



DATA CENTER

Frontier Special Report

Phoenix Data Center Market

Written by Rich Miller



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Introduction

This report was prepared by Data Center Frontier, in conjunction with 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>

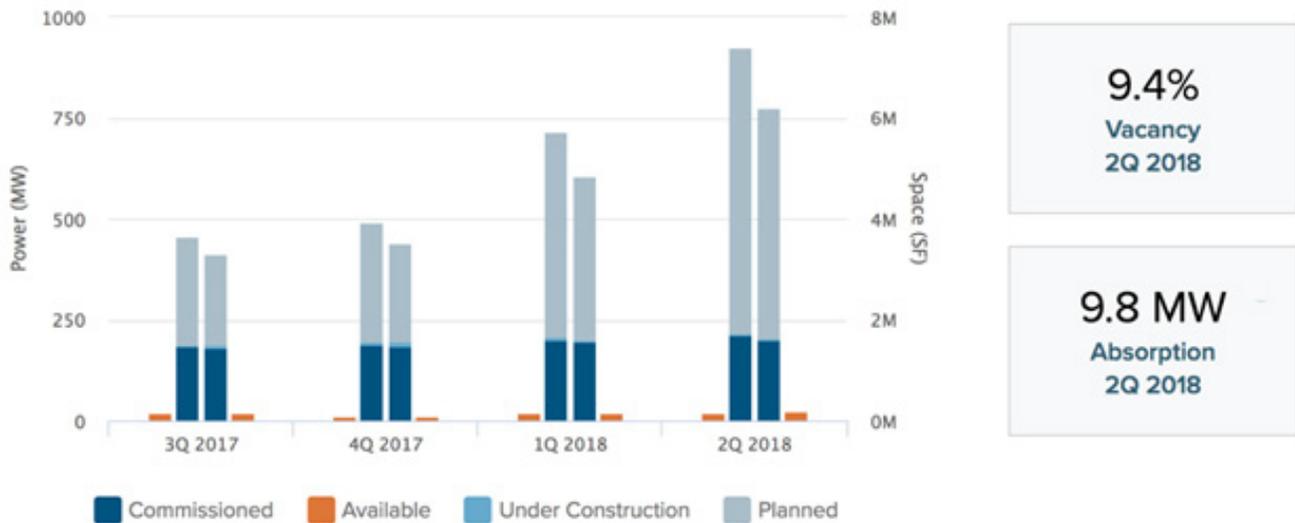
datacenterHawk is a convenient “one-stop-shop” for IT professionals, consultants, data center operators and investors to find data center and cloud solutions. Our subscription-based service makes the complex process of searching and analyzing colocation and cloud service providers simple and faster than ever. Our online tools help users compare potential data center solutions using real-time capacity information, financial data, and market research; then present the findings in a sharp, easy to understand report.

For non-subscribers, datacenterHawk delivers hard to find information on the top Internet exchanges, cloud computing providers, carrier hotels, and colocation facilities in North America on a per-report basis. With a credit card number, IT professionals can use datacenterHawk to reduce the time it takes to find data center market information down from hours to seconds.

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Market Overview & Analysis



Phoenix is an ascendant data center market, and is rapidly emerging as a destination for the largest players in hyperscale computing. It is currently experiencing a data center building boom, with hundreds of megawatts of potential capacity in the pipeline. The Phoenix region benefits from power and fiber infrastructure, and growing competition among service providers.

Phoenix has become one of the most dynamic data center growth markets in the U.S., with a surge in leasing in the past two years, including major deals featuring hyperscale cloud companies. Users have long sought space in Phoenix as an alternative to California locations with higher cost and disaster risk. It's now clear that Phoenix is becoming a data center destination in its own right, attracting a larger concentration of both customers and service providers in the process.

The Phoenix market is home to 1.61 million square feet (SF) of commissioned data center space, representing 211 megawatts (MW) of commissioned power, according to market research from datacenterHawk. That makes Phoenix the sixth-largest market for data center capacity in the U.S., trailing Northern Virginia, Silicon Valley, Dallas, Chicago and New Jersey.

Growth trends suggest that in Phoenix will join the Top 5 markets in 2018, with total capacity that exceeds that of New Jersey. There was a solid 24 megawatts (MWs) of capacity absorbed in 2017, and 2018 is shaping up as another strong year, with 9.8 MWs of absorption in 2Q 2018 alone..

