Oracle® SD-WAN

How to Configure Oracle Talari Appliance High Availability

Original Publication Date: Nov 1, 2019

Table of Contents

About This Document

This document describes how to implement Oracle Talari Appliance High Availability (HA) at sites within a Talari WAN. This guide covers various HA deployments and configurations.

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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
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1. Access the Oracle Help Center site at http://docs.oracle.com.
2. Click Industries.
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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*

Introduction to High Availability

Oracle Talari Appliances can be deployed in High Availability (HA) configuration as a pair of appliances in Active/Standby roles. There are three modes of HA deployment:

- Parallel Inline HA
- Serial Inline HA
- One Arm HA

These HA deployment modes are similar to Virtual Router Redundancy Protocol (VRRP) but use a proprietary protocol called Redundant APN Control Protocol (RACP). Both Client Nodes (Clients) and Network Control Nodes (NCNs) within a Talari Adaptive Private Network (APN) can be deployed in an HA configuration, if the selected Talari Appliance model supports HA. The T510 and E50 do not support HA; all other appliance models do.

Note: The NCN is the central Talari Appliance that acts as the master controller of the APN, as well as the central point of administration for the Clients. The NCNs primary purpose is to establish and utilize Conduits with one or more Clients across the network for enterprise Site-to-Site communications.

In HA configuration, one Talari Appliance at the Site is designated the Active appliance and is continuously monitored by the Standby appliance. Configuration is mirrored across both appliances. If the Standby appliance loses connectivity with the Active one for a defined period of time, the Standby appliance assumes the identity of the Active appliance and takes over the traffic load. Depending on the deployment mode this fast failover has minimal impact on the application traffic flowing through the Site. We will discuss the impact in more detail later in this document.

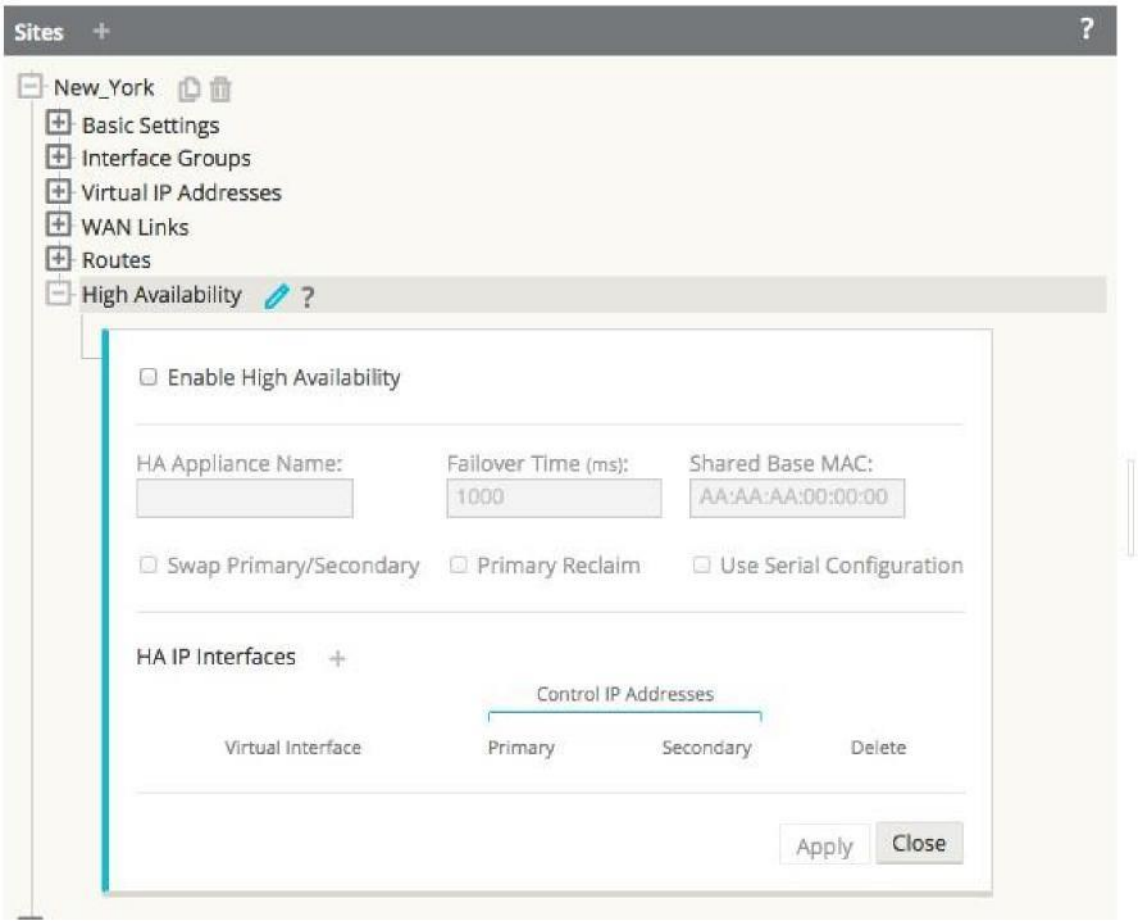
Note: For NCNs, we also support what is called Geographically- Diverse NCN redundancy. In this mode, one of the Clients is also designated as a secondary NCN. It will continuously monitor the health of the Primary NCN and if a catastrophic event occurs, it will assume the role of the NCN. The T510, T730, and E50 appliance models cannot act as NCNs

