

WHITE PAPER

The Future of Enterprise Networking

Trends, Challenges, and Solutions



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Executive Summary

Your Network is Your Net Worth – Porter Gale

When American author Porter Gale penned her bestseller *Your Network Is Your Net Worth*, she was undoubtedly talking about the power of connections at a human level. Gale herself could not have imagined how well her thoughts would resonate in the world of IT infrastructure too.

Just as a strong network of relationships can elevate any person's opportunities, a modern networking solution can remarkably impact a business's efficiency and resilience. A strong network infrastructure enables seamless collaboration across locations and ensures secure access to essential data and applications, serving as the foundation of digital operations.



Thesis Statement

Let's start with a look at some of the recent headlines from this space:

Mark Zuckerberg loses \$3 billion after Facebook, Instagram global outage

India Today, March 6, 2024

AT&T Shares Lose Ground as Outage Affects Thousands of Users

Investopedia, February 22, 2024

DMV services disrupted nationwide by system outage

NBC News, March 22, 2024

Australia to Investigate Optus Outage as Customers Seek Compensation

Reuters, November 9, 2023

Behind these scary headlines lie losses worth billions of dollars, reams and reams of bad press, and severe damage to user experience and the brand. You may have assumed that these are all massive multinational corporations with extensive

networks and ultra-deep pockets and that a network outage wouldn't affect your business as badly.

Well, the following numbers will change your viewpoint.

According to Uptime Institute's global data center survey, In 2021, 69% of data center owners and operators reported outages in the past three years, down from 78% in the prior period. The survey states that despite the number of outages going down, their impact is going up remarkably. While almost half of the outages are brief and insignificant, the other half cause significant financial, operational, and reputational damage. The survey revealed, 62% of serious outages cost over \$100,000, with 15% exceeding \$1 million in costs depending on the size of the business.

These staggering numbers underscore the growing need for robust and resilient networks in the interconnected, complex digital landscape. This complexity is further enhanced by the era of hybrid and remote work culture after the pandemic. This new order has significantly increased the demand for secure and reliable network infrastructure in businesses.

According to the Working From Home Around the Globe 2023 Report by WFH Research, 26% of full-time employees operate within a hybrid work model, with an additional 8% of employees working fully remotely from home.² Clearly, if this workforce is not connected to a network (and a secure one), the productivity and data security will go for a toss.

The WFH Research report surveyed 40,000 employees across 34 countries, providing valuable insights into contemporary work trends.

From exploring the evolution of networking to analysing emerging trends and addressing key challenges, this white paper aims to highlight the significance of superior network infrastructure. By examining the interconnected aspects of reliability, scalability, security, and efficiency, we will uncover the essential components contributing to a successful enterprise networking strategy.

Through this exploration, we aim to equip businesses with the knowledge and understanding necessary to navigate the complexities of modern networking environments, leverage emerging technologies effectively, and ultimately harness the power of a well-connected digital ecosystem.

The Evolution of Connectivity

Beyond Boundaries

The evolution of connectivity can be traced back to the early stages of computer networking, which enabled data exchange within organisations, starting as early as the 1970s. This period marked a significant shift from traditional ways of data transfer to computer networks that enabled efficient sharing of data among departments and locations.



Over time, the invention of the internet, intranet, and cloud computing redefined enterprise networking. These innovations transcended organisational boundaries and connected businesses with the outside world. The ability to access and share information from virtually anywhere completely changed the way businesses managed their operations.

This evolution of connectivity has come with its own set of challenges. The modern, connected networks ushered in new challenges concerning data security, privacy, and scalability. The need for reliable and secure networking solutions was never this critical.



Interconnected Ecosystems

The Rise of Global Connectivity

Modern businesses operate within interconnected ecosystems that span time zones and industry sectors. The rise of global connectivity has created a networked economy where collaboration and communication are critical for growth.

Global connectivity has enabled businesses to access markets, resources, and talent pools from around the world. It has facilitated supply chain optimisation, real-time data analytics, and faster decision-making processes.

