FCC Performance Testing

••• Your Playbook For Success •••

Calix

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# FCC Performance Testing Is Here And The Stakes Are High

FCC Performance testing is here, and with the stakes so high, it's essential to get it right the first time. But preparing and executing on your testing is not always straightforward. There's a lot to know and there are many steps you have to take just to get your test environment set up for success.

Once you begin running speed and latency tests, dealing with the enormous amount of data that will be generated has the potential to be a significant headache. In a recent Calix survey, making sense of CAF testing data was identified by 45 percent of BSPs as their top challenge.

The Time To Get Ready Is Now

To overcome these and other challenges, the key is to be prepared. And with testing already underway for some categories, and deadlines looming for others, the time to get ready is now.

This eBook explains how to implement proven best practices for testing to ensure that you get the results you need to succeed.
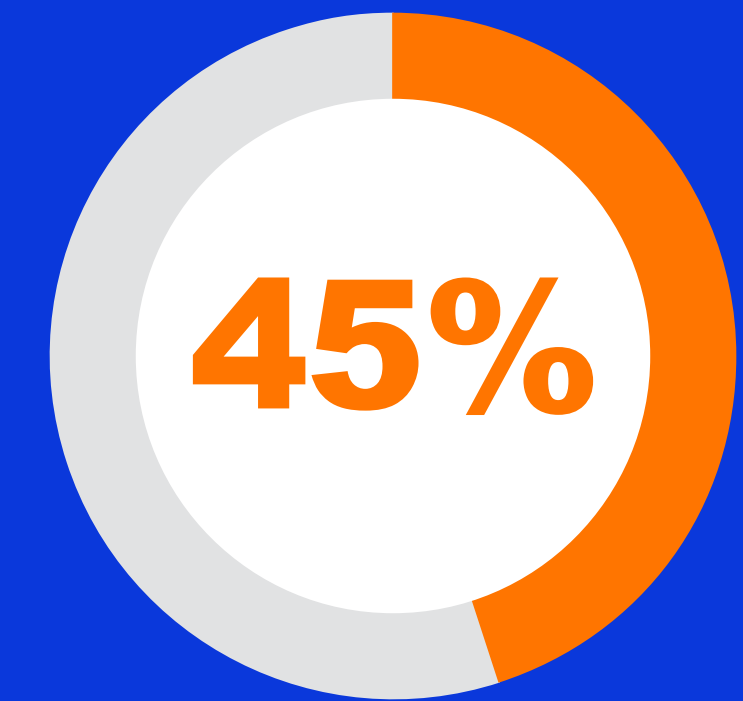
45%

In a recent Calix survey, *making sense of CAF testing data* was identified by 45 percent of BSPs as their top challenge.

Key Steps On Your FCC Testing Journey

Before you begin speed and latency testing, there are several key steps you need to take first.

Step 1: Get Familiar With All The Testing Requirements

The first step is to make sure you fully understand all of the testing requirements, including:

- ❓ Which subscribers you need to test and how many
- ❓ When you have to start pre-testing and official testing
- ❓ The difference between pre-testing and official testing
- ❓ What performance levels you are required to meet for speed and latency
- ❓ How to set up your testing platform
- ❓ How to submit your reports to the Universal Services Administrative Company (USAC)

Step 2: Understand Exactly What You Need To Test

The number of subscribers you need to test in each test group is based on your total number of subscribers, as shown in the following table. You are responsible for requesting a randomized list of the specific subscribers you need to test from USAC.

Total Subs	Subs Per Test
50 or fewer	5
51–500	10% of subs
Over 500	50

A separate test group is required for each speed tier and state deployment combination. The number of test groups you are required to test depends on how many service tiers you are offering and how many states you are operating in. For example, if you are only offering one service tier in one state, then you only need one test group. If you are offering two service tiers in two states, then four test groups are required.
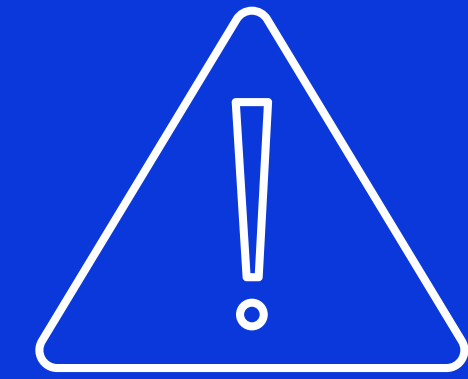
COVID-19 Performance Waiver

In response to the COVID-19 emergency, the FCC has reduced the required sample size to 70 percent of test locations per tier through 2021 to reduce risk to subscribers and technicians.

