Apache NiFi 3

Versioning a DataFlow

Date of Publish: 2019-03-15



https://docs.hortonworks.com/

Contents

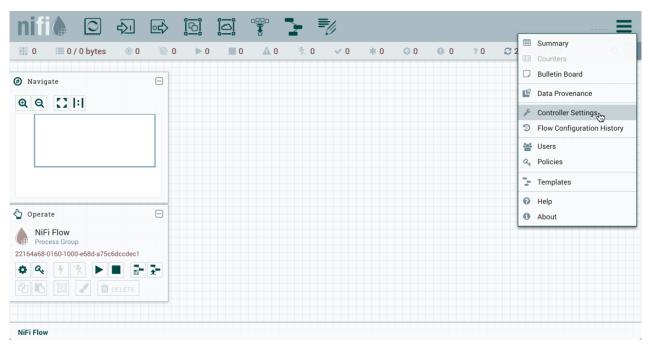
Versioning a DataFlow	
Connecting to a NiFi Registry	
Version States	6
Import a Versioned Flow	
Start Version Control	
Managing Local Changes	
Show Local Changes	
Revert Local Changes	16
Commit Local Changes	
Change Version	
Stop Version Control	
Nested Versioned Flows	
Variables in Versioned Flows	
Restricted Components in Versioned Flows	
Restricted Controller Service Created in Root Process Group	
Restricted Controller Service Created in Process Group	

Versioning a DataFlow

When NiFi is connected to a NiFi Registry, dataflows can be version controlled on the process group level. For more information about NiFi Registry usage and configuration, see the documentation at https://nifi.apache.org/docs/nifi-registry-docs/index.html.

Connecting to a NiFi Registry

To connect NiFi to a Registry, select Controller Settings from the Global Menu.



This displays the NiFi Settings window. Select the Registry Clients tab and click the + button in the upper-right corner to register a new Registry client.

NiFi Setting	5					×
GENERAL	REPORTING TASK CONTROLLER SERVICES	REPORTING TASKS	REGISTRY CLIENTS			
				Click to add	a Registry Client	+
Name 🔺	Loc	ation		Description		

In the Add Registry Client window, provide a name and URL.

Add Registry Client		
Name		
Local Registry		
URL		
http://localhost:18080		
Description		
		11
	CANCEL	ADD

Click "Add" to complete the registration.

liFi Settings							
GENERAL	REPORTING TASK CONTROLLER SE	RVICES RE	PORTING TASKS	REGISTRY CLIENTS			
							+
lame 🔺		Location			Description		
Local Registry		http://loca	lhost:18080			₽ 🖞	
Local Registry		http://loca	lhost:18080			1	
Local Registry		http://loca	lhost:18080			₽ 🖞	
Local Registry		http://local	lhost:18080			10	
Local Registry		http://local	lhost:18080			A 1	
Local Registry		http://loca	lhost:18080			1	
Local Registry		http://loca	lhost:18080			/ 0	
Local Registry		http://local	lhost:18080			/ 0	
Local Registry		http://local	host:18080			/ 0	
Local Registry		http://local	lhost:18080			/ 0	
Local Registry		http://local	lhost:18080			/ 0	

Note: Versioned flows are stored and organized in registry buckets. Bucket Policies and Special Privileges configured by the registry administrator determine which buckets a user can import versioned flows from and which buckets a user can save versioned flows to. Information on Bucket Policies and Special Privileges can be found in the NiFi Registry User Guide (https://nifi.apache.org/docs/nifi-registry-docs/html/user-guide.html).

Version States

Versioned process groups exist in the following states:

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Up to date: The flow version is the latest.

2

Locally modified: Local changes have been made.

6

Stale: A newer version of the flow is available.



Locally modified and stale: Local changes have been made and a newer version of the flow is available.

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Sync failure: Unable to synchronize the flow with the registry.

Version state information is displayed:

- **1.** Next to the process group name, for the versioned process group itself. Hovering over the state icon displays additional information about the versioned flow.
- 2. At the bottom of a process group, for the versioned flows contained in the process group.
- 3. In the Status Bar at the top of the UI, for the versioned flows contained in the root process group.

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🎎 0 🗮 0 / 0 bytes 💿 0	◎ 0 ► 0	28 🔺 12	i	*1	0 1 (1 ?1	😂 14:16:31 EST	Q 🛛
Navigate			8					
ଭ୍ର୍ 🕻 : 	0	Process	Group ABC					
			ig to "ABC" version 2	in "Local Re	egistry - Buc	ket 2"		
		Que <mark>u Flow ve</mark> In Read/Write Out	ersion is current 0 (0 bytes) \rightarrow 0 bytes / 0 bytes 0 \rightarrow 0 (0 bytes)			5 min 5 min 5 min		
		√ 0 * 0	• • • • • • •					
C Operate								
NiFi Flow			Process Group D	EF				
Process Group			◎ 0 ◎ 0 ▶ 0	23 🛕	12 🦎 0			
22164a68-0160-1000-e68d-a75c6dccdec1			Queued 0 (0 bytes)				
🌣 🔍 🕴 🔆 🕨 🔳 📑	2-			0 bytes) → 0			5 min	
Carl 🖸 🖌 🏛 delete				ytes / 0 byte → 0 (0 bytes)			5 min 5 min	
							5 min	
		2	✓1 *1 01	01?1				
NiFi Flow								

Version state information is also shown in the "Process Groups" tab of the Summary Page.

Displa Filte	iying 7 of 7 er	by name 🗸							
	Name	Version State 🔺	Transferr	In / Size 5	Read / Write 5 mi	Out / Size	Sent / Size	Received /	
	NiFi Flow		0 (0 bytes)	0 (0 bytes)	0 bytes / 0 bytes	0 (0 bytes)	0 (0 bytes)	0 (0 bytes)	→ <u> ≜</u>
	Process Group DEF		0 (0 bytes)	0 (0 bytes)	0 bytes / 0 bytes	0 (0 bytes)	0 (0 bytes)	0 (0 bytes)	→ (
	Flow 3	* Locally modified	0 (0 bytes)	0 (0 bytes)	0 bytes / 0 bytes	0 (0 bytes)	0 (0 bytes)	0 (0 bytes)	→ (
	test	Locally modified and stale	0 (0 bytes)	0 (0 bytes)	0 bytes / 0 bytes	0 (0 bytes)	0 (0 bytes)	0 (0 bytes)	→ 📥
	MySQL CDC	Stale	0 (0 bytes)	0 (0 bytes)	0 bytes / 0 bytes	0 (0 bytes)	0 (0 bytes)	0 (0 bytes)	→ (
	PG 13	? Sync failure	0 (0 bytes)	0 (0 bytes)	0 bytes / 0 bytes	0 (0 bytes)	0 (0 bytes)	0 (0 bytes)	→ 📥
	Process Group ABC	 Up to date 	0 (0 bytes)	0 (0 bytes)	0 bytes / 0 bytes	0 (0 bytes)	0 (0 bytes)	0 (0 bytes)	→ 📥

Note: To see the most recent version states, it may be necessary to right-click on the NiFi canvas and select 'Refresh' from the context menu.

