

The Future of Enterprise Networking

Trends, Challenges, and Solutions



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Executive Summary

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 alarming headlines lie billions in losses, tons of bad press, and irreparable damage to brand reputation. If you think these issues affect only the global giants, look at the numbers below.



In 2021, 69% of data centers reported outages, with their impact increasing remarkably. Serious outages cost over \$100,000, with 15% exceeding \$1 million. These numbers highlight the urgent need for resilient networks, especially in today's hybrid work era, driving demand for secure infrastructure.



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 Without a secure network, workforce productivity and data security suffer. The WFH Research report, surveying 40,000 employees across 34 countries, sheds light on contemporary work trends.

Our ebook delves into networking evolution, emerging trends, and key challenges, emphasizing the importance of superior network infrastructure. By examining reliability, scalability, security, and efficiency, we equip businesses to navigate modern complexities, leverage emerging technologies, and thrive in a connected digital ecosystem.

The background of the slide features a complex network diagram. It consists of numerous circular nodes, each containing a stylized icon of a person. These nodes are interconnected by a web of thin, light-colored lines, creating a dense, interconnected mesh that symbolizes a network or connectivity. The overall color scheme is a gradient of purples and blues, with the text in white for high contrast.

The Evolution of Connectivity

Beyond Boundaries

The evolution of connectivity began with early computer networking in the 1970s, revolutionizing data exchange within organizations. The advent of the internet, intranet, and cloud computing further reshaped enterprise networking, breaking down organizational barriers and enabling global connectivity.

However, this evolution brought new challenges in data security, privacy, and scalability. Reliable and secure networking solutions are now more critical than ever before.



Interconnected Ecosystems

The Rise of Global Connectivity

In today's globalized business landscape, interconnected ecosystems fuel growth through collaboration and communication. Global connectivity unlocks access to markets, resources, and talent worldwide, driving supply chain efficiency, real-time analytics, and agile decision-making.

The reliance on dependable networks is paramount. A November 2023 report by AtlasVPN³ warns that a single-day global internet blackout could result in a \$43 billion loss, with the US and China bearing half of it. India alone faced \$184.3 million in losses due to internet blackouts in 2022.

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The Essence of Robust Networking Solutions

The Essence of Robust Networking Solutions



Reliability and Uptime

According to Gartner, network downtime costs an average of \$5,600 per minute in 2021⁴, underlining the critical importance of robust networking solutions to avoid costly disruptions.



Scalability

Networks must scale effortlessly to accommodate growth in customers, users, devices, or applications, ensuring organizations can adapt to changing operational needs.



Security

Modern networks face sophisticated cyber threats, with attackers leveraging AI. To combat this, networks need robust security measures, including firewalls, encryption, and AI-powered intrusion detection systems.

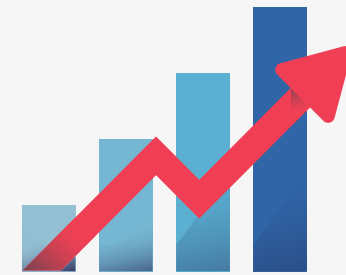
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Emerging Trends and Technologies

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 shows 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.

