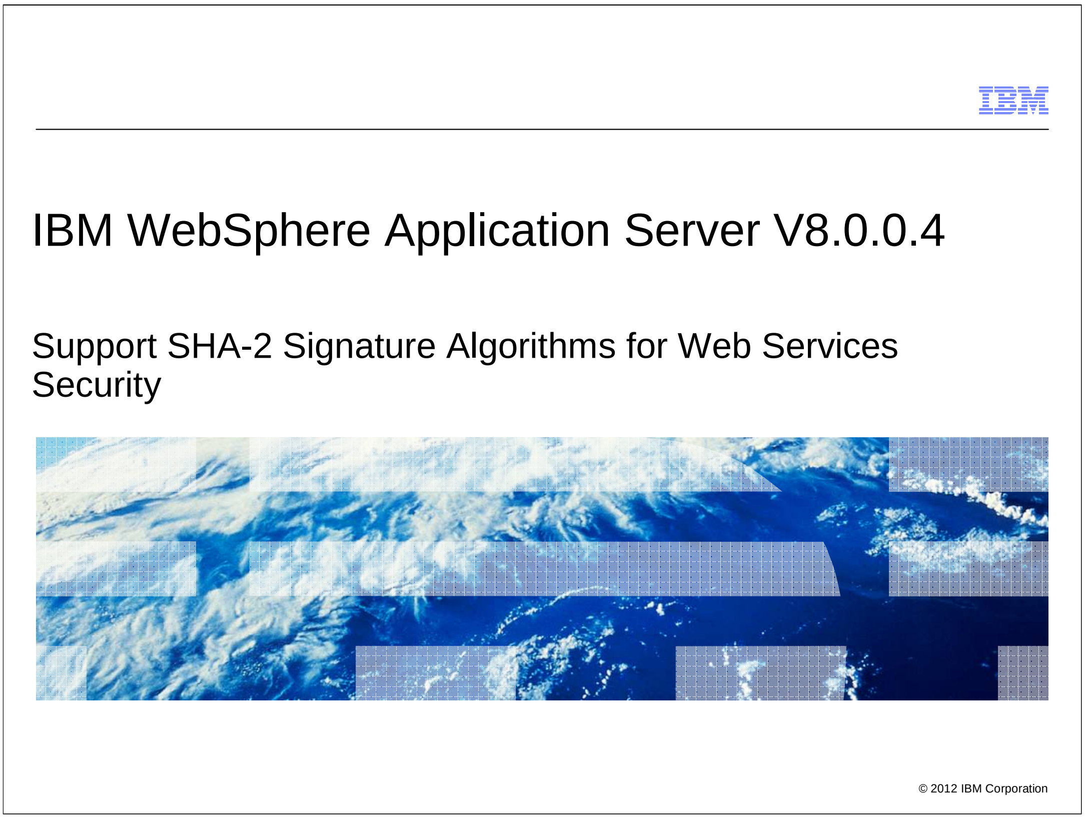
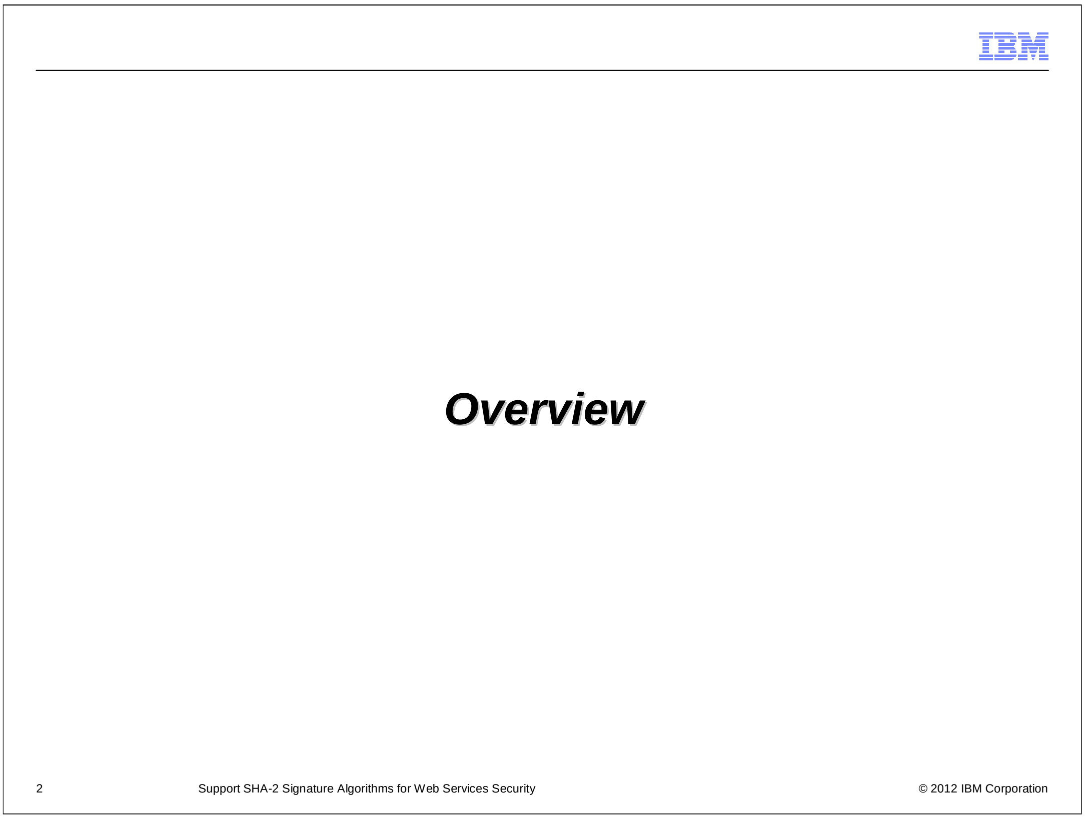