Import a Versioned Flow

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When a NiFi instance is connected to a registry, an "Import" link will appear in the Add Process Group dialog.

Add Proces	ss Group	
Process Group N	lame	
Import	oort a flow from a re	egistry
	CANCEL	ADD

Selecting the link will open the Import Version dialog.

Registry				
Local Reg	istry			~
Bucket				
Bucket 1				~
Name				
MySQL CE	DC			~
Version 🚽	Created	Comments		
3	01/02/2018 17:18:44.686	Changed Run Schedule of CDC processor to 300 r	ms.	
3 2	01/02/2018 17:18:44.686 01/02/2018 17:17:38.128	Changed Run Schedule of CDC processor to 300 r Corrected LogAttribute Processor by auto-termina		
2	01/02/2018 17:17:38.128	Corrected LogAttribute Processor by auto-termina		
2	01/02/2018 17:17:38.128	Corrected LogAttribute Processor by auto-termina		
2	01/02/2018 17:17:38.128	Corrected LogAttribute Processor by auto-termina		
2	01/02/2018 17:17:38.128	Corrected LogAttribute Processor by auto-termina		

Connected registries will appear as options in the Registry drop-down menu. For the chosen Registry, buckets the user has access to will appear as options in the Bucket drop-down menu. The names of the flows in the chosen bucket will appear as options in the Name drop-down menu. Select the desired version of the flow to import and select "Import" for the dataflow to be placed on the canvas.

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					MySQL	CDC								
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MySQL CDC Process Group				~	0 * 0	00	0 ? 0							
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🌣 🔍 🦩 🏋 🕨														
	DELETE													
	DELETE													
NiFi Flow														

NiFi Flow

Since the version imported in this example is the latest version (MySQL CDC, Version 3), the state of the versioned process group is "Up to



If the version imported had been an older version, the state would be



Start Version Control

To place a process group under version control, right-click on the process group and in the context menu, select "Version#Start version control".

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🇱 0 🗮 0 / 0 bytes 💿 0 🔯 0 🛛	► 0 📕 5 🔺 0	× 0 🗸 0	*0 0 0 0 ?	0 😂 10:47:53 EST 🛛 🔍 🖸
🙆 Navigate 📃	Process Group ABC	(Configure	
Q Q 🕻 I:I	◎ 0 📎 0 ▶ 0 📕	5 🔺 0 🏌 0	Variables	
	Queued 0 (0 byt) In 0 (0 byt)		Version	Start version control 6000000000000000000000000000000000000
		/ 0 bytes	Enter group	
	✓ 0 * 0 ⊙ 0 0	0 ? 0	StartStop	
			 View status history View connections 	•
🔓 Operate 📃			🕰 Manage access policies	
Process Group ABC			Center in view	
bc90960f-0160-1000-5805-5c2e2cee845d			🖸 Group	
🌣 🔍 🕈 🏌 🕨 📑 🚋			Preate template	
එ			🔁 Сору	
			1 Delete	
NiFi Flow				

In the Save Flow Version window, select a Registry and Bucket and enter a Name for the Flow. If desired, add content for the Description and Comment fields.

Save Flow Version		
Registry		
Local Registry		~
Bucket		
Bucket 2		~
Name		
ABC		
Description		
Get movie CSV data, convert to JSON and publish to Kafka topic "Movies"		4
Comments		
Initial Save		4
	CANCEL	SAVE 🁆

Select Save and Version 1 of the flow is saved.

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		s Group ABC					
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	Queued	0 (0 bytes)					
	In	0 (0 bytes) → 0		5 min			
	Read/Write Out	0 bytes / 0 bytes 0 → 0 (0 bytes)		5 min			
				0.1111			
	✓ 0 ★ 0	0 0 0 ? 0					
) Operate 📃							
NiFi Flow Process Group							
Process Group							
Process Group 164a68-0160-1000-e68d-a75c6dccdec1							
Process Group 164a68-0160-1000-e68d-a75c6dccdec1							
Process Group 164a68-0160-1000-e68d-a75c6dccdec1							
Process Group 164a68-0160-1000-e68d-a75c6dccdec1							

NiFi Flow

As the first and latest version of the flow, the state of the versioned process group is "Up to





Note: The root process group can not be placed under version control.

Managing Local Changes

When changes are made to a versioned process group, the state of the component updates to "Locally



The DFM can show, revert or commit the local changes. These options are available for selection in the context menu when right-clicking on the process group:

 Navigate Navigate Process Group ABC 0 0	nifil 🖸 🕹 🖙	<u>الم</u> الم	}		User1
1 Delete	 O = 0 / 0 bytes O O O Navigate Q Q I II III Operate Process Group ABC Process Group bcb6cc32-0160-1000-4503-16c7bbba2dd9 Q Q Y Y D III 	0 5 A 1 * Process Group ABC © 0 0 5 A Queued 0 (0 bytes) 1 A A In 0 (0 bytes) → Read/Write 0 bytes / 0 byte 0 byte Out 0 → 0 (0 bytes) 0 A A A	1 % 0 • Configure Variables • Version • Enter group • Start • Start • Stop • View status history • View connections • Center in view I Group • Create template	Comm Show I Revert Stop ve	9 EST Q C it local changes local changes local changes
			📋 Delete		

NiFi Flow

or when right-clicking on the canvas inside the process group:

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👬 0 🗏 0 / 0 bytes 💿 0 🔞 0	🕨 0 📕 5 🛕 1 🦎 0 🛹	0 🗰 1 💿 0 🕕 0 ? 0	2 14:39:29 EST Q
Navigate	Get Movie Data GetHTTP 1.5.0-SNAPSHOT org.apache.nifi - nifi-standard-nar		
Q Q 🕻 :	In 0 (0 bytes) Read/Write 0 bytes / 0 bytes Out 0 (0 bytes)	5 min 5 min 5 min	
	Tasks/Time 0/00:00:00.000	5 min	
	Name success Queued 0 (0 bytes)	C Refresh	
	Unzip UnpackContent 1.5.0-SNAPSHOT org.apache.rili - rilf-standard-nar	Configure	
	In 0 (0 bytes) Read/Write 0 bytes / 0 bytes	5 n 5 n Variables	
	Out 0 (0 bytes) Tasks/Time 0 / 00:00:00.000	Sn Version	Commit local changes
) Operate	Name success	► Start	Show local changes
Process Group ABC	Queued 0 (0 bytes)	Stop	C Revert local changes
Cb6cc32-0160-1000-4503-16c7bbba2dd9	RouteOnAttribute RouteOnAttribute 1.5.0-SNAPSHOT org.appede.nli-nlifistandard-nar	& Manage access policies	Stop version control
• • • • • • • • • •	In 0 (0 bytes) Read/Write 0 bytes / 0 bytes	5 🛃 🛃 Upload template	J-SNAPSHOT standard-nar 5 min
	Out 0 (0 bytes) Tasks/Time 0 / 00:00:00.000	5 n 🗗 Create template	s 5 min 5 min 5 min
	Name movies Queued 0 (0 bytes)	Tasks/Time 0/00:00:	
	Add Schema Name Attribute updateAttribute 1.5.0-SNAPSHOT org apache nili - nili update attribute nar	· · · · · · · · · · · · · · · · · · ·	Publish to "Movies" Topic PublishKafkaRecord_0_10 1.5.0-SNAPSHOT org apache.nlfi - nlfikafka-0-lonar
	In 0 (0 bytes) Read/Write 0 bytes / 0 bytes	5 min Queued 0 (0 bytes)	n 0 (0 bytes) 5 min Read/Write 0 bytes / 0 bytes 5 min
	Out 0 (0 bytee)		tut 0.(0.butco) 5 min

The following actions are not considered local changes:

- · disabling/enabling processors and controller services
- stopping/starting processors
- modifying sensitive property values
- modifying remote process group URLs
- updating a processor that was referencing a non-existent controller service to reference an externally available controller service
- creating, modifying or deleting variables



Note: Creating a variable does not trigger a local change because creating a variable on its own has not changed anything about what the flow processes. A component will have to be created or modified that uses the new variable, which will trigger a local change. Modifying a variable does not trigger a local change because variable values are intended to be different in each environment. When a versioned flow is imported, it is assumed there is a one-time operation required to set those variables specific for the given environment. Deleting a variable does not trigger a local change because the component that references that variable will need need to be modified, which will trigger a local change.

Variables do not support sensitive values and will be included when versioning a Process Group.

Show Local Changes

The local changes made to a versioned process group can be viewed in the Show Local Changes dialog by selecting "Version#Show local changes" from the context menu.

Show Local Change	es		
The following changes have	e been made to ABC (Versio	n 1).	
Displaying 4 of 4			
Filter			
Component Name 🔺	Change Type	Difference	
Get Movie Data	Run Schedule Changed	From '10 mins' to '5 mins'	→
LogAttribute	Component Added	Processor was added	→
Publish to "Movies" Topic	Property Value Changed	From 'Compression Type=none' to 'Compression Type=g	jzip' →
RouteOnAttribute	Bulletin Level Changed	From 'WARN' to 'ERROR'	→
			CLOSE

)

)

You can navigate to a component by selecting the "Go To" icon

(in its row.

Note: As described in the Managing Local Changes section, there are exceptions to which actions are reviewable local changes. Additionally, multiple changes to the same property will only appear as one change in the list as the changes are determined by diffing the current state of the process group and the saved version of the process group noted in the Show Local Changes dialog.

Revert Local Changes

Revert the local changes made to a versioned process group by selecting "Version#Revert local changes" from the context menu. The Revert Local Changes dialog displays a list of the local changes for the DFM to review and consider prior to initiating the revert. Select "Revert" to remove all changes.

Revert Local Chang	es			
The following changes have	been made to ABC (Version	1). Revert will remove all changes.]	
Displaying 4 of 4			-	
Filter				
Component Name 🔺	Change Type	Difference		
Get Movie Data	Run Schedule Changed	From '10 mins' to '5 mins'		→
LogAttribute	Component Added	Processor was added		\rightarrow
Publish to "Movies" Topic	Property Value Changed	From 'Compression Type=none' to	o 'Compression Type=gz	zip' →
RouteOnAttribute	Bulletin Level Changed	From 'WARN' to 'ERROR'		\rightarrow
			CANCEL	REVERT

You can navigate to a component by selecting the "Go To" icon



Note: As described in the Managing Local Changes section, there are exceptions to which actions are revertible local changes. Additionally, multiple changes to the same property will only appear as one change in the list as the changes are determined by diffing the current state of the process group and the saved version of the process group noted in the Revert Local Changes dialog.

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Commit Local Changes

To commit and save a flow version, select "Version#Commit local changes" from the context menu. In the Save Flow Version dialog, add comments if desired and select "Save".

Save Flow Version		
Registry Local Registry Bucket Bucket 2 Name ABC	Version of fit to be save	
Description Get movie CSV data, convert to JSON and publish to Kafka topic "Movies" Comments		
Lowered Run Schedule on GetHttp Added Gzip compression Increased bulletin level from Warn to Error Added new LogAttribute processor		
		li.
	CANCEL	SAVE 🕁

Local changes can not be committed if the version that has been modified is not the latest version. In this scenario, the version state is "Locally modified and



Change Version

To change the version of a flow, right-click on the versioned process group and select "Version#Change version".

