HOW TO REDUCE THE COST OF YOUR WAN
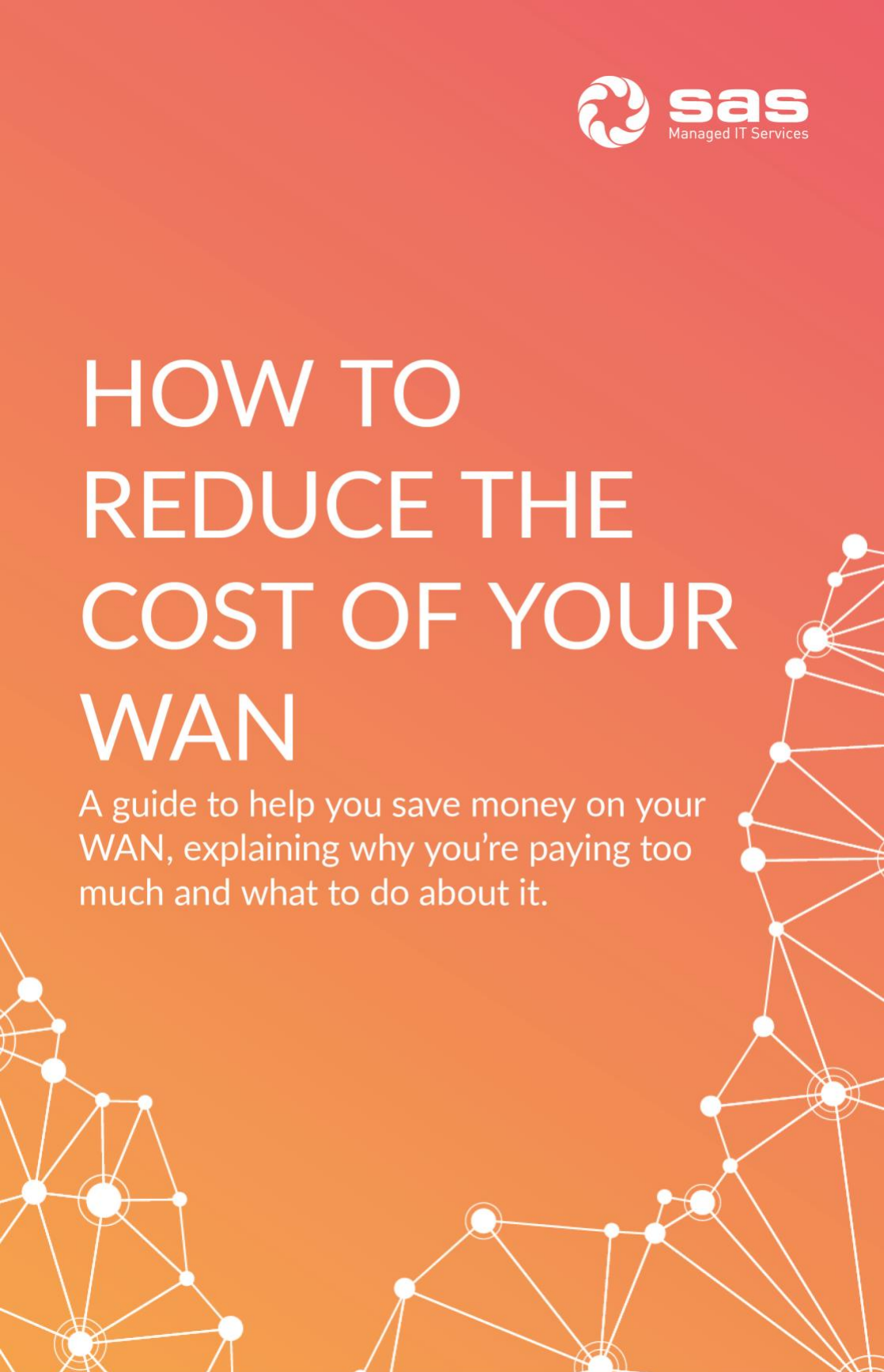
A guide to help you save money on your WAN, explaining why you're paying too much and what to do about it.

A business network is a significant investment, so it's important to ensure you're getting value for money. It's common to wonder whether you're paying more than you should, and it's common to find that the answer is 'yes'!

People are usually surprised by the savings they can make when they look carefully. If you find yourself needing funds for a project, a review of your managed networks spend might be just what you need.