# IBM WebSphere Application Server V8.0.0.4

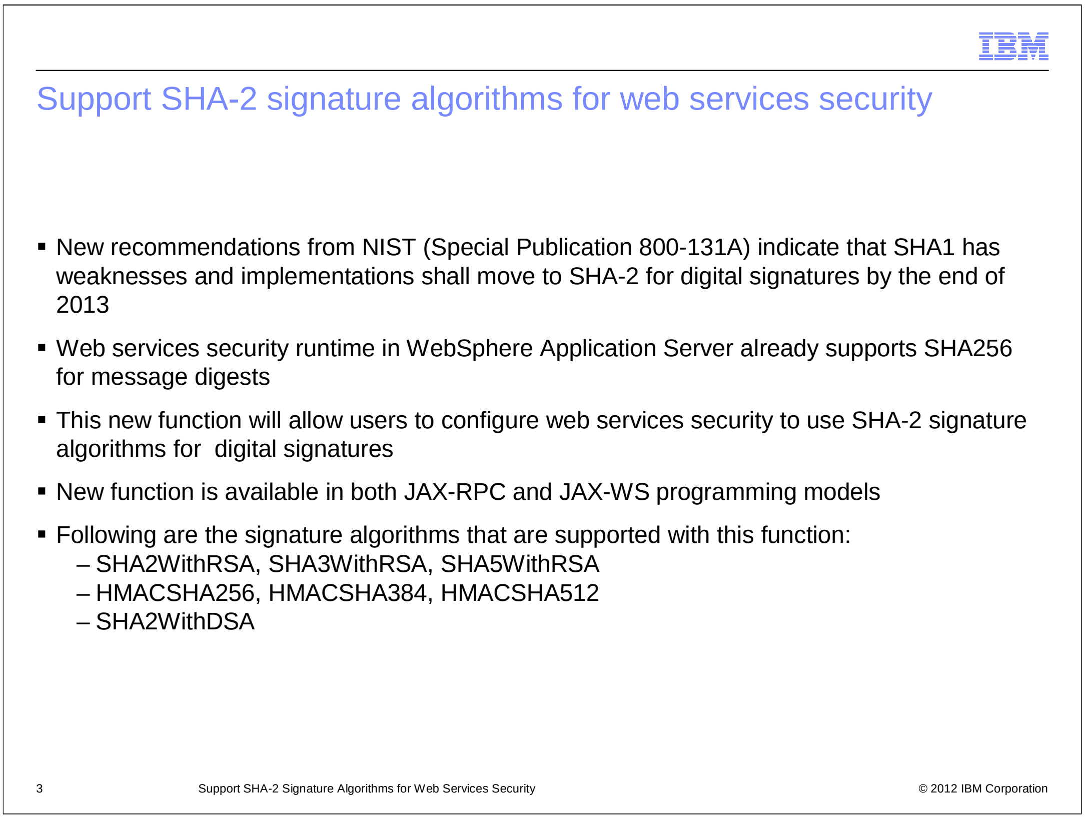
## Support SHA-2 Signature Algorithms for Web Services Security

