DATA CENTER Frontier Special Report

2020 Data Center Market Overview
Portland

Written by Rich Miller

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Introduction

This report was prepared by Data Center Frontier, with market data provided by datacenterHawk.

ABOUT DATA CENTER FRONTIER

http://datacenterfrontier.com

Data Center Frontier charts the future of data centers and cloud computing. We write about what's next for the Internet, and the innovations that will take us there. The data center is our prism. We tell the story of the digital economy through the facilities that power the cloud and the people who build them. In writing about data centers and thought leaders, we explain the importance of how and where these facilities are built, how they are powered, and their impact on the Internet and the communities around them.

Data Center Frontier is edited by Rich Miller, the data center industry's most experienced journalist. For more than 15 years, Rich has profiled the key role played by data centers in the Internet revolution.

ABOUT DATACENTERHAWK

http://www.datacenterhawk.com

Experts use datacenterHawk's online tools for instant access to hard to get info on the data center industry.

For strategic leaders, we aggregate and analyze our data at the market level each quarter, spanning 20+ markets in North America and 5 in Europe, with historical data on 15+ quarters for most markets.

For professionals, our search tool lets you instantly find and drill down on individual data center facilities across 120+ markets.

On datacenterHawk, you can also find:

- Capacity figures broken out into commissioned, available, under construction, and planned power and space at both the markets and facility level
- Pricing for different transaction sizes across markets
- Data centers owned by private companies

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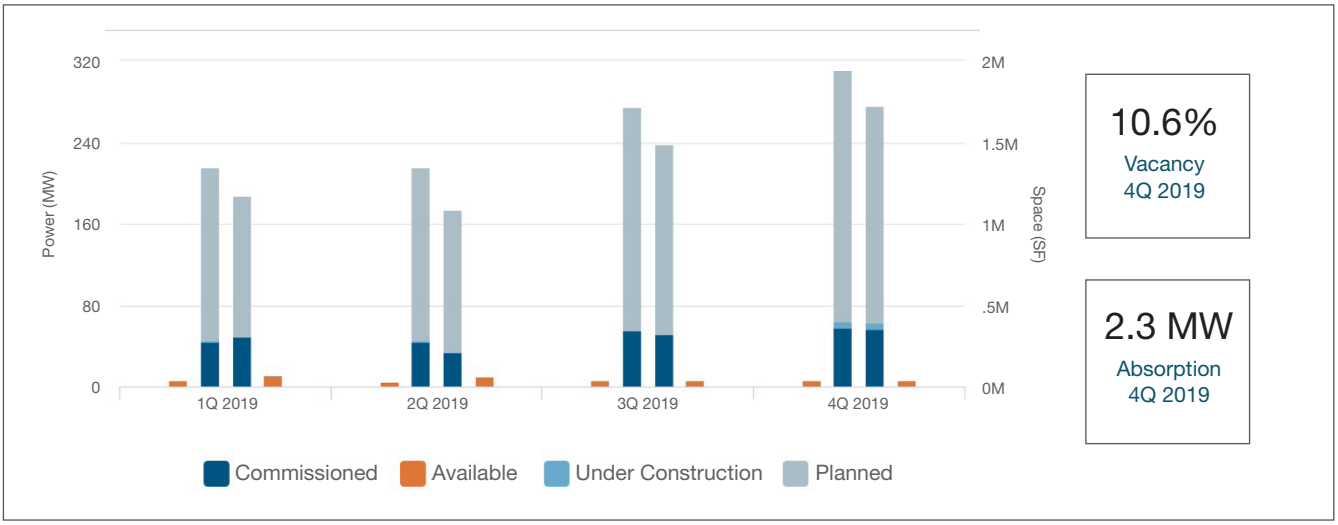
Market Overview & Analysis



Market data and graph provided by datacenterHawk

Portland, Oregon has emerged as a leading market for multi-tenant data center development in the Pacific Northwest. The region is poised for substantial growth over the next several years, and data center developers clearly see Portland as a future hot spot for hyperscale and enterprise facilities.

