Oracle® SD-WAN eBGP

Supported Features

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About This Document

This guide illustrates how a Talari Appliance now supports eBGP. This guide will cover how the Talari Appliance can peer with eBGP speakers (LAN and WAN side routers). It will provide use cases containing details of how to leverage their current eBGP topology with a parallel Talari AS topology. The Talari eBGP features have been incorporated in the APN 6.1 GA software release. The supported features include AS-path support, Communities support and Origin Code Support.

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- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
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1. Access the Oracle Help Center site at http://docs.oracle.com.
2. Click Industries.
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   Under the SD-WAN header, select a product.
4. Select the Release Number.

A list of the entire documentation set for the selected product and release appears.

5. To download a file to your location, right-click the PDF link, select Save target as (or similar command based on your browser), and save to a local folder.

References

The following documents are available:

- *Talari Glossary*
- *Talari APN 6.1 GA Release Notes*
- *Talari APN 6.1 Configuration File Reference*
- *Talari APN 6.1 New Feature Guide*

Oracle SD-WAN eBGP Support

In APN 6.1 GA, Talari Networks is introducing support for some of the most commonly used BGP attributes. These features will be used to steer traffic on and off the Talari APN, which will act as its own contiguous Autonomous System (AS). The BGP attributes supported include:

- AS-Path
- Communities
- Origin Code

The Talari APN will be a transitive Autonomous System (AS) and Figure 1 provides a view of how this will appear in a configured network.

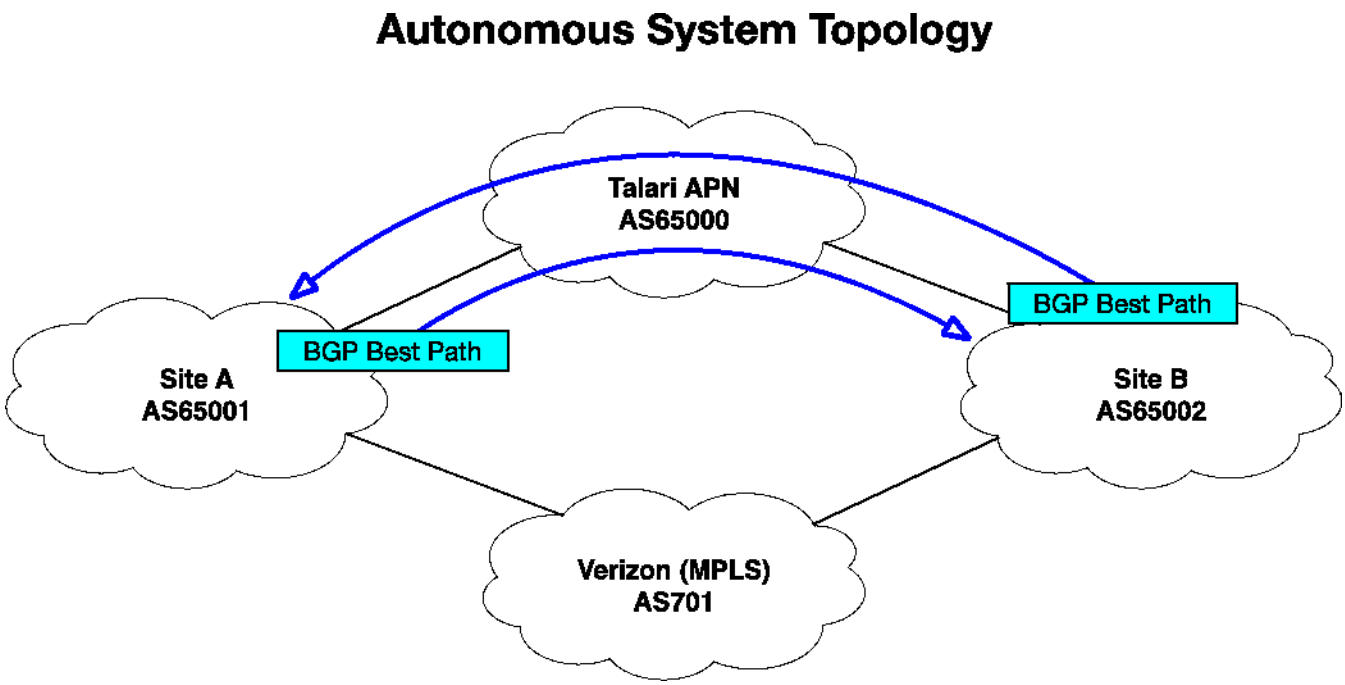

Figure 1

The Talari APN in this example is configured with its own AS - AS65000. In this configuration, we steer traffic across the APN via manipulating BGP attributes.