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0 🗮 0 / 0 bytes 💿 0 📎 0	▶ 0 ■ 5 🔺 0	× 0 • 0 ×	* 0 😡 1 😗 0	? 0 😂 11:56:41 EST	Q 🗆
Image: Second	Process Group ABC \odot 0 \odot 0 \bullet 0 \bullet 5Queued0 (0 bytes)In0 (0 bytes)Read/Write0 bytes /Out0 \rightarrow 0 (0) \checkmark 0 \checkmark 0 \odot 0	5 ▲ 0 ※ 0 s) → 0 0 bytes bytes) 0 ? 0	Configure Variables Version Enter group	Change version Stop version cor	
Coperate			 Start Stop View status history View connections Manage access polic Center in view Group Create template Copy 	•	
NiFi Flow			û Delete		

In the Change Version dialog, select the desired version and select "Change":

Change	Version			
Registry Local Regist Bucket Bucket 2 Name ABC Current Vers 1				
Version 🚽	Created	Comments		
2	01/04/2018 11:23:10.564	Lowered Run Schedule on GetHttp Added Gzip co	mpression Increase	d bulletin leve
1	01/03/2018 10:39:36.520	Initial Save		
			CANCEL	CHANGE 🕁

The version of the flow is changed:

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🎎 0 🗮 0 / 0 bytes 💿 0 📎 0	▶ 0 📕 5 🔺 1 🦎 0	✓ 1 * 0 ⊙ 0 ● 0	? 0 🛛 📿 14:36:41 EST	Q 🛛
2 Marine	1			
🕑 Navigate 📃	Process Group ABC			
ତ୍ତ୍ର 🕻 🕻 🕻		2 in "Local Registry - Bucket 2"		
	Queue Flow version is current			
	In 0 (0 bytes) → Read/Write 0 bytes / 0 bytes	5 min 5 min		
	Out $0 \rightarrow 0 \text{ (0 bytes)}$	5 min		
	✓ 0 * 0 ⊙ 0 ● 0 ? 0			
🖒 Operate 🖂				
 NiFi Flow 				
Process Group				
22164a68-0160-1000-e68d-a75c6dccdec1				
* < * * > = = : :				
省 🖪 🔝 🥒 🛍 delete				
	1			
NiFi Flow				

In the example shown, the versioned flow is upgraded from an older to the newer latest version. However, a versioned flow can also be rollbacked to an older version.



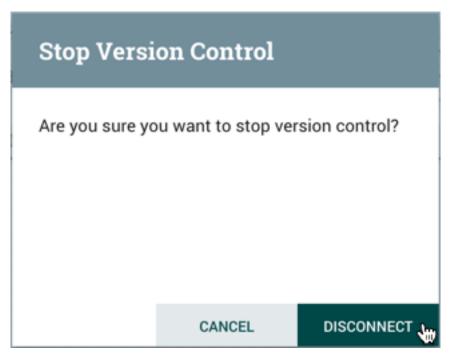
Note: For "Change version" to be an available selection, local changes to the process group need to be reverted.

Stop Version Control

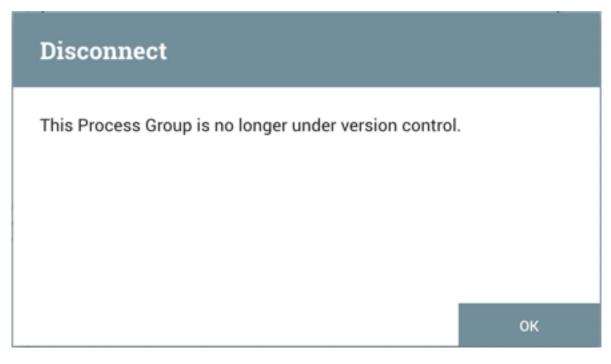
To stop version control on a flow, right-click on the versioned process group and select "Version#Stop version control":

nifil O 🖓 🖙			Userl
0 0 / 0 bytes 0 0 0 Ø Navigate □ □ □ Q Q [] □ □	0 5 ▲ 1 % 0 ✓ ✓ Process Group ABC ③ 0 ○ 0 5 ▲ 1 % Queued 0 (0 bytes) In 0 (0 bytes) 0 % 0 0 8 1 % Queued 0 (0 bytes) 0 ● 0 ● 5 ▲ 1 % Queued 0 (0 bytes) 0 ● 0 ● 5 ▲ 1 % Queued 0 (0 bytes) ● 0 ● 0 ● 0 ● 0 ● 0 Read/Write 0 bytes / 0 bytes ○ ● → 0 (0 bytes) ● ● ● Out • → 0 (0 bytes) ● ● ● ● ● ●	0 Configure Variables Version Change	8:15 EST Q D
Coperate		Start Stop View status history View connections	
bcb6cc32-0160-1000-4503-16c7bbba2dd9		Manage access policies Center in view G Group	
		Create template	
NiFi Flow		1 Delete	

In the Stop Version Control dialog, select "Disconnect".



The removal of the process group from version control is confirmed.



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Image: Second	Process Group ABC	
Operate IFI Flow Process Group		
22164a68-0160-1000-e68d-a75c6dccdec1		
NiFi Flow		

Nested Versioned Flows

A versioned process group can contain other versioned process groups. However, local changes to a parent process group cannot be reverted or saved if it contains a child process group that also has local changes. The child process group must first be reverted or have its changes committed for those actions to be performed on the parent process group.

Variables in Versioned Flows

Variables are included when a process group is placed under version control. If a versioned flow is imported that references a variable not defined in the versioned process group, the reference is maintained if the variable exists. If the referenced variable does not exist, a copy of the variable will be defined in the process group. To illustrate, assume the variable "RPG_Var" is defined in the root process group:

Process Group NiFi Flow			+	Variables RPG_Var
Scope	Name 🔺	Value		Referencing Processors 2 None
NiFi Flow	RPG_Var	/Users/tmp	Û	Referencing Controller Services @ None
				Unauthorized Referencing Components 🛛
				Hone

A process group PG1 is created:

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🕖 Navigate 🗧	3		
ଷ୍ ସ୍ 🕻 🕻 :			
		GetFile GetFile 1.6.0 org.apache.nifi - nifi-standard-nar	
		In 0 (0 bytes)	5 min
		Read/Write 0 bytes / 0 bytes	5 min
		Out 0 (0 bytes)	5 min
		Tasks/Time 0/00:00:000	5 min
🖞 Operate			
	-	Name success	
G PG1		Queued 0 (0 bytes)	
🌣 🔍 🦻 🦎 🕨 🖿 🚰 🏝		LogAttribute	
2 🖪 🖾 🖌 🛍 delete		LogAttribute LogAttribute 1.6.0 org.apache.nifi - nifi-standard-nar	
		In 0 (0 bytes)	5 min
		Read/Write 0 bytes / 0 bytes	5 min
		Out 0 (0 bytes)	5 min
		Tasks/Time 0/00:00:00.000	5 min

The GetFile processor in PG1 references the variable "RPG_Var":

			/ariables RPG_Var
		_	ReG_var
			GetFile
RPG_Var	/Users/tmp	→	Referencing Controller Services 🛛 😨
			lone
			Inauthorized Referencing Components 🛛 🕢
		N	lone
	Name 🔺 RPG_Var		Name ▲ Value RPG_Var /Users/tmp → F

