



# Is your network geared for the digital world?

Seven Dimension Data experts  
*share their views*

## The fundamental importance of network infrastructure to today's digital enterprise

Dimension Data occupies a unique position in today's new industrial revolution. We not only know how to connect all the pieces of a modern, integrated IT infrastructure, we also build, integrate, and manage infrastructure to accommodate any business requirement. This includes enterprise applications, public and private cloud platforms, data centres, local and wide area networks, and even, through our special relationship with NTT Group — one of the world's largest telecommunication service providers. Why does this matter?

It matters because the new industrial revolution is all about seamlessly connecting everyone and everything. Front and back office operations, customer engagement, manufacturing, supply chains, and logistics are all becoming connected through an integrated enterprise IT infrastructure. It's this connectivity of sensors and devices, cloud resources, and traditional IT assets, powered by new programmable and increasingly flexible networks, that is becoming the foundation of today's forward-looking enterprises.

In recent years, the cloud has matured from a low-cost but risky way to extend infrastructure to a mature, more secure and reliable resource. But it has also grown in complexity. Many organisations moving to the cloud fail to gain what they expect from it. This is often because they don't think about the connectivity piece, the network. A network is a network, right? Unfortunately, traditional networks weren't designed with the cloud in mind. When you take an application out of your data centre and turn it

## About Dimension Data

Founded in 1983, Dimension Data is a USD 8 billion global leader in designing, optimising, and managing today's evolving technology environments. This enables its clients to leverage data in a digital age, turn it into information, and extract insights.

Headquartered in Johannesburg, Dimension Data employs 28,000 people across 47 countries. The company brings together the world's best technology provided by market leaders and niche innovators with the service support that clients need for their businesses – from consulting, technical, and support services to a fully-managed service.

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into workloads distributed in the cloud, it isn't going to behave like it used to without a lot of thought about how its components connect to each other and to users. Then you have to factor in the large amounts of data used by new applications that are smarter and consume Internet of Things (IoT) data streams.

Enterprises preparing for a digital future have much to consider when they modernise their network infrastructure and have to contend with connectivity demands from their business units, staff, and customers. In this e-book, leaders from different parts of our business provide their perspectives on how to approach digital transformation. In our experience at Dimension Data, you can't look at any one piece of the infrastructure puzzle without looking at all of it. And it's the network that holds all those pieces together.

I hope you enjoy this e-book.



Best Regards,  
**Rob Lopez**  
Dimension Data



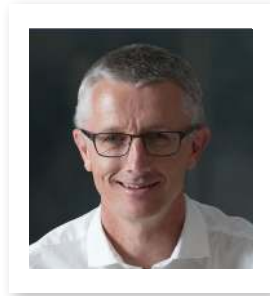
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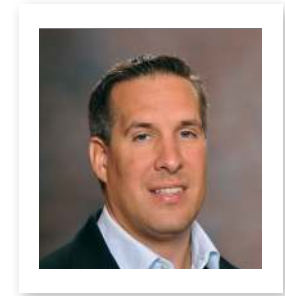
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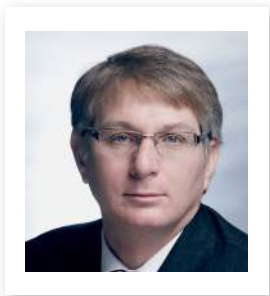
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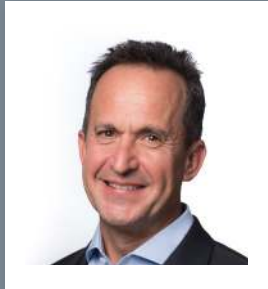


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# Building your digital business on a solid network infrastructure



**Rob Lopez**

Group Executive:  
Digital Infrastructure



Rob Lopez currently holds the position of Group Executive for Digital Infrastructure. Rob's key focus is helping our clients build secure digital infrastructure that is responsive to cloud-computing with its myriad benefits, all the while maximising our clients' business functions and communications. Rob has held numerous roles in a global capacity for Dimension Data since 2003 and before that was CTO of Dimension Data Europe and Dimension Data South Africa.

It used to be that technology was a limiting factor. An enterprise could dream up products and services, but the technology to deliver on those great ideas often wasn't there. Now we are in the middle of a new industrial revolution where people have become the limiting factor. Technology is moving faster than many enterprises are able to apply it effectively.

Being able to apply new technology has become pivotal in creating a competitive advantage and even for the survival of many businesses. Business has become data driven. The fourth industrial revolution has arrived. But even as we absorb that reality, we are moving beyond just data. Applications and systems are becoming cognitive, and processes are becoming automated. Machines are increasingly making decisions for us as consumers, and we have grown to expect those data-driven experiences. For many businesses, their core value is the experience they deliver to customers, partners, and even employees. Those experiences are only possible through a well-designed and managed digital infrastructure that is able to adapt to ever-changing applications, data requirements, and connectivity from a myriad of people and devices. This infrastructure is emerging against a backdrop of rapidly growing security threats and more stringent privacy requirements. >

*As IT infrastructure becomes more decentralised, the network is the glue that holds the entire enterprise together.*

The complexity of digital infrastructure has increased dramatically as the cloud has spurred the rapid growth of digital operations, as business activity has become more mobile and global, and as the ability to collect and analyse data from social media, applications, and connected things has become central to operational effectiveness and competitive success. Yet many businesses fully engaged in digital transformation are operating with older network infrastructures that are not designed to support digital business operations. And when they set out to modernise their infrastructure, they are not prepared for the challenges.

