



VOLUME

2


GLOBAL INTERCONNECTION INDEX

MEASURING THE GROWTH OF THE GLOBAL DIGITAL ECONOMY



EQUINIX

GLOBAL INTERCONNECTION INDEX

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Volume 2 of the Global Interconnection Index offers compelling new insights into how Interconnection Bandwidth is powering the success of digital business.

THE INTERCONNECTION IMPERATIVE: INTEGRATE TO ACCELERATE DIGITAL BUSINESS

Just as Interconnection was critical to enable the internet, scale the web and power the global digital economy, it is the key to a strong digital business. Without it, companies grow weaker. Why? Because competitive strength is measured by how well an organization can perform, scale and speed its products and services to market. But unlike pre-digital days, these core business drivers now rely on a company's ability to reach everywhere, interconnect everyone and integrate everything essential for success.

People, software and machines are consuming data faster, and in more locations than ever before. This data explosion is creating new pressures and opportunities for business and technology leaders who need to aggregate data in new, scalable ways that allow for real-time analysis. As digital transformation accelerates for every company in every industry, around the world, Enterprises are turning to private and direct Interconnection to solve this complex integration challenge.

With Interconnection, businesses can directly and securely connect an increasingly distributed global mix of employees, partners and customers, as well as their most valuable asset: their data. By bringing all their data sources and constituents together digitally, businesses can simultaneously capture, correlate and transform all that data into new customer value.

The Global Interconnection Index (the Index), published annually by Equinix, delivers insights that drive digital business advantage by tracking, measuring and forecasting growth in Interconnection Bandwidth—the total capacity provisioned to privately and directly exchange traffic with a diverse set of counterparties¹ and providers at distributed IT exchange points inside carrier-neutral colocation data centers. Volume 2 of the Index sheds new light on the massive growth of Interconnection Bandwidth that is supporting digital business interaction between companies or organizations.

The Index predicts Interconnection Bandwidth to grow to 8,200+ Terabits (Tbps) by 2021, a dramatic increase over the previous year's projection. This represents a significant five-year compound annual growth rate (CAGR) of 48%, almost double the expected 26% CAGR of global IP Traffic².

Fueling this rapid rise are major macro, technology and regulatory forces that are changing how businesses, consumers and technologies interact. IDC predicts that by 2021, at least 50% of global GDP will be digitized, with growth in every industry driven by digitally enhanced offerings, operations, and relationships³. To capture digital value, companies will need to support real-time interactions by more strategically interconnecting the workflows across people, things, locations, clouds and data.

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GET DIGITAL READY: MASTER THE INTERCONNECTION USE CASES THAT MATTER

Simultaneously, large-scale cybersecurity breaches are one of the most serious risks facing the world today. By 2021, the global cost of cybersecurity breaches will reach US\$6 trillion¹. This escalating security risk is challenging the internet as the preferred mode of data traffic exchange as businesses increasingly bypass it in favor of private, direct connections.

As our digital world becomes more complex and decentralized, businesses need to simplify how they distribute and integrate their IT infrastructures while maintaining a high caliber of service. The 2018 Global Interconnection Index includes new insights into the common Interconnection use cases that identify how strategic services placement, across metro Interconnection hubs, allows companies to master the digital business changes that today's trends demand:

- **Network Optimization:** Digital business requires real-time interactions between people, things, locations, clouds and data. Businesses can solve latency issues by shortening the distance between users and services, localizing traffic in the hubs.
- **Hybrid Multicloud:** Leveraging hybrid, multicloud architectures and accessing vital business ecosystems with agility requires Interconnection between distributed IT infrastructures and the clouds and partners that drive global digital business. Businesses can solve complexity by directly connecting multiple public and private clouds and segmenting traffic in the hubs.
- **Distributed Security:** Digital business increases vulnerability points, especially when data is distributed across many different counterparties. Reduce risk, and solve compliance challenges by deploying and connecting security services, and expanding security ecosystem connectivity, in the hubs.
- **Distributed Data:** Digital trade flows are creating global business and data processes involving an increasing mix of customers, partners and employees. To scale this exchange of data requires integrating analytics, data lakes and data controls in the hubs.

These four classes of Interconnection use cases solve for the impact of major macro, technology and regulatory trends and combine to form an Interconnection maturity model that drives accelerated digital business transformation.

It's make-or-break time for digital transformation and the stakes are getting higher every day. The need for Interconnection has never been greater, and the growth of Interconnection Bandwidth has never been so important to the future of digital business. The Enterprises and Service Providers that know how to harness the power of Interconnection to strengthen and accelerate their digital strategies will position themselves to lead the next era of global business.

EVOLUTION

OVERVIEW OF INTERCONNECTION

INTERCONNECTION EMERGED FROM THE CHALLENGE TO GLOBALLY SCALE THE INTERNET

This required the industry to solve how to exchange and transfer traffic among different provider networks across different regions and countries.

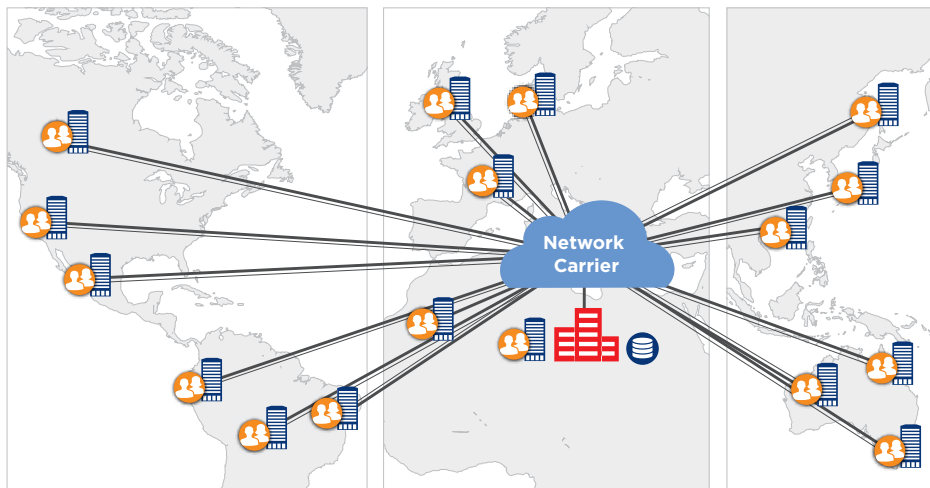
Physical infrastructure meeting places, called internet exchanges, were created and hosted inside carrier-neutral colocation data center campuses. The voluntary exchange of traffic among providers became known as peering.

Over time, peering in carrier-neutral data center campuses evolved to become IT traffic exchange points for all types of business-to-business and machine-to-machine traffic by integrating direct private connections of counterparties with distributed IT components collocated. This is known as Interconnection.

This process was manual. Now, with the emergence of SDN (Software-Defined Networking) and NFV (Network Function Virtualization), businesses can 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.