While not yet a major market, Portland has a rising profile as a destination for data centers. The region benefits from a favorable cost environment—including a prominent enterprise zone and Oregon's business-friendly tax policies—as well as a climate that's ideal for keeping servers cool. That's attractive to sustainability-aware enterprises, who also like the region's ample supply of renewable energy.

The Portland market is home to more than 354,283 square feet (SF) of commissioned data center space, representing 57.81 megawatts (MW) of commissioned power, according to market research from datacenterHawk.

The real news about Portland is not so much its present, but its future. Data center developers plan to deploy 275 megawatts of new data center capacity in coming years, representing 1.33 million square feet of new space.

Data center development in the Portland market is focused on Hillsboro, a northern suburb that is home to a large Intel semiconductor fabrication facility. The adjacent Enterprise Zone offers tax benefits and abundant power, making the area a magnet for data center development. Tax breaks saved Hillsboro data center operators and customers $3.1 million in 2019 and $5.4 million in 2018, according to state records.

The Intel campus is surrounded by data center projects for the leading players in data center development, including Digital Realty, NTT Global Data Centers Americas, Stack Infrastructure, QTS Data Centers, EdgeConneX and Flexential, among others.

Much of the optimism around Portland's growth stems from the belief that it will become a leading alternative to California, which boasts a large concentration of data centers. The California market has been roiled by the troubles of utility PG&E, which filed for bankruptcy protection in 2019 due to wildfire-related liabilities. The prospect of higher future utility bills, along with PG&E's imposition of rolling service outages during periods of heightened wildfire risk, has customers looking beyond California's borders for their West Coast data center workloads.

Oregon's power is not only cheaper than California, but greener as well. Portland utility PGE has a number of programs providing 100 percent renewable energy to data center operators, including solar and wind generation facilities and an ample supply of hydro-electric power.

A key factor in the future of the Portland cluster is how it fares in the fierce competition to woo data center users exiting California. Data center providers in Las Vegas and Phoenix compete aggressively for business from California-based customers, while the Pacific Northwest offers several other attractive options for large single-tenant requirements, including Quincy, Washington and Prineville, Oregon.

The consensus is that the data center industry will see strong demand for network services to support the shift to digital platforms, which will likely outweigh any loss of business from sectors that are hard-hit by COVID-19 lockdowns.

A meaningful differentiator is Hillsboro's direct access to trans-Pacific subsea cables offering connectivity to fast-growing cities in the Asia-Pacific region, which are a key growth market for many customers.

On a broad scale, the COVID-19 Coronavirus pandemic has reinforced the importance of data centers and cloud computing for our society. In the early days of the crisis, the data center industry has served as the backstop for the global economy, supporting a massive shift to online services for businesses, schools and non-profits.

The consensus is that the data center industry will see strong demand for network services to support the shift to digital platforms, which will likely outweigh any loss of business from sectors that are hard-hit by COVID-19 lockdowns. A key question is how the pandemic's evolution will impact data center construction, as well as the ability to conduct tours of properties—both of which will impact the industry's execution over the long haul.

SUPPLY AND DEMAND

Trends in Demand

Although Portland is considered a secondary data center market (especially compared to nearby large primary markets Seattle and Northern California), data center users increasingly find the market attractive.

Portland's numerous advantages for data centers include:

1. **Growing Economy**
   The Portland economy continues to increase, with 3.3% annual employment growth.
2. **Growing Technology Sector**
   Much of Portland's economy comes from high-tech manufacturing and IT jobs. The Hillsboro sub-market also has business clusters of firms specializing in advanced manufacturing and biotechnology.
3. **Heavy Data Center Tax Incentives**
   Portland's data center tax is the 2nd lowest in the United States. The tax incentives are available in Portland's suburban "enterprise zones." Oregon does not have a sales tax.
4. **Lower Seismic Threat**
   Compared to other West Coast markets, the seismic threat in the greater Portland area is relatively low.
5. **Access to Subsea Cables**
   Portland data centers have access to several trans-Pacific subsea cables, an option not available in competing markets in interior U.S. states. An ultra-high count fiber ring joins all the major local data centers and businesses, and serves as a cross connect for cables including FASTER, TPE, TGN, Hawaiki and New Cross Pacific that reduce latency to high-value Asia-Pacific markets.