Additionally, if Broadband Service Providers (BSPs) experience supply chain equipment issues, the waiver may allow them to test less than 70 percent of test locations per tier. Make sure to read the requirements carefully to determine if this portion of the waiver applies to your program. If it does, you need to file a request for waiver with the FCC that includes an affidavit explaining that you do not have sufficient testing equipment. These requests will be approved on a case-by-case basis.

Step 3: Understand The Testing Deadlines For Your Funding Program

Understanding when you need to do your testing is critical. If your company is participating in multiple funds, you have to meet the individual testing requirements of each of them.

Program: CAF Phase II

Pre-Testing	
Start Date: January 1, 2020	
Results Due: Following last week of end of each Qtr 2020	

Testing	
Start Date: January 1, 2021	
Results Due: July 2022	

Program: Rural Broadband Experiments, Alaska Plan, A-CAM I, A-CAM I Revised

Pre-Testing	
Start Date: January 1, 2021	
Results Due: Following last week of end of Qtr 2021	

Testing	
Start Date: January 1, 2022	
Results Due: July 2023	

Program: ACAM II, Legacy Rate of Return (CAF BLS), CAF II Auction, NY Broadband Program

Pre-Testing	
Start Date: January 1, 2022	
Results Due: Following last week of end of Qtr 2022	

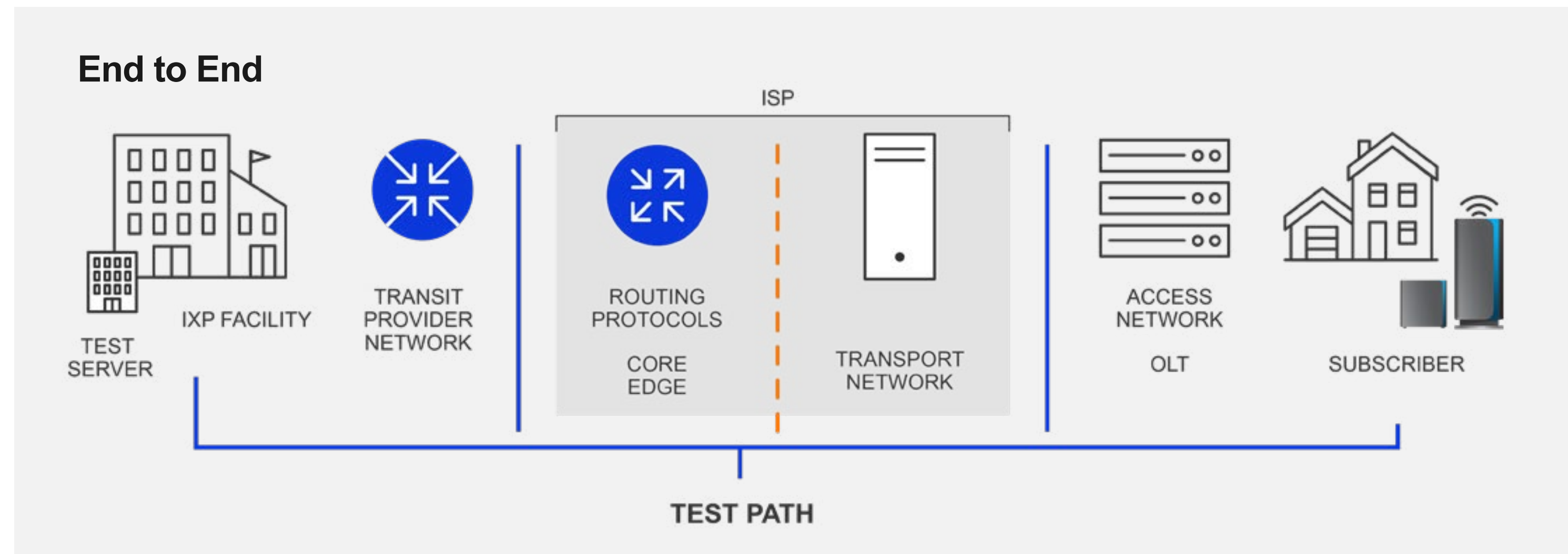| Testing	
Start Date: January 1, 2023	
Results Due: July 2024	

What To Report And When

You are required to test both speed and latency every quarter of the year by the end of the quarter for seven consecutive days. When you have completed your tests, you need to upload the results to USAC during the first week of the following quarter.

