

APPLICATION NOTE

FOXMAN-UN

E-Tree Application Scenarios

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1 Introduction

This application note describes typical sample E-Tree application scenarios supported with the FOXMAN-UN R18 Web UI. It complements the information provided within the FOXMAN-UN user manual [\[1KHW002412\] User Manual “FOXMAN-UN Help System”](#).

From R18 onwards, support for a specific VPLS topology “E-Tree over VPLS” is provided within the VPLS creation wizard in the FOXMAN-UN Web UI. The present document provides guidance on supported use cases and prerequisites for successful E-Tree configuration via the wizard.

For basic information on the Web UI, refer to [\[1MRC000084\] User Manual “FOXMAN-UN Web UI”](#).

2 Supported Basic Topologies

FOXMAN-UN supports the following basic E-Tree topologies, supported by the wizard when creating a VPLS with topology "E-Tree over VPLS".

2.1 E-tree Topologies

2.1.1 E-Tree with single Root

The Split-Horizon roles are defined to avoid Leaf - Leaf connections:

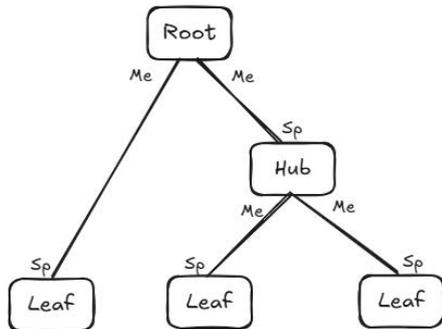


Figure 1: E-Tree with single Root

2.1.2 E-Tree with double Root and PE Dual Home

To avoid Root - Root connection the Pseudo Wires from the Roots are added to a PE Dual Home Group:

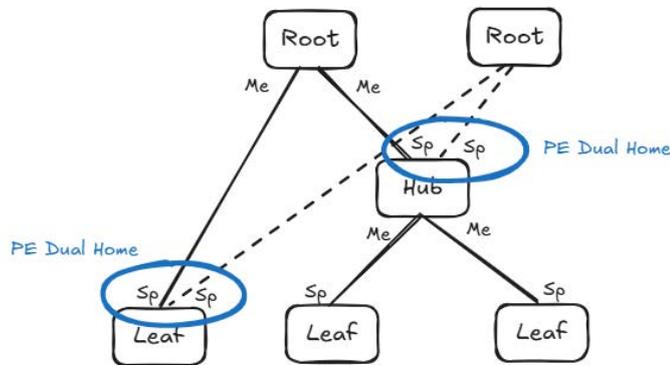


Figure 2: E-Tree with double Root and PE Dual Home

2.1.3 E-Tree with double Root and Broadcast

In case of broadcast definition the Leaves send traffic to both roots:

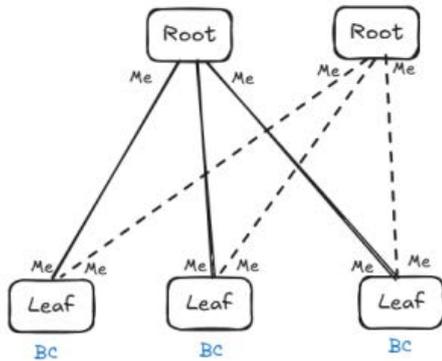


Figure 3: E-Tree with double Root and Broadcast

2.1.4 E-Tree with double Root and Root-Root connection

Root - Root connections improve redundancy:

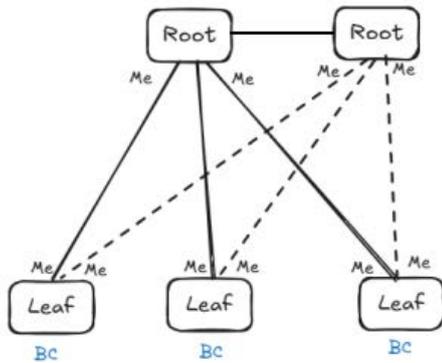


Figure 4: E-Tree with double Root and Root-Root connection

2.2 NE Type selection

FOXMAN-UN supports the following basic E-Tree node types:

- Root :
 - Cannot have parents.
 - The user can select child nodes which can be Hub or Leaf.
- Leaf :
 - Can have parents Root or Hub.
 - Cannot have child nodes.
 - Multiple parents can be added to a PE-Dual home group.
- Hub :
 - Can have parents Root or other Hub.
 - The user can select child nodes which can be other Hub or Leaf.
 - Multiple parents can be added to a PE-Dual home group.

3 E-Tree creation wizard

This section describes sample procedures for the four scenarios listed in section 2 with a low number of nodes. They are applicable in a similar manner for larger networks.

The sample procedures below assume that you have already executed the following steps, which are common to all procedures for creating an E-Tree:

- 1 In FOXMAN-UN, open the Homepage.
- 2 On the Homepage, start the “MPLS” application.
- 3 In the MPLS application, select the “VPLS” tab.
- 4 In the ribbon, start the VPLS Creation wizard by clicking on the  command.
- 5 In step 1 of the wizard, enter a VPLS Name and select Topology = E-Tree over VPLS.
- 6 Preferably select the map style “Graph” instead of “Map” in the header bar of the map. You can switch back and forth at any time between Graph and Map.

Now continue with the required procedure below:

- [Create E-Tree with single Root](#),
- [Create E-Tree with double Root and PE Dual Home](#),
- [Create E-Tree with double Root and Broadcast](#),
- [Create E-Tree with double Root and Root-Root connection](#).

