GLOBAL INTERCONNECTION INDEX

VOLUME 3

Measuring the growth of
the global digital economy

#INTERCONNECTION**INDEX**

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GLOBAL INTERCONNECTION INDEX (GXI)

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INTRODUCTION

DISTANCE IS THE BIGGEST DIGITAL BUSINESS PERFORMANCE KILLER

With today's latency-sensitive workloads requiring response times ranging from <60 to <20 milliseconds, IT teams must mobilise to materially close the distance gap.

No investment in latency reduction tactics can deliver the impact that can be gained by removing the distance between data, applications, clouds, partners and users. As the world continues to digitise, interactions are happening at the edge—close to population centres, where the digital and physical worlds meet, and where businesses come together to exchange information and services. This is the digital edge.

INTRODUCTION

THE INTERCONNECTION IMPERATIVE: REMOVE THE DISTANCE TO STAY COMPETITIVE

Deploying direct, private connections at the digital edge propels both application performance and user experience, allowing you to leapfrog ahead of competitors.

The mashup of legacy IT and modern cloud technologies has created a hybrid world where corporate data centres are shrinking as workloads shift to the edge. At the same time, major macro, technology and regulatory trends have created a new normal in every industry: if your IT infrastructure isn't digital ready, your business can't compete.

To accelerate their transformation to a digital-ready state, today's IT leaders must harness interconnection—direct and private traffic exchange between key business partners—to remove the distance between IT services and users. This is the only way to rapidly and exponentially improve digital business performance, which is driven by dynamic interactions between people, systems, applications, data and clouds at the digital edge.

INTRODUCTION

THE EDGE IS AN ESSENTIAL DRIVER OF DIGITAL BUSINESS VALUE

Companies are finding new business models, more partners and more paths to differentiation. They're transforming IT delivery and bringing applications and data processing closer to the users—at the digital edge.

This is why even cloud-native companies are striving to get a better edge foothold. For example, as the volume of data being produced and consumed at the digital edge rapidly expands, forward-thinking digital businesses are consolidating data stores adjacent to interconnection hubs. This gives them ready access to third-party, cloud-enabled apps and analytics services that offer data-driven customer insights they can quickly monetise. Leveraging private interconnection at strategic edge locations compounds digital business efficiency, revenue growth and cost savings and connects companies to collective growth opportunities that no single company can achieve alone.

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INTRODUCTION

THE GLOBAL INTERCONNECTION INDEX GETS YOU DIGITAL READY

Volume 3 of the annual Global Interconnection Index (GXI) measures and forecasts the growth of the private interconnection bandwidth required to support the companies driving digital business.[1]

As digitalisation of the global economy increases, so does installed interconnection bandwidth capacity worldwide. Capacity is expected to reach 13,300+ Tbps by 2022, which represents a 7% increase over the previous year's capacity projections.

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1. Interconnection bandwidth is defined as the total capacity provisioned to privately and directly exchange traffic, with a diverse set of partners and providers, at distributed IT exchange points inside carrier-neutral colocation data centres.

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INTRODUCTION

DIGITAL LEADERS ARE TAKING ACTION

The GXI also identifies five pivotal actions digital leaders can take today to accelerate IT transformation and achieve digital readiness.

Together, these actions form an interconnection maturity model that addresses the disruptive trends facing all businesses. The GXI also provides a real-world deployment profile of a digital-ready infrastructure that will help you assess where your company is in its own digital maturity. Armed with this fresh insight, you can develop a gamechanging digital business platform that maximises your position at the digital edge to bring new value to your customers, employees and partners on a global scale.

EVOLUTION

INTERCONNECTION EMERGED FROM THE CHALLENGE TO GLOBALLY SCALE THE INTERNET

The digitisation of business and the compounding growth and exchange of data required the IT industry to solve the problem of how to exchange and transfer data among multiple companies across different networks, regions and countries.

Internet exchanges were created as physical infrastructure meeting places to facilitate data traffic exchange. These exchanges were built and hosted inside carrier-neutral colocation data centre campuses. The voluntary exchange of traffic among providers became known as peering.

Peering in carrier-neutral data centre campuses evolved to become IT traffic exchange points, where all types of business-to-business and machine-to-machine traffic integrated direct, private connections between each other with distributed, colocated IT components. These direct, private connections became known generally as interconnection, and are central to an Interconnection Oriented Architecture® (IOA®), in which the distance between users and producers is removed.

The economics of aggregation and exchange for digital business engagement has resulted in concentrations of interconnectivity and ecosystem density that have supported the digital economy worldwide.

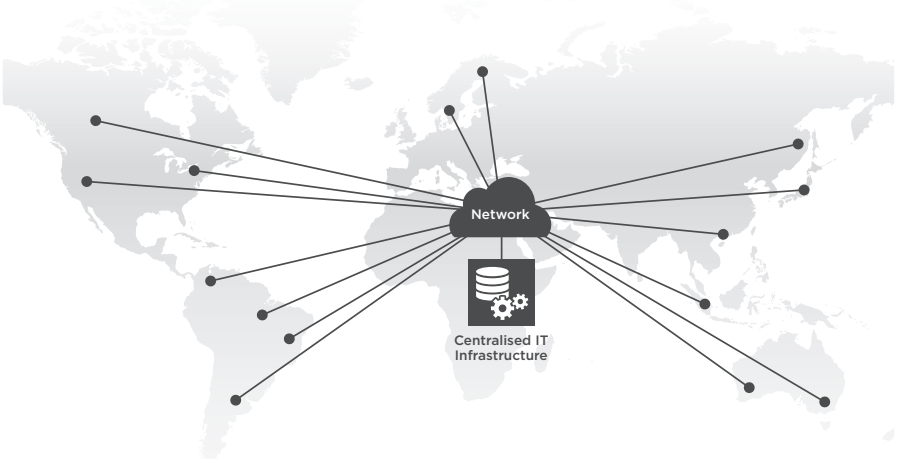
The digital edge became the point at which these physical and digital worlds meet—where a company's data meets these concentrations of interconnectivity and ecosystems.

EVOLUTION

Today, this environment is driven by SDN (software-defined networking) 5G, SDI (software-defined interconnection), NFV (network functions virtualisation) and edge computing, which result in a combination of hybrid multicloud and distributed edge interconnected services. Businesses are then enabled to create and connect new global business workflows, dynamically proliferating the number of interactions and volume of data exchanged between users, applications and devices. This results in an accelerated need for interconnection bandwidth within and across more exchange points worldwide.

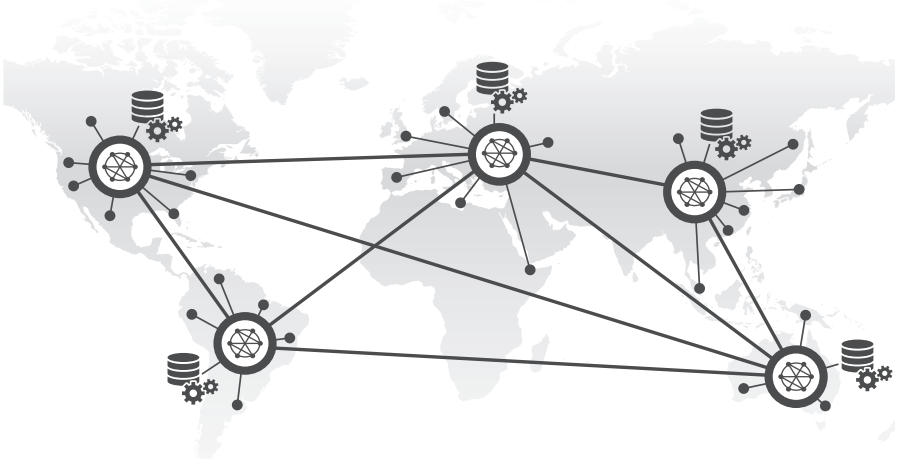
BEFORE INTERCONNECTION*

Centralised IT Infrastructure with constrained, point-to-point connectivity, backhauling user traffic to a central data centre



WITH INTERCONNECTION*

Optimised, multipoint connectivity via direct, private traffic exchange points between users and local services



*Architecture details can be found on the IOA Knowledge Base at IOAKB.com

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RELEVANCE

INDUSTRY TRENDS PRIORITISE THE NEED FOR INTERCONNECTION

The convergence of significant macro, technology and regulatory trends is driving complexity and risk. They must be collectively solved to effectively compete in the digital economy.

These trends are accelerating the need for a secure, compliant and responsive global business platform as a key part of digital transformation, fundamentally supported by interconnection.

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INDUSTRY TRENDS

The following chart breaks down the major trends and shows how businesses can use interconnection to solve this era's transformation challenges.