For example, migrating applications to the cloud is a great idea. You can now run those applications on an infinitely scalable platform that you no longer need to maintain or manage. The cost savings can be significant. But when a business makes its move, it is met with surprises. Suddenly the applications aren't working right and telco bills have spiraled. On top of that, you've just been hit with new compliance regulations and don't exactly know where in the world your data is located. You don't even know for sure who's securing your assets.

Many growing pains associated with digital transformation are rooted in the fact that companies, consultants, and service providers fail to consider their solutions in the context of an entire IT environment. The journey should start with a detailed understanding of the companies' applications and data requirements. The cloud is just one piece of the infrastructure that serves the applications and data. >

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a digital infrastructure  
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The data centre is another, and the network that ties them all together is yet another. As IT infrastructure becomes more decentralised, the network is the glue that holds the entire enterprise together. But the network is even more than that.

Networks have become smart — capable of automating operational functions. They have security built in, possibly providing the only security controls that consistently cover the entire multi-vendor, distributed infrastructure. And data that can be drawn from network traffic is being analysed to provide new insights that clients can use to better serve their customers and staff.

Networks have also become the foundation of digital business operations. A consultant can tell you how to change your business process. An application specialist can show you ways to automate and optimise. Data specialists can show you how to leverage digital assets into new business possibilities. But if you don't plan for how the network will connect all the people and all the digital assets, and how this is done securely, you may never meet your business objectives. You may even put your business at risk when new applications fail to operate as expected, unanticipated costs spiral out of control, and you no longer have visibility into the security of your assets.

We believe that designing a digital infrastructure starts with understanding business goals. We believe in having an intimate connection with the business. You need to fully understand the business, its culture, its people, and how it operates. And the first questions need to be, what are you trying to achieve in your business? What role do your applications play? What insights can you get from your data? What do you need your network to do for you, and what do you expect from us as a networking company?

Then we talk about how to achieve those things by looking at all the pieces of the infrastructure, including:

- **The application and data environment.** You must look at the applications needed to achieve the business objectives, how critical they are to business processes, who needs access to what data, how they need to access their applications and data, and what demand will they place on the network. >

- **Data centre and cloud environment.** This involves understanding where data and workloads will reside, what can be put into public clouds and what should remain in a private cloud or data centre, and what is required to seamlessly connect this hybrid environment.
- **Connectivity to the end user.** This includes wired and wireless connectivity, mobility, and infrastructure that supports user access to corporate assets.
- **Wide area networking.** This is about connecting all aspects of the distributed enterprise, including connecting distributed workloads to each other; connecting branch offices to corporate assets; and making global business activity cost effective, fast and secure.

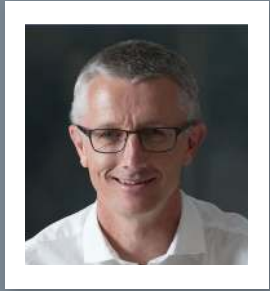
The network needs to become the way that we solve the security challenge. The network cannot just be the first line of defence in a complex infrastructure. The network now needs to learn from traffic patterns and become self-healing. Only by looking at the infrastructure holistically, and viewing the network through the lens of business objectives, is it possible to build an infrastructure that will fully support your digital enterprise. ■

## Key points

- 1 Many growing pains associated with digital transformation are rooted in the fact that enterprises, consultants, and service providers fail to consider their solutions in the context of an entire enterprise IT environment.
- 2 The first questions need to be, what are you trying to achieve in your business? What role do your applications play? What insights can you get from your data? What do you need your network to do for you?



# Network planning begins with business goals and applications



**Scott Gibson**

Group Executive: Digital  
Business Solutions



Scott Gibson is the Group Executive of Dimension Data's newly established Digital Practice, now Digital Business Solutions. In this role, Scott oversees Dimension Data's digital advisory and application competences which accelerate clients' digital transformation journey. Scott is passionate about the possibilities of the digital economy. When not at work he enjoys time with his family, cycling, and flying helicopters.

**W**hen planning an enterprise's digital future, everything begins with business outcomes. The conversations I have with our clients are often not about technology. They are conversations about building a much better experience for employees, customers, suppliers, and the community. This is because today's enterprise operates in a world that has become an ecosystem of high-speed human interactions. It is a world in which customer loyalty has shifted away from brand loyalty towards experience loyalty. A customer might love your brand, but if they have a bad experience, they're less likely to come back to you, and they might share their bad experience on social media where it can influence many potential customers.

To understand the context of a digital transformation, we begin with a business-outcome conversation. We ask our clients what they want to achieve, and from there we can look at the technology needed to deliver against those objectives. This leads to a stakeholder experience discussion and is closely followed by an application discussion. We talk about what applications are needed to achieve those business outcomes, whether the applications should be on premises or in the cloud, and how to migrate existing applications to the cloud. We discuss the application network and how applications integrate with one another, and then we talk about the network infrastructure needed to support those applications. >

*We are moving into a post-digital age, a cognitive age where everything from networks to applications to the front-end user experience is getting smarter.*

Taking business objectives and applications into consideration is an essential part of the infrastructure-design process. Some organisations consult with application architects to design the kind of experiences they want to deliver, but they do so without considering the back-end infrastructure required to run the application architecture. Sometimes they walk away with a solution that is completely impractical because of the back-end environment. The data might not be structured properly, or connections to big data pools might not be there to support analytical services designed into the solution. In addition the solution might not scale properly for the intended customer base, or it could be too rigid to accommodate the level of agility needed to serve a changeable market space. The reality is you shouldn't even be thinking about digital transformation if you haven't aligned back-end infrastructure to new work processes, and the new world that we live in.