There are various technical considerations in each deployment scenario. These will be explored in the sections below.

Configuring High Availability

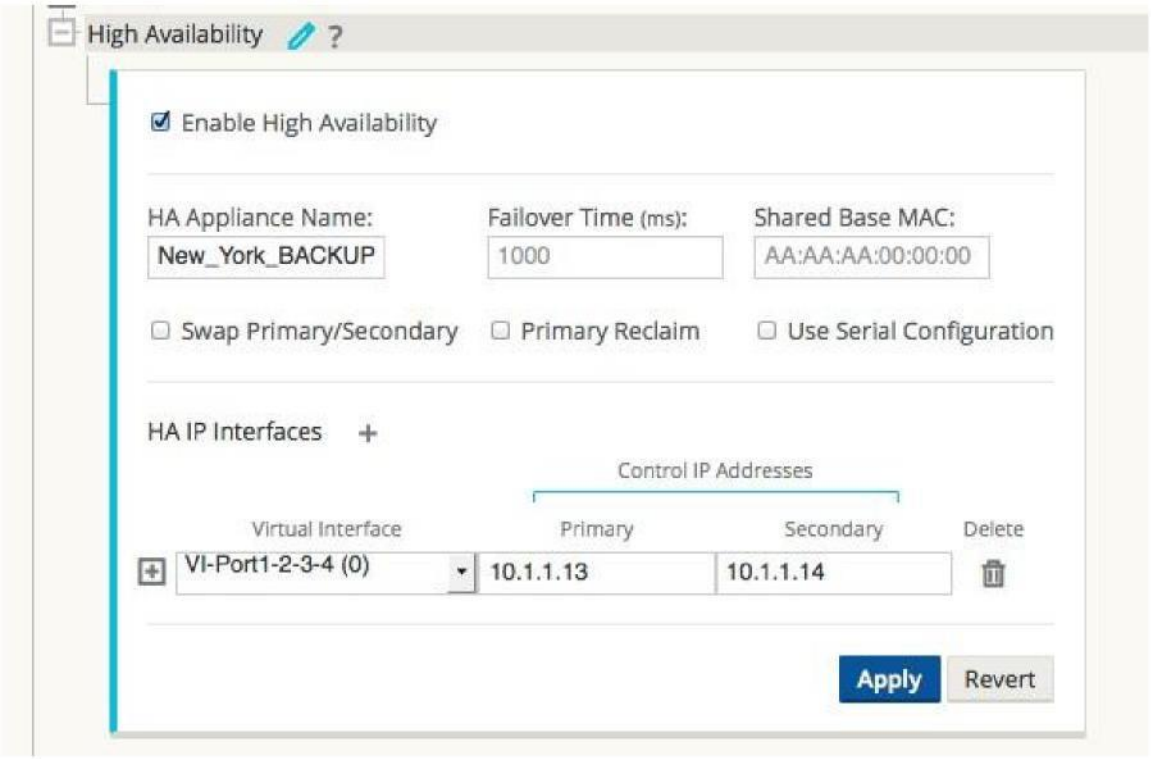
Configuring a Site for HA

HA is configured through the Talari Configuration Editor tool. When a Site is added, an HA appliance can be configured for the Site:



Configuring HA Properties

Once a Site has been configured with an HA appliance, the HA appliance and interface groups can be configured:



Primary Reclaim

In the event that the Ative appliance fails and then comes back, it can be configured to reclaim the Active status once it has rebooted. This feature is disabled by default To enable it, select the check box for “Primary Reclaim” in the High Availability section of the site configuration.

