

PGP SupportPac for IBM Integration Bus v9

Part-3: PGP Decrypter Node Properties

By

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Summary

This article is the third in a multi-part series of articles describing PGP security implementation in IBM Integration Bus v9. This series of articles introduces an industry standard solution to Data Security in IBM Integration Bus, enforcing data confidentiality and integrity by implementing PGP cryptographic solution. This solution is developed as a custom pluggable feature (or SupportPac) of IBM Integration Bus v9. This article illustrates node properties of the **PGP Decrypter Node** offered by this **SupportPac** (v1.0.01).

Introduction

PGP Decrypter Node is primarily used to decrypt and validate signature of signed and encrypted messages/files as per OpenPGP standard (RFC 4880). PGP supportPac plugins for IBM Integration Bus Toolkit is required to be applied before using this node at messageflows. Once PGP supportPac plugins is applied to the IBM Integration Bus Toolkit, PGP Decrypter node will be available in the PGP drawer of the message flow node palette, and is represented in the IBM Integration Bus Toolkit by the following icon.

Figure-1: PGP Decrypter Node icon



Using the PGP Decrypter node in a message flow

PGP Decrypter node supports both message and file decryption. By default, PGP Decrypter node places decrypted data at output message tree, but the node can be configured to write decrypted data into file system. This node requires a User Defined Configurable Service to load PGP private/public key repositories and default decryption (recipient's private key) key passphrase information. By using a user defined configurable service, you can change the PGP private/public key repository details and default private key passphrase information without the need to redeploy the messageflows. Refer to first article (Part-1) of this series to download SupportPac and sample messageflows.

Coordinated Transactions

PGP Decrypter node does not participate into local transaction initiating by Input node of the messageflow. But if downstream nodes connected to it's output terminal end up with unhandled exception, PGP Decrypter node does not take any action (Delete/Archive) on input file, even if the node is configured to do that.

Terminals and properties

The properties of the node are displayed in the Properties view. Few mandatory properties that do not have a default value defined are marked with an asterisk. But

some properties are not marked with asterisk though these properties are mandatory for File decryption and PGP Signature. Please refer to node properties for detail configuration.

The Terminals of the PGP Decrypter node are described at Table-1.

Table-1: PGP Decrypter Node Terminals

Terminal	Description
In	The input terminal that accepts the request message.
Out	The output terminal to which the message is routed upon successful completion of the PGP decryption, and if further processing is required within this message flow.

The following tables describe the node properties. The columns headed M indicate whether the property is *mandatory* (marked with an asterisk on the panel if you must enter a value when no default is defined); the columns headed C indicate whether the property is *configurable* (you can change the value when you add the message flow to the BAR file to deploy it).

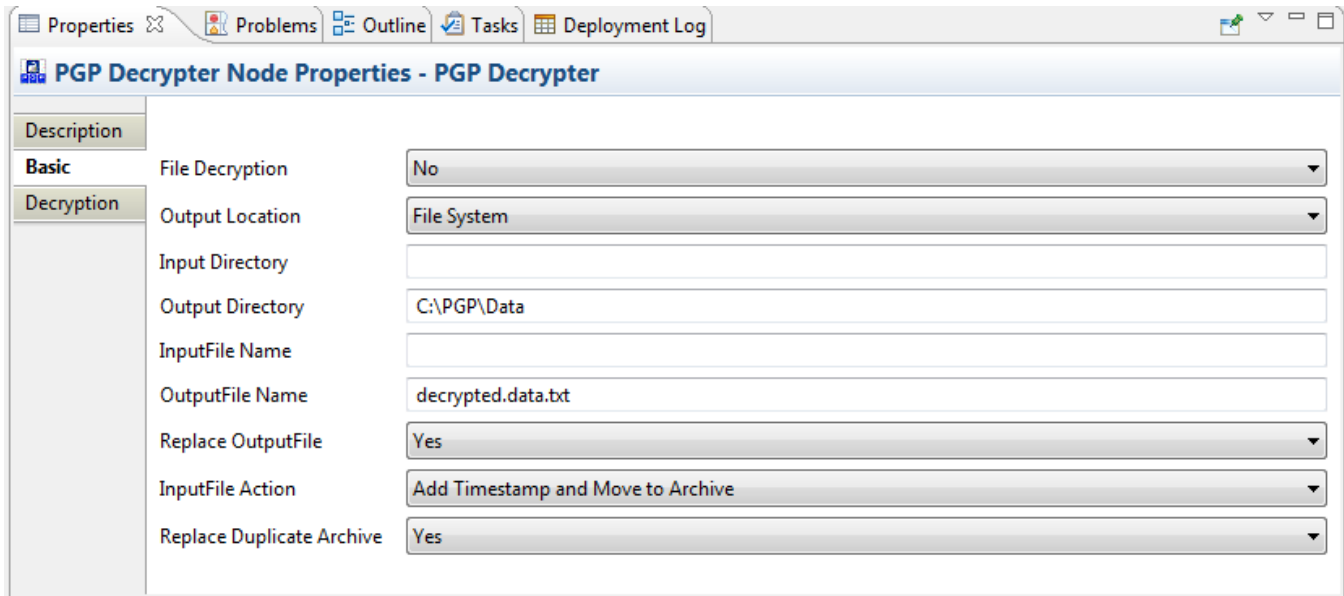
The PGP Decrypter node *Description* properties are described at Table-2.