TREND	INSIGHT	IMPLICATION	NEED
Digital Business	By 2022, at least 60% of global GDP will be digitised, with growth in every industry driven by digitally enhanced offerings, operations and relationships[1]	Digital business forces the need to support real-time interactions to capture value	Real-time interactions require the local interconnection of people, things, locations, clouds and data
Urbanisation	Between now and 2030, 86% of worldwide GDP growth will be generated from large cities[2]	Urbanisation is transforming global demographics and demand origins, creating a need for localised digital capabilities	Supporting urban density requires the local interconnection and analytics of applications, data, content and networking where there is a concentration of users
Cybersecurity	A large-scale cybersecurity breach is a serious risk. Cybersecurity insurance premiums paid by companies are expected to increase from $2.5 billion in 2015 to $20 billion in 2025[3]	Digital business increases vulnerability points, especially when data is distributed across many different sources and consumers	Managing cybersecurity risk requires distributing and interconnecting security controls at points of business presence to improve security posture locally and globally
Data Volumes and Compliance	By 2022, more than 50% of enterprise-generated data will be created and processed outside the data centre or cloud.[4] More than 20 major countries block data transfers across their borders[5]	Compliance with data regulations at scale requires the need to process, maintain and secure data locally while making it available globally	Remaining compliant while meeting performance demands requires data, storage, analytics and networking to be directly interconnected in the business regions that have specific (or specialised) compliance requirements
Business Ecosystems	Digital ecosystems will account for more than $60 trillion in revenue by 2025, or more than 30% of global corporate revenue[6]	Digital trade flows are shaping global business and data processes involving an increasing mix of customers, partners and employees	To scale, business ecosystems require a technology infrastructure that interconnects participants and related digital flows

1. "IDC FutureScape: Worldwide IT Industry 2019 Predictions," IDC, October 2018.
2. Parag Khanna, "Ten Questions with Global Strategist Parag Khanna," interviewed by Jeffrey Donohoe, Georgetown Magazine, July 2016.
3. "Cyber Insurance: How Insuretechs Can Unlock the Opportunity," KPMG, 26 February 2018.
4. "The Edge Completes the Cloud," Gartner, September 2018.
5. "Cross-Border Data Flows," ITIF, 2018.
6. Martin Hirt, "If You're Not Building an Ecosystem, Chances Are Your Competitors Are," McKinsey & Company, 12 June 2018.

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IMPACT

INTERCONNECTION EQUALS COMPETITIVE ADVANTAGE

Globally distributed hybrid multicloud has become an imperative, but an edge-first architecture will dominate in digital infrastructure.

The GXI demonstrates that digital transformation requires moving from a centralised IT services model – with consolidated producers and consumers – to one that is geographically distributed and regionalised with cloud, resulting in a hybrid multicloud infrastructure. This model has become critical to meeting today's digital engagement and business exchange expectations.

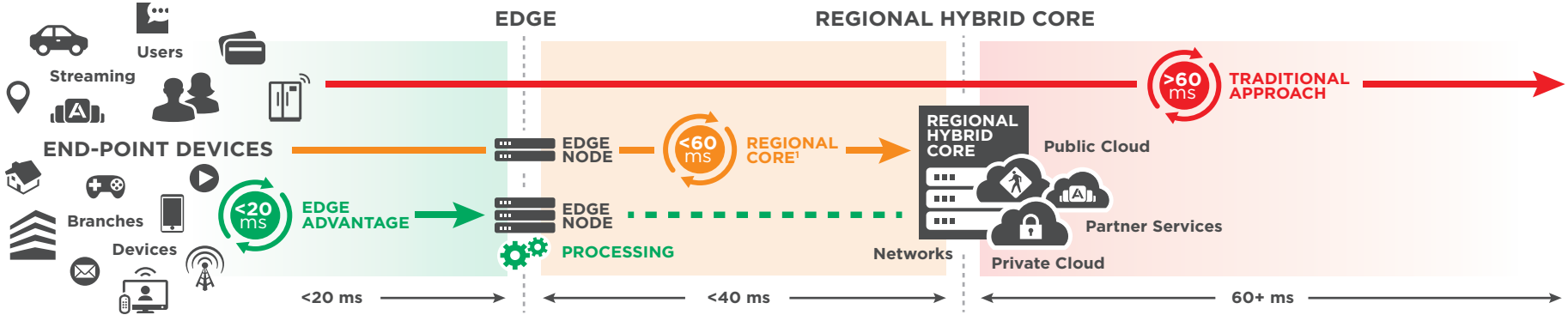
The GXI forecast and supporting deployment data reveal that workloads are moving to the digital edge, where business data can be exchanged in proximity to customers, employees and partners.

Delivering experiences and exchanging data at the digital edge exponentially improves responsiveness and business processing capabilities.

As an example, 5G is expected to reduce the last-mile (endpoint) latency to 5 ms, meaning that edge-delivered services will have a 9x advantage over regional core delivery.

As customer and partner expectations rise, the shift to an edge-first workload and application architecture will be essential for a digital-ready infrastructure that helps enterprises stay competitive.

THE EDGE ADVANTAGE



	WORKLOADS	IT DELIVERY	CAPABILITY	EXPECTATIONS
Traditional Approach	**Centralised** Workload components are centralised in corporate data centres. Traffic is brought from the digital edge to the core.	**Consolidated** Data centre centralised and delivered	**Concentrated** Not designed for digital infrastructure—cannot compete >60 ms	✗
Regional Core	**Regionalised** Workloads are hybrid multicloud. Traffic is brought from the digital edge to the nearest regional core.	**Distributed** 100% hybrid cloud delivered and edge integrated	**Regional** Meets digital infrastructure demands. Engagement averages ~60 ms	✓
Edge Advantage	**Localised** Workloads are designed for localised performance. Processing components are colocated at the digital edge, where edge services interact with the regional hybrid core.	**Tailored** 70% hybrid, 30% edge delivered and integrated	**Edge** Superior performance. Engagement averages <20 ms at scale	🏆

1. "Public Cloud Performance Benchmark Report," ThousandEyes, 2018..

2022 INTERCONNECTION BANDWIDTH FORECAST

51% CAGR EXPECTED[1]

As the digitisation of the economy advances, interconnection bandwidth compounds and producers and consumers become increasingly interconnected.

By 2022, installed interconnection bandwidth capacity is expected to reach 13,300+ Tbps with a 51% compound annual growth rate worldwide.

Enterprises are companies in traditional business sectors like Manufacturing, Energy & Utility, Banking & Insurance, Retail, Healthcare & Life Sciences and Government. These are expected to experience 7x growth, 2 surpassing traditional service providers to become the largest consumers of interconnection bandwidth. These in turn become digital service providers themselves. Enterprises are leveraging hybrid multicloud IT platforms for digital business.

Service providers, as digital natives, are companies that have digital traffic flows as a primary element of their business model, covering sectors like Telecommunications, Cloud & IT Services, and Content & Digital Media industries. These businesses as a group are predicted to experience robust 4x growth,2 as IT traffic exchanges continue to be core to their business models.

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1. This report contains forward-looking statements. These forward-looking statements involve known and unknown risks and uncertainties that may cause actual events or results to differ materially from the estimates or the results implied or expressed in such forward-looking statements.
2. Predicted growth between 2018–2022.

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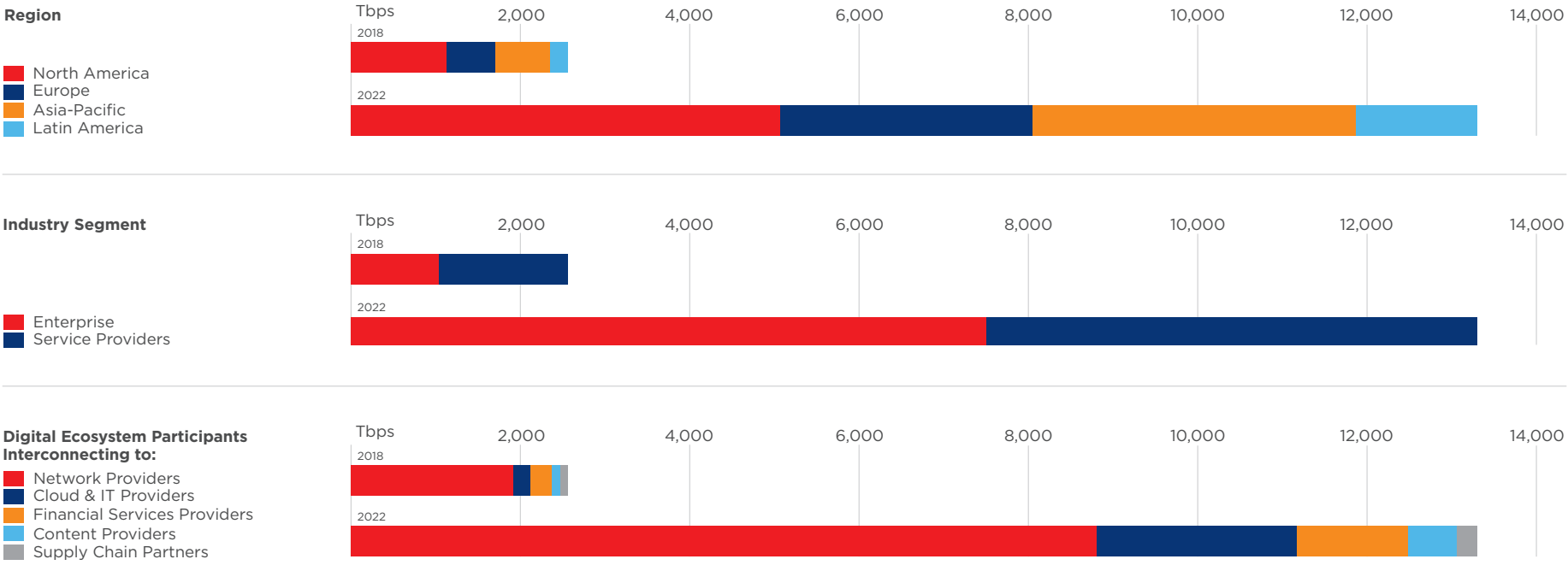
BANDWIDTH FORECAST

Across regions, by industry and by vertical, interconnection bandwidth growth forecasts continue to accelerate.