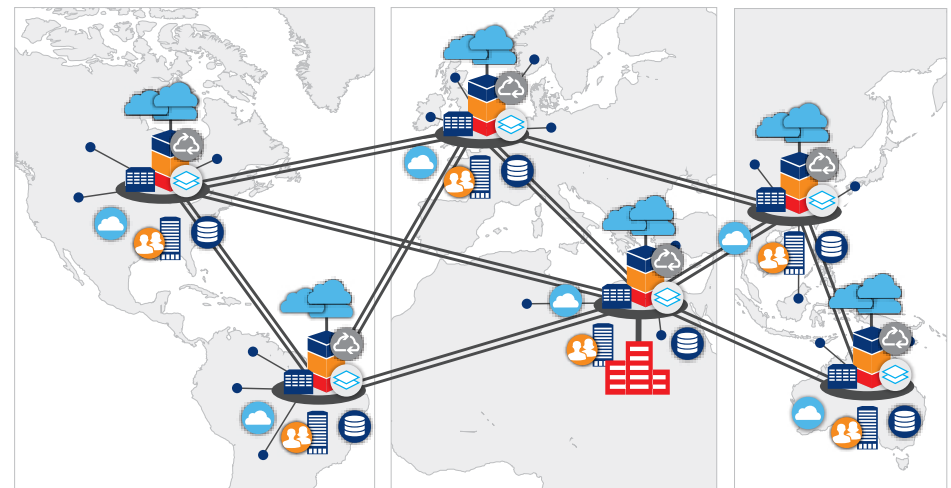
BEFORE INTERCONNECTION

Constrained point-to-point connectivity, backhauling user traffic to central data center



WITH INTERCONNECTION

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



RELEVANCE

INDUSTRY TRENDS PRIORITIZING THE NEED FOR INTERCONNECTION

Major macro, technology and regulatory trends are converging to form an unprecedented era of complexity and risk, and are forcing the integration of physical and digital worlds.

This drives the acceleration necessary for digital business transformation to create a secure, compliant and responsive global business platform. Interconnection is a key building block to solve for this transformation.

INDUSTRY TRENDS

TREND	INSIGHT	IMPLICATION	NEED
Digital Business	By 2021, at least 50% of global GDP will be digitized, 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 Interconnection of people, things, locations, clouds and data
Urbanization	Every year, 65 million people are added to the world's urban population, the equivalent of adding seven cities the size of Chicago ² , creating as many as 50 urban metro hubs by 2030 ³	Urbanization is transforming global demographics and demand origins, creating a proximity need for digital services	Supporting urban density requires the Interconnection of applications, data, content and networking in locations where there is a concentration of users
Cybersecurity	A large-scale breach of cybersecurity is one of the most serious risks facing the world today. The scale of the threat is expanding drastically: by 2021, the global cost of cybersecurity breaches will reach US\$6 trillion ⁴	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 Compliance	More than 18 major countries globally block the transfer of data related to accounting, tax and financial information ⁵	Compliance with data regulations requires the need to maintain data locally while being used globally	Addressing compliance requires the Interconnection of data storage, analytics and networking placed directly in business regions that require compliance
Business Ecosystems	By 2021, organizations using a mix of intermediaries will more than double, and active engagement with industries outside their native industry will nearly triple ⁶	Digital trade flows are creating global business and data processes involving an increasing mix of customers, partners and employees	To scale, business ecosystems require digital ecosystems supported by technology infrastructure interconnecting the participants and supporting digital flows

BANDWIDTH FORECAST

2021 FORECAST¹

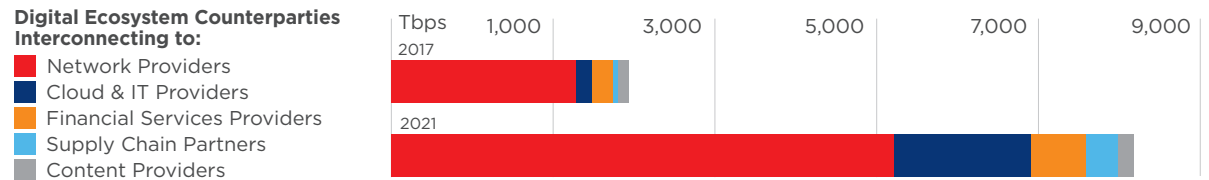
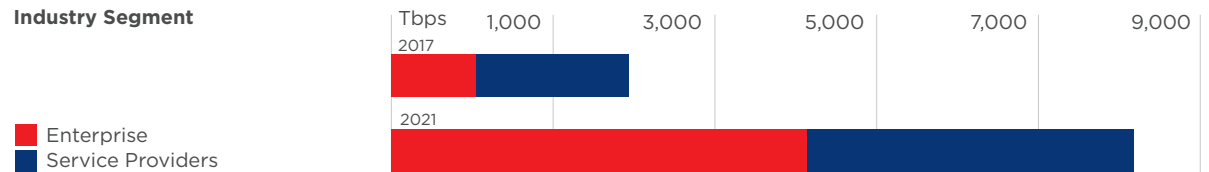
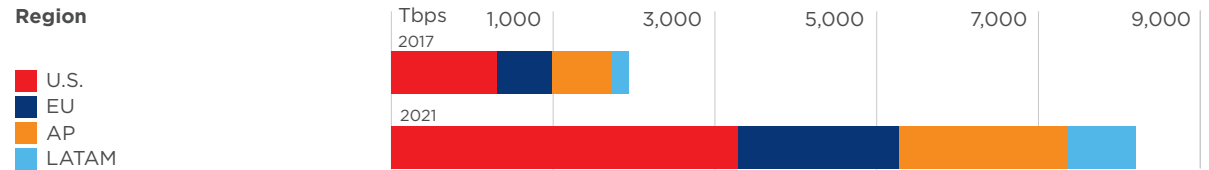
Accelerating global growth of Interconnection Bandwidth² as Enterprises and Service Providers interconnect together for digital business.

By 2021, installed Interconnection Bandwidth capacity is expected to reach 8,200+ Tbps, a five-fold increase, with double-digit growth across all industries.

Enterprises are companies in traditional business sectors like Banking and Insurance, Manufacturing, Energy and Utility, Retail, Healthcare and Government. These firms are expected to experience 7x growth³, surpassing Service Providers as the largest consumers of Interconnection Bandwidth, driven by the transformation of their IT platforms for digital business.

As digital natives, Service Providers are companies that have digital traffic flows as a primary element of their business model, covering sectors like Telecommunications, Cloud and IT Services, and Content and Digital Media industries. These businesses as a group are predicted to experience robust 3x growth³, as they continue to utilize IT traffic exchanges as core to their business models.

BANDWIDTH FORECAST



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. Interconnection Bandwidth is defined as the total capacity provisioned to privately and directly exchange traffic, with a diverse set of counterparties and providers, at distributed IT exchange points inside carrier-neutral colocation data centers.
 3. Predicted growth between 2017-2021

REGIONAL VIEW

The impact of macro trends driving Interconnection Bandwidth growth varies by region.

