With NTT data centers like this one underlying its services, Dimension Data is capitalizing on the corporate trend toward data center virtualization amid a larger set of IT services and solutions.
Image courtesy of Dimension Data

Need some help in your data center decision-making? Let the data itself show you the way.

by ADAM BRUNS
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When **Apple** on February 2 announced it would locate a new $2-billion command center for its global data center network at Eastmark, the DMB-developed property in Mesa, Ariz., where Apple partner GT Advanced Technologies' sapphire screen manufacturing effort came up short, the news was infused with the same sort of mystery that accompanies many Apple product development narratives. Namely: What are they up to behind that curtain?

"Apple has solidified the vision for Eastmark as a vital economic engine for the Southeast Valley," said DMB of the project, which brings a 30-year commitment and promises of 150 new Apple jobs and up to 500 construction and trade jobs.

That vision might have appeared to be a mirage to some after GT, which held the promise of 2,000 jobs, went bankrupt instead. But Apple was earnest in its efforts to preserve and create jobs at the location, where the state had provided $10 million in incentives originally for the sapphire glass facility. The state is not providing any additional incentives for this project.

But still, what is Apple actually going to do there?

"Outside of Apple describing the nature of the property's role as it relates to its specific function within their network of data center infrastructure, the use of the term 'command center' does not provide the sort of details to those outside the organization that allow for an understanding of how the new data center/command center fits in to the broader architecture of Apple's IT platform," says Luke Denmon, an associate on CBRE's Data Center

Solutions team. On the date of the Apple announcement, CBRE coincidentally had just released research that highlighted the area's data center activity from such firms as CyrusOne, CenturyLink/IO Data Centers, BitCoin and Digital Realty Trust.

"What can be discerned is that Apple has found merit in the underlying infrastructure at a regional level to place an immense amount of capital investment in Arizona," Denmon says. "That is a signal to data center users that the power grid is safe, stable and cost-efficient."

Apple is doing its part to contribute to that grid, building and financing solar projects that will produce 70 MW of clean energy in order to power the facility with 100-percent renewable energy. But just as important as the power grid is the grid of connectivity.

"Other data center operators can be assured that the regional network topology of the East Valley can accommodate some of the world's highest-traffic companies," says Denmon of the implications of the Apple project.

> **"Apple has found merit in the underlying infrastructure at a regional level."**
>
> — Luke Denmon, CBRE Data Center Solutions

Michael Murphy, CEO, NEF

Kim Lofgreen, marketing and business development manager with the City of Mesa, says the city's Elliot Road Technology Corridor where Eastmark is located has a streamlined entitlement process, robust infrastructure and more than 1,000 acres (405 hectares) of shovel-ready land. The city also boasts a downtown data center location on city-owned property with reliable, efficient, green power provided by the City, a robust fiber network with dark fiber availability, and the possibility of a public-private partnership.

CBRE says a 1-MW tenant's bottom line could see as much as $6 million to $7 million in tax savings over a 10-year period because of incentives passed in 2013 by the Arizona Legislature, though the language of the statute is more aligned to multitenant operators than stand-alone data centers.

Most companies' data center concerns are more mundane than global command centers, says Jeff West, director of data center research for Cushman & Wakefield. Essentially, just as corporate real estate in general rose over years to more prominence in the C-suite, so too is the importance of data center space emerging from being just another part of the IT budget.

"Most small to large enterprise end users are still struggling to evaluate their own data center footprint," says West, and to make that footprint both more efficient and more secure, as everyone expects to walk into any space and immediately connect their devices to the network. In addition to standard evaluations of factors such as power cost, power usage effectiveness (PUE) and latency, the questions range from "Are there closets in office buildings we should re-evaluate?" to "How much redundancy do we need?"

This graphic and the graphic on p. 35 on following pages are used by permission from "Data Center Decisions," a February report from Mortenson Construction based on a survey of more than 220 professionals at the 2014 Data Center World conference.

Mapping the Dark

The opportunity nascent in Phoenix-area dark fiber is not limited to that area. Michael Murphy is CEO of Boston-based NEF, one of the first dark-

The above map from NEF, color-coded by carrier, shows the relative regional density of US dark fiber.

fiber-only agents in the United States. Naturally enough, it got its start after the telecom meltdown a decade ago.

"There were a lot of assets in different states of operation," he says. "We started with a local utility here in Boston that had a fiber footprint. Their demand-based carrier base went away, they had all this fiber base and didn't know what to do with it."

Today, NEF maintains a proprietary database called Fiber Locator that keeps track of street-level fiber maps of about 300 carriers, long-haul metro and subsea lines, lit buildings and publicly known data centers. "We'll take all this great information and look at site surveys in a more granular way," says Murphy, including sending staff out to inspect physical lines, connections and manholes to make sure what the map says is there is really there.