The reliance on dependable networks has reached a critical juncture for businesses, as emphasised in a report published in November 2023 by VPN service provider AtlasVPN.³ The report forecasts that a global internet blackout lasting just a single day would incur a whopping loss of \$43 billion, with the United States and China accounting for nearly half of these losses. The report also revealed that India alone suffered losses amounting to the tune of \$184.3 million due to internet blackouts in 2022.

The Essence of Robust Networking Solutions



Reliability and Uptime

Reliability and uptime are the foundation of robust networking solutions. According to Gartner, network downtime inflicted substantial financial losses in 2021, averaging a significant \$5,600 per minute.⁴ Any business, regardless of its size, cannot afford losses of this magnitude due to faulty networks. This fact underlines the fact that businesses must maintain reliable networks with minimal downtime to avoid costly disruptions.





Scalability

Scalability allows networks to expand effortlessly as businesses acquire new customers, users, devices, or applications. This flexibility is crucial for organisations to quickly adapt to changes in operational requirements.



Security

Artificial Intelligence (AI) is a boon, even for bad actors! Cyber attackers are using the power of AI to make their attacks more lethal for networks. To fight fire with fire, modern networks must also leverage AI. Networks with strong security measures, including firewalls, encryption protocols, and AI-powered intrusion detection systems, provide superior defence against evolving cyber threats.

Emerging Trends and Technologies

Networking for Modern Businesses

● SD-WAN

Software-Defined Wide Area Networking (SD-WAN) is a cutting-edge technology revolutionising enterprise networking. SD-WAN offers huge benefits and use cases in enterprise environments, including improved network agility, enhanced application performance, and cost savings through centralised management and automation. SD-WAN stands out from traditional WAN architectures by offering dynamic traffic routing, application-aware routing, and seamless integration with cloud services.



Gartner's data show that in 2021, businesses worldwide spent \$5.26 billion on SD-WAN infrastructure, which was a 23.6% increase from the previous year.⁵ This big jump in spending indicates that more companies are realising how helpful SD-WAN can be for modernising their networks.

- **SASE**

Secure Access Service Edge (SASE) represents the convergence of network security and cloud-based services. This innovative framework merges network security functions like secure web gateways, firewall as a service, and zero trust network access with cloud-native capabilities, thus providing scalable and flexible security solutions.

The advantage of SASE is particularly notable for supporting remote workforces. By providing secure access to applications and resources regardless of location, SASE enables seamless connectivity for remote employees and branch offices. It also improves data protection by enforcing consistent security policies across the network, regardless of the location of the user, or device.

- **AI in Networking**

Just like countless technologies, AI is transforming the world of networking operations too. AI-driven networks automate and streamline routine tasks, such as configuration, monitoring, and troubleshooting, eliminating manual intervention.

Moreover, AI-powered predictive analytics enable proactive network management by identifying potential issues before they escalate into major incidents. By analysing historical data and real-time metrics, AI algorithms can anticipate network bottlenecks and security threats, allowing administrators to take preemptive measures.

The Power Trio

Routers, Switches, and Access Points

At the heart of enterprise networking infrastructure lie routers, switches, and access points, each playing a crucial role in establishing and maintaining a thriving network ecosystem.



- **Routers** serve as intelligent traffic directors, utilising routing protocols to determine the best path for data packets between different networks. This speeds up data transmission between networks, significantly reducing latency.
- **Switches** function as data traffic managers within a local area network (LAN). By utilising Media Access Control (MAC) addresses to forward data packets only to their intended destinations, switches enhance network efficiency and bandwidth utilisation. Their ability to create virtual LANs (VLANs) further enhances network segmentation and security.
- **Access Points** provide wireless connectivity within the network infrastructure. They enable devices like laptops, smartphones, and Internet of Things (IoT) devices to connect wirelessly. Advanced access points incorporate features like beamforming, MU-MIMO (Multi-User, Multiple Input, Multiple Output), and band steering to optimise wireless performance, enhance coverage, and support a growing number of connected devices.