It is critical to understand, from a BGP perspective, how Talari uses BGP attributes. As in the past, the user must configure BGP peers within the Talari configuration file. In the past, the routes learned from iBGP were propagated into the APN routing table via Import Filters. Once the route was in the APN routing table, it was shared across the Conduit to a Client site. This ability has not changed.

With eBGP support, the Talari Appliance will establish an eBGP session with a LAN or WAN router and learn eBGP routes within the routing instance on local appliance. The route is used by the local appliance APN routing table, but is not shared across the APN to other appliances. The Talari APN (BIRD) is configured as an iBGP-mesh to share these routes with all Talari APN Client sites. The NCN Talari (& GEO NCN if applicable) will act as a Route Reflector for BGP. This is achieved by the NCN forming an iBGP session with each appliance in the APN (each Client has a static Conduit to the NCN & GEO NCN). Aside from dynamically learned routes, the APN routing table will still carry the locally-learned routes (connected and static), and the learned eBGP routes will be exchanged via the iBGP overlay.

Finally, to influence the far-end Autonomous System(s) to steer traffic on or off the Talari APN, the user will create a user-definable configuration file containing BIRD-syntax functions that can be applied immediately (run-time) without having to walk through the Talari configuration process. The BGP attributes the user can change include:

1. Autonomous System Path (ASPATH) [prepending]
2. Communities [additive, zeroize, (re)set]
3. Local Preference

Note: Specific examples of this configuration process will be provided below so the user can understand the process and what specific use cases the Talari supports for eBGP.

Supported Use Cases

Talari supports well-defined topologies and use cases for this release and eBGP. These use cases will provide details on Talari configuration requirements to support these topologies and will explain how the user can influence BGP attributes with the Talari acting as its own private AS.

AS-Path (Transitive & Talari-Internal Prepending)

The use case for using the BGP AS-Path attribute is to provide the ability to steer traffic on and off the APN AS without a Talari configuration change and update. Talari will advertise routes to the adjacent eBGP router with the appropriate AS-Path. Recommendations for this feature include:

- Understand the current BGP topology
- Identify the method and criteria for BGP best-path-selection at the far end AS(s)
    - Use existing routers' route maps to repend AS Paths or create new ones
    - Use the Talari router configuration to prepend AS Path
- Users should choose the method they understand and are most comfortable with

Currently there are two options methodologies for AS-Path prepend.

4. Internal – User can use the Talari CLI to prepend the AS-Path
5. External – User can use an external route-map to prepend the AS-Path