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REGIONAL VIEW

INTERCONNECTION BANDWIDTH GROWTH BY REGION

The digital economy continues to drive worldwide interconnection bandwidth growth, with a 51% CAGR.

North America leads globally, contributing to 38% of interconnection bandwidth, and is predicted to grow with a 46% CAGR. As the most digitally mature region, the focus is on further digitising industries like Manufacturing.

Europe, predicted to grow at a 51% CAGR, contributes 22% of interconnection bandwidth globally. Strong data compliance regulations enable growth in Healthcare & Life Sciences, Government & Education, and Business & Professional Services.

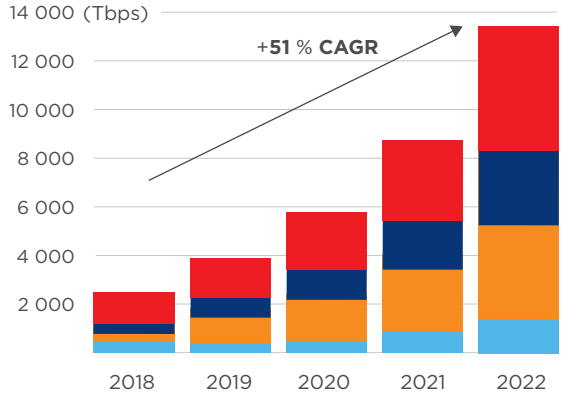
Asia-Pacific is anticipated to grow at a 56% CAGR, contributing more than 29% of interconnection bandwidth globally. In Asia-Pacific, Cloud & IT Services leads and is forecast to outpace growth of cloud in all other regions.

Latin America is predicted to grow by a 63% CAGR, reaching 1,430+ Tbps of predicted capacity and contributing 11% of interconnection bandwidth globally. In this region, the Content & Digital Media industry is expected to outpace other regions in adoption.

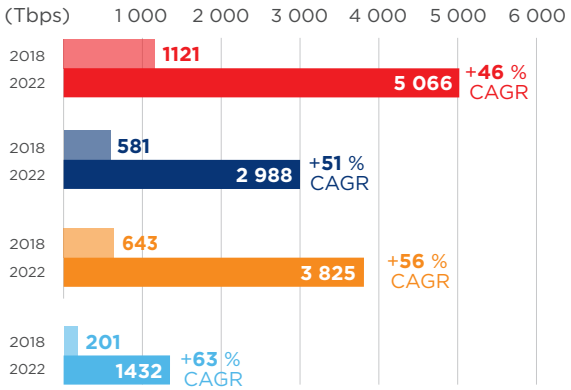
REGIONAL VIEW

From North America's lead in capacity to Asia-Pacific's rapidly expanding CAGR, all regions are experiencing a dramatic rise in interconnection bandwidth growth, driven by continued expansion of the digital economy.

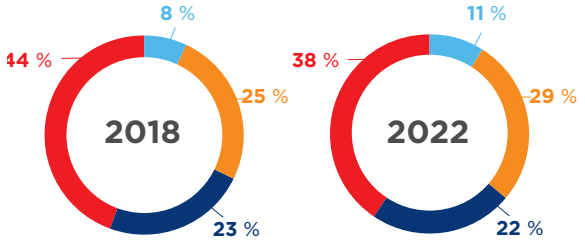
WORLDWIDE GROWTH



REGIONAL GROWTH



REGIONAL MIX



North America | Europe | Asia-Pacific | Latin America

INDUSTRY VIEW

INTERCONNECTION BANDWIDTH GROWTH BY INDUSTRY

As industries increase digitisation, they rely on digital business ecosystems, driving the growth of interconnection bandwidth.

Telecommunications represents almost 20% of all interconnection bandwidth, as interconnection is central to business. Interconnection bandwidth is expected to grow at a 39% CAGR, enabling new digital business services and adding last-mile scale with 5G technologies.

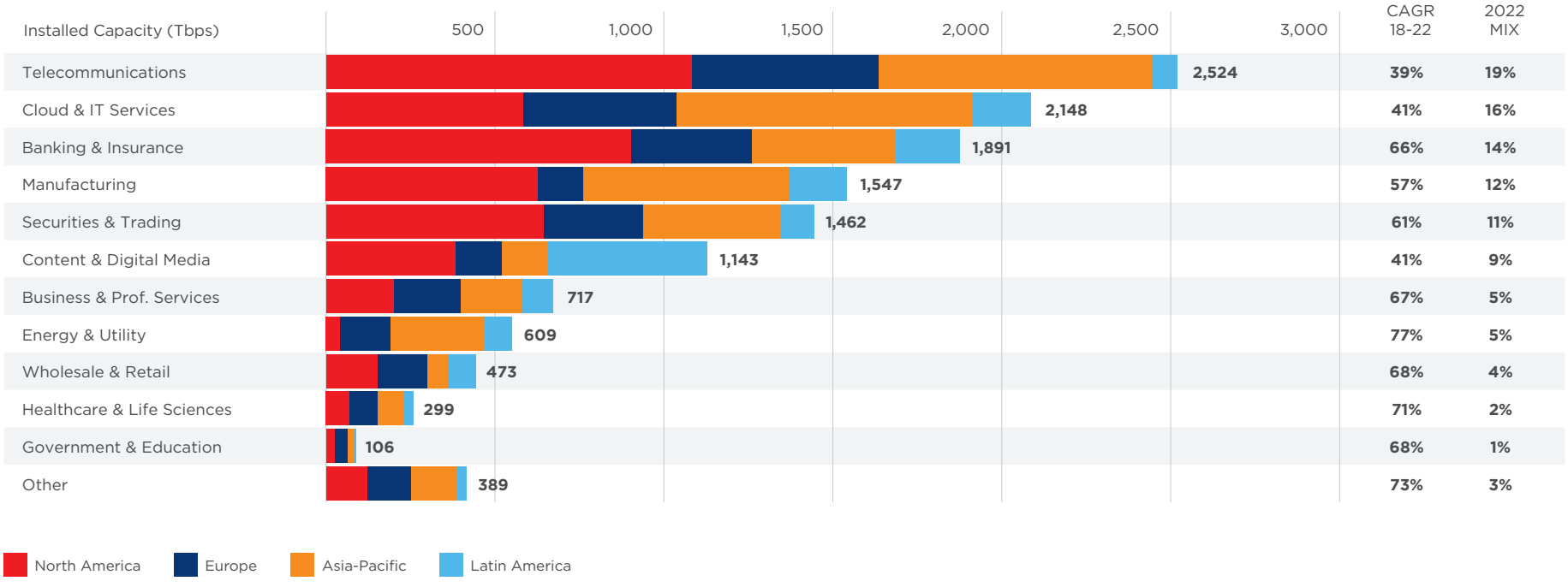
Cloud & IT Services is a leading consumer of interconnection bandwidth, predicted to grow at a 41% CAGR, as these businesses further extend their global reach and enable hybrid multicloud infrastructures.

Banking & Insurance is at the forefront of a perfect digital storm, as fintech, cybersecurity, data compliance and new competitive ecosystems converge. A force multiplier effect results in a predicted 66% CAGR, as the industry rapidly transforms.

Manufacturing, one of the most physically distributed industries, is digitally restructuring for new efficiencies and revenue streams (servitisation). When cross-industry data exchange is factored in, this industry, growing at a 57% CAGR, is expected to comprise 12% of all interconnection bandwidth.

INTERCONNECTION BANDWIDTH BY INDUSTRY TYPE

As digital ecosystems continue to evolve, installed capacities are predicted to increase globally for each industry, with regional variances.



ECOSYSTEM VIEW

DIGITAL PRODUCERS AND CONSUMERS ARE CONVERGING

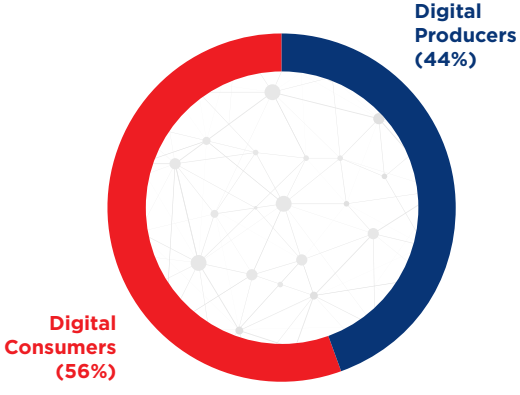
Interconnection is bringing digital producers and consumers together to form platform-driven digital ecosystems.