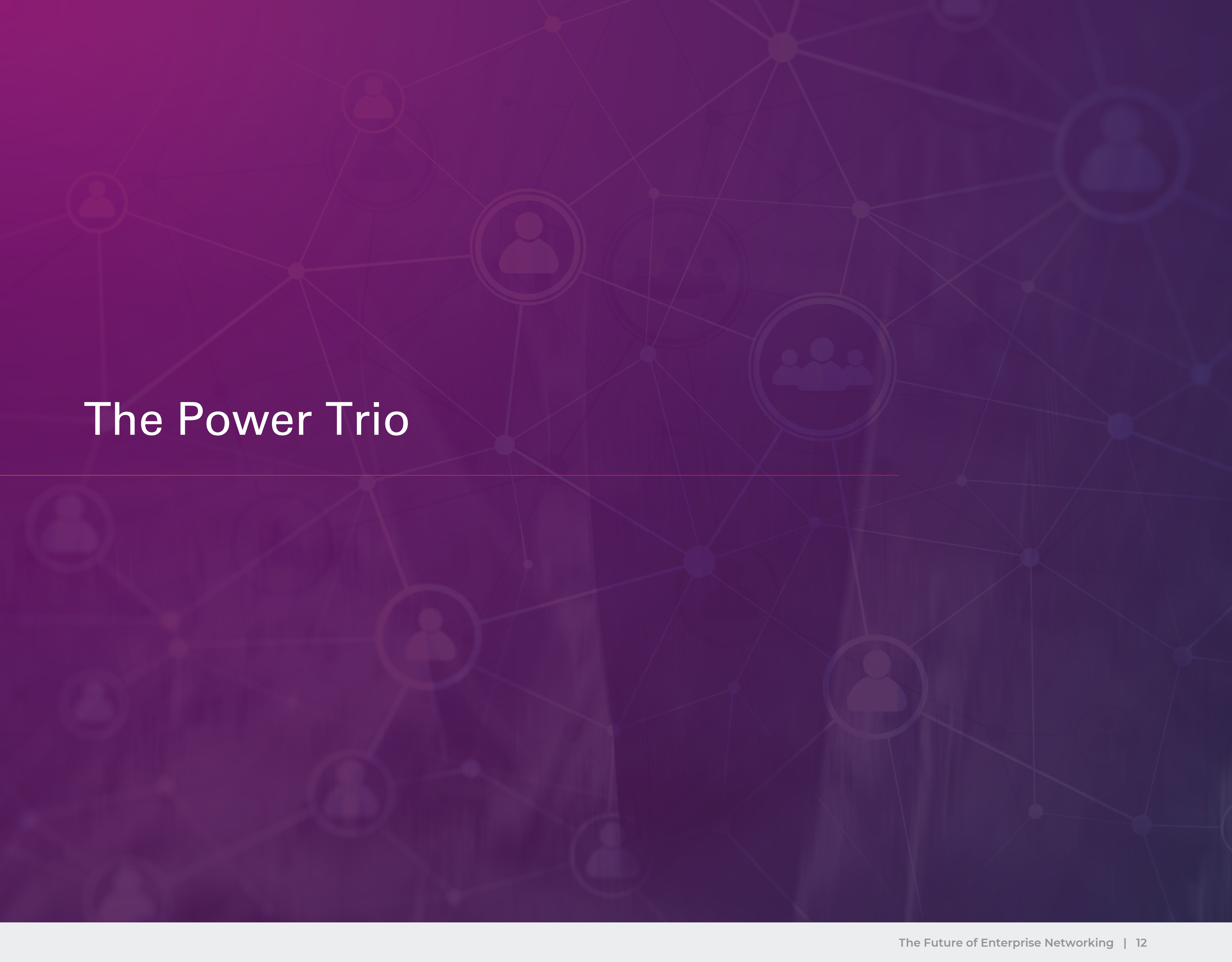
The advantage of SASE is particularly notable for supporting remote workforces. By providing secure access to applications and resources regardless of location, SASE enables seamless connectivity for remote employees and branch offices. It also improves data protection by enforcing consistent security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

AI in Networking

Just like countless technologies, AI is also transforming the world of networking operations. 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.