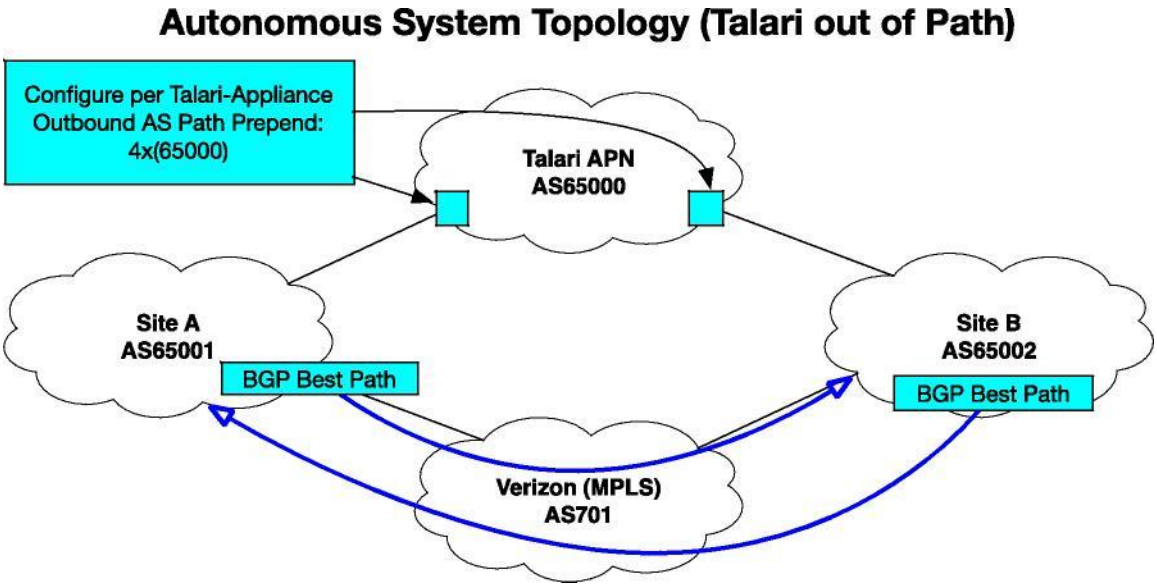

Figure 2

Refer to Figure 2. The Talari will Egress prepend to the LAN side router. This will influence the LAN router to forward traffic to the MPLS router, as the AS-Path length is shorter than across the APN. Figure 3 shows the same information with additional detail.

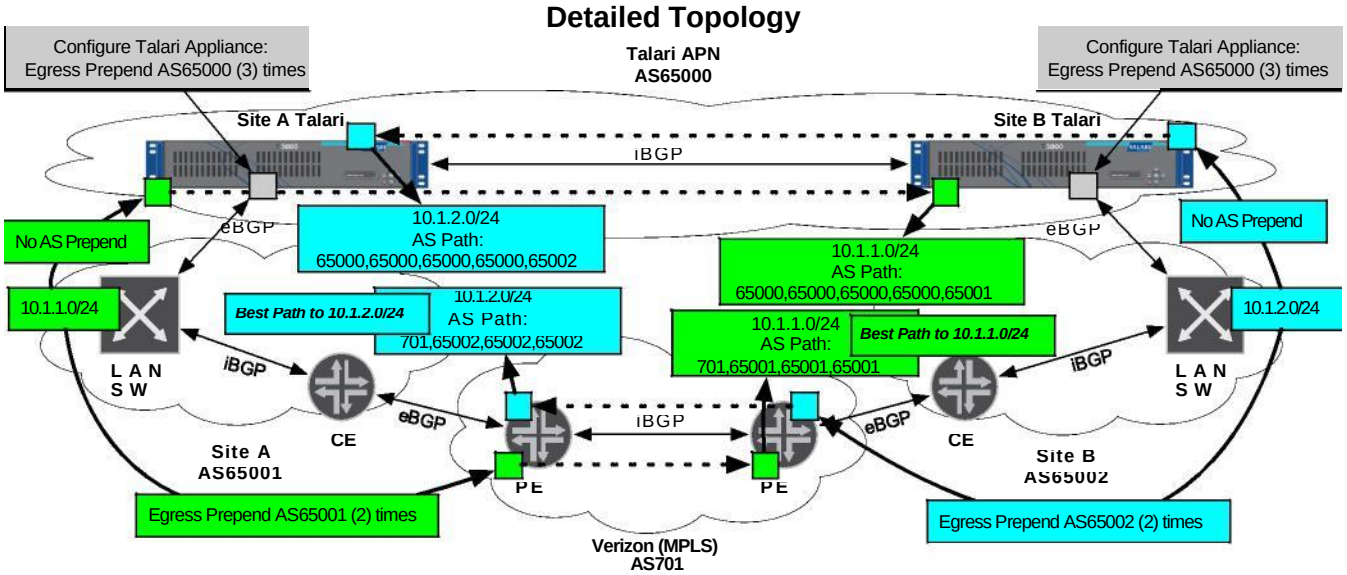

Figure 3

In the first example, the user would leverage the Talari APN to carry the AS-Path attribute end-to-end, as well as prepend additional ASNs to influence the LAN side router to forward traffic to the MPLS AS. By default, without any prepending, the path length for routes learned via the APN would be the same as the MPLS Provider.

The user has the option of influencing this metric within the Talari. An example is provided below.

The Talari eBGP configuration file is in the following directory: **/home/talariuser/bird/etc/**

The file the user will edit is named **apn_bird_bgp_advanced.conf**

The user may increase the AS path length in the **apn_bird_bgp_advanced.conf** file as well.

The steps to add or remove these are:

6. Edit the configuration file (or delete the file and create a new one) for AS-path prepend for the appropriate sites in the above diagram
7. Apply the file to the active routing process
8. Optionally, clear the functions from the active routing process

Note: The “advanced_routing” command must be run as a non-privileged user, and preceded with “sudo”.