INTERCONNECTION BANDWIDTH¹ GROWTH BY 2021

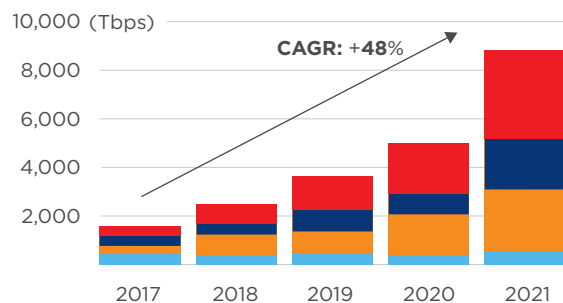
As early adopters of digital business and the headquarters for the largest number of multi-national enterprises, the **United States** is expected to grow at a 45% CAGR, contributing more than 40% of Interconnection Bandwidth globally.

A growing number of regulations requiring data compliance is serving as a catalyst for growth in **Europe**, which is predicted to grow at a 48% CAGR, contributing about 23% of Interconnection Bandwidth globally.

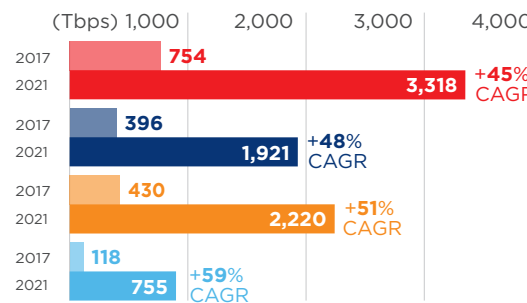
Benefiting from rapid urbanization and home to many of the largest digital content providers, **Asia-Pacific** is anticipated to grow at a 51% CAGR, contributing more than 27% of Interconnection Bandwidth globally.

Emerging market dynamics and growing digital business adoption positions **Latin America** for an expected 59% CAGR to reach 755 Tbps of installed capacity, contributing more than 9% of Interconnection Bandwidth globally.

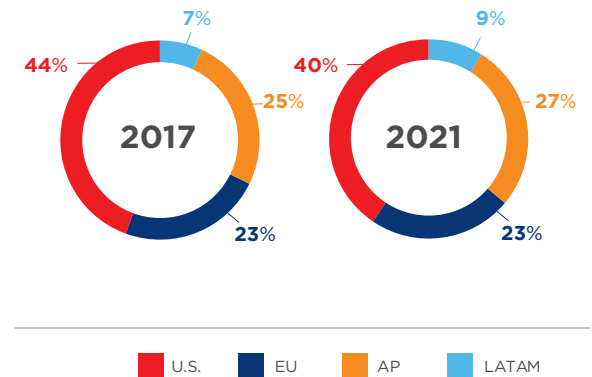
WORLDWIDE GROWTH



REGIONAL GROWTH



REGIONAL MIX



INDUSTRY VIEW

INTERCONNECTION BANDWIDTH¹ GROWTH BY 2021

Interconnection is emerging pervasively across all industries to help speed and scale digital business transformation.

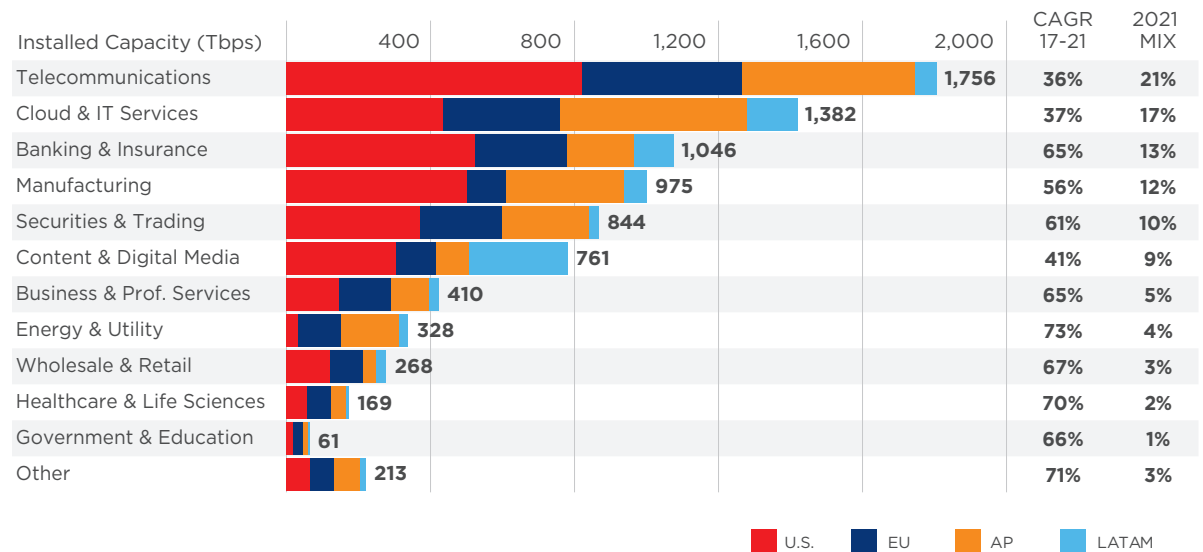
INTERCONNECTION BANDWIDTH BY INDUSTRY TYPE

As the early adopters of Interconnection, the Telecommunications industry is expected to grow at a 36% CAGR as it evolves its platforms to enable digital business, address cybersecurity and provide new interconnected services while implementing 100G capabilities into its platform.

As a purveyor of digital capabilities, the Cloud and IT Services industry is expected to remain a leading consumer of Interconnection Bandwidth, predicted to grow at a 37% CAGR, as these businesses continue to extend the global reach of their platforms, while enabling secure data exchange in a compliant manner with their customers.

A perfect digital storm is brewing for the Banking and Insurance industry with the convergence of fintech, cybersecurity, data compliance and new competitive ecosystems. This is creating a force multiplier effect with a predicted 65% CAGR, as digital transformation of the industry unfolds.

As one of the most physically distributed industries, Manufacturing is experiencing a renaissance period as digital business unlocks new revenue streams while creating new efficiencies. This is expected to drive Interconnection Bandwidth usage to grow at a 56% CAGR, as the industry shifts to movement of information and local production of goods.



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ECOSYSTEM VIEW

INTERCONNECTION BANDWIDTH¹ GROWTH BY 2021

Interconnection is enabling Enterprises to build their digital ecosystem by seamlessly integrating a myriad of Service Providers and business partners.

