



STATE OF DELAWARE
DEPARTMENT OF TECHNOLOGY AND INFORMATION
 801 Silver Lake Blvd.
 Dover, Delaware 19904

Doc Ref Number:	SE-DCP-001	Revision Number:	1
Document Type:	Enterprise Policy	Page:	1 of 13
Policy Title:	Data Center Policy		

Synopsis:	Establish a state-wide policy for the designation, classification, construction and expansion of data center facilities.		
Authority:	Title 29, Delaware Code, §9004C - General powers, duties and functions of DTI "2) Implement statewide and interagency technology solutions, policies, standards and guidelines as recommended by the Technology Investment Council on an ongoing basis and the CIO, including, but not limited to, statewide technology and information architectures, statewide information technology plans, development life cycle methodologies, transport facilities, communications protocols, data and information sharing considerations, the technique of obtaining grants involving the State's informational resources and the overall coordination of information technology efforts undertaken by and between the various State agencies;"		
Applicability:	This Policy is applicable to all users of the State of Delaware communications and computing resources. DTI is an Executive Branch Agency and has no authority over the customers in Legislative and Judicial Branches, as well as School Districts, and other Federal and Local Government entities that use these resources. However, all users, including these entities, must agree to abide by all policies, standards promulgated by DTI as a condition of access and continued use of these resources.		
Effective Date:	3/9/2007	Expiration Date:	None
POC for Changes:	Bill Hickox, Chief Operating Officer		
Approval By:	Secretary Jim Sills, Chief Information Officer		
Approved On:	8/27/2014		





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I. Policy

EXECUTIVE SUMMARY

This policy establishes the designation and classification of data center facilities within the state, and the requirement for DTI approval of all construction and/or expansion of data center facilities.

Contained within this policy are technical guidelines for Information Technology professionals. It lays the groundwork for the proper use of data centers, server rooms, computer rooms, computer closets, and all locations where multi-user computing equipment (servers, communications equipment, etc.) is housed. Additional standards and policies will build upon this foundation. Further insight into this policy may be obtained through your organization's IRM (Information Resource Manager) or the DTI CES (Customer Engagement Specialist) assigned to your organization.

PURPOSE

This policy includes a means of consistently describing data centers and defining the appropriate relationship between types of systems.



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This policy provides guidelines for State entities to classify the various reliability levels of their data centers and be able to determine the relative safety of the State's data that is under their stewardship. This includes, but is not limited to Application Service Provider's, critical business partners and service providers.

This policy must be used in concert with other policies and standards in order to be effective. The [Data Classification Policy](#), [Delaware Information Security Policy](#) and the [System Architecture Standard](#) are especially applicable. The tier of data center reliability increases in importance when the data is non-public or the computer system is critical to the State's mission. The required tier of reliability for a data center is a result of classifying the data and determining the criticality of the computer system.

This policy will be revised and reviewed every three years. However, the State is obligated to comply with new laws or regulations coming into effect between revisions.

POLICY STATEMENT

1. The establishment of a new data center by a state organization will require the prior approval of the Chief Information Officer of the State of Delaware.
2. Significant expansion of an existing data center by a state organization will require the prior approval of the Chief Information Officer of the State of Delaware. For purposes of this policy, a significant expansion is an undertaking that:
 - A) expands the floor space by 20% or more;
 - B) would change the data center classification; or
 - C) is expected to cost \$50,000 or more.
3. Organizations with existing data centers should arrange to have the data center evaluated and classified based on the characteristics defined in this policy. Beginning January 1, 2008, any data center intended to be used by an IT project must have a DTI-approved data center classification. To facilitate this, DTI will provide data center classification services at no cost to the requesting organization through December 31, 2007.



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IMPLEMENTATION RESPONSIBILITY

The responsibility of arranging for classification of an organization's data center according to this policy lies with the organization's appointed IRM. DTI is responsible to determine a data center classification based upon the criteria established herein, whether through DTI personnel or through use of qualified vendors.

There are no plans at this time to require the upgrade or movement of existing equipment or facilities based upon this policy. It is expected, however, that as Business Cases are submitted for review by the internal Technology Investment Council / Technology Investment Council, the issue of data center classification will arise.

If there is ambiguity or confusion regarding any part of this policy, contact the point of contact defined in the header of this policy.