Another consideration that must be integral to the transformation process is data security and regulatory compliance. As hybrid application and networking environments become more complex and regulatory governance increases, the security challenge grows. Application and network solutions are increasingly vendor agnostic. This provides cost and performance advantages, but it adds to the challenge of gaining a holistic view of an infrastructure-wide security posture. This is changing the way organisations are approaching security, with more security functions being embedded at the network level, and more reliance on managed security services capable of delivering a comprehensive view of the environment. >

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We ask our customer what they want to achieve, and from there we can look at the technology needed to deliver against those objectives.  
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For example, we at Dimension Data, as a provider of infrastructure at the application, local network, and wide-area network levels, are uniquely positioned to provide this kind of holistic approach to ecosystem security.

Any organisation laying the digital foundation for its current and future business operations should recognise that, going forward, demand on the network will increase exponentially. This is being driven by increased reliance on applications that use machine learning, advanced analytics, and artificial intelligence (AI), all of which place greater demand on network infrastructure, both in terms of bandwidth and reliability. In designing a network infrastructure that supports application requirements, organisations need to look beyond what they are doing today, and perhaps beyond their current phase of transformation.

Additionally, organisations need to accept that applications and their requirements are continuously changing. Customers, partners, and workers have come to expect that they can get what they want, when they want it. If your applications and the underlying networks do not respond fast enough, you risk delivering unsatisfactory experiences. Infrastructure needs to be scalable and agile to adequately support new functionality that organisations rely upon to remain competitive.

We are moving into a post-digital age, a cognitive age where everything from networks to applications to the front-end user experience are getting smarter. Applications with built-in AI algorithms are now making many decisions for us. This makes it possible to streamline engagements and provide more satisfying experiences to all stakeholders. To do this well, organisations must design applications and network infrastructure that support their business objectives. ■

## Key points

- 1 Taking business objectives and applications into consideration is an essential part of the infrastructure design process. Failing to do this can result in an architected solution that is completely unachievable in practice.**
- 2 Any organisation laying the digital foundation for its current and future business operations should recognise that in the future, demand on the network will increase exponentially.**





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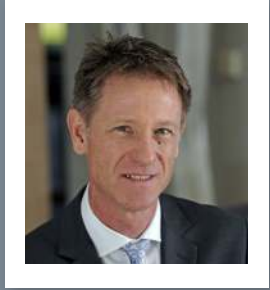
**‘72% of respondents rated improving their customer experience as the most important benefit of digital transformation’**

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**Digital Means Business**  
*Benchmark report*

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# SDN is redefining the data centre



**Gary Middleton**

Group VP: GTM and Skills  
Transformation



Gary Middleton is qualified in Electrical Engineering and has 24 years of IT industry experience. He spent four years with IBM and has been with Dimension Data for 20 years. He's held various positions across Dimension Data in the Security and Networking business units and is currently responsible for the Data Centre Networking business, in addition to skills and sales transformation for the Digital Infrastructure practice.

To understand how the data centre is changing within the enterprise, it's important to recognise that its essential functions are not changing. Its role is to house applications that run the businesses. An enterprise will always need a data centre of some kind so that it can run applications and therefore run the business. Many organisations seeking more cost-effective alternatives to an on-premises data centre turn to the cloud as a platform for some of their applications. But the cloud is just a data centre that's owned by someone else delivering that platform as a service.

One of the things that is really changing data centres is software-defined infrastructure, and specifically software-defined networks (SDN). For example, in a traditional data centre infrastructure, where you can quickly deploy virtualisation, the network has often been the least flexible part of the infrastructure. Although you could provision a virtual machine very quickly, it might take days or weeks, and in some cases months, for the network administrator and operations team to log into every single data centre device and make the requisite changes in the network so that virtual machine could become available to the business. >

*An enterprise will always need a data centre of some kind so that it can run applications and therefore run the business.*



Now with SDN and automated network configuration, a virtual machine can be ready for service almost as quickly as it is provisioned. Exacerbating this ‘network bottleneck’ problem is the pace of data centre technology modernisation with the advent of containers, flash storage, and hyper-converged infrastructures that need ever faster connectivity and dynamic configurations. Although SDN is often thought of as a tool for connecting assets in a public cloud, the same SDN technology works in private clouds and in on-premises data centres. This enables organisations to get more out of their network infrastructure by building a hybrid data centre with optimum locations for different workloads, and to quickly reconfigure the environment to meet business needs.

