EXTREME NETWORKS

Fabric Extend Onboard XIQ-SE workflow

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Technical Marketing Engineering

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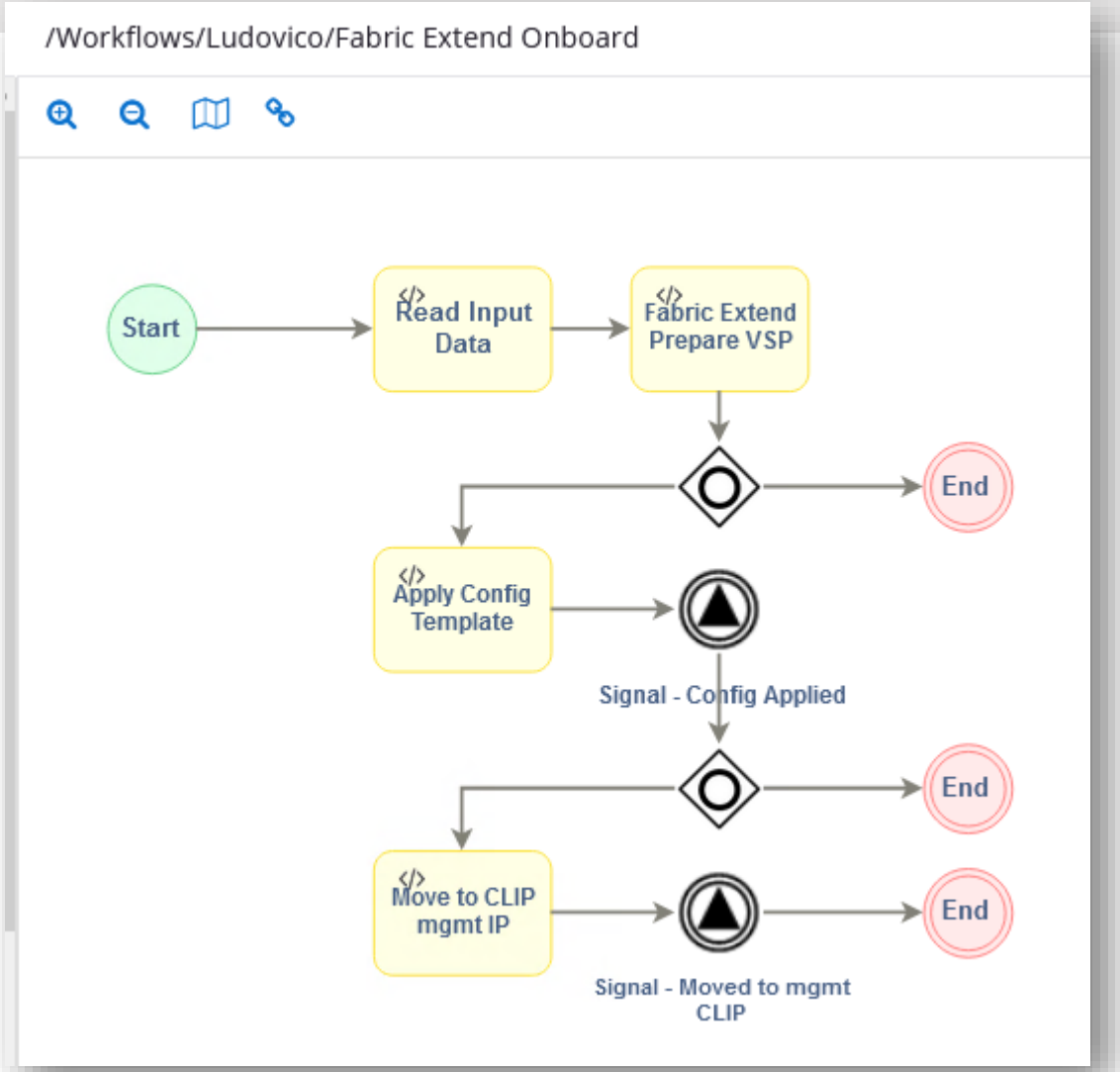
ADVANCE WITH US

Fabric Extend Onboard XIQ-SE workflow

- Workflow to onboard newly provisioned VSPs with Fabric Extend.
- The first two activities will move the mgmt VLAN IP onto newly defined Fabric Extend VLAN and VRF.
- Middle activity, Apply Config Template, pushes an ASCII config template where variables can be dereferenced against site variables and/or a CSV file.
- Last activity, Move to CLIP mgmt IP, creates a mgmt CLIP then re-adds device to XIQ-SE using that mgmt CLIP to same or different XIQ-SE site
- Both the ASCII config template and CSV file need to be uploaded to the XIQ-SE filesystem.
- This workflow is designed to be assigned to a Site, under Action tab, as a Custom Configuration Task.
- It can also be manually run against one ~~or more~~ VSPs.



Fabric Extend Onboard workflow - Apply Config Template activity

The embedded variables can be of three types:

- ${variableName}: XIQ-SE Global or Site specific variables, in this preference order: local site, site parents, global
  - Selected emc_vars can be included by adding them to const_EXPORT_EMC_VARS; currently: deviceIP, serverIP, serverName
- $<csvColumnKey>: Device specific variables extracted from supplied CSV file
- $UD1, $UD2, $UD3, $UD4: Device specific values extracted from device User Data 1-4

For the CSV variables, a CSV file must be provided with the following syntax:

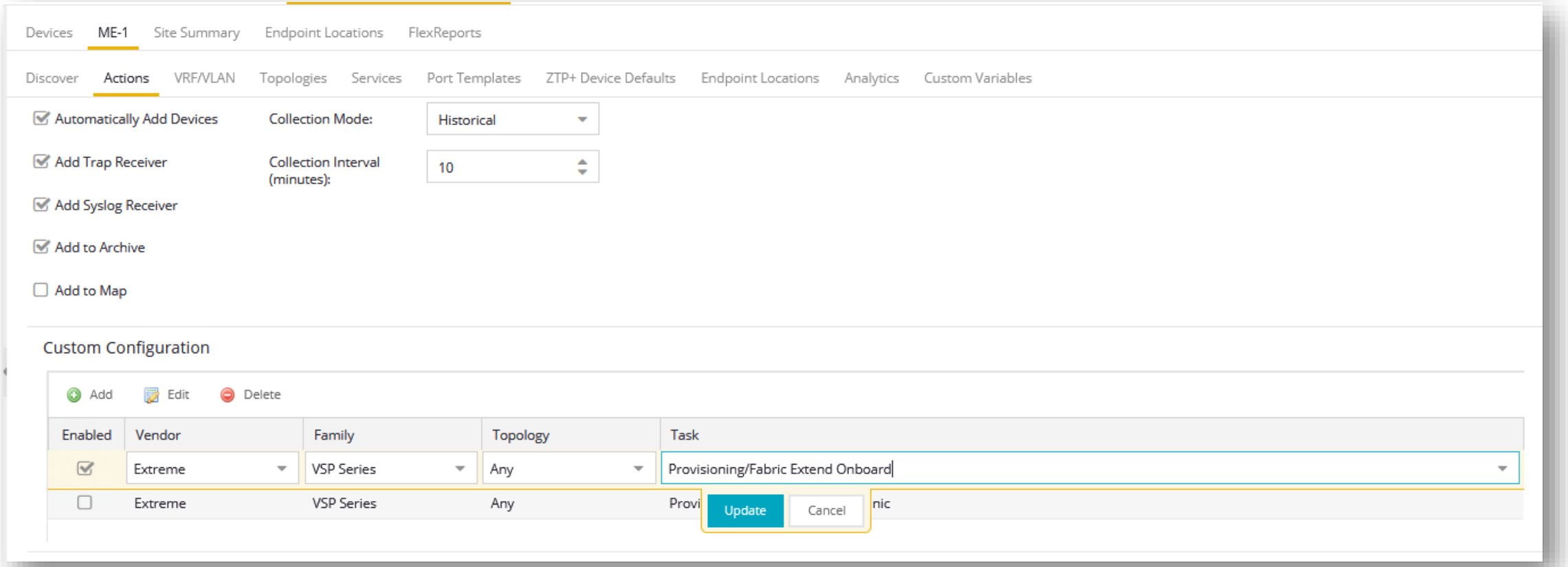
- First row has column labels, which need to match the $<csvColumnKey> variables, without the $<>
- Subsequent rows contain data values for every device, one row per device.
- First column contains the device lookup, either the device IP or Serial Number

ASCII config template file and the CSV file must be placed on the XIQ-SE filesystem.

Commands which generate a confirmation prompt enter as example: "no spanning-tree mstp\ny"

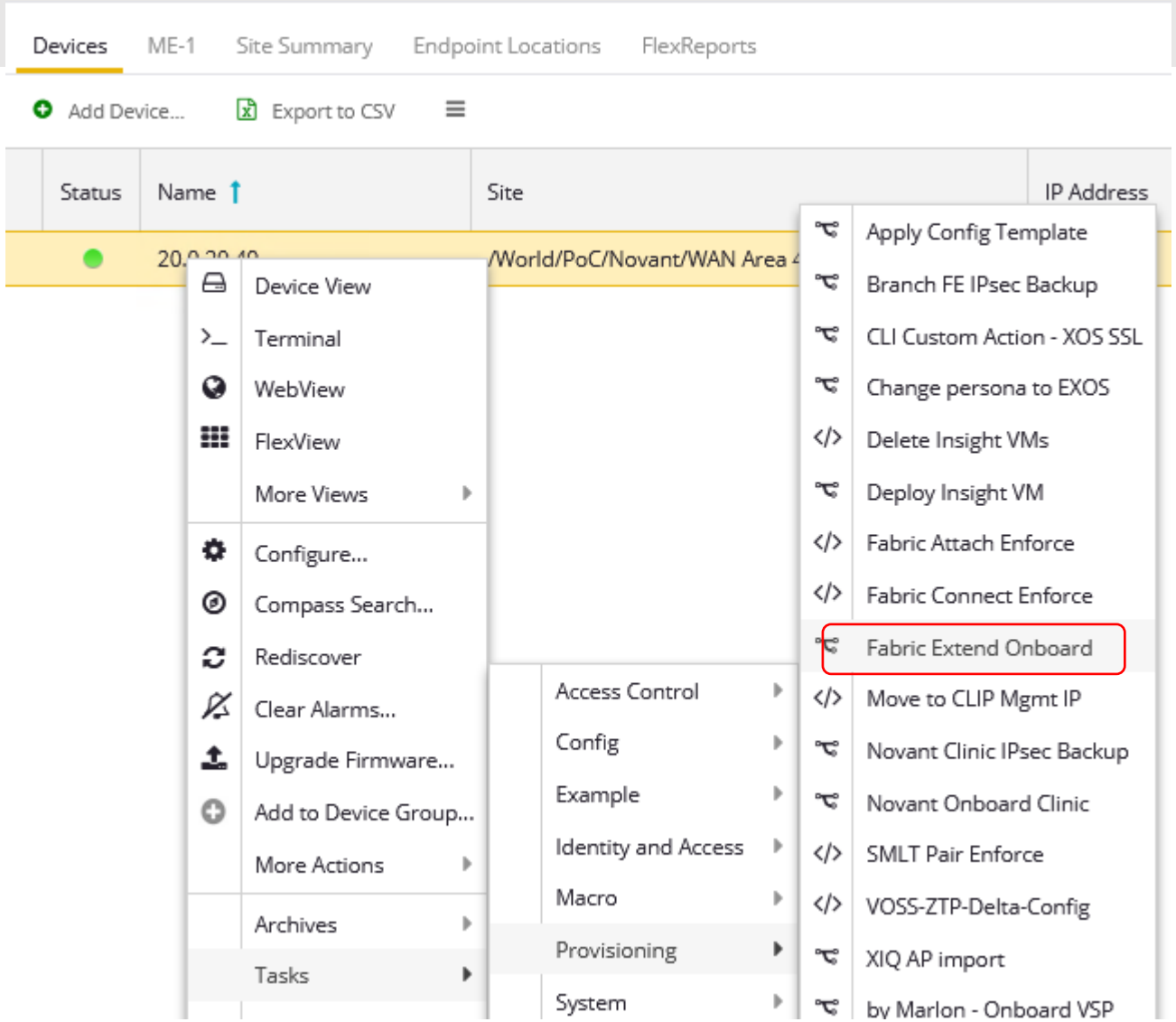
Workflow automatic execution during onboarding