Tier Classifications Define Site Infrastructure Performance

- Tier 1 - Basic Site Infrastructure
- Tier 2 - Redundant Capacity Components Site Infrastructure
- Tier 3 - Concurrently Maintainable Site Infrastructure
- Tier 4 - Fault Tolerant Site Infrastructure

Tier 1 – Basic Site Infrastructure

The fundamental requirements:

- a. A Tier 1 basic data center has non-redundant capacity components and a single, non-redundant distribution path serving the computer equipment.
- b. 1 distribution Path
- c. Continuous Cooling based on load density

The performance confirmation tests:

- a. Planned work will require most or all of the site infrastructure systems to be shut down affecting computer equipment, systems, and end users.



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- b. An unplanned outage or failure or any capacity system, capacity component, or distribution element will impact the computer equipment.
- c. There is sufficient capacity to meet the needs of the site.

The operational impacts:

- a. The site is susceptible to disruption from both planned and unplanned activities. Operation errors or spontaneous failures of site infrastructure components will cause a data center disruption.
- b. The site infrastructure must be completely shut down on an annual basis to safely perform necessary preventive maintenance and repair work. Failure to regularly perform maintenance significantly increase the risk of unplanned disruption as well as the severity of the consequential failure.

Other attributes:

- a. 99.671% Uptime
- b. 28.8 downtime hours
- c. Staff/Shift –None
- d. Support Space to Raised Floor Ratio: – 20%
- e. Raised Floor Height: 12 inches
- f. Single Points of Failure: Many and Human error
- g. Representative Planned Maintenance Shut Down: 2 annual events at 12 hours each
- h. Representative Site Failures: 6 failures over 5 years





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Tier 2: Redundant Capacity Components Site Infrastructure

The fundamental requirements

- a. A Tier 2 data center has redundant capacity components and a single, non-redundant distribution path serving the computer equipment.
- b. 1 Distribution Path
- c. Continuous Cooling based on load density

The performance Confirmation tests:

- a. Redundant capacity components can be removed from service on a planned basis without causing any of the computer equipment to be shut down.
- b. Removing distribution paths from service for maintenance or other activity requires shut down of computer equipment.
- c. An unplanned outage or failure of any capacity system or distribution element will impact the computer equipment. An unplanned capacity component failure may impact the computer equipment.

The operational impacts:

- a. The site is susceptible to disruption from both planned activities and unplanned events. Operation errors or spontaneous failures of site infrastructure components may cause a data center disruption.
- b. The site infrastructure must be completely shut down on an annual basis to safely perform preventive maintenance and repair work. Failure to regularly perform maintenance significantly increases the risk of unplanned disruption as well as the severity of the consequential failure.

Other attributes:

- a. 99.749% Uptime
- b. 22 Downtime hours
- c. Staff/Shift: 1 shift
- d. Support Space to Raised Floor Ratio: – 30%



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- e. Raised Floor Height: 18 inches
- f. Single Points of Failure: Many and Human error
- g. Representative Planned Maintenance Shut Down: 3 annual events at 12 hours each
- h. Representative Site Failures: 1 failure every year

Tier 3: Concurrently Maintainable Site Infrastructure –

The fundamental requirements

- a. A Concurrently Maintainable data center has a redundant capacity components and multiple independent distribution paths serving the computer equipment. Typically, only one distribution path serves the computer equipment at any given time.
- b. All IT equipment is dual powered and installed properly to be compatible with the topology of the site's architecture.
- c. 1 active and 1 alternate distribution path
- d. Continuous Cooling based on load density.

The performance confirmation tests

- a. Each and every capacity component and element is the distribution paths can be removed from service on a planned basis without impacting any to the computer equipment.
- b. An unplanned outage or failure of any capacity components will impact the computer equipment.
- c. An unplanned or failure of capacity component or distribution element may impact the computer equipment.
- d. There is sufficient permanently installed capacity to meet the needs of the site when redundant components have been removed from service.

The operational impacts

- a. The site is susceptible to disruption from unplanned activities. Operation errors or spontaneous failures of site



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infrastructure components may cause a computer disruption.

- b. Planned site infrastructure maintenance can be performed by using the redundant capacity components and distribution paths to safely work on the remaining equipment.
- c. In order to establish Concurrent Maintainability of the critical power distribution system between the UPS and the computer equipment, Tier 3 infrastructure data centers require all computer hardware to have dual power inputs.

Other attributes:

- a. 99.982% Uptime
- b. 1.6 downtime hours
- c. Staff/Shift: 1 or more shifts with 1 to 2 staff per shift
- d. Support Space to Raised Floor Ratio: 80-90%
- e. Raised Floor Height: 30-36 inches
- f. Single Points of Failure: Some and Human error
- g. Representative Planned Maintenance Shut Down: None required
- h. Representative Site Failures: None required

Tier 4: Fault Tolerant Site Infrastructure

The fundamental requirements

- a. A Fault Tolerant data center has multiple, independent, physical isolated systems that each have redundant capacity components and multiple, independent, diverse, active distribution paths simultaneously serving the computer equipment.
- b. All IT equipment is dual powered and installed properly to be compatible with the topology of the site's architecture.
- c. 2 simultaneously active distribution paths.
- d. Continuous Cooling 24/7 at maximum load.



