



DIGITAL REALTY TRUST

The Importance of Level 5 Commissioning

560 MISSION STREET, SUITE 2900
SAN FRANCISCO, CA 94105
TEL 415-738-6500
FAX 415-738-6501
WWW.DIGITALREALTYTRUST.COM

2323 BRYAN STREET, SUITE 2300
DALLAS, TX 75201
877-DRT-DATA (378-3282)
TEL 214-231-1356
FAX 214-231-1345
WWW.DIGITALREALTYTRUST.COM



DIGITAL REALTY TRUST

Would you fly in a plane that hadn't been tested first? If you're like most of us your answer would be no. Your rationale is straightforward. Without being tested, you have no demonstrable evidence that all of the aircraft's systems work as they should, particularly under stress. In short, you have no assurance that once it is up and operating that your plane won't crash.

Although the failure of a datacenter system or component isn't as personally catastrophic as in the airplane example above, it can be devastating to the operations of your organization's mission critical applications. Just as you wouldn't consent to being a passenger on an untested airplane, you also shouldn't entrust your company's most important applications to operate in a datacenter that hasn't undergone the most extensive level of performance testing possible.

The Importance of the Commissioning Process

In simple terms, the datacenter commissioning process can be defined as its operational pre-test. All of the complex and interrelated systems that comprise the facility (power, cooling, security, and fire suppression) are evaluated to ensure their proper operation prior to its first customer commencing their operations above its raised floor. Unfortunately, the level of commissioning testing conducted often varies between datacenter providers. Thus, while all potential providers may affirmatively respond to your inquiries regarding datacenter commissioning, you'll have to dig deeper to make sure that the facility has been sufficiently tested to support your mission critical applications.

Level 5 Commissioning...The Key Point of Differentiation

Also known as the "integration phase", Level 5 commissioning is the most important component of the commissioning process. In this phase, every aspect of the datacenter is tested while it is running at its maximum capacity. In other words, every component and system of the facility must prove its ability to perform when the datacenter is operating in its most stressful environment. During Level 5 commissioning, all failure modes are tested and resiliency is validated, including scenarios such as:

- How do the back-up systems perform in the event of a dropped utility line?
- How do the redundant units respond when a CRAC fails?
- Does the facility's power architecture switch over upon the failure of a UPS?

If integration testing is not performed then how the site will respond to an outage is unknown until it happens in a live environment, or simply, when it is too late. Therefore, the failure of a provider to perform Level 5 commissioning is tantamount to asking its customers to "fly in their untested plane".



Why Do Some Providers Neglect Level 5 Commissioning?

For many datacenter providers their performance of Level 5 commissioning is not so much a conscious decision not to conduct this level of performance testing, but rather a physical limitation that prohibits them from doing so. Since the testing protocol that defines Level 5 commissioning necessitates that it cannot be performed in a “live” environment (one with operating customers) the method and architecture used by a provider to build-out a facility serves as the determining factor in their ability to conduct this final critical phase of testing.

The vast majority of today’s datacenter provider’s use what can best be described as a “phased” design and build-out methodology across a shared system in the development of their facilities. In this structure the entire space to be converted to a raised floor environment is supported by a common backbone of components including its power and cooling elements. As a result, all components that are selected to support the facility must be sized to support the entire floor space regardless of the number of customers it houses. Since a provider’s customers are typically gathered incrementally rather than all at once this means that the entire space cannot ever be tested at its maximum load without interrupting customer operations. For example, a provider deploying eight (8) diesel relay UPS’ in an N+1 configuration cannot install three (3) units in the first phase and still conduct true Level 5 commissioning without outages as all of the remaining units (numbers 4-8) have yet to be deployed. Thus, customers operate in an environment in which the ability of the facility’s systems to perform in the event of a component failure is unknown until it actually happens! This inability to guarantee a “fail safe” environment is particularly dangerous when viewed in light of Digital Realty Trust research findings in which 85% of survey respondents rated operational reliability as the key factor in their datacenter decision.

Due to the use of our unique POD Architecture™, Digital Realty Trust builds out our facilities in 8-12,000 square foot discrete increments (PODs). Each POD contains its own supporting infrastructure and components, as opposed to the shared backbone architecture described earlier. This incremental design approach enables us to perform a full commissioning process, including Level 5 activities, for each POD as the final element of its development. In other words, no Digital Realty Trust customer moves into one of our facilities without the assurance that all system operations have been fully load tested and verified to insure that they provide the level of reliability that today’s mission critical applications demand.



Summary

The importance of the applications housed within corporate datacenters only continues to increase. This escalating level of mission criticality has only increased the need for datacenter providers to ensure that their facilities can deliver the level of operational reliability that their customers demand. Despite the fact that all providers perform some level of commissioning, only by completing the integration phase (Level 5 commissioning) can they insure that all of a facility's systems will perform as required under maximum load. As we have seen, based on their architectural constructs many of today's datacenter providers cannot perform this level of testing, thereby placing their customers in a potentially volatile operational environment--a truly risky proposition. Through our use of our POD Architecture™ Digital Realty Trust is not only able to perform Level 5 commissioning it is a standard element of our development process. Trusting your mission critical applications to an unproven facility is a decision that you shouldn't have to make.



DIGITAL REALTY TRUST

About Digital Realty Trust

Digital Realty Trust is the largest purchaser, owner, developer and operator of datacenter space in the industry. Since 2004, we have purchased over \$2 billion in datacenter assets and designed and built facilities across North America and Europe. We currently own over 60 properties in 25 markets and manage over one (1) million square feet of datacenter space worldwide. This is why over 50 Fortune 500 firms rely on Digital Realty Trust to provide their datacenter solutions.