The integration of routers, switches, and access points forms the foundation of a resilient and thriving network. These components work in harmony to ensure flawless connectivity, security, and scalability.

Breaking Free of Wires

Wireless Networking in Modern Business

In the modern business landscape, wireless networking plays a key role in enhancing mobility, flexibility, and operational efficiency. This section delves into the advantages of wireless networking for a mobile workforce and explores the integration of IoT devices to streamline operations.



Mobility and Flexibility

Wireless networking solutions, such as Cisco Meraki, provide businesses with the flexibility needed to adapt to hybrid work environments. Meraki's cloud-managed approach simplifies network management and enables IT teams to configure, monitor, and troubleshoot wireless networks from a centralised dashboard, regardless of the location of devices or users.

A survey conducted by IDC found that businesses using wireless networking solutions experienced a 28% increase in productivity among mobile workers vis-a-vis those connected through wired networks.⁷ This productivity boost is due to the ability of wireless networks to provide uninterrupted access to critical applications and resources.

IoT Integration

The integration of IoT devices further amplifies the benefits of wireless networking. IoT devices, ranging from smart sensors, and cameras to connected machinery, gather valuable data and facilitate automation, predictive maintenance, and real-time monitoring. A study by McKinsey estimates that the adoption of IoT solutions could generate up to \$11.1 trillion in economic value by 2025 across various industries.⁸

For example, in the manufacturing sector, IoT-enabled sensors can collect data on machine performance, detect anomalies, and pre-emptively schedule maintenance, ultimately reducing downtime. Similarly, in the healthcare industry, IoT devices like wearable health monitors can transmit patient data securely over wireless networks, enabling remote patient monitoring.

Cost-Efficiency and ROI of Investing in Modern Networks

The upfront costs vs. long-term benefits

The upfront costs of switching to a robust network infrastructure include hardware procurement, software licenses, installation, configuration, and initial setup. These investments lay the foundation for long-term benefits and savings. For example, a well-designed network can streamline business processes, automate routine tasks, and facilitate collaboration, resulting in better operational efficiencies and reduced human resource costs.

An IDC report (commissioned by Cisco) released in August 2022 revealed that using Cisco SD-WAN can bring significant benefits to businesses. Over five years, they could save \$15.9 million (equal to \$158,300 per 100 users), thanks to better network performance. Meanwhile, the total discounted investment costs over this period would be approximately \$3.2 million per organisation (or \$31,600 per 100 users).



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These figures suggest an impressive five-year ROI of 402%, with organisations breaking even on their investment in about 15 months.⁹

In conclusion, while the upfront costs of investing in a well-designed network may seem significant, the long-term benefits make it money well spent. .

Networking Empowerment: Unified Communication Solutions

Streamlining Collaboration Through Networking Tools

Networking infrastructure plays an important role in supporting remote work and virtual collaboration. Unified communication (UC) solutions like Cisco Webex integrate networking tools such as instant messaging, file sharing, video conferencing, hosting webinars, and virtual meetings to enhance collaboration.

A report by Grand View Research predicts that the global unified communication market will hit \$417.86 billion by 2030, growing at a CAGR of 17.4% from 2023 to 2030.¹⁰ This phenomenal growth forecast highlights the increasing dependence on networking-powered UC platforms for better collaboration.



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Looking to the Future: Emerging Trends in Networking

As we look ahead, several emerging trends are poised to revolutionise the world of enterprise networking:



1 5G: The Game-changer

With its promise of higher data speeds, lower latency, and increased capacity, 5G stands as a transformative force that will enable businesses to unlock new levels of connectivity and support a host of innovative applications.

With 5G networks, businesses can transfer large volumes of data, including multimedia content, at lightning speed. This is particularly beneficial for real-time applications, such as video conferencing, live streaming, and virtual reality experiences.

Moreover, the lower latency of 5G networks significantly reduces the delay in data transmission, resulting in near-instantaneous response times.

