

# Digital Realty Trust

Case Study | Data Centers



# A Network of Mission Critical Facilities Run by Trusted BMS



Dependability and customer-oriented solutions are critical components of Digital Realty Trust's value proposition. As the largest third-party owner of technology-related real estate, it acquires, manages and builds mission critical communication and data center facilities. Customers gain a "building within a building."

The founders of Digital Realty Trust—(NYSE: DLR) began acquiring properties in early 2001. Today, Digital Realty Trust's portfolio has 60 properties totaling over 11 million square feet in 25 markets across North America and Europe.

More than a collection of facilities, Digital Realty Trust saw an opportunity to create a network of properties united by its own Ethernet over a fiber data network. A key to this vision was a set of building technologies supporting the company's unique value proposition:

- Guaranteed massive electrical power to run multi-tenant server farms in a single building.
- Precision temperature and air flow control systems to maintain the range of cooling conditions required to keep servers running at maximum efficiency.
- A building management system that would integrate easily with building system controllers in multiple facilities and provide partitioned access to controls for Digital Realty Trust and its individual tenants.
- A building management system that would operate efficiently over an IP network with a central hub controlling nodes distributed across multiple cities and regions.

These requirements were not easy to fulfill. Selecting a trusted partner that could guarantee these capabilities was essential. Tenants would not want to risk their data or lose control of the security and environmental protection of their information systems.

## FLEXIBILITY IS THE GOAL

TAC was chosen because it met the unique needs for access to building management system controls for Digital Realty Trust and its tenants. The close collaboration between TAC Strategic Accounts Group and Schneider Electric unified the critical requirements of a trusted partner for power systems and building management systems. This is an ideal relationship for Digital Realty Trust, according to Ted Martin, VP of Operations.

"We conducted a strenuous selection process, looking at all the suppliers. TAC and Schneider Electric provided the greatest degree of flexibility to address our multi-tenant applications," Martin says.

Digital Realty Trust uses the TAC Andover Continuum system to provide precision controls for heating, ventilation and air conditioning. Yet the programmability of the system to meet different tenant scenarios was the main attraction.

"Some tenants want total ownership and access to operations. For them we provide the bandwidth, the IP address and access to their part of the building management system controls," Martin says. "Other tenants are happy to have us manage systems for them. In either case, we are responsible for the buildings, which include the power, environmental and security systems."

With a business model that allows tenants to lease an entire floor, office or section, Digital Realty Trust's building management system must be flexible to new scenarios of control. When this is multiplied across 13 major data centers in a region and 60 properties worldwide, flexibility and scalability are critical.



## DIGITAL REALTY TRUST PORTFOLIO AS OF DECEMBER 31, 2006

Location	Properties	Buildings	Square Feet	Square Meters
Amsterdam	2	3	168,057	15,613
Atlanta	2	2	563,772	52,376
Austin	2	2	119,962	11,145
Boston	4	5	681,086	63,275
Charlotte	3	3	95,499	8,872
Chicago	2	2	1,295,286	120,336
Dallas	7	9	1,707,985	158,677
Denver	1	1	82,229	7,639
Dublin	2	2	140,000	13,006
Geneva	1	1	59,190	5,499
Houston	1	6	300,705	27,936
London	1	1	63,233	5,875
Los Angeles	4	4	755,046	70,146
Miami	2	3	226,314	21,025
Minneapolis/St. Paul	1	1	112,827	10,482
New York	3	3	678,211	63,008
Northern Virginia	3	4	107,234	9,962
Paris	1	2	352,146	32,715
Philadelphia	1	1	654,758	60,829
Phoenix	3	3	455,531	42,023
Sacramento	1	1	62,957	5,849
San Francisco	1	4	527,680	49,023
Seattle	1	1	389,460	36,182
Silicon Valley	10	15	1,712,911	159,135
Toronto	1	1	83,758	7,781
<b>TOTALS</b>	<b>60</b>	<b>80</b>	<b>11,395,837</b>	<b>1,058,708</b>

## TENANT ACCESS VIA BROWSER

TAC's Andover Continuum CyberStation® web browser allows each tenant to access the controls and monitoring systems they need across Digital Realty Trust's virtual private network. Firewall protection and authentication systems guard the virtual boundaries between tenants.

"We update and refine the system regularly and TAC's ability to adapt to change is very important," Martin says.

The system also provides alarms to alert users if there are issues with air flow, humidity or utility controls. Constant and accurate monitoring reassures tenants that the environment for their servers is maintained within specified parameters.

Schneider Electric provides the power systems, including uninterruptible power supply with battery backup to meet the crucial requirement of continuous high-capacity power for the facilities.

In addition, Digital Realty Trust utilizes specialized Access Control systems including closed-circuit television cameras and digital video recorders from TAC's Integral Technologies.

## BEYOND THE BUILDING

To ensure high reliability for its customers, Digital Realty Trust backs up its building management system with redundant servers. This provides full disaster recovery in case of an emergency. Digital Realty Trust has incorporated the NetController SNMP alarming to provide an alternative method to send critical alarms to third party Network Management Systems. Digital Realty Trust also manages its own energy costs by using TAC energy conservation measures such as load shedding, where possible, across facilities.

## TAC PARTNERSHIP A SUCCESS

The building systems selection and the business model have worked quite successfully for Digital Realty Trust, according to Martin.

The company provided a 78% return to its investors in 2005 and was named the top Real Estate Investment Trust (REIT) for that year. Tenants include Advanced Micro Devices, Amazon.com, Amoco, British Petroleum, Electronic Data Systems and Yahoo!

As a REIT, Digital Realty Trust invests in real estate similar to the way a mutual fund invests in stocks. The company must annually distribute at least 90% of its taxable income in the form of dividends to its shareholders. This makes profitability a primary driver for its investments. With a data network in place and building management systems that provide optimal building control, Digital Realty Trust can keep its tenants happy and rapidly grow its revenues and portfolio.

The properties of Digital Realty Trust encompass 11.3 million square feet of space. Some examples of tenant requirements include:

- Tenants' data centers demand enormous power systems which are supplied by Schneider Electric. Digital Realty Trust's 1.1 million square foot Chicago facility provides five times the power capacity of the Sears Tower in one-quarter of its size.
- Precision TAC control systems deliver reliable conditions for Digital Realty Trust's 100,000 square foot facility in Dallas. This site features state-of-the-art network security, power capacity and telecommunications.

## BACnet PREFERRED

The company operations department also likes the open standards approach provided by TAC's native BACnet implementation.

"We like BACnet for integrating components, especially since we do a lot of retrofits with existing building systems in place at some of the facilities we acquire," Martin says. "Any additional overhead costs for BACnet are incremental and well-covered by the ease of integration."

## PARTNERS FOR THE LONG HAUL

As Digital Realty Trust continues to grow its "Turn-Key Datacenter" business model, TAC Strategic Accounts Group will provide global coordination and design expertise. This will ensure that Digital Realty Trust's standards are implemented.

"International expansion goals for Digital Realty Trust include TAC and Schneider Electric as key partners to guarantee high performance capacity and profitability of our facilities," according to Martin.

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