

# **Aquia Data Center Information**

## **Research Computing & Co-Location Guide**

Information Technology Unit  
Technology Systems Division

### **Co-location**

The Information Technology Unit (ITU) is pleased to announce a Data Center Co-location service for the Mason research community. This service is designed to bring research computing systems into an operating environment dedicated to system availability and uptime.

The data center provides air conditioning, redundant power, redundant cooling, uninterruptible power supply (UPS) and a robust, high capacity data network in an access-controlled facility with round-the-clock monitoring. The service allows researchers to house computer systems in the datacenter while still maintaining the capability to manage the systems. Facilities maintenance, environmental control and monitoring are all provided by Facilities and the ITU.

Research systems using this service attach to the data center Ethernet network on individual links operating at 1 or 10 Gigabits per second. To meet high-availability or capacity requirements, multi-link attachment circuits are available.

Virtual Networks are available with this service, allowing a very flexible security profile based on the needs of the researcher. Systems can reside on hidden private networks, secure public networks, dedicated departmental networks or unsecure networks open to the Internet.

Both commodity Internet and access to research backbones are available in the data center. Currently, the university has an aggregate 3.5 Gigabits per second of bandwidth. Mason connects to Level 3, AboveNet, Internet2 and the PacketNet service from National Lambda Rail. Connections are available to all major research labs and centers.

The ITU expects this service offering to the research community to better support the physical research infrastructure and align better with the common goals of service stability, uptime, energy efficiency and availability. To learn more about this service, please contact John Kettlewell, Technology Systems Division (TSD) Director of Technology Support Services. He can be reached at [jkettlew@gmu.edu](mailto:jkettlew@gmu.edu) or by phone at [703.993.3358](tel:703.993.3358).

## **Virtual Networks**

The ITU offers virtual network services at Mason, enabling nearly any type of network between any set of subscribers anywhere on campus.

The primary service offering is a Layer 3 Virtual Private Network (L3VPN). L3VPNs are used to connect geographically dispersed groups of users into common security domains, where internal traffic does not cross a firewall. L3VPNs are available for departments or research project groups.

There is an existing L3VPN for research applications focused on network performance or wide area collaboration. This Research L3VPN is immediately available anywhere across campus to all systems requiring access to Internet2 and the National Lambda Rail.

Additional service offerings include: pseudowire - linking 2 systems by a "virtual wire"; multi-point Layer 2 VPN (L2VPN) - an emulated Ethernet broadcast domain; extranet - a refinement of the L3VPN where parts of different L3VPNs are able to communicate without passing through a firewall.

To learn more about how virtual network can support your needs or you would like to start using virtual networks, please contact Ben Allen, Manager, Advanced Network Technologies. He can be reached by email [ballen5@gmu.edu](mailto:ballen5@gmu.edu) or by phone, 703-993-3478

## **Special Services**

TSD can facilitate the acquisition, installation and operation of dedicated network infrastructure for your project. This includes everything from a dedicated Ethernet switch to your own attachment circuit to a national Research and Education Networks. There may be a cost for other than shared services and costs to configure the power in the data center to support research equipment. If your research project requires any special network services, or you would like to learn more about what's available, please contact Ben Allen, Manager, Advanced Network Technologies, by email [ballen5@gmu.edu](mailto:ballen5@gmu.edu) or by phone, 703-993-3478.

# **Aquia Data Center**

## **Co-Location and Research Computing Services**

### **Aquia Data Center General Information**

The Aquia Data Center is a state of the art modern and secure data center on the campus of George Mason University in Fairfax, Virginia. Located on the first floor of the Aquia Building, the data center is staffed 24 hours a day 365 days a year. Access to this facility is restricted to only authorized individuals. The Aquia DC hosts many of Mason's administrative and academic production systems. Research computing and Co-location services are available for Mason departments and other groups.