PG1 is saved as a versioned flow:

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👬 0 🗮 0 / 0 bytes 💿 0 🕅	0 🕨 0 📕 2	A 0	՝≹ 0	√ 1	* 0	O	00?	0 😂 10:26:49 EDT	۹ 🖬
 Ø Navigate Q Q [] : 									
			✓ P(
			0	Q 0 🕨	0 📕 2	A 0	× 0		
😋 Operate			Queue		0 (0 byte:				
NiFi Flow			In Read/		0 (0 bytes 0 bytes /			5 min 5 min	
Process Group			Out		$0 \rightarrow 0 (0)$			5 min	
b0f827fb-0162-1000-f651-13328699a42d			~ 0	* 0 6	0 0 0	20			
🌣 🔍 🦻 🦎 🕨 🔳 📑	- <u>-</u>			400					
🔁 🖪 🔝 🖌 🛍 DELETE									
NiFi Flow									

If PG1 versioned flow is imported into this same NiFi instance:

Image: Image	
Q Q () :: Image: Construction of the state	
$ \begin{tabular}{ c c c c } \hline & & & & & & & & & & & & & & & & & & $	
Image: Constraint of the second of the s	
Queued 0 (0 bytes) In 0 (0 bytes) → 0 5 min Read/Write 0 bytes / 0 bytes 5 min Out 0 → 0 (0 bytes) 5 min Out 0 → 0 (0 bytes) 5 min WiFie Flow • 0 * 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0	✓ PG1
$\begin{tabular}{ c c c c c c } \hline In & 0 & (0 & bytes) \rightarrow 0 & 5 & min \\ \hline Read/Write & 0 & bytes & 5 & min \\ \hline Cut & 0 \rightarrow 0 & (0 & bytes) & 5 & min \\ \hline Cut & 0 \rightarrow 0 & (0 & bytes) & 5 & min \\ \hline Operate & \hline O & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 &$	◎ 0 ◎ 0 ▶ 0 ■ 2 ▲ 0 ※ 0
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
Out $0 \rightarrow 0 (0 \text{ bytes})$ 5 min Operate $\checkmark 0 \Rightarrow 0 @ 0 ? 0$ NiFi Flow Process Group points27fb-0162-1000-f651-13328699a42d $\checkmark PG1$ $@ 0 @ 0 @ 0 @ 0 @ 0 @ 0 @ 0 @ 0 @ 0 @ 0$	
Operate □ NiFi Flow Process Group Dof827fb-0162-1000-f651-13328699a42d ✓ PG1 Image: Constraint of the state of t	
NiFi Flow Process Group bof827fb-0162-1000-f651-13328699a42d Image: Control of the state of the stat	
Image: Process Group Image: PG1 Image: PG1	
0/827/b-0162-1000-f651-13328699a42d	
Queued 0 (0 bytes) Image: Constraint of the second	✓ PG1
Queued 0 (0 bytes) Image: Constraint of the second	
In 0 (0 bytes) → 0 5 min Read/Write 0 bytes / 0 bytes 5 min	
	In 0 (0 bytes) → 0 5 min
Out 0 → 0 (0 bytes) 5 min	
✓ 0 ★ 0 ③ 0 ④ 0 ? 0	✓ 0 * 0 ⊙ 0 ● 0 ? 0

the added GetFile processor will also reference the "RPG_Var" variable that exists in the root process group:

Process Group PG1			Variables RPG_Var
Scope NiFi Flow	Name ▲	Value /Users/tmp	Referencing Processors ② ■ GetFile ■ GetFile
		, odero, mp	Referencing Controller Services @
			Unauthorized Referencing Components @ None

If PG1 versioned flow is imported into a different NiFi instance where "RPG_Var" does not exist:

			}			
🎎 0 🗮 0 / 0 bytes 💿 0 🔌	0 0 2	▲ 0 ½ 0	✓ 1 * 0 G	0 0 0 ? 0	C 10:44:52 EDT	Q [
🕖 Navigate	8					
ତ୍ତ୍ର 🖸 🗄						
		✓ PG1				
		• • • •	▶ 0 ■ 2 ▲ 0	× 0		
🖞 Operate	Θ			×υ		
NiFi Flow		Queued	0 (0 bytes) 0 (0 bytes) → 0		5 min	
Process Group		Read/Write	0 bytes / 0 bytes		5 min	
0c75d8df-0162-1000-ef72-2ecd332243b6		Out	0 → 0 (0 bytes)		5 min	
🌣 🤐 🦿 🏋 🕨 🖬 📑		✓ 0 * 0	○ 0 ● 0 ? 0			

A "RPG_Var" variable is created in the PG1 process group:

rocess Group G1			+	Variables RPG_Var
Scope	Name 🔺	Value		Referencing Processors 0 GetFile
PG1	RPG_Var	/Users/tmp	Û	Referencing Controller Services @ None
				Unauthorized Referencing Components 🛛

Restricted Components in Versioned Flows

To import a versioned flow or revert local changes in a versioned flow, a user must have access to all the components in the versioned flow. As such, it is recommended that restricted components are created at the root process group level if they are to be utilized in versioned flows. Let's walk through some examples to illustrate the benefits of this configuration. Assume the following:

- There are two users, "sys_admin" and "test_user" who have access to both view and modify the root process group.
- "sys_admin" has access to all restricted components.

& + 1
0

• "test_user" has access to restricted components requiring 'read filesystem' and 'write filesystem'.