- Workflow can be automatically run after ZTP+ onboarding, under XIQ-SE Site Actions
- Workflow will always run against 1 switch only, the onboarding switch



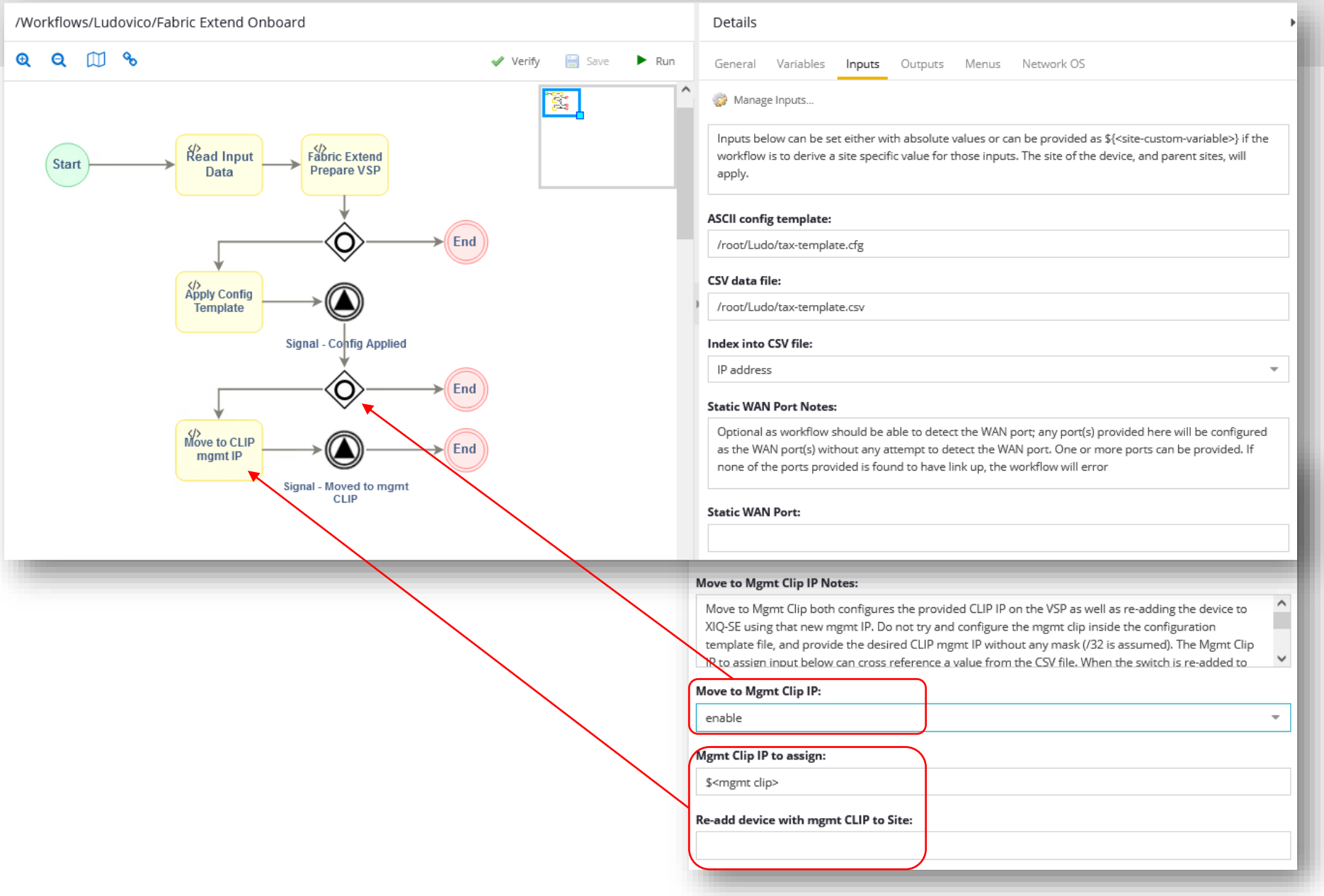
Workflow manual execution

- Workflow can also be manually executed, if needed
- Only against 1 switch, as the signals won't cater more devices.



Workflow inputs

- The Move to Mgmt CLIP enable/disable pulldown determines whether the last activity runs or not
- When last activity re-adds device (with mgmt CLIP) to XIQ-SE it can do so into a user specified Site; if no Site is specified then the device will be re-added to the same site (but that will trigger the same site actions and this workflow will run again… and fail the 2nd time)



Workflow inputs, with CSV values

General | Variables | **Inputs** | Outputs | Menus | Network OS

Manage Inputs...

Notes:

Inputs below can be set either with absolute values or can be provided as ${<site-custom-variable>} if the workflow is to derive a site specific value for those inputs. The site of the device, and parent sites, will apply.

ASCII config template:

/root/Ludo/tax-template.cfg

CSV data file:

/root/Ludo/tax-template.csv

Index into CSV file:

IP address

IP address

Serial Number

WAN port(s) without any attempt to detect the WAN p
provided is found to have link up, the workflow will en

Static WAN Port:

*template.cfg - Notepad

File Edit Format View Help

```
link-state group 1 enable
link-state group 1 upstream interface gigabitEthernet $UD1
link-state group 1 downstream interface gigabitEthernet $<tuni port>
router vrf fabext
   ip route 0.0.0.0 0.0.0.0 $UD2 weight 10
   ip route ${tunnelDest} 255.255.255.255 $UD2 weight 10
exit
router isis
   ip-tunnel-source-address ${deviceIP} vrf fabext
   manual-area $<isis area>
exit
logical-intf isis 255 dest-ip ${tunnelDest} name $<tunnel name>
   isis
   isis spbm 1
   isis spbm 1 l1-metric $<vxlan nni metric>
   isis enable
exit
filter acl 1 type inPort
filter acl port 1 $<tuni port>
filter acl ace 1 1001
filter acl ace action 1 1001 permit remark-dot1p $<macsec qos remark>
filter acl ace action 1 1001 permit count
filter acl ace action 1 1001 permit internal-qos $<macsec qos remark>
filter acl ace ethernet 1 1001 dst-mac mask 00:00:00:00:00:00 0xffffffffffff
filter acl ace 1 1001 enable
i-sid $<tuni isid> elan-transparent
   port $<tuni port>
exit
```