INTERCONNECTION BANDWIDTH BY COUNTERPARTY

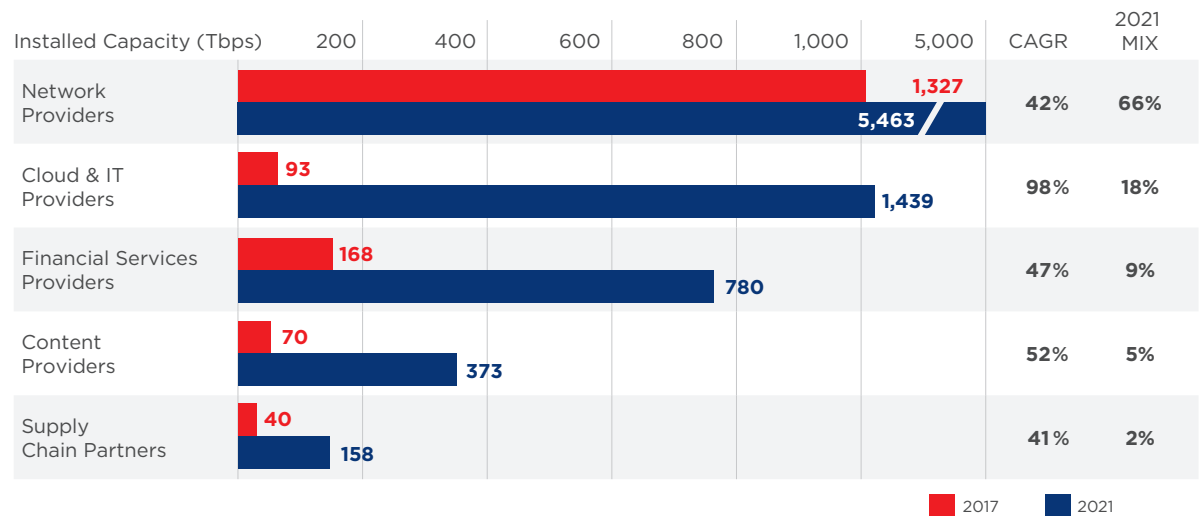
Enterprises continue to increase and diversify their Interconnection to Network Providers as they optimize network topology for digital business. The Interconnection Bandwidth to support this is expected to grow at a 42% CAGR as Enterprises look to effectively integrate an increasing mix of connected services across different access points globally.

The direct Interconnection of Enterprises with Cloud and IT Providers continues to proliferate as businesses leverage hybrid multicloud architectures for digital business scale and agility. Interconnection Bandwidth growth here, at a 98% CAGR, is expected to surpass all other categories, supporting businesses building out new digital services and migrating existing workloads to third-party cloud platforms.

Securely transacting and exchanging payments digitally requires Enterprises to directly Interconnect to Financial Service Providers to support the flow of business transactions across digital ecosystems. The Index forecasts a 47% CAGR in Interconnection Bandwidth required to enable this.

Businesses prioritizing rich, customer-first digital experiences will directly Interconnect to Content Providers to solve the integration of video interactive multimedia across varying devices and geographies. This is expected to drive the need for Interconnection Bandwidth by a 52% CAGR.

Transforming a business supply chain to digital requires Enterprises to directly Interconnect to Supply Chain Partners, which creates secure and compliant data exchange for business workflows. To support this emerging B2B digital paradigm, Interconnection Bandwidth is predicted to grow at a 41% CAGR.



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FIRMOGRAPHICS VIEW

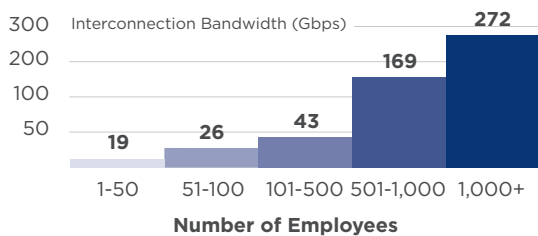
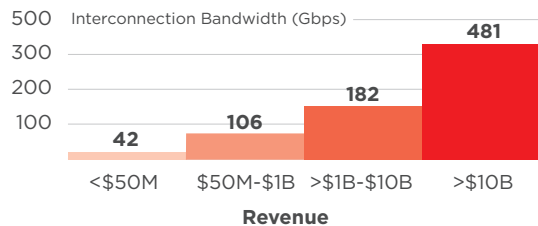
INTERCONNECTION BANDWIDTH¹ GROWTH BY 2021

FIRMOGRAPHIC PROFILE PRIORITIZES NEED FOR INTERCONNECTION BANDWIDTH

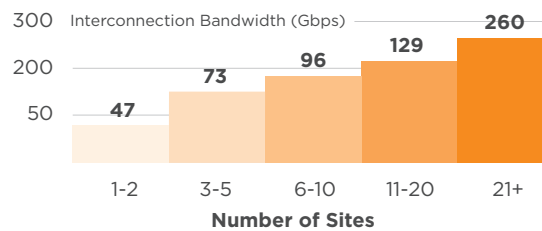
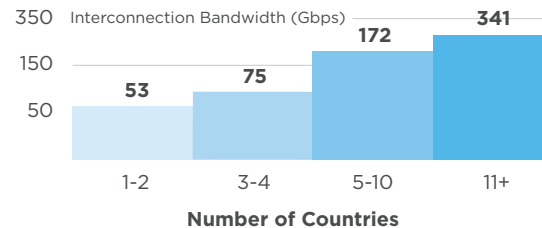
Firmographic profiling shows a direct correlation of Interconnection Bandwidth adoption by businesses based on three categories—Users, Geographical Presence and Use of Distributed IT Services—as businesses of all sizes interconnect their digital business platforms globally.

- **Users:** Using employee count as a proxy for number of users, the Index predicts for every 500 employees, businesses will need to increase Interconnection Bandwidth 4x to support the Interconnection of users across their digital business workflows.
- **Geographical Presence:** For businesses operating in more than five countries, the Index forecasts an 8x increase in Interconnection Bandwidth required to locally interconnect data sources with security controls to address both data compliance and reduce cybersecurity vulnerability points.
- **Use of Distributed IT Services:** The Index identified when businesses spend greater than US\$50K per month on distributed IT services, the need for Interconnection Bandwidth capacity is expected to increase 9x to support real-time interactions enabled by the Interconnection of people, things, clouds and data.

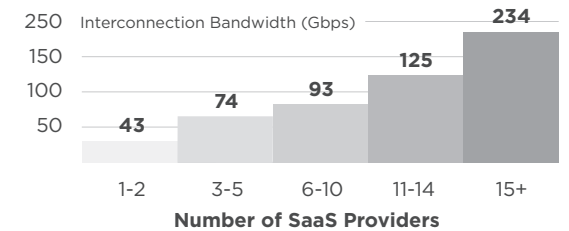
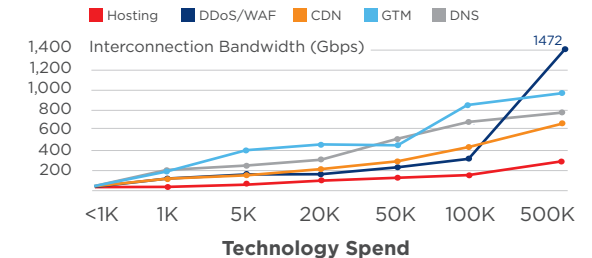
1 USERS Average Interconnection Bandwidth by Revenue and Number of Employees