The most remarkable aspect of the Phoenix market is the industry optimism about future demand. Data center developers have 707 MWs of capacity on the planning board, more than any market except Northern Virginia. The surging demand in Phoenix has also attracted new players, and prompted expansions by existing providers. Iron Mountain, EdgeCore, CyrusOne, QTS Data Centers, Digital Realty, EdgeConneX and Aligned Data Centers have all announced new campuses or expansions of existing properties.

At present, data center supply and demand appear to be well matched, as reflected in the vacancy rate of 9.4 percent in the region. This will be a number to watch as new capacity is deployed. A key factor will be whether service providers are able to successfully pre-lease space, or seek to build new projects on speculation in order to have inventory available for large deals.

What's Hot About Phoenix?

Many Phoenix businesses experienced challenges over the past five years, but data centers have been a success story in the market. Data center users and operators have been extremely active in Phoenix recently, spurring an increase in supply to meet the demand from users both in and out of the market.

As the Phoenix business climate has improved, it has created opportunities and growth for data center users and operators from across the United States. Phoenix attracts data center users for the following reasons:

- 1. Low Natural Disaster Risk**
The city has almost no history of damage associated with seismic, tornado, and flooding events.
- 2. Inexpensive Power Cost**
A diverse fuel mix and competition from several power providers create a reliable and competitive power environment.
- 3. Tax Abatement Opportunities**
Legislation passed in 2013 enhances the state's ability to compete on large, national data center requirements.
- 4. Competitive Colocation/Cloud Environment**
Quality colocation and cloud providers have invested significantly in Phoenix over the past few years, creating a competitive market for data center users.

As Lee McPheters, research professor of economics at Arizona State University noted in his 2015 economic outlook for Phoenix, the market's economic challenges are related to the boom-and-bust cycle of the region's housing market almost a decade ago. "The construction industry in Arizona is down about 100,000 jobs since its peak (in 2007)" said McPheters. "So if we had to point a finger, the construction industry alone has accounted for a high proportion of jobs not yet regained."

However, the U.S. Bureau of Labor Statistics numbers showed a turnaround in 2015, as construction employment in Arizona steadily increased. In 2017, construction jobs grew by 8.8 percent, compared to a 2.7 percent boost in overall private sector employment.

A recent survey by HIS Markit found that small business wage growth in Phoenix grew 5.14% in the 12-month period ending in March 2018, the fastest growth rate in the U.S. Employment gains have also been seen in the financial, professional services, and education sectors for Phoenix, helping with data center adoption in the market.

The Phoenix market benefits from its reasonably low power cost, especially when compared to the highly-occupied Northern California and Los Angeles data center markets, where there is a significant price difference. Power cost is a critical decision point for both data center providers and users, and the difference of a few cents per kilowatt can mean millions of dollars saved for data center transactions.

Arizona's politicians have increased the appeal of the market to data center users by offering 10-year tax breaks on both data center equipment and labor services.

In addition, Phoenix is viewed as a disaster recovery market specifically tied to its low threat for natural disasters. For example, according to the United States Geological Survey, the city ranks on the lowest scale of earthquake threat. In addition, the threat for tornadoes and floods is at a minimum. Compared to nearby primary data center markets, Phoenix is a market companies feel safe investing in.

Phoenix's desert environment also provides opportunities for free cooling at night, directly impacting a data center's power usage effectiveness (PUE) and operational cost. Arizona's politicians have increased the appeal of the market to data center users by offering 10-year tax breaks on both data center equipment and labor services.

Trends in Demand

Demand in Phoenix originates from companies in the market and companies outside that view the Phoenix market as a disaster recovery location. When compared to other major U.S. data center markets, Phoenix is very competitive as it relates to colocation

The Phoenix market's growing traction with enterprise customers could be seen in the evolution of IO Data Centers (acquired by Iron Mountain in December of 2017), which has historically been among the largest providers in the Phoenix market.

rates, power cost, and tax incentive opportunities. These market attributes enable Phoenix to compete for many small and large data center users as a possible location for their requirement.

Phoenix has attracted several Bitcoin companies to house their infrastructure with local colocation operators comfortable with the concept. These requirements typically have very low redundancy requirements and are priced accordingly.

Other companies consistently searching the Phoenix market include those in the e-commerce, financial, insurance, healthcare, and technology industries. The Phoenix market's growing traction with enterprise customers could be seen in the evolution of IO Data Centers (acquired by Iron Mountain in December of 2017), which has historically been among the largest providers in the Phoenix market. IO opened a 500,000 SF facility in 2009, and gradually filled the huge data center with clients in finance, aerospace and technology, as well as Internet service providers.