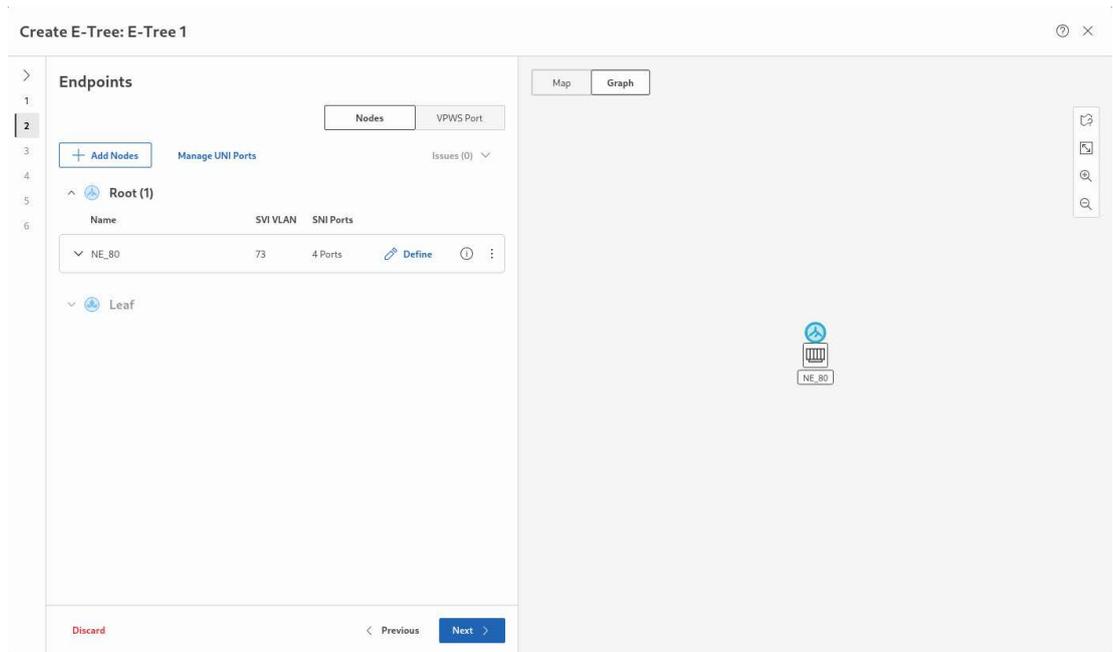
3.1 Create E-Tree with single Root

The following procedure describes the creation process for a sample E-Tree with a single Root after having passed the initial steps in section 3.

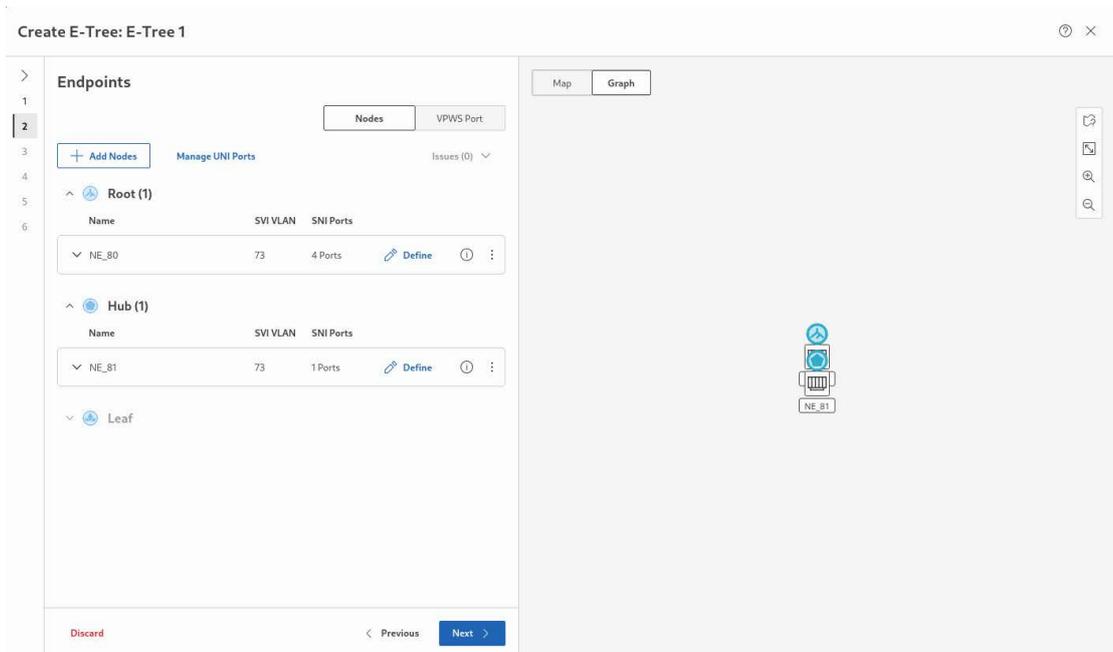
To create an E-Tree with a single root,

Proceed as follows:

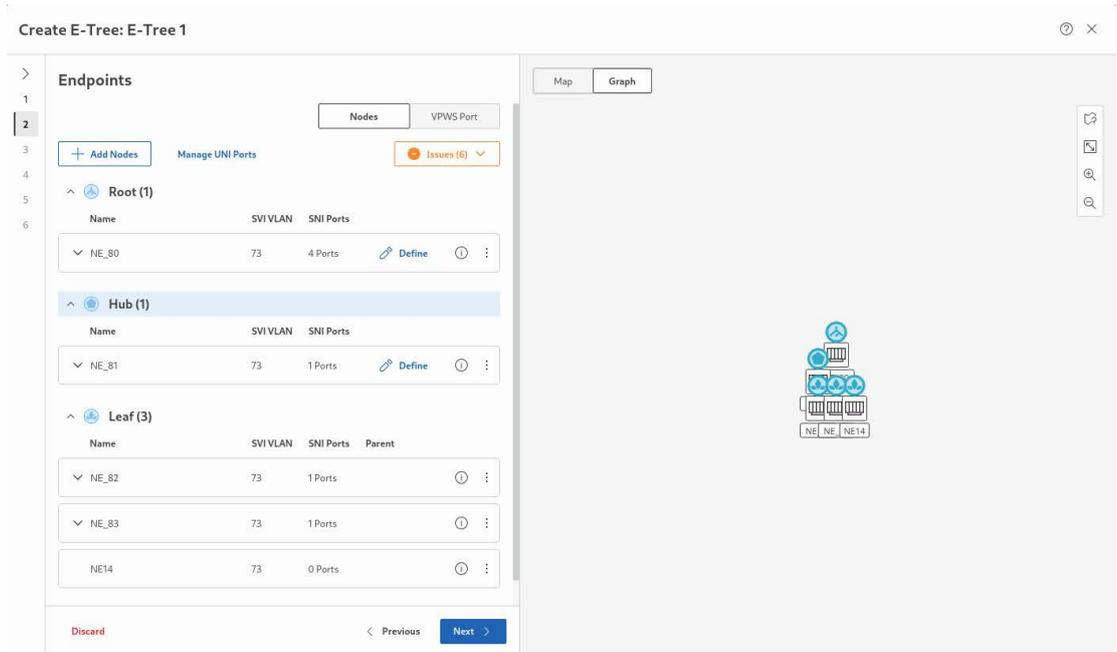
1. Still in step 1 “General” of the wizard, select an appropriate service profile for the E-Tree VPLS.
 - Click “Next >” to proceed to step 2 “Endpoints” of the wizard.
2. Click “+ Add Nodes”, then select the “Root” role.
 - Enter the required VLAN ID for the E-Tree
 - Select a single Root node from the list and click “Apply”; the Root node will be listed under “Root (1)” and appear on the Graph:



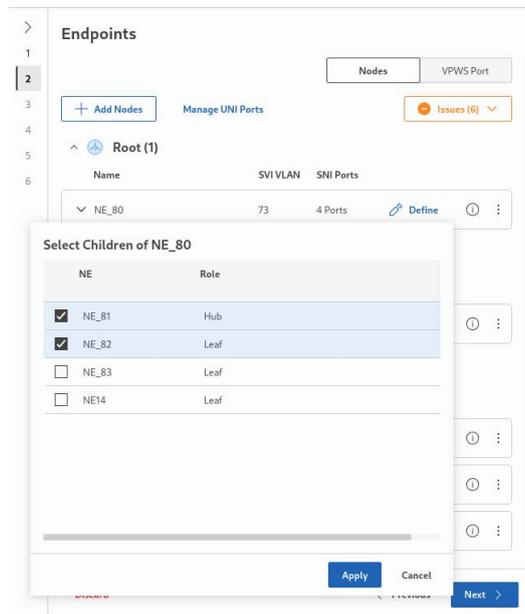
3. Click again “+ Add Nodes”, then select the “Hub” role.
 - Select a single Hub node from the list and click “Apply”; the Hub node will be listed under “Hub (n)” and appear on the Graph:



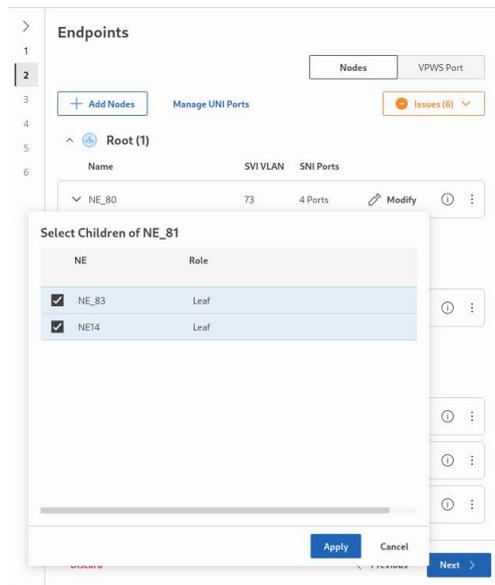
4. Click again “+ Add Nodes”, then select the “Leaf” role.
 - Select three Leaf nodes from the list and click “Apply”; the Leaf nodes will be listed under “Leaf (n)” and appear on the Graph:



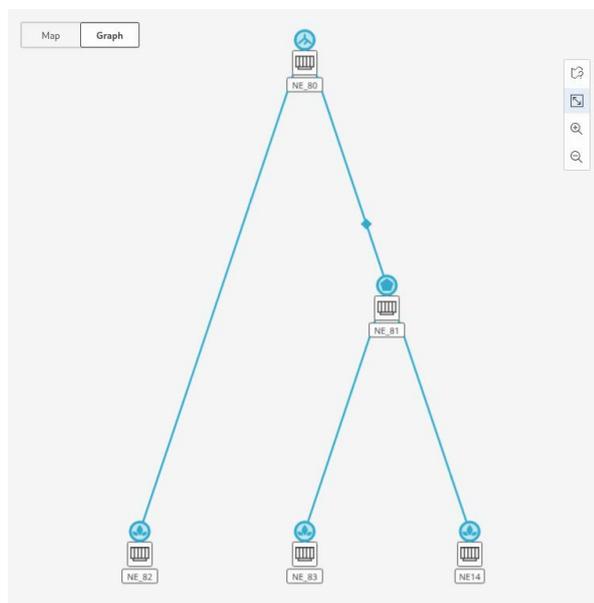
- In the map, click the “fit content to screen”  icon to adjust the graph to the map size.
5. In the box for the Root node, click on the  **Define** command to set the children of the Root node.
- Select the Hub node and a Leaf node as children. Click “Apply”.



6. In the box for the Hub node, click on the  **Define** command to set the children of the Hub node.
 - Select two Leaf nodes as children. Click “Apply”.



7. In the map, click the “fit content to screen”  icon if required to adjust the graph to the map size if not yet done.
 - This will show the final graph for the sample E-Tree with single Root.



8. Click “Next >” to proceed to step 3 “Rate Limiter” of the wizard to configure the Rate Limiter if required and if supported by the service profile.
9. Click “Next >” to proceed to step 4 “Pseudo Wires” of the wizard to configure, confirm or modify the Pseudo Wires.
10. Click “Next >” to proceed to step 5 “Tunnels” of the wizard to route, select or confirm Tunnels. Missing or incomplete tunnels must be created/routed. This can be done by clicking “Route All Tunnels Automatically” command or by creating a new tunnel where required. All Tunnels must be valid to be able to proceed.

11. Click “Next >” to proceed to step 6 “Summary” of the wizard to view a summary. Click on “Save”, then “Deploy”, or expand the Save command and select “Save & Deploy” to deploy the E-Tree VPLS.
12. Click “Finish” to close the wizard. With this the application will return to the MPLS map.
13. When back in the MPLS map, the new E-Tree VPLS is listed in the Entity Browser (left panel). Select the new E-Tree VPLS and click the  Details command in the ribbon or from the context menu. In the table of contents, select “E-Tree Graph” to view the graph for the E-Tree.

Result: The E-Tree has been created and deployed to the network.

End of instruction

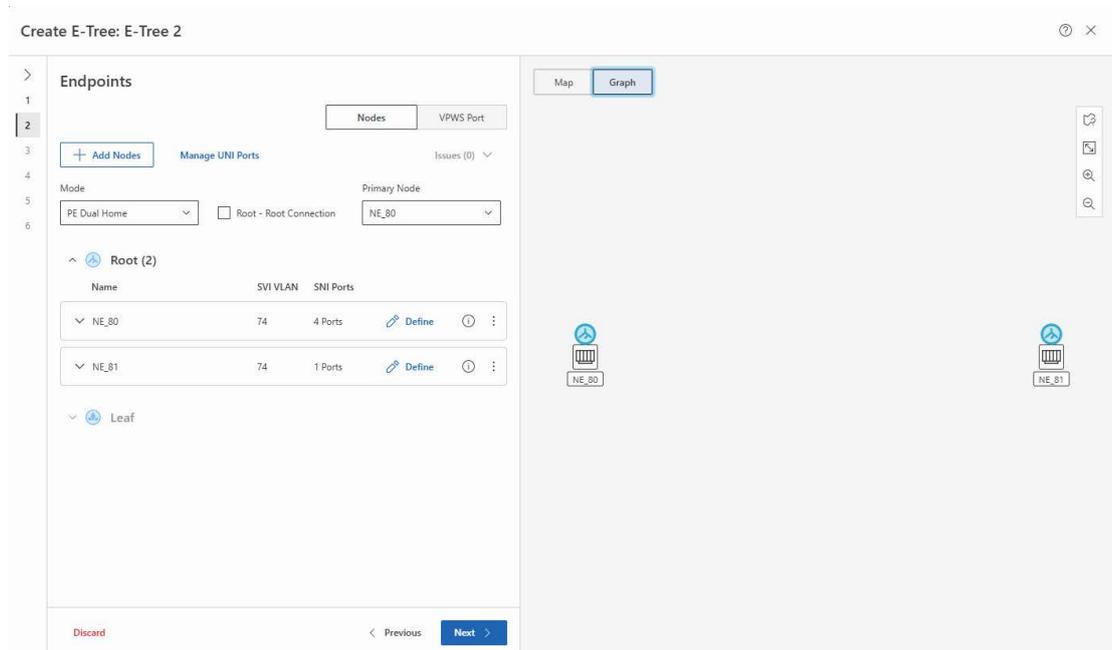
3.2 Create E-Tree with double Root and PE Dual Home

The following procedure describes the creation process for a sample E-Tree with a double Root and PE Dual Home after having passed the initial steps in section 3.

