CVP1R: IR1101 Wired SD-WAN with LTE as Last Resort in Routed Mode

Overview

This single-router SD-WAN configuration is for the Cisco Industrial Router IR1101. It is designed specifically for this platform with all its unique interface names and modules to aid in the rapid deployments at small to medium sized locations where flexibility, simplicity and standardization are key. This catalog represents a Cisco Validated Profile (CVP) suited for deployments at locations like retail, Oil & Gas Pipelines, Roadways & Intersections.

This network configuration is wired transport with single LTE connectivity as last resort. This configuration offers network segmentation via 1 secure VPN (VPN 10).

Configuration Catalog Details

Ethernet LAN connectivity is mapped into one VPN for security and granular control:

- Connected Devices (VPN 10): Secure network or DIA for corporate devices.
- One or more Hubs are required to be deployed as shown. Hubs need to be deployed using a configuration group not provided here as part of this catalog entry. The hubs will facilitate communication between connected devices behind edge routers and the enterprise network by advertising to edge devices a default route or a list of subnets the edge devices need to reach in the enterprise. It will be up to the Hub to allow also for edge traffic to reach the internet or block it if not needed at the edge. It is also necessary to assign each edge device a unique Service VPN subnet and IP address to allow for return traffic.

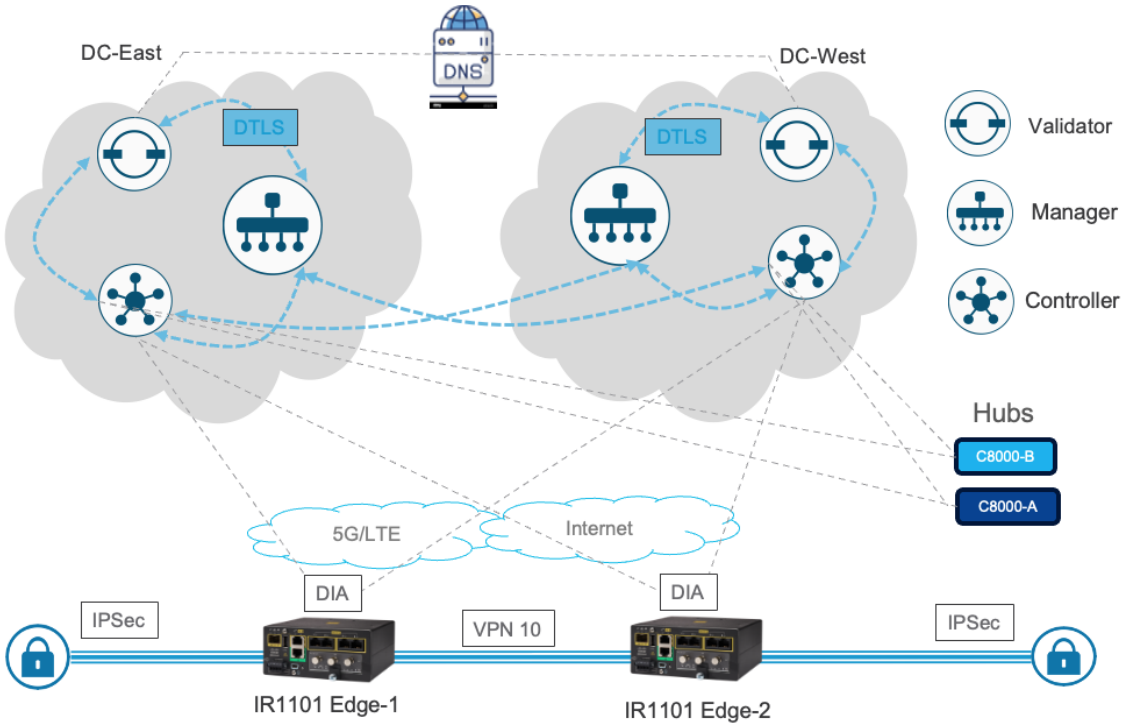
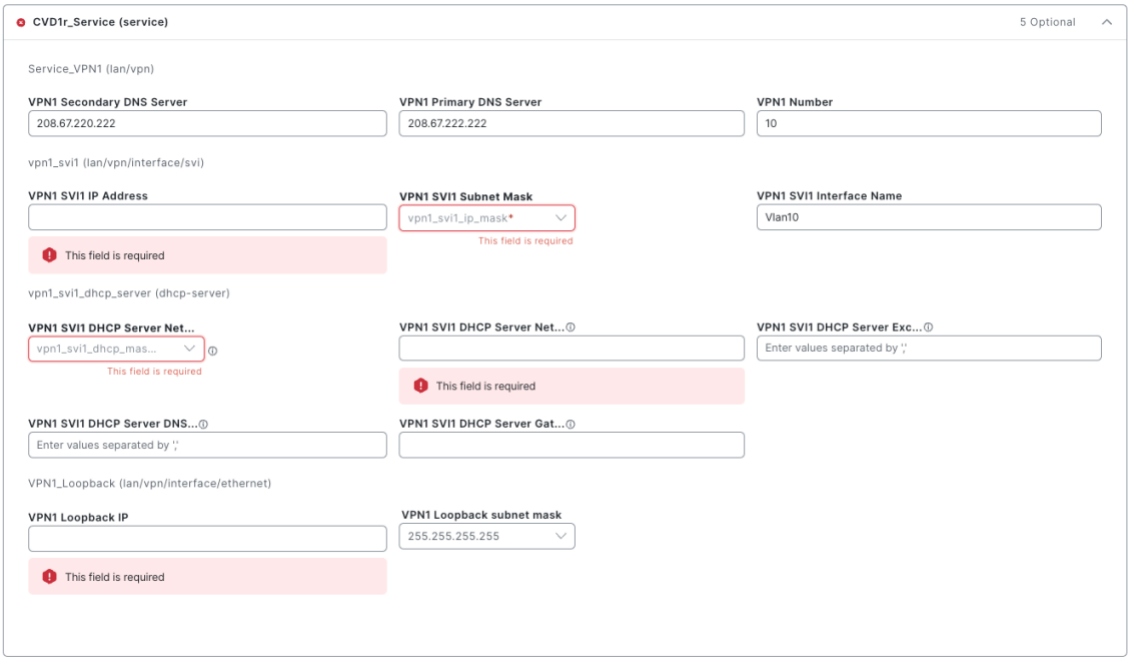