Step 1a – Remove the sample configuration file.

```
# Site A-VT800:
# To add function
rm /home/talariuser/bird/etc/apn_bird_bgp_advanced.conf
```

Step 1b – Add the functions to the file.

```
function bgp_prepend_as_5_times(int local_as)
{
    bgp_path.prepend(local_as);
    bgp_path.prepend(local_as);
    bgp_path.prepend(local_as);
    bgp_path.prepend(local_as);
    bgp_path.prepend(local_as);
     return true;
}
```

Step 2 – Apply the changes to the configuration file (issued at the NCN for the peer Talari Appliance).

sudo advanced_routing --bgp_neighbor "10.1.2.100" --import "bgp_prepend_as_5_times(65001)" --export "bgp_prepend_as_5_times(65000)"

The description of the commands is as follows:

sudo advanced_routing – command to initiate configuration script

--bgp_neighbor "10.1.2.100" – define the bgp neighbor IP address, remote BGP neighbor IP address

--import "bgp_prepend_as_5_times(65001)" – when importing prepend the as 65001 5 times -

-export "bgp_prepend_as_5_times(65000)" – when exporting prepend the AS 65000 5 times

Upon import, this will pre-pend the AS 65001 5 times, and pre-pend the AS 65000 5 times upon export.

Step 3 – Clear the prepending of paths from the routing process.

Clear applied functions

sudo advanced_routing --clear_functions

To be consistent, a similar (AS prepending) configuration would be applied at the Client site (Site B) if Talari was used to steer the traffic on or off the APN.

This is an example of how to use the Talari CLI “advanced_routing” utility to prepend AS paths to importing and exporting of routes on a local Talari Appliance. Since the Talari will send the AS-Path attribute using a single path when configured, the user can use the Talari configuration process or their existing route maps to steer traffic on and off the APN. From a eBGP perspective, it is important that the user understand that the Talari APN is a separate AS. With that information, the user can decide how to steer traffic on and off the APN.

BGP Communities (Transitive)

Refer to Figure 4 for an example of using communities across an APN. In this topology, there is iBGP between the CE router and the LAN layer 3 device, as well as eBGP between the Talari and the LAN layer 3 device. The Talari will import a route from the LAN layer 3 neighbor with a community (or multiple) attached to it. The Talari APN will carry the BGP route and associated communities across the APN to the other ASs intact. The far end LAN layer 3 devices will use an inbound route-map to compare routes received from both peers to determine the best path. Routes received with (*:100) will be installed with the default BGP local preference of 100. Routes received with (*:200) will be installed with the increased BGP local preference of 200, winning the BGP best path selection process.

It is important to note that in this example, the Talari is simply maintaining the route attributes across the APN; the APN is taking no action based on communities, nor is it stripping or imposing communities on learned routes.

We have community strings associated with each AS.

For Site A to Site B:

- MPLS AS – 65001:100
- APN AS – 65001:200

For Site B to Site A:

- MPLS AS – 65002:100
- APN AS – 65002:200

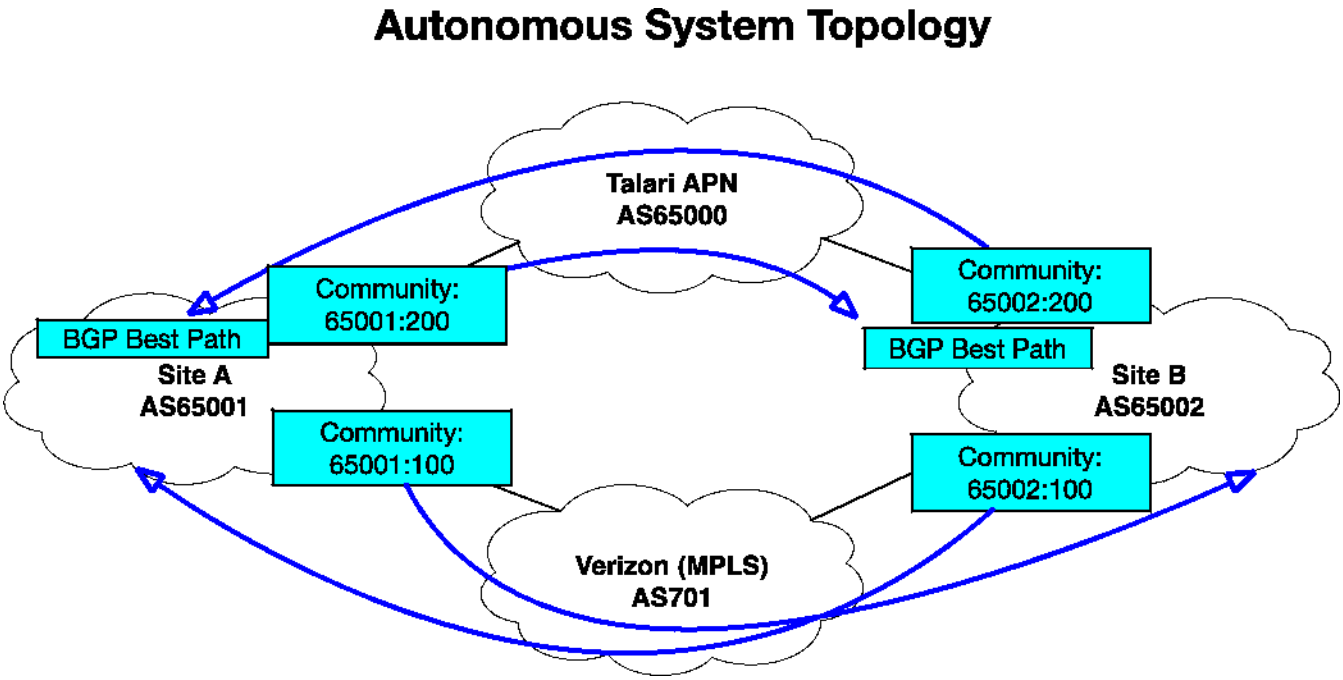

Figure 4

BGP Communities (Additive)

For this example, we will us the Figure 5 which uses the same topology as the previous detailed diagram, however in this example the Talari APN is configured to add a community (additive, not modifying/removing any other communities) to a route learned at each local site. Routes learned from Site A will have a community of 65000:65001 added to it. Routes learned from Site B will have a community of 65000:65001 added to it.

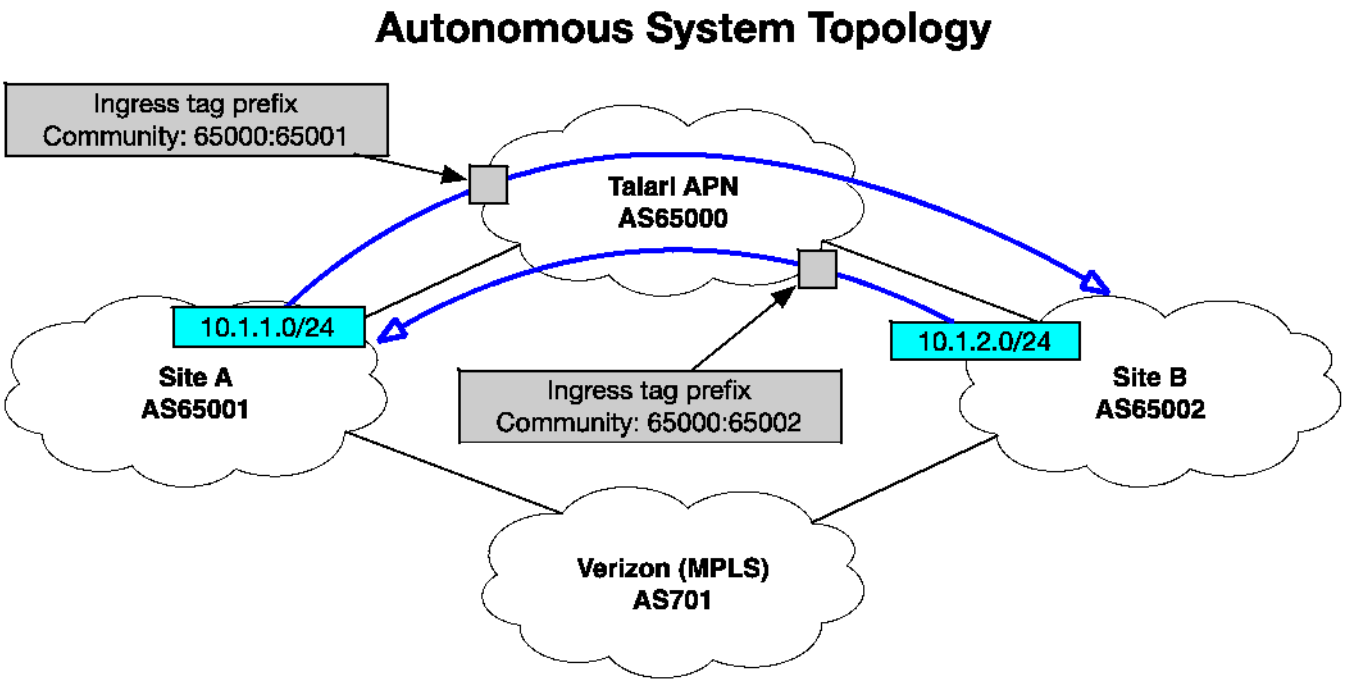

Figure 5

In this use case example, the Talari configuration will tag BGP prefixes with a community attribute upon import. From the CLI, the user will edit the configuration file and apply it. This example will show the user how to tag the community attribute at Site B.