A second Deliging		:
Access Policies		
access restricted components	✓ requiring 'read filesystem'	2 + 1
User 🔺		
CN=test_user, OU=NIFI		Û
•		
C Last updated: 12:51:25 EDT		one" not chown but are also allowed
-	Only listing restriction specific users. Users with permission "regardless of restriction	5115 TIOL SHOWIT DUL ALE AISO Allowed.
	Only insting restriction specific users. Users with permission regardless of restricting	nis not snown but are also anowed.
Flow » * ABC		
Flow » * ABC		:
Flow * ABC		:
Flow * ABC Access Policies access restricted components User •		: &+ 1
Flow * ABC Access Policies access restricted components User •		: &+ 1
Flow * ABC Access Policies access restricted components User •		: &+ 1
Flow * ABC Access Policies access restricted components User •		: &+ 1
Flow * ABC Access Policies access restricted components User •		: &+ 1
Flow * ABC Access Policies access restricted components User •		: &+ 1
Flow * ABC Access Policies access restricted components User •		: &+ 1
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Flow * ABC Access Policies access restricted components User •		: &+ 1
Flow * ABC Access Policies access restricted components User •		: &+ 1
Flow * ABC Access Policies access restricted components User •		: &+ 1
Flow * ABC Access Policies access restricted components User •		: &+ 1
Flow * ABC Access Policies access restricted components User •		: &+ 1

Restricted Controller Service Created in Root Process Group

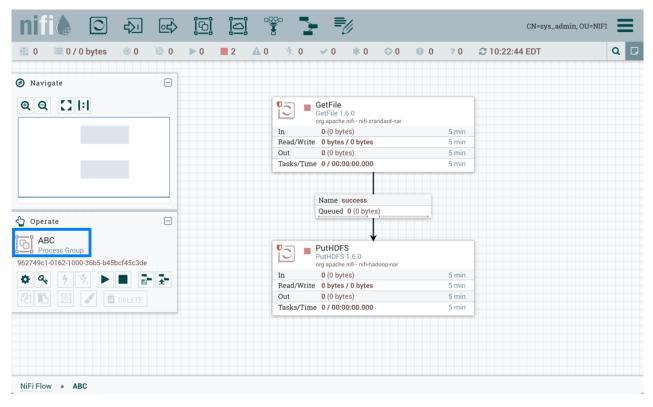
In this first example, sys_admin creates a KeytabCredentialsService controller service at the root process group level.

GENERAL	CONTROLLER SERVICES					
						+
	Name	Туре	Bundle 🔺	State	Scope	
Ð	KeytabCredentialsService RPG	KeytabCredentialsService 1.6.0	org.apache.nifi - nifi-kerberos-credential	Enabled	NiFi Flow	o % Q.

KeytabCredentialService controller service is a restricted component that requires 'access keytab' permissions:

	Courses	Displaying 48 of 48		Filter	
GENERAL	Source all groups		Version	Tags	
		JettyWebSocketServer	1.6.0 🔳	server, Jetty, WebSocket	
	avro cache cluster	JsonPathReader	1.6.0 🔳	parser, reader, record, jsonpath,	+
	csv database	JsonRecordSetWriter	1.6.0 🔳	serialize, record, json, resultset,	
	delimited distributed	JsonTreeReader	1.6.0 🔳	parser, reader, record, tree, json	
	enrich join json key	KeytabCredentialsService	1.6.0 🔳	Kerberos, Keytab, Authenticati	
	record recordset reloadable restricted	MongoDBLookupService	user to define a Keytab and prints.	mongo, lookup, record, mongodb lookup, cache, reloadable, enric	
	row server set value				
	writer	RedisConnectionPoolService RedisDistributedMapCache	1.6.0	cache, redis cache, distributed, map, redis	
		AWSCredentialsProviderC Defines credentials for Amazon configuration. Default credentia	controllerService 1.6.0 or Web Services processors. Uses Is support EC2 instance profile/	g.apache.nifi - nifi-aws-nar default credentials without	

Sys_admin creates a process group ABC containing a flow with GetFile and PutHDFS processors:



GetFile processor is a restricted component that requires 'write filesystem' and 'read filesystem' permissions:

nifi C	Add Processor		=/		udmin, OU=NIFI
Ø Navigate	Source all groups	Displaying 258 of 258	Version	Filter Tags	
Q Q [] : Q Operate NiFi Flow Process Group	amazon attributes avro aws consume csv delete fetch get hadoop ingest ingress insert json kafka listen logs message pubsub put record restricted send	access to.	1.6.0 1.6.0 1.6.0 1.6.0 1.6.0 1.6.0 semissions: vides operator the ability to delet ides operator the ability to read f 1.6.0 1.6.0		ql
0c75d8df-0162-1000-ef72	source update	Track a Rolling Window based FlowFile and add that value to	1.6.0 1.6.0 org.apache.nifi - nifi-sta on evaluating an Expression Lan the processor's state. Each Flow te value of values processed in th	inout. aet. fetch. htto. ooll. htto teful-analysis-nar guage expression on each File will be emitted with the cour	

PutHDFS is a restricted component that requires 'write filesystem' permissions:

nifi	Add Processor	f-1	=/		ndmin, OU=NIFI
Navigate	Source	Displaying 258 of 258		Filter	
	all groups 🗸 🗸	Туре 🔺	Version	Tags	
QQ []!		PutGCSObject	1.6.0	gcs, google cloud, google	, archi
	amazon attributes	PutHBaseCell	1.6.0	hadoop, hbase	
	avro aws consume	PutHBaseJSON	1.6.0	json, hadoop, hbase, put	
	csv delete fetch	PutHBaseRecord	1.6.0	record, hadoop, hbase, pu	t
	get hadoop	PutHDFS	1.6.0	restricted, HDFS, hadoop,	copy,
	ingest ingress insert json kafka	 Requires the following 'write filesystem' - P access to in HDFS or 	permissions: rovides operator the ability to del r the local filesystem.	css, dom, html, put, eleme ete any file that NiFi has inve, database, update, in	sert,
	listen logs	PutHiveStreaming	1.6.0	hive, streaming, database	e, stor
) Operate	message pubsub	PutIgniteCache	1.6.0	cache, stream, insert, upd	late, I
ABC	put record	PutInfluxDB	1.6.0	timeseries, insert, influxd	b, writ
Process Group	restricted send	PutJMS	1.6.0	jms, send, put	
962749c1-0162-1000-36b	source update	PutKafka	160	PuhSuh Messarie Kafka	Anac
🌣 Q. 🦻 🦎		PutHDFS 1.6.0 org.apa	che.nifi - nifi-hadoop-nar		
		Write FlowFile data to Hadoo	op Distributed File System (HDFS)	
				CANCEL	ADD
NiFi Flow » ABC					

The PutHDFS processor is configured to use the root process group level KeytabCredentialsService controller service:

0 / 0 bytes	Configure Processor				
vigate Q [] [:]	SETTINGS SCHEDULING P	ROPERTIES	COMMENTS		
	Required field				+
	Property		Value		
	Hadoop Configuration Resources	0	/Users/tmp/core-site.xml		
	Kerberos Credentials Service	0	KeytabCredentialsService RPG		→
	Kerberos Principal	0	No value set		
	Kerberos Keytab	0	No value set		
	Kerberos Relogin Period	0	4 hours		
erate	Additional Classpath Resources	0	No value set		
PutHDFS	Directory	0	/Users/tmp		
rocessor	Conflict Resolution Strategy	0	fail		
bc-0162-1000-98b5-f3	Block Size	0	No value set		
2. 9 % >	IO Buffer Size	0	No value set		
	Replication	0	No value set		
	Permissions umask	0	No value set		
	Remote Owner	0	No value set		
	Pamata Graun	0	No valua eat		
				CANCEL	APPLY