As companies and industries become increasingly digitised, new business models evolve. This has resulted in digital versions of what were traditional ecosystems. Digital services no longer exclusively mean digital infrastructure services (i.e. networks, clouds and content delivery). In fact, in today's environment, companies need to be digital businesses first and market participants second. Technology is no longer a separate part of the organisation, or a stand-alone set of industry verticals. It is now embedded into and is a defining aspect of the organisation.

This is what digital business transformation means. Standard industrial classifications begin to break down as the line between digital consumers and digital producers blurs.

The GXI uses standard industry classifications today to show how quickly industry segments are becoming digitised. The GXI also shows that the definition of digital producer and digital consumer are changing, due to the evolution of digital services. Consumers are more likely to also be producers in the emerging digital economy.

INTERCONNECTION CONSUMPTION BY INDUSTRY



INTERCONNECTION DEPLOYMENTS

WHO CONNECTS TO WHOM?

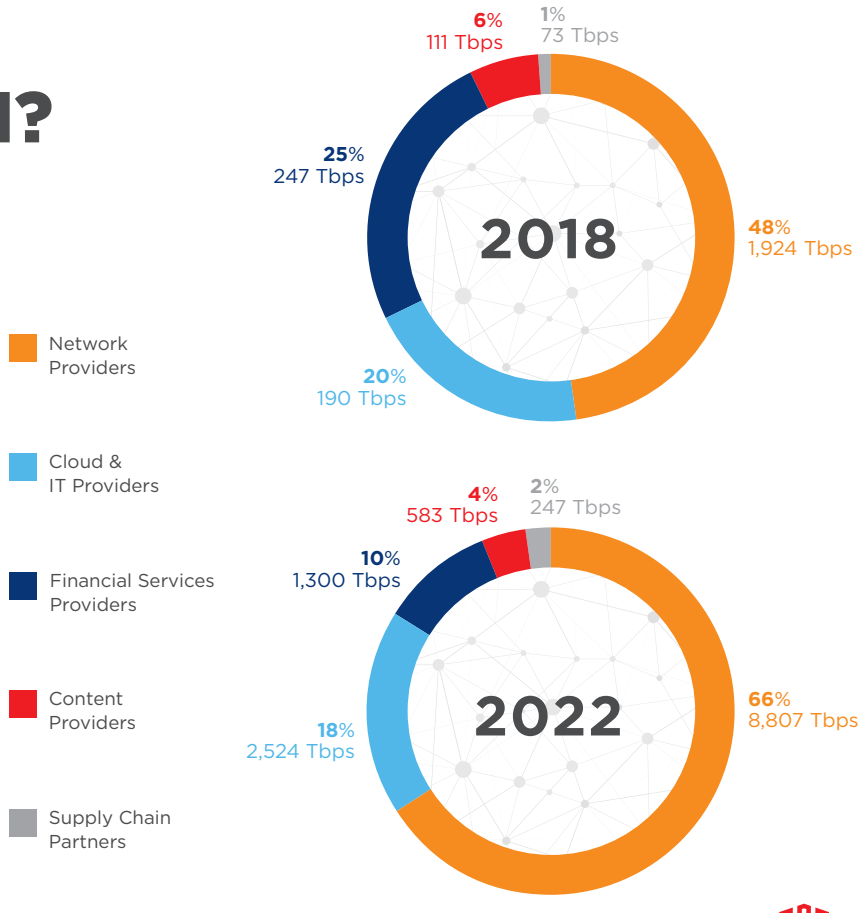
Businesses are benefitting from interconnection using a combination of the following key deployment models.

Interconnecting many networks, and network providers across many locations is the dominating use case for interconnection bandwidth and makes up more than half of all interconnection bandwidth (66%).

Interconnecting multiple clouds and IT services across multiple locations and cloud regions represents the next largest and fastest growing use of interconnection bandwidth (18%).

Interconnecting digital business partners for Financial Services, Payments, Content & Digital Media and Supply Chain integration makes up the remainder of interconnection bandwidth use cases (16%).

Digital trade flows are creating increasingly complex business and data processes involving local customers, partners and employees. Ecosystem participants leverage interconnection hubs to privately exchange data in support of these evolving processes.



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KEY INDICATORS OF ADOPTION

DOES YOUR COMPANY NEED INTERCONNECTION?

As businesses of all sizes globally interconnect their digital business platforms, firmographic profiling correlates interconnection bandwidth growth with trends in three categories: users, geographical presence and use of distributed IT services.

USERS

Using employee count as a proxy for number of users, the GXI predicts that for every 500 employees, the need to increase interconnection bandwidth almost doubles to support the interconnection of users across their digital business workflows.

GEOGRAPHICAL PRESENCE

For businesses operating in more than three countries, the GXI forecasts a 5x increase in the interconnection bandwidth required to locally connect data sources and security controls to meet data compliance regulations and reduce cybersecurity vulnerability points.

USE OF DISTRIBUTED IT SERVICES

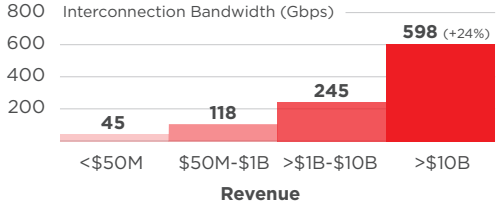
The GXI identified that when businesses spend greater than US$50,000 per month on distributed IT services, the need for interconnection bandwidth capacity increases 4x on average to support real-time interactions.

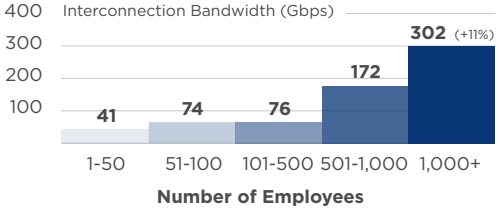
KEY INDICATORS OF ADOPTION

Across three key indicators, all increased significantly over the last year.

1 USERS

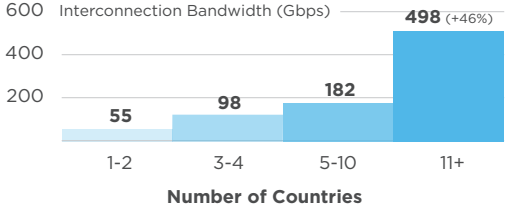
Average Interconnection Bandwidth by Revenue and Number of Employees

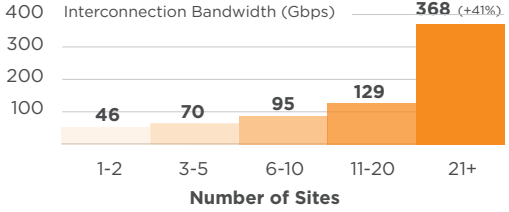




2 LOCATIONS

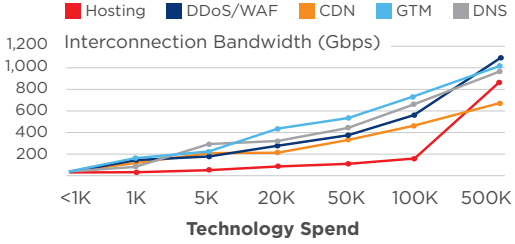
Average Interconnection Bandwidth by Geographical Presence

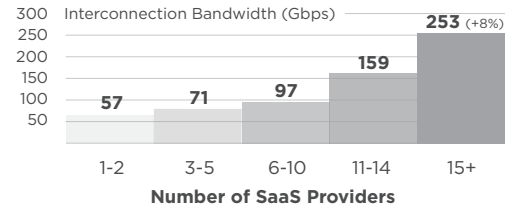




3 USE OF DISTRIBUTED IT SERVICES

Average Interconnection Bandwidth by Number of Distributed IT Services





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INTERCONNECTION USE CASES

WHICH IT SERVICES DRIVE INTERCONNECTION?

There is a consistent set of distributed IT services that requires a digital business platform for superior performance, security and data exchange at the digital edge. The GXI found that these distributed IT services correlate to an increased need for interconnection bandwidth, and key actions that leading businesses take to achieve a digital-ready state.

These key actions—the five IT transformational steps outlined in the following pages – when combined, form an interconnection maturity model that addresses macro digital business, urbanisation, cybersecurity, data compliance and business ecosystem trends.

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INTERCONNECTION AND DIGITAL TRANSFORMATION

THE FIVE STEPS TO DIGITAL TRANSFORMATION

The GXI identifies five IT transformational steps that digital leaders consistently implement to transform IT and reach a digital-ready state.

The journey starts with re-architecting the corporate network—one strategic location at a time—into a distributed set of interconnected hubs located at the digital edge.

Locally interconnect networks, clouds and partners, leveraging economies of aggregation to unlock the benefits of a robust digital ecosystem.

Distribute security services to the interconnected digital edge for real-time transparency and control across the digital landscape, dramatically reducing risk.

Integrate data pipelines and monetised data sources in interconnected hubs to efficiently manage massive data volumes while remaining compliant.

A digital-ready state, now achieved, enables application exchange – placing highly interactive business and user-facing services physically proximate to customers, employees, partners and clouds for the greatest performance, ecosystem access and security. This optimised state gives businesses a significant advantage in the digital economy.