The recent investments in the area made by enterprise users and colocation providers are indicative of large-scale future growth for Portland. The main data center development has occurred in the Portland suburb of Hillsboro, where heavy investments from Intel led to growing interest in the region.

Colocation and data center development was originally started by Stack Infrastructure (formerly Infomart Data Centers) and Digital Realty's data center construction in 2011–2012. Other providers, such as T5 Data Centers, Telx (acquired by Digital Realty in 2015), and ViaWest (now Flexential) quickly saw the value in the market, causing a jump to 36 MW of capacity delivered to Portland. Other providers followed, boosting the Portland market to the current 58 MW of commissioned power. More recently, both incumbent providers and new players have acquired land to add further capacity.

A FOCUS ON TECHNOLOGY

Compared to the U.S. average, Hillsboro has 3 to 5 times the concentration of engineering jobs and 2 times as many computer jobs. Technology Services is Hillsboro's fastest growing trade sector industry—expanding jobs by 46% over the past 5 years.

The anchor of the Hillsboro market is Intel, which employs 21,000 high-tech workers across four campuses. The chipmaker has invested more than $43 billion in its Hillsboro presence, which has been a magnet for other technology firms. A semiconductor supply chain cluster is being created that includes firms like NVIDIA, Applied Materials, Qorvo, and Thermo Fisher Scientific.

Other technology firms who have a presence include Adobe, Comcast, Salesforce and LinkedIn, all of whom have data center operations in Hillsboro.

Photo credit: SevenMaps / Shutterstock

At the state level, Oregon gained momentum as a data center market when it capitalized on lapsed data center tax incentives in Washington State in 2011. That was when Infomart and Digital Realty arrived, while Facebook's deployment of a huge campus in Prineville in 2011 further highlighted Oregon as a destination for data centers.

OREGON'S COMPETITIVE REGIONAL ADVANTAGE

The data center competition between Washington and Oregon was examined in a 2018 analysis by the Washington State Department of Commerce, which documented the slowing growth in Washington's leading data center clusters in Seattle and Quincy/Wenatchee.

"Since 2013 virtually all data center site locators looking for an urban location (in the Pacific Northwest) ultimately arrive at a Hillsboro versus Seattle decision," the study says. "Because of the sales tax differential between them, the deal flow overwhelmingly favors Hillsboro. As a result, the Seattle data center market now has an 18.8 percent vacancy rate and is underperforming on absorption.

"The Portland metropolitan area has become the go-to regional hub for urban data centers in the Pacific Northwest while growth in urban western Washington has languished," the analysis found. "As a result, Oregon has won approximately a billion dollars in positive economic outcomes."

The detailed study found that the key differentiator between the two markets is that the sales tax applied to data center equipment purchases and deployments results in a 10 percent cost advantage for Hillsboro.

The data center sub-market in Central Washington is focused on Quincy. The tiny farming town in central Washington is home to a cluster of data centers, including several cloud campuses operated by Microsoft. Quincy is not for everyone, however. Several single-tenant facilities have thrived in Quincy, but multi-tenant service providers have a more mixed track record.

Quincy and neighboring Wenatchee offer cheap hydro-powered energy and an environment ideal for the use of fresh air in data center cooling systems, which allows facilities to operate without energy-hungry chillers. But the region lacks major universities or other technology industries that can provide a steady supply of skilled local labor, which is a common trait of most major data center markets. As a result, the area has been most attractive to tenants that run huge, highly-automated compute farms, including hyperscale operators (Quincy) and cryptocurrency miners (Wenatchee).