Sys_admin saves the process group as a versioned flow:

nifi 🖸 🕹	₀₫⟩	<u>i</u> 0j			U				CN=sys_admin	n, OU=NIFI
👬 0 🗮 0 / 0 bytes 💿 0	0 Ø	▶ 0	A 0	🏌 O 🛛 🛩 1	* 0	0 📀	0	? 0	C 10:44:44 EDT	Q 🛛
Navigate	Θ									
ବ୍ ସ୍ 🖸 :	_			GetFile GetFile org.apach	9 1.6.0 ne.nifi - nifi-sta	indard-nar				
			In	0 (0 b)				5 min		
				ad/Write 0 byte				5 min		
			Ou					5 min		
			Ta	sks/Time 0/00	:00:00.000			5 min		
					success d 0 (0 bytes	5)				
Operate	Θ									
ABC Process Group 962749c1-0162-1000-36b5-b45bcf45c3de						doop-nar				
			In	0 (0 b)				5 min		
🌣 🔍 🦻 🕺 🕨 📑	£-			ad/Write 0 byte				5 min		
🙆 🖪 🔟 🖌 🛍 delete			Ou					5 min		
			Ta	sks/Time 0/00	:00:00.000			5 min		
									-	
NiFi Flow » 🗸 ABC										

Test_user changes the flow by removing the KeytabCredentialsService controller service:

0 🗏 0 / 0 bytes	Configure Processor					Q
Navigate	SETTINGS SCHEDULING PROPERT	TES	COMMENTS			
Q []	Required field				+	
	Property	١	Value			
	Hadoop Configuration Resources	0	/Users/tmp/core-site.xml			
	Kerberos Credentials Service	0	No value set			
	Kerberos Principal	0	No value set			
	Kerberos Keytab	0	No value set			
	Kerberos Relogin Period	0	4 hours			
Operate	Additional Classpath Resources	0	No value set			
PutHDFS	Directory	0	/Users/tmp			
Processor	Conflict Resolution Strategy	0	fail			
836bc-0162-1000-98b5-f3	Block Size	0	No value set			
a. 4 × >	IO Buffer Size	0	No value set			
	Replication	0	No value set			
	Permissions umask	0	No value set			
	Remote Owner	0	No value set			
	Pomoto Group	0	No voluo eot			
				CANCEL	APPLY	

If test_user chooses to revert this change:

nifi 🖸 🖸				2	≡ //			CN=tes	t_user, OU=N	NIFI
888 0 🗮 0 / 0 bytes	Revert Local C	Changes								Q 🗆
Image: Organization Image: Organization	Displaying 1 of 1 Filter		to ABC_Flow		1). Revert will remove all cha	anges.				
	Component Name PutHDFS	Change Type Property Removed			ference 🔺 roperty 'Kerberos Credentials Si	ervice' was removed	-			
Operate ABC Process Group 962749c1-0162-1000-36b5-b4										
						CANCEL	REVERT	J		
NiFi Flow » * ABC										

the revert is successful:

nifi (O 🖓 🖙 🔄	¥ 1	CN=test_user, OU=NIFI
🗱 0 🗏 0 / 0 bytes 💿 0 📎 0 🕨 0 🔳 1 🛕	1 🔆 0 🗸 0 🗰 1 📀 0	🕒 0 ? 0 😂 13:01:08 EDT 🛛 🔍 🖵
🕖 Navigate		
QQ [] :		
	GetFile 1.6.0	_
Ch	ange Flow Version	
		5 min 5 min
This	Process Group version has changed.	5 min
	100%	-
🖞 Operate 📃		
ABC Process Group		
962749c1-0162-1000-36b5-b45bcf45c3de	CLOSE	
	org.apache.nifi - nifi-hadoop-na	
	In 0 (0 bytes)	
	Read/Write 0 bytes / 0 bytes	
	Out 0 (0 bytes)	
	Tasks/Time 0 / 00:00:00.000	
NiFi Flow » 🛩 ABC		

Additionally, if test_user chooses to import the ABC versioned flow:

nifi 🖸 🖸					2	≡		CN=	test_user, OU=NIFI
888 0 🗮 0 / 0 bytes	Import \	Version							Q
	Bucket Bucket_AB Name ABC_Flow							~ ~ ~	
🖞 Operate	Version 🚽	Created 04/05/2018 13:0	00:37.510	Commer Initial S					
NiFi Flow Process Group 0c75d8df-0162-1000-ef72-2ec Image: Construction of the second sec							CANCEL	IMPORT	
NiFi Flow									

The import is successful:

nifi 🖸 🖸	⇔	₀⊴>	ស្រ្ត	<u>اْ</u> تَ				U				CN:	=test_user, OU=NIFI	≡
👬 0 🗮 0 / 0 bytes	• 0	0 🧭	▶ 0	2	A 0	* 0	✓ 1	* 0	0 📀	0	? 0	C 09:59:54 EDT		Q 🛛
 Ø Navigate Q Q [] : 		Θ												
					✓ A○ 0		0 📕 2	A 0 %	0					
Operate NiFi Flow		8			Queued 0 (0 bytes) In 0 (0 bytes) → 0 5 min Read/Write 0 bytes / 0 bytes 5 min Out 0 → 0 (0 bytes) 5 min									
Process Group 0c75d8df-0162-1000-ef72-2ecd3	32243b6				✓ 0	* 0 (0000	? 0						
	DELETE	÷-												
NiFi Flow														

Restricted Controller Service Created in Process Group

Now, consider a second scenario where the controller service is created on the process group level.