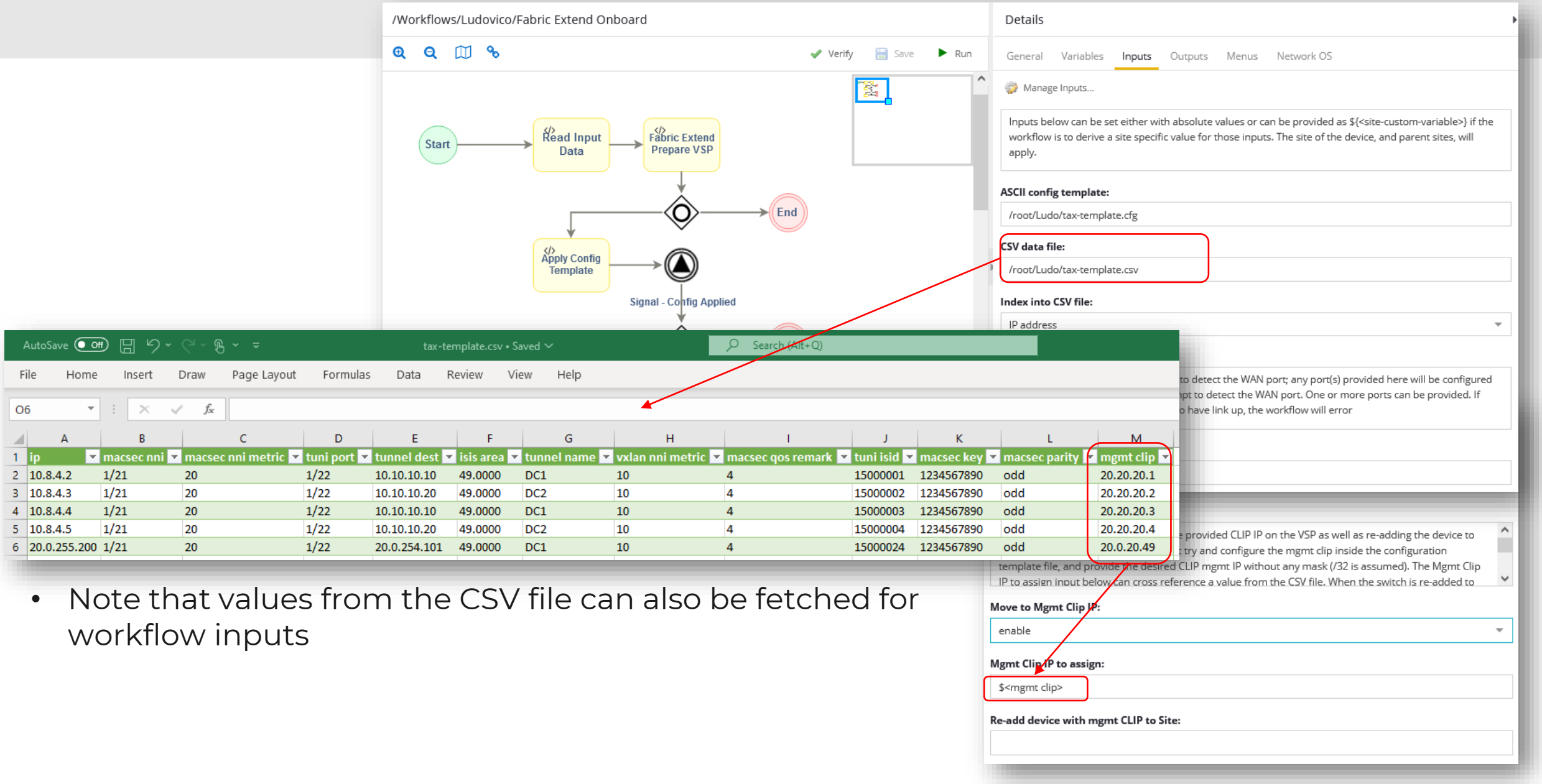
AutoSave Off | tax-template.csv • Saved | Search (Alt+Q)

File Home Insert Draw Page Layout Formulas Data Review View Help

O6

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	ip	macsec nni	macsec nni metric	tuni port	tunnel dest	isis area	tunnel name	vxlan nni metric	macsec qos remark	tuni isid	macsec key	macsec parity	mgmt clip
2	10.8.4.2	1/21	20	1/22	10.10.10.10	49.0000	DC1	10	4	15000001	1234567890	odd	20.20.20.1
3	10.8.4.3	1/21	20	1/22	10.10.10.20	49.0000	DC2	10	4	15000002	1234567890	odd	20.20.20.2
4	10.8.4.4	1/21	20	1/22	10.10.10.10	49.0000	DC1	10	4	15000003	1234567890	odd	20.20.20.3
5	10.8.4.5	1/21	20	1/22	10.10.10.20	49.0000	DC2	10	4	15000004	1234567890	odd	20.20.20.4
6	20.0.255.200	1/21	20	1/22	20.0.254.101	49.0000	DC1	10	4	15000024	1234567890	odd	20.0.20.49

Workflow inputs



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	ip	macsec nni	macsec nni metric	tuni port	tunnel dest	isis area	tunnel name	vxlan nni metric	macsec qos remark	tuni isid	macsec key	macsec parity	mgmt clip
2	10.8.4.2	1/21	20	1/22	10.10.10.10	49.0000	DC1	10	4	15000001	1234567890	odd	20.20.20.1
3	10.8.4.3	1/21	20	1/22	10.10.10.20	49.0000	DC2	10	4	15000002	1234567890	odd	20.20.20.2
4	10.8.4.4	1/21	20	1/22	10.10.10.10	49.0000	DC1	10	4	15000003	1234567890	odd	20.20.20.3
5	10.8.4.5	1/21	20	1/22	10.10.10.20	49.0000	DC2	10	4	15000004	1234567890	odd	20.20.20.4
6	20.0.255.200	1/21	20	1/22	20.0.254.101	49.0000	DC1	10	4	15000024	1234567890	odd	20.0.20.49

- Note that values from the CSV file can also be fetched for workflow inputs

Workflow, site variables

- Template can also take ${var} variables
- Values for these variables are looked up in the Site Custom variables, in this preference order:
  - Site of device
  - Parent Site of device
  - Parent sites up to Root site
  - Global variable

