UConn School of Business Information Technology Services
Research Resource Guide
Fall 2018

At the University of Connecticut, there are many resources available to you to help you conduct research. This guide will provide descriptions, comparisons of the systems, and how to access many of these resources.

Help Desk Inquiries

To receive the most immediate attention to any IT inquiry, please email the BUSN IT Help Desk at help@business.uconn.edu, or call at (860) 486-5450.

Our front desk operates from 8:00 AM to 8:00 PM at all locations, and until 9:00 PM at Storrs.

Service Desk Locations

The School of Business operates a dedicated Information Technology Services Department which provides curated support to School of Business Faculty, departments, Programs and Centers. Our offices can be found at the following locations:

Storrs
BUSN Room 225
2100 Hillside Rd, Storrs, CT 06269
Service Desk Manager: Mathew Krest

Stamford
STAM Room 2.53
1 University Place, Stamford CT 06901
Service Desk Manager: James Simon

Hartford
Graduate Business Learning Center
GBLC Room 201
100 Constitution Plaza, Hartford, CT 06103
Service Desk Manager: John Rhoads

Compute Resources

Please find the following links and descriptions to significant computing resources available at UConn.

Business Academic Research Cluster (BARC)

BARC is a shared resource created specifically for School of Business faculty, to address a need for hosted Virtual Desktops with significant RAM, CPU, High-speed, high band-width networking between clusters and multi-tier storage which includes all-flash as the first tier. The primary benefit of BARC is that it offers faculty and researchers the ability to work on diverse Operating Systems, Linux desktops and servers, Windows desktops and servers with Graphical User Interfaces.

- **BARC Compute Resources**
  - 1 Data Center - Primary Container for objects listed below
  - 8 hosts:
    - 4 x Dell FC640 nodes
      - 2 x Gold 6130 CPU @ 2.10GHz (16 cores/32 threads each)

        - 384 GB RAM
        - 10Gb Ethernet
    - 4 x Dell FC630 Nodes
        - 2 x Intel Xeon CPU E5-2680 v3 @ 2.50GHz (12 cores/24 threads each)
        - 256 GB RAM
        - 10 Gb Ethernet
- **BARC Storage Resources for Compute**
    - 180 TB of SSD-accelerated storage

Pros:

- Can scale with research. Add more compute, RAM or storage as needed
- 7X24 Access
- No job scheduling
- Dedicated, persistent resources on a shared infrastructure
- Use an Operating System of your choice
    - Windows 7-10, 2012R2/106/2019, Linux Server distributions or Linux Desktop distributions
    - No requirement to learn systems that are unfamiliar
- Use a graphical user interface
- Remotely manage through common remote tools including Windows Remote Desktop Protocol, X11, SSH, WinSCP, FTPS, VNC and VMware remote Console.

Cons:

- Max CPU and RAM allocation cannot exceed the largest available host
    - Example 24 CPU, 192GB RAM

- **To request access** please email help@business.uconn.edu
- **For further information** visit https://it.business.uconn.edu/barc/
- **System Administrators**
  Chris Buckridge, christopher.buckridge@uconn.edu
  Chris Hewitt, christopher.hewitt @uconn.edu
  Chris Zissis, christopher.zissis@uconn.edu

Enterprise High Performance Computing

There are two Centralized HPC Center - Storrs and Farmington

UConn Storrs High Performance Computing

UConn HPC was once substantially owned and operated by the School of Engineering. As demand for HPC grew at UConn the service was absorbed by ITS to allow broader access and standardization, and to leverage capital investment.

Storrs HP Compute resources are managed by SLURM - a cluster manager and job scheduler. In the table below 6 lines represent the total resources. Each line is a new cluster. SLURM will que jobs and initiate them on the clusters they are assigned to.

Pros

- SLURM management for both Storrs and UConn Health HPC
- Access to parallel computing clusters designed to speed up calculation intensive operations.
- Self-supported, physical or virtual machine instances made available to run your applications.
- Virtual machine instances running Windows 7, Windows 8, Windows 2008R2, Windows 2012R2, CentOS x64 or Ubuntu x64
- Access to over 2 PB of storage resources for collaboration, backup and archival operations.

Cons

- Linux command line interface only
- Requires advanced Linux competency to use
- Very limited run schedules
- Jobs that don't complete are not resumed
- HPC is heavily utilized - most scheduled jobs are queued for 72 to 96 hours
- Limited software availability, see https://wiki.hpc.uconn.edu/index.php/Category:Software

- **To request access** please visit the main HPC page https://hpc.uconn.edu/ and go to Request Account.