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COMPANIES TRANSFORM IT WITH THESE FIVE STEPS

Implementing these five IT transformational steps is critical to creating a competitive advantage for your digital business.

	NETWORK OPTIMISATION Network Hub	**HYBRID MULTICLOUD** Network and Cloud Hub	**DISTRIBUTED SECURITY** Network, Cloud and Security Hub	**DISTRIBUTED DATA** Network, Cloud, Security and Data Hub	**APPLICATION EXCHANGE** Network, Cloud, Security, Data and Exchange Hub
OBJECTIVE	**Optimise network segment(s)**	**Directly connect public and private clouds**	**Adjacently deploy security services**	**Manage data exchange globally**	**Engage in digital business ecosystems**
CHALLENGES	Distributed content and workflow latency issues	Distributed compute, apps and user complexity issues	Distributed security risks	Distributed data and insights integration	Application exchange issues—real-time engagement and participation
STRATEGY	Shorten the distance between users and services, localise traffic in the hubs	Connect multiple clouds and segment traffic in the hubs	Deploy and connect security controls in the hubs	Integrate analytics, data lakes and data controls in the hubs	Place business-differentiating services at exchange points
DISTRIBUTED IT SERVICES DEPLOYED	CDN, DNS/GTM, DDoS/WAF	IaaS, SaaS, Mobile Web	DDoS/WAF, SaaS, Web Analytics	NoSQL/Hadoop, IaaS, SaaS	Public APIs, messaging, blockchains, BPM
BENEFITS[1]	60%+ reduction in transport costs, 30%+ reduction in latency, 10x increase in bandwidth	70% reduction in connectivity costs to clouds, greater connectivity choice and reduced complexity	Real-time control over access and data with a reduction in audit costs and overall exposure	Reduction in data transport costs, real-time delivery and localised processing advantage	Highest digital throughput at lowest latency maximising digital experience and market position

1. "Total Economic Impact™ Study," Forrester, Commissioned by Equinix, April 2019.

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DIGITAL TARGET STATE

A GLOBAL MESH OF TAILORED INTERCONNECTION HUBS

GXI research indicates a typical deployment profile that is needed to achieve a digital-ready state. This target state incorporates interconnection hubs across regions, connecting unique ecosystem participants via a vast array of direct interconnections. The result is the ability to not just survive, but to leverage the significant macro trends facing all businesses today for greater advantage.

HUBS

PARTICIPANTS
Networks, Clouds and Partners

INTERCONNECTIONS
per location

ACTIONS

- Network Optimisation
- Hybrid Multicloud
- Distributed Security
- Distributed Data
- Application Exchange

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INTERCONNECTION DATA TABLES

2022 FORECAST DATA[1]

The shift to digital, driven by macro trends, is driving digital ecosystem and interconnection bandwidth growth. The lines between digital service provider and consumer are beginning to blur as ecosystem density increases along with interconnection bandwidth.

The applications that run businesses are undergoing their next seismic shift as they move from being cloud-delivered from the centre to cloud-enabled at the digital edge.

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1. Predicted growth between 2018–2022

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INTERCONNECTION BANDWIDTH GROWTH: GLOBAL

INTERCONNECTION INSTALLED BANDWIDTH CAPACITY (Tbps)

BY INDUSTRY	2018	2019	2020	2021	2022	CAGR
Telecommunications	683	986	1,388	1,886	2,524	39%
Cloud & IT Services	549	772	1,107	1,537	2,148	41%
Banking & Insurance	249	407	667	1,158	1,891	66%
Manufacturing	258	395	629	988	1,547	57%
Securities & Trading	216	337	535	932	1,462	61%
Content & Digital Media	286	396	559	804	1,143	41%
Business & Professional Services	92	149	251	434	717	67%
Energy & Utility	62	112	202	358	609	77%
Wholesale & Retail Trade	59	96	164	286	473	68%
Healthcare & Life Sciences	35	58	100	179	299	71%
Government & Education	13	22	39	65	106	68%
Other	43	75	131	230	389	73%
Total Industry[1]	**2,546**	**3,804**	**5,771**	**8,857**	**13,310**	**51%**

BY REGION	2018	2019	2020	2021	2022	CAGR
North America	1,121	1,617	2,382	3,543	5,066	46%
Asia-Pacific	643	989	1,542	2,452	3,825	56%
Europe	581	875	1,320	1,999	2,988	51%
Latin America	201	324	527	864	1,432	63%
Total Region	**2,546**	**3,804**	**5,771**	**8,857**	**13,310**	**51%**

BY ENTERPRISE	2018	2019	2020	2021	2022	CAGR
Interconnecting to Network Providers	777	1,192	1,803	2,932	4,760	57%
Interconnecting to Cloud & IT Providers	83	209	549	1,029	1,662	112%
Interconnecting to Financial Services Providers	142	206	294	534	841	56%
Interconnecting to Supply Chain Partners	15	26	46	83	147	77%
Interconnecting to Content Providers	12	18	24	52	84	63%
Total Enterprise	**1,029**	**1,650**	**2,716**	**4,630**	**7,494**	**64%**

BY PROVIDER	2018	2019	2020	2021	2022	CAGR
Interconnecting to Network Providers	1,147	1,585	2,158	2,939	4,047	37%
Interconnecting to Cloud & IT Providers	107	193	357	513	711	60%
Interconnecting to Content Providers	99	157	242	357	499	50%
Interconnecting to Financial Services Providers	105	149	215	325	459	44%
Interconnecting to Supply Chain Partners	58	70	83	93	99	14%
Total Provider	**1,517**	**2,154**	**3,055**	**4,227**	**5,816**	**40%**

1. Rounding may affect totals

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INTERCONNECTION BANDWIDTH GROWTH BY 2022

NORTH AMERICA

North America is predicted to grow at a 46% CAGR, contributing more than 38% of interconnection bandwidth globally.

North America, with its mature digital service provider industries, is expected to shift focus and growth to the digitisation of enterprise businesses, forming robust digital ecosystems.

Interconnection bandwidth is expected to reach 5,065+ Tbps driven by strong anticipated growth in New York (51% CAGR) and Chicago (49% CAGR).

Enterprises are expected to use more than 58% of their total interconnection bandwidth to reach network providers, while another 24% will be used to connect to Cloud & IT providers.

Telecommunications is expected to remain the largest growth industry representing 21% of the market; Healthcare & Life Sciences and Energy & Utility are expected to be the fastest-growing interconnection industries through 2022 (both 63% CAGR), although from a more modest base.

Enterprises are expected to account for 57% of interconnection bandwidth in 2022, with a 58% CAGR.

The top four metro areas are expected to represent 79% of interconnection bandwidth in 2022, with a 47% CAGR, to outpace the rest of the market (42% CAGR).

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INTERCONNECTION BANDWIDTH GROWTH: NORTH AMERICA

INTERCONNECTION INSTALLED BANDWIDTH CAPACITY (Tbps)

BY INDUSTRY	2018	2019	2020	2021	2022	CAGR
Telecommunications	304	445	637	827	1,079	37%
Banking & Insurance	137	218	343	583	899	60%
Manufacturing	136	197	310	493	748	53%
Securities & Trading	103	162	245	418	615	56%
Cloud & IT Services	193	252	342	462	613	33%
Content & Digital Media	142	181	237	316	408	30%
Business & Professional Services	37	54	86	145	228	58%
Wholesale & Retail Trade	29	46	77	124	195	61%
Healthcare & Life Sciences	13	20	32	57	92	63%
Energy & Utility	8	13	22	34	53	63%
Government & Education	5	7	12	19	30	57%
Other	15	24	39	66	105	62%
Total Industry[1]	**1,121**	**1,617**	**2,382**	**3,543**	**5,066**	**46%**

BY METRO[2]	2018	2019	2020	2021	2022	CAGR
New York	310	473	745	1,126	1,616	51%
Chicago	175	261	405	605	863	49%
Washington, D.C.	211	289	420	602	837	41%
Silicon Valley	170	237	349	506	708	43%
Total Metro[1]	**865**	**1,260**	**1,918**	**2,840**	**4,025**	**47%**

BY ENTERPRISE	2018	2019	2020	2021	2022	CAGR
Interconnecting to Network Providers	342	498	717	1,118	1,709	50%
Interconnecting to Cloud & IT Providers	41	98	248	459	704	103%
Interconnecting to Financial Services Providers	88	127	176	316	479	53%
Interconnecting to Supply Chain Partners	6	9	16	28	46	68%
Interconnecting to Content Providers	5	7	9	18	27	56%
Total Enterprise	**482**	**739**	**1,166**	**1,939**	**2,965**	**58%**

BY PROVIDER	2018	2019	2020	2021	2022	CAGR
Interconnecting to Network Providers	508	680	905	1,169	1,533	32%
Interconnecting to Cloud & IT Providers	46	80	144	201	266	55%
Interconnecting to Content Providers	34	52	79	114	150	44%
Interconnecting to Financial Services Providers	33	44	63	93	124	40%
Interconnecting to Supply Chain Partners	18	21	25	27	28	11%
Total Provider	**639**	**878**	**1,216**	**1,604**	**2,101**	**35%**

1. Rounding may affect totals
2. These are the top metros and not inclusive of all metros

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INTERCONNECTION BANDWIDTH GROWTH BY 2022

EUROPE

Europe is predicted to grow at a 51% CAGR, comprising about 22% of interconnection bandwidth globally.