Why might your WAN be costing too much? There are lots of reasons, but we can categorise them into three main groups:

- Prices have fallen since you bought your network
- New networking models and technologies are cheaper than yours
- You may be getting a poor commercial deal

We'll explore these over the three parts of this series. If you fancy being a hero, you can make some real savings with the help of the step by step, ten-point plan!

Part One - Understanding Price Changes

Like for like prices are falling

Like for like price reductions have been an annual feature for years. Competition has been a major driver; as new entrants have introduced cheaper alternatives to established carriers. Market growth activity has certainly played a part, as established players have offered big discounts to encourage customers to higher bandwidths. Regulation has also played a significant part. For example, carriers often connect customer sites to their networks using BT's Openreach fibre Ethernet circuits. Ofcom's Business Connectivity Market Reviews imposed charge controls on BT to make significant year on year price reductions to those circuits.

What do these price reductions mean in practice?

- If you bought a managed network more than a couple of years ago, it's likely you're paying more than market price.

- If you bought 5 years ago, then you're probably paying considerably more.

- If you re-signed your network with a fairly typical combination of a 10% cost reduction and a few bandwidth increases on your major circuits, then there is probably more discount available to you.

Access costs are falling

When we connect a business site to a modern network, we use an Access Circuit. Several types are available to suit the differing requirements for price, performance and reliability across a typical network.

Common examples are:

- DSL (which uses broadband technology connected direct to the network)

- Superfast (fibre broadband technology)
- EFM ([Ethernet in the First Mile](), which uses multiple bonded copper pairs for uncontended, symmetric speed connections)
- Fibre Ethernet (such as Openreach's EAD circuits, for the highest speed connections)

Importantly, the availability and pricing of Access Circuit types have changed over time. For any given site, the type of circuit you would choose to buy today may not have been available when you bought your network, or it may have cost considerably more when you bought it. Therefore, you may be paying over the odds!

Let's explore this a bit further.

New types of Access Circuit were launched and upgraded by carriers at different times, and their availability across the country was usually rolled out slowly, over a long period of time (months or years). New circuit types launched in the last several years include:

- Higher speed DSL
- Superfast DSL

- GEA (think: Superfast for Ethernet networks)
- [EFM](#)
- Higher bearer speeds for fibre Ethernet EAD circuits (think: 1Gbps and 10Gbps)

There are three key insights to be aware of ...

New access types brought higher speed and reliability on lower cost circuits

If you bought your network before one of these circuit types was introduced, you might now be able to use one of them instead of the more expensive circuit type that you bought.

For example, you may have bought a fibre Ethernet circuit for a site that could now be served by a considerably cheaper [EFM](#) or Superfast circuit.

Top Tip

If your network is more than a few years old, a number of your circuits might now be replaceable with cheaper access types.

Just because a new access technology had been launched when you bought your network, it doesn't follow that it was available at any or all of your sites

Your circuits connect into your Carrier's network at a number of physical Points of Presence (POPs) around the country.

- When new circuit types were first launched, they were usually made available at a limited number of POPs, and then rolled out to more POPs over a considerable period of time.
- Circuits have a limited range from the POP (a few kilometres for usable EFM, and originally 25km for EAD circuits).

This combination of limited POPs and limited range from the POP, meant that availability was usually extremely patchy for the first year or so. It's important to check each site to see whether a cheaper option has become available there since you bought your network.

Top Tip

If you've had an mpls or ethernet network for more than a couple of years, you may now have sites for which a cheaper access type is now in range.

There might now be a POP that's closer to one of your fibre Ethernet sites than the POP you're connected to

If one of your fibre Ethernet sites went live and then a closer POP was subsequently launched, you might save money by switching POP, and thus reducing the distance-related charging for the circuit.

If that closer POP is connected directly to a BT exchange, your site could use an even cheaper version of BT's Openreach EAD circuit, known as EAD Local Access.

Top Tip

EAD Local Access could save you a considerable sum if you have sites that could now use it.

21CN migration cost reductions may not have been fully passed on to you

Several years ago, BT, the market leader in UK data networking, decided to invest heavily in a new data network on which to run the majority of its data services. They called this their 21st century network (21CN). Other carriers called it Next Generation Network (NGN). The 21CN network gave rise to a number of modern services that are now available from BT: such as their BT Wholesale Ethernet network and the EAD fibre Ethernet circuits that are used to connect into almost all BT services, including BT IP Connect and BT Ethernet Connect.