Fig 1: Configuration Catalog Design

Further details on functionality provided by this catalog entry which can be changed for the device at deployment time:

- The Service VPN (LAN) side is configured to advertise static and connected routes (VPN 10) or flexible integrations at sites with routed LAN access layer. User will need to enter unique subnet for each edge device at deployment time to route back from a Hub router to each edge. User will also need to advertise all subnets from the hub router to edge devices, including a default route as needed. Below is an image of the Service section and the items user needs to set per device (in red). This can be automated for a list of devices using a csv file. If user does not want to have a DHCP server in the service VPN, the "VPN1 SVI1 DHCP Server Network", Mask and Default gateway can be set to dummy values to prevent any connected device from having DHCP service or access through DHCP.



- A DHCP Server is configured for VPN 10 allowing connected clients to receive IP addresses from service VPN 10. In addition, a few timers for BFD and OMP have been tuned to reduce LTE bandwidth usage while maintaining SD-WAN functionality. DHCP details (subnet, default route, DNS...etc.) should be added as needed at deploy time (no defaults provided).
- A primary and secondary NTP servers with corresponding VPN for access can be configured with primary as preferred source. Also, NTP on wired can be disabled if needed.
- User can set the router console rate (default provided).
- Default DNS servers (Cisco DNS) are provided in both VPN 0 and VPN 10. User can change those in VPN 10 as needed.

- Point router logs to a server of their choice and provide the correct VPN and source interface for such traffic. The field is in the system section called “Logging Server IP Address” and is currently set to “0.0.0.0”, please change it at install time to a valid logging server IP address or set it to be the same as the “System IP” from the system section if one does not exist.
- Assign a loopback IP address to the field “VPN1 Loopback IP” under the service section. This can be assigned same IP address as “System IP” address and serves as a troubleshooting IP that can be advertised to and reachable from a Hub router over the same VPN.
- Enter either a static GPS coordinates for the device to display in UI/MAP or if the device has LTE modem with GPS, then it can be enabled. Both GPS and NMEA must be enabled and the mode set to “standalone” to acquire GPS signal. Modem GPS coordinates will override static coordinates in UI/MAP. If NMEA data streaming is also required, source/destination IP and port should be provided to forward the GPS stream.