



Transforming the value of cellular services



Introduction

Cellular services, where a mobile SIM is installed in a network device and the 4G/5G service is then used as part of a business network, are a rapidly growing part of the networking industry. Cellular services are quick to install with SIMs only taking minutes to activate, are inexpensive if the data usage is low, and with 4G coverage now commonplace, and 5G around the corner, speeds are increasingly as good as if not better than copper fixed line connections.

In this paper we discuss the use cases of cellular connections. We'll talk about the problems that service providers and enterprises commonly have with these connections, and how a service provider can use the Cellular Clarity functionality in Highlight to build a valuable managed service that customers will love and trust – and so stand out from the competition.

“Cellular services are quick to install with SIMs only taking minutes to activate”

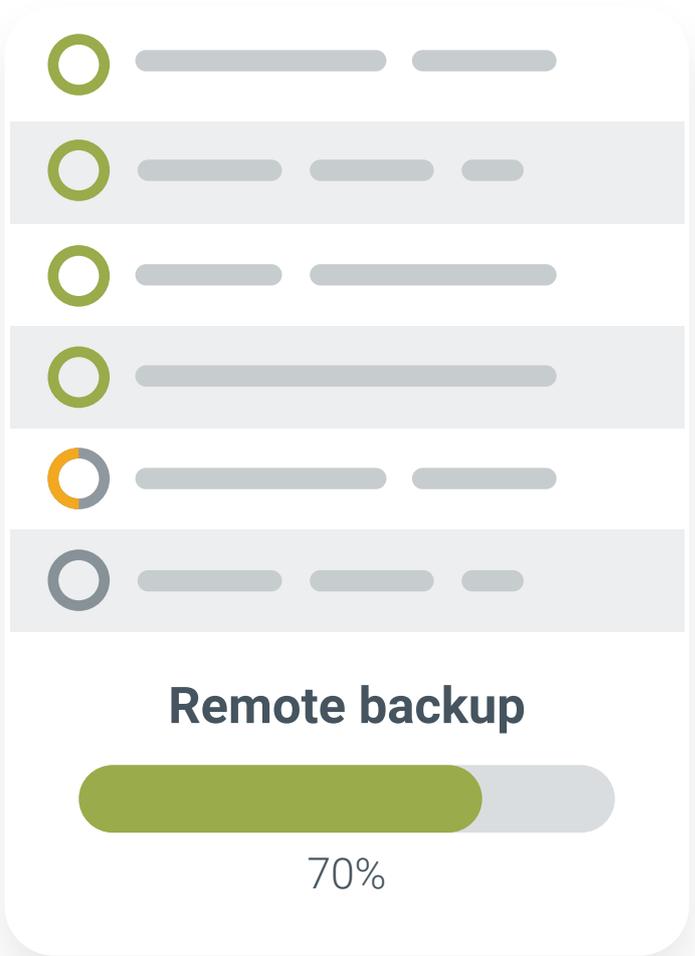


Cellular Use Cases:

Here are 4 example use cases for cellular services in a provider's networking portfolio:

1. Secondary (or tertiary) backup service

Cellular services are an effective backup to fixed line connectivity such as Ethernet or Broadband. While the cellular service isn't being used the costs are low, and once the cellular signal has reached the mobile tower, data will pass over a fixed line network that's typically completely separate from the customer's Ethernet or Broadband service, reducing the likelihood of both services failing at the same time due to a cable cut or power issue.



2. Fast start connectivity service

Cellular services are very quick to install as they don't depend on connecting a fixed line to the site. This makes cellular services very appealing for situations where you need a connection installed quickly and for a short period of time. Examples include a 'popup' temporary retail store or concession, a construction site cabin or a healthcare service such as blood donor bank or vaccine centre. Cellular connections can also be used to get a site online while a fixed line connection is installed. Once the fixed line service is active, the cellular service can then convert to being a secondary backup connection to the primary fixed line.

3. Augmenting remote worker connectivity

Post the COVID-19 pandemic, remote working and home working practices are far more common than they used to be. Home workers relying on their own residential broadband connection may struggle to work effectively if the connection runs slowly or occasionally disconnects. Cellular services are an effective way of augmenting a home worker's connectivity by providing a secondary path for work applications in case the primary home broadband fails.