In this kind of environment, there are many decisions to make about where best to locate data and applications, whether they are on-premises or in various clouds, or in service provider co-located data centres. It’s highly likely that clients will have many destinations or cloud platforms where they will be running their applications, which makes operating the data centre’s infrastructure that much more challenging. >

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By turning the data centre network into a fully programmable infrastructure, SDN makes the network more agile and flexible than the people and processes that support it.  
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SDN makes it possible to manage this level of complexity by adding intelligence to the network, so that it can orchestrate and secure applications and data. Many security controls that were handled by appliances attached to the network, such as firewalls, intrusion prevention, encryption, and authentication are now delivered in concert with the network itself. In a highly distributed hybrid data centre infrastructure, it is critical that SDN and cloud-based security controls are consistently applied across the entire infrastructure.

By turning the data centre network into a fully programmable infrastructure, SDN makes the network more agile and flexible than the people and processes that support it. This presents a new kind of challenge.

For example, in a business in which network function is critical, such as banking, automating network configuration and management may break a change-control process designed to protect the bank against process interruptions or regulatory violations. That is why architecting data centre networks requires critical input from many stakeholders.

When architecting a data centre, I always recommend that these things be integral to the process:

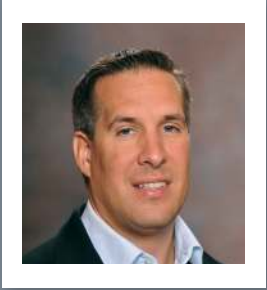
- **Include networking teams in any data centre or cloud-planning projects.** The network is the platform that connects applications and cloud instances. Not including the networking team in these planning sessions is a recipe for disaster.
- **Discuss business intent and what applications are essential for fulfilling that intent.** This includes application location, which has significant cost, performance, security, and compliance implications.
- **Understand your current network architecture and whether it will support the application strategy.** Also understand what the future architecture needs to be to support both your application and business strategy.
- **Have SDN consulting engagements to better understand what SDN is and the different approaches to it.** There is still a lot of confusion about SDN and what it can do, and technology manufacturers contribute to this by being single-minded with their own approaches and technologies. You need independent consultation that provides a level of education and clarity about how, and even if, SDN will help you. >

Data centres are as important as ever to the enterprise, and they are not going away. However they are changing, and so is data centre networking. They are evolving in ways that affect how organisations architect their data centre networks, how they deploy them and how they operate them. This calls for new skill sets and processes for making the business a true stakeholder in its data centre and networking solution. ■

## Key points

- 1 SDN enables organisations to get more out of their network infrastructure by building a hybrid data centre with optimum locations for different workloads, and to quickly reconfigure the environment to meet business needs.**
- 2 The network is the platform that connects applications and cloud instances. Not including the networking team in data centre planning sessions is a recipe for disaster.**

# Workplace networks must evolve to support digital ambitions



## Lawrence Van Deusen

Group Director:  
Wired and Wireless



Lawrence Van Deusen is the Group Director for the Wired and Wireless practice. He's held multiple roles in Dimension Data over the past 15 years, including leading the network business in the Americas. Prior to joining Dimension Data, Larry was employed in various consulting roles for IBM, EDS, and Bearing Point. He has a BS in Computer Science and Mathematics from Rutgers University.

**T**he nature of work is changing. Remote working and mobility is on the rise. Employees looking for better work-life balance and flexible workstyles are driving organisations to embrace a mobility mind-set, and empower their teams with flexible, collaborative, and dynamic workspaces and tools to work securely from anywhere on any device.

Following the mantra 'work is no longer somewhere you go, but something you do', organisations are evolving from a traditional office environment to a digital workplace. But according to our 2017 Digital Workplace Report, IT leaders may be undervaluing, or taking for granted, technologies that are, in fact, vital to their digital transformation. Only 9% of organisations identify ubiquitous network access as the most important element of their digital workplace strategy, and only 27% place it in their top three. This is problematic. The network is a vital part of an organisation's digital transformation initiative.

The network has become the fabric that supports the modern digital workplace and a vast array of sophisticated applications and services – everything from unified communication tools to smart building management, asset tracking, and wayfinding. >

*A modern workplace network ... is made possible by leveraging the benefits and features of new software-defined networking and intent-based networking technologies.*

It must be ready to address the needs of virtual and remote workers, nomadic workstyles and evolving, collaborative workspaces with sufficient bandwidth, well-configured quality-of-service policies, and constant availability.

As we move towards more user-centric computing, a modern workplace network can enhance and deliver better workforce productivity by integrating with the environment to prioritise business-critical applications. This is made possible by leveraging the benefits and features of new software-defined networking and intent-based networking technologies.

With the ability to autonomously implement and validate business policies in real time, intent-based networking uses artificial intelligence and machine learning to interpret business policy and uses software-defined networking to implement the changes. It can then analyse the environment to ensure that it is performing as intended by network administrators. The consequence of a policy-based approach to networking is that it enhances the security of the environment. By clearly defining which users have access to what applications, and from where, network security is inherently programmed into the modern network. >

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Change is happening, and  
you should be investing  
to take advantage of  
new technologies so  
you remain relevant and  
competitive.  
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At the same time Wi-Fi has become the de facto connectivity method in the modern workplace. This is not the only technology that organisations are using to enhance their digital workplace. Technologies such as Bluetooth low energy and radio frequency identification are an essential part of providing an enhanced user experience through location analytics and presence.