Sys_admin creates a process group XYZ:

nifil 🖸 🖓	<u>_</u>	ស្រ្ត	ا ا ا				U					CN=s	ys_admin, OU	=NIFI	
🎎 0 🗮 0 / 0 bytes 💿 0	0 🥨	▶ 0	0	A 0	🔆 О	✓ 0	* 0	O O	0	? 0	2 15:	46:51 EDT		Q	D
Ø Navigate	Θ														
Q Q []															
					XYZ										
					0	0 🕨 (0 🔳 0	🗛 O 🤺 (0						
🖒 Operate	Θ				Queued		(0 bytes)								
	_				In		(0 bytes)				5 min				
NiFi Flow Process Group					Read/W Out		bytes / 0 l → 0 (0 by				5 min 5 min				
0c75d8df-0162-1000-ef72-2ecd332243b6											5 11111				
🌣 🔍 🦻 🦹 🕨 📑	3-				< 0 3	K 0 🕥	0 🕛 0 '	2 0							
	I														
2 C 🖸 🗹 🗴 DELETE															
NiFi Flow															

Sys_admin creates a KeytabCredentialsService controller service at the process group level:

GENERA	L CONTROLLER SERVICES					
						+
	Name	Туре	Bundle 🔺	State	Scope	
8	KeytabCredentialsService PG	KeytabCredentialsService 1.6.0	org.apache.nifi - nifi-kerberos-credential	Enabled	XYZ	¢ % Q.

The same GetFile and PutHDFS flow is created in the process group:

nifil 🖸 🕹	⊶	<u>[6]</u>					U					CN=	sys_admin, OU=NIF	т Ш
🎎 0 🔲 0 / 0 bytes 💿 0	0 Ø	▶ 0	2	A 0	у о	√ 0	* 0	0 🖸	0	? 0	2 15:	57:41 EDT		Q 🛛
Ø Navigate	Θ													
Q Q [] :					0	G	GetFile ietFile 1.6.0 rg.apache.nifi		'd-nar					
					In		0 (0 bytes)				5 min			
							0 bytes / 0	bytes			5 min			
					Out		0 (0 bytes) 0 / 00:00:0	0.000			5 min 5 min			
					Tasks	s/11me	0700:00:0	0.000			5 min			
										_				
A	0						Name <mark>succ</mark> Queued 0 (
🖕 Operate	Θ						Queueu 0 (o bytes)		-				
KYZ Process Group														
Process Group														
96db60fc-0162-1000-1ac8-dc96718ec37a	2-				0	P	PutHDFS PutHDFS 1.6 rg.apache.nifi		-nar					
Car					In		0 (0 bytes)			Ę	5 min			
					Read	/Write	0 bytes / 0	bytes		ŧ	5 min			
					Out		0 (0 bytes)				5 min			
					Tasks	s/Time	0 / 00:00:0	0.000		ŧ	5 min			
NiFi Flow » XYZ														

However, PutHDFS now references the process group level controller service:

0 🗏 0 / 0 bytes	Configure Processor				Q
Navigate	SETTINGS SCHEDULING PROPERT	TIES	COMMENTS		
	Required field			+	
	Property		Value		
	Hadoop Configuration Resources	0	/Users/tmp/core-site.xml		
	Kerberos Credentials Service	0	KeytabCredentialsService PG	→	
	Kerberos Principal	0	No value set		
	Kerberos Keytab	0	No value set		
	Kerberos Relogin Period	0	4 hours		
perate	Additional Classpath Resources	0	No value set		
PutHDFS	Directory	0	/Users/tmp		
Processor	Conflict Resolution Strategy	0	fail		
ce82-0162-1000-6ed6-f7	Block Size	0	No value set		
Q. 4 × >	IO Buffer Size	0	No value set		
	Replication	0	No value set		
	Permissions umask	0	No value set		
	Remote Owner	0	No value set		
	Pamota Croun	0	No value est		
			CANCEL	APPLY	

Sys_admin saves the process group as a versioned flow.

Test_user changes the flow by removing the KeytabCredentialsService controller service. However, with this configuration, if test_user attempts to revert this change:

nifia 🖸				CN=test_user, OU=NIFI
888 0 🗮 0 / 0 bytes	Revert Local C	Changes		Q 🗆
Ø NavigateQ< ∑ : 	The following chang Displaying 1 of 1 Filter	ges have been made to XYZ_Flow (\	ersion 1). Revert will remove all changes.	
	Component Name PutHDFS	Change Type Property Removed	Difference Property 'Kerberos Credentials Service' was removed	→
🖒 Operate				
XYZ Process Group				
96db60fc-0162-1000-1ac8-dc4				
			CANCEL	REVERT
NiFi Flow » 🗰 XYZ				
MITTIOW * + X12				

the revert is unsuccessful because test_user does not have the 'access keytab' permissions required by the KeytabCredentialService controller service:

		CN=test_user, OU=NIFI			
🗱 0 🗮 0 / 0 bytes 💿 0 💿 0 🕨 0) ■1 🗚1 🕺0 🗸0 🗰1 🐼0 ❶0 ?	0 😂 16:03:17 EDT 🛛 🔍 🖵			
🙆 Navigate					
QQ[]!	GetFile 1.6.0 org.apache.nifi - nifi-standard-nar				
	Insufficient Permissions				
	Unable to modify Components requiring additional permission: access keytab. Contact the system administrator.				
🖒 Operate 📃					
WYZ Process Group 96db60fc-0162-1000-1ac8-dc96718ec37a					
	OK				
	PutHDFS 1.6.0 org.apache.nifi - nifi-hadoop-nar				
	In 0 (0 bytes)				
	Read/Write 0 bytes 0 bytes				
	Out 0 (0 bytes) Tasks/Time 0 / 00:00:00.000				
	Tasks/Time 0700.00.000				
NiFi Flow » * XYZ					

Similarly, if test_user tries to import the XYZ versioned flow:

nifi 🖸 🖸		¥ 🕨 🗾	CN=test	t_user, OU=NIFI
888 0 🗮 0 / 0 bytes	Import Version			Q
Navigate Q Q I:I	Registry Local Secured Registry Bucket Bucket_XYZ Name		~	
	XYZ_Flow Version + Created	Comments	~	
Operate NiFi Flow Process Group 0075d8df0162-1000-ef72-2ec	1 04/05/2018 16:01:53.935	Initial Save		
NiFi Flow			CANCEL IMPORT	

The import fails:

nifi 🖸 🕹 🖙	iai 🚏 🍃 🗾	CN=test_user, OU=NIFI
🏭 0 🗮 0 / 0 bytes 💿 0 🔌 0	▶0 ■1 ▲1 ※0 ✓0 ≉1 ©0 ●0 ?0	C 16:07:53 EDT Q
Navigate		
	Insufficient Permissions Unable to modify Components requiring additional permission: access keytab. Contact the system administrator.	
Operate Signification 96db60fc-0162-1000-1ac8-dc96718ec37a Image: Signification Image: Signification	OK	