4. Internet of things connectivity

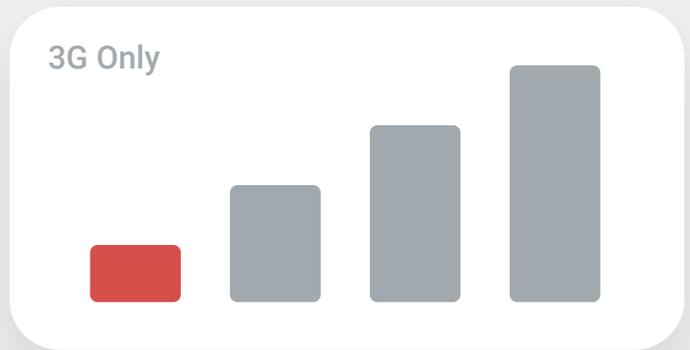
IoT is an exciting area of growth in the networking industry. Remote sensors or devices, such as fire alarms, building control, vending machines and environmental sensors require network access to post their data back to the cloud. Often these sensors and devices are located in remote areas where it would be too expensive or difficult to connect using a traditional fixed-line connection. Cellular services work well in these scenarios as long as there is an adequate cellular signal and power, so the device can be connected and provide its data.

“Cellular services are an effective way of augmenting a home worker's connectivity”



Problems with cellular services

Highlight conducted extensive research with its existing partners and enterprises, and identified the following common problems with cellular services:



Poor signal strength

Cellular services are based on radio technologies which are primarily designed for mobile devices such as phones and tablets. Radio gifts cellular its key advantage of being

quick to install and low cost to run, but also burdens cellular with its biggest problem, poor signal strength resulting in poor or no connectivity.

Poor signal strength can occur due to a variety of reasons:

Poor service coverage due to a mast being far away

Local radio interference impacting or blocking the cellular signal

Poorly positioned cellular antennas in the centre of buildings

Mobile operator temporarily or permanently decommissioning the local cell tower

If any of these are factors while the service is installed, the engineer may be able to mitigate against them, but once the engineer has left site and the service is in life, any of these reasons could result in the cellular signal strength and quality dropping to a point where the site is 'online' but little or no data can be passed up the network. The typically dynamic environments where cellular is used often create their own problems, for example, partitions being moved in a building and

blocking previously-good signal ; or even a delivery at a supermarket every Monday which puts a large, aluminium-sided truck outside the room containing the router.

It's therefore vital that the service provider and the enterprise have clear visibility of what the signal strength is on a cellular service and can be alerted to any issues when they occur for prompt resolution.

Bill shock

For a mobile provider to be successful they need to blanket as much of the populated areas as possible with coverage. Gaining a high percentage of coverage is expensive, requiring many masts each requiring backhaul connectivity to the local network and beyond. More recently, governments have held auctions for mobile operators to bid on new radio frequencies, with successful bids often costing many millions of pounds or dollars. As a result, mobile operators must recoup these capital costs from the subscribers in the form of subscription fees, and the typical business

model for mobile operators is to base their charges on usage rather than speed or time online.

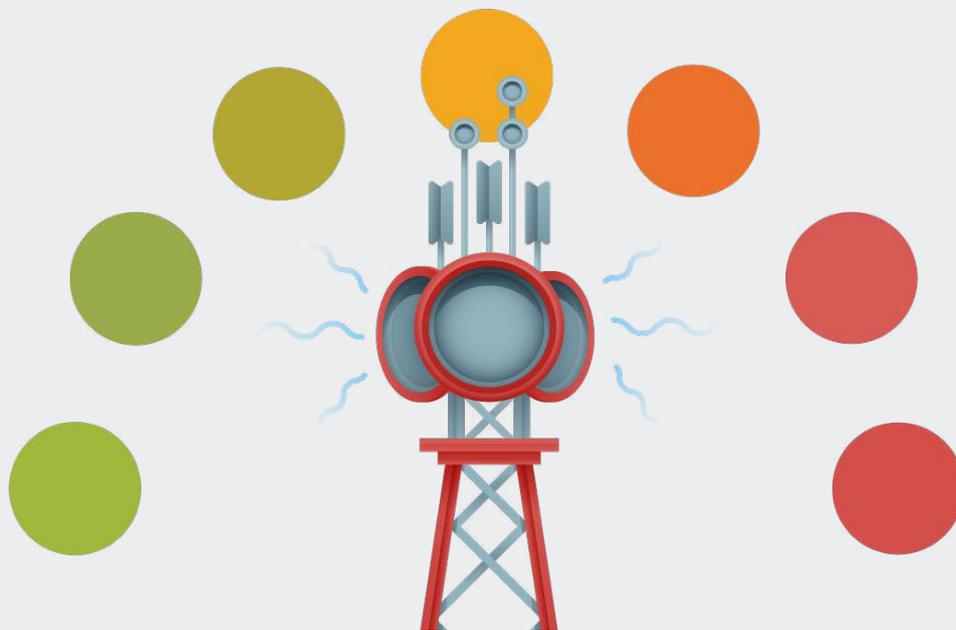
If a mobile connection doesn't use much data, it can be a very cost-effective form of connectivity, but as soon as a connection starts becoming heavily used, it can create huge usage bills which shock the service provider and their customers. It's therefore very important to keep a close track on cellular data usage to ensure no unwanted surprises happen at the end of the billing cycle.