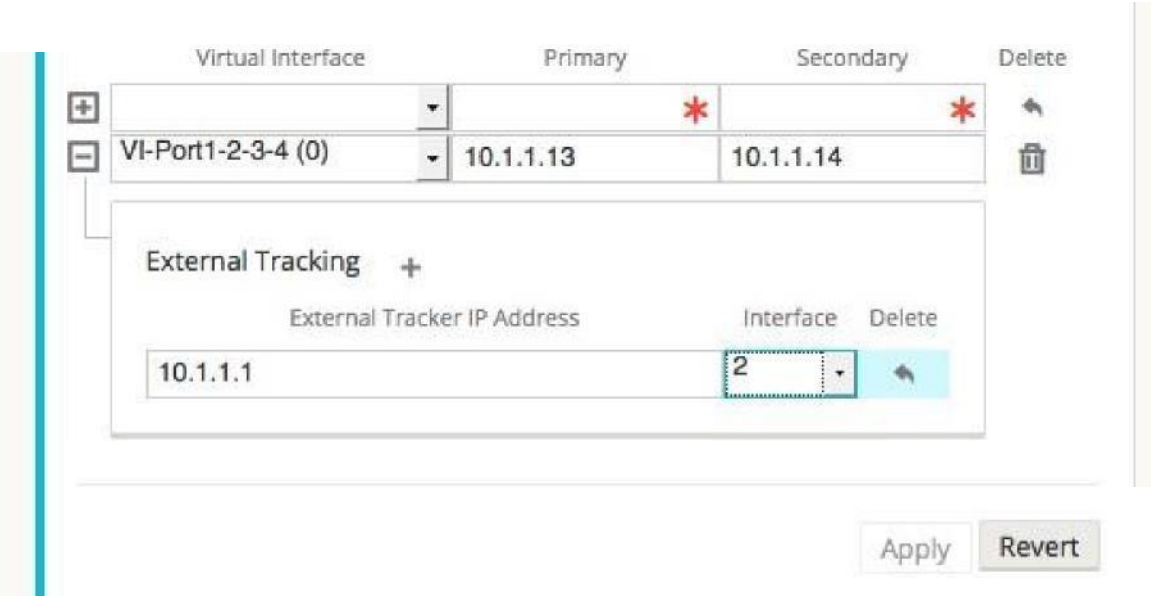
The Active/Standby states of an HA pair can be manually switched from the web console of either appliance during run-time operation.

Serial Inline HA

When Serial Inline HA mode is desired, select the check box for “Use Serial Configuration.”

Interface Groups

At least one HA interface group must be configured. This is the interface that the HA RACP protocol will be established across in order to monitor the Actrive appliance for reachability. For One Arm HA mode, only one interface group is required. For Inline HA mode, additional interface groups may be configured in order to use External Tracking to monitor reachability of the upstream or downstream network infrastructure (e.g. switch port failure) to detect if an HA state change is needed.

