NIAGARA NETWORKS

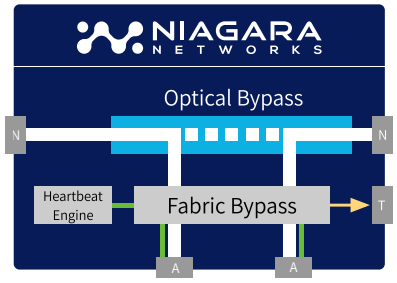
Application Note

Dual-Protection Bypass

Niagara Networks dual-protection bypass switches enable carrier-grade high-availability and improved network resiliency

Inline security tools such as firewalls and intrusion prevention systems make an important part of the security infrastructure of service providers, enterprise networks and government agencies. To ensure uninterrupted data flow even in a situation where an inline security tool is offline for maintenance or due to a failure it is important to have these tools protected by an inline bypass switch. Niagara's unsurpassed family of inline bypass switches provide dual protection to ensure maximum availability and optimal bypass switching.

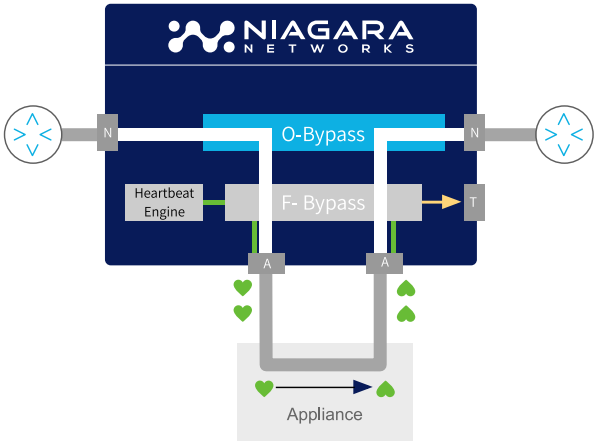
Niagara's inline bypass switches deploy a combination of a switching fabric bypass in combination with inline heartbeat injection for service availability and forwarding detection, and an optical relay to ensure traffic forwarding in power-loss situations where the bypass switch is disconnected from its power source. As a result, such powerful architecture has no single point of failure that can degrade the connected service chain and neither the network.



Normal inline operation mode

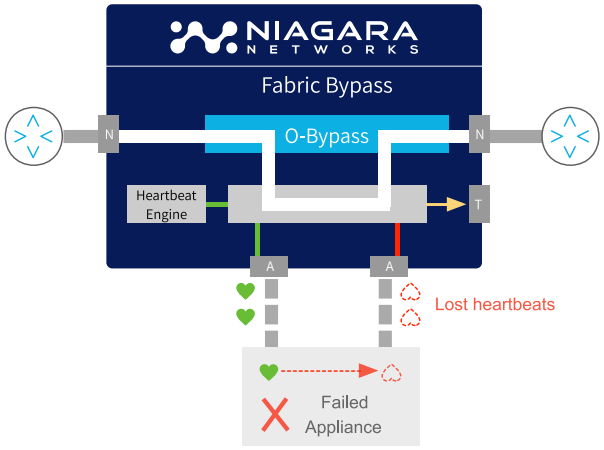
In the normal inline operation mode, traffic from the network entering the bypass switch is received by an internal optical relay which operates in inline mode and connects to a switching fabric. This fabric forwards the traffic to the attached appliance and enables simultaneous injection of a heartbeat signal. An internal heartbeat engine injects configurable heartbeat signal which is used to verify that the attached security appliance is actually forwarding the traffic.

The traffic forwarded by the inline appliance is received by the bypass's switching fabric which will forward the traffic through the optical relay into the network. In addition to traffic forwarding and distribution, enhanced functionality of the switching fabric is the ability to duplicate the traffic for active tapping purposes.



Inline appliance unavailability

In the situation where the inline appliance is unable to forward the traffic due to the appliance being in maintenance mode, misconfiguration etc., the heartbeats generated by the bypass switch are also not forwarded. The loss of heartbeat will trigger the bypass switch to activate the Fabric Bypass. This is called Active Bypass mode. Traffic is bypassed by the switching fabric. The bypass will still send a heartbeat to the appliance to verify whether the appliance has become available again. The switching fabric enables fast and seamless bypass switching.
If the heartbeat reception is restored, it will trigger the bypass to switch to the inline mode to restore the normal operation mode.



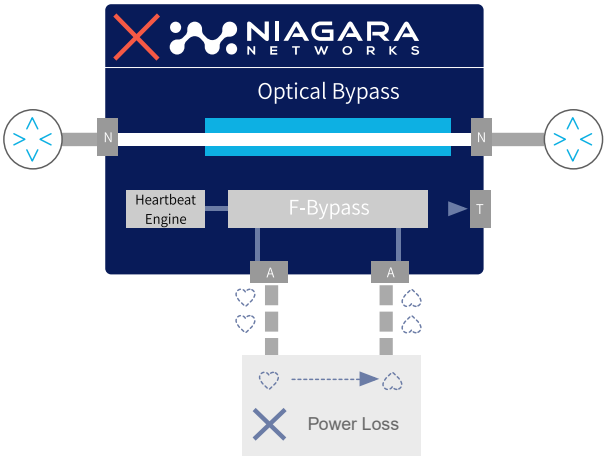
The type and frequency of the heartbeats, as well as the number of lost heartbeats before switching to bypass mode, and the number of received heartbeats before reverting to inline mode are user-configurable.

A loss of Signal (LoS) from the attached appliance will trigger the bypass immediately, in this case, the loss of heartbeat is ignored. To revert to inline mode the configured number of received heartbeats still applies.

Power loss

In the extreme scenario of power loss on the bypass switch, the internal optical relay is activated, interconnecting both network ports of the bypass switch. This is called Passive Bypass mode. In this scenario, the bypass switch acts as a fiber relay.
After power restoration, the bypass remains in passive bypass mode until heartbeat reception is restored. Reception of the heartbeat confirms that the attached appliance is forwarding traffic and inline mode can be enabled.

Note: The number of bypass segments varies across the different bypass switches in Niagara Network's bypass switch portfolio. The mode and heartbeat for each segment is configurable.



About Niagara Networks

Niagara Networks provides high performance network visibility solutions for seamless administration of security solutions, performance management and network monitoring. Niagara Networks products provide advantages in terms of network operation expenses, downtime, and total cost of ownership. A former division of Interface Masters, Niagara Networks provides all the building blocks for an advanced Visibility Adaptation Layer at all data rates up to 100Gb, including TAPs, bypass elements, packet brokers and a unified management layer. Thanks to its integrated in-house capabilities and tailor-made development cycle, Niagara Networks is agile in responding to market trends and in meeting the customized needs of service providers, enterprises, data centers, and government agencies. For more information please visit us at www.niagaranetworks.com.

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