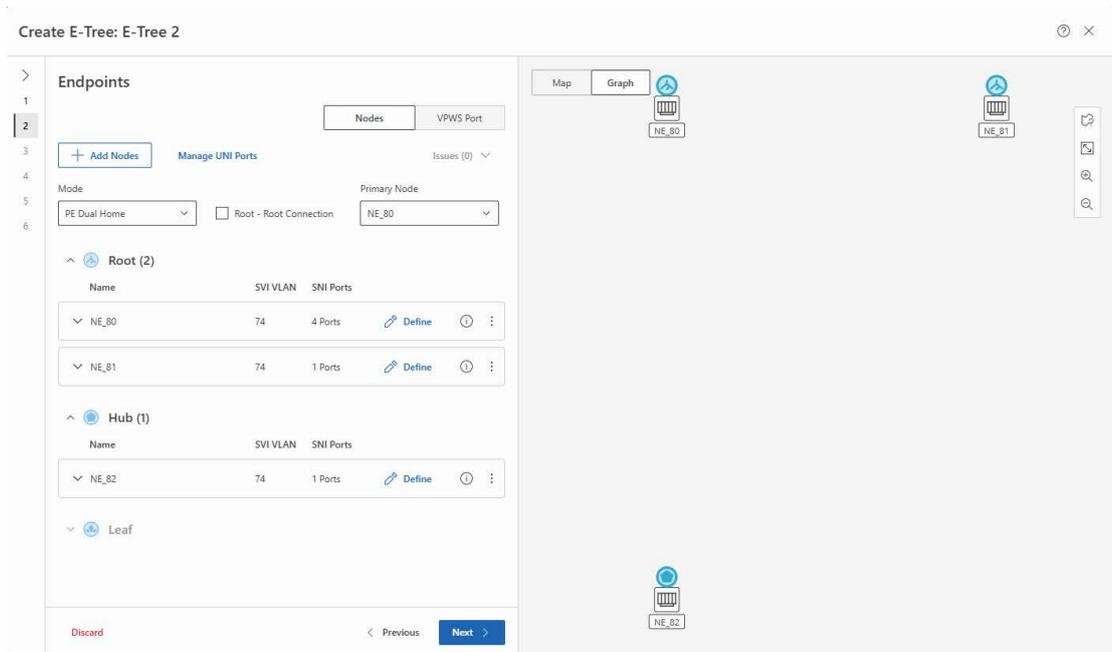
To create an E-Tree with a double root and PE Dual Home,

Proceed as follows:

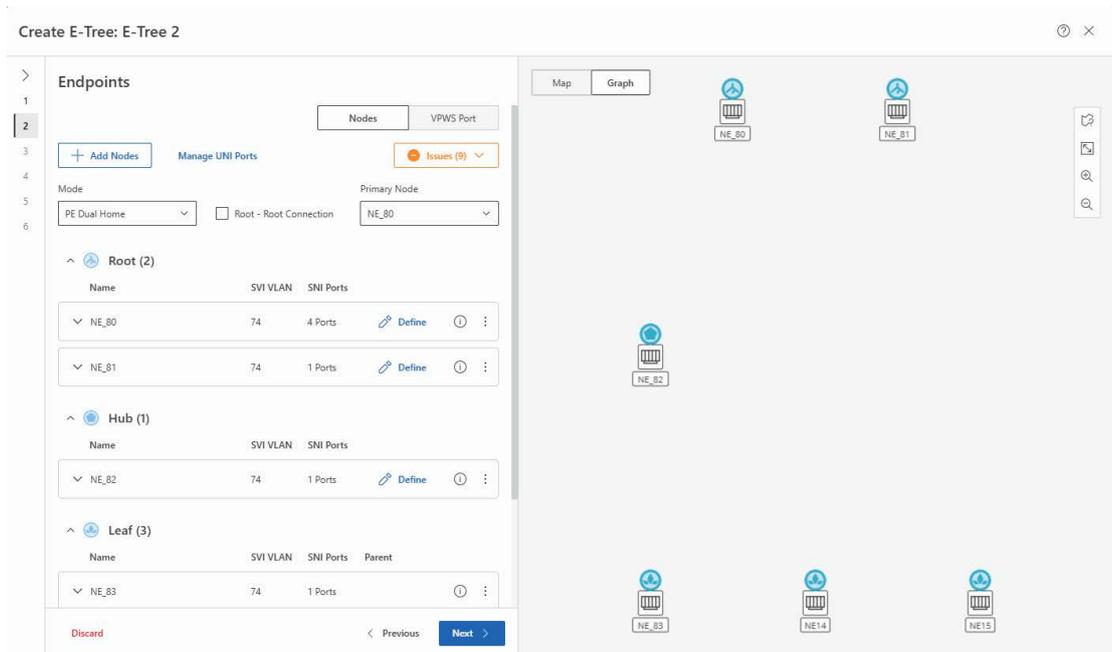
1. Still in step 1 “General” of the wizard, select an appropriate service profile for the E-Tree VPLS.
 - Click “Next >” to proceed to step 2 “Endpoints” of the wizard.
2. Click “+ Add Nodes”, then select the “Root” role.
 - Enter the required VLAN ID for the E-Tree
 - Select two (2) Root nodes from the list and click “Apply”.
 - Set the Mode to “PE Dual Home”, select the required Primary Node; in this sample it is NE_80.