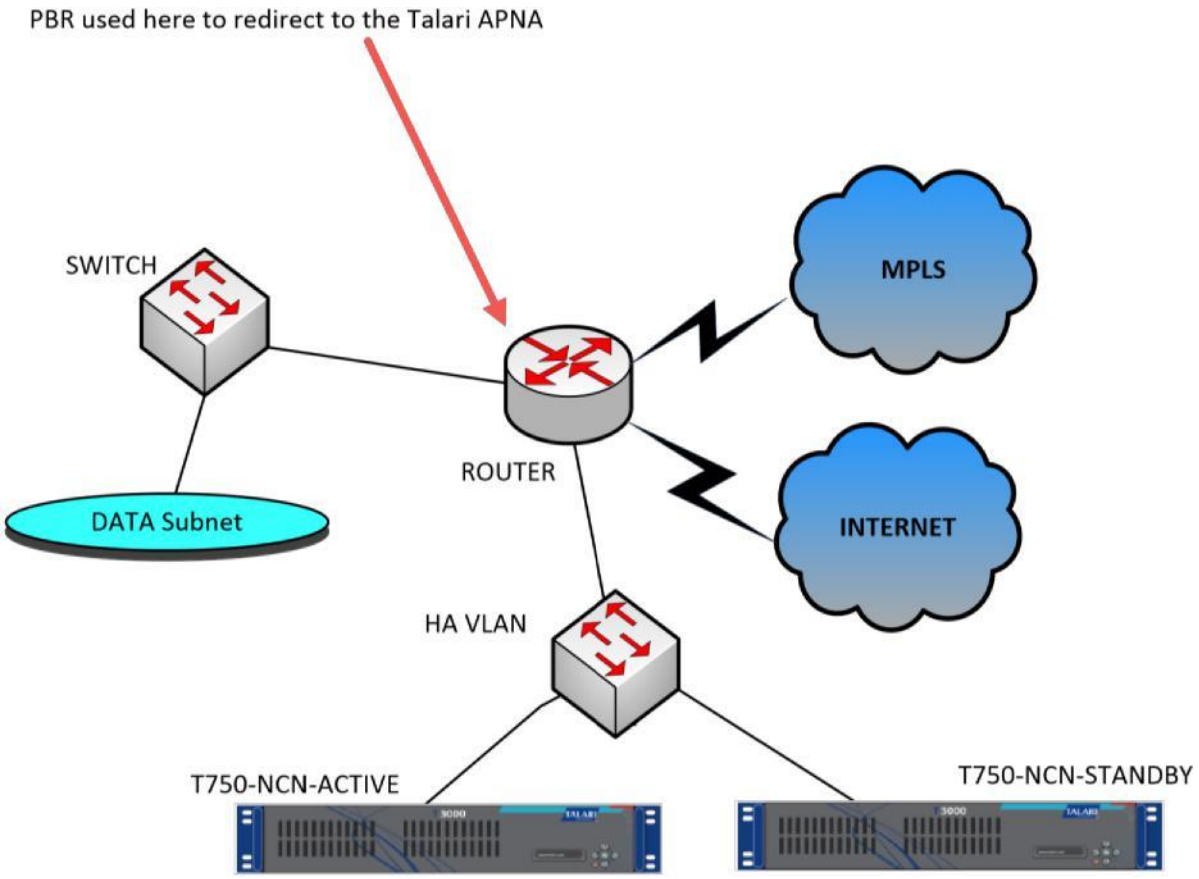


Selecting a High Availability Mode

One Arm HA

In One Arm mode, the HA appliance pair is outside of the data path. Application traffic of interest is redirected to the appliance pair, typically using Policy Based Routing (PBR). One Arm is used when a single insertion point in the network is not feasible or to avoid the challenges of fail-to-wire.

In this case, adding HA is straight forward. The Standby appliance can simply be added to the same VLAN or subnet as the Active appliance and the router, as we show in the diagram below:



In One Arm mode it is recommended that the Talari Appliances do not reside in the data network subnets. This means the Talari Conduit traffic doesn't have to traverse the PBR and avoids route loops, etc. The Talari Appliacnes and router do have to be directly connected, either via an Ethernet port or by residing in the same VLAN.