Step 4: Understand How To Set Up The Test Path

The test path for CAF performance testing is the path between a subscriber's home and a remote test server located at one of the qualifying Internet Exchange Points (IXPs) specified by the FCC. USAC provides the list of subscribers you need to test and the FCC gives you the flexibility to choose the IXP that works best for you.

Pre-Testing vs. Official Testing: What's The Difference?

The FCC requires you to conduct one week of speed and latency testing for a random sample of CAF-supported broadband subscriber locations in each quarter of the calendar year.

For all CAF programs, however, you begin with the pre-testing phase.

Pre-Testing
The purpose of pre-testing is to demonstrate that your test environment is set up correctly and you can successfully submit your quarterly test reports to USAC. It's not critical at the pre-testing stage that your tests meet the speed and latency requirements.

Official Testing
Official testing begins when pre-testing is complete and requires you to provide test results that show you are compliant with speed and latency standards.

Use the pre-test period to put yourself in the best position to succeed and avoid any potential penalties.

Step 5: Understand The Penalties So You Can Avoid Them

If the unexpected happens and for some reason you are not able to meet the FCC's compliance levels, a percentage of your monthly CAF support will be withheld, based on your level of compliance.

> *In the worst-case scenario, when you're less than 55 percent compliant, as much as 25 percent of your monthly support will be withheld.*

Note that during pre-testing, even though the FCC will not be judging whether you meet speed and latency standards, failing to submit your results will still result in five percent of your funding being withheld. The good news is that any time USAC finds an issue, you have a year to correct it, and when you do, USAC will refund any funds that were withheld.

Compliance Levels and Support Reductions

	Qualifying Compliance %	Requiring Quarterly Reporting	Monthly Support Withheld
Full Compliance	X ≥ 100%	No	N/A
Level 1	85% ≤ x <100%	Yes	5%
Level 2	70% ≤ x <85%	Yes	10%
Level 3	55% ≤ x <70%	Yes	15%
Level 4	X < 55%	Yes	25%

Source: FCC DA 18-710, section 64, page 25

"HUBB hygiene is very important when you get to the point where you're going to upload the information to the Performance Management Module. It's got to be pretty close to perfect with no incorrect or duplicate addresses."

Scott Nyman,
CEO & General Manager,
Cirrinty Broadband

Best Practices For Successful Performance Testing

Once you've got a handle on the many testing requirements for CAF, it's time to start implementing your testing framework—the sooner the better. Here are the best practices you need to ensure you get your testing right.

The Importance Of Maintaining HUBB Data Hygiene

The High Cost Universal Broadband (HUBB) is the USAC portal you use to upload information about the deployment you are building using CAF support. It's also where you upload your testing data when you've completed the testing requirements.

One of the most important steps in the entire testing process is to ensure that your deployment data is as accurate and complete as possible before you upload it to the HUBB. That means making sure you observe the principles of good data hygiene.

According to Scott Nyman, general manager and CEO of Cirrinty Broadband in Wisconsin, good HUBB hygiene will pay dividends later as you continue on your FCC testing journey.

"We thought our data was in good shape," said Nyman. "But when we downloaded it from the HUBB, we realized we had some problems. Some locations were off a little bit and we had the wrong speed tiers for some addresses."

Nyman recommends that service providers review and clean up the data before uploading it back into the Randomizer on the Performance Management Module (PMM). If your initial data is not in good order, it could mean extra cost and effort for you down the line.

Cirrinty
FORMERLY WITTENBERG TELEPHONE COMPANY
ENTERING THE NEXT 100 YEARS AS CIRRINITY

Download And Select Your Endpoints For Testing

Another key series of steps in the process involves selecting the endpoints that will be used to conduct your pre-testing and official testing. To do this, you download certified locations from the HUBB and then mark the locations that are active with a unique subscriber ID. When this is complete, you upload the file containing this information to the Performance Management Module (PMM) in the HUBB. The PMM will then select a random sample of these locations that you will use for your testing.

The FCC does not require you to inform your subscribers that they have been selected for speed and latency testing.