My first piece of advice to anyone on the digital transformation path is not to be afraid of change. Whether your goal is to ensure your working environment is set up to effectively deal with the changing workforce, or to enhance user experience for your employees, this should be your guiding principle. Change is happening, and you should be investing to take advantage of new technologies so you remain relevant and competitive. Working with a partner like Dimension Data to understand and identify the areas of change that are most important to the business will ensure you achieve the business outcome you are looking for. In addition to helping design appropriate wireless network solutions, we can offer services that help you bridge the gap between current skills and resources and what you need to do to transform your business.

It's also important to recognise that these kinds of infrastructure transformations can be done in phases. Regardless of the path you take, investing in new technologies is becoming critical to delivering the kinds of experience that employees and customers expect, whether it's in retail, healthcare, or even business engagement. To leverage these technologies, you need to understand what's available to you, and to do that, you need to work with IT specialists like Dimension Data. ■

## Key points

- 1 The network has become the fabric that supports the modern digital workplace and a vast array of sophisticated applications and services.**
- 2 Investing in new technologies is becoming critical to delivering the kinds of experiences that employees expect, whether it's in retail, healthcare, or even business engagement.**



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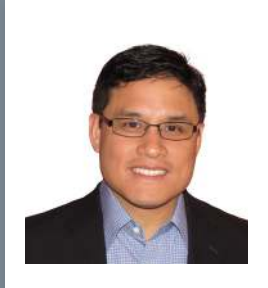
Lars Åke Nyman, Head of Department of Science Operations, ALMA

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**If you believe you can do anything,  
we're here to help you do it.**

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# When moving to the cloud, don't forget the network



**Raoul Tecala**

Group Senior Director: WAN



Raoul Tecala has been with Dimension Data for 16 years, serving in a number of different roles from global strategic alliances to business unit practice lead. Raoul is currently the Group Senior Director: WAN, responsible for setting the group solution and go-to-market strategy. Raoul has a BS in Electrical Engineering from the University of Virginia and an MBA from the George Washington University in Washington DC.

**E**nterprises today are embarking on digital transformations that are causing the greatest changes to wide area networking (WAN) in the past 20 years. Not since multiprotocol label switching (MPLS) replaced frame relay as a WAN standard has there been such disruption in WAN technology. WAN transformation is being driven by the need for improved operational costs and efficiencies, business agility, data security, and the way organisations make IT decisions.

What's causing all this change? Here are the key factors pushing WAN transformation:

- **Shifting workloads into the cloud.**

Traditional WANs were designed to connect static environments, such as office workers to an application workload sitting in a data centre somewhere.

Neither the workloads nor the employees moved around very much. By definition, moving workloads to the cloud changes network traffic patterns that could potentially impact application performance. Moreover, application workloads may be globally distributed. The data could be in one place, and the application and web servers in others. This architecture completely changes the traffic flow related to that workload, which impacts application performance, security, and cost. >

*Making the wrong WAN choices can sink a perfectly good application strategy.*



- **Demand for more bandwidth.** This is being propelled by the growth of enterprise mobility and the increase in the number of devices dumping traffic onto the network. In addition, the nature of the traffic is also changing, with a much greater share being bandwidth-consuming rich media such as video and conferencing. Analysts report bandwidth demand growing 30% per year, but many of my clients tell me their bandwidth requirements are growing as much as 80% to 90% per year. Yet most of these same enterprises have flat to declining telco budgets.
- **Willingness to consider the Internet as a WAN transformation medium.** The public Internet has improved as a communication vehicle over the past decade. For example, packet loss of 15%, common 10 to 15 years ago, is now down to about 3% to 4%. While not as good as MPLS, the price differential on a per-MB of bandwidth basis makes it an option that enterprises cannot ignore. In addition, as new software-defined WAN (SD-WAN) technologies have matured over the past couple of years, it is possible to easily set up and manage WANs with multiple types of circuits that enable you to optimise cost and performance for different workloads. Doing this right makes all the difference between distributed workloads that operate smoothly and ones that are an unreliable mess. >

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You’re building the  
technical foundation  
for the future of your  
enterprise.  
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I see many enterprises that are working to digitally transform their organisations spending a lot of time thinking about the speed, flexibility, and cost savings they can achieve by moving workloads to the cloud. This is great. Unfortunately the discussions often end there. So, my first piece of advice to anyone pursuing a cloud strategy is this: Don't forget the WAN.

When deciding which workloads to run in the cloud and which ones to run in your data centre, don't forget to ask the next question, which is, 'What's the best way for end users to connect to those workloads?' The answer used to be simple — MPLS. But that's no longer the only answer. MPLS is too costly and inflexible to support all the needs of most businesses today. The right answer for many organisations will be some kind of cloud-optimised hybrid WAN that includes MPLS and lower-cost alternatives such as the Internet-leveraging new SD-WAN routing solutions.

But this is no longer a simple equation, because so many factors contribute to optimum workload cost and performance. Making the wrong WAN choices can sink a perfectly good application strategy.

I would also advise getting security involved at the very beginning. When moving assets to the cloud and building a cloud-optimised hybrid WAN infrastructure, you must break down that security silo and pull the security pros in early. This becomes an opportunity to revisit security controls and adjust them for the new environment. If security is not brought in at the beginning, you will have problems and pain down the road.