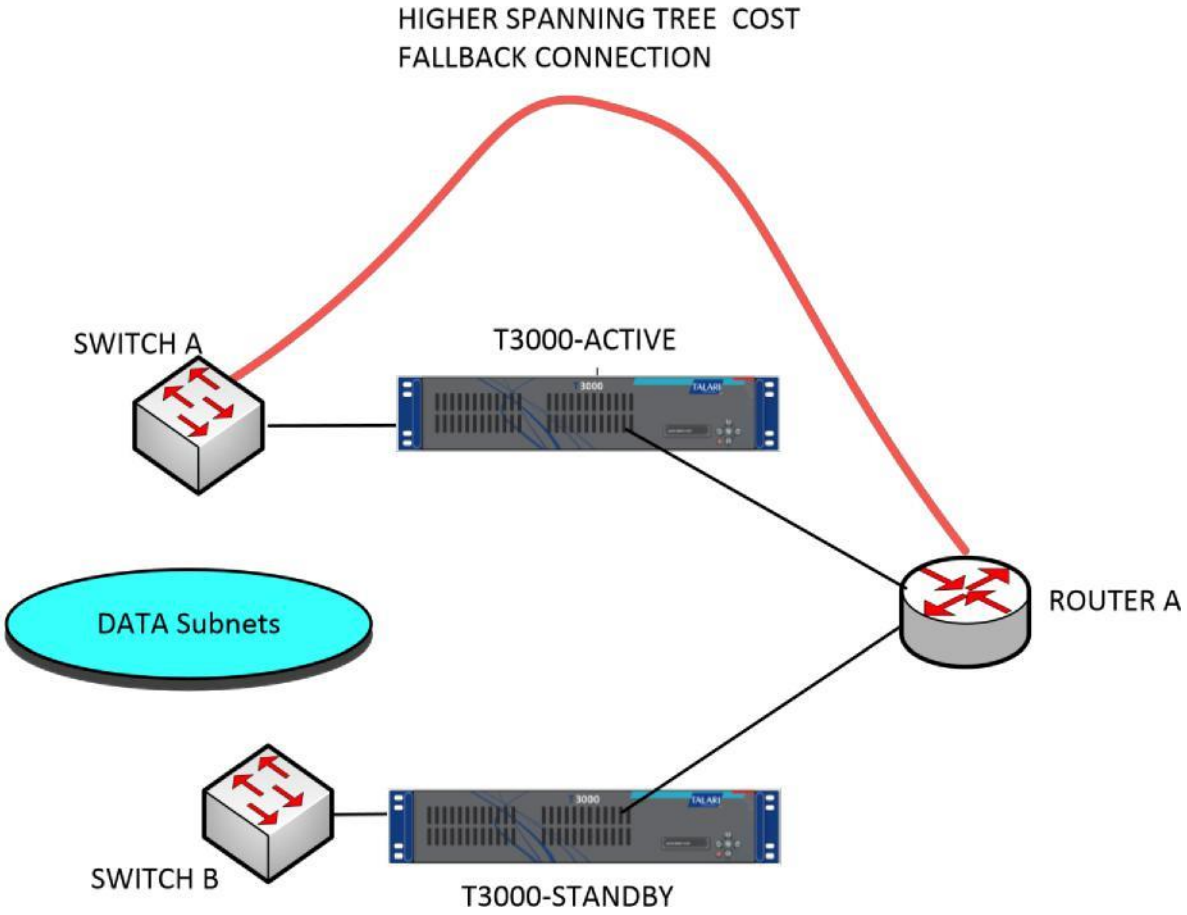
Using IP SLA Monitoring for Fall Back

As long as one of the Talari Appliances is active, traffic will still flow even if the Conduit is down. In this case, the Talari Appliance will redirect the traffic back to the router as Intranet traffic. However, if both Talari Appliances become disabled, the router will still try to redirect traffic to the appliances. IP SLA monitoring can be configured at the router to disable the PBR if the next device is not reachable. This allows the router to fall back to doing a route lookup in the normal way and forwarding packets appropriately.

Note: Not all routers and firewalls support PBR or IP SLA.

Parallel Inline HA

In Parallel Inline HA mode, the Talari Appliances are deployed alongside each other, in line with the data path. The diagram below shows a common deployment with multiple switches and a single router.