#### **Contact us:**

John Kettlewell  
Director of Technology Support Services  
[jkettlew@gmu.edu](mailto:jkettlew@gmu.edu)  
703-993-3358

Howard Davis  
Manager, Aquia Data Center  
[hdavis12@gmu.edu](mailto:hdavis12@gmu.edu)  
703-993-3385

### **Getting Started**

Departments or groups interested in having their system(s) hosted in the Aquia Data Center should be prepared to follow the guidelines and requirements below.

#### **What information is needed in order for us to evaluate a request for space in the Aquia Data Center?**

1. Determine the number of "rack mountable" systems that you plan to locate in the data center. (Racks are furnished for use in the Aquia DC)
  - a. Determine the U space that will be needed in a computer rack and/or how many racks will be required? (Be prepared to discuss future expansion needs to assist Aquia DC staff in space planning. If a full rack is not required, the customer will be asked to share a rack with other customers where feasible)
2. What are the electrical requirements?
  - a. Determine type of electrical outlet required.
  - b. Determine electrical circuit(s) needed, 30, 50, 60 amp?

(Aquia DC can meet any electrical requirement. Redundant circuits are a standard provision. Backup electrical service is provided capable of maintaining power to the entire DC using a 750 KVA UPS and a 1500 KVA generator)

**\*\*Customers are responsible for the initial costs of installation of circuits if they do not already exist in the data center**

3. Determine networking requirements.
  - a. Initiate network planning for system(s) by completing the form at the link <http://tsd.gmu.edu/net/Forms/index.html>  
(Before network port configurations can be completed, a physical location will need to be identified for equipment in the Aquia DC)

### **Requirements for Resident Customers of the Aquia Data Center**

#### Data Center Access

All customers requiring access to their equipment will provide a list of pre-approved individuals who will need to enter the Aquia Data Center. Non full time George Mason Staff/Faculty will be required to have a criminal background check which will be coordinated through HR and handled through the individual's department or group.

Authorized individuals will be required to sign in and state the purpose of their visit with Aquia DC Operations staff prior to entry. All individuals will be required to sign out upon completion of their visit.

All individuals on the authorized access list are restricted to the area of the data center where their equipment is located in the Aquia DC.

#### Service Level Agreements (SLAs)

All customers using data center services will be required to enter into an SLA with the Technology Systems Division (TSD) prior to or within 90 days after the start of services being provided.

#### Policies and Procedures

All customers will be required to follow TSD Aquia Data Center policies and procedures written and unwritten. Please review [Aquia Data Center Operational Policies/Procedures](#).

- ❖ **Policy Title - Aquia Data Center Operational Policy & Procedure**
- ❖ **Policy ID - TSD-ADC001**
- ❖ **Version - Version: 1.0**
- ❖ **Supersedes – Version 1.0**
- ❖ **Review Date – One (1) year from effective date.**

**Policy & Procedure -** Provides guidance and governance for the use of the Aquia Data Center; installation, removal, and disposal of equipment; physical access controls and security; safety; requests for special services or resources; space requests; power management; cable management; general maintenance and cleanliness of work areas; and other miscellaneous items within the data center.

**Purpose -** To provide a state of the art, professional, clean, reliable, safe, and secure data center, certain practices must be instituted and adhered to. The Aquia Data Center Operations staffs are tasked with the responsibility for ensuring that this policy and procedure will be followed by all who use the facility.

**Applicability –** This operational policy and procedure applies to all ITU employees, the various authorized departmental employees who use the data center services, and authorized business partners of ITU including contractors, vendors, and other authorized state agency employees. This policy and procedure addresses topics which include, but are not limited to safety; security; storage, staging, disposal and surplus of equipment; space requests; computer hardware installs and de-installs; power management; cabling; and other miscellaneous items within the data center.

**EXCEPTIONS:** The Executive Director of Technology Systems Division (TSD) or Director of Technology Support Services (TSS) will be the only individuals authorize to make any exceptions to this operational policy and procedure document.