From Building Out To Testing—Driven By The HUBB

Download Locations	Mark Active Locations	Download Test Locations	Recruit Subscribers	Starting Testing
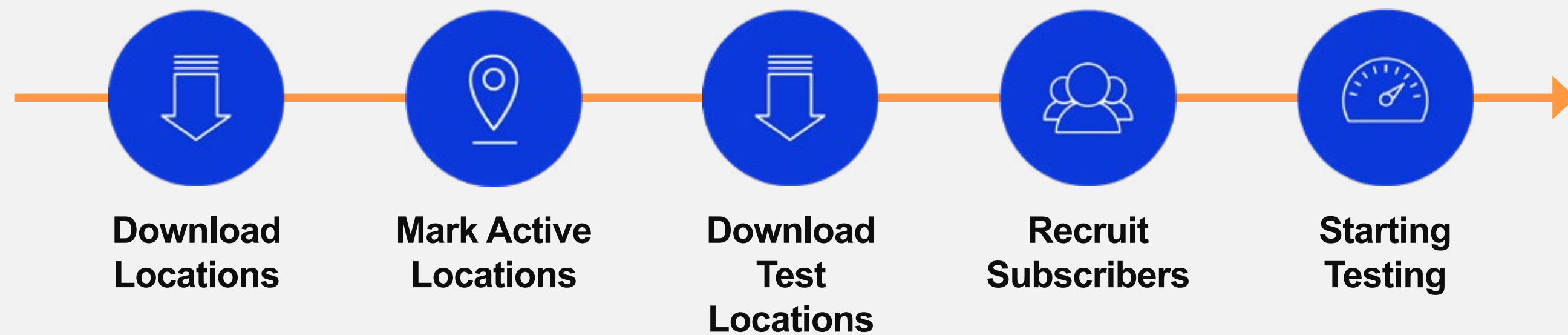
Select Test Servers That Provide High Speed and Low Latency

In addition to practicing good HUBB hygiene, it's also important to select the right test servers for your testing and then evaluate them on an ongoing basis. The goal is to ensure that the servers provide the best combination of high speed and low latency so they do not have a negative impact on your test results. Just because you are using the closest server, it doesn't mean that it's also the best performing server.

If some servers are not performing adequately during your testing, you may need to switch to different servers. Also, keep in mind that server performance may degrade as more and more BSPs are using them to complete their testing.

Make Sense Of The Tsunami Of Testing Data

One of the biggest challenges that BSPs encounter during the performance testing process is dealing with the "tsunami" of data generated by testing. With thousands of tests performed each day, you'll soon have millions of data points that you have to contend with. And that can be challenging, especially if you don't have an automated solution to help with the analysis.

If you're relying on a spreadsheet tool like Excel, you'll spend a lot of time and manual effort processing the data before you can even start to make sense of it. It's not a trivial task. The goal is to be able to dig deep into the data so you can look at the performance of specific test locations, identify testing path impairment points, detect which endpoints are experiencing speed and latency failures, etc. Armed with this information, you can then take the appropriate corrective action to ensure you're ready for reporting.

Potential sources of inaccurate test results

- Provisioning errors related to the Service Provider ID Number (SPID)
- CPE is offline for a variety of reasons
- Subscriber has turned off their CPE
- Various unknown outside plant issues
- Physical network impairments
- Overloaded test servers