This presentation describes the support of SHA-2 signature algorithms in web service security included in IBM WebSphere Application Server V8.0.0.4.



## Overview

This feature provides the support of SHA-2 signature algorithms in web service security. With this feature, web service client can sign SOAP message with SHA-2 signature algorithm, and web service provider can verify SOAP message signature signed with SHA-2 signature algorithm.

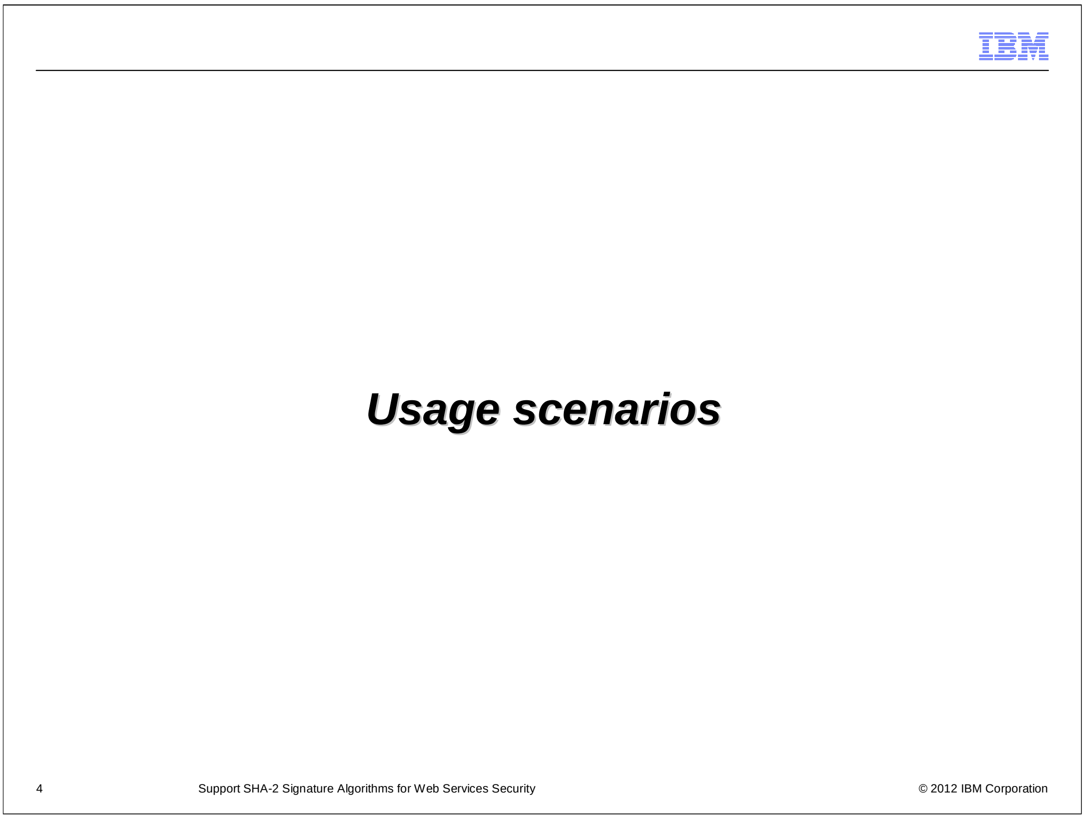


## Support SHA-2 signature algorithms for web services security

- New recommendations from NIST (Special Publication 800-131A) indicate that SHA1 has weaknesses and implementations shall move to SHA-2 for digital signatures by the end of 2013
- Web services security runtime in WebSphere Application Server already supports SHA256 for message digests