- **For further information** visit the main HPC page https://hpc.uconn.edu/ or the wiki at https://wiki.hpc.uconn.edu/

- **System Administrators**
  Jill Wegrzyn, jill.wegrzyn@uconn.edu, CBC Director/Assistant Professor
  Vijender Singh, vijender.singh@uconn.edu, Associate Director, Lead Bioinformatics Scientist
  Neranjan Perera, neranjan.perera@uconn.edu, Postdoctoral Researcher
  Mike Wilson, michael.p.wilson@uconn.edu, Systems Administrator
  Stephen King, stephen.g.king@uconn.edu, Systems Administrator (UCHC)

UConn Health High Performance Computing

Located on the UConn Health campus in Farmington, CT, the Center for Cell Analysis and Modeling (CCAM) computational facility, connects to the Storrs HPC facility via a 100GB link.

Pros

- SLURM management for both Storrs and UConn Health HPC
- Access to parallel computing clusters designed to speed up calculation intensive operations.
- Self-supported, physical or virtual machine instances made available to run your applications.
- Virtual machine instances running Windows 7, Windows 8, Windows 2008R2, Windows 2012R2, CentOS x64 or Ubuntu x64

- Access to over 2 PB of storage resources for collaboration, backup and archival operations.

Cons

- Linux command line interface only
- Requires advanced Linux competency to use
- Very limited run schedules
- Jobs that don't complete are not resumed
- HPC is heavily utilized - most scheduled jobs are queued for 72 to 96 hours
- Limited software availability, see https://wiki.hpc.uconn.edu/index.php/Category:Software

- **To request access** please visit https://health.uconn.edu/high-performance-computing/contact/

- **For further information** visit the main HPC page https://hpc.uconn.edu/ or the wiki at https://wiki.hpc.uconn.edu/

- **System Administrators**
  Ion Moraru, M.D., Ph.D., moraru@uchc.edu, Department of Cell Biology
  Stephen King, stking@uchc.edu, Systems Administrator
  Michael Wilson, mikewilson@uchc.edu, Infrastructure Architect

  UConn Health High Performance Computing Facility
  Richard D. Berlin Center for Cell Analysis and Modeling
  Cell and Genome Sciences Building
  400 Farmington, Avenue
  Farmington, CT 06030-6406

Other UConn Compute Resources

Other Compute facilities include: Computational Biology Core, Institute for Systems Genomics and Open Science Grid, Physics Department (Beowulf Cluster).

- **Physics**
  http://gryphn.phys.uconn.edu/cgi-bin/uconn_stat.cgi

- **COR²E - Center for Open Research Resources & Equipment**
  Please visit the COR²E site https://core.uconn.edu/resources, for a catalog of services and the centers providing resources.

External High Performance Computing Initiatives

AWS for Higher Education

"Amazon Web Services is a subsidiary of Amazon.com providing on-demand cloud computing platforms to individuals, companies and governments, on a paid subscription

basis. The technology allows subscribers to have at their disposal a virtual cluster of computers, available all the time, through the Internet"

Built for rapid deployment of the following services and more:
Compute, Storage, Database, Migration, Networking & Content Delivery, Mobile Services, Developer Tools, Management Tools, Security, Identity & Compliance, Analytics, Application Services, Messaging, Internet of Things, Support, Machine Learning

Pros

- Highly scalable
  - Scales almost immediately
- Off Premises
- Standardized
- Most Analytics software has plugins
- Fairly robust documentation
- Closer to Open Source Tools
- Other hosting benefits - https://aws.amazon.com/application-hosting/benefits/

Cons

- Expensive, Compute time, Storage, Network
  - Use the cost calculator https://calculator.s3.amazonaws.com/index.html
- Academic discount is negligible, primarily for demonstration
- May utilize non-US servers - some data cannot reside on non US servers.
- Documentation is disorganized and unintuitive.
- Interfaces are clumsy and unintuitive

- **For further information** visit the main page https://aws.amazon.com/education/higher-ed/

Azure

"Microsoft Azure is a cloud computing service created by Microsoft for building, testing, deploying, and managing applications and services through a global network of Microsoft-managed data centers"