In recent years, several hyperscale operators have leased space in Chandler, helping establish the Phoenix market as a destination for larger deals.

Trends in Supply

From a geographic perspective, most of the colocation data center providers are located in Phoenix proper and Chandler, AZ, a city approximately 25 miles to the southeast of downtown Phoenix.

A Digital Realty-owned data center at 120 East Van Buren is also the prime carrier hotel in the downtown Phoenix market. Digital Realty purchased the property back in 2006 and has grown it to be one of the largest in the market. Several other providers, including Iron Mountain (IO), Cyxtera and PhoenixNAP are located west of downtown Phoenix, near Phoenix Sky Harbor International Airport. QTS Data Centers has also procured land for a large future campus just north of Sky Harbor.

A combination of lower electricity prices and real estate costs have lured data center providers to Chandler, prompting Digital Realty, CyrusOne, and NextFort to create facilities designed to meet the needs of large users. In addition, other areas including Tempe, Scottsdale, and Deer Valley have several data center providers.

A combination of lower electricity prices and real estate costs have lured data center providers to Chandler, prompting Digital Realty, CyrusOne, and NextFort to create facilities designed to meet the needs of large users.

Over the past 18 months, Mesa has also emerged as a sub-market, with projects in the pipeline from Apple, EdgeCore, CyrusOne and DuPont Fabros Technology (which has since been acquired by Digital Realty).

Over the past 18 months, the amount of planned power to be delivered in Phoenix has nearly tripled, from 265 MW in Q1 2017 to 707 MW in Q2 2018). These are planned projects that could be built if demand is there. Here's an overview of some of the notable projects in development:

Iron Mountain commences new data center on former IO campus.

In July, Iron Mountain launched construction on a 550,000 square foot data center on its Phoenix campus, on land adjacent to the former IO Phoenix facility. The project will add 48 megawatts of capacity in two phases, with the first 24 megawatts of capacity scheduled to come online in June 2019. Iron Mountain expects to invest \$430 million in the new facility. Iron Mountain has invested more than \$2 billion in data center acquisitions and development since early 2017 resulting in a 2.5+ million square foot global portfolio comprised of 12 data centers in four countries

EdgeCore breaks ground on first data center on 7-building campus.

EdgeCore, a new wholesale provider, officially broke ground on their Phoenix campus on a site located in Mesa. The campus is designed to accommodate seven buildings and an on-site substation. Each facility will include two main data halls, totaling approximately 180,000 SF and 32 MW of commissioned power operating at a PUE of 1.25 or better. EdgeCore plans to deliver the first 6 MW and 30,000 SF in 4Q 2018. EdgeCore is also active in Dallas and Reno, with plans to announce additional markets in 2018.

Big 4Q 2017 win for Aligned Data Centers pushes next stage of development.

After signing a large lease with a tenant at the end of 2017r, Aligned started to expand its Phoenix facility in 1Q 2018. The expansion plans include preparing additional space to accommodate 60 MW of commissioned power, which will be completed as demand presents itself.

Evocative comes to Phoenix with CyberVerse purchase.

Evocative purchased CyberVerse in 1Q 2018, which added three data centers to Evocative's portfolio. Included in the acquisition is the CyberVerse 600 kW lease inside Aligned's Phoenix data center. The purchase also included a presence for CyberVerse inside both Los Angeles and Dallas.

Digital Realty now offering Oracle cloud.

Digital Realty increased their cloud service offering in 1Q 2018 by adding Oracle Cloud Fast Connect to their Phoenix locations (among others throughout the US). Similar to AWS Direct Connect or Azure ExpressRoute, Fast Connect provides a dedicated, direct, and secure link between a user's colocation and cloud infrastructure. Oracle leases over 500,000 SF across 16 different Digital Realty data centers.

EdgeMicro to introduce mini data centers at cell towers.

To accommodate future demand for IoT adoption, companies like EdgeMicro are going to begin installing micro data centers at the bases of cell towers. Doing so would help handle the increased amount of data generated from connected devices and self-driving cars, with very little latency. EdgeMicro announced a list of 30 different metros in the US, including Phoenix, where they would begin deploying these micro data centers.

Land banking provides expansion options for Digital Realty, QTS and CyrusOne.