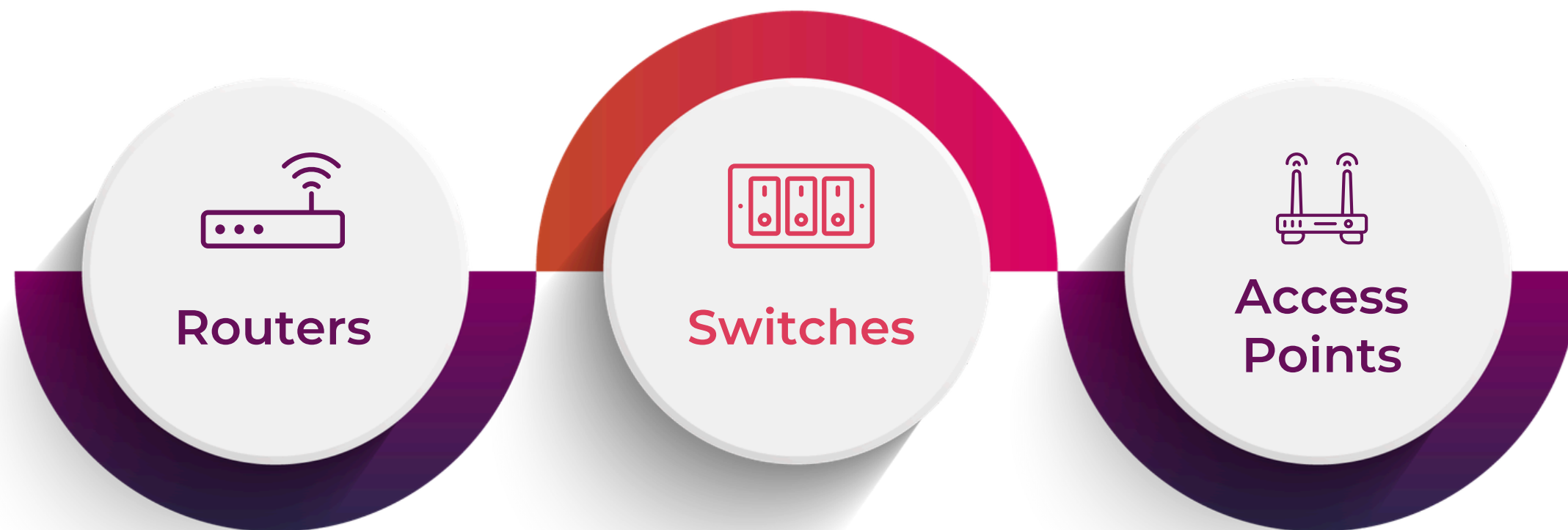


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The Power Trio

Routers, Switches, and Access Points

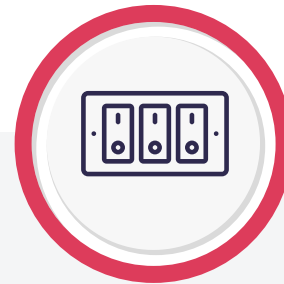
At the heart of enterprise networking infrastructure lie routers, switches, and access points, each playing a crucial role in establishing and maintaining a thriving network ecosystem.





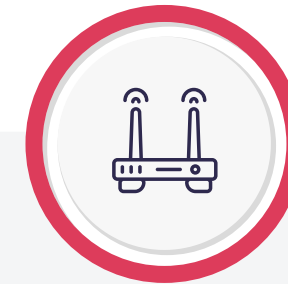
Routers

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

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

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.

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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

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Cost-Efficiency and ROI of Investing in Modern Networks