For rapid deployment of more than 100 services with an emphasis on Microsoft specific technologies

Pros

- Rich and Intuitive interface
- Solutions are guided and learning curve may be shorter than other cloud providers

Cons

- Mostly proprietary Microsoft centric tools and technologies
- Expensive
  - Use the cost calculator https://azure.microsoft.com/en-us/pricing/calculator/

- **For further information** visit https://azure.microsoft.com/en-us/services/

- **Getting started** - https://azure.microsoft.com/en-us/free/

Google Cloud Platform

"Google Cloud Platform is a suite of cloud computing services that runs on the same infrastructure that Google uses internally for its end-user products. Alongside a set of management tools, it provides a series of modular cloud services including computing, data storage, data analytics and machine learning. Registration requires a credit card or bank account details"

Pros

- Highly scalable
  - Scales almost immediately
- Off Premises
- Standardized
- Fairly robust documentation
- Has the most Open Source Tools integration

Cons

- Expensive, Compute time, Storage, Network
  - Use the cost calculator https://calculator.s3.amazonaws.com/index.html
- Academic discount is negligible, primarily for demonstration
- May utilize non-US servers - some data cannot reside on non US servers.

- **For further information** visit https://cloud.google.com/docs/overview/cloud-platform-services

- **Getting started** - https://console.cloud.google.com/getting-started?pli=1

Storage

Below you will find descriptions and resources for the many storage systems at faculty's disposal to store large subsets of data.

Business Academic Research Cluster (BARC)

Users can request storage space accessible via SMB/NFS/iSCSI for usage with BARC VM or with Windows/Linux/maOS workstations/laptops. This space may be used for academic and research purposes only.

The R: Drive is a network mapped drive for research data storage. School of Business users may request an R: Drive that can be accessed by one or more users. Space will be allocated as it is available.

- **Best for**
  - Directly accessing data from your BARC Virtual Machine(s)
  - Data not requiring backups
  - Hot data actively being researched/analyzed daily
  - High performance, low latency requirements
    - Larger databases
    - Tasks that are too large or fail on workstations

- **To request access** please email help@business.uconn.edu

- **For further information** visit https://it.business.uconn.edu/barc/

- **System Administrators**
  Chris Buckridge, christopher.buckridge@uconn.edu
  Chris Hewitt, christopher.hewitt@uconn.edu
  Chris Zissis, christopher.zissis@uconn.edu

University Enterprise File Services

ITS's Enterprise File Services is a system designed for secure computer file storage and online file sharing for faculty and staff.

- **Best for**
  - Very small datasets
  - Data requiring backups
  - Colder data, accessed week to week vs. daily
  - Data that does not require high performance reads and writes

- **To request access** please email helpcenter@uconn.edu

- **System Administrators**
  Robert Morrell, robert.morrell@uconn.edu

Rick Portuguez, rick.portuguez@uconn.edu

OneDrive (personal account)

Microsoft offers free online storage of up to 5GB, and paid storage for up to 1 TB per user.

- **Best for**
  - Data you wish to be replicated and accessible from many devices
  - Data infrequently accessed
  - Access from any device, including web browser
- **For further Information and to create an account** visit https://onedrive.live.com/
- **To compare the free and paid plans,** visit https://onedrive.live.com/about/en-us/plans/.
- **Contact/System Admins**
  Microsoft, https://support.microsoft.com/en-us/contactus/

OneDrive for Business 1TB (included with uconn.edu account)

All UConn Faculty, staff, and students receive one terabyte of data storage through Microsoft OneDrive, which is part of the Office 365 cloud-hosted suite of tools.
https://its.uconn.edu/services/personalcomputing/onedrive/

- **Best for**
  - Uncompressed data
  - Data you wish to be replicated and accessible from many devices
  - Data infrequently accessed
  - Access from any device, including web browser
- **Further Information and access** go to https://email.uconn.edu/
- **System Administrators**
  Meera Nair, meera.s.nair@uconn.edu

Internal Drive Storage

Your School of Business desktop PC will have internal storage, however faculty may be able to use SPAR or Department funding to purchase an additional hard drive to store research data. The BUSN IT Department is able to assist with recommendations, the purchasing process, and installation.

- **Best for**
  - Smaller databases
  - Data requiring encryption
    - Confidential data
    - Highly sensitive data
  - Data infrequently accessed

- **To purchase and configure an external drive for your needs**, please contact help@business.uconn.edu for assistance. General guidelines for size are 256MG to 2TB SSD for speed and reliability, 3TB to 10TB mechanical for long-term infrequent use.