- The Root nodes will be listed under “Root (2)” and appear on the Graph:
3. Click again “+ Add Nodes”, then select the “Hub” role.
 - Select a single Hub node from the list and click “Apply”; the Hub node will be listed under “Hub (n)” and appear on the Graph:



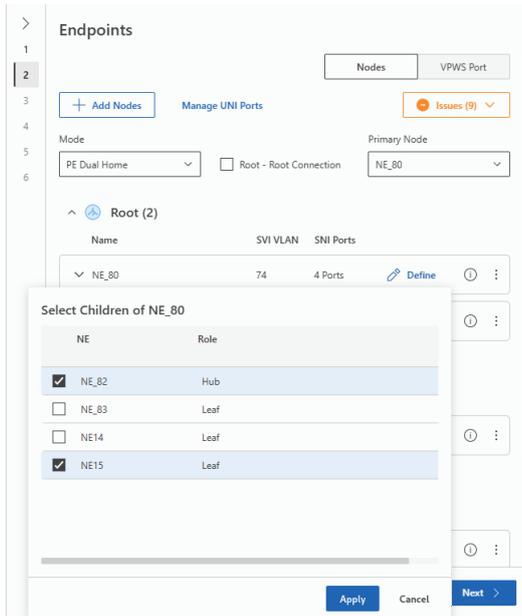
4. Click again “+ Add Nodes”, then select the “Leaf” role.
 - Select three Leaf nodes from the list and click “Apply”; the Leaf nodes will be listed under “Leaf (n)” and appear on the Graph:



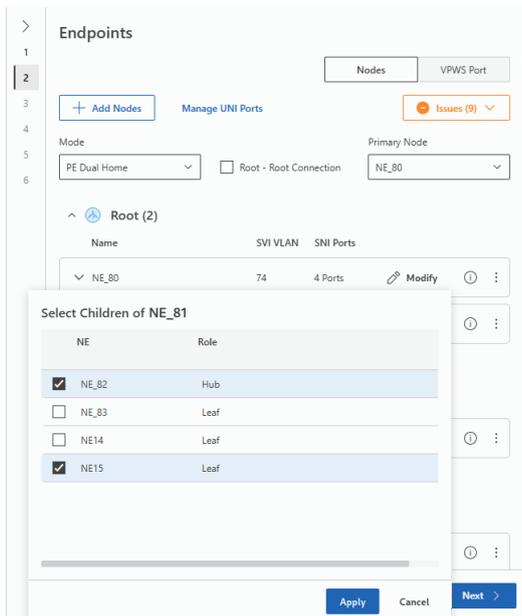
- In the map, click the “fit content to screen”  icon to adjust the graph to the map size.

5. In the box for the first Root node, click on the  **Define** command to set the children of the Root node.

- Select the Hub node and a Leaf node as children.

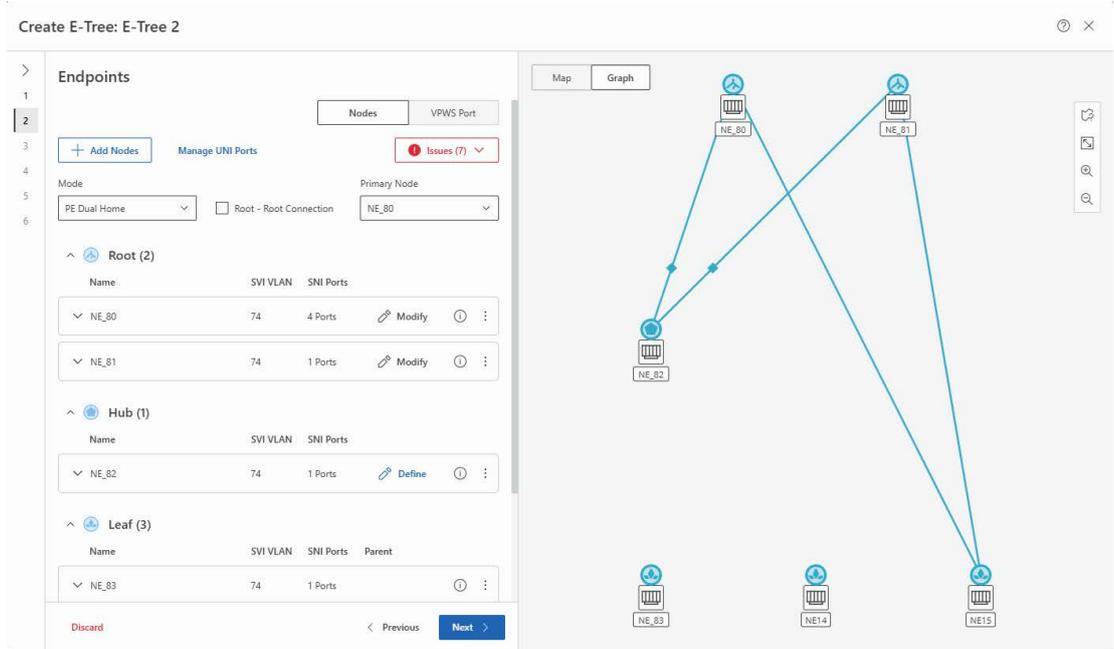


- Click "Apply".
- In the box for the second Root node, click on the  **Define** command to set the children of the Root node.
- Select the Hub node and the same Leaf node as children as done for the first Root node.

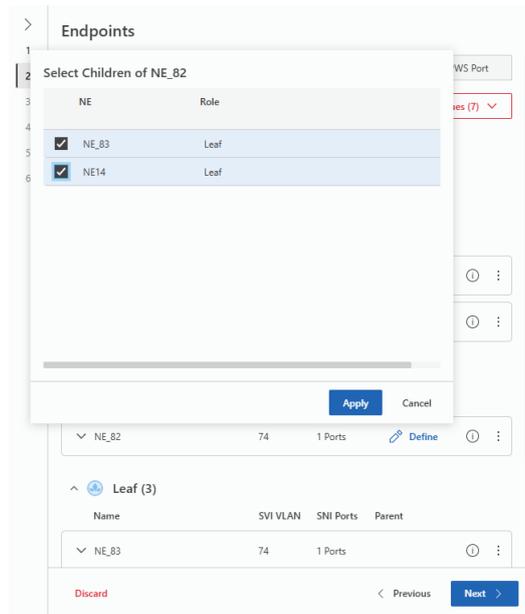


- Click "Apply".

- This will show the children to the two Root nodes on the Graph:

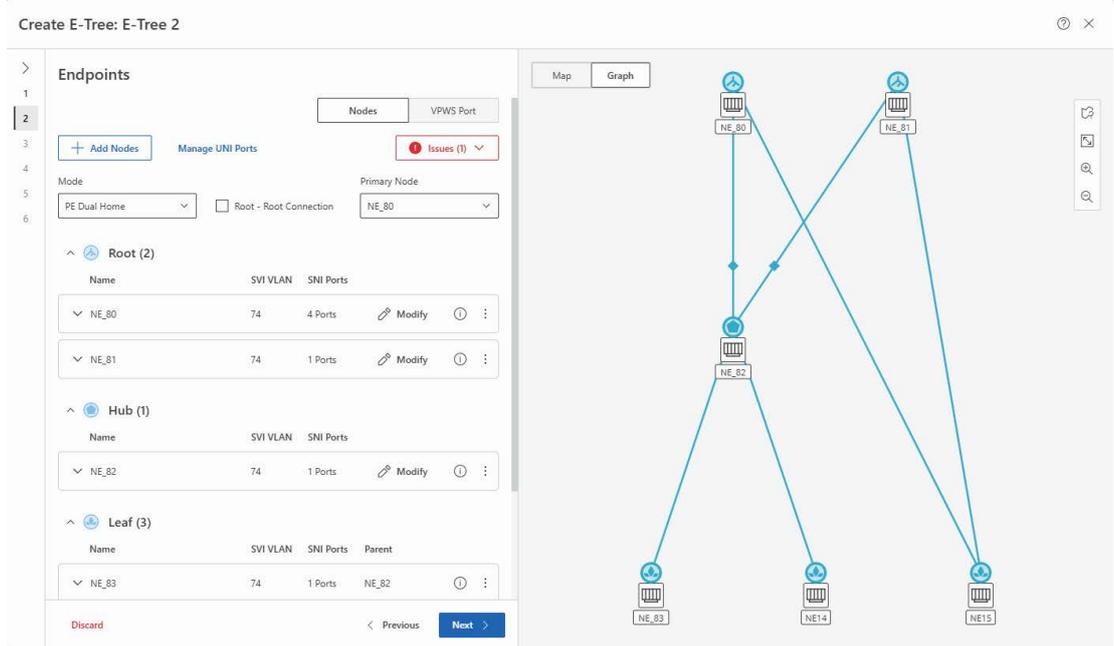


6. In the box for the Hub node, click on the **Define** command to set the children of the Hub node.
 - Select the remaining two Leaf nodes as children.



- Click "Apply".

7. In the map, click the “fit content to screen”  icon if required to adjust the graph to the map size if not yet done.
 - This will show the final graph for the sample E-Tree with double Root.



The screenshot displays the 'Create E-Tree: E-Tree 2' wizard. The left sidebar shows the configuration for endpoints, categorized into Root (2 nodes), Hub (1 node), and Leaf (3 nodes). The right pane shows a network graph with nodes NE_80, NE_81, NE_82, NE_83, NE_84, and NE_85 connected in a double-root topology.

8. Click “Next >” to proceed to step 3 “Rate Limiter” of the wizard to configure the Rate Limiter if required and if supported by the service profile.
9. Click “Next >” to proceed to step 4 “Pseudo Wires” of the wizard to configure, confirm or modify the Pseudo Wires.
10. Click “Next >” to proceed to step 5 “Tunnels” of the wizard to route, select or confirm Tunnels. Missing or incomplete tunnels must be created/routed. This can be done by clicking “Route All Tunnels Automatically” command or by creating a new tunnel where required. All Tunnels must be valid to be able to proceed.
11. Click “Next >” to proceed to step 6 “Summary” of the wizard to view a summary. Click on “Save”, then “Deploy”, or expand the Save command and select “Save & Deploy” to deploy the E-Tree VPLS.
12. Click “Finish” to close the wizard. With this the application will return to the MPLS map.
13. When back in the MPLS map, the new E-Tree VPLS is listed in the Entity Browser (left panel). Select the new E-Tree VPLS and click the  Details command in the ribbon or from the context menu. In the table of contents, select “E-Tree Graph” to view the graph for the E-Tree.

Result: The E-Tree has been created and deployed to the network.

End of instruction

3.3 Create E-Tree with double Root and Broadcast

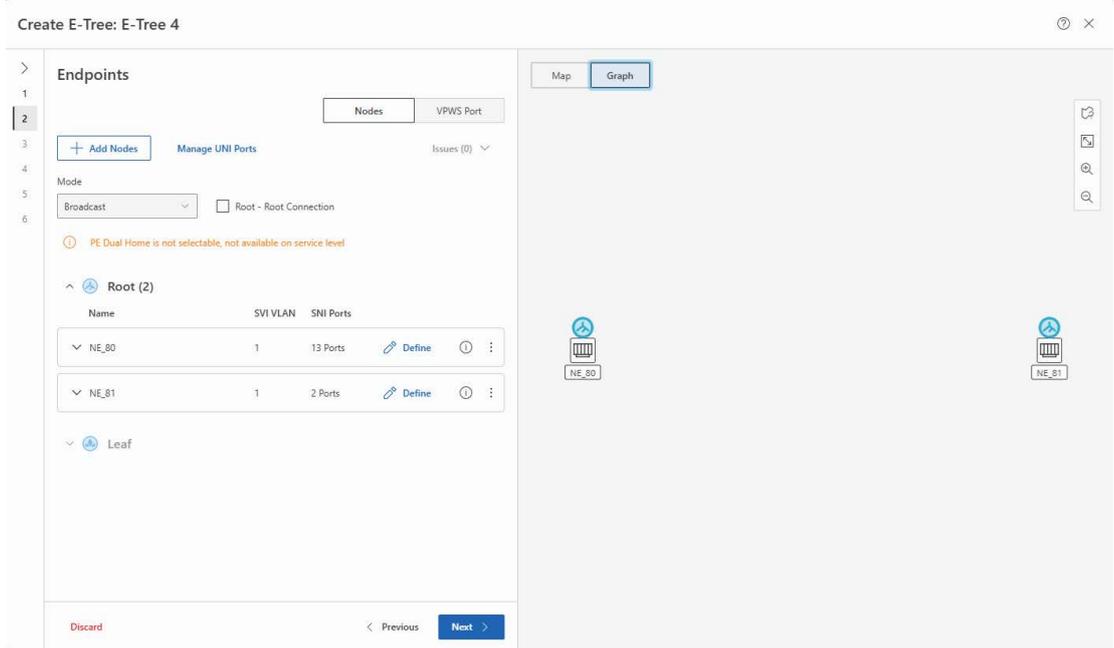
The following procedure describes the creation process for a sample E-Tree with a double Root and Broadcast after having passed the initial steps in section 3.

To create an E-Tree with a double root and Broadcast,

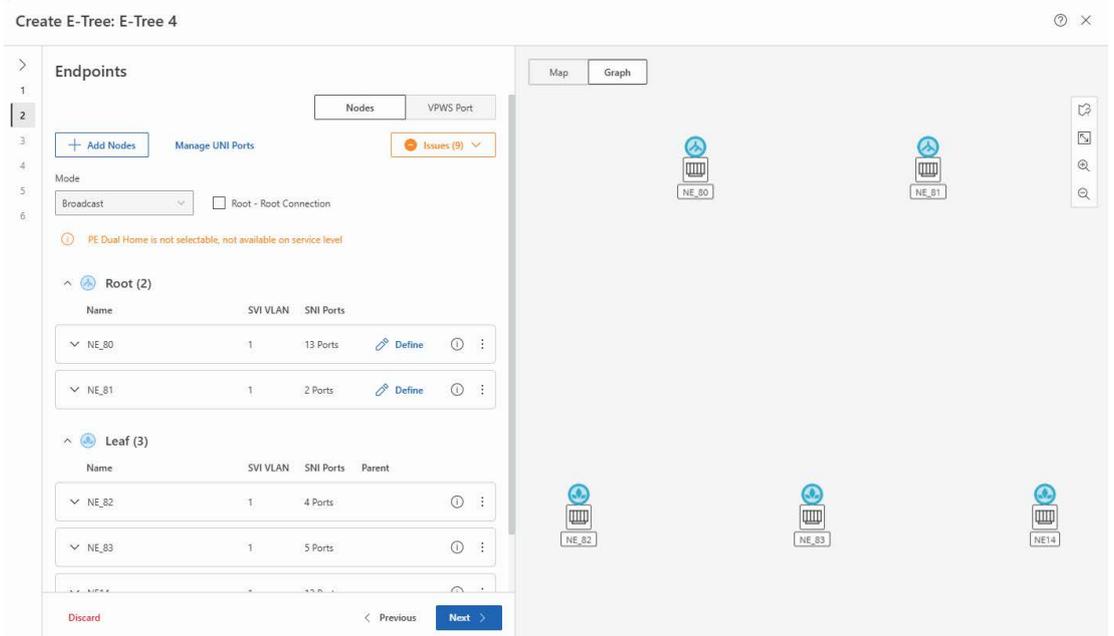
Proceed as follows:

1. Still in step 1 “General” of the wizard, select an appropriate service profile for the E-Tree VPLS.
 - Click “Next >” to proceed to step 2 “Endpoints” of the wizard.

