. The signature was unmarshalled we couldn't validate it for an unknown reason", e); } }		
<u>}</u>		
Workaround / Fix:		
Worksround / Fix:		
#TODO		
Timeline:		
2020-04-29: Discovery by Felix Sleges 2020-05-06: Assigned CVE-2020-12676 2020-05-06: Initial vendor notification		
2020-05-06: Initial vendor notification 2020-05-06: Initial vendor response		





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