The Portland market has emerged as an attractive alternative, offering many of the same advantages as the Central Washington cluster—affordable green power and cool climate—along with tax incentives and an existing technology workforce.

Pacific coast, Oregon

A CRITICAL MASS OF SUBSEA CABLES PROVIDE GLOBAL ACCESS

Another key differentiator for Portland is the Hillsboro cluster's direct access to seven subsea telecommunications cables, which offer high-capacity connectivity to China, Taiwan, Japan, Korea, Guam, Hawaii, New Zealand, Australia, and American Samoa.

These cables come ashore in Pacific City, Oregon and tie into a dark fiber network from Wave Business that serves six data centers in Hillsboro. A second phase of the Wave fiber ring will be completed in the second quarter of 2020, connecting an additional eight data center locations to the cable landing station.

The Hillsboro cluster can offer customers easy access to Asia-bound data traffic, an option which is not available in markets in interior states (such as Nevada and Arizona) that are also competing for California customers.

The data center business is increasingly a global business, with cloud providers and multi-national enterprises seeking to create data-centric businesses that can span continents. Subsea cables are now a strategic asset for hyperscale customers, who often make direct investment in new cables. Amazon (Hawaiki), Microsoft (New Cross Pacific) and Google (FASTER) are investors or major users for cables that land in Pacific City.

Asia is a major growth market for cloud platforms and service providers seeking to expand in China, India, Australia and other Pacific Rim nations. The Hillsboro cluster can offer customers easy access to Asia-bound data traffic, an option which is not available in markets in interior states (such as Nevada and Arizona) that are also competing for California customers.

That's one reason that data center developers are investing in Portland for new capacity.

TRENDS IN SUPPLY

The story of Portland as a data center market will be defined in the next several years. With a historic volume of supply in the pipeline, the Hillsboro cluster is poised for dramatic growth. Developers are embracing the thesis that Portland is the hot emerging market for low-cost data center development in the Pacific Northwest.

Data center companies have announced plans for up to 275 MWs of new capacity, representing a potential 1.33 million SF of additional space. Meanwhile, there were 2.3 MWs of absorption in 4Q of 2019, with a 10.6 percent vacancy rate.

Here's a look at the major projects that are in the pipeline:

NTT Global Data Centers Americas (formerly RagingWire Data Centers) constructs major new campus coming online in summer 2020

NTT Global Data Centers Americas (formerly RagingWire) has just announced a 47-acre campus that will house up to 144 MWs of critical IT load, and 1 million SF of data center space. The first of five buildings is scheduled to open in the summer of 2020. The data centers on the Hillsboro campus will be designed with customizable high-density vaults in order to support both single-user and colocation requirements of hyperscale cloud and enterprise clients. Power and cooling systems will offer a 100% availability SLA by leveraging a "4 to make 3 design" to provide N+1 redundancy at the rack level. Renewable energy packages will be available as well.

Digital Realty kicks off development in Hillsboro; Plans to utilize renewable energy

Digital Realty acquired its development site in Hillsboro as part of its purchase of DuPont Fabros in 2017, and is under construction on its first building, which uses the company's large-footprint designs and is positioned to come to the market in 2020. In 4Q 2019 the company executed an agreement with PGE that will supply 120,000 MWH of solar and wind energy to Digital Realty's Portland campus. Data center operators continue to focus on renewable energy and ensuring their fuel mix is as environmentally friendly as possible for the future.

QTS data center development underway in Hillsboro

QTS is actively developing its latest data center on its 92-acre Hillsboro campus, which the company says will support five data center buildings totaling 1.5 million square feet of space and 250 megawatts of power capacity. The company has pre-leased the entire 4.5 MW first phase of its initial 158,000 SF building, which will span 27 MWs of commissioned power.

Stack Infrastructure planning expansion in Hillsboro

Stack Infrastructure is the largest current provider in Portland, and recently announced plans for additional growth in the area. The company plans to build a new 60 MW data center on the remaining 35 acres of land in its Hillsboro footprint. The new data center will be the largest in the Portland market and will provide ample capacity. Stack tenant Opus Interactive also announced a 400 kW expansion of their lease.