A typical cellular managed service

Typically, cellular services are sold as 'break-fix supported' rather than proactively managed because cellular connections can be temperamental. If the support team are using traditional technical monitoring tools, monitoring cellular connections can generate a large number of false-positive alarms, wasting the support team's time. Without any form of monitoring, service provider support teams regularly miss genuine outages of cellular

services, relying on the customer to notice and report an outage. This may be fine when the connectivity isn't essential, but in the modern world where applications are hosted in the cloud, businesses demand that even low-cost connectivity like cellular should still be reliable and proactively managed. The result is that customers feel their provider doesn't have a proper grip on the network they bought, and they're sharing the burden of keeping that network "up".



A vision of a valued cellular managed service powered by Highlight

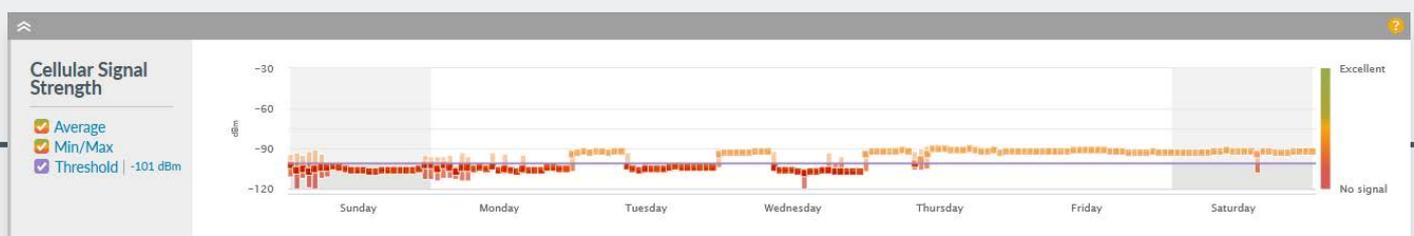
Highlight exists to help service providers use network technology to create valuable managed services that customers love and want to keep buying. After extensive feedback from Highlight's service provider partners and their customers, Cellular Clarity

was designed to solve the most common problems associated with cellular connections – signal strength and bill shock – enabling a service provider to enhance their cellular offering from simple break-fix support to this proper, managed service.

Signal strength assurance

Cellular Clarity collects signal strength data from the network, stores the data with full granularity for more than a year, visualises the

data in a clear and easy to understand way and sends an alert if the signal strength drops below an agreed level.



By including Cellular Clarity in a cellular managed service, a service provider's operations team gains the visibility and alerting on cellular signal strength they need to offer an effective, proactive managed service. Operations can scan large cellular estates to spot signal issues before they become a problem, and impress customers with proactive warnings. In real-time, service teams can respond to a customer's support call about a specific site with accurate information, identifying issues caused by signal problems, spotting patterns and providing reassurance they have the tools needed to support the client.

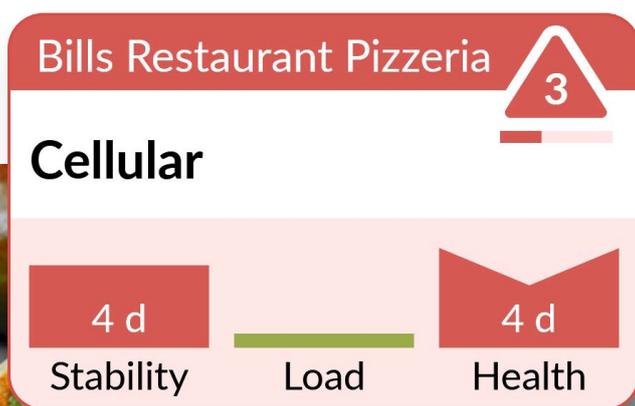
Customer Sales account managers can now review their estate of cellular connections and look for opportunities to evolve the network with the customer. Cellular services aren't perfect for every location or situation, and if it's clear from the data and insights in Highlight that 4G isn't going to work for a customer, they'll be as interested as the provider to investigate alternatives.