- This new function will allow users to configure web services security to use SHA-2 signature algorithms for  digital signatures
- New function is available in both JAX-RPC and JAX-WS programming models
- Following are the signature algorithms that are supported with this function:
  - SHA2WithRSA, SHA3WithRSA, SHA5WithRSA
  - HMACSHA256, HMACSHA384, HMACSHA512
  - SHA2WithDSA

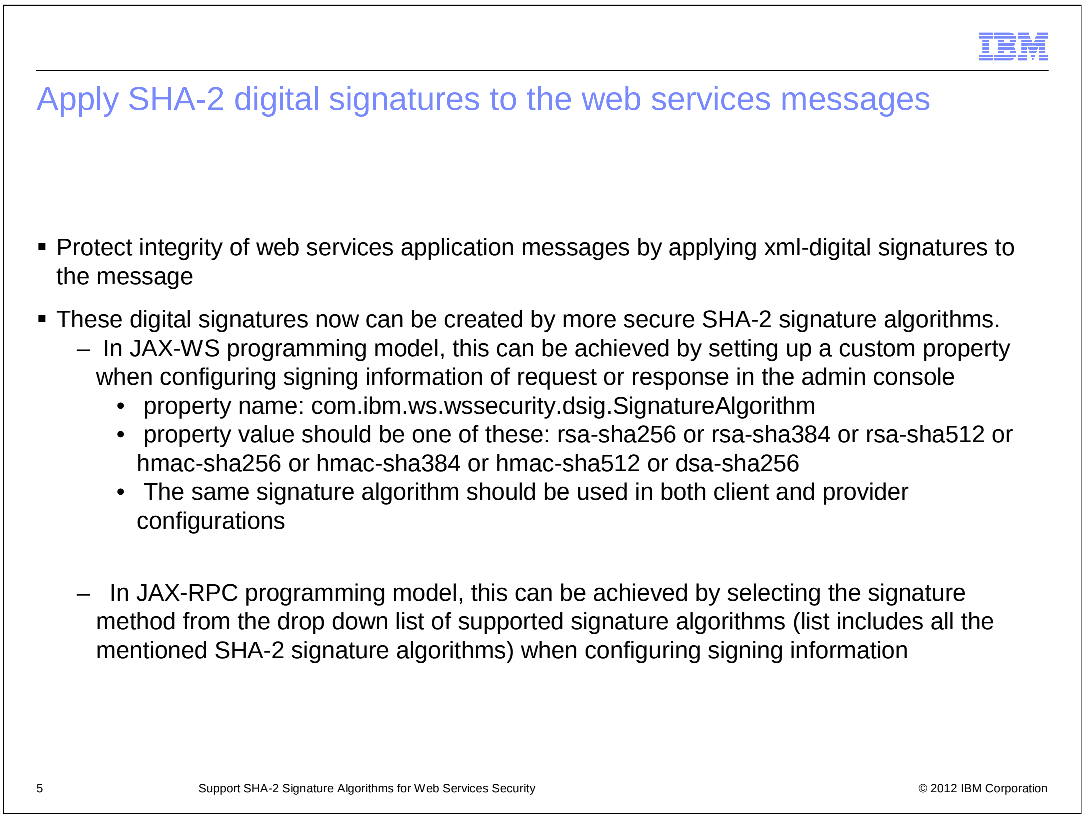
National Institute of Standards and Technology (NIST) originates the series of publications to coordinate the requirements and standards for cryptographic modules. The NIST publication SP800-131 requires longer key lengths, strong digital signature algorithms and cryptographic algorithms. It further requires all implementations move to use the stronger SHA-2 from SHA-1 digital signatures by the end of 2013.

