Enabling the
Hyper-Connected World

Improve Quality-of-Experience and Generate Incremental Revenues with DZS CloudCheck

DZS XPerience CloudCheck

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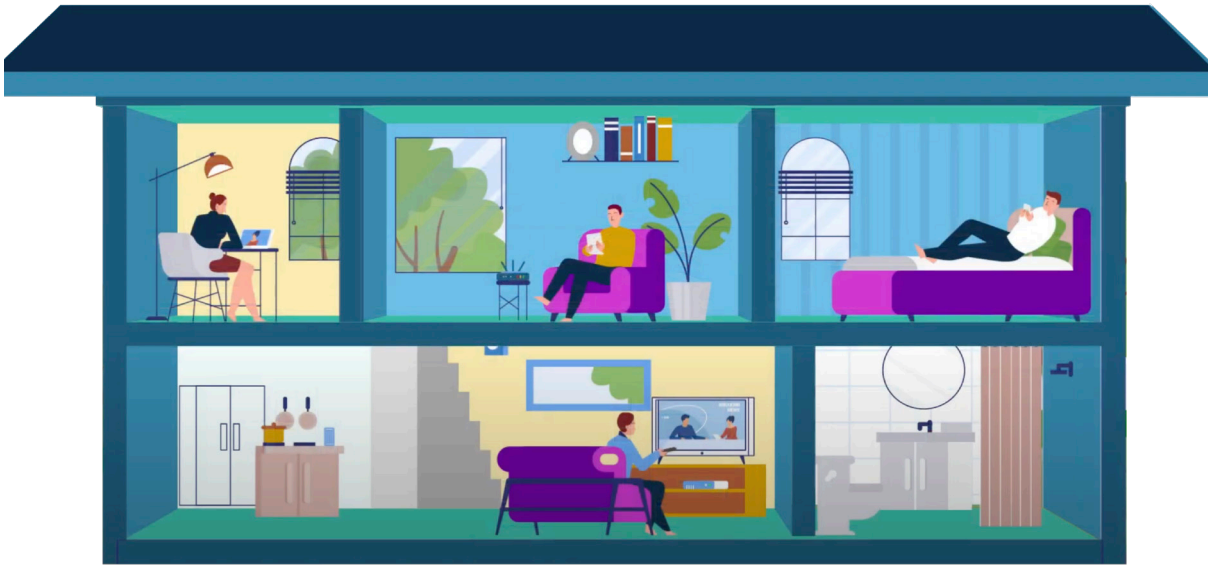
Overview

Today's ISPs face significant challenges supporting their subscribers as the demand for bandwidth and the number of devices connected to Wi-Fi networks explodes. Yet, as we look to imagine the "new normal," accelerated by the global pandemic, one thing's for certain: the need for speedy, reliable broadband is here to stay. So, what now?

What matters to subscribers is that the internet works when they need it to. Imagine the frustration of not being able to see or hear participants during a Zoom sales call, or them not being able to hear or see you. When issues like this occur, providers should expect a flood of calls and possibly churn.

In this guide, we provide you with a comprehensive overview of CloudCheck®. And, we outline the critical capabilities and features that you need on your networks in today's new normal to deliver your subscribers the value, customer experience, and performance they want, while unlocking opportunities for ISP revenue growth.

Deliver the Highest QoE to Your Residential Subscribers



CloudCheck is a software platform that enables operators to manage and optimize residential home Wi-Fi networks and deliver a high Quality-of-Experience (QoE) for their residential subscribers. The CloudCheck layered architecture combines the advantages of both real-time analytics and decision-making with long-term diagnostics and proactive optimization policies in the cloud.

This document is intended to provide guidance on how CloudCheck can be used within your organization and how you can track its impact for the following topics:

- Cloud Intelligent Optimization
- Reactive Customer Care
- Proactive Reporting
- Subscriber Control and Self Help
- Internal Analysis Reporting
- Firmware Analysis
- Alerting
- Network Wide Reporting

Cloud Intelligent Optimization

Automatic Actions in Real-Time

Key Features

Channel Change

Dynamic channel change optimization is implemented to reduce interference for access points (APs) and extenders in high-interference environments such as multi-family dwellings. Reducing interference will have a positive impact on in-home network performance and subscriber QoE. Once deployed, we can provide you with before and after comparisons to show how CloudCheck helped reduce interference per-interface across your network.

Band Steering

Band steering optimization is used in two different scenarios.