*template.cfg - Notepad

File Edit Format View Help

```
link-state group 1 enable
link-state group 1 upstream interface gigabitEthernet $UD1
link-state group 1 downstream interface gigabitEthernet $<tuni port>
router vrf fabext
   ip route 0.0.0.0 0.0.0.0 $UD2 weight 10
   ip route ${tunnelDest} 255.255.255.255 $UD2 weight 10
exit
router isis
   ip-tunnel-source-address ${deviceIP} vrf fabext
   manual-area $<isis area>
exit
logical-intf isis 255 dest-ip ${tunnelDest} name $<tunnel name>
   isis
   isis spbm 1
   isis spbm 1 l1-metric $<vxlan nni metric>
   isis enable
exit
filter acl 1 type inPort
filter acl port 1 $<tuni port>
filter acl ace 1 1001
filter acl ace action 1 1001 permit remark-dot1p $<macsec qos remark>
filter acl ace action 1 1001 permit count
filter acl ace action 1 1001 permit internal-qos $<macsec qos remark>
filter acl ace ethernet 1 1001 dst-mac mask 00:00:00:00:00:00 0xffffffffffff
                                ace 1 1001 enable
                               ni isid> elan-transparent
                               tuni port>
```

Devices | Sandbox ZTF | Site Summary | Endpoint Locations | FlexReports

Discover | Actions | VRF/VLAN | Topologies | Services | Port Templates | ZTP+ Device Defaults | Endpoint Locations | Analytics | Custom Variables

Add | Edit | Delete

Scope			Variable		
Category	Site ↓	Type	Name	Type	Value
Site	/World/PoC/Sandbox ZTF		locationGroup	String	PhysicalSandbox
Site	/World/PoC/Sandbox ZTF		dataIsid	String	0
Site	/World/PoC/Sandbox ZTF		tunnelDest	String	20.120.10.20
Site	/World/PoC/Sandbox ZTF		dataVlan	String	0
Site	Global		Auto Sync VLANs in...	String	Done
Site	Global		nacEnable	String	enable
Site	Global		locationGroup	String	0

Workflow, emc_vars as variables

- Selected emc_vars can also be fed into the same ${var} space, by adding them to workflow variable const_EXPORT_EMC_VARS

*template.cfg - Notepad

File Edit Format View Help

```
link-state group 1 enable
link-state group 1 upstream interface gigabitEthernet $UD1
link-state group 1 downstream interface gigabitEthernet $<tuni port>
router vrf fabext
   ip route 0.0.0.0 0.0.0.0 $UD2 weight 10
   ip route ${tunnelDest} 255.255.255.255 $UD2 weight 10
exit
router isis
   ip-tunnel-source-address ${deviceIP} vrf fabext
   manual-area $<isis area>
exit
logical-intf isis 255 dest-ip ${tunnelDest} name $<tunnel name>
   isis
   isis spbm 1
   isis spbm 1 l1-metric $<vxlan nni metric>
   isis enable
exit
filter acl 1 type inPort
filter acl port 1 $<tuni port>
filter acl ace 1 1001
filter acl ace action 1 1001 permit remark-dot1p $<macsec qos remark>
filter acl ace action 1 1001 permit count
filter acl ace action 1 1001 permit internal-qos $<macsec qos remark>
filter acl ace ethernet 1 1001 dst-mac mask 00:00:00:00:00:00 0xffffffffffff
filter acl ace 1 1001 enable
i-sid $<tuni isid> elan-transparent
```

Workflow Dashboard | Scheduled Tasks | Saved Tasks | Scripts | Workflows

Palette | /Workflows/Ludovico/Apply Config Template

Activities

Verify | Save | Run

Start → Apply Config Template → End

Signal - Config Applied

Details

General | Variables | Inputs | Outputs | Menus | Network OS

Add | Edit | Delete | Global Variables...

Name	Default Value	Variable Reference	Scope	Type
const_EXPORT_EMC_VARS	["deviceIP", "serverIP", "serverName"]		Workflow	Json
devices			Workflow	Json
input_configFile			Workflow	String
input_csvFile			Workflow	String
input_csvKey			Workflow	String
input_notes			Workflow	String

Workflow, UserData1-4 variables

- Values unique to each device can also be fetched from the device UserData1-4 fields
- Only value after "=" is used
- As can be seen, the 1st Activity populates the 1st two fields with the detected WAN port and the detected WAN router next-hop IP

*template.cfg - Notepad

File Edit Format View Help

```
link-state group 1 enable
link-state group 1 upstream interface gigabitEthernet $UD1
link-state group 1 downstream interface gigabitEthernet $<tuni port>
router vrf fabext
   ip route 0.0.0.0 0.0.0.0 $UD2 weight 10
   ip route ${tunnelDest} 255.255.255.255 $UD2 weight 10
exit
router isis
   ip-tunnel-source-address ${deviceIP} vrf fabext
   manual-area $<isis area>
exit
logical-intf isis 255 dest-ip ${tunnelDest} name $<tunnel name>
   isis
   isis spbm 1
   isis spbm 1 l1-metric $<vxlan nni metric>
   isis enable
exit
filter acl 1 type inPort
filter acl port 1 $<tuni port>
filter acl ace 1 1001
filter acl ace action 1 1001 permit remark-dot1p $<macsec qos remark>
filter acl ace action 1 1001 permit count
filter acl ace action 1 1001 permit internal-qos $<macsec qos remark>
filter acl ace ethernet 1 1001 dst-mac mask 00:00:00:00:00:00 0xffffffffffff
filter acl ace 1 1001 enable
i-sid $<tuni isid> elan-transparent
   port $<tuni port>
exit
```

Devices | Sandbox ZTF | Site Su

Add Device... | Export to C

Status	Name	Si
▲	Sbox-VSP7200-1	/V
▲	Sbox-VSP7200-2	/V
▲	Sbox-VSP7200-3	/V
▲	Sbox-VSP7200-4	/V
●	X460G2-1	/V

Configure Device

Device ID	System Name	Device Nickname	Device Type	P
10.8.4.3	Sbox-VSP7200-2	Sbox-VSP7200-2	VSP-7254XSQ	SN