With this new function, web service security will have the capability to create or verify SOAP digital signatures using more secure SHA-2 signature algorithms.



## Usage scenarios

WebSphere application server web service security can be configured to use the more secured SHA-2 signature algorithm  to sign SOAP message, or to verify SOAP signature.

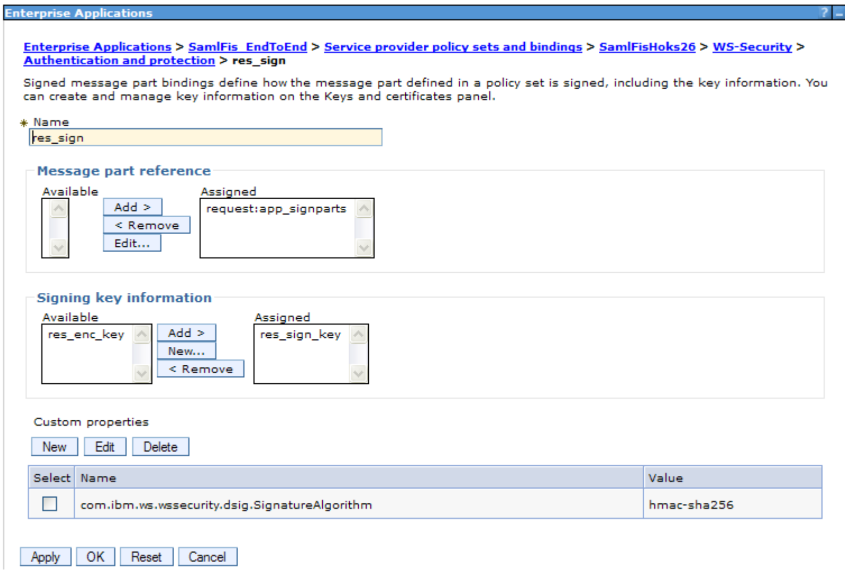


## Apply SHA-2 digital signatures to the web services messages

- Protect integrity of web services application messages by applying xml-digital signatures to the message
- These digital signatures now can be created by more secure SHA-2 signature algorithms.
  - In JAX-WS programming model, this can be achieved by setting up a custom property when configuring signing information of request or response in the admin console
    - property name: com.ibm.ws.wssecurity.dsig.SignatureAlgorithm
    - property value should be one of these: rsa-sha256 or rsa-sha384 or rsa-sha512 or hmac-sha256 or hmac-sha384 or hmac-sha512 or dsa-sha256
    - The same signature algorithm should be used in both client and provider configurations
  - In JAX-RPC programming model, this can be achieved by selecting the signature method from the drop down list of supported signature algorithms (list includes all the mentioned SHA-2 signature algorithms) when configuring signing information

Both JAX-WS web service and JAX-RPC web service support SHA-2 signature algorithms. In JAX-WS, you use custom property com.ibm.ws.wssecurity.dsig.SignatureAlgorithm to the required signature algorithm when configuring signing information. The allowed algorithm values are rsa-sha256, rsa-sha384, rsa-sha512, hmac-sha256, hmac-sha512, hmac-sha384, and dsa-sha256. In JAX-RPC, you can select the desired SHA-2 algorithm from a list available algorithms when configuring signing information.

## JAX-WS signing configuration using sha-2 algorithm



Enterprise Applications

Enterprise Applications > SamlFis_EndToEnd > Service provider policy sets and bindings > SamlFisHoks26 > WS-Security > Authentication and protection > res_sign

Signed message part bindings define how the message part defined in a policy set is signed, including the key information. You can create and manage key information on the Keys and certificates panel.