1. When a station is close to the access point, it is steered from the 2.4GHz interface to the 5GHz interface to improve throughput.
2. When a station is far from the access point, it is steered from the 5GHz interface to the 2.4GHz interface to improve coverage. Improving throughput and coverage will have a positive impact on your in-home network performance and subscriber QoE.

Roaming

To ensure whole-home coverage, many homes have access points and extenders to ensure consistent uptime between different devices. Roaming is helpful for customers with homes too large or walls too dense for a single access point to provide all stations with a solid QoE. Providing whole-home coverage for these subscribers will positively impact your in-home network performance and subscriber QoE.

Auto-Reboot

CloudCheck can automatically reboot the customer premises equipment for scenarios where only a reboot can solve a problem: for example, when losing an internet connection or the system health of the customer premises equipment is deteriorating. The system keeps track of how often the system is rebooted and the percentage of reboots which restore connectivity and normal performance.

Auto Wi-Fi Driver Restart

CloudCheck can automatically restart the Wi-Fi driver when it detects that a specific Wi-Fi interface is degraded by looking at various Wi-Fi metrics. The system keeps track of the quantity of driver restarts and percentage of restarts the improve performance.

Refresh Station Wi-Fi Link

CloudCheck can automatically refresh the Wi-Fi link for a specific station if it detects that performance has degraded beyond an acceptable level for normal usage. The system keeps track of the number of station restarts and the percentage of stations where performance is improved.

Reactive Customer Care

Empower Your People to Do Great Things for Your Customers

Change starts from within. If your customer care teams have the resources they need to be successful, your customers will too. Customer care teams use CloudCheck to troubleshoot subscriber technical complaints through a rich set of analytics and diagnostic algorithms. CloudCheck provides agents with complete visibility into the subscriber's home network and helps pinpoint underlying problems affecting performance.

Call agents can troubleshoot connectivity issues with either the CloudCheck Wi-Fi GUI or by pulling data into their own operator monitoring tools via a northbound API (NAPI). With guided flows, agents can assist subscribers to troubleshoot issues themselves. If field technicians are required, they can use the CloudCheck Wi-Fi GUI for verification during install or service validation on repair calls.

Key Features

CloudCheck Wi-Fi GUI

The CloudCheck Wi-Fi GUI is a user interface for the call center agent and is also easily used by any customer support agent to triage customer technical problems. Your assigned deployment engineer can enable the CloudCheck Wi-Fi GUI and provide detailed documentation. We recommend a "train the trainer" format in which your organization uses our documentation and offers a session to formalize an internal training program for call center agents and field techs. Once users are trained, you can track usage of the tool and survey agents to assess their comprehension.

NAPI

CloudCheck can be integrated into your operator tools, and customer care agents may access this information through a standardized interface. Data displayed in the CloudCheck Wi-Fi GUI is available via a NAPI. Once integrated, DZS will provide details on the number of API calls to the system and KPI tracking via your existing operator customer care tools. Integration options and details can be discussed with your DZS account manager or your assigned deployment engineer.

Proactive Reporting

Resolve Issues Before Your Customers Call

Proactive Reporting enables operators to take action to improve the subscriber experience, before the subscriber calls to complain. Operators can put programs in place to contact the subscriber proactively and/or utilize the information provided in the complaint. Your program can include tracking results of the proactive outreach program as compared to baseline. We offer a set of off-the-shelf reports to help operators measure how they've improved subscribers' experiences.

Key Features

Wi-Fi Extender Recommendation

Often, subscribers that report coverage problems could greatly benefit from an extender to improve the quality of their Wi-Fi experience. With Wi-Fi Extender recommendations, agents can contact subscribers in advance to see if they would be interested in purchasing a Wi-Fi extender to improve coverage while specifically mentioning the devices that may be impacted. The impact of these recommendations can be measured by tracking calls/dispatches, net promoter scores (NPS), and customer churn.Broadband Underperformers

When subscribers are not receiving their contracted broadband speed, operators can contact the customer to schedule a dispatch after confirming the issue or proactively resolve the problem before the customer complains. To track performance, reference NPS and churn metrics.

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Broadband Upsell

Identify and rank subscribers that would benefit from faster service speed based on their usage information. Once you have verified that the customer is eligible for an upsell, proactively contact the subscriber. Upsell conversion efficiency—the amount of time or effort to upsell the customer—is the key metric for this program.