EdgeConneX under construction in Hillsboro

Denver based EdgeConneX is also expanding in the Portland market. The company's Hillsboro facility is located in a traditional office park, and EdgeConneX has acquired an adjacent building and will combine the two buildings through a shared electrical yard. The expanded site should be available in 2020.

Flexential plans large new data center

Flexential plans to construct a 300,000 SF facility (its largest to date) in Hillsboro on 20 acres of land near the company's existing data centers. The company has not set a date to start construction.

Market chatter suggests that several of these providers have likely lined up anchor tenants, a thesis supported by the volume of construction activity, and past practice by these developers, who seek to closely match capital expenditures with tenant commitments.

The amount of pre-leasing will be a factor in the growth and success of the Portland market. If developers succeed in closely matching capacity to rising demand, the region is poised for long-term growth and a higher profile as a data center destination.

Business Environment

CONNECTIVITY

Portland has an extensive fiber footprint available downtown and in its suburbs, due to heavy investment by Zayo, XO Communications, Windstream, CenturyLink, and Integra. Portland also lies upon several long-haul routes connecting the West Coast, from Vancouver to San Diego. Gigabit Ethernet connections are available downtown through CenturyLink. Furthermore, Portland benefits from several submarine cable routes, acting as a connectivity gateway to Australia, New Zealand, Japan, China, and South Korea. The most recent development is the Hawaiki Submarine Cable, connecting Portland, Hawaii, and Australia. The project was heavily backed by Amazon. The subsea cable landing in Pacific City connects to the Hillsboro area via a dark fiber ring from Wave Business.

POWER

Portland's electricity costs are low, especially compared to other West Coast markets, such as Los Angeles and Silicon Valley. The primary power provider, Portland General Electric, generates power from diverse sources. A benefit of PGE is their abundance of hydroelectric power, with five owned hydroelectric plants, with an additional two plants jointly owned. Intel has been heavily involved in Portland since 1974, and has invested in building the city's electric infrastructure. PGE has three high-reliability substations in Hillsboro's industrial district, ensuring full redundancy at each level of the power network. At 5 to 6 cents per kilowatt hour, PGE's rates are significantly cheaper than utility power options in major California markets, and slightly more competitive than pricing in the Seattle market (although higher than rates in Quincy).

HAZARD RISK

The Portland market is relatively safe, with a fairly stable climate. There is little risk of large, damaging storms, hurricanes, or tornados. As with most West Coast markets, Portland is at risk for earthquakes. Similar to Seattle, however, most earthquakes are non-damaging, with only three earthquakes recorded above a magnitude of 3.5. Portland ranks lower than California and Seattle in the number of damaging earthquakes. Although volcanos represent a small risk, Portland's four volcanos within 50 miles is worthy of note.

ECONOMIC DEVELOPMENT AND INCENTIVES

Companies leverage Oregon's lack of sales tax along with the property tax exemptions earmarked for companies that build in special tax havens called "Enterprise Zones" in Portland's suburbs. Enterprise Zones in Beaverton, Hillsboro, and The Dalles spurred the building of massive data centers in the market. CBRE ranks Portland 2nd in the nation for tax incentives, with taxes representing only 2.7% of the data center project cost, far below the average 8.7%. The lower tax rates for large data centers have been the driving force in attracting users and providers to Portland instead of other large West Coast markets. Tax breaks saved Hillsboro data centers $3.1 million in 2019 and $5.4 million in 2018, according to state records.

Willamette Falls hydroelectric power plant in Portland, Oregon

Portland Data Center Market Supply Overview

DIGITAL REALTY

Digital Realty (DLR) is a real estate investment trust (REIT) and the largest wholesale data center provider in the world. The company has grown to over 210 locations across five continents after going public in 2004; leveraging economies of scale to measurably benefit customers. Digital Realty delivers colocation, powered shell, private suite, and custom data center solutions. In addition, Digital Realty is focused on delivering relevant services to their clients such as move-in ready racks and cabinets in certain locations. The company is also focused on providing services surrounding connectivity to the Internet and cloud providers at multiple locations.