Finally, recognise that operating a hybrid infrastructure requires new management practices. For example, managing a cloud-optimised WAN will, more than likely, require working with multiple carriers to achieve the desired cost economies, especially for a large organisation with multiple branches in different regions. The way you managed your single MPLS carrier will no longer work for a cloud-optimised hybrid WAN. Additionally, SD-WAN technologies have many more capabilities than legacy routers and require more technical decisions than is the case with a network based solely on MPLS. This also becomes a chance to investigate different consumption models that impact total cost. Many organisations work with networking specialists to navigate these issues, and I would advise doing that so you can focus on your core business. >



A cloud-optimised hybrid WAN solution can deliver increased bandwidth at a significant telco cost saving. You will likely have to give some of those savings back in the form of consulting and managed services to assure your WAN is optimised for your business and application architecture. However, it's important to look beyond just the cost-saving equation: You are building the technical foundation for the future of your enterprise. Cost is important, but so are performance, security, scalability, agility, and operational and business enablement — all the things that come into play when your business moves in directions you may not be able to foresee. ■

## Key points

- 1 Many organisations moving workloads to the cloud fail to ask the obvious questions of how end users will connect to those workloads, and how that will impact performance, security, and cost.**
- 2 Cost is important, but so are performance, security, scalability, agility, and operational and business enablement — all the things that come into play when your business moves in directions you may not be able to foresee.**

# Bridging the digital transformation skills gap



## Gary Middleton

Group VP: GTM and Skills Transformation



Gary Middleton is qualified in Electrical Engineering and has 24 years of IT industry experience. He spent four years with IBM and has been with Dimension Data for 20 years. He's held various positions across Dimension Data in the Security and Networking business units and is currently responsible for the Data Centre Networking business, in addition to skills and sales transformation for the Digital Infrastructure practice.

Performing network design and operations in modern software-defined infrastructure requires skills that traditional network engineers often don't have. Today's programmable networks automate many of the routine network management tasks that engineers once performed manually. At the same time they introduce new functions and controls network managers have never had to deal with before.

Organisations modernising their application and network infrastructures have many decisions to make regarding design and operations. They have to decide which workloads they should move to the public cloud and which are best left in a private cloud environment or on-premises data centre. They need to make performance optimisation and security decisions that depend on network segmentation and proper routing of traffic across different carrier technologies and service providers. They need to consume application programming interfaces (APIs) that link processes distributed across multiple cloud environments and on-premises infrastructure, and they need to automate network provisioning and policy management. They must do all these things while building the most cost-effective operational model possible. >

*Large organisations have ongoing training programmes to maintain their in-house skill sets. However, it's costly and time consuming to do this at scale.*

Some of the skills organisations must acquire include:

- **More certified expertise in a greater breadth of vendor technologies.** This is because modern networks are multi-vendor infrastructures. Organisations are adopting many products and services from different technology manufacturers in addition to multiple cloud platforms, choosing solutions that are best suited to fulfil essential business requirements.
- **An understanding of programmable networks.** As networks become increasingly software defined, IT organisations need to understand how functions and policies are built into the network fabric. We are already seeing the content of network certifications changing from physical engineering to software programming. Virtual network functions are becoming the building blocks of a modern network infrastructure.
- **A greater understanding of workload balancing across a multi-carrier, distributed network infrastructure.** This will involve understanding traffic engineering and performance analytics as they relate to applications running a hybrid infrastructure, which becomes an important part of performance optimisation and cost management. >

Managed service providers have the scale and vendor partnerships, and it's their job to make the investment in transforming their skills.

- **An understanding of new approaches that embed security functions into applications and the network fabric.** Security is moving from being a function performed by security appliances attached to the network to functionality that's embedded in the network infrastructure. Most cloud platforms provide their own security controls that users must master. There's an entirely new generation of vulnerabilities arising from improper implementation of cloud-provider security controls and lack of clarity around where the service provider's security responsibilities end and the customer's responsibilities begin. This becomes a serious issue in complex environments that involve multiple vendors and service providers. Security is increasingly becoming a network function.

Many organisations face a skills gap as they begin to transform their network infrastructures in the face of continuous technical innovation. One way to address this is to hire the expertise, but technical architects, solution architects, and enterprise architects with skills and experience in programmable networking are notoriously difficult roles to fill.

Another approach is to train existing staff. Many large organisations have ongoing training programmes to maintain their in-house skill sets. However, it's costly and time consuming to do this kind of training at scale. Although companies should always train their IT staff, it may not be practical to do that in preparation for a large infrastructure transformation. >

Many firms work with a networking consultant to bridge their skills gap. Managed service providers have the scale and vendor partnerships, and it's their job to make the investment in transforming their skills. Having more people with the right skills sooner than individual companies, they are able to help their clients move forwards faster than those companies could on their own. An important part of any transformation process is for the consultant and client to sit down early to determine exactly what resources and skills are needed for a transformation, and how to fill those gaps. A large managed service provider will be in a position to fill out a client's existing IT team with the necessary skills and resources to ensure a successful transformation. ■

## Key points

- 1 Today's programmable networks automate many of the routine network management tasks that engineers performed manually in the past. At the same time they introduce new functions and controls network managers have never had to deal with before.**
- 2 An important part of any transformation process is for the consultant and client to sit down early to determine exactly what resources and skills are needed for a transformation, and how to fill those gaps.**





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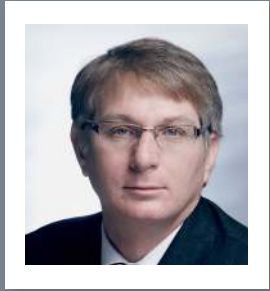
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# Taking a business-led approach to network strategy



**Jeff Jack**

Group SVP: Networking  
and Digital Infrastructure  
Operations



Jeff Jack joined Dimension Data in 2000 and currently holds the position of Group SVP: Networking and Digital Infrastructure Operations. Jeff and his team are responsible for setting the strategic direction and executing the go-to-market strategy of Dimension Data's networking business. Before joining the global business unit in 2010, Jeff was the General Manager for the South African business.

