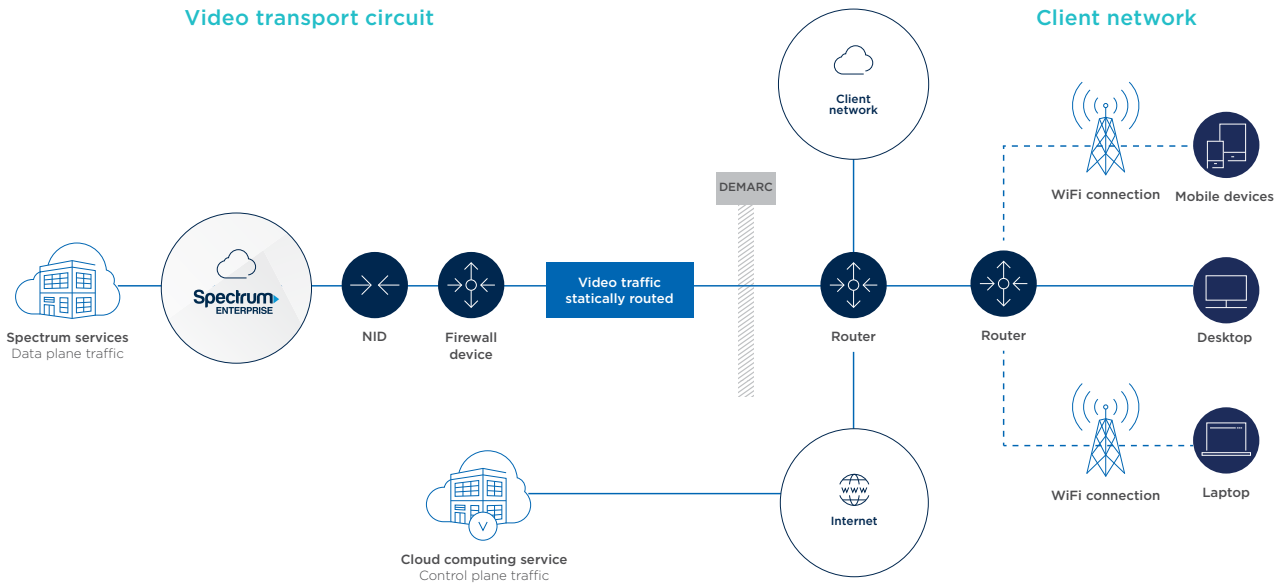


TV STREAMING ACCESS GUIDE

Reference guide for configuring video delivery
with internet service that is not provided by
Spectrum Enterprise

Overview

TV Streaming Access is delivered via a private and dedicated video transport circuit to your location, which ensures highly reliable service. If you have internet service that is not provided by Spectrum Enterprise™, you will need to configure the static routes that are provided in this guide. The diagram below outlines the delivery architecture.



The bandwidth of the video transport circuit, Network Interface Device (NID) and firewall device will be determined by your Spectrum Enterprise sales engineer based on the estimated amount of your video usage. If you have any questions or concerns about the available bandwidth of the video transport circuit, please reach out to your sales engineer or account representative.

Configuration and Validation

A key component of this solution is the configuration of static routes from your network to the firewall device. This will guide streaming video traffic across the video transport circuit.

To simplify this configuration, only IP targets for the data plane traffic (video) will need be configured. All control plane traffic is permitted to be routed over the public internet.

Services	IP Target/Prefix	Ports
Linear CDN	71.74.45.128/25	80/443
VOD CDN	24.92.95.128/25	80/443
	98.7.128.0/18	
	69.23.16.240/29	
	72.129.0.0/18	
	68.173.192.0/20	
	65.29.16.0/22	
Linear/VOD CDN	71.44.5.0/25	80/443
	97.69.193.128/27	
	24.28.0.0/16	
	24.58.40.0/21	
	24.25.244.0/22	
	24.31.196.12/31	

If the above IP Targets are not configured as static routes to the firewall device, the Spectrum Enterprise TV app will not be able to stream live or on-demand content. To verify that this configuration is correct and working, check that the app is able to play both live and on-demand programming.

Installation troubleshooting

Confirm that the IP targets are configured. If you are tuning to a channel and observe that the loading circle is displayed for several minutes and is followed by an error code that displays as <xx>LP-1999 (where the “xx” will be populated with a platform code, such as VALP-1999 for Apple TV), confirm the following:

1. Live TV
 - a. Verify static routes are configured and check for network traffic from/to IP targets.
 - b. Ask your Spectrum Enterprise project manager to confirm that we are seeing traffic from your network and to verify traffic requests from/to IP Targets.
2. On demand
 - a. Verify static routes are configured and check for network traffic from/to IP targets.
 - b. Ask your Spectrum Enterprise project manager to confirm that we are seeing traffic from your network and to verify traffic requests from/to IP Targets.

Troubleshooting after the Enterprise TV app has been working correctly

Network configuration issues can present in the following ways:

- Programming content will pause as if it is buffering, and after a few moments the screen will change to black and the loading circle will be displayed until the stream time out value is reached, after which error <xx>LP-1999 will be shown.
- While tuning to a channel, the loading circle will display until the stream time out value is reached, after which error <xx>LP-1999 will be shown.
- If the stream recovers before the <xx>LP-1999 error, the programming content will continue to play. If the stream recovers after the error shows, you will have to tune to another channel and then back to recover.

If any of these behaviors are displayed consistently after the app has been observed to be working correctly, please follow these troubleshooting steps:

1. Live TV
 - a. Verify static routes are configured and check for network traffic from/to IP targets.
 - b. Contact Client Care at 888-812-2591 to confirm that we are seeing traffic from your network and to verify traffic requests from/to IP Targets.
2. On demand
 - a. Verify static routes are configured and check for network traffic from/to IP targets.
 - b. Contact Client Care at 888-812-2591 to confirm that we are seeing traffic from your network and to verify traffic requests from/to IP Targets.

With other questions or concerns, please call Spectrum Enterprise Client Care at 888-812-2591.

About Spectrum Enterprise

Spectrum Enterprise, a part of Charter Communications, Inc., is a national provider of scalable, fiber technology solutions serving many of America's largest businesses and communications service providers. The broad Spectrum Enterprise portfolio includes [networking and managed services solutions: Internet access, Ethernet access and networks, Voice and TV solutions](#). The Spectrum Enterprise team of experts works closely with clients to achieve greater business success by providing solutions designed to meet their evolving needs. For more information, visit enterprise.spectrum.com.