Digital Realty delivers colocation, powered shell, private suite, and custom data center solutions.

Part of Digital Realty's growth can be attributed to two sizable acquisitions. The first was the purchase of Telx in July 2015 for $1.89 billion. The Telx acquisition expanded and expedited Digital Realty's ability to provide integrated services for SMB-to-enterprise customers. Additionally, Digital Realty purchased DuPont Fabros in September 2017 for nearly $8 billion, adding 12 wholesale data centers to Digital Realty's portfolio. Digital Realty employs nearly 1500 people and is headquartered in San Francisco, CA.

Digital Realty's Portland data center is located at 3825 NW Alocek Pl. in the Portland suburb Hillsboro. The facility was originally constructed in late 2012, with NetApp and Telx as major tenants. The data center is LEED Gold certified, and features 2N UPS and generator redundancy.

In 1Q 2018, Digital completed the consolidation of the DuPont Fabros assets, giving Digital Realty a 47-acre land site in Portland. As of 4Q 2019, Digital Realty was under construction with the shell for the first two-story data center on their 47-acre land site, and executed a green tariff agreement with Portland General Electric that will supply the campus with 120,000 MWH of solar and wind energy.

All EdgeConneX EDCs are designed to support extremely high power densities with a simplified per kW pricing model.

EDGECONNEX

EdgeConneX is a colocation and network services company headquartered in Herndon, VA. The company created a network of over 40 "edge-of-network" data centers throughout North America, South America, and Europe designed to lower latency and increase application performance. The company's Edge Data Centers (EDC) enable distribution of content at the edge of the Internet. All EdgeConneX EDCs are designed to support extremely high power densities with a simplified per kW pricing model.

EdgeConneX's Portland data center is a Tier III designed facility in Hillsboro. The 6,000 SF of raised floor is capable of supporting over 600 watts/SF. EdgeConneX has the ability to double capacity at the facility based on demand.

Founded in 2000 as Peak 10, Flexential grew through new developments and acquisitions and has grown in both new and existing markets.

FLEXENTIAL

Flexential provides colocation, cloud, and managed services for customers in 10 markets throughout the United States. The company is headquartered in Charlotte, NC. Founded in 2000 as Peak 10, Flexential grew through new developments and acquisitions and has grown in both new and existing markets. Flexential has completed the following: SOC 1 Type 2, SOC 2 Type 2, SOC 3 Type 2, PCI and HIPAA compliance. In 2Q 2017, Peak 10 announced their acquisition of ViaWest from Shaw Communications. The purchase adds 24 data centers to their portfolio, and expands Peak 10's presence to 20 domestic and international markets. In 1Q 2018, the combined companies rebranded as Flexential.

Flexential's two Portland data centers are located in Hillsboro. Their Hillsboro I-II data center features over 50,000 SF of raised floor space. The space provides fully redundant 2(N+1) UPS systems. Flexential's second data center, Brookwood, is a 210,000 SF purpose-built facility also located in Hillsboro. This data center is a direct termination point of the New Cross Pacific subsea cable, giving tenants a direct fiber line to Asia. The first 5 MW phase of the facility was delivered in late 2015, and the second 5 MW phase was completed in 3Q 2018.

In 2Q 2019, Flexential announced their plans to construct a third data center in Portland. The company plans to construct a 300,000 SF facility in close proximity to their existing data centers.

NTT GLOBAL DATA CENTERS AMERICAS

(Formerly known as RagingWire)

NTT Global Data Centers operates more than 160 data centers spanning more than 20 countries, making it the third-largest global data center provider. Clients will have access to full-stack technology solutions

NTT Global Data Centers was created through the consolidation of 28 IT brands owned by NTT Communications, including data center providers RagingWire, e-shelter, Gyron, Netmagic, NTT Nexcenter and Digital Port Asia.