Device | Device Annotation | VRF Definitions | VLAN Definitions | CLIP Addresses | Topology | Servi

Nickname: Sbox-VSP7200-2

Asset Tag:

User Data 1: wan port = 1/1

User Data 2: wan router = 192.168.255.123

User Data 3:

User Data 4:

Note:

Comparison of template variables

- Site variables ${var}: Useful to apply same values to all devices in same XIQ-SE Site. Or to apply same values to all devices in same sub-Sites
- CSV variables $<var>: Useful to provide device specific values
- UserData variables $UD1-4: Useful to provide device specific values, but for values obtained dynamically from the device itself (by another workflow or activity) and then make these available in this Apply Config Template workflow
- Emc_vars ${deviceIP}: Useful to feed some of these values into the same space as Site variables

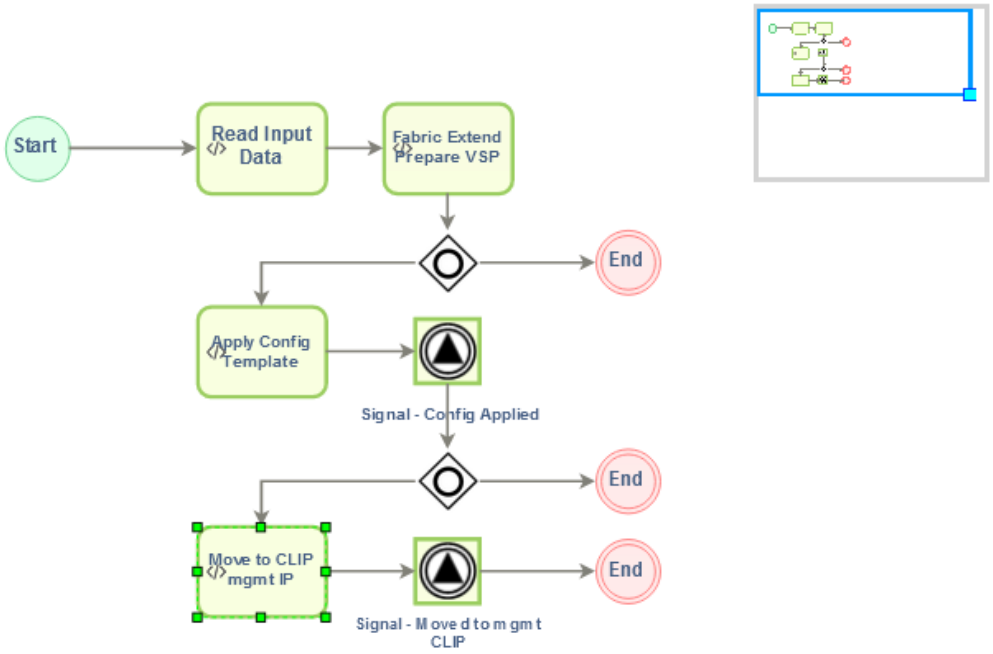
Worflow execution

Summary

Status	Start Date/Time	Name	Version	Source	# Devices	Started By	End Date/Time	Message	Path
✔	8/17/2022 2:55:47 ...	Fabric Extend Onbo...	63	Workflow Designer ...	1	lstevens	8/17/2022 2:58:03 ...	Re-added device using mgmt CLIP IP 20.0.20...	/Workflows/Ludovico/Fabric Extend Onboard

Graph View | Table View

Stop Workflow | Show Output | Show Variables



Devices Grid

Show

Status	Device IP	Output Path	Start Date/Time	End Date/Time	Message
SUCCESS	20.0.255.200		8/17/2022 2:5...	8/17/2022 2:5...	Re-added device using mgmt CLIP IP 20.0.20.49 to XIQ-SE Site '/World/PoC

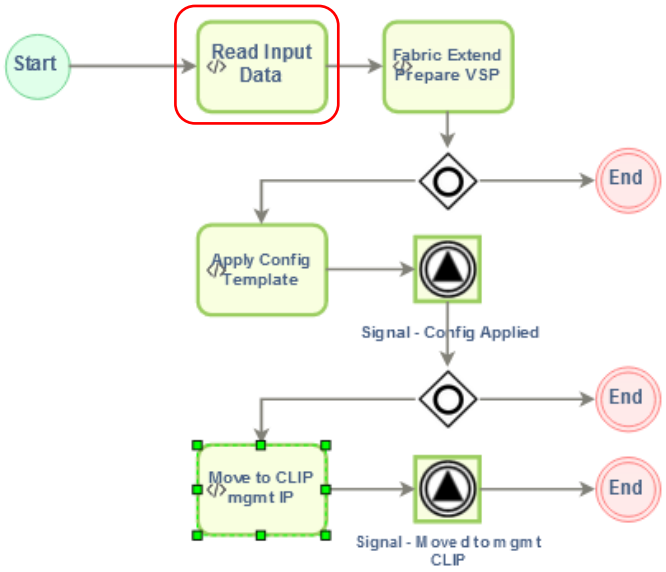
Worflow execution

Summary

Status	Start Date/Time	Name	Version	Source	#
✔	8/17/2022 2:55:47 ...	Fabric Extend Onbo...	63	Workflow Designer ...	1

Graph View | Table View

Stop Workflow | Show Output



Output - 20.0.255.200

```
Script Name: Fabric Extend Onboard_Read_Input_Data
Date and Time: 2022-08-17T14:55:47.797
XIQ-SE User: lstevens
XIQ-SE User Domain:
IP: 20.0.255.200
Workflow version 63 on XIQ-SE/XMC version 22.6.12.11
Activity: ReadInputData_01

Input Data:
 - Selected Switch IP = 20.0.255.200
 - Selected Switch Serial Number = 2002F-10039
 - Input Config Template file = /root/Ludo/tax-template.cfg
 - Input CSV file = /root/Ludo/tax-template.csv
 - Key to CSV data = IP address
 - Static WAN port(s) =
 - Move to CLIP Mgmt IP enable activity = 1
 - CLIP Mgmt IP = 20.0.20.49
 - New Site to re-add device with Mgmt CLIP =

Exit code SUCCESS
```