Table-2: PGP Decrypter Node *Description* Properties

Property	M	C	Default	Description
Node name	No	No	The node type, PGP Decrypter	The name of the node. Please provide a unique name if multiple nodes are used at same messageflow.
Short description	No	No		A brief description of the node.
Long description	No	No		Text that describes the purpose of the node in the message flow.

Following figures represent IBM Integration Bus Toolkit screen-shots of PGP Decrypter Node Properties.

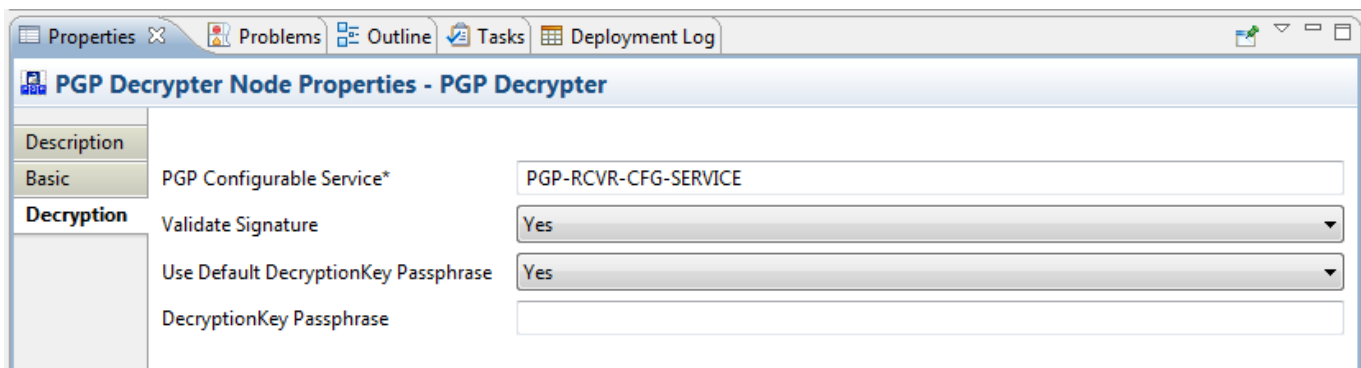
Figure-2: PGP Decrypter node *Basic* properties screen-shot



The screenshot shows the 'PGP Decrypter Node Properties - PGP Decrypter' dialog box with the 'Basic' tab selected. The 'Description' tab is also visible. The 'Basic' tab contains the following properties:

Property	Value
File Decryption	No
Output Location	File System
Input Directory	
Output Directory	C:\PGP\Data
InputFile Name	
OutputFile Name	decrypted.data.txt
Replace OutputFile	Yes
InputFile Action	Add Timestamp and Move to Archive
Replace Duplicate Archive	Yes

Figure-3: PGP Decrypter node *Decryption* properties screen-shot



The screenshot shows the 'PGP Decrypter Node Properties - PGP Decrypter' dialog box with the 'Decryption' tab selected. The 'Basic' tab is also visible. The 'Decryption' tab contains the following properties:

Property	Value
PGP Configurable Service*	PGP-RCVR-CFG-SERVICE
Validate Signature	Yes
Use Default DecryptionKey Passphrase	Yes
DecryptionKey Passphrase	

PGP Decrypter node *Basic* properties are described at Table-3.