**F**or a digital business, IT infrastructure is the platform on which the business operates, and the network is the glue that holds that platform together. The infrastructure and the network have to be able to move at the speed the digital business requires to execute the overall company strategy. In the digital age, you can't think of your network strategy as separate from your business strategy.

When building infrastructure for the digital business, a network strategist's first task is to understand the business strategy. What are the business goals and direction? What key performance indicators have been passed down to the chief information officer? How are IT metrics aligned with the business strategy? Then the question becomes: How do we enable those goals?

This will inform choices about core business systems and the platforms that support them. It will tell you if you need to support a mobile-first organisation. It will tell you about communication channels with partners, employees, and customers. Business goals determine what kind of network you need. Next you must ask yourself what are your constraints in terms of time, people, and budget, and how do these affect what you can do, when you can do it, and how you can do it. >

*When building infrastructure for the digital business, a network strategist's first task is to understand the business strategy.*

Once you know your goals and constraints, there are many ways to approach infrastructure change, and in fact, digital transformation has a different meaning to different organisations. For some, it may only require incremental adjustments to maintain a competitive position. For others threatened by disruptors, it may require a radical reinvention. In many cases incremental improvers can adjust their existing infrastructure to handle new business processes and network traffic. Those undergoing dramatic transformation often choose to build a parallel business with its own digital-first IT infrastructure and network. It should be the business requirements that drive these transformations. It is the technology that makes it possible.

A business-led approach to transformation is changing work-group organisation within the enterprise. Teams making technology decisions are becoming multidisciplinary, with IT teams now including representatives from business management and operations. The boundaries between departments are blurring. For example, traditional application development involving long development cycles and big releases has been superseded by an approach in which application development is a continuous stream of incremental application improvements. >

Aligning infrastructure with business strategy goes beyond just choosing the right technology to solve a problem. It extends to how you operate and consume the infrastructure.



People from multiple disciplines, including business groups, become part of the application development project team. This approach makes business a major driver in the speed and direction of infrastructure change.

Aligning infrastructure with business strategy goes beyond just choosing the right technology to solve a problem. It extends to how you operate and consume the infrastructure. Businesses have a more varied continuum of service models to choose from that increasingly involves more proactive forms of support built on predictive analytics and automation. It includes a range of managed service models, whereby you can agree who owns the infrastructure separately from who runs it. And you can vary the depth to which you want different parts of the network to be managed.

The choice of operating model is determined by knowing the true source of your competitive advantage. You may want to keep sources of competitive advantage, such as application development and data analytics, in-house. Other areas, such as operating the network infrastructure, while important, may not be differentiating, and somebody else may be able to do it more effectively and efficiently than you can yourself.

Networking partners appreciate clients' growing desire to include an increasing proportion of consumption-based charges in their contracts. However, it is important that clients understand consumption models may vary by technology domains, and that consumption flexibility typically comes at a premium. Just as hiring a car every day would cost more than buying a car at a certain point, at some stage a pay-as-you-grow models will cost more than an outright purchase of an asset. Providers and clients must work to match the consumption model to business needs. This requires having a clear understanding of the client consumption needs early in the process. >

To determine the best model for an organisation, we use a consulting approach that considers the true decision drivers: strategic, technical, service, and commercial. We also look at building technology transformation and ongoing technology refresh into all our managed-service contracts, so the client gets transformative innovation, rather than merely lower-cost operations.

In building a modern network and IT infrastructure, it's essential to recognise that business requirements now drive the process. In the digital age, there's no such thing as a digital strategy. There's only a business strategy. Likewise, there's no such thing as a digital network strategy. In the digital age, there's only a network strategy that aligns with business strategy. ■

## Key points

- 1 In the digital age, you can't think of your network strategy as separate from your business strategy. There's no such thing as a digital network strategy. In the digital age, there's only business strategy built upon technology.**
- 2 Once you know your goals and your constraints, there are many ways to approach infrastructure change. Digital transformation means different things to different organisations.**

# Success depends on asking tough questions



**Stephen Green**

Chief Technology Officer:  
Middle East and Africa



Stephen Green is the CTO for Dimension Data, Middle East and Africa. He has extensive industry experience as a business and technical consultant and in his previous position, played a key role in transforming the Data Centre business. His current role brings with it many highlights as he acts as a change agent and seeks to disrupt Dimension Data itself, to ensure that the business remains relevant.

In our world today, business is constantly being influenced by emerging and maturing technology trends and enablers. One such trend is cloud computing, where we see companies looking to hyperscale cloud providers who promise to be that single solution that enables digital freedom and start-up agility. Our experience shows that, if you are not a start-up, the journey is more complex and the questions you need to ask require a more mature interpretation. As a company we are taking our clients on this journey by asking the hard questions upfront. This way we better understand the desired outcomes and are able to deliver against our clients' expectations of efficiency and optimisation.