* Name: res_sign

**Message part reference**

Available: (none)

Assigned: request:app_signparts

**Signing key information**

Available: res_enc_key

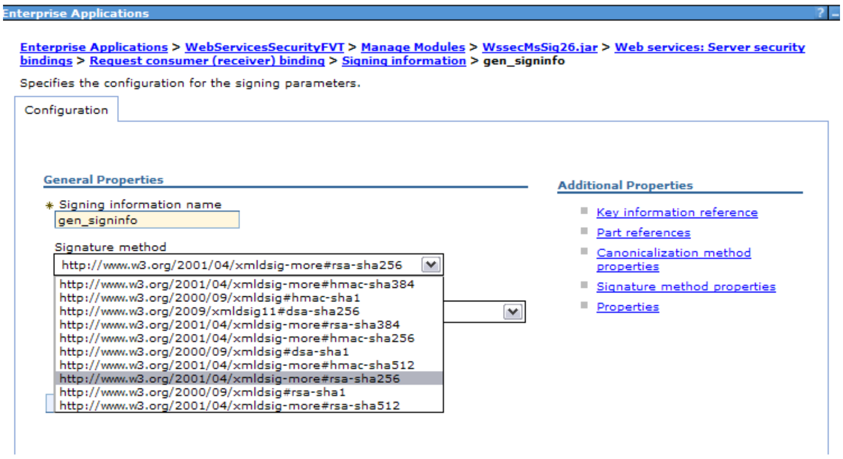
Assigned: res_sign_key

Custom properties

| Select | Name | Value |
|---|---|---|
| □ | com.ibm.ws.wssecurity.dsig.SignatureAlgorithm | hmac-sha256 |

This slide shows an admin console screen capture of JAX-WS configuration and how it is setup to use SHA-2 signature algorithm. The custom property com.ibm.ws.wssecurity.dsig.SignatureAlgorithm indicates which signature algorithm to use.

# JAX-RPC signing configuration



Enterprise Applications > WebServicesSecurityFVT > Manage Modules > WssecMsSig26.jar > Web services: Server security bindings > Request consumer (receiver) binding > Signing information > gen_signinfo

Specifies the configuration for the signing parameters.

**General Properties**

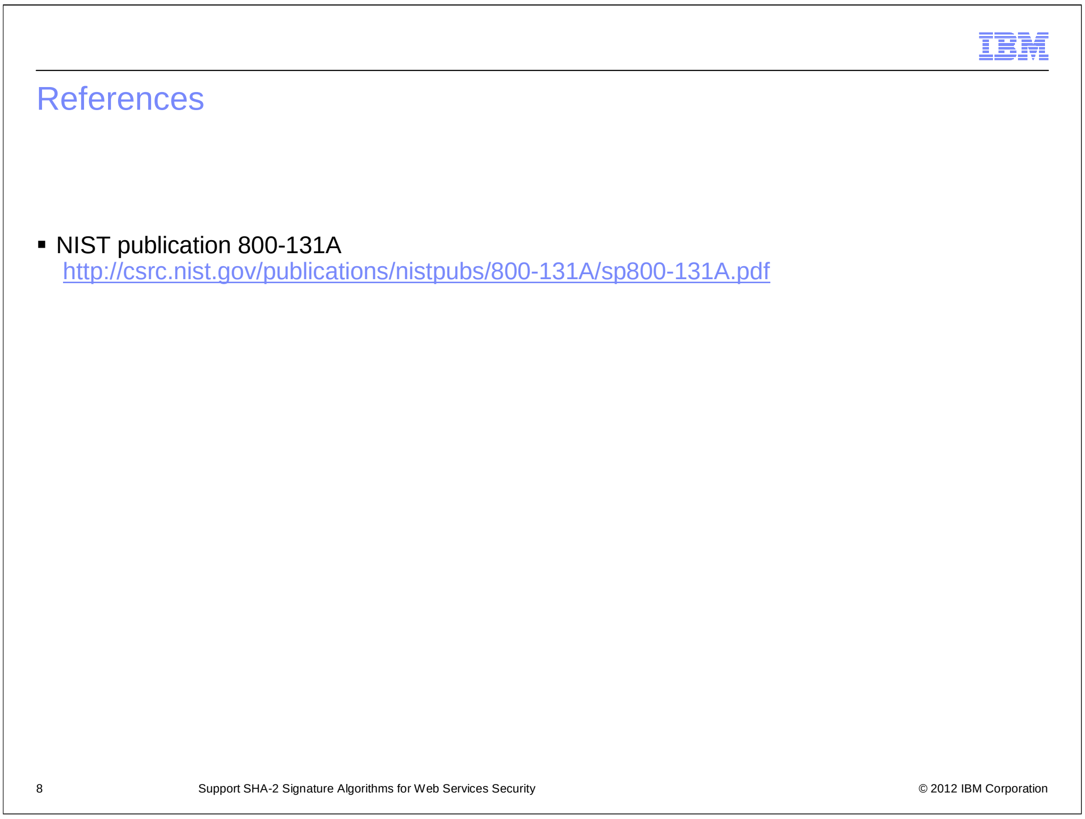
* Signing information name: gen_signinfo