A significant implication was the retirement of legacy parts of BT's network. In practice, this meant the retirement of older circuit types used to connect to the network. A few years ago, BT began a programme to migrate customer circuits from

the legacy platform to new 21CN circuits, so that it could close the legacy platform and realise the savings from only running the 21CN network. Since most UK carriers buy networks from BT Wholesale and BT Openreach, the same cost savings apply to them too.

A key point here is that 21CN network circuits generally cost less than the circuits they were replacing, but the pricing of the replacement circuits did not always fully reflect this. We calculated at the time that 21CN circuits were on average 48% cheaper than their 20CN counterparts, with the major savings generally on the higher bandwidth circuits. These circuits were in use across multiple products. Here are some typical examples for mpls cost reductions on BT's IP Connect MPLS service:

Type	Original and Replacement Service	Annual Rental	Saving
DSL	20CN: ADSL Plus (2 Mbps) 21CN: ADSL Connect Plus (Rate adaptive up to 24 Mbps)	£1,238 £650	47%
Leased Line	20CN: Leased Line (2 Mbps) 21CN: EFM (Multiple pair, uncontended, symmetric c.2-10 Mbps)	£12,000 £3,500	71%
Fibre Ethernet	20CN: 10 Mbps port speed (100 Mbps bearer) 21CN: 10 Mbps port speed (100 Mbps bearer)	£38,500 7,000	82%

If you have an MPLS or ethernet network, or internet circuits, more than five years old - from BT or a carrier that uses their circuits, then you probably had some 20CN circuits

When these were migrated, you may not have received a price reduction that fully reflected the reduced circuit cost.

- Your price might have stayed the same, with the change being labelled 'Planned Engineering Works' to upgrade the circuit.

- Alternatively, you might have been offered increased bandwidth, but not a fully reduced cost.

In either of these scenarios, you'll now be paying too much!

The summary so far

In part one we've seen just a few of the ways in which you could be paying to much for your mpls or ethernet network … indeed any network (there are lots more in parts two and three).

Some of these can be dealt with in situ on your current network. Some may make more sense to implement via a new network.

We typically find that if you have a five-year-old network, haven't done a great deal of cost reduction and want to keep the existing network, you might expect to realise savings of 10-15% on your network running costs.

If your preference is to move to a new network and embrace Hybrid Networks, you might expect 20-25% reduction in annual running costs, recovery of setup costs in the first term, and a more effective, higher performance network.

Part Two - Leveraging new networking models

New networking technologies have generally been cheaper than those that went before them

Many years ago, people connected their sites using Private Circuits – digital ones if they were lucky. You may recall names such as Kilostream and Megastream.   These were simple, point to point circuits whose simple topology gave them extremely good reliability and latency. But they were expensive, and you needed a lot of them for any-to-any connectivity because you had to build a mesh of connections from every site to every other.

Private circuits eventually gave way to switched networks. These required each site to have a single

connection into the provider's cloud (which was far cheaper), but still allowed every site to connect to every site.

A classic example is the IP VPN (often referred to as an MPLS network), such as BT's IP Connect.

Later still, Ethernet networks emerged, again requiring just one connection per site. First there were E-LINE services, where you constructed virtual point to point connections across the provider's Ethernet VPN. Then came E-LAN services (aka VPLS), which enabled any to any connectivity. With a few caveats, VPLS networks could often shave 25% off the price of an equivalent MPLS network.

The point here is that the older your network technology, the more likely it is that you could save money by upgrading.

Some people could save money by networking over the internet

Moving to the internet is counter-intuitive, with good reason. However, for some businesses it is sufficient, and cheap! Let's take a closer look...

The principle reason for having a network is to allow people to use applications. Perhaps the primary measure of network performance is whether applications run well across it. Historically, businesses hosted their applications on-premise. As they started to run more business-critical (especially time-critical) applications over their networks, they needed to use private networks and bandwidth optimisation technologies (such as Cisco WAS, Ipanema, Riverbed and Silverpeak), to ensure the applications worked well.

Here's a classic example. A business would use an MPLS IPVN such as BT's IP Connect, and a technique called class of service (COS) to prioritise critical traffic. Of course, such a network isn't cheap, which begs the question: "Couldn't we use the internet?"

Perceived wisdom was that networking over the internet was inappropriate because the internet is a best endeavours network whose performance can't be guaranteed, and over which you cannot implement class of service.