The upfront costs vs. long-term benefits

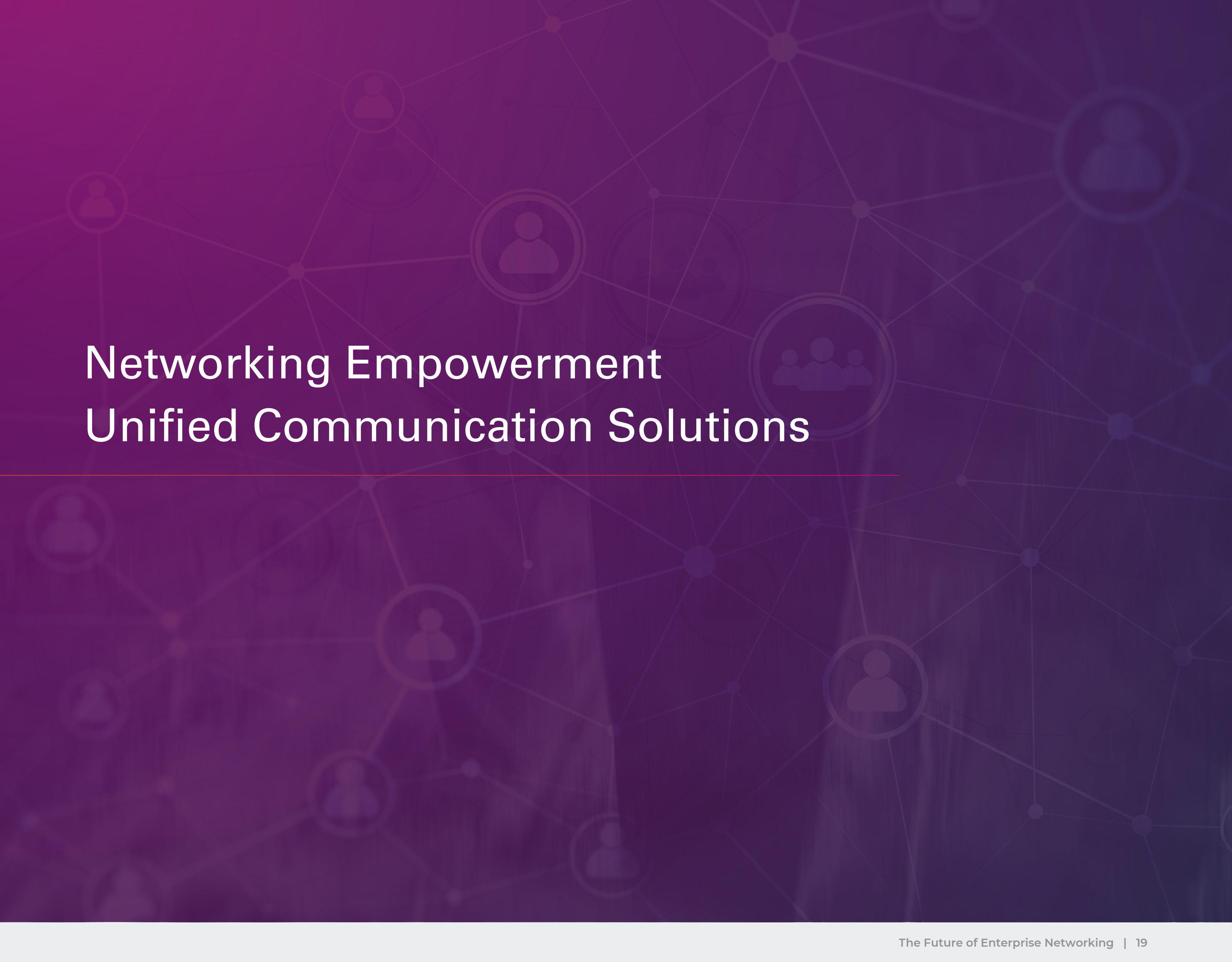
The upfront costs of switching to a robust network infrastructure include hardware procurement, software licenses, installation, configuration, and initial setup. These investments lay the foundation for long-term benefits and savings.

An IDC report (commissioned by Cisco) released in August 2022 revealed that using Cisco SD-WAN can significantly benefit 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). These figures suggest an impressive five-year ROI of 402%, with organisations breaking even on their investment in about 15 months.⁹



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

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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

Looking to the Future

Emerging Trends in Networking

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

- **5G: The Game-changer**

5G is a game-changer, offering higher data speeds, lower latency, and increased capacity, empowering businesses with unprecedented connectivity and innovation.

With 5G, transferring large data volumes, especially multimedia content, happens at lightning speed, ideal for real-time applications like video conferencing and virtual reality.

5G's lower latency ensures near-instantaneous response times, crucial for rapid data processing and decision-making in various applications.

Its increased capacity supports a massive number of connected devices simultaneously, perfect for the IoT era where billions of devices exchange data seamlessly.



Beyond networking, 5G fuels emerging technologies like edge computing, AI, and AR, unlocking a myriad of new possibilities for businesses.

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

Edge computing is a game-changer in enterprise networking, boosting performance and enabling real-time applications with enhanced responsiveness. By processing data closer to its source, typically at the network edge, it reduces latency and conserves bandwidth.

In scenarios like industrial automation, where real-time data analysis is vital, edge computing enables immediate reactions, unlocking new use cases previously hindered by latency.

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

- **The Role of Predictive Analytics in Proactive Network Management**

Predictive analytics is vital for network management, using data analysis to forecast issues before they happen. By analyzing historical data, these tools predict network congestion, identify bottlenecks, and optimize resources proactively, reducing downtime and enhancing user experience.

For instance, they anticipate high-demand periods by analyzing traffic patterns, enabling resource allocation and congestion prevention. Historical data also helps identify potential device failures, mitigating the risk of unexpected outages.

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, 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!

Conclusion

About Proactive

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 networking solutions,
write to us at pro@proactive.co.in

www.proactive.co.in

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Citations

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