Several providers have secured property to provide runway for future capacity in Phoenix. QTS has an 84-acre site in Phoenix to support its growing focus on hyperscale deals, while CyrusOne (68 acres) and Digital Realty (56 acres) have land in Mesa for future campuses. Digital acquired the site through its acquisition of DuPont Fabros Technology, which has identified Phoenix as an attractive expansion market for its hyperscale product.

Business Environment

The Phoenix market sees demand from local businesses, but has become a destination for providers from other markets – particularly California – who are seeking to place data center assets in a location with low disaster risk, either for primary or backup data centers.

CONNECTIVITY

Phoenix has good fiber infrastructure. CenturyLink, Electric Lightwave/Integra, Level 3, Sprint, XO, and Zayo all run long-haul fiber connections through Phoenix. Carriers such as ICFN, Syringa, Tru Com, and Windstream have developed locally-focused fiber networks. Municipal fiber is available in Mesa, AZ to serve the area's data centers.

POWER

Power costs in Arizona are well below the national average. Similar to the Los Angeles market, Phoenix is served by a public utility provider of power and water, the Salt River Project (SRP). An integrated utility, SRP provides electric generation, transmission, and distribution services in the Phoenix metro area. A privately-owned competing electric provider, Arizona Public Service (APS), serves most of the Phoenix market where data centers are clustered. Both SRP and APS offer a diverse fuel mix that includes renewable sources such as hydroelectric and solar. Phoenix's plentiful sunshine is a double-edged sword for the data center industry: It offers

an almost year-round source of "green" energy (driving public and private investments in solar power infrastructure construction, largely to accommodate a major Apple manufacturing facility in the area) but also requires more electricity to cool data centers during the area's numerous days of over 100-degree Fahrenheit temperatures.

DISASTER RISK

Phoenix is rated as a low risk for all types of natural disasters. Hurricane damage is non-existent, floods are uncommon, and there are no major fault lines to cause seismic events in the Phoenix market.

ECONOMIC DEVELOPMENT AND INCENTIVES

In an effort to lure data centers to the Phoenix market, Arizona offers a ten-year waiver on state, county, and local sales taxes on both equipment purchases and labor services for data centers.

In an effort to lure data centers to the Phoenix market, Arizona offers a 10-year waiver on state, county, and local sales taxes on both equipment purchases and labor services for data centers. Furthermore, data center projects that qualify as Sustainable Redevelopment Projects are eligible for an additional 10-year waiver on sales taxes. To qualify, a new data center must either fill a building that was at least 50% vacant, or attain a green building status such as Energy Star or LEED."

Overview of Major Providers

ALIGNED DATA CENTERS

Aligned Data Centers, a division of Aligned Energy, offers consumption-based pricing for on-demand data center capacity to enterprises, service providers, and governments. The company operates large data centers in Phoenix and suburban Dallas and is building a project near Salt Lake City.

Phase I of the company's 2500 West Union Hills data center in Phoenix was delivered in 2Q 2017. It has four separate 69 kV utility feeds provided by the Salt River Project (SRP) and a dedicated on-site substation. The secure, carrier-neutral 550,000 SF facility is capable of delivering 65 MW of utility

power. Designed to Tier 3 reliability standards, the data center's power and cooling infrastructure is configured for 2N. Aligned Data Centers also guarantees a power usage effectiveness (PUE) rating of 1.15 and designed this desert data center to use less water. Aligned's data center in Phoenix won the Global Data Center Alliance's "Data Center Energy Efficiency Project of the Year" award for 2016.

In 4Q 2017, Aligned executed a lease with Sharp Healthcare in their Phoenix data center. In 1Q 2018, Aligned began an expansion to add another 60 MW of commissioned power to their Phoenix data center.

CYRUSONE

CyrusOne is a global colocation company headquartered in Dallas, TX. They have 40 data center facilities throughout the United States, Europe and Asia and are continually growing. In efforts to drive down operational costs for customers, CyrusOne delivers their “Massively Modular” data center concept, which brings power/space to the market quickly in large facilities. CyrusOne went public in 1Q 2013, steadily growing through both construction of new data center facilities in top markets and strategic acquisitions of rivals.

CyrusOne has significantly invested in capacity in the Phoenix market. The company owns a 57-acre site in Chandler, AZ, approximately 20 miles southeast of downtown Phoenix. In June, CyrusOne announced the purchase of 69 acres in Mesa, another emerging sub-market just to the north of Chandler.

CyrusOne’s Chandler complex currently consists of two separate data center buildings, Phoenix 1 and Phoenix 2 and 3. The campus has its own 110 MW electric substation and is capable of producing 90 MW of critical power when fully built out.