Table-3: PGP Decrypter Node *Basic* Properties

Property	M	C	D e f a u l t	Description	mqsiapplyb aoverride command property
File Decrypti on	Yes	No	N o	<p>Specify whether the node will be used for message or file decryption.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> Yes: select this value for file decryption. Make sure you provide following property values – Input Directory, InputFile Name. No: select this value for message decryption. Node read data from input message tree. Note that only BLOB domain is supported. 	
Output Location	Yes	No	O u t p u t M e s s a g e T r e e	<p>Specify whether the node will place decrypted data into output message tree or file system.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> Output Message Tree: node places decrypted data into output message tree in BLOB message domain. Note that, the node first copies entire input message tree as-is into output message tree, then it replaces last child with decrypted data. File System: decrypted data is written into file system. Make sure you provide 	

Property	M	C	D e f a u l t	Description	mqsiapplyb aoverride command property
				following property values – Output Directory , OutputFile Name . Note that, node copies entire input message tree as-is into output message tree.	
Input Directory	No	Yes		<p>Absolute path of the input directory in the broker's file system. For example, on Windows systems, the directory path starts with the drive letter prefix (such as C:).</p> <p>This property is mandatory for file decryption. However you can override the property value at node's input local environment tree.</p>	inputDirector y
Output Directory	No	Yes		<p>Absolute path of the output directory in the broker's file system. For example, on Windows systems, the directory path starts with the drive letter prefix (such as C:).</p> <p>This property is mandatory if you select Output Location property value as File System. However you can override the property value at node's input local environment tree.</p>	outputDirecto ry
InputFile Name	No	Yes		<p>Specify input file name which is required to be decrypted.</p> <p>This property is mandatory for file decryption. However you can</p>	inputFileNam e

Property	M	C	D e f a u l t	Description	mqsiapplyb aoverride command property
				override the property value at node's input local environment message tree.	
OutputFile Name	No	Yes		Specify output file name. This property is mandatory if you select Output Location property value as File System . However you can override the property value at nodes input local environment message tree.	outputFileName
Replace OutputFile	Yes	No	Yes	Specify whether the node will replace output file in specified output directory if the file already exists. This property is relevant only if Output Location property value is File System . Valid values are: <ul style="list-style-type: none"> • Yes: node replaces existing file. • No: node throws exception if file already exists. 	
InputFile Action	Yes	No	No Action	The action performed to the input file on successful completion of PGP decryption. Valid actions are: <ul style="list-style-type: none"> • No Action: do nothing to the file. • Delete: delete the file. 	

Property	M	C	D e f a u l t	Description	mqsiapplyb aoverride command property
				<ul style="list-style-type: none"> • Move to Archive: move the file to archive sub-directory (pgparchive). • Add Timestamp and Move to Archive: Archive with timestamp - move the file to the archive sub-directory (pgparchive) and add a timestamp. <p>In case of Archive, the node creates a sub-directory (name: pgparchive) at input directory specified at Input Directory property.</p> <p>If downstream nodes connected to PGP Decrypter node's output terminal end up with unhandled exception, this node does not take any action (Delete/Archive) on input file.</p>	
Replace Duplicate Archive	Yes	No	Y e s	<p>Specify whether the node will replace duplicate archive file in pgparchive sub-directory.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> • Yes: node replaces duplicate archive file. • No: node throws exception if the archive file already exists in pgparchive sub-directory. 	

The PGP Decrypter node *Decryption* properties are described at Table-4.

Table-4: PGP Decrypter Node *Decryption* Properties

Property	M	C	D e f a u l t	Description	mqsiapplyb aoverride command property
PGP Configurable Service	Yes	Yes		Specify name of the user defined Configurable Service containing PGP key repository details. PGP Decrypter node load PGP private/public keys from respective repository files specified at this configurable service. Node also load default encryption (recipient's private) key passphrase information if specified at this configurable service.	pgpConfigService
Validate Signature	Yes	No	N o	Specify whether to validate signature contained in encrypted data. Valid values are: <ul style="list-style-type: none"> • Yes: Node validates the PGP signature. If the signature is invalid or signer's public key is not available at public key repository, node throws exception. • No: Node skips signature validation. 	
Use Default DecryptionKey Passphrase	Yes	No	Y e s	Specify whether the node will use default decryption key passphrase specified at DefaultDecryptionKeyPassphrase property value of the user defined configurable service.	

Property	M	C	D e f a u l t	Description	mqsiapplyb aoverride command property
				<p>Valid values are:</p> <ul style="list-style-type: none"> Yes: node ignores the passphrase specified at DecryptionKey Passphrase property of this node, and uses the value from user defined configurable service. No: node uses the value specified at DecryptionKey Passphrase property of this node. <p>Note: If you override DecryptionKey Passphrase property value through node's input local environment, node ignores this (Use Default DecryptionKey Passphrase) property.</p>	
DecryptionKey Passphrase	No	Yes		<p>Specify the decryption key (recipient's private key) passphrase.</p> <p>This property is ignored if Use Default DecryptionKey Passphrase property value is Yes.</p> <p>You can override this property value at node's input local environment message tree by using a Compute or Java Compute node prior to this node. Value specified at local environment tree has highest precedence, but it is applicable to the current invocation (transaction) of the messageflow only.</p> <p>Node extracts a suitable private key</p>	decryptionKey Passphrase

Property	M	C	D e f a u l t	Description	mqsipplyb aoverride command property
				from PGP private key repository based on the specified key uses Id or hexadecimal key Id (DecryptionKey UserId) and this passphrase. Make sure you provide correct passphrase.	