(from data center and network infrastructure to applications) and full-lifecycle services (from consultancy to fit-out services to ongoing management) with end-to-end managed services. The company was created through the consolidation of 28 IT brands owned by NTT Communications, including data center providers RagingWire, e-shelter, Gyron, Netmagic, NTT Nexcenter and Digital Port Asia.

The company provides colocation and network solutions for users needing cabinets, cages or private suites, as well as wholesale data center space. The Americas division, previously known as RagingWire, operates 2 million square feet of data center space in the United States delivering 265 MW of critical IT load, with an additional 3 million square feet currently under development.

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NTT recently acquired a 47-acre campus in Hillsboro that is projected to house 144 megawatts of critical IT load, and more than 1 million square feet of data center space. The first building is scheduled to open in the summer of 2020, with a 6 megawatt vault available for pre-lease. It will be the first of five buildings planned for the Hillsboro site.

QTS DATA CENTERS

QTS Realty Trust (QTS) is a publicly-traded real estate investment trust (REIT) with more than 25 data center properties in the continental United States. The company traditionally finds large, robust facilities and transforms them into LEED-certified data centers. QTS' client list includes mostly Fortune 1000 customers, to whom they provide hybrid, wholesale, and hyperscale data center services, along with a variety of managed services through their Software-Defined Data Center infrastructure.

QTS acquired a 92-acre parcel of land in Hillsboro with plans to construct a multi-building data center campus. The company says the campus will support five data center buildings totaling 1.5 million square feet of space and 250 megawatts of power capacity. The company has pre-leased the entire 4.5 MW first phase of its initial 158,000 SF building, which will span 27 MWs of commissioned power.

Stack Infrastructure provides three data center solutions: HYPER STACK (hyperscale campuses and build-to-suit options), POWER STACK (powered shells), and READY STACK (readily available wholesale colocation and private suites).

STACK INFRASTRUCTURE

Launched in 2019, Stack Infrastructure is a data center company branded and sponsored by investment company IPI Partners. Designed to meet the needs of both rapidly scaling enterprises and hyperscale companies, Stack offers an array of tailored infrastructure services to customers across the US. The company provides three data center solutions: HYPER STACK (hyperscale campuses and build-to-suit options), POWER STACK (powered shells), and READY STACK (readily available wholesale colocation and private suites). Stack's current assets include nine data centers spanning seven US markets, with expansion sites located adjacent to six of those facilities.

Stack operates one data center in Portland, acquired in 2014. The 364,000 SF will hold up to 22 MW across six data halls at full build. The data center currently offers 16 MW of commissioned power, can support high density deployments of 25 kW or higher, and is LEED Gold certified. The company also owns 35 acres of land formerly owned by T5, where they can develop up to 60 MW of additional capacity.

In 3Q 2019, Stack announced plans to construct a new 60 MW data center on their remaining land.

T5 DATA CENTERS

T5 Data Centers is an experienced colocation developer headquartered in Atlanta, GA. T5 delivers colocation, powered shells, and build to suit data centers to enterprise clients across the United States. Backed by solid financial partners, the company has data centers or land in the following markets: Colorado Springs, Kings Mountain, Los Angeles, New York, Portland, Atlanta, and Dublin. T5 offers cloud services (via a provider partner) to ensure customers cloud needs would be met in their facilities. T5 Facilities Management, a value-added service offering, aims to assist data center users and providers in need of an experienced data center management company focused on safety, training, process and communication.

T5 currently owns a site in Hillsboro where it plans to construct a 124,000 SF data center. The facility is designed to offer up to 11 MW of commissioned power once fully delivered.

VXCHNGE

Created in 2013 when private equity firm Stephens Group bought the Bay Area Internet Services (BAIS), vXchnge is a national colocation provider. In May 2015, vXchnge bought eight Sungard AS data center facilities to expand their footprint into a total of 15 U.S. markets. The acquisition is part of vXchnge's strategy to create "Built for Performance" carrier-neutral data centers and address distance to customer or localization issues for the cloud and service providers that fuel the digital economy.

vXchnge operates one data center in downtown Portland, making them one of the only data center providers not located in Hillsboro. The 40,000 SF data center guarantees 100% uptime and is designed to scale based on user's demand.