Data and compliance regulations are serving as a catalyst of interconnection growth throughout Europe, potentially unlocking private records exchange. Europe is projected to reach ~3,000 Tbps by 2022.

The top four metros will reach nearly 78% of European traffic by 2022, with London alone accounting for 34% of European traffic.

Telecommunications and Cloud & IT Services are expected to remain the largest industry segments, together comprising 35% of total interconnection bandwidth.

Healthcare & Life Sciences, Government & Education and Wholesale & Retail trade are forecast to grow the fastest (70%+ CAGR).

Enterprises are expected to account for 60% of total interconnection bandwidth in 2022, growing at a 67% CAGR.

67% of enterprise interconnection bandwidth is expected to be used to interconnect with network providers.

INTERCONNECTION BANDWIDTH GROWTH: EUROPE

INTERCONNECTION INSTALLED BANDWIDTH CAPACITY (Tbps)

BY INDUSTRY	2018	2019	2020	2021	2022	CAGR
Telecommunications	183	263	364	474	618	36%
Cloud & IT Services	127	176	239	315	418	35%
Banking & Insurance	55	89	146	239	387	63%
Securities & Trading	50	77	131	230	378	66%
Business & Professional Services	30	52	90	149	241	68%
Energy & Utility	25	44	78	128	198	68%
Manufacturing	27	38	57	100	168	58%
Wholesale & Retail Trade	18	29	48	92	154	72%
Content & Digital Media	37	53	75	106	147	41%
Healthcare & Life Sciences	14	24	41	70	115	71%
Government & Education	5	10	17	27	43	70%
Other	12	20	35	69	119	79%
Total Industry[1]	**581**	**875**	**1,320**	**1,999**	**2,988**	**51%**

BY METRO[2]	2018	2019	2020	2021	2022	CAGR
London	195	297	467	705	1,011	51%
Frankfurt	94	152	148	383	556	56%
Amsterdam	78	125	201	309	448	55%
Paris	60	90	141	212	303	50%
Total Metro[1]	**426**	**663**	**1,057**	**1,609**	**2,318**	**53%**

BY ENTERPRISE	2018	2019	2020	2021	2022	CAGR
Interconnecting to Network Providers	178	283	448	738	1,204	61%
Interconnecting to Cloud & IT Providers	14	36	98	186	303	116%
Interconnecting to Financial Services Providers	36	52	79	144	234	60%
Interconnecting to Supply Chain Partners	4	6	12	21	38	79%
Interconnecting to Content Providers	3	5	7	15	25	70%
Total Enterprise	**234**	**383**	**643**	**1,105**	**1,804**	**67%**

BY PROVIDER	2018	2019	2020	2021	2022	CAGR
Interconnecting to Network Providers	262	362	483	633	841	34%
Interconnecting to Cloud & IT Providers	19	34	60	79	105	54%
Interconnecting to Content Providers	25	40	61	83	112	46%
Interconnecting to Financial Services Providers	27	38	54	77	103	40%
Interconnecting to Supply Chain Partners	15	18	20	22	23	11%
Total Provider	**347**	**492**	**677**	**894**	**1,184**	**36%**

1. Rounding may affect totals
2. These are the top metros and not inclusive of all metros

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INTERCONNECTION BANDWIDTH GROWTH BY 2022

ASIA-PACIFIC

Asia-Pacific is predicted to grow at a 56% CAGR, contributing 29% of interconnection bandwidth globally.

Interconnection traffic growth in Asia-Pacific is predicted to be faster than more developed regions, with total traffic to reach 3,825+ Tbps by 2022, which is 28% larger than Europe.

The top five metros equate to 72% of overall Asia-Pacific interconnection bandwidth, growing at a 52% CAGR through 2022.

Cloud & IT Services is forecast to be the largest industry segment in Asia-Pacific, and in the world (50% larger than North America), growing at a 50% CAGR and representing 24% of total Asia-Pacific interconnection bandwidth.

Energy & Utility and Banking & Insurance are the fastest-growing segments with both increasing nearly 11x over a four-year period.

Enterprises are expected to account for 53% of total interconnection bandwidth in 2022, growing at a robust 68% CAGR vs 47% CAGR for service providers.

68% of enterprise interconnection bandwidth is expected to be used to interconnect with network providers and 24% to clouds.

INTERCONNECTION BANDWIDTH GROWTH: ASIA-PACIFIC

INTERCONNECTION INSTALLED BANDWIDTH CAPACITY (Tbps)

BY INDUSTRY	2018	2019	2020	2021	2022	CAGR
Cloud & IT Services	183	276	429	622	914	50%
Telecommunications	170	246	347	532	754	45%
Manufacturing	82	136	216	314	485	56%
Securities & Trading	55	86	139	251	417	66%
Banking & Insurance	34	57	101	201	364	81%
Energy & Utility	27	47	85	159	285	81%
Business & Professional Services	21	35	59	106	183	71%
Content & Digital Media	39	51	71	104	146	40%
Healthcare & Life Sciences	8	13	22	41	72	75%
Wholesale & Retail Trade	8	13	21	35	59	63%
Government & Education	3	5	8	15	26	74%
Other	14	25	45	70	118	71%
Total Industry[1]	**643**	**989**	**1,542**	**2,452**	**3,825**	**56%**

BY METRO[2]	2018	2019	2020	2021	2022	CAGR
Tokyo	161	244	381	574	821	50%
Singapore	124	180	274	405	573	47%
Shanghai	85	145	244	382	561	60%
Sydney	84	125	194	290	414	49%
Hong Kong	66	105	171	263	381	55%
Total Metro[1]	**520**	**799**	**1,264**	**1,914**	**2,750**	**52%**

BY ENTERPRISE	2018	2019	2020	2021	2022	CAGR
Interconnecting to Network Providers	207	322	485	806	1,358	60%
Interconnecting to Cloud & IT Providers	24	61	160	294	489	114%
Interconnecting to Financial Services Providers	13	20	28	54	92	61%
Interconnecting to Supply Chain Partners	4	8	14	25	46	79%
Interconnecting to Content Providers	3	5	7	15	26	65%
Total Enterprise	**252**	**416**	**695**	**1,194**	**2,011**	**68%**

BY PROVIDER	2018	2019	2020	2021	2022	CAGR
Interconnecting to Network Providers	276	388	543	796	1,147	43%
Interconnecting to Cloud & IT Providers	33	63	120	183	266	68%
Interconnecting to Content Providers	30	50	81	127	187	58%
Interconnecting to Financial Services Providers	33	49	73	117	174	51%
Interconnecting to Supply Chain Partners	18	23	29	35	40	22%
Total Provider	**391**	**573**	**847**	**1,258**	**1,814**	**47%**

1. Rounding may affect totals
2. These are the top metros and not inclusive of all metros

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INTERCONNECTION BANDWIDTH GROWTH BY 2022

LATIN AMERICA

Latin America is predicted to grow at a 63% CAGR to reach 1,430+ Tbps of installed capacity by 2022, contributing more than 10% of interconnection bandwidth globally.

Latin America has the strongest regional interconnection bandwidth growth rate, driving investment in the internet infrastructure required to access it.

The top four metros are expected to equate to 77% of overall Latin American interconnection traffic, growing at a 61% CAGR through 2022.

Content & Digital Media in Latin America is forecast to be the largest industry for interconnection bandwidth in the world (8% larger than North America), growing at a 59% CAGR and representing 31% of total Latin American interconnection bandwidth.

While starting from a modest base, five industry segments are forecast to grow at a CAGR greater than 100%.

Enterprises are expected to match service providers, due to a strong 85% CAGR through 2022.

68% of enterprise interconnection bandwidth is expected to be used to interconnect to network providers.