Close

Show

XIQ-SE Site '/World/PoC

Worflow execution

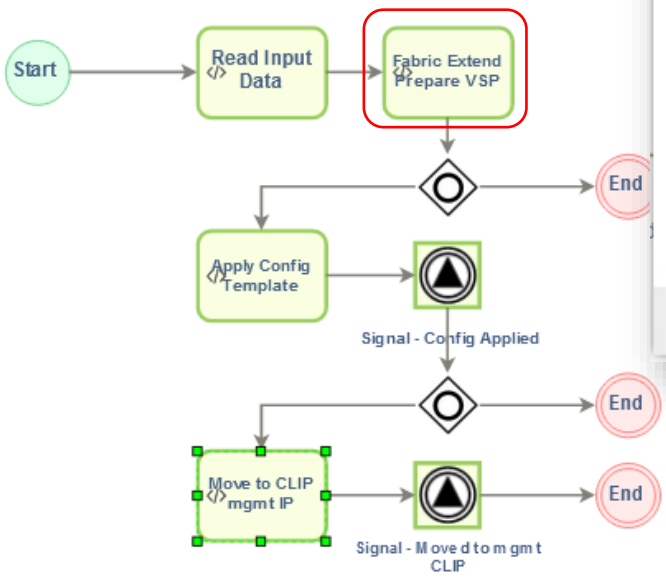
Summary

Status	Start Date/Time	Name	Version	Source
✔	8/17/2022 2:55:47 ...	Fabric Extend Onbo...	63	Workflo

Ludovico/Fabric Extend Onboard

Graph View | Table View

Stop Workflow



Output - 20.0.255.200

```
Script Name: Fabric Extend Onboard_Fabric_Extend_Prepare_VSP
Date and Time: 2022-07-20T17:23:33.804
XIQ-SE User: lstevens
XIQ-SE User Domain:
IP: 20.0.255.200
Workflow version 35 on XIQ-SE/XMC version 22.6.10.70
Activity: FabricExtendPrepareVsp
Using family type 'VSP Series' for this script

Input Data:
 - Onboarded VSP switch IP = 20.0.255.20
 - Static WAN port(s) =
 - Fabric Extend VRF id = 511
 - Fabric Extend VRF name = fabext
 - Fabric Extend VLAN id = 4000
 - Fabric Extend VLAN name = FE-and-Mgmt
 - Disconnect & reconnect after moving m
 - Disconnect wait time = 40

VSP-4900-24XE:1>terminal more disable
VSP-4900-24XE:1>

VSP-4900-24XE:1>enable
VSP-4900-24XE:1#
```

Output - 20.0.255.200

```
-> config term
-> ip vrf fabext vrfid 511
-> vlan create 4000 name FE-and-Mgmt type port-mstprstp 0
-> interface vlan 4000
->    vrf fabext
->    ip address 20.0.255.200/24
-> exit
-> router vrf fabext
->    ip route 0.0.0.0 0.0.0.0 20.0.255.1 weight 10
-> exit
-> router isis
->    ip-tunnel-source-address 20.0.255.200 vrf fabext
-> exit
-> boot config flags tftpd
-> copy "10.8.255.15:lstevens.Fabric_Extend_Onboard.20_0_255_200" /intflash/.script.src -y
-> source .script.src debug
-> no mgmt vlan
-> mgmt vlan 4000
->    ip address 20.0.255.200/24
->    ip route 0.0.0.0/0 next-hop 20.0.255.1 weight 200
->    enable
-> exit
-> vlan members add 4000 1/6
-> interface gigabitEthernet 1/6
```

Close

Config applied by PrepVsp activity; must not be included in template.cfg

```
The following configuration was successfully performed on switch:

-> config term
-> ip vrf fabext vrfid 511
-> vlan create 4000 name FE-and-Mgmt type port-mstprstp 0
-> interface vlan 4000
->    vrf fabext
->    ip address 20.0.255.200/24
-> exit
-> router vrf fabext
->    ip route 0.0.0.0 0.0.0.0 20.0.255.1 weight 10
-> exit
-> router isis
->    ip-tunnel-source-address 20.0.255.200 vrf fabext
-> exit

-> no mgmt vlan
-> mgmt vlan 4000
->    ip address 20.0.255.200/24
->    ip route 0.0.0.0/0 next-hop 20.0.255.1 weight 200
->    enable
-> exit
-> vlan members add 4000 1/6
-> interface gigabitEthernet 1/6
->    no spanning-tree mstp
-> exit
-> no boot config flags tftpd
-> end
```

Worflow execution

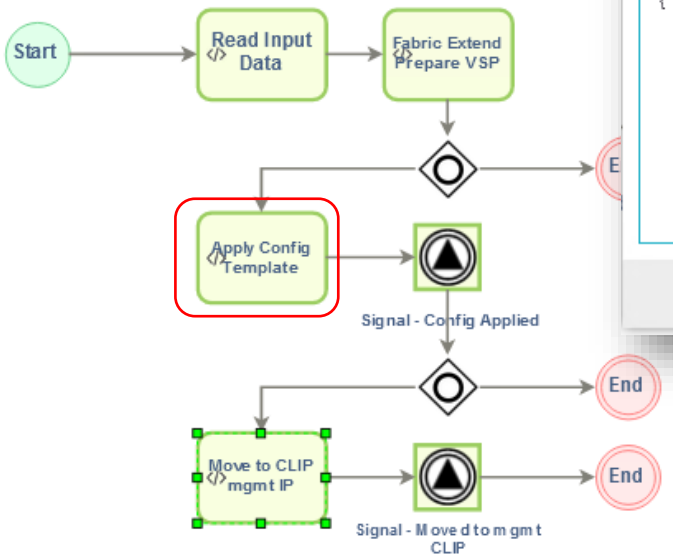
Summary

Status	Start Date/Time	Name	Version	Sour
✔	8/17/2022 2:55:47 ...	Fabric Extend Onbo...	63	Work