The Testing Data Tsunami

Even with a small number of locations, a few days' worth of FCC performance testing generates millions of data points.
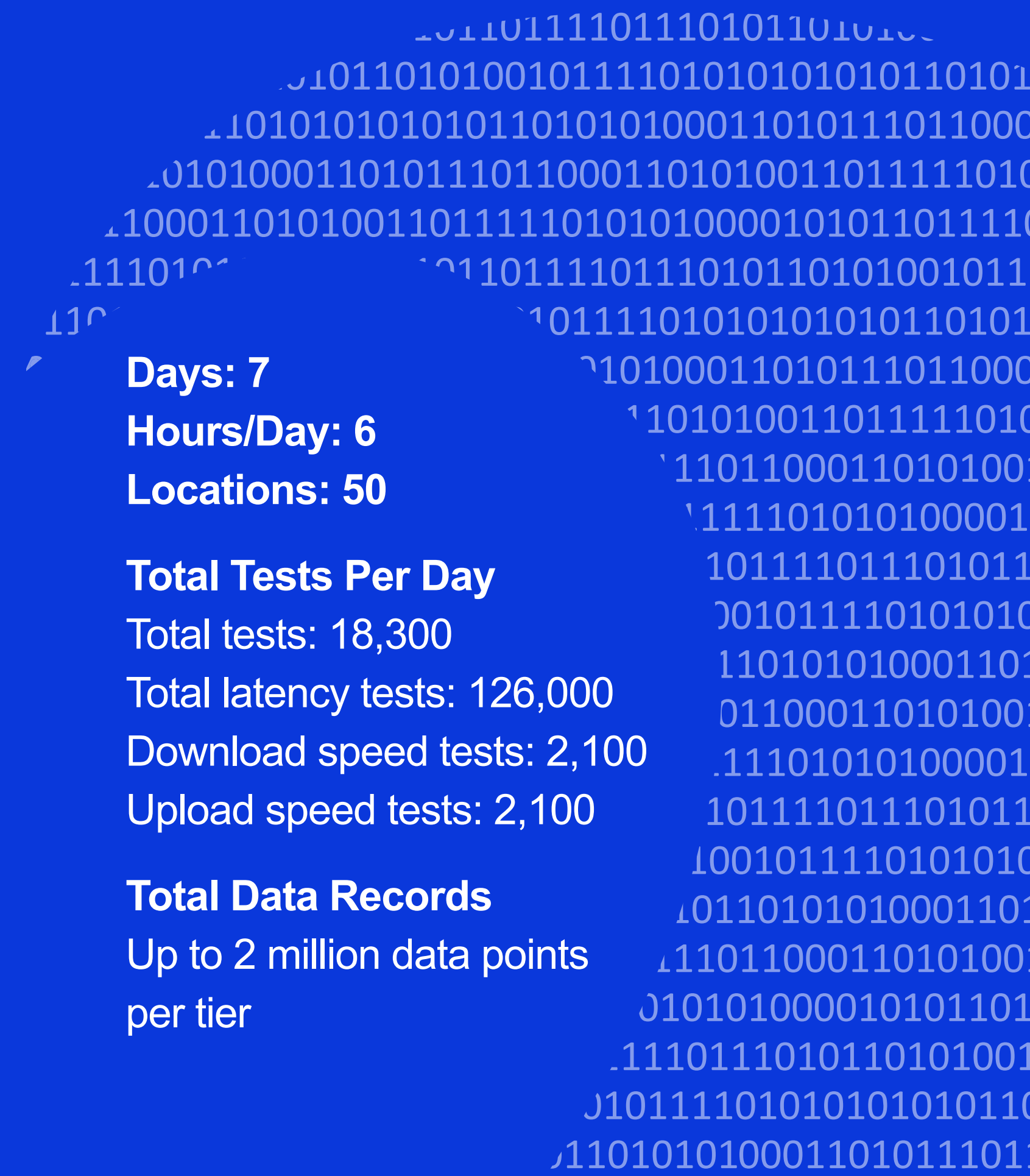
Days: 7
Hours/Day: 6
Locations: 50

Total Tests Per Day
Total tests: 18,300
Total latency tests: 126,000
Download speed tests: 2,100
Upload speed tests: 2,100

Total Data Records
Up to 2 million data points per tier

Prepare For USAC Reporting

With so much data generated during the pre-testing and official testing phases, it's important to build your reports early so you have enough time for validation before you submit them. Make sure your report has all the correct information and that it's in the format required by USAC. If your report doesn't contain all the required data, USAC will notify you of any issues after you submit your report.

When you have completed your testing, you have to upload the test results file in the proper format to the Performance Management Module by the required date and certify it. This data includes the HUBB ID, Subscriber ID, and details for both speed and latency testing.

Broadband Performance Testing With Calix

With your testing deadlines approaching, it's critical to ensure your Broadband Performance Testing framework is operational and you're equipped to make sense of the results before uploading them to USAC. Fortunately, Calix can help. We work with CAF and RDOF funding recipients to help them meet their performance testing requirements, and we can help you, too.

Calix Broadband Performance Testing Solution

The Calix Broadband Performance Testing solution is a simple, comprehensive testing solution that gets you up and running quickly. The solution includes:

- A Test Controller
- A Report Builder
- A Test Client
- Support for select TR143-capable devices

Solution components are built into Calix Support Cloud and the Calix GigaSpire and GigaCenter systems, so you don't have to install and support any additional hardware.

Calix Broadband Performance Testing Service

Complementing the Calix Broadband Testing solution is the Calix Broadband Performance Testing Service, which provides you with guidance to set up your testing framework, and expertise and best practices to help you successfully complete all the steps in the testing process from end to end, including:

- Proactive monitoring
- Monthly reviews with high-level triage
- Test data analysis and validation of results
- Guidance on taking the appropriate corrective action
- Report preparation support

Contact Us To Learn More

Contact Calix today to learn more about how we can help you succeed with FCC Performance Testing.

Contact Calix