2 LOCATIONS Average Interconnection Bandwidth by Geographical Presence



3 USE OF DISTRIBUTED IT SERVICES Average Interconnection Bandwidth by Number of Distributed IT Services

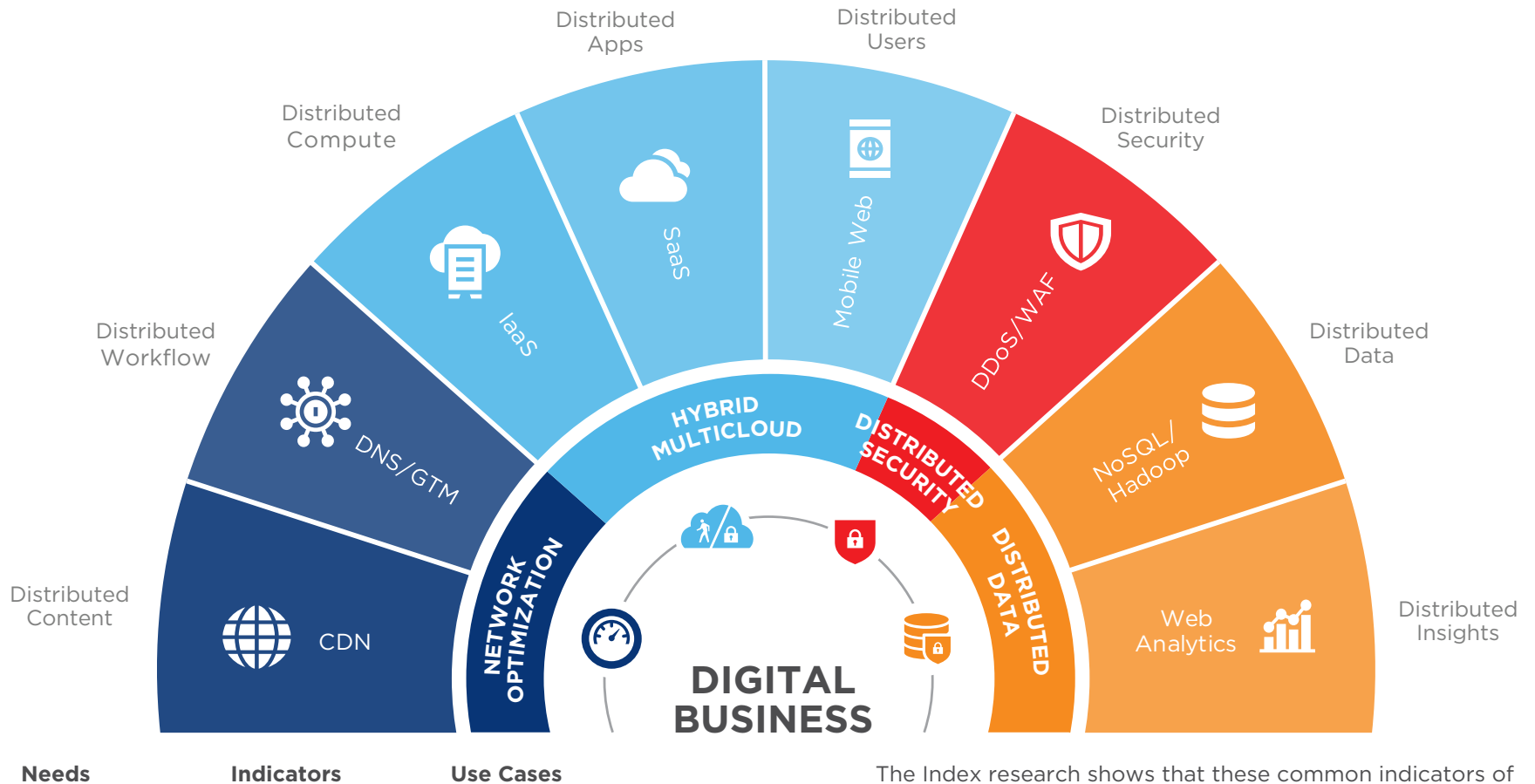


INTERCONNECTION INDICATORS

INTERCONNECTION BANDWIDTH¹ DRIVERS

DISTRIBUTED IT SERVICES DRIVING INTERCONNECTION BANDWIDTH GROWTH

The Index has identified a consistent set of distributed IT services that indicates the implementation of digital business platforms. These distributed IT services can be directly correlated to an increased need for Interconnection Bandwidth. When combined with Interconnection, these distributed IT services solve critical use cases that must be addressed by all businesses.