Phoenix 1 was the first building completed on the campus and features approximately 25 MW of total power and 80,000 SF of commissioned data center space. Much of Phoenix 1’s capacity was originally dedicated to a bitcoin user, which traditionally take larger power requirements but with less redundancy.

In efforts to drive down operational costs for customers, CyrusOne delivers their “Massively Modular” data center concept, which brings power/space to the market quickly in large facilities.

The bitcoin user left the data center in 2015, and CyrusOne re-leased a smaller portion of the capacity by the end of 2016. Phoenix 2 supplies 12 MW of commissioned data center power and approximately 60,000 SF of commissioned data center space. Phoenix 3, was delivered in 3Q 2016 and provides 72,000 SF and approximately 6.0 MW of commissioned power.

In 3Q 2016, CyrusOne announced the acquisition of an additional 27-acres directly adjacent to their current Chandler campus. In 3Q 2017, CyrusOne delivered two new data centers to their Phoenix campus,

Chandler IV and Chandler V. Chandler V is a fully leased data center offering approximately 73,000 SF of raised floor and 12 MW of critical capacity. Chandler V is a 185,000 SF powered shell capable of supporting up to 22 MW of capacity. CyrusOne is also under construction with Chandler VI, a 9 MW, 74,000 SF data center which will be delivered in 4Q 2017. Chandler VI will also feature 96,000 SF of shell space.

CyrusOne says it plans to build a five-building campus on its property in Mesa, which will support as much as 198 MW in additional capacity.

CYXTERA

When private equity firms BC Partners and Medina Capital acquired CenturyLink’s colocation portfolio in 2017, they combined the assets gained to create a brand-new company called Cyxtera Technologies. Cyxtera is a global colocation business with 57 data centers in more than 30 markets. The company offers highly secure solutions to meet strict requirements such as those expected in financial and government entities. Cyxtera Technologies is headquartered out of Coral Gables, Florida and is comprised of Cryptzone, Catbird, Easy Solutions, and Brainspace to offer a reliable and cloud-ready infrastructure platform for more than 3,500 customers.

The Cyxtera PH1 data center is leased space inside IO Data Centers’ main Phoenix campus. This data center offers CenturyLink Cloud services such as managed hosting, cloud, security as a service, and cloud storage. In 4Q 2017, Cyxtera added Megaport services at their Phoenix data center, improving cloud connectivity options.

DIGITAL REALTY

Digital Realty (DLR) is a real estate investment trust (REIT) and the largest wholesale data center provider in the world. Digital Realty delivers colocation, powered shell, private suite, and custom data center solutions in more than 180 global facilities. In July 2015, Digital Realty acquired Telx for \$1.89 billion in a deal that expanded and expedited Digital Realty’s ability to provide integrated services for SMB-to-enterprise customers.

Digital Realty’s 120 East Van Buren building in downtown Phoenix is a four-story, multi-tenant facility with 10.0 MW of commissioned power. The facility is capable of 33.8 MW total power delivery, enabling a number of other colocation providers and

users to lease space on a triple-net lease basis from DLR and then commission power on their own. The Internet Gateway building is highly connected with fiber infrastructure, drawing interest from users with colocation and connectivity needs in the area.

Digital Realty's other large investment in the Phoenix market is at 2121 South Price in Chandler, a 519,000 SF data center where DLR has delivered 36.2 MW of commissioned data center space. Digital Realty has three other locations designed as development opportunities in the Phoenix market: two in Chandler, and one in Tempe.

In 2Q 2017, Digital Realty announced their merger with DuPont Fabros, with Digital Realty absorbing DuPont's data centers over the coming months, including the 56 acres of Phoenix land, to Digital Realty's portfolio.

EDGECONNEX

EdgeConneX is a colocation and network services company headquartered in Herndon, VA. The company created a network of over twenty smaller "edge-of-network" data centers throughout the United States 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 carrier-neutral Edge Data Center in the Phoenix market is located at 3011 South 52nd Street, Suite 107 in Tempe. Designed to support extremely high power densities with a simplified per kW pricing model, their Tempe EDC is capable of delivering 8,600 SF of commissioned data center space. Designed to SOC 2 Type 2 standards as well as the Open-IX certification, the Tempe EDC supports power densities of up to 600 W/SF with power and cooling infrastructure configured for N+1 redundancy.