Additional Proactive Reporting

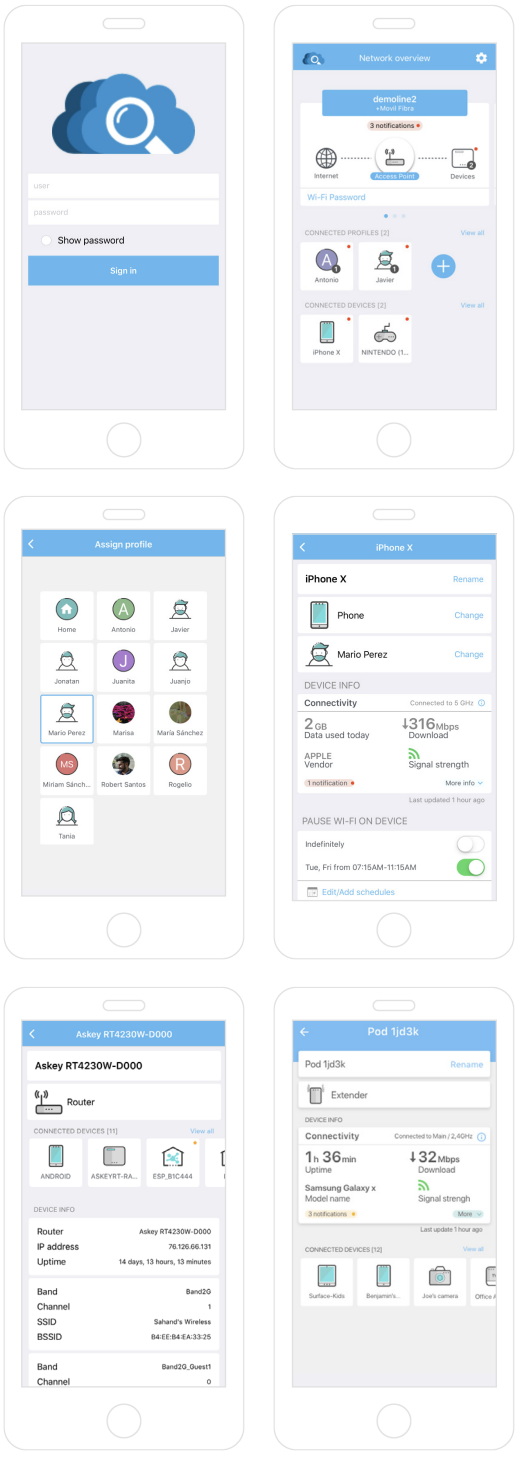
In addition, CloudCheck can be set up tol provide the following reports:

+ Chronic Broadband Disconnection. Identify customers with frequent broadband disconnections.
+ Band Steering Candidates (Single SSID Transition). Identify customers that would most benefit from band steering but are still using separate SSID for the 2.4GHz and 5GHz interfaces.
+ Wi-Fi Configuration Problems. Identify customers who have Wi-Fi Multimedia (WMM) disabled or a non-functional security setting.
+ Poor Customer Premises Equipment Placement. Identify customers with chronic interference from a poorly placed customer premises equipment.
+ Poor Extender Placement. Identify customers with poorly-placed extenders, along with contextual information on the root cause behind this (too close vs. too far).Weak Security Settings. Identify customers with open or weak security that would benefit from a newer security standard.
+ High Delay Subscribers. Identify customers who are experiencing latency above a reasonable threshold.
+ 3rd Party Wi-Fi Device Users. Identify customers that have no Wi-Fi devices connected to any interface on the gateway and have a 3rd party extender, to disable the Wi-Fi on the gateway as it is not being used but is creating interference.
+ Customer Premises Equipment Upgrade. Identify customers that would most benefit from a customer premises equipment upgrade (single band to dual-band) or 11ac to 11ax.
+ Real-time Broadband Outage Detection. Identify and notify customers about outages in near real-time.

Subscriber Control & Self Help

Empower Subscribers To Manage and Troubleshoot Their Home Networks On Their Own

CloudCheck gives subscribers a way to manage and troubleshoot their home networks. Via the CloudCheck Mobile App or by building an app via the NAPI, operators can make network changes and limit internet access for children with the simple push of a button. Additionally, more advanced users can avoid the potentially frustrating experience of contacting customer support and troubleshoot issues directly on their own. Service providers can offer uniform functionality across both a mobile app and a web portal using the NAPI.



Key Features

Home Management

Subscribers can monitor usage on their home networks and have the ability to modify SSIDs and passwords.

Time-of-Day Parental Controls

Subscribers can create profiles and set schedules for when users can access the internet.

Broadband Speed Test

Subscribers can run a speed test to measure the true broadband speed from the gateway to a speed test node.