"Are diverse sites really diverse?" Murphy asks. "They're supposed to be, but maybe everything collapses in one manhole. We're also looking at power feeds — looking at the manholes, looking at the tags on the fiber, allows us to validate that the cables are where they need to be. Some companies frankly will look at the risk/cost equation and say they'll accept some risk, eyes wide open," says Murphy, such as a manhole three miles from a site with multiple providers going into it. "We'll usually have recommendations on how to address it."

NEF's customers tend to be large enterprise clients, a trend that started with DC-area data center developers such as Digital Realty. But smaller, more specialized customers come along too.

Recently a healthcare provider with hospitals across several states needed to place a pair of data centers for disaster recovery. "Hospitals are famous for placing data equipment in their hospitals," says Murphy, in space that would be better spent on patient beds. "We did a survey that took in four to five states, and we looked at network interconnections — they needed a lot of dark fiber for teleradiology applications. We had to have certain primary carriers for MPLS [multi protocol label switching], a technology that's great for remote offices — think of all the clinics and offices that need to access patient records. From there they worked with us on total cost of ownership — space, power, infrastructure they'd have to provide versus where they were today. A big component, which ended up being 35 percent or so, was fiber networks. So picking the wrong location drives the cost way, way up."

Another recent customer was a large content provider that operates a travel website, with truckloads of photos and user reviews.

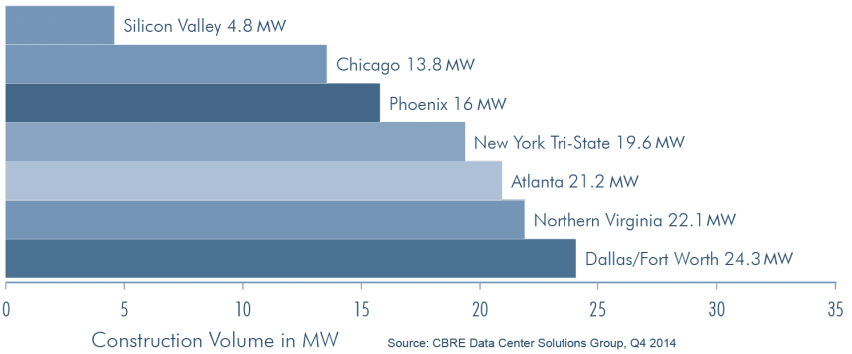
"They needed to get their content closer to end users," says Murphy. "Think about latency, which is critical to a lot of applications today. We needed to look at demographic data, plus usage, and here it was more about interconnection points and having IP connections. Certain providers have better routes to different parts of the country and the world. We had to match the site mechanics with the network requirements, and look at all the costs."

Hot Spots

Murphy says Jacksonville, Fla., has been "really hot" location for data center colocation activity because of the new subsea cables landing there, in addition to others already there and the multiple cables coming onshore from West Palm Beach to Miami. "We have seen Reno popping up, looking to build a new fiber route, and there's more activity in Las Vegas — Switch, which was Enron's bandwidth trading operation, has a very robust facility and it's very eclectic."

Kansas City is another location seeing more activity, says Murphy, noting that the NEF map shows "a whole bunch of fiber lines that all connect there. "They have the Google Fiber project," he says, "and you also have some interesting backbone connections that all traverse through Kansas City. Just to the east, St. Louis is low cost of power, and starting

Q4 2014 DATA CENTER CONSTRUCTION PIPELINE



Source: CBRE Data Center Solutions Group, Q4 2014

to build more of their bandwidth infrastructure. Salt Lake City is another location people are taking a look at, and North Carolina."

Cushman & Wakefield's Jeff West says Hillsboro, Ore., near his base in Portland, is emerging as a key destination. With an enterprise zone and a property tax abatement program there, "you can zero out your tax bill on a pretty large capex," he says. "Portland also has fairly cheap power, and green power too."

Jim Kerrigan of North American Data Centers, whose focus is on multitenant centers, says he sees companies developing data centers to get closer to consumers. It started at the beginning of 2014, he says.

"Historically it's always been business to business. But with telecom and CDNs [content distribution networks], we're seeing a lot more going into tertiary markets," he says. "They're trying to get closer from a latency perspective."

Another continuing trend is "the continued effort by states to increase the incentives that inure to the smaller tenants. A lot of the tax credits are not tied to employees like they would be for a call center or office deal. Say you're spending $10 million every two years to refresh your space, and the personal property tax is 5 percent or 6 percent. If all of a sudden the state waives that, that's not a small dollar number over a 10-year lease."