Signature method: http://www.w3.org/2001/04/xmldsig-more#rsa-sha256

```
http://www.w3.org/2001/04/xmldsig-more#hmac-sha384
http://www.w3.org/2000/09/xmldsig#hmac-sha1
http://www.w3.org/2009/xmldsig11#dsa-sha256
http://www.w3.org/2001/04/xmldsig-more#rsa-sha384
http://www.w3.org/2001/04/xmldsig-more#hmac-sha256
http://www.w3.org/2000/09/xmldsig#dsa-sha1
http://www.w3.org/2001/04/xmldsig-more#hmac-sha512
http://www.w3.org/2001/04/xmldsig-more#rsa-sha256
http://www.w3.org/2000/09/xmldsig#rsa-sha1
http://www.w3.org/2001/04/xmldsig-more#rsa-sha512
```

Additional Properties
Key information reference
Part references
Canonicalization method properties
Signature method properties
Properties

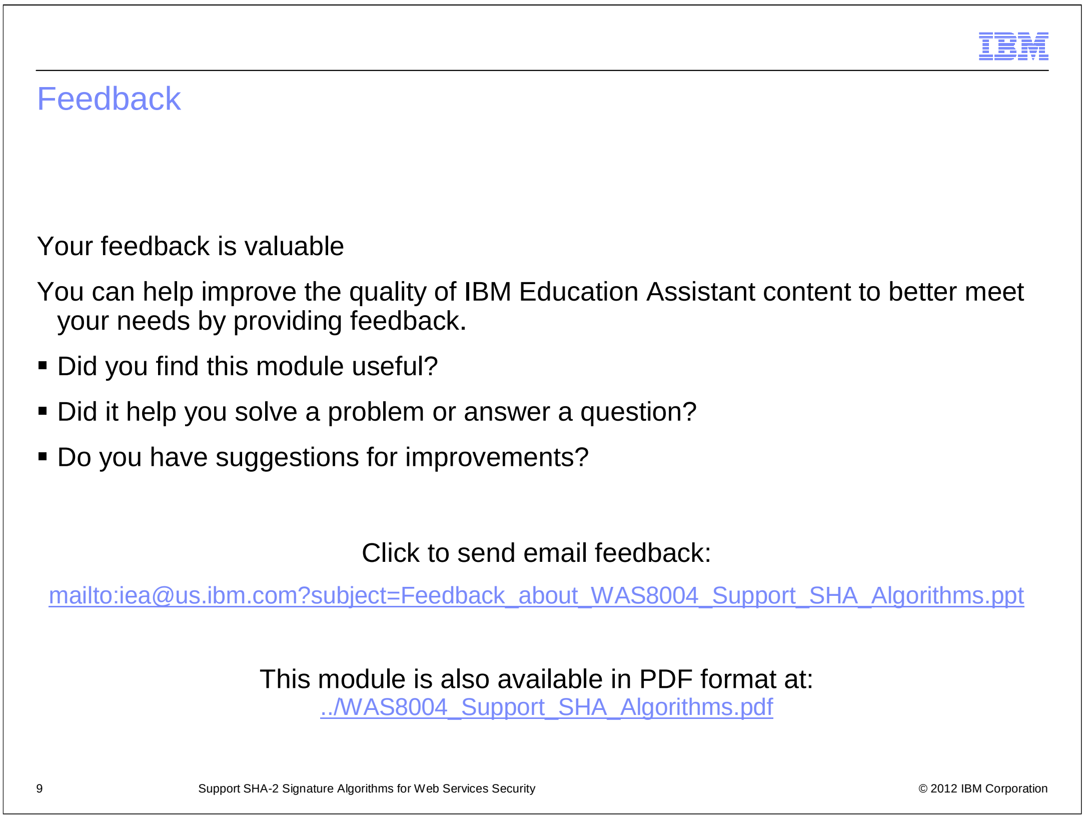
This is a screen capture from JAX-RPC when configuring signing information, and you can choose any available signature from the list.