EDGECORE

EdgeCore is national provider of Tier III designed, highly connected, scalable data center solutions. Founded in 2017, EdgeCore has plans to develop campuses in Dallas, Phoenix, and Reno by the end of 2018. Each campus is designed to accommodate over 100 MW of critical capacity. Their large-scale approach coupled with diverse cloud connections make their facilities an ideal candidate for enterprise and hyperscale users.

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EdgeCore's Phoenix campus is located in Mesa, adjacent to Apple's data center. EdgeCore plans to build seven data centers on the campus, totaling approximately 224 MW of commissioned power and 980,000 SF of commissioned space. Each 32 MW, 140,000 SF data center will be fed by an on-site substation and operate at a PUE of 1.25 or better.

In 1Q 2018, EdgeCore broke ground on the first data center at their Mesa campus.

FLEXENTIAL

Flexential provides cloud computing, data center, and other scalable technology infrastructure solutions and managed services, primarily for mid-market businesses. The company is headquartered in Charlotte, NC and has a growing data center footprint in the southeastern corner of the United States. Founded in 2000, Flexential concentrates on managed cloud services such as infrastructure as a service (IaaS) and disaster recovery with compliance regimes that include SOC 1 Type 2, SOC 2 Type 2, SOC 3 Type 2, PCI, and HIPAA. In 3Q 2017, Peak 10 completed their acquisition of ViaWest, giving the company a portfolio spanning 40 data centers across 20 different markets. In 1Q 2018, the combined companies rebranded as Flexential.

Flexential entered the Phoenix market in 1Q 2014 after purchasing a data center owned and operated by Cox Communications. Cox remained in the facility as the anchor tenant, and Flexential converted the additional data center footprint to multi-tenant use. Flexential will provide 42,500 SF of commissioned data center space and 5.4 MW of commissioned power at full build.

H5 DATA CENTERS

H5 Data Centers purchased NextFort's Chandler, AZ colocation facility in 1Q 2016. The company's 130,000 SF facility at 2600 West Germann Road is just a few minutes southeast of downtown Phoenix. The facility was designed to be a carrier-neutral data center to offer clients their trademarked "High Density Computing Suites (HCS)."

Each HCS is a separate concrete and steel room inside the 2600 West Germann facility that enables clients to lease a turnkey self-contained secure data center. Each suite is designed to house up to 20 racks with power densities of up to 600 W/SF or 225 kW per suite. From a cooling and energy-efficiency design standpoint, the facility uses 100% free cooling and will achieve a better than 1.25 PUE rating.

In 2Q 2017, H5 completed an expansion on the private data suites at their Phoenix facility, doubling the density in the suites.

In 4Q 2017, H5 executed a lease for wholesale space to colocation provider LeaseWeb at their Phoenix data center. The long-term lease is LeaseWeb's first with H5, but the company has indicated they will explore leases with H5 at other locations.

INAP

INAP is a global colocation company headquartered in Atlanta, GA. INAP has a presence in fifteen different cities around the world, offering colocation, cloud, and managed services to each market. The company's focus on the technology, healthcare, financial, online education, and gaming industries has propelled their growth over the last few years. In addition, INAP's focus on low latency/high availability network services provide vertically-integrated services to their clients. INAP markets their OpenStack-based AgileCLOUD service as a scalable, high-performance cloud solution for small-to-mid sized companies.

INAP's Phoenix data center is located inside Digital Realty's data center at 2121 S Price Rd in Chandler. In 3Q 2017, INAP finalized an expansion in the Phoenix data center driven by demand from a major anchor tenant from the software industry. In 4Q 2017, INAP executed a lease for the entirety of the new capacity from the unnamed anchor tenant.

IRON MOUNTAIN DATA CENTERS

Iron Mountain is a data center operator headquartered in Boston, MA. The company has offered wholesale data center services from underground data centers since the 1980's, but has recently made headlines with the acquisitions of EvoSwitch Netherlands, IO Data Centers, FORTRUST data centers and two Credit Suisse data centers (London, Singapore). Iron Mountain now offers colocation services in Amsterdam, Boston, Denver, Kansas City, New Jersey, London, Northern Virginia, Ohio, Pennsylvania, Scottsdale, Singapore, and Western Pennsylvania.

In 4Q 2017, Iron Mountain purchased colocation provider IO Data Centers for \$1.3 billion, adding a presence in Phoenix, New Jersey, and Columbus, OH. The purchase gives Iron Mountain ownership over a 98,000 SF data center in Scottsdale and a 500,000 SF campus in Phoenix. IO had historically been the largest provider in the Phoenix market, has also built an impressive customer base among enterprise customers, including clients in finance, aerospace and technology.