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INTERCONNECTION USE CASES

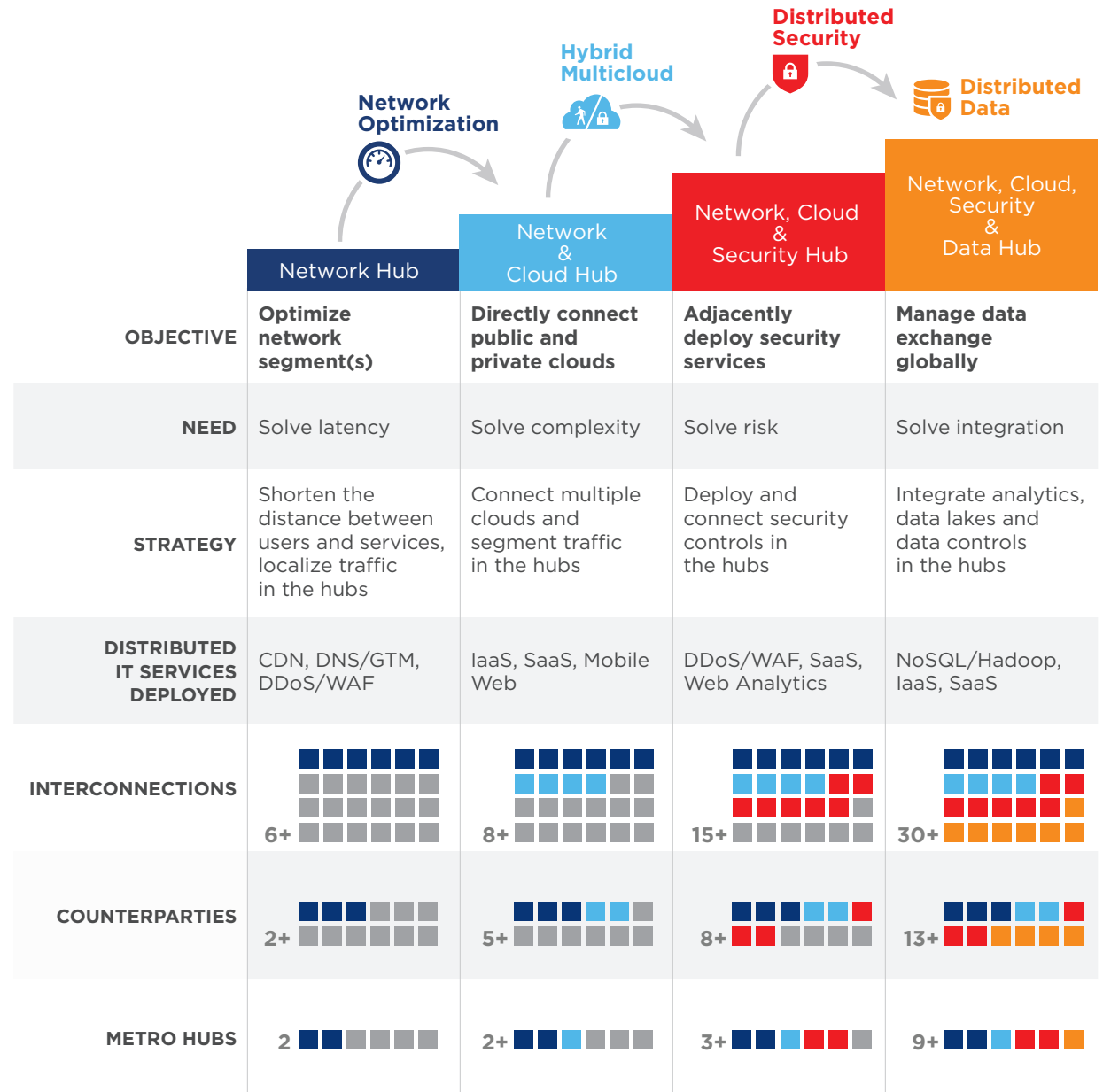
INTERCONNECTION MATURITY MODEL

The four classes of Interconnection use cases, identified on the prior page, combine to form an Interconnection maturity model that results in a digital-ready infrastructure.

The model evolves in a journey of incremental steps resulting in an accretive set of capabilities. Businesses build hubs, connect multiple clouds, deploy security components and enable data exchange in points of business presence.

The data shows a common journey starts with 2 hubs, 6 Interconnections and 2 third-party counterparties. This grows to 9+ hubs globally with 30+ Interconnections across 13+ counterparties for a company that has fully implemented a global digital-ready infrastructure.

USE CASES REQUIRING INTERCONNECTION BANDWIDTH¹



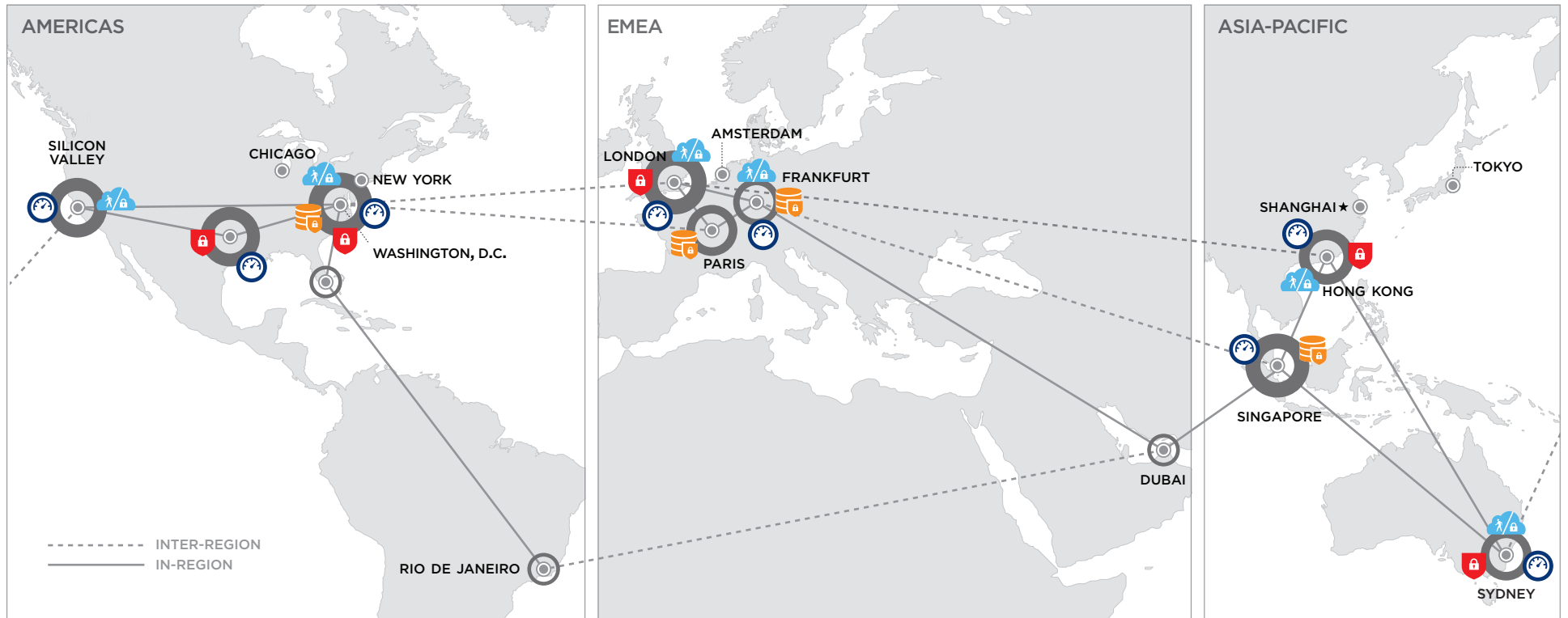
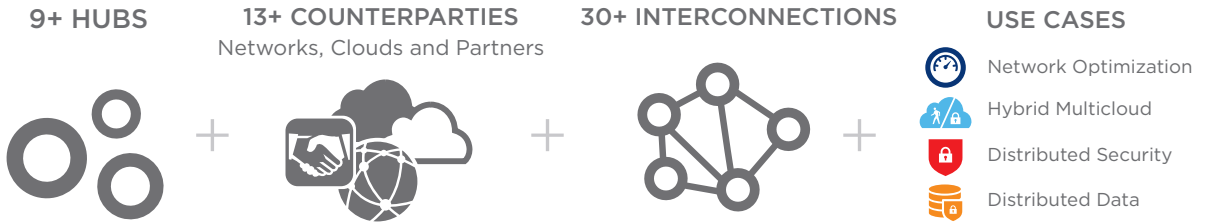
¹ Interconnection Bandwidth is defined as the total capacity provisioned to privately and directly exchange traffic, with a diverse set of counterparties and providers, at distributed IT exchange points inside carrier-neutral colocation data centers.

INTERCONNECTION TARGET STATE

INTERCONNECTION DEPLOYMENT MODEL

A GLOBAL MESH OF TAILORED INTERCONNECTION HUBS

The Index has identified the deployment profile of a digital-ready state that unlocks the power of Interconnection to address major macro industry trends facing all businesses. This target state incorporates more than 9 hubs across 3 regions, interconnecting 13+ unique counterparties, using over 30 direct Interconnections to implement a combination of the critical use cases necessary to solve for digital business.



METHODOLOGY

The Index¹ tracks, measures and forecasts the growth of bandwidth required for private Interconnections among companies supporting digital business.

The methodology for sizing the global Interconnection market commenced with an analysis of colocation ecosystem participants in carrier-neutral facilities across every region and major metropolitan area. The research sample was stratified across industries and company size segments, 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. Our methodology accounts for both physical and virtual Interconnections, including those counterparties 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.

OUR PROCESS



2021 FORECAST

GLOBAL INTERCONNECTION BANDWIDTH¹ GROWTH BY 2021

Total Interconnection Bandwidth is expected to grow at a 48% CAGR by 2021, reaching 8,200+ Tbps.