## Policy and Procedure:

1. Every effort must be made to assure personal safety in the data center.
  - a. Floor tiles should never be removed. If floor tiles must be removed, the assistance of the operator on duty should be sought; and safety cones and tape must be used around any area left unattended.
  - b. When not being serviced, all computer cabinets and doors will remain closed at all times.
  - c. University electricians or an authorized contractor will perform all modifications to electrical service. All such changes will comply with the TSD 5 day prior notice requirement, and be coordinated with the Data Center Manager (DCM) for submission of the required work order(s).
  - d. No work will be done below the raised floor area without the notification of the DCM or operator on duty.
  - e. No industrial cleaning liquids/fluids will be left in the data center unattended. No highly ammoniated or chlorinated products shall be allowed in the data center.
  - f. No food or drink will be allowed on the main data center floor.
2. Air condition and air quality are essential to the reliable operation of computer equipment and must be maintained within acknowledged data center standards.
  - a. Humidity levels in the Data Center will be maintained at 45% – 50%.
  - b. Temperature levels in the Data Center will be maintained at 69 – 75 degrees.
  - c. All tile alterations must be reviewed, approved, and coordinated with the DCM. If holes must be cut in the floor panels to accommodate new equipment, the panel shall be removed from the data center to cut the hole. The DCM will assist with any needed floor tile alterations.
  - d. Due to the effect on sub-floor air pressure the number of tiles pulled must be kept to a minimum. All vented floor tiles must be returned to the position from which it was removed.
  - e. No holes shall be left exposed thereby creating unbalanced airflow. No additional vents, grilles or perforated tiles will be added without coordination with the DCM.
  - f. All open slots in racks must be closed on the cold aisle side with a slot blank.
  - g. No changes shall be made to the data center HVAC systems without consultation and approval of the DCM.



development systems excluded from CM) and must be coordinated with the DCM to ensure updating of the data center layout documentation.

- c. All off-hours work within the data center shall be coordinated with the DCM. Written notification referencing the RFC #, if applicable, will be provided to the DCM stating the date and time when work is to be done and the names of the parties involved in the work. If there is no CM entry, details of the work to be done should be included in the notification.
  - d. No hardware, racks, furniture, shelving, or other materials will be removed or added to the data center without DCM coordination. This is required in order to maintain accurate records of inventory and maintain an orderly and neat environment within the data center.
  - e. All space allocations within the data center are the responsibility of the DCM. All projects requiring additional rack space shall be coordinated with the DCM.
  - f. All equipment must be rack mountable, except for test or development equipment. All open slots within racks must be closed with a slot blank mounted on the cold aisle side of the rack. Exceptions must be approved by the TSS Director. Racks used in the Data Center are designated by TSD. All exceptions must be pre-approved by the TSD Executive Director.
  - g. All power and network cables must be labeled for easy identification. Any changes which affect the accuracy of this information must be provided to the DCM and all labels must be updated. Labeling will be provided on the outside of racks displaying rack location and electrical circuit information
5. Decommissioned equipment must be removed from the data center in a timely manner.
- a. All removal of decommissioned equipment shall be coordinated with the DCM and operator on duty for proper documentation of data center assets and for security purposes. (see also d:)
  - b. All decommissioned equipment must be removed from the Data Center in a timely manner, preferably within 60 days.
  - c. All decommissioned cabling, including voice, data and fiber shall be removed immediately. Decommissioned cables shall be defined as cables that are abandoned and are no longer actively used in the data center.
  - d. When equipment is removed from the data center, all pertinent documentation must be updated. This includes assets management, CMDB, and any support matrix that references decommissioned equipment.