Note: The “advanced_routing” command must be run as a non-privileged user, and preceded with “sudo”.

Step 1 – Edit the apn_bird_bgp_advanced.conf file with the function call. SSH into the Talari Appliance and “cd” into the appropriate directory.

/home/talariuser/bird/etc/

Edit configuration file: apn_bird_bgp_advanced.conf

Add the following function call:

```
function bgp_add_community(int peeras)
{
    bgp_community.add((65000,peeras));
    return true;
}
```

Step 2 – Activate the configuration file.

sudo advanced_routing --bgp_neighbor "10.1.1.100" --import "bgp_add_community(1)"

sudo advanced_routing – command to initiate configuration script

--bgp_neighbor "10.1.1.100" – define the bgp neighbor IP address, remote BGP neighbor IP address

Import - When importing routes, apply the function call: bgp_add_community.

This creates a community value of the Talari AS:peer AS number. For Site B, that would be a community value of 65000:65001 which is depicted in Figure 6.

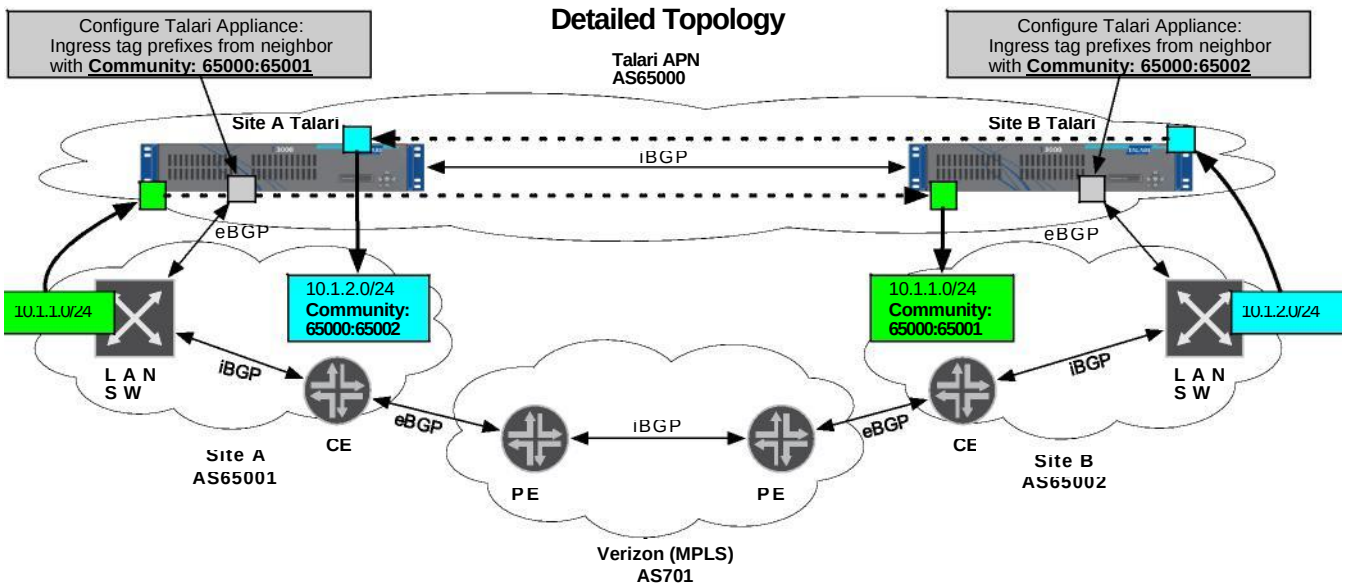

Figure 6

Summary

In the APN 6.1 GA software release, Talari can now act as its own Transitive AS. This provides users the ability to use their traditional MPLS or their Talari APN for connectivity. With the additional ability to steer traffic on and off the APN, users can perform software upgrades and maintenance without impacting to user traffic. In the future, additional configuration guides will be available to help with specific BGP configurations.