The company has launched construction on a 550,000 square foot data center on its Phoenix campus, on land adjacent to the former IO Phoenix facility. The project will add 48 megawatts of capacity in two phases, with the first 24 megawatts of capacity scheduled to come online in June 2019. Iron Mountain expects to invest \$430 million in the new facility.

Iron Mountain now offers colocation services in Amsterdam, Boston, Denver, Kansas City, New Jersey, London, Northern Virginia, Ohio, Pennsylvania, Scottsdale, Singapore, and Western Pennsylvania.

PHOENIXNAP

Founded in 2009, PhoenixNAP is a global IT services provider offering high-performance Infrastructure-as-a-Service (IaaS) solutions from locations worldwide. The company focuses on bare metal servers, cloud, hardware leasing, and colocation options built to meet the evolving technology demands enterprises. The company has locations in Atlanta, Phoenix, Northern Virginia, Belgrade, Singapore, and Amsterdam.

The company's data center at 3402 East University in Phoenix is a carrier-neutral facility with dual feeds from nearby SRP substations. PhoenixNAP commissioned 4.5 MW with another 3 MW planned for their 90,000 SF of commissioned data center. Their modular design enables power densities for compute and storage environments of up to 500 W/SF with power and cooling infrastructure configured for 2N redundancy.

In 4Q 2017, PhoenixNAP added Megaport to their cloud connectivity services.

QTS DATA CENTERS

QTS Realty Trust (QTS) is a data center provider and REIT with twenty-two data center properties worldwide. The company traditionally finds large, robust facilities and transforms them into LEED-certified data centers. Integrating real estate services with data center operational experience, QTS enables their mostly Fortune 1000 customers to utilize the “3Cs” of custom data centers (C1), colocation (C2), and cloud services (C3).

The QTS data center in Phoenix, located in DLR’s 120 East Van Buren facility, is designed as both a colocation and disaster recovery facility for the company’s private cloud platform. As a tenant in Digital Realty’s facility, the QTS data center meets HIPAA, PCI, and FISMA data privacy requirements and sits on the backbone of more than a dozen major network providers. Power to the data center is delivered by APS from diverse underground feeds. QTS’s data center power and cooling infrastructure is configured for N+1 redundancy.

In 4Q 2017, QTS completed the purchase of an 84-acre land site in Phoenix for \$25 million. QTS will construct a multi-building campus on the site, but is waiting on an anchor tenant before they begin development.

ZCOLO

Boulder, CO-based zColo is a carrier-neutral data center provider whose parent company, Zayo, is a publicly-traded global provider of bandwidth infrastructure services. zColo’s data center footprint of 34 facilities extends to over twenty United States markets. They also offer their Metro Interconnect Service in eleven major U.S. markets, providing connections to multiple data centers across their network. In 2015, the company purchased Latisys, a provider of hybrid Infrastructure-as-a-Service (IaaS) solutions for cloud and colocation customers, for \$675 million.

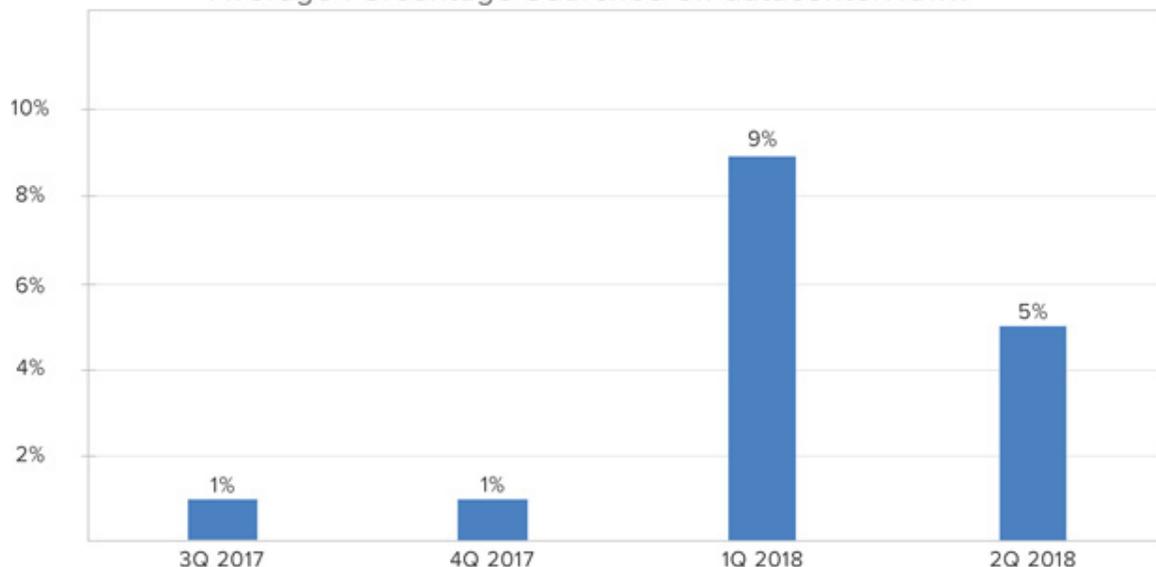
Designed to support their managed cloud clients, the zColo data center is located in the Park Central Mall at 3110 North Central near downtown Phoenix. zColo has 1.2 MW of commissioned power off the 9 MW total SRP utility power and is configured for N+1 power/cooling redundancy. zColo has 8,200 SF of commissioned space for suites, private cages, and cabinets.