6. Electrical Power in the Data Center will comply with accepted electrical standards and local electrical codes for data centers.
  - a. Only qualified Facilities Management personnel shall open or change any power panel or power distribution unit.
  - b. Modifications in the data center power design and/or the addition of power outlets must be coordinated with the DCM for installation. The DCM is the only person authorized to request a work order for electrical modifications within the data center.
  - c. Cleaning equipment or tools used to perform work in the data center shall only be plugged into wall outlets located on the outer walls around the data center. *(Computer rack power outlets (PDUs) are not to be used!)* Data center staff will provide extension cords or power strips if requested.
  - d. Power requirements for equipment shall be provided to the DCM before installation. The DCM will verify availability of power and coordinate the documentation of the equipment location and power requirements in the data center layout.
  - e. Only the power distribution units (PDUs) located in the equipment racks are to be used to provide power for racked equipment.
    - i. The only exceptions to this rule are:
      1. In cases of emergency installations where equipment must be brought into service before a permanent power source can be installed. If used in this manner, a temporary power strip must be tagged and dated. Plans for permanent power must be made with the DCM.
  - f. No radios or other non-computer related equipment should be plugged into any dedicated circuit or computer rack power outlets (PDUs). Wall outlets are available for these instances on the outer walls around the data center.
7. All equipment should be labeled in the front and rear panels with identification information.
  - a. Wherever possible, all equipment will have a label affixed identifying the power distribution unit and the main power panel to which it is attached. At a minimum all equipment power cables should be labeled with this information. Labeling will be provided on the outside of racks displaying rack location and electrical circuit information
  - b. All power cables will be labeled and identified for its specific use and identified by its amperage, voltage, and type of connector if possible.
  - c. All device-to-device cables installed within the data center will be labeled to identify their use and/or purpose. This label must be at both ends.

8. Management of equipment, peripherals, associated cabling, and general work processes in the data center shall be performed in such a manner as to facilitate an optimum data center operation, maximizing resources effectively, and providing a professionally maintained data center environment.
- a. New equipment destined for the data center will be unpacked outside the data center prior to its placement in the data center environment.
    - i. The staging/storage area adjacent to the data center is provided for this purpose.
    - ii. No boxed or loose equipment or other related materials are to be stored on the main data center floor. All materials are to be housed in the staging/storage area or other location until placed into service. Any materials left on the data center floor will be removed by Operations staff and placed in an appropriate area until required.
  - b. Whenever possible, all equipment deliveries to the data center shall be coordinated with the operator on duty or the DCM to ensure proper receipt and storage. Each unit will be responsible for notification and/or acceptance of their equipment.
  - c. To insure appropriate use of data center space, placement of new racks will be coordinated by the DCM with the guidance of the TSS, ES&M, and NET Directors.
  - d. Equipment owners are responsible for the installations of their equipment in the data center. All installs must be coordinated with the DCM for documentation purposes.
  - e. ITU TSD Network Engineering & Technology staffs manage connectivity requirements and install data/telecommunications cabling in the overhead conveyance system (wiring tray). No other cabling or material will be run in the tray system without prior approval of the Director, Network Engineering & Technology.
  - f. All cable runs will be run in an orderly manner and dressed out for a professional appearance. Cables should be labeled appropriately to provide easy identification. No cables should run diagonally in the sub-floor without prior approval. Electrical and computer cables may run perpendicularly. When cables cross paths, it should be in a perpendicular manner.
  - g. All cabling within racks shall be neatly organized, tied, and labeled appropriately, allowing doors to racks to close.
  - h. All doors to racks/computer cabinets shall be kept closed when equipment is not being serviced.
  - i. After completing installation or service on equipment, all tools and materials must be removed from the data center floor and the area left clean of any trash or debris.

- j. All equipment and furniture including desks, chairs, tables, shelving, racks and cabinets within the data center are the responsibility of the DCM and are not to be removed from the data center.

## **Compliance**

All users of the Aquia Data Center facilities have a responsibility to comply with this policy and procedure. Additional rules or restrictions that fall outside this current policy and procedure may be applied as required by Technology Support Services in order to maintain a safe, secure, and professional environment. Should that be necessary, those new rules or restrictions will be incorporated into this document.

Failure to comply could result in disciplinary action or the loss of access to the facilities and services of the Aquia Data Center.

**Effective June 4, 2010.** To be reviewed and updated annually.

### **PRIMARY CONTACT PERSON:**

Howard Davis, ITU Data Center Manager

Telephone: 703-993-3385

Email: [hdavis12@gmu.edu](mailto:hdavis12@gmu.edu)

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