External Drive Storage

An external hard drive is a good option for having large amounts of data that has a need to be portable, and also for backing up your research data to a second source.

- **Best for**
  - Backups
  - Data requiring less security
  - Cold storage, data that is not accessed but needed (consider slow mechanical drives)
  - Data that might travel and is too large to access conveniently or remotely

- **To purchase and configure an external drive for your needs**, please contact help@business.uconn.edu for assistances. General guidelines for size are 256MG to 2TB SSD for speed and reliability, 3TB to 10TB mechanical for long-term infrequent use.

BUSN IT recommendations regarding backing up data

All faculty are urged to keep all of their data backed up; teaching material, administrative files, and their research data. Please be aware that due to storage system limitations and functionality, research data should be kept backed up in a system separate from teaching and administrative data.

- **Research data** should be backed up locally or on external drives. You may also consider synchronizing data with OneDrive for Business.

- **Mission Critical data - data having to do with the daily operation of the university such as teaching material and administrative files - can be saved to the P: and Q: drives on your desktop PC.** These folders are networked shares which are backed up nightly. They are supported by BUSN ITS. P: drive is intended for private files that are not shared, while Q: drive is intended for information wished to be shared with specific members of your home department. By default, the Department Head and Administrative Assistant can view all information in a department's Q: drive.

- For any questions regarding backing up data, please contact School of Business ITS via our helpdesk at (860) 486-5450 or help@business.uconn.edu

    - **Service Administrator**
      Mat Krest, mathew.krest@uconn.edu

      School of Business
      2100 Hillside Road, Unit 1041
      Storrs, CT 06269-1041
      Phone: (860) 486-5450
      Email: help@business.uconn.edu

Software

UConn/BUSN Subsidized Software Licensing

It is the researcher's / instructor's responsibility to abide by the End User License Agreements (EULA). Academic software may not be used to profit an individual or corporation. Grant funded research may not be eligible to use Academic Licensing.

UConn subsidizes the licensing costs of a large number of software packages to aid in researching or teaching. A full list of available software can be found at http://software.uconn.edu/software/.

Some categories of software are available on specific access sites:

- **Windows/Office** - Faculty and Staff can also get Windows and Office for personal machines by signing into https://uconn.onthehub.com/ with their Uconn NetID.
- **Microsoft Imagine** - Provides access to many valuable Microsoft software resources such as Visual Studio Ultimate Edition, Windows Server Operating Systems, Visio, Project and more. Access via Microsoft Imagine.
- **VMWare On the Hub** provides access to a library of different VMware software including: VMware ,Fusion, VMware Workstation, VMware player, VMware vCenter, VMware vCloud and VMWare vSphere. Faculty access to this software at VMWare onthehub, but will first need to Request an Account.

Extended Software Licenses

The School of Business offers software not available to other UConn Schools or Colleges including:

- SAS 9.4
  - Includes Enterprise Miner
  - Includes Forecasting
- JMP 14.1 Pro (both Windows and macOS)
- SPSS Modeler 18.1 Premium (both Windows and macOS)
- VMware Workstation (Windows ONLY)
- VMware Fusion (macOS ONLY)

Popular Open Source Software

There are a number of Open Source analytics software packages available for free to download. Please note that while BUSN IT can assist with the download and installation of these, faculty are expected to use online resources to educate themselves on their use and optimization. BUSN IT will provide

technical support to the best of their ability, but the main line of support will be the product vendor's own resource lines.

Current trending analytics software include:

Data Mining
- Weka Data Mining

Visualization
- Tableau Public
- Gephi

Programing - Mining, Analyzation, Wrangling, Visualization, AI, Automation
- Python
- Anaconda
- NumPy
- SciPy
- Ipython
- SymPy
- Pandas

Data Wrangling
- OpenRefine
- DataWrangler

Other Software

If there is a specific program that we do not currently have licensed, please email help@business.uconn.edu with what it is, where to find it, and why you require it. After doing so, we will investigate acquiring it for you.

Questions, Consultation, and Installation

BUSN IT can assist in installing any piece of software that is either free or licensed by the university. For any questions regarding a software request or install, email us at help@business.uconn.edu

- **Service Administrators**
  Mat Krest, mathew.krest@uconn.edu

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