As the speed and reliability of internet access has improved – and more on-premise applications have moved to cloud-based services such as Office 365; Hosted UC; Microsoft Azure and Amazon Web Services - it has become simpler, and more reasonable, to use the internet as the primary network link.

Importantly, if you use a provider like BT for all your connections (e.g. BTNet or BT business broadband circuits),your inter-site traffic stays on-net and you still get great latency. If you're using a private network but the internet would be sufficient for you, then you're probably paying too much for your network.

A surprising, but little-known fact

Perhaps the primary measure of a network's performance is its latency – the time it takes to get a packet of data across the network and back.

The SLA for latency on BT's MPLS service (IP Connect) is 20 milliseconds.   That's for the best case, when using the highest priority Class of Service.

The SLA for BT's leased line internet service, BTnet, is also 20 milliseconds.

A hybrid network is nearly always cheaper and always more flexible

More recently, the concept of a [Hybrid Network](#) has emerged. With a Hybrid Network, a business aims to get the best of both worlds by connecting different network types together to suit the varying price/performance requirements at each site. This can save money while delivering performance (and can alleviate problems with long delivery times for new circuits).

A great example is to move some of your WAN traffic to the internet. Another might be to mix VPLS, MPLS and internet.

Hybrid Networks have become a popular aspiration with the advent of Software Defined Networking (SDN, SD-WAN). This is because one of SDN's aims is to reduce costs, and one of its claims is to do that by helping to move traffic to the internet. If you visit an Enterprise Networking exhibition, it's hard to avoid talk of SDN and SD-

WAN, or the principle use-case of moving some of your less time-critical traffic to the internet to save money.

That's fine. In fact, it's great.

Key Point

A Hybrid Network doesn't just mean adding internet to your existing network. It means the ability to blend multiple network technologies together. This gives the ultimate blend of performance where you need it, lowest cost where you need it, and ultra-rapid circuit deployment using [4G Cellular connections](#).

In many cases, customers keep private MPLS or VPLS networks for their important sites and data centres, but start using Internet connections for less critical sites. For example:

Type	Primary network connection	Secondary network connection
Data Centre	Diversely routed MPLS, VPLS or low latency Ethernet circuits	Dual carrier Internet circuits
Major Site	MPLS or VPLS circuit	Internet circuit using Ethernet or EFM
Medium site	Internet circuit using EFM or DSL	Internet circuit using 4G Cellular
Minor site	Internet circuit using DSL	Internet circuit using 4G Cellular
Temporary, urgent or mobile site	Internet or WAN circuit using 4G Cellular	

So, if you're paying for a private network but a Hybrid Network could meet your needs, then you're likely to be paying more than you need.

Wait, you're buying circuits from just one carrier?

If you're only buying from one carrier, then you'll almost certainly be paying too much. You'll always be paying that carrier's price for each site, so you will over-pay wherever the carrier's limited portfolio or geographic coverage is bettered by a competitor. Using multiple carriers allows you to have the right circuit in the right place at the right price.

This is one of the unseen benefits of hybrid WAN. People often assume it's about putting some of your traffic onto the internet, when in actual fact,

it's the ability to connect using any technology and any carrier. When we design a Hybrid Network for a customer, we very rarely end up with a single carrier solution.

The summary so far

In part two we've seen more ways in which people can be over-paying for their managed networks (there are more in part three).

Some of these can be reduced on a current network. Others may make more sense to implement on a new network.

As I mentioned, we usually find that people can make 10-15% reductions in mpls costs or ethernet costs, but can make up to 20 or 25% reductions if they move to a hybrid network.

Part Three - Improving your commercial deal

Carriers have a vested interest in keeping network costs high

When you buy a network, there are actually several things that you're buying. First, there's what you might call 'the wires'. In the old days, this might have been a Point to Point circuit. These days, it's likely to be the core network and the access circuits that connect you to it.

Then there is the hardware – typically WAN routers but perhaps LAN switches and WiFi Access Points, too.

Finally, there is the [management service](#) which covers anything from design through delivery, installation, configuration, monitoring, change control, troubleshooting etc.

Commonly, the wires make up the lion's share of the cost and of your price. Often, the wires might be the only element that a carrier is selling you.

This means that the carrier has a vested interest in maximising the value that they get from selling you the wires. Managed Service Companies, Systems Integrators and VARs, are not usually making a profit from the wires. Consequently, they don't have the same vested interest. So, if you bought through a carrier, you may have paid too much.