INTERCONNECTION BANDWIDTH GROWTH: LATIN AMERICA

INTERCONNECTION INSTALLED BANDWIDTH CAPACITY (Tbps)

BY INDUSTRY	2018	2019	2020	2021	2022	CAGR
Content & Digital Media	68	111	176	279	442	59%
Banking & Insurance	24	43	77	136	240	78%
Cloud & IT Services	46	69	97	138	203	45%
Manufacturing	13	24	46	82	145	82%
Telecommunications	26	32	41	54	73	30%
Energy & Utility	3	8	17	36	72	117%
Business & Professional Services	4	8	17	34	65	105%
Wholesale & Retail Trade	4	9	18	34	65	97%
Securities & Trading	8	13	20	33	53	60%
Healthcare & Life Sciences	1	2	5	10	20	111%
Government & Education	0	1	2	3	7	109%
Other	3	6	12	24	47	105%
Total Industry[1]	**201**	**324**	**528**	**864**	**1,432**	**63%**

BY METRO[2]	2018	2019	2020	2021	2022	CAGR
Sao Paulo	76	134	229	363	535	63%
Rio de Janeiro	38	65	110	173	253	61%
Buenos Aires	25	43	73	115	170	62%
Mexico City	27	43	68	103	149	52%
Total Metro[1]	**167**	**284**	**480**	**754**	**1,106**	**61%**

BY ENTERPRISE	2018	2019	2020	2021	2022	CAGR
Interconnecting to Network Providers	50	89	153	270	489	77%
Interconnecting to Cloud & IT Providers	4	13	43	90	166	148%
Interconnecting to Financial Services Providers	4	7	11	20	36	71%
Interconnecting to Supply Chain Partners	1	2	4	9	18	104%
Interconnecting to Content Providers	1	1	2	4	6	66%
Total Enterprise	**61**	**112**	**213**	**393**	**715**	**85%**

BY PROVIDER	2018	2019	2020	2021	2022	CAGR
Interconnecting to Network Providers	101	155	227	341	525	51%
Interconnecting to Cloud & IT Providers	9	17	33	50	74	67%
Interconnecting to Content Providers	10	15	22	34	50	51%
Interconnecting to Financial Services Providers	13	18	25	38	58	45%
Interconnecting to Supply Chain Partners	7	8	8	9	9	7%
Total Provider	**140**	**212**	**315**	**471**	**717**	**50%**

1. Rounding may affect totals
2. These are the top metros and not inclusive of all metros

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METHODOLOGY

CREATION OF THE GLOBAL INTERCONNECTION INDEX (GXI)

The GXI tracks, measures and forecasts the growth of interconnection bandwidth required for private interconnections among companies supporting digital business.[1]

The methodology for sizing the global interconnection market commenced with an analysis of colocation ecosystem participants in Equinix carrier-neutral facilities across every region and major metropolitan area. The research sample was stratified across industries and company size segments,[2] providing a comprehensive breakdown of colocation subscribers and their interconnections.

Average interconnections per company were applied to global counts of colocation participants to identify the current volume of interconnections worldwide. The methodology accounts for both physical and virtual interconnections, including those participants whose infrastructure may sit outside of a carrier-neutral facility but still accesses the fabric of a carrier-neutral facility via SDN.

The estimated provisioned bandwidth, as measured in gigabits per second, was identified for each interconnection used by the companies in this study's research sample.

1. This report contains forward-looking statements. These forward-looking statements involve known and unknown risks and uncertainties that may cause actual events or results to differ materially from the estimates or the results implied or expressed in such forward-looking statements.
2. Used technology market intelligence from data sources including Forrester, IDC, 451 Research and Synergy Research Group

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THE PROCESS

1 CREATED MARKET BASELINE		Analysed the adoption profile of thousands of carrier-neutral colocation data centre providers and participants globally across every region and major metro[1]	Created a stratified market baseline across industries, regions and company size segments
2 ASSESSED MARKET CONDITIONS		Assessed local and regional market conditions, including macro economic trends, market demographics and industry concentrations	Developed a set of indicators and local market condition filters to assist in producing tailored predictions
3 CORRELATED DEMAND DRIVERS		Identified key demand drivers of digital business that force the distribution and interconnection of IT components within the proximity of users	Produced a weighted demand multiplier to assist in predicting growth to factor the impact of digital business transformation
4 BUILT PREDICTIVE MODEL		Built a predictive model to forecast interconnection bandwidth growth by region, use case and market segment	"Used market baseline, applied local market condition filters and factored demand drivers to derive forecast"

1. Used technology market intelligence from data sources including Forrester, IDC, 451 Research and Synergy Research Group

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HOW LEADERS GET DIGITAL READY

INTERCONNECTION ANALYSIS

A digital-ready infrastructure state is quickly becoming imperative. Leaders are increasingly shifting workloads to hubs at the digital edge. The following insights are based on deployment data from leading enterprises worldwide over a three-year period.[1]

On average, these companies deployed 9 hubs, 240 cabinets and 340 connections in total.

Network providers are shifting from company-owned data centres with bespoke connectivity to major interconnection hubs locally exchanging traffic.

Cloud & IT Services, along with Content & Digital Media companies, seek the greatest geographical reach with more locations on average.

Content & Digital Media includes gaming, which is highly user experience-oriented and drives higher network ecosystem connection and colocated edge services.

Manufacturing is very data-intensive (more cabinets), in combination with remote operating locations and cloud enabled services.

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1. Deployment data includes an analysis of 450 new companies who deployed more than 4,100 implementations worldwide between Q12016 and Q12019. 55% of the studied companies are F500/G2000, with a mix of local and multinational deployments across the regions (35% AMER, 35% EMEA, 30% Asia-Pacific). Since each company (and industry) solves different problems with different priorities at different times, the ratio of cabinets and connections is expected to vary significantly. Total Cabinets and Total Interconnections are across all Metro Locations.

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2019 GLOBAL INTERCONNECTION DEPLOYMENT[1] ANALYSIS

BY DEPLOYMENTS	Metro Locations	Total Cabinets	Interconnection: Total Interconnections	Interconnection: NSPs	Interconnection: IAAS CSPs	Interconnection: Business
Telecommunications	17	610	1,600	54%	13%	32%
Cloud & IT Services	11	250	260	53%	23%	24%
Banking & Insurance	7	180	260	42%	11%	47%
Manufacturing	9	390	230	51%	20%	29%
Securities & Trading	8	230	370	33%	9%	58%
Content & Digital Media	11	280	330	71%	7%	22%
Business & Professional Services	7	200	90	46%	19%	34%
Energy & Utility	8	270	190	38%	21%	41%
Wholesale & Retail Trade	9	70	200	30%	21%	49%
Healthcare & Life Sciences	8	110	80	64%	11%	26%
Other	7	80	80	50%	21%	29%
Average by Industry	**9**	**240**	**340**	**48%**	**16%**	**36%**

UNIQUE COMPANIES[2]	NSPs	IAAS CSPs	Business	Total
Telecommunications	103	7	71	181
Cloud & IT Services	26	5	16	47
Banking & Insurance	15	4	31	50
Manufacturing	23	6	10	39
Securities & Trading	24	4	69	97
Content & Digital Media	36	4	16	56
Business & Professional Services	14	4	6	24
Energy & Utility	14	8	6	28
Wholesale & Retail Trade	13	4	6	23
Healthcare & Life Sciences	17	4	6	27
Other	14	5	6	25
Average by Industry[2]	**27**	**5**	**22**	**54**

TOP TWO BY REGION	NORTH AMERICA		EMEA		ASIA-PACIFIC	
Telecommunications	Washington, D.C.	Silicon Valley	Frankfurt	Amsterdam	Singapore	Sydney
Cloud & IT Services	Washington, D.C.	Silicon Valley	Amsterdam	London	Singapore	Sydney
Banking & Insurance	New York	Washington, D.C.	London	Frankfurt	Singapore	Hong Kong
Manufacturing	Washington, D.C.	Silicon Valley	London	Amsterdam	Singapore	Tokyo
Securities & Trading	New York	Chicago	London	Frankfurt	Hong Kong	Tokyo
Content & Digital Media	Silicon Valley	Washington, D.C.	Amsterdam	Frankfurt	Singapore	Tokyo
Business & Professional Services	Washington, D.C.	Chicago	London	Paris	Sydney	Hong Kong
Energy & Utility	Dallas	Chicago	London	Amsterdam	Singapore	Tokyo
Wholesale & Retail Trade	Silicon Valley	Miami	London	Amsterdam	Tokyo	Shanghai
Healthcare & Life Sciences	Silicon Valley	Washington, D.C.	London	Dubai	Tokyo	Hong Kong
Other	Washington, D.C.	Silicon Valley	London	Frankfurt	Hong Kong	Singapore
Average by Industry	**Washington, D.C.**	**Silicon Valley**	**London**	**Amsterdam**	**Tokyo**	**Hong Kong**

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1. Deployment data includes an analysis of 450 new companies who deployed more than 4,100 implementations worldwide between Q12016 and Q12019. 55% of the studied companies are F500/G2000, with a mix of local and multinational deployments across the regions (35% AMER, 35% EMEA, 30% Asia-Pacific). Since each company (and industry) solves different problems with different priorities at different times, the ratio of cabinets and connections is expected to vary significantly. Total Cabinets and Total Interconnections are across all Metro Locations.
2. Represents the number of unique network service providers (NSPs), IaaS cloud service providers (CSPs) and business partners connected to multiple times (i.e. multiple interconnections to each company).