The impact of macro trends driving Interconnection Bandwidth growth varies by region, though one clear theme emerges, the expected outsized growth of Enterprise. By 2021, Enterprise Interconnection Bandwidth is expected to increase by nearly 7x, overtaking Service Providers.

Given the rapid rise in digital traffic, Service Providers—the digital natives—are expected to maintain healthy growth (expanding 3x) by 2021, as they scale their operations via IT exchange points.

INTERCONNECTION INSTALLED BANDWIDTH CAPACITY (Tbps)

By Industry	2017	2018	2019	2020	2021	CAGR
Telecommunications	507	692	970	1,335	1,756	36%
Cloud & IT Services	389	537	746	1,031	1,382	37%
Banking & Insurance	143	243	394	640	1,046	65%
Manufacturing	165	243	385	611	975	56%
Securities & Trading	125	207	329	529	844	61%
Content & Digital Media	191	270	384	546	761	41%
Business & Professional Services	55	86	146	245	410	65%
Energy & Utility	36	61	108	189	328	73%
Wholesale & Retail Trade	34	55	94	159	268	67%
Healthcare & Life Sciences	20	33	57	99	169	70%
Government & Education	8	13	22	37	61	66%
Other	26	41	71	124	214	71%
Total Industry²	1,699	2,481	3,706	5,545	8,214	48%

By Digital Ecosystem Counterparties	2017	2018	2019	2020	2021	CAGR
Interconnecting to Network Providers	1,327	1,876	2,712	3,835	5,463	42%
Interconnecting to Cloud & IT Providers	93	184	394	852	1,439	98%
Interconnecting to Financial Services Providers	168	241	344	488	780	47%
Interconnecting to Content Providers	70	109	170	253	373	52%
Interconnecting to Supply Chain Partners	39	71	88	117	159	41%
Total Ecosystem Counterparties	1,699	2,481	3,706	5,545	8,214	48%

By Region	2017	2018	2019	2020	2021	CAGR
U.S.	754	1,091	1,585	2,301	3,318	45%
AP	430	628	962	1,470	2,220	51%
EU	396	579	864	1,299	1,921	48%
LATAM	118	187	295	475	755	59%
Total Region²	1,698	2,481	3,706	5,545	8,214	48%

UNITED STATES (U.S.)

NEW YORK | WASHINGTON, D.C. | CHICAGO | SILICON VALLEY

INTERCONNECTION BANDWIDTH¹ GROWTH BY 2021

The United States is expected to grow at a 45% CAGR, contributing more than 40% of Interconnection Bandwidth globally.

As early adopters of digital business, the United States has led Interconnection adoption. Looking forward, the U.S. is expected to have relatively consistent mid-40% growth each year through 2021 in spite of its maturity.

- U.S. Interconnection Bandwidth is expected to reach 3,300+ Tbps by 2021 due to a 45% CAGR, driven by strong anticipated growth in Chicago (52% CAGR) and New York (49% CAGR).
- Telecommunications is expected to remain the largest industry, driving the largest increase of traffic through 2021, representing 24% of the market; Healthcare & Life Sciences is expected to be the fastest-growing Interconnection industry through 2021 (65% CAGR), although from a more modest base.
- Enterprises are expected to account for 54% of Interconnections in 2021, up from 38% last year.
- Over 63% of Enterprises' Interconnection Bandwidth is expected to be used to reach Network Providers, while another 18% will be to connect to Cloud & IT Providers.
- The top four metros are expected to represent >80% of Interconnections in 2021 and, with a 46% CAGR, outgrow the rest of the market (39% CAGR).

INTERCONNECTION INSTALLED BANDWIDTH CAPACITY (Tbps)

By Industry	2017	2018	2019	2020	2021	CAGR
Telecommunications	227	313	439	605	801	37%
Banking & Insurance	80	133	207	324	509	59%
Manufacturing	84	124	196	310	490	55%
Cloud & IT Services	140	188	250	329	426	32%
Securities & Trading	60	99	153	237	362	57%
Content & Digital Media	100	135	178	232	299	31%
Business & Professional Services	22	33	54	87	141	60%
Wholesale & Retail Trade	17	27	45	74	121	62%
Healthcare & Life Sciences	7	12	20	33	55	65%
Energy & Utility	4	7	12	20	33	63%
Government & Education	3	4	7	12	19	59%
Other	10	15	24	38	62	63%
Total Industry²	754	1,090	1,585	2,301	3,318	45%

By Digital Ecosystem Counterparties	2017	2018	2019	2020	2021	CAGR
Interconnecting to Network Providers	593	827	1,157	1,573	2,153	38%
Interconnecting to Cloud & IT Providers	43	84	176	376	626	96%
Interconnecting to Financial Services Providers	81	117	165	229	365	46%
Interconnecting to Content Providers	24	38	58	85	123	62%
Interconnecting to Supply Chain Partners	13	24	29	38	51	40%
Total Ecosystem Counterparties	754	1,090	1,585	2,301	3,318	45%

By Metro	2017	2018	2019	2020	2021	CAGR
New York	216	329	481	711	1,063	49%
Washington, D.C.	151	211	295	411	583	40%
Chicago	99	149	230	348	525	52%
Silicon Valley	121	174	254	363	522	44%
Total Metro³	587	863	1,260	1,833	2,693	46%

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

2. Rounding may affect totals.

3. These are the top metros and not inclusive of all metros.

EUROPE (EU)

LONDON | FRANKFURT | AMSTERDAM | PARIS

INTERCONNECTION BANDWIDTH¹ GROWTH BY 2021

Europe is predicted to grow at a 48% CAGR, contributing about 23% of Interconnection Bandwidth globally.

A growing number of regulations requiring data compliance are serving as a catalyst of Interconnection growth throughout Europe. Combined with economic growth and cross-border trade, this is projected to reach 1,900+ Tbps by 2021.

- The top four metros will reach nearly 60% of European traffic by 2021, with London alone being more than 25% of Europe; each of these four key metros is expected to outgrow the rest of Europe by at least a 10% CAGR.
- Similar to the U.S., Telecommunications is expected to remain the largest industry segment growing at a 32% CAGR, followed by Cloud & IT Services, with these two industries composing 38%+ of total bandwidth.
- Banking & Insurance is expected to add 210+ Tbps through 2021, while Securities & Trading could add almost 200 Tbps.
- The Enterprise vertical is expected to account for 55%+ of total Interconnections in 2021, up from 34% last year, growing at a 67% CAGR.
- Two-thirds of Enterprise bandwidth is expected to be used to Interconnect to Network Providers.