Across industries today, there is a strong momentum to use the cloud. Many companies see the cloud as the answer, but they do not have a clear idea of the question. So their journey to the cloud is not mature, and when they arrive, they are often disappointed by the results. They begin uncovering problems they did not anticipate. Our goal is to add maturity to this journey.

We start by unpacking and quantifying the impact of the legacy environment that most going concerns have. Typically, the IT landscape is littered with different systems, acquired over time to address specific business problems or inherited as a result of mergers and acquisitions activity. The landscape is complex. One of our financial services clients referred to it as his 'spaghetti environment.' >

*We find that few of our clients have started their journey to cloud with a clear understand of what it means to their network.*

The question here is how do we contain, reduce, and allow our clients to grow beyond their legacy. Visiting a data centre is like visiting a museum with lots of old networking, server, and storage equipment, usually from different brands. The result is that these environments are difficult to manage, and very few of them are programmable. The cost of keeping that legacy constrains the business. The quick solution is to move to cloud, right? And that is what many companies have done without asking some of the next tough questions, such as what application integration exists around this application, are all connected workloads moving to the cloud at the same time, what are the database connectivity requirements, and many others. We have found that few of our clients have started their journey to cloud with a clear understand of what it means to their network and how that might need rearchitecting.

As a result, we see companies running into tremendous complexities around connecting the applications they've moved to cloud with their on-premises landscape. The integrations are much tougher to achieve than they had thought, and most of the automation, if they had any to begin with, must be rebuilt. All of this puts a strain on the network that it was not designed to address. Most enterprise networks were built with an 'inside-out' approach, keeping systems internal to the business, keeping the baddies out, and only exposing a few bits of capability. >

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In our cloud-readiness workshops we help our clients go beyond the hype by architecting their solutions in detail.  
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When you move to cloud, the networking design becomes ‘outside-in.’ This presents a whole lot of new questions around class of service and security. Cloud connectivity also creates many latency-related complications which have to be resolved to deliver the same level of performance as before.

One of our clients, who did not anticipate these complexities, has spent many months dealing with the challenges that this has created for their business. In our cloud-readiness workshops we help our clients go beyond the hype by architecting their solutions in detail. This illustrates the importance of asking the difficult questions upfront, detailing the future state you are working towards, and determining how specifically you are going to achieve that.

Answering those questions early became a key success factor in our work for a major retailer who wanted to add voice-based services to their branches. This required new functionality, connecting cloud and data centre services, and it included a software-defined wide area networking (SD-WAN) approach to their branch network, which meant optimising network capacity. All of this was achieved while optimising and lowering the existing network costs, and for the retail industry, cost is a key business driver.

The difficulty here was getting the client to agree to rethink their network and approach — you know the old adage, ‘if it ain’t broke, don’t fix it’? However, using this as our starting point, we were able to show that, given the complexity of their branch network, they could do what they wanted much more cost-effectively using a software-defined networking (SDN) based blended network.

Using SDN technology we were able to quickly build a proof-of-concept environment over cost-effective 3G broadband networks and demonstrate the result. The initial proof of concept was so successful that during the testing we migrated their entire service desk over to the proof-of-concept service. Based on their internal testing, they found it was delivering a better quality of service at a lower cost. And that led to a more comprehensive design built on a re-engineered and cost-effective network. >

While a standardised approach makes sense as a starting point, each business scenario has its own drivers and its own set of tough questions that need answering. Another example is when we built a Wi-Fi network in a game reserve, as part of our Connected Conservation solution. You can imagine addressing the challenges of building a reliable network in such a harsh environment that cost-effectively enables the monitoring and rapid response against rhino poachers. By wirelessly connecting biometric, audio, thermal, and video sensors, applying predictive analytics, and building a communication network that linked anti-poaching teams to law enforcement, the anti-poaching team was able to cut down ranger response from 30 minutes to seven, and reduce poaching by 96%.

The Tour de France bicycle race is another example of a challenging network environment and demanding data inputs. In this case we built a mobile, truck-based data centre used to collect and analyse data gathered in real time during a race and applying visualisation and analytics that not only aided the teams, but greatly enhanced fan engagement.

These examples demonstrate how very complex network and cloud-based solutions can be delivered. In all these cases, our starting points are the key business drivers and the desired business outcomes. Through co-innovation design workshops we work with our clients to architect digital infrastructure solutions that support the desired outcome and demonstrate the viability of a future state. ■

## Key points

- 1 Many companies run into tremendous complexities around connecting the applications they've moved to cloud with their on-premises landscape. The integrations are much tougher to achieve than they thought, and most of the automation must be rebuilt.**
- 2 When planning on migrating workloads to the cloud, you need to start the difficult questions of what exactly is the future state are you working towards, and how specifically are you going to achieve that.**





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**‘We believe our children deserve a  
*world in which animals roam free*’**

*– Dimension Data and Cisco*

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**If you believe you can do anything,  
*we’re here to help you do it.***

Connected Conservation is like no other solution, in that it’s proactive in preventing poaching before it occurs. There’s no interaction with the animals, because it tracks the movement of people instead. We’re building on the success of our programme through our continued innovation in technology.

We’re currently expanding our solution into Africa, to protect more vulnerable, endangered species, with the aim to eventually eradicate all forms of poaching, globally. We believe it’s time to change the way we think about conservation.

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