Self-Help

Subscribers receive important alerts, tips, and guided flows to manage devices that are experiencing issues.

Extender Onboarding

Subscribers get help with adding and onboarding extender devices in optimal locations.

Operator Internal Analysis Reporting

Provide Your Teams with Data and Insights To Measure Performance

Give your internal technical teams a way to monitor network performance with data and analytics features designed to be combined with other sources of operator data.

Key Features

Internet Down Report

CloudCheck keeps track of internet disconnections for all access points connected to the system, including the timestamp and duration of the outage. With this data, you can aggregate information by a common network element (CMTS/Node/DSLAM/OLT) to identify proactive maintenance targets for networking equipment and customers with potential wiring issues. Success metrics are tracked based on the number of customers addressed with each action and the accuracy of those dispatches. Support with this service is available from your CloudCheck deployment engineer.

Broadband Speed Test

CloudCheck automates broadband speed and latency tests to monitor the broadband performance of every customer on your network. Data can be used for a variety of internal analyses: for example, to compare broadband speed tests with the customer contract speed to find underperformers. This feature is primarily useful for service providers that are unable to provide subscriber provisioning data. Additionally, this data can be used to find issues at a common network element.

Support with this service is available from your CloudCheck deployment engineer.

The success of these campaigns should be tracked based on the number of customers addressed with each action.

Diagnostic Recommendations

Diagnostics recommendations summarizes complex Wi-Fi, broadband, and systems information into easy-to-understand diagnostic recommendations. This information can be used for a wide range of internal analyses to better understand where subscribers are experiencing challenges. Cross-referencing these data sources with calls, dispatches or customer survey information can provide valuable insights. Support with this service is available from your CloudCheck deployment engineer.

Firmware Analysis

QA, Testing and Rollout Analysis

Improves the testing and rollout of new firmware with QA testing automation tools and rollout analysis. Gain insights and visibility to field performance and identify potential issues before pushing firmware out to subscribers. This same analysis can be done to help with other network upgrades to closely monitor customer premises equipment performance.

Key Features

Firmware Lab Testing

Lab teams use the CloudCheck Tier 3 GUI interface to obtain a deep analysis of all key customer premises equipment metrics. To understand the value of this feature, survey your lab team to determine how often they are using the tool and whether they have noticed productivity improvements. In addition, we suggest you introduce quantitative measurement by evaluating how your team's performance has improved since introducing firmware analysis. Your deployment engineer will provide an overview of the various user interface pages and enable this functionality in your deployment environment.

Firmware Upgrade Analysis

Once your firmware has been validated in your lab, you can set up a reporting program to track how the new firmware is performing in real-customer environments. This can be done by creating an internal dashboard/reporting program or with DZS-provided reporting services during the upgrade process.
The key metric used to track the impact of this functionality is the number of field issues discovered before a firmware upgrade, which can have a huge impact on subscriber satisfaction and customer care costs moving forward.

Before-After Comparison

This is the most common tracking method for firmware upgrades by looking at the performance of the upgraded devices before and after the upgrade to see trending in a positive or negative direction using the Tier 3 GUI interface. Typically, this analysis is done at regular intervals after the upgrade; at a minimum, 3 days, 7 days and 30 days for effective short-term tracking.

A/B Comparison

In some cases, a before and after upgrade comparison is impossible, such as when launching a new customer premises equipment. In this case, an A/B comparison is done comparing 2 groups with similar attributes. This can also be done in addition to the before-after comparison for a normal firmware upgrade in the event other network changes would benefit from a control group.

Alerting

Raise Alarms When Something's Wrong To Help You Put Things Right

CloudCheck automatically flags diagnostic changes on a week-to-week basis to identify changes not related to a firmware upgrade. These include network, station, configuration or cloud changes that can benefit from an automated monitoring system. The number of issues identified and resolved through the alerting system should be used as the key metric to track the impact of this feature.

Network-Wide Reporting

Data-Driven Decision Making

CloudCheck's network-wide reporting capabilities provide decision-makers across your organization with actionable insights into key performance indicators (KPIs) via a set of standard reports designed for specific teams and business functions. These reports will help your teams obtain a deeper understanding of subscribers and drive targeted initiatives within your organization, which you can measure with these reports over time. Your assigned deployment engineer or account manager can help you configure the following reports:

Executive

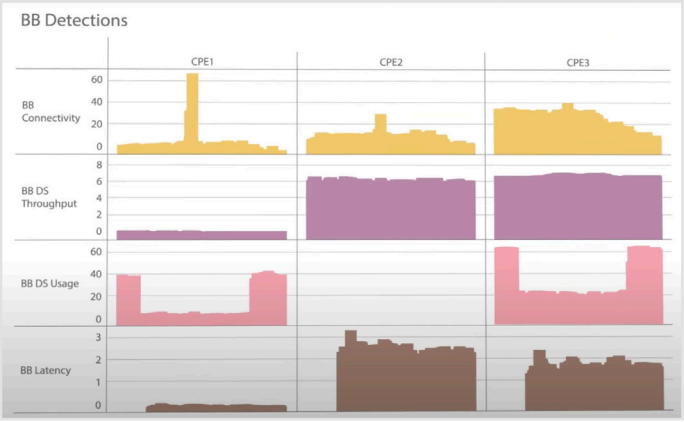
QoE Tracking Report: This report provides a KPI that is correlated with customer sentiment that can be used to track improvements on the broadband, Wi-Fi and overall end-to-end customer experience.

Sales/Marketing

+ Customer Knowledge Report: This report focuses on how your subscribers are consuming your internet service by showing you broadband speed, broadband usage, number of stations used, Wi-Fi vs. wired, and many other useful statistics.
+ Gaming Station Report: This report provides details on how many of your subscribers are using gaming stations, what brand of stations those are and how much they are using them.
+ OTT Streaming Report: This report provides details on how many of your subscribers are using OTT streaming stations, what brand of stations those are and how much they are using them.

Engineering

+ Wi-Fi Performance Report: This report gets into a more detailed view of Wi-Fi performance across different models and firmware versions.
+ Broadband Performance Report: This report provides a more detailed view of broadband performance across different models and firmware versions
+ Device Performance Report: This report provides details to see how the performance of the most common devices (i.e. iPhones and Samsung Phones) has changed over time.



Cross-Functional

+ 3rd Party Wi-Fi Extender Report: This report provides details on how many of your subscribers are using 3rd party extenders connected to your access point, the brand of those extenders and how many are deployed in a typical home.
+ Station Performance Report: This report provides details to see how the performance of the most common stations (ie. iPhones and Samsung Phones) has changed over time. This can be used to understand performance changes after a station software update.

DZS

Who We Are

DZS (NSDQ: DZSI) is a global provider of leading-edge access, 5G transport, and enterprise communications platforms that enable the emerging hyper-connected, hyper-broadband world. A pioneer in disaggregated platforms, SDN, and virtualization, service providers and enterprises look to DZS for the innovation that leads to future-proof networks and outstanding performance.

Over 1200 service providers, operators, and enterprises in over 120 countries have leveraged DZS innovation, open solutions, and agility to arm them with the network resources and deployment freedom they need to lead in their markets and deliver an unrivaled communications experience. With manufacturing, engineering, service and support centers of excellence spread across the globe, DZS is positioned to bring next-generation technologies and world-class solutions to service providers and enterprises who are poised to transform, compete and win.

DZS

How We Help

We Save You Time: Wi-Fi issues can be diagnosed and resolved entirely remotely with CloudCheck, helping service providers to deliver a better experience. Operators also can access quality of experience (QoE) data to optimize network performance as needed or assess service. CloudCheck reduces costs for network operators and service providers to provide them with the visibility and control they need to ensure a world-class Wi-Fi subscriber experience.

Our results with one customer showed:

- 50,000 fewer service calls for Wi-Fi support within 6 weeks of installing CloudCheck.
- Fewer truck rolls than would normally occur in a 60-day period.
- A 2% reduction in subscriber churn within the initial 30 day period alone.

We Save You Money: We set out to quantify the exact impact of our offerings, conducting a study of call data, optimization measurements, and diagnostic algorithms at one of our CSP customers. We found that we delivered $5.4 million in revenue (savings and new revenue) to our customers in just a few weeks. Beyond the savings, we significantly reduced subscriber churn and improved service delivery.

We Enable Smart Decision-Making: CloudCheck was specifically designed to manage and optimize residential home networks. Its layered architecture combines the advantages of real-time analytics and decision-making with long-term diagnostics and optimization policies in the cloud to provide network operations and customer care teams with the visibility they need to diagnose and proactively resolve subscriber Wi-Fi issues.

We Care About Delivering The Best Quality-of-Experience To Your Users: Your best champion is a happy subscriber, and we're proud to be able to share that operators using our platform see their network Quality-of-Experience scores soar by an average of 25-35%. With results like that, it's a no-brainer that our customers see their subscriber retention increase by an average of 15-20%. When you look after your subscribers, your bottom line looks after itself.

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