About Our Sponsor NTT

NTT Global Data Centers Americas (formerly RagingWire)

www.ragingwire.com

RagingWire was one of the early companies that helped to build what would one day become a multi-billion dollar global industry—data center colocation. RagingWire has been owned by NTT since 2014, and has been operating as an independent entity since that time. Now NTT is combining 28 of its affiliate companies (including NTT Communications, Dimension Data, and NTT Security) into one new entity called NTT Ltd.

Within NTT Ltd. is the new Global Data Centers division, which incorporates e-shelter, Gyron, Netmagic, NTT Indonesia Nexcenter, RagingWire and other data center companies. This division operates one of the largest data center platforms in the world, now with over 160 data centers spanning more than 20 countries and regions, and provides NTT clients and partners with access to a powerful digital ecosystem with global reach and local expertise.

NTT Global Data Centers Americas has operations in key U.S. markets such as Ashburn (VA), Sacramento (CA) and Dallas (TX), with expansion plans in place for Silicon Valley (CA), Chicago (IL) and Hillsboro (OR). Other divisions within NTT Global Data Centers have facilities in Tokyo, Osaka, Hong Kong, Singapore, Cyberjaya, Bangkok and Jakarta in the APAC region. In EMEA, locations include London, Amsterdam, Frankfurt, Berlin, Munich, Vienna, Zurich, Madrid, and Johannesburg. In India, NTT Global Data Centers has significant data center operations in Mumbai, Bangalore, Noida, and Chennai.

NTT Ltd. has vast expertise in building technologically advanced data centers with low total cost of ownership (TCO) and high redundancy. NTT Ltd.'s global presence supports and enables end-to-end solutions while offering flexibility for clients to balance their critical IT load across various locations.

The global data centers platform of NTT Ltd. features efficient, mission-critical power and cooling to maximize performance and minimize costs. Customizable space configurations and reliable, carrier-neutral connectivity, including integration with hybrid or multi-cloud, are standard. Customers are supported 24x7x365 by highly-trained, in-house staff experts in operations, facilities management, security, and shipping and receiving.

datacenterHawk Methodology

datacenterHawk continuously monitors data center activity for 35 regional markets in North American. Regional markets are placed into one of two categories:

1. **Primary -** Large markets with multiple colocation and cloud data center facilities
2. **Secondary -** Mid-to-small markets with data centers.

We define our market sizes based on the total amount of power and space in the market. The total amount of power and space in each market is calculated by datacenterHawk's team of analysts based on four key attributes:

- The amount of commissioned power and space
- The amount of available power and space
- The amount of under construction power and space
- The amount of planned power and space

As an example, Data Center Provider A builds a 75,000 gross square foot (SF) data center facility, with 3 separate data halls of 1,200 kilowatts (kW) and 10,000 raised floor square feet (RFSF) each. Data Center Provider A leases one of the data halls (1,200 kW/10,000 RFSF) to a user, and makes the second data hall (1,200 kW/10,000 RFSF) available by completing construction to be ready to lease the next opportunity. The third data hall is in shell condition and therefore considered planned space.

In addition, the datacenterHawk analysis considers that many colocation and cloud providers lease infrastructure from larger data center providers. In our analysis, we count power and space leased from one data center provider to another only once.

As an example, if the lease completed by Data Center Provider A in the scenario above was completed with Data Center Provider B with the intent to sublease that 1,200 kW/10,000 RFSF to users, the analysis would only include the 1,200 kW and 10,000 RFSF of space one time.

At datacenterHawk, we track these attributes in each market throughout the year and frequently refresh them. By continuously monitoring these attributes, we can calculate a baseline for each market, rate how a market grows relative to their baseline score, and deliver the most current and valuable information needed by our customers.

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