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The performance confirmation tests

- a. A single failure of any capacity system, capacity component, or distribution element will not impact the computer equipment.
- b. The system itself automatically responds (self-heals) to a failure to prevent further impact to the site.
- c. Each and every capacity component and element in the distribution paths can be removed from service on a planned basis without impacting any of the computer equipment.
- d. Continuous Cooling is required.
- e. There is sufficient capacity to meet the needs of the site when redundant components or distribution paths have been removed from service.

The operational impacts

- a. The site is not susceptible to a disruption from a single unplanned event or any planned work activities.
- b. In order to establish Concurrent Maintainability of the critical power distribution system between the UPS and the computer equipment, TIER 4 sites require all computer hardware to have dual power inputs.
- c. The site infrastructure maintenance can be performed by using the redundant capacity components and distribution paths to safely work on the remaining equipment.
 - a. During maintenance activities, the risk of disruption may be elevated.
 - b. During maintenance activity where one path is shut down, the computer equipment is exposed to an increased risk of disruption should a failure occur on the remaining path. This maintenance condition does not defeat the Tier rating achieved in normal operations.





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- d. Operation of the fire alarm, fire suppression, or the emergency power off (EPO) feature may cause a data center disruption.

Other attributes:

- a. 99.995% Uptime
- b. .4 downtime hours
- c. Staff/Shift: 24/7/365 and 2 staff per shift
- d. Support Space to Raised Floor Ratio: 100%
- e. Raised Floor Height: 30-42 inches
- f. Single Points of Failure: Fire, EPO and some human error
- g. Representative Planned Maintenance Shut Down: None required
- h. Representative Site Failures: None required

Data Center Infrastructure for all Tiers (Fire Detection and Suppression):

- Both heat and smoke detection
- Interconnected with fire suppression system, local alarms, monitoring system, etc.
- Sensors are installed below raised floors and other areas
- Airflow patterns determines location of detection units
- Sprinkler systems for both flooded and pre-action
- Chemical systems or Clean Agent(FM200), Manual systems (manual pull stations, portable fire extinguishers)
- Manual systems (Manual pull stations, Portable fire extinguishers)



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DTI Data Center Infrastructure (Security):

The Data Center Facility provides secure access in accordance with industry recommendations and PCI requirements. Internal Data Center and External building Access Points are equipped with Video Surveillance.

ENFORCEMENT and WAIVER

DTI will enforce this policy during the course of normal business activities, including review of proposed projects and during the design, development or support of systems. This policy may also be enforced by others during the course of their normal business activities, including audits.

If any dispute arises regarding the classification of data centers, it should be presented to the Technology and Architecture Standards Committee (TASC) for determination of proper classification.

II. Definitions

Business Case Summary (BCS) – A document and associated process whereby state organizations describe proposed IT projects and submit them for DTI approval.

Computer closets – Typically a wiring or utility closet that contains servers.

Computer rooms – An area used for conducting IT activities over and above the housing of servers. This may include high speed printers, output control, tape management equipment.

Data Center – A building or series of rooms set aside expressly for IT services. For purposes of this policy, the size of the building or room is immaterial. All such rooms, whether referred to as computer rooms, server rooms, computer closets, or other terminology, are considered data centers.



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iTIC (internal Technology Investment Council) – A committee created by the TIC with the responsibility of reviewing technology investments in the form of a BCS to ensure that the resulting investment is compliant with state-wide policies, standards and sound practices.

Server - A computer or device on a network that manages resources. Examples are file and print servers. The intent of the device is to provide benefit to more than one person at a time. Servers usually perform many functions for multiple users. A server would generally have a more robust Operating System than a PC (for example Windows 2003 Server Edition). Servers tend to be rack mounted rather than desktop mounted.

Server Rooms - A server room would be a collection of servers within one room.

System – A combination of servers, communications equipment, and other computing devices that together comprise an interrelated whole and deliver a set of services to a defined set of customers.

TIC (Technology Investment Council) – The body established by Delaware code with the responsibility of overseeing the technology investments of the State.

III. Development and Revision History

Initial version established **03/09/2007**

First update version established on **8/27/2014**



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IV. Approval Signature Block

Name & Title: Cabinet Secretary - State Chief Information Officer	Date