You may not be getting discounts applied consistently

One of the key challenges in cost control is understanding the discounts being applied to your circuits. These discounts are applied in different ways for different types of circuits. So a DSL discount operates differently to an EFM or Ethernet discount scheme.

As an example: for an Ethernet circuit, the cost is made up from two components - a bearer (aka access) cost and a port cost. The access charge is for the physical circuit from the POP to your office premises (usually these are 100Mb, 1Gb or 10Gb circuits for an Ethernet service). The port cost is the bandwidth enabled over that circuit (E.g. a 40Mb

port speed). So, for a 40/1000Mb circuit there is a separate discount on both the port and the access element of that circuit that needs to be understood and applied. This discount needs to be applied to all of the Ethernet circuits.

Top Tip

One trick of the trade that carriers play is to apply this discount only to certain circuits, and leave the others undiscounted.

You may be being overbilled for what you're getting

Networks are complicated things. IT and WAN Managers often make things more complex by making multiple changes to them over the life of the contract. This might involve changing the bandwidth or changing the class of service configuration. All this can make billing a complicated affair and something that some carriers can find difficult to cope with. It isn't uncommon for billing to get out of step with the network that's being supplied. For example, a

circuit that has been cancelled might continue to be billed; or a new circuit might be billed before it has been installed; or price reductions may not have been correctly applied.

Watch out

Some clients pay their network bills by direct debit, leading to inconsistencies in the carrier's favour which compound every month or quarter. Conversely, there are instances where a carrier will come back after 18 months, having forgotten to bill some of the services and demand payment. It is important to get a billing benchmark set and monitored.

There is more information available in our post: 9 proven ways to reduce costly errors on your WAN bill.

Poor insight into problems leads to costly bandwidth you may not need

One of the most common issues with a WAN is poor [application performance](). This is usually blamed on the WAN, but could actually have been caused by issues anywhere across the network, the infrastructure or the application itself.

Clearly, if you are to fix a performance issue and return to the performance you want, it's important to have insight into the precise cause of the problem. When we analyse our customers' performance issues, we generally find that only 30% are actually caused by the network.

It can be tempting to increase bandwidth to counter poor application response times, but just as an example, appropriately prioritising traffic might give a better result at a lower cost. Account managers are always happy to upgrade a circuit, but will they have done the due diligence to see if bandwidth shortage is the root cause?

Since up to 70% of performance issues derive from the application or infrastructure, recognising when

this is the case could help you avoid paying for more bandwidth without gaining any improvement in performance.

Decisions such as these should be made on fact rather than opinion, so next time your carrier suggests increasing bandwidth without proving that this is the problem, demand that they will regrade the circuit back to your previous bandwidth without charge if it doesn't fix the problem.

Keep in mind

If your management service cannot distinguish between application, infrastructure and network issues, then you may well pay too much to achieve the application performance - and therefore user experience, that you need.

If your supplier was not competing for your business, then you may have paid too much

A carrier never offers their best price from the outset and generally will not do so until the threat of a customer leaving is real.

Carriers almost always have sufficient margin in the network to be able to reduce their prices, but they have little incentive to do this unless they need to win your business. If your supplier wasn't aware of competing proposals, or wasn't asked to reduce its price, then you could have paid too much.

Keep in mind

Unless there is a competitive process in WAN renewal, you will not achieve the best price. Sometimes a competitive process will deliver a price reduction that will also offset the cost of installing a new network.

Ragged end contracts for managed networks are expensive and hard to get out of

Many carriers engineer their contracts so that they are ragged ended and hard to get out of. Ragged End is where each new purchase (sometimes also upgrades to circuits) starts a brand new term for that circuit. If you frequently need to order new circuits or change them, you could end up with a very ragged end to your contract. This could mean many circuits incurring early termination charges well past the original end date of your contract. With early termination costs often being 20% of the outstanding term, this can make it very hard, financially, to get out of a contract.

Early Termination Charges (ETCs) are often calculated incorrectly in the provider's favour. Surprisingly, the carrier may not have the data to calculate it correctly. Or it might be using an inflated figure to discourage early termination and mitigate revenue loss. If you wish to establish your early termination charges (ETCs), do your own calculations so you can check your carrier's figures.

Top Tip

If you have a coterminous contract (where there is a single end date for the network and all its circuits), then also check when that multi-year contract starts. In many cases the contract period will only start from the live service date of the last circuit to be installed. In effect, this could mean that a three-year contract could extend to three and a half, perhaps four years.