2. Click “+ Add Nodes”, then select the “Root” role.
 - Enter the required VLAN ID for the E-Tree
 - Select two (2) Root nodes from the list and click “Apply”; the Root nodes will be listed under “Root (2)” and appear on the Graph:



3. Click again “+ Add Nodes”, then select the “Leaf” role.
 - Select three Leaf nodes from the list and click “Apply”; the Leaf nodes will be listed under “Leaf (n)” and appear on the Graph.
 - In the map, click the “fit content to screen”  icon to adjust the graph to the map size.



4. In the box for each of the Root nodes, click on the  **Define** command to set the children of the Root node.
 - Select the Leaf nodes as children. Click “Apply”.
 - If required, click the “fit content to screen”  icon in the map to adjust the graph to the map size if not yet done.
 - This will show the final graph for the sample E-Tree with single Root.

The screenshot displays the 'Create E-Tree: E-Tree 4' wizard. On the left, the 'Endpoints' section is active, showing a configuration table for nodes. The table is divided into 'Root (2)' and 'Leaf (3)' sections. The 'Root' section includes nodes NE_80 and NE_81. The 'Leaf' section includes nodes NE_82, NE_83, and NE14. The right pane shows a network graph with two root nodes at the top (NE_80 and NE_81) and three leaf nodes at the bottom (NE_82, NE_83, and NE14). Lines connect the root nodes to the leaf nodes, forming a tree structure.

Root (2)	
Name	SNI Ports
NE_80	13 Ports
NE_81	2 Ports

Leaf (3)			
Name	SNI VLAN	SNI Ports	Parent
NE_82	1	4 Ports	NE_80, NE_81
NE_83	1	5 Ports	NE_80, NE_81
NE14	1	5 Ports	NE_80, NE_81

5. Click “Next >” to proceed to step 3 “Rate Limiter” of the wizard to configure the Rate Limiter if required and if supported by the service profile.
6. Click “Next >” to proceed to step 4 “Pseudo Wires” of the wizard to configure, confirm or modify the Pseudo Wires.
7. Click “Next >” to proceed to step 5 “Tunnels” of the wizard to route, select or confirm Tunnels. Missing or incomplete tunnels must be created/routed. This can be done by clicking “Route All Tunnels Automatically” command or by creating a new tunnel where required. All Tunnels must be valid to be able to proceed.
8. Click “Next >” to proceed to step 6 “Summary” of the wizard to view a summary. Click on “Save”, then “Deploy”, or expand the Save command and select “Save & Deploy” to deploy the E-Tree VPLS.
9. Click “Finish” to close the wizard. With this the application will return to the MPLS map.
10. When back in the MPLS map, the new E-Tree VPLS is listed in the Entity Browser (left panel). Select the new E-Tree VPLS and click the  **Details** command in the ribbon or from the context menu. In the table of contents, select “E-Tree Graph” to view the graph for the E-Tree.

Result: The E-Tree has been created and deployed to the network.

End of instruction

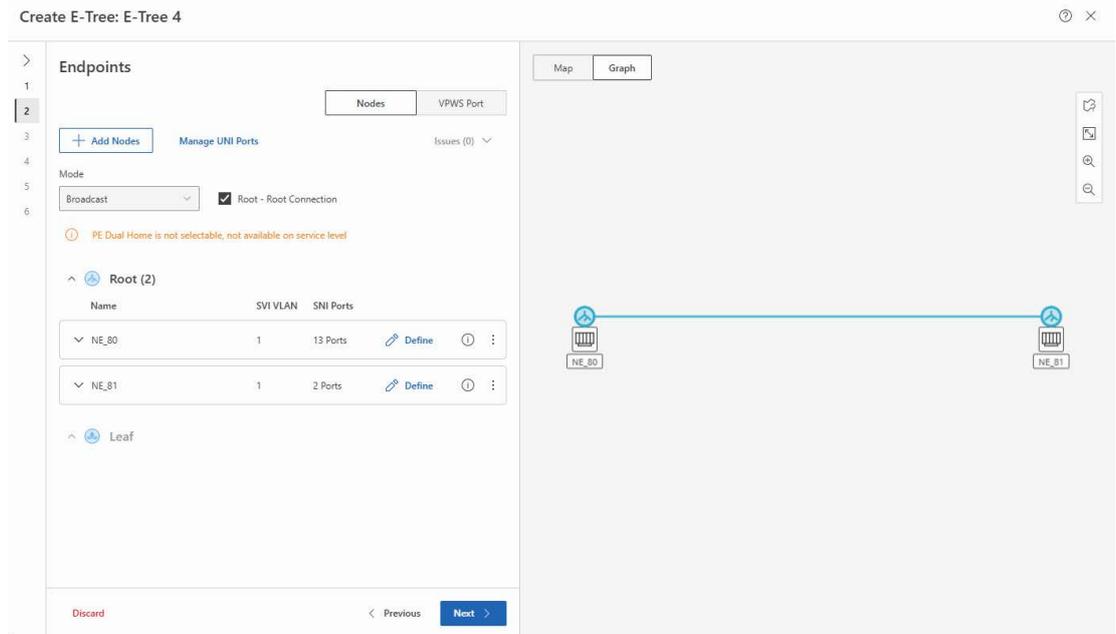
3.4 Create E-Tree with double Root and Root-Root connection

The following procedure describes the creation process for a sample E-Tree with a double Root and Broadcast after having passed the initial steps in section 3.