## References

- NIST publication 800-131A
  http://csrc.nist.gov/publications/nistpubs/800-131A/sp800-131A.pdf

This slide contains a reference link.



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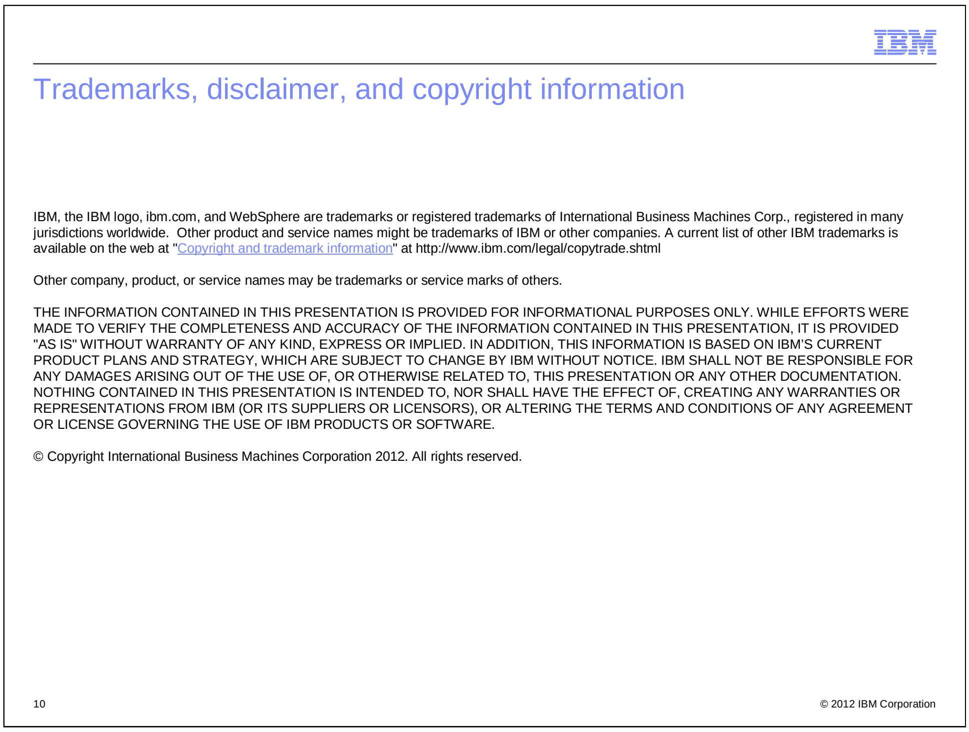

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