INTERCONNECTION INSTALLED BANDWIDTH CAPACITY (Tbps)

By Industry	2017	2018	2019	2020	2021	CAGR
Telecommunications	142	187	252	339	430	32%
Cloud & IT Services	91	126	174	240	314	36%
Banking & Insurance	33	57	93	151	247	66%
Securities & Trading	27	47	79	133	220	69%
Business & Professional Services	19	30	51	85	142	65%
Energy & Utility	16	26	43	71	117	64%
Content & Digital Media	26	37	53	77	105	42%
Manufacturing	15	23	38	63	103	61%
Wholesale & Retail Trade	9	16	28	50	87	75%
Healthcare & Life Sciences	8	13	23	39	66	69%
Government & Education	3	6	9	15	25	65%
Other	7	11	21	36	65	81%
Total Industry²	396	579	864	1,299	1,921	48%

By Digital Ecosystem Counterparties	2017	2018	2019	2020	2021	CAGR
Interconnecting to Network Providers	310	438	637	917	1,311	43%
Interconnecting to Cloud & IT Providers	16	32	68	149	254	98%
Interconnecting to Financial Services Providers	42	62	91	134	216	51%
Interconnecting to Content Providers	18	28	44	68	96	53%
Interconnecting to Supply Chain Partners	10	19	22	31	44	44%
Total Ecosystem Counterparties	396	579	864	1,299	1,921	48%

By Metro	2017	2018	2019	2020	2021	CAGR
London	96	147	221	334	514	52%
Frankfurt	46	72	115	181	286	58%
Amsterdam	21	32	51	80	129	57%
Paris	39	56	87	131	201	58%
Total Metro³	202	307	474	726	1,130	54%

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

2. Rounding may affect totals.

3. These are the top metros and not inclusive of all metros.

ASIA-PACIFIC (AP)

TOKYO | SINGAPORE | HONG KONG | SYDNEY |

INTERCONNECTION BANDWIDTH¹ GROWTH BY 2021

Asia-Pacific is anticipated to grow at a 51% CAGR, contributing 27%+ of Interconnection Bandwidth globally.

Benefiting from rapid urbanization, AP's Interconnection traffic growth rate is expected to be faster than more developed regions, with expectations that total traffic will reach 2,200+ Tbps by 2021, or 15%+ larger than Europe.

- The top metros are expected to equate to 48% of overall AP Interconnection traffic, growing at a 51% CAGR through 2021.
- Cloud & IT Services is the largest industry segment, and is expected to remain so through 2021, growing at a 40% CAGR and representing 22%+ of total AP Interconnection Bandwidth.
- Energy & Utility is expected to be the fastest-growing segment with Interconnection Bandwidth increasing nearly 11x over a four-year period.
- The Enterprise vertical is expected to account for 52% of total Interconnection Bandwidth in 2021, and grow at a robust 66% CAGR vs. 40% for Service Providers.
- Two-thirds of Enterprise bandwidth is expected to be used to Interconnect to Network Providers.

INTERCONNECTION INSTALLED BANDWIDTH CAPACITY (Tbps)

By Industry	2017	2018	2019	2020	2021	CAGR
Cloud & IT Services	130	181	259	370	507	40%
Telecommunications	120	169	249	349	470	41%
Manufacturing	57	82	128	202	321	54%
Securities & Trading	33	53	86	142	234	63%
Banking & Insurance	18	32	57	102	181	79%
Energy & Utility	14	24	46	84	154	83%
Business & Professional Services	12	19	34	59	104	71%
Content & Digital Media	27	37	50	68	90	35%
Healthcare & Life Sciences	4	7	13	23	41	79%
Wholesale & Retail Trade	5	8	13	21	35	63%
Government & Education	2	3	5	8	15	75%
Other	8	13	22	42	68	67%
Total Industry²	430	628	962	1,470	2,220	51%

By Digital Ecosystem Counterparties	2017	2018	2019	2020	2021	CAGR
Interconnecting to Network Providers	334	471	697	1,001	1,462	45%
Interconnecting to Cloud & IT Providers	28	56	121	262	443	99%
Interconnecting to Financial Services Providers	34	46	65	92	147	45%
Interconnecting to Content Providers	21	33	53	79	118	53%
Interconnecting to Supply Chain Partners	13	22	26	36	50	40%
Total Ecosystem Counterparties	430	628	962	1,470	2,220	51%

By Metro	2017	2018	2019	2020	2021	CAGR
Tokyo	121	182	284	431	657	53%
Singapore	39	57	84	123	182	47%
Hong Kong	20	31	48	75	117	55%
Sydney	22	31	46	68	101	48%
Total Metro³	202	301	462	697	1,057	51%

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

2. Rounding may affect totals.

3. These are the top metros and not inclusive of all metros.

LATIN AMERICA (LATAM)

SÃO PAULO | RIO DE JANEIRO | BUENOS AIRES | MEXICO CITY

INTERCONNECTION BANDWIDTH¹ GROWTH BY 2021

Latin America is expected to grow at a 59% CAGR to reach 750+ Tbps of installed capacity by 2021, contributing more than 9% of Interconnection Bandwidth globally.

Though Latin America is the smallest region, it is also expected to have the strongest regional Interconnection Bandwidth growth rate, thanks to emerging markets and growing digital business adoption.

- The top four metros are expected to equate to 81%+ of overall Latin American Interconnection traffic, the highest concentration of any region, growing at a 61% CAGR through 2021.
- Brazil's two major cities are expected to increase seven-fold over the next four years.
- Content & Digital Media is the largest industry segment, and is expected to remain so through 2021, growing at a 63% CAGR and representing 35% of total LATAM Interconnection Bandwidth.
- Nine of 11 industry segments (excluding Other) are growing at a CAGR greater than 60%.
- The Enterprise vertical is expected to grow at a strong 71% CAGR through 2021, though Enterprise remains relatively low in proportion to total Interconnection traffic at 39%.
- 71% of Enterprise bandwidth is expected to be used to Interconnect to Network Providers.

INTERCONNECTION INSTALLED BANDWIDTH CAPACITY (Tbps)

By Industry	2017	2018	2019	2020	2021	CAGR
Content & Digital Media	38	61	102	169	267	63%
Cloud & IT Services	27	42	63	93	135	49%
Banking & Insurance	12	21	37	63	109	72%
Manufacturing	9	14	22	37	61	62%
Telecommunications	18	23	31	42	56	32%
Securities & Trading	5	7	11	17	28	55%
Wholesale & Retail Trade	3	5	8	14	25	75%
Energy & Utility	2	3	7	13	24	93%
Business & Professional Services	2	4	7	13	24	82%
Healthcare & Life Sciences	1	1	2	4	7	88%
Government & Education	0	0	1	1	2	86%
Other	1	2	4	9	17	83%
Total Industry²	118	185	295	475	755	59%

By Digital Ecosystem Counterparties	2017	2018	2019	2020	2021	CAGR
Interconnecting to Network Providers	90	140	221	345	537	56%
Interconnecting to Cloud & IT Providers	6	13	29	64	116	109%
Interconnecting to Financial Services Providers	12	16	22	33	52	44%
Interconnecting to Content Providers	6	9	15	23	36	55%
Interconnecting to Supply Chain Partners	4	7	8	10	14	35%
Total Ecosystem Counterparties	118	185	295	475	755	59%

By Metro	2017	2018	2019	2020	2021	CAGR
São Paulo	42	68	112	185	306	64%
Rio de Janeiro	22	34	54	88	143	60%
Buenos Aires	14	22	35	56	91	60%
Mexico City	14	22	34	52	75	51%
Total Metro³	92	146	235	381	615	61%

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