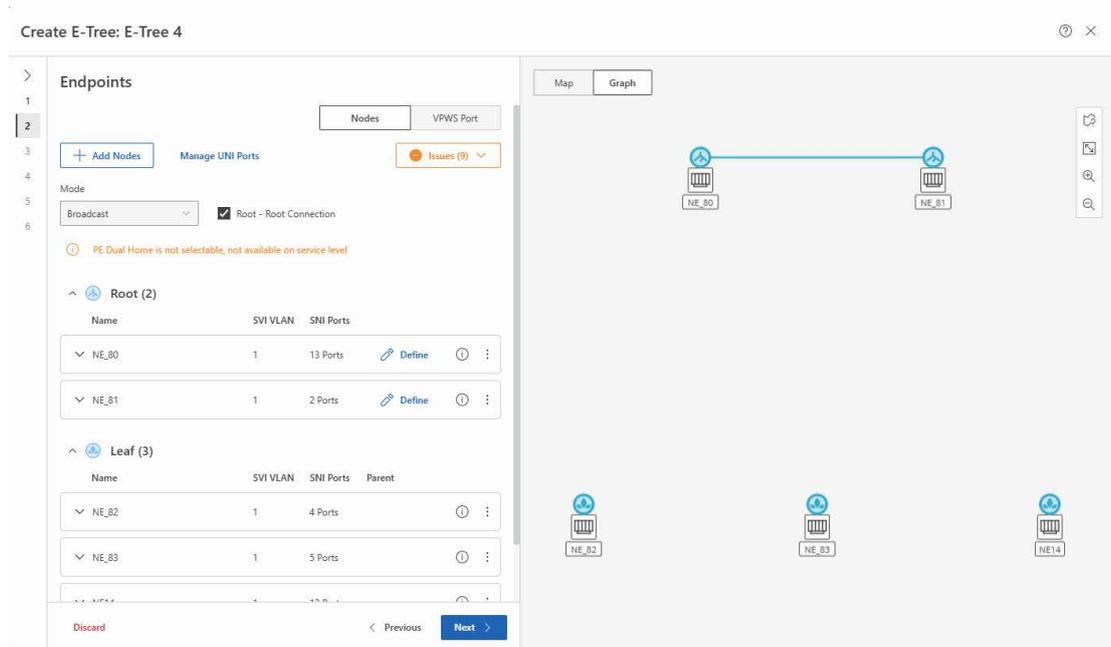
To create an E-Tree with a double root and Broadcast,

Proceed as follows:

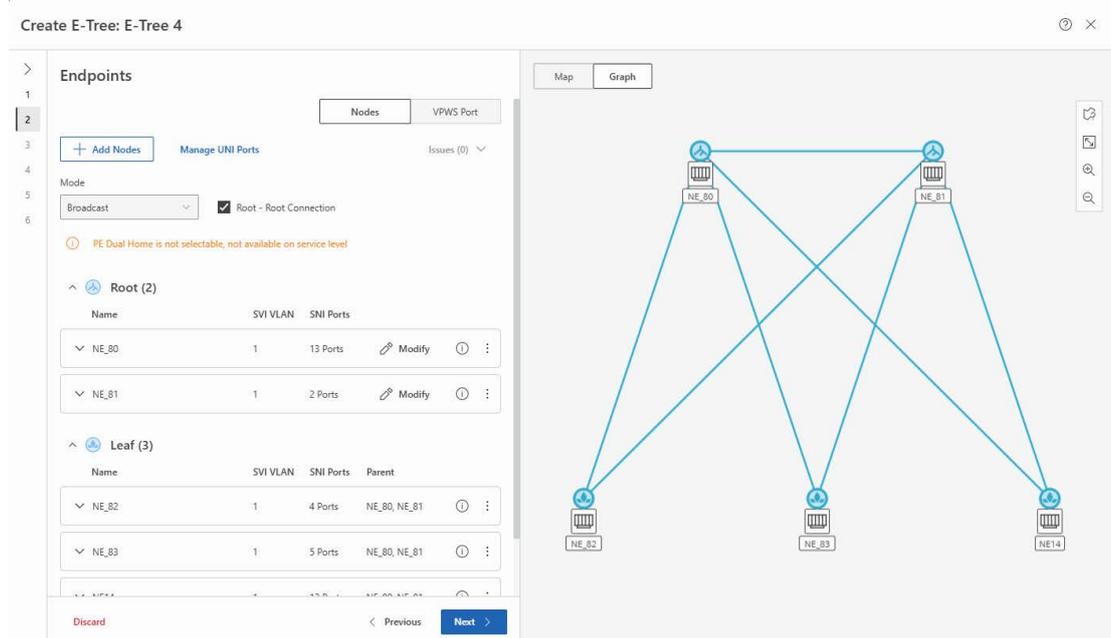
1. Still in step 1 “General” of the wizard, select an appropriate service profile for the E-Tree VPLS.
 - Click “Next >” to proceed to step 2 “Endpoints” of the wizard.
2. Click “+ Add Nodes”, then select the “Root” role.
 - Enter the required VLAN ID for the E-Tree
 - Select two (2) Root nodes from the list and click “Apply”; the Root nodes will be listed under “Root (2)” and appear on the Graph.
 - Activate the Root-Root Connection:



3. Click again “+ Add Nodes”, then select the “Leaf” role.
 - Select three Leaf nodes from the list and click “Apply”; the Leaf nodes will be listed under “Leaf (n)” and appear on the Graph.
 - In the map, click the “fit content to screen”  icon to adjust the graph to the map size.



4. In the box for each of the Root nodes, click on the **Define** command to set the children of the Root node.
 - Select three Leaf nodes as children. Click “Apply”.
 - If required, click the “fit content to screen”  icon in the map to adjust the graph to the map size if not yet done.
 - This will show the final graph for the sample E-Tree with single Root.



5. Click “Next >” to proceed to step 3 “Rate Limiter” of the wizard to configure the Rate Limiter if required and if supported by the service profile.
6. Click “Next >” to proceed to step 4 “Pseudo Wires” of the wizard to configure, confirm or modify the Pseudo Wires.
7. Click “Next >” to proceed to step 5 “Tunnels” of the wizard to route, select or confirm Tunnels. Missing or incomplete tunnels must be created/routed. This can be done by clicking “Route All Tunnels Automatically” command or by creating a new tunnel where required. All Tunnels must be valid to be able to proceed.

8. Click “Next >” to proceed to step 6 “Summary” of the wizard to view a summary. Click on “Save” , then “Deploy”, or expand the Save command and select “Save & Deploy” to deploy the E-Tree VPLS.
9. Click “Finish” to close the wizard. With this the application will return to the MPLS map.
10. When back in the MPLS map, the new E-Tree VPLS is listed in the Entity Browser (left panel). Select the new E-Tree VPLS and click the  Details command in the ribbon or from the context menu. In the table of contents, select “E-Tree Graph” to view the graph for the E-Tree.

Result: The E-Tree has been created and deployed to the network.

End of instruction

4 Annex

4.1 Associated documents

[1MRC000084] User Manual “FOXMAN-UN Web UI”

[1KHW002412] User Manual “FOXMAN-UN Help System”

4.2 Document history

Table 1: Document history

Document ID	FOXMAN- UN Release	Rev	Date	Changes since previous version
1MRC000134	R18	A	May 2025	First version.

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