“Operations can scan large cellular estates to spot signal issues before they become a problem”

Enterprise users have full transparency about how the services they are paying for are performing and can be confident that the cellular services will work when needed, thus improving trust in their service provider.

If a service provider wants to go above and beyond the competition, they could offer the customer time-to-respond guarantees for low signal strength to show their managed service offering has some commercial backing rather than just operational processes.

Additionally, because the customer has the same visibility of signal strength as the provider, they can perform a certain level of self-diagnosis and improvement, perhaps investigating why the signal strength has suddenly dropped and repositioning the cellular antenna to improve it.



- Cellular Circuits for Folder "Acme Widgets Ltd"

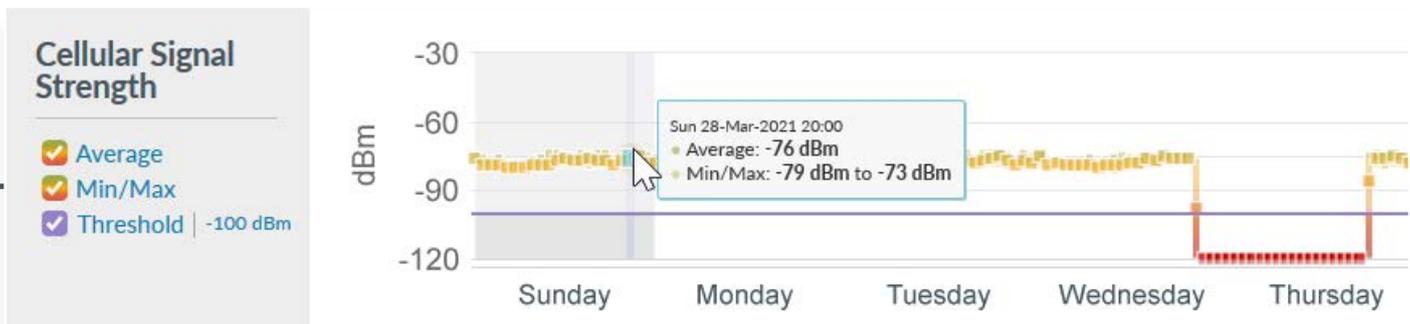
Watch Type	Location	Signal Strength (dBm)			
		Avg	Min	Max	% Within Threshold
Cellular	77740 Inverlornu	-101	-120	-84	17.71 %
Cellular	Edwinton	-103	-108	-99	20.14 %
Cellular	Maesteg	-102	-115	-88	29.51 %
Cellular	Bottom Valley	-101	-112	-88	30.56 %
Cellular	Oxford	-98	-120	-84	32.99 %

Historical reporting and bill shock prevention:

The provider's managed service doesn't just stop at in-life service assurance. Relationships with customers should last for years, and so it's just as important for the non-technical teams in service providers to keep the relationship as healthy as possible by regularly reviewing recent performance and agreeing with the customer how the networking service should change and evolve.

Service managers have a more complete view of a customer's entire network as they can pull historical reports on the signal strength and data usage of their cellular connections, present it to the customer and discuss potential issues and how they could be resolved. Finance can use the same historical reporting to view the usage of cellular services and check that bills are correct from upstream mobile operators.

Highlight can also send scheduled reports tailored specifically to identify very high or unexpected usage - which can then be sent to both the customer and the service team within the service provider to warn of potential bill shock.



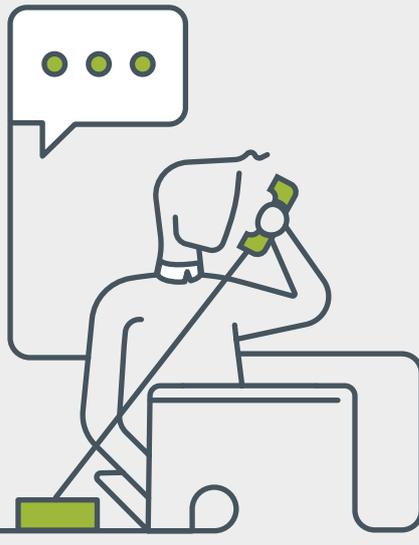
Summary

The popularity of and interest in cellular connectivity is growing rapidly, but service providers need to recognise that cellular connectivity has its own unique challenges and if these are ignored the result will be an unhappy customer and a short-lived relationship with them.

By adding Highlight Cellular Clarity to the cellular managed service and adapting and moulding the service procedures around its functionality, service providers can offer a more valuable managed service which is clearly differentiated from the competition.

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**Transform your network
and create more profitable
customer relationships.**

Talk to an expert