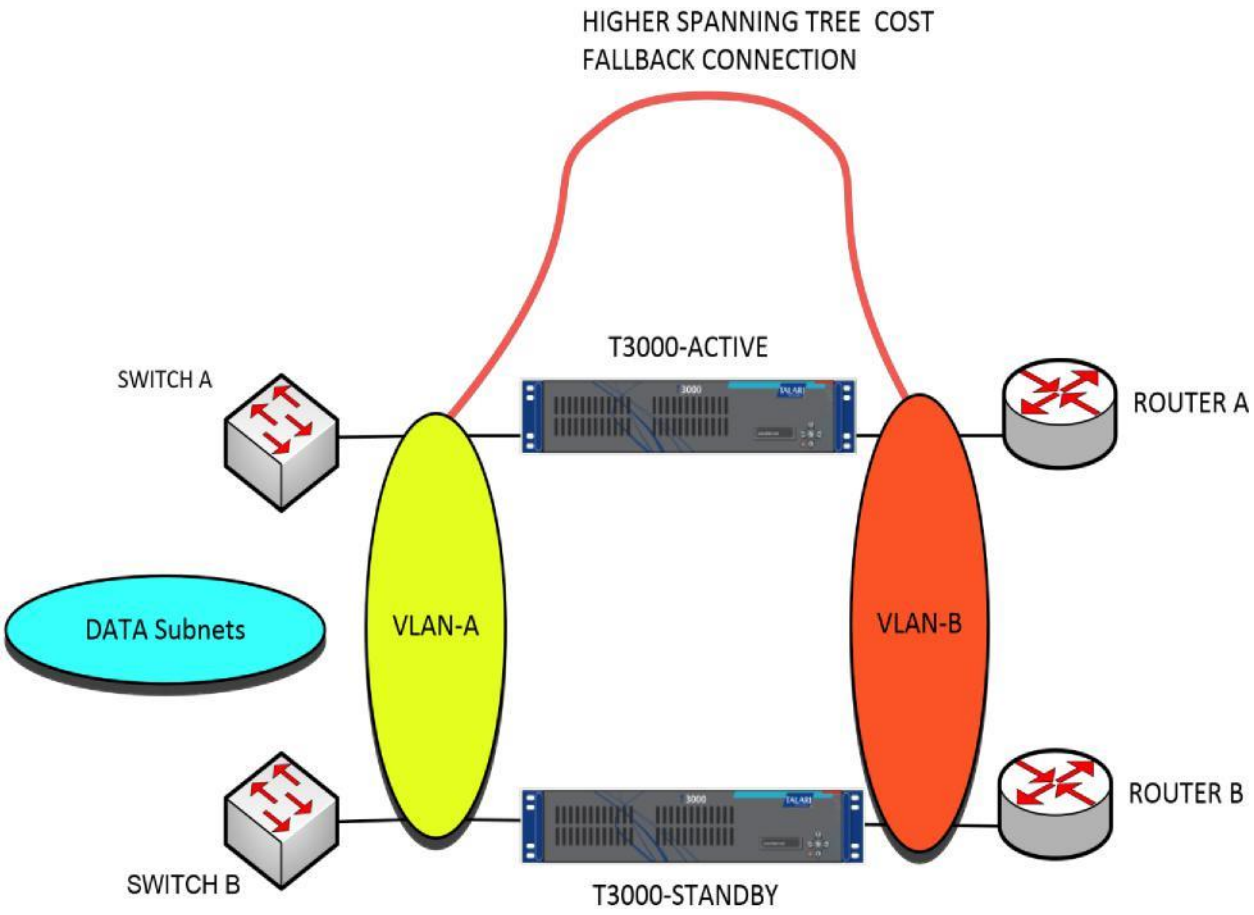


In the above diagram, only one path through the Active appliance is used. It is important to note the bypass interface groups are configured to be fail-to-block and not fail-to-wire so that we don't get spanning tree loops during a failover.

The HA state can be monitored through the inline interface groups or through a direct connection between the appliances. External Tracking can be be used to monitor the reachability of the upstream or downstream network infrastructure (e.g. switch port failure) to detect if an HA state change if needed. If both Talari Appliances are disabled or fail, a tertiary path can be used directly between the switch and router. This path must have a higher spanning tree cost than the Talari Appliance paths so that it is not used under normal conditions.

Failover in Parallel Inline HA mode is very quick and nearly hitless, as no physcial state change occurs. Fallback to the tertiary path is not typically hitless and can cause traffic to be blocked for 5-30 seconds depending on the spanning tree configuration.

If there are out of path connections to other WAN Links, both appliances must be connected to them. In more complex scenarios, where multuple routers might be using VRRP, non-routable VLANS are recommended to ensure the LAN side switches and WAN side routers are reachable at Layer 2.