Renewal clauses can lock you into an extended contract or prevent you negotiating better prices to renew

It's a curious fact that carriers tend not to check proactively whether cheaper access circuits are available for your sites. Remember, account managers are focused on revenue retention and not providing the most cost effective solution.

Top Tip

One trick of the trade is to get clients to renew their contract on the historic pricing schedule and not the latest and cheaper pricing schedule.

"65% of clients have an annual price review clause, but only 35% actually use it."

Some carriers include a renewal clause, requiring you to submit notice of termination well in advance of the end of the contract. If you fail to do so, your contract auto-renews with no opportunity to renegotiate the price. Take care here: the notice period could be as much as three to six months.

Unexpected costs

Sometimes you can find yourself hit with costs that you didn't expect and would not have agreed to if you had anticipated them. For example:

Excess Construction Charges (ECCs) may be too high

When you buy a new circuit to connect into your network, there is some allowance made by the carrier for the installation cost of that circuit.

Often there will be additional work required, such as the digging of a new duct to house the cable en route to your premises. The cost of this work is chargeable, is known as an [Excess Construction Charge](#), and is passed on to the customer when above a certain threshold.

Sometimes, this is too high, but it can be reduced if effectively challenged.

Keep in mind

Some carriers carry a sales target for ECCs because it goes towards their revenue targets.

Therefore, all ECCs should be challenged, and planning information reviewed in detail before authorising them.

In some cases, a small amount of lateral thinking can result in ECCs being negated

Loss of discount on future orders

Discounts agreed in the initial contract for circuits, installation and hardware might not flow down to subsequent orders.

Charging for soft moves

You're possibly being charged for every 'move' on your network – even the 'soft' moves that are done on-screen and without an engineer visit.

You should ask that these are only charged when they're significant (for example, we use a threshold of greater than 30 minutes' work, done as an emergency before we charge).

Charging for Site moves

When moving a site, you might be held to term on the old site, and then have to commit to new full term on the new site, This further exacerbates the ragged end of your contract.

You need to ensure on the order form that any upgrade of a circuit in-life does not extend the contract period.

Paying for things you're not getting

Sometimes, you can find yourself paying for things that you are no longer getting. Here are some examples.

SLAs reduced, same price

Some contracts allow for the service to be changed without your agreement. An example could be an international service. It had a 24x7x7 SLA when you signed, but the carrier later changed its agreement with the in-country provider of that circuit to an 8x5x5 support service and you still pay the same price for a reduced service.

Fewer EFM pairs, same price

An example here is an EFM circuit where a carrier can reduce the number of phone line 'pairs' delivering that service without notifying you – have a look at this blog.

Charging you for broken or absent backup circuits

You may have back-up circuits, but have they been tested? In some cases, the automated failover doesn't work or has not been configured. In a few cases, some have never even been delivered.

Finally

We've previously discussed how the impact of price changes and new networking models could mean your WAN costs are higher than they should be. We've just explored how poor commercial deals can lead to you paying too much for your network.

As before, some of these issues can be dealt with on a current network, while others may make more sense to implement on a new network.

If you've had a network in the ground for a little while then dealing with some of these issues might be expected to give you 10-15% reductions on your mpls or ethernet running costs. If you move

to a hybrid network, you might expect much more significant savings, AND a better network.

ABOUT SAS

We design, deploy and manage the networks on which our customers run their businesses in an increasingly digital world.

Our hybrid networks will help customers digitalise their businesses

THE BEST PRICE POSSIBLE
Our hybrid networks, enhanced by SD-WAN, blend carriers and technologies to optimise the price of every site, and minimise installation cost with zero touch deployment. We offer transparent pricing for peace of mind.

THE FASTEST DEPLOYMENT
Our hybrid networks let you choose circuits that deliver fastest for each site, and our 4G WAN circuits offer 2 day delivery with seamless transition to permanent circuits.

THE EASIEST MIGRATION
We can phase your migrations to suit you, minimising cost and hassle.

THE BEST PERFORMANCE AND UPTIME
Our advanced monitoring shows the whole application path, raise 95% of key issues proactively and allows detailed reporting and drill-down to show issues and long-term trends.

THE MOST ENJOYABLE AND PAIN FREE EXPERIENCE
Our end to end digital systems and processes deliver Right First Time with clear, accurate bills.