...vs/Ludovico/Fabric Extend Onboard

Graph View | Table View

Stop Workflow



Output - 20.0.255.200

```
Script Name: Fabric Extend Onboard_Apply_Config_Template
Date and Time: 2022-07-20T17:24:33.134
XIQ-SE User: lstevens
XIQ-SE User Domain:
IP: 20.0.255.200
Workflow version 35 on XIQ-SE/XMC version 22.6.10.70
Activity: ApplyConfigTemplate
Using family type 'VSP Series' for this script

Input Data:
 - Selected Switch IP = 20.0.255.200
 - Input Config Template file = /root/Ludo
 - Input CSV file = /root/Ludo/tax-templat
 - Key to CSV data = IP address

Retained device 20.0.255.200 Site Variable
{
    "Auto Sync VLANs in progress": "Done",
    "__PATH__": "/World/PoC/Novant/WAN Are
    "core1": "20.0.20.76",
    "core2": "20.0.20.77",
    "dataIsid": "15999998",
    "dataVlan": "202",
    "deviceIP": "20.0.255.200",
```

Output - 20.0.255.200

```
->    isis spbm 1 l1-metric 10
->    isis enable
-> exit
-> filter acl 1 type inPort
-> filter acl port 1 1/22
-> filter acl ace 1 1001
-> filter acl ace action 1 1001 permit remark-dot1p 4
-> filter acl ace action 1 1001 permit count
-> filter acl ace action 1 1001 permit internal-qos 4
-> filter acl ace ethernet 1 1001 dst-mac mask 00:00:00:00:00:00 0xffffffffffff
-> filter acl ace 1 1001 enable
-> i-sid 15000024 elan-transparent
->    port 1/22
-> exit
-> macsec connectivity-association macsecProfile connectivity-association-key 1234567890 key-
parity odd
-> interface GigabitEthernet 1/21
->    macsec connectivity-association macsecProfile
->    macsec encryption enable
->    macsec enable
-> exit
-> end
Exit code SUCCESS
```

Close

Worflow execution

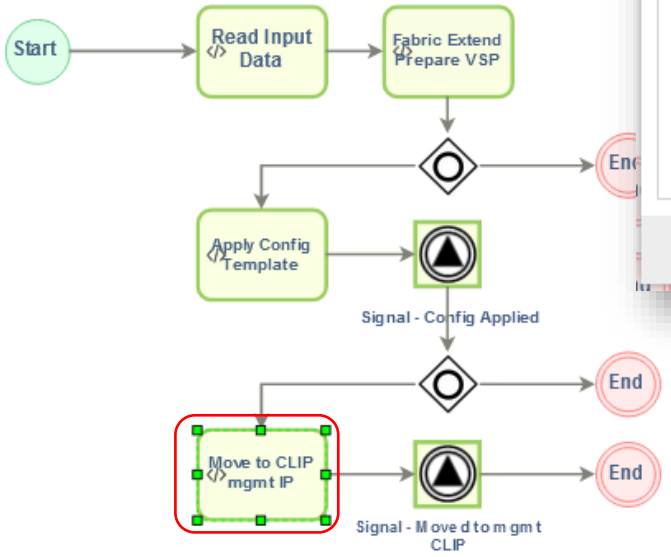
Summary

Status	Start Date/Time	Name	Version	Source
✔	8/17/2022 2:55:47 ...	Fabric Extend Onbo...	63	Workfl

/Ludovico/Fabric Extend Onboard

Graph View | Table View

Stop Workflow



Output - 20.0.255.200

```
Script Name: Fabric Extend Onboard_Move_to_CLIP_mgmt_IP
Date and Time: 2022-08-17T14:57:18.954
XIQ-SE User: lstevens
XIQ-SE User Domain:
IP: 20.0.255.200
Workflow version 63 on XIQ-SE/XMC version 22.6.12.11
Activity: MoveToClipMgmtIp_04

Input Data:
 - Current Switch IP = 20.0.255.200
 - New CLIP VRF = None
 - Existing Mgmt VLAN IP action = do not delete
 - New CLIP IP = 20.0.20.49
 - New System Name =
 - XIQ-SE Site to re-add device to =

Switch information:
 - VOSS software version = 8.8.0.0_B555

VSP-4900-24XE:1>terminal more disable
VSP-4900-24XE:1>

VSP-4900-24XE:1>enable
VSP-4900-24XE:1#
```

Output - 20.0.255.200

```
CP-1: Save config to file /intflash/config.cfg successful.
CP-1: Save license to file /intflash/489BD59EF800.xml successful.

VSP-4900-24XE:1#

The following configuration was successfully performed on switch:
-> config term
-> router isis
->    spbm 1 ip enable
-> exit
-> mgmt clip vrf GlobalRouter
->    ip address 20.0.20.49/32
->    enable
-> exit
-> boot config flags tftpd
-> copy "10.8.255.15:lstevens.Fabric_Extend_Onboard.20_0_255_200" /intflash/.script.src -y
-> source .script.src debug
-> no boot config flags tftpd
-> save config
Deleted IP '20.0.255.200' from XIQ-SE's database
Added new device IP '20.0.20.49' to XIQ-SE Site '/World/PoC/Novant/WAN Area 49.0001/ME-1' with
admin profile 'PoC Profile'
Exit code SUCCESS
```

Close

Config applied by Move to Mgmt CLIP activity; must not be included in template.cfg

```
The following configuration was successfully performed on switch:

-> mgmt clip vrf GlobalRouter
->    ip address 20.0.20.49/32
->    enable
-> exit
```

Workflow Event signal

Alarms | Alarm Configuration | Events | Event Configuration

All | Type: Console | Export to CSV | 20.0.255.200

Date/Time	Source	Subcomponent	Client	User	Type	Event	Information
8/17/2022 2:58:02 PM	20.0.255.200	Workflow: Fabric Extend Onboard	---	lstevens	Event	Moved device to CLIP mgmt IP 20.0.20.49	Device moved from VLAN mgmt IP 20.0.255.200 to CLIP mgmt IP 20.0.20.49
8/17/2022 2:57:42 PM	20.0.255.200		xmc.reading.ct...	lstevens	Event	Device Deleted	20.0.255.200 and Site Engine data were deleted from the database.
8/17/2022 2:57:18 PM	20.0.255.200	Workflow: Fabric Extend Onboard	---	lstevens	Event	Configuration Template /root/Ludo/tax-templat...	Configuration Template /root/Ludo/tax-template.cfg applied to device [20.0.255.200]

Workflow 2nd run, if device re-added with Mgmt CLIP to same Site

- 2nd run will either fail, as shown, if the CSV lookup in the CSV file finds no match for the switch's mgmt CLIP IP
- Else the workflow will come out on the 1st End exit point, if a mgmt CLIP is found configured on the device