In 4Q 2016, 365 Data Centers partnered with Zayo to increase cloud connectivity at several of 365’s data centers, giving their customers direct private access to their cloud infrastructure.

Customer Search Trends

Search trends at datacenterHawk provide insights into customer interest in the Phoenix data center market.

Phoenix Search Market Graph
 Average Percentage Searched on datacenterHawk



About Our Sponsor



Iron Mountain's data center in Manassas, Virginia.

IRON MOUNTAIN

www.ironmountain.com

Iron Mountain data centers meet the exacting requirements of the world's most demanding organizations. However, what really sets us apart is the confidence we instill in every customer. Iron Mountain works with 230,000+ customers across the globe including 95% of the Fortune 1000. Whether you are a growing company in need of an individual cabinet or a multi-national looking for a 20,000 square-foot dedicated data center, you can trust Iron Mountain as your data center provider to protect what matters most.

Iron Mountain Incorporated (NYSE: IRM), founded in 1951, is the global leader for storage and information management services. With a real estate network of more than 85 million square feet across more than 1,400 facilities in over 50 countries, Iron Mountain stores and protects billions of valued assets, including critical business information, highly sensitive data, and cultural and historical artifacts.

Providing solutions that include information management, digital transformation, secure storage, secure destruction, as well as data centers, cloud services and art storage and logistics, Iron Mountain helps customers lower cost and risk, comply with regulations, recover from disaster, and enable a more digital way of working.

Methodology

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

1. Primary - Data center markets with larger number of colocation and cloud providers. These are in major cities with diverse business sectors and large economies
2. Secondary - Data center markets with smaller number of colocation and cloud providers. These are in mid-sized cities with small-to-medium economies

Primary and Secondary data center market sizes are defined based on the total amount of power and space in the market. The total amount of power and space in each market is calculated based on four key attributes:

1. The amount of commissioned power and space
2. The amount of available power and space
3. The amount of under construction power and space
4. The amount of planned power and space

METHODOLOGY EXAMPLE

Data Center Provider A builds a 75,000 gross square foot data center, with three separate data halls of 1,200 kilowatts (kW) and 10,000 square feet (SF) of data center space each during a phased

construction. Data Center Provider A leases one of the three data halls (1,200 kW/10,000 SF) to a user and completes construction on the second data hall (1,200 kW/10,000 SF) to be ready for the next leasing opportunity. The third data hall is in shell condition and therefore considered “planned” space. The resulting datacenterHawk analysis of Data Center Provider A’s power and space capacity is:

In addition, the datacenterHawk analysis considers that many colocation and cloud providers lease infrastructure from larger data center providers. In datacenterHawk’s analysis, power, and space leased from one data center provider to another is counted 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 lease that 1,200 kW/10,000 SF of commissioned power and space to smaller customers, the analysis would only include the 1,200 kW of commissioned power and 10,000 SF of commissioned space one time.

These attributes in each market are tracked and refreshed on a quarterly basis throughout the year. Through the continuous monitoring of these components, a baseline is calculated for each market that is used to measure market growth and deliver the most current and valuable information needed.

DATA CENTER PROVIDER A – CAPACITY OVERVIEW

Power	Available 1200 kW	Commissioned 2400 kW	Under Const. 0 SF	Planned 1200 kW
Space	Available 10000 SF	Commissioned 20000 SF	Under Const. 0 SF	Planned 10000 SF

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