Using local environment variables with PGP Decrypter node.

You can override following node properties through node's input local environment tree by using a Compute or Java Compute node prior to **PGP Decrypter** node. Properties specified at local environment tree have highest precedence, but property values are applicable to the current invocation (transaction) of messageflow only.

Following table (Table-5) describes the **LocalEnvironment.PGP.Decryption** elements:

Table-5: PGP Decrypter Node Local Environment variables

Element Name	Element Data Type	Node Property [Property Tab]	Description
InputDirectory	CHARACTER	Input Directory [Basic]	Absolute path of the input directory in the broker's file system. For example, on Windows systems, the directory path starts with the drive letter prefix (such as C:).
InputFileName	CHARACTER	InputFile Name	Name of the input

Element Name	Element Data Type	Node Property [Property Tab]	Description
		[Basic]	file.
OutputDirectory	CHARACTER	Output Directory [Basic]	Absolute path of the output directory in the broker's file system. For example, on Windows systems, the directory path starts with the drive letter prefix (such as C:).
OutputFileName	CHARACTER	OutputFile Name [Basic]	Name of the output file.
ValidateSignature	CHARACTER	Validate Signature [Decryption]	Specify whether to validate Signature. Valid values are: <ul style="list-style-type: none"> • Yes • No
DecryptionKeyPassphrase	CHARACTER	DecryptionKey Passphrase [Decryption]	Decryption key (Recipient's private key) passphrase.

Creating User Defined Configurable services

PGP Encrypter/Decrypter nodes read default sign key user Id and passphrase, default decryption key passphrase and PGP private/public keys from respective key repository files specified at User Defined Configurable Service. By using a configurable service, you can change the PGP private/public key repository details, default sign key user Id and passphrase, decryption key passphrase information without the need to redeploy the messageflow. You need to restart the execution group for the change of property value to take effect.

You can use the IBM Integration Bus Explorer to view, add, modify and delete the configurable service.

Alternatively, use the following commands to create the user defined configurable service:

```
mqsicreateconfigurableservice <Broker Name> -c UserDefined -o <Configurable Service Name> -n  
PrivateKeyRepository,PublicKeyRepository,DefaultSignKeyUserId,DefaultDecryp  
tionKeyPassphrase,DefaultSignKeyPassphrase -v <Absolute path of private key  
repository file>,<Absolute path of the public key repository file>,<Sign (private  
key User Id>,<Decryption (private) key passphrase>,<Sign (private) key  
passphrase>
```

Note that **DefaultSignKeyUserId**, **DefaultSignKeyPassphrase** are not required for PGP decryption. Similarly **DefaultDecryptionKeyPassphrase** is not required for PGP Encryption. However same Configurable Service can be used for both Encryption and Decryption process.

Conclusion

This series of articles provides an industry standard solution that mitigates a huge gap in IBM Integration Bus Data Security zone, where this article primarily illustrates the node properties of **PGP Decrypter** Node supplied with the SupportPac. Current version (v1.0.0.1) of this SupportPac supports integrated signature validation combined with PGP decryption process. However future version will provide isolated signature validation functionality.

You can post any query regarding to this PGP SupportPac at following IBM DeveloperWorks public community forum, author of this article will address those queries.

[PGP SupportPac for IBM Integration Bus](https://www.ibm.com/developerworks/community/groups/community/pgpsupportpaciib)

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References

- **PGP Basics**
 - **PGP Basics: PGP basic concepts** (<http://www.pgpi.org/doc/pgpintro/>)
 - **Bouncy Castle: Bouncy Castle Resources** (<http://www.bouncycastle.org/>)
 - **Gpg4Win: PGP encryption/decryption command line and GUI tool** (<http://www.gpg4win.org/index.html>)
 - **Portable PGP: Java based GUI tool for PGP** (<http://ppgp.sourceforge.net/>)
 - **GnuPG: GnuPG PGP library** (<http://www.gnupg.org/>)
 - **GitHub: Samples and other Artifacts** (<https://github.com/dipakpal/MyOpenTech-PGP-SupportPac>)

- **Public Community at IBM DeveloperWorks**
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