This low latency is crucial for applications that require rapid data processing and decision-making.

The increased capacity of 5G networks also enables them to support a massive number of connected devices simultaneously. This scalability is vital in the era of the IoT, where billions of devices are expected to be interconnected and exchanging data. 5G networks can handle this surge in data traffic effortlessly, making them ideal for IoT deployments across industry sectors.

The transformative capabilities of 5G technology go way beyond traditional networking. They enable businesses to adapt emerging technologies such as edge computing, artificial intelligence (AI), and augmented reality (AR), unlocking a host of new use cases.

2 Edge Computing: Enhancing Network Performance and Real-Time Applications

Edge computing has emerged as an important landmark in the world of enterprise networking. It significantly enhances network performance and enables real-time applications to operate with greater responsiveness. At its core, edge computing involves processing data closer to where it's generated, typically at the edge of the network, rather than relying only on centralised data centers.

This proximity to data sources reduces latency and conserves precious bandwidth.

The benefits of edge computing are particularly clear in scenarios where real-time data analysis is critical. For instance, in industrial automation, the ability to process data instantaneously at the edge enables prompt reactions.

This aspect opens the door to the application of new use cases that were previously unimagined due to latency issues.

A report by MarketsandMarkets forecasts that the global edge computing market will grow from \$53.6 billion in 2023 to \$111.3 billion in 2028, with a compound annual growth rate (CAGR) of 15.7% during this period.¹²

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This growth rate underscores the increasing adoption of edge computing in modern networking environments.

3

The Role of Predictive Analytics in Proactive Network Management

Predictive analytics is increasingly becoming essential in the realm of network management. These tools leverage data analysis techniques to predict potential network issues before they occur. By examining historical data, predictive analytics tools can forecast network congestion, identify bottlenecks, and proactively optimise resources, reducing downtime and ensuring an improved user experience.

For example, predictive analytics can analyse network traffic patterns to predict periods of high demand, allowing network administrators to allocate resources accordingly and prevent congestion. With the help of historical data and trends, it can also identify devices that are likely to fail, reducing the risk of unexpected outages.

Conclusion

In summary, modern-day enterprise networking solutions stand as the backbone of businesses. A well-designed network drives productivity and reduces blackouts, brownouts, and downtime losses. As businesses strive for rapid growth in the highly competitive world, the need for investing in futuristic networking solutions cannot be overstated.

In case you have already updated the network for your business, congratulations! It's time to enjoy the fruits of your decision. Just sit back, and stay tuned to the updates and keep upgrading. In case you are still on the old network, it's time to bid adieu to the legacy tech and move on to the future of networking!

About Proactive: Our Expertise in Enterprise Networking

Proactive Data Systems is an enterprise IT infrastructure and services company. For more than three decades, the company has designed, deployed, and operated the technology foundations behind some of India's most demanding enterprise environments, from regulated industries to large distributed operations.

Founded in 1991, Proactive serves more than 1,500 customers, from fast-growing businesses to Fortune 500 enterprises, across banking and financial services, manufacturing, healthcare, public sector, IT and ITES, retail, education, and global capability centres. Our work spans enterprise networking, cybersecurity, cloud and AI-ready data centres, collaboration platforms, structured cabling, and managed services.

A Cisco Preferred Partner under the Cisco 360 Partner Program, Proactive is recognised across the Networking, Security, Collaboration, Cloud & AI, and Services portfolios, and is a Cisco Advanced Customer Experience Specialised Partner. The company is ISO 9001:2015 and ISO/IEC 27001 certified, and engineers solutions in partnership with Dell, Nutanix, NetApp, Palo Alto Networks, Fortinet, VMware, Veeam, and CommScope.

Headquartered in Delhi NCR, with offices in Mumbai, Bengaluru, Pune, Hyderabad, Indore, and Singapore.

To learn more about our solutions, write to us at pro@proactive.co.in

 www.proactive.co.in

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