Mostly Cloudy

NEF's Michael Murphy says "cloud" is now the most overused term in today's IT discussion. But in data center terms, it just changes the end point, not the need or requirement, he says.

"If someone's going from their headquarters location to their own private data center, the needs and traffic are the same as if they are going to an Amazon interconnect point — all the same things apply to the cloud."

What shouldn't get lost, he says, is the idea that data needs can be prioritized and distributed. He offers travel websites as an example.

"They may look at the three to four pieces of content that make the site, such as listings, reviews, photos, and some sort of booking engine where they make money. Those four components can sometimes be separated and live in different areas. One can be in an archive vault for cloud, one can be distributed across some lower-cost data centers. It's understanding the criticality, and the latency, and building from there."

Cushman & Wakefield's Jeff West echoes Murphy in noting the strategy evolution toward parceling out certain applications and functions. He also sees a relatively new phenomenon as the multitenant market reaches maturity: space opening up from former large leases, which some landlords were concerned about re-filling.

"Last year we saw sublease space from Yahoo, Facebook, Zynga and others" in Silicon Valley and Northern Virginia, he says. Landlord concerns vanished, however, as that space was snapped up. Interest also is rising in legacy, borderline-obsolete space and carrier hotels that have hardened buildings, power capacity and fiber proximity. A former AOL facility in Ashburn, Va., has been purchased by Infomart

Data Centers with the intent to turn it into a multitenant operation, and DCI Technology Holdings in February bought a legacy American Express data center in Minneapolis intending to do the same thing, as that market's multitenant activity heats up.

Dimension Data, a $6.7-billion subsidiary of Japan's giant NTT Group, is one of those providers offering an increasingly virtualized model of solutions and services.

"There is a facility element," says Rich Garratt, director of the data center business unit for Dimension Data for the Americas, "but we primarily focus on ICT infrastructure across agile platforms. What we see is more and more clients looking to consume IT as a service. We see clients looking to providers like ourselves to leverage our footprint on a global basis. They're looking at moving more and more of their investment into co-location facilities to take advantage of aggregation of management, or consuming their infrastructure in a hybrid cloud model."

In Dimension Data's case, that footprint is NTT's global network across its many subsidiaries, including NTT Communications, which just acquired RagingWire.

But the firm needs human footprints too: In February, Dimension Data announced it will hire 300 data center experts over five regions of the globe over

the next 18 months, as the group looks to quadruple its data center business to $4 billion by 2018.

In November 2014 Equinix surveyed more than 650 IT decision makers in Australia, Brazil, Germany, United Kingdom, North America, and Singapore, where the company is unveiling SG3, a new $55-million, seven-story, 5,000-cabinet data center, its third on its Singapore campus, driven by the area's financial services activity. Equinix found that the vast majority (77 percent) plan to implement multi-cloud architectures in the coming year.

Global Outlook

Mike Spieldenner, NEF's head of consulting, just completed a study of Central and South America, and is also the resident EU expert.

"In general, 90 percent of the development has been in the Western European area, which is considered the core of the network," writes Spieldenner by e-mail. "From an infrastructure standpoint, Frankfurt is the heart (center of the EU) and Amsterdam is certainly just as strong, but not centered. There is a lot of movement in Dublin, primarily because the costs and lack of development space in London has driven things in that direction."

As for Latin America, "In general, most of the activity for new data center development has been in Brazil, but recently there has been movement to the less painful and more cost-effective locations such as Peru, Chile and Panama," says Spieldenner. The pain in Brazil is echoed in a 2014 report on that market from Cushman & Wakefield, which noted the country's 99.3 million Internet users and 271 million mobile phones, but also said "it is a country with one foot tied by unreliable infrastructure, government red tape and a shortage of skilled labor."

Panama tops NEF's Latin America list when judged by interconnections, growth, stability and costs. "While the base-transport service costs are similar, the equipment and service duties/taxes are lower overall resulting in a 20- to 25-percent reduction in overall costs," writes Spieldenner in a recent report of Panama's advantage over Brazil. "More importantly, importing equipment, implementing a network environment and managing a remote system in Panama is easier because of the regulatory and operational environment.

"However," says Spieldenner in another note, "from a pure infrastructure standpoint, it is hard to beat Brazil, which has multiple long-haul and metro networks, cloud, latency-optimized long-haul and a wide variety of interconnection points."

Sometimes dependability emerges from places a bit off the usual radar. In December, Technopolis, a business park in Rabat, Morocco, that is already home to 76 companies with 30,000 employees, signed a contract with a company to implement the first certified Tier III Data Center in Morocco, after studies confirmed the hardiness of the location's infrastructure and business climate. The project will bring a $28-million investment in the shell and core alone, and is projected to create 100 direct and indirect jobs.