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2019 GLOBAL INTERCONNECTION DEPLOYMENT1 ANALYSIS: AMERICAS

BY DEPLOYMENTS	Metro Locations	Total Cabinets	Interconnection: Total Interconnections	Interconnection: NSPs	Interconnection: IAAS CSPs	Interconnection: Business
Telecommunications	7	190	600	60%	14%	26%
Banking & Insurance	3	80	120	34%	18%	48%
Manufacturing	4	110	90	58%	20%	22%
Securities & Trading	3	90	210	28%	11%	61%
Cloud & IT Services	5	80	120	55%	24%	21%
Content & Digital Media	5	100	200	74%	8%	19%
Business & Professional Services	3	30	20	59%	23%	18%
Wholesale & Retail	5	50	180	30%	17%	53%
Healthcare & Life Sciences	4	60	50	65%	10%	25%
Energy & Utility	3	150	120	36%	12%	53%
Other	3	30	40	54%	28%	18%
Average by Industry	**4**	**90**	**160**	**50%**	**17%**	**33%**

UNIQUE COMPANIES[2]	NSPs	IAAS CSPs	Business	Total
Telecommunications	30	2	19	51
Banking & Insurance	5	2	16	23
Manufacturing	8	2	3	13
Securities & Trading	10	2	39	51
Cloud & IT Services	10	2	9	21
Content & Digital Media	13	2	7	22
Business & Professional Services	4	2	2	8
Wholesale & Retail	7	2	4	13
Healthcare & Life Sciences	8	2	3	13
Energy & Utility	5	3	3	11
Other	5	4	3	12
Average by Industry[2]	**10**	**2**	**10**	**22**

TOP FIVE BY REGION	1st	2nd	3rd	4th	5th
Telecommunications	Washington, D.C.	Silicon Valley	Chicago	Miami	New York
Banking & Insurance	New York	Washington, D.C.	Chicago	Dallas	Silicon Valley
Manufacturing	Washington, D.C.	Silicon Valley	Chicago	Dallas	Miami
Securities & Trading	New York	Chicago	Washington, D.C.	Toronto	Silicon Valley
Cloud & IT Services	Washington, D.C.	Silicon Valley	Chicago	Dallas	New York
Content & Digital Media	Silicon Valley	Washington, D.C.	New York	Chicago	Dallas
Business & Professional Services	Washington, D.C.	Chicago	Toronto	Dallas	Sao Paulo
Wholesale & Retail	Silicon Valley	Miami	Dallas	Sao Paulo	Seattle
Healthcare & Life Sciences	Silicon Valley	Washington, D.C.	Los Angeles	Dallas	Sao Paulo
Energy & Utility	Dallas	Chicago	Miami	Houston	Washington, D.C.
Other	Washington, D.C.	Silicon Valley	Chicago	New York	Miami
Average by Industry	**Washington, D.C.**	**Silicon Valley**	**Chicago**	**Dallas**	**New York**

1. Deployment data includes an analysis of 450 new companies who deployed more than 4,100 implementations worldwide between Q12016 and Q12019. 55% of the studied companies are F500/G2000, with a mix of local and multinational deployments across the regions (35% AMER, 35% EMEA, 30% Asia-Pacific). Since each company (and industry) solves different problems with different priorities at different times, the ratio of cabinets and connections is expected to vary significantly. Total Cabinets and Total Interconnections are across all Metro Locations.
2. Represents the number of unique network service providers (NSPs), IaaS cloud service providers (CSPs) and business partners connected to multiple times (i.e. multiple interconnections to each company).

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2019 GLOBAL INTERCONNECTION DEPLOYMENT[1] ANALYSIS: EUROPE

Interconnection

BY DEPLOYMENTS	Metro Locations	Total Cabinets	Total Interconnections	NSPs	IAAS CSPs	Business
Telecommunications	7	190	670	46%	12%	41%
Cloud & IT Services	4	130	90	53%	19%	29%
Banking & Insurance	3	50	60	37%	9%	54%
Securities & Trading	3	80	110	34%	7%	59%
Business & Professional Services	3	160	50	41%	17%	43%
Energy & Utility	3	90	50	39%	33%	29%
Manufacturing	3	120	60	51%	29%	20%
Wholesale & Retail	2	10	10	44%	44%	11%
Content & Digital Media	4	130	70	66%	8%	26%
Healthcare & Life Sciences	2	30	10	75%	13%	13%
Other	2	40	30	39%	13%	48%
Average by Industry	**3**	**90**	**110**	**48%**	**18%**	**34%**

UNIQUE COMPANIES[2]	NSPs	IAAS CSPs	Business	Total
Telecommunications	44	3	34	81
Cloud & IT Services	10	2	5	17
Banking & Insurance	6	2	11	19
Securities & Trading	8	2	23	33
Business & Professional Services	7	2	4	13
Energy & Utility	6	3	3	12
Manufacturing	8	2	3	13
Wholesale & Retail	3	2	2	7
Content & Digital Media	13	2	6	21
Healthcare & Life Sciences	4	1	1	6
Other	6	2	2	10
Average by Industry[2]	**10**	**2**	**9**	**21**

TOP FIVE BY REGION	1st	2nd	3rd	4th	5th
Telecommunications	Frankfurt	Amsterdam	London	Paris	Stockholm
Cloud & IT Services	Amsterdam	London	Frankfurt	Paris	Dubai
Banking & Insurance	London	Frankfurt	Amsterdam	Sofia	Paris
Securities & Trading	London	Frankfurt	Zürich	Amsterdam	Paris
Business & Professional Services	London	Paris	Frankfurt	Amsterdam	Madrid
Energy & Utility	London	Amsterdam	Paris	Milan	Madrid
Manufacturing	London	Amsterdam	Paris	Frankfurt	Munich
Wholesale & Retail	London	Amsterdam	Paris	Frankfurt	Stockholm
Content & Digital Media	Amsterdam	Frankfurt	London	Paris	Stockholm
Healthcare & Life Sciences	London	Dubai	Stockholm	Paris	Frankfurt
Other	London	Frankfurt	Amsterdam	Stockholm	Paris
Average by Industry	**London**	**Amsterdam**	**Paris**	**Frankfurt**	**Stockholm**

1. Deployment data includes an analysis of 450 new companies who deployed more than 4,100 implementations worldwide between Q12016 and Q12019. 55% of the studied companies are F500/G2000, with a mix of local and multinational deployments across the regions (35% AMER, 35% EMEA, 30% Asia-Pacific). Since each company (and industry) solves different problems with different priorities at different times, the ratio of cabinets and connections is expected to vary significantly. Total Cabinets and Total Interconnections are across all Metro Locations.
2. Represents the number of unique network service providers (NSPs), IaaS cloud service providers (CSPs) and business partners connected to multiple times (i.e. multiple interconnections to each company).

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2019 GLOBAL INTERCONNECTION DEPLOYMENT[1] ANALYSIS: ASIA-PACIFIC

BY DEPLOYMENTS	Metro Locations	Total Cabinets	Interconnection: Total Interconnections	Interconnection: NSPs	Interconnection: IAAS CSPs	Interconnection: Business
Cloud & IT Services	3	40	50	49%	31%	22%
Telecommunications	4	230	330	60%	14%	27%
Manufacturing	3	160	80	43%	16%	42%
Securities & Trading	3	60	50	53%	4%	44%
Banking & Insurance	2	50	80	59%	1%	41%
Energy & Utility	2	30	20	55%	45%	0%
Business & Professional Services	3	10	20	47%	26%	32%
Content & Digital Media	3	50	60	67%	5%	28%
Healthcare & Life Sciences	2	20	20	53%	11%	37%
Wholesale & Retail	2	10	10	22%	67%	11%
Other	2	10	10	83%	17%	0%
Average by Industry	**3**	**60**	**70**	**54%**	**21%**	**26%**

UNIQUE COMPANIES[2]	NSPs	IAAS CSPs	Business	Total
Cloud & IT Services	8	2	4	14
Telecommunications	30	3	19	52
Manufacturing	8	3	5	16
Securities & Trading	7	2	8	17
Banking & Insurance	5	1	5	11
Energy & Utility	4	3	1	8
Business & Professional Services	4	1	1	6
Content & Digital Media	12	2	4	18
Healthcare & Life Sciences	6	1	3	10
Wholesale & Retail	5	1	1	7
Other	4	1	1	6
Average by Industry[2]	**8**	**2**	**5**	**15**

TOP FIVE BY REGION	1st	2nd	3rd	4th	5th
Cloud & IT Services	Singapore	Sydney	Tokyo	Hong Kong	Melbourne
Telecommunications	Singapore	Sydney	Tokyo	Hong Kong	Melbourne
Manufacturing	Singapore	Tokyo	Sydney	Hong Kong	Osaka
Securities & Trading	Hong Kong	Tokyo	Singapore	Sydney	Shanghai
Banking & Insurance	Singapore	Hong Kong	Sydney	Tokyo	Shanghai
Energy & Utility	Singapore	Tokyo	Sydney	Melbourne	Osaka
Business & Professional Services	Sydney	Hong Kong	Singapore	Melbourne	Shanghai
Content & Digital Media	Singapore	Tokyo	Sydney	Hong Kong	Osaka
Healthcare & Life Sciences	Tokyo	Hong Kong	Singapore	Melbourne	Shanghai
Wholesale & Retail	Tokyo	Shanghai	Hong Kong	Sydney	Melbourne
Other	Hong Kong	Singapore	Tokyo	Sydney	Osaka
Average by Industry	**Hong Kong**	**Tokyo**	**Singapore**	**Sydney**	**Shanghai**

1. Deployment data includes an analysis of 450 new companies who deployed more than 4,100 implementations worldwide between Q12016 and Q12019. 55% of the studied companies are F500/G2000, with a mix of local and multinational deployments across the regions (35% AMER, 35% EMEA, 30% Asia-Pacific). Since each company (and industry) solves different problems with different priorities at different times, the ratio of cabinets and connections is expected to vary significantly. Total Cabinets and Total Interconnections are across all Metro Locations.
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