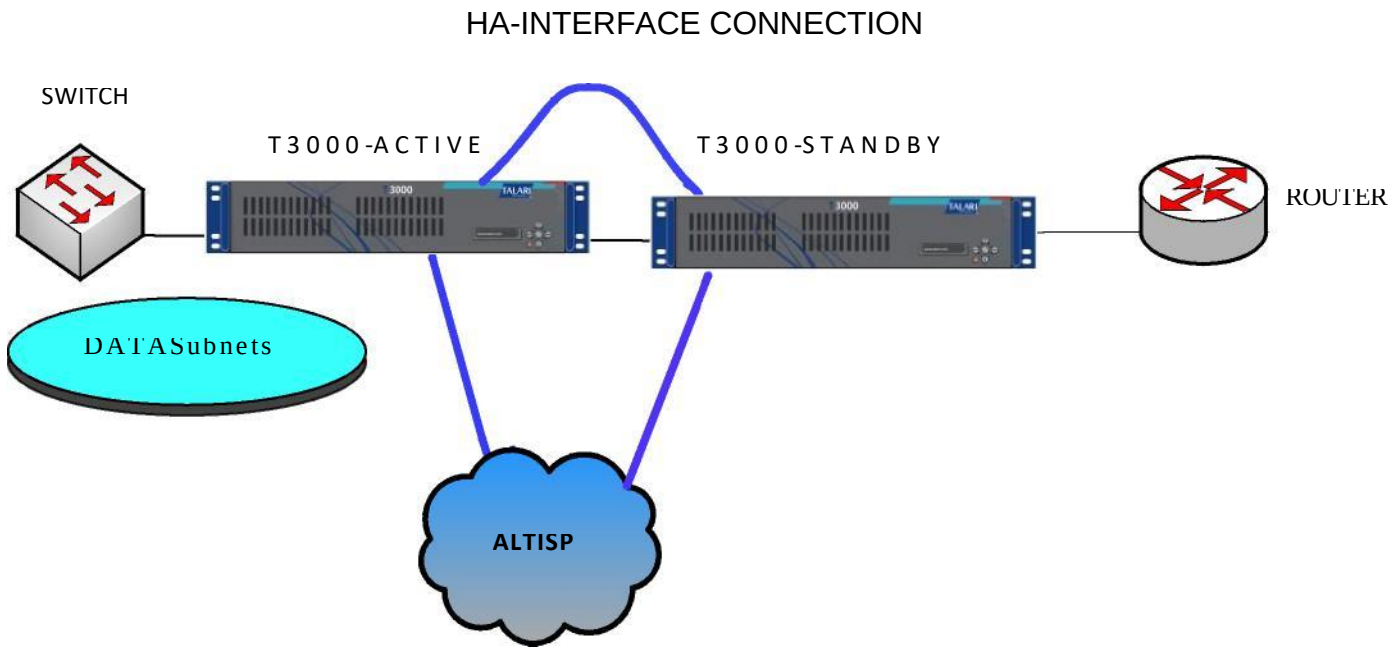


Serial Inline HA

In Serial Inline HA mode, the Talari Appliances are inline on the same path. In this case the bypass interface groups should be in the fail-to-wire mode, with the Standby appliance in a Passthrough or bypass state. A direct connection between the two appliances on a separate port must be configured and used for the HA interface group. Serial Inline has the advantage of being very simple to deploy but has some drawbacks:

- Due to a physical state change when the Talari Appliance switches over from Active to Standby, failover can cause some loss of connectivity depending on how long the auto-negotiation takes on the Ethernet ports. It is likely to be several seconds and can be service impacting.
- It is not recommended that Serial Inline be used on ports that are auto-negotiated, as this will increase failover time.
- If the HA connection between the appliances fails in some way, both appliances will go active and cause a service interruption. This can be mitigated by assigning multiple HA connections so there is no single point of failure.
- We recommend testing fully when inline with other devices, using the following scenarios to verify bypass (fail-to-wire) operation.
    - Talari Appliance In-Line: **Powered** OFF
    - Talari Appliance In-Line: **Powered ON with Talari Service DISABLED**
    - Talari Appliance In-Line: **Powered ON with Talari Service**

ENABLED An example of Serial Inline HA deployment is shown below:



Summary

The three modes of HA deployment and their advantages and disadvantages are summarized in the table below:

Deployment Mode	Configuration Complexity	Physical Complexity	Failover Time	Fallback
One Arm	High (PBR)	Low	Fast <1s	Yes (Intranet & IP SLA)
Parallel Inline	Medium	Medium (VLANS)	Fast <1s	Yes (High Cost Path)
Serial Inline	Medium	Low	Slow 5-15s	Yes (Passthrough)

As a rule of thumb, either One Arm HA configuration or Parallel Inline HA configuration is recommended for Datacenters or Sites that forward a hig volume of traffic to minimize disruption during failover. If a small loss of service is acceptable during a failover, then Serial Inline is a reasonable solution.

Serial Inline HA protects against appliance failure and Parallel Inline HA protects against all failures. In all cases, HA is valuable to preserve the continuity of the APN during a system failure