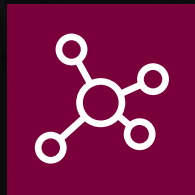


Imaging Materials for a Brighter World

CANADIAN CENTRE FOR ELECTRON MICROSCOPY
CCEM Virtual Machine (VM) Workstation Guide

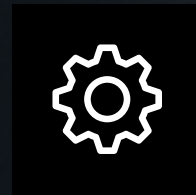
**BREAKTHROUGH
MATERIALS
RESEARCH**



**LEADING IN
EDUCATION AND
TRAINING**



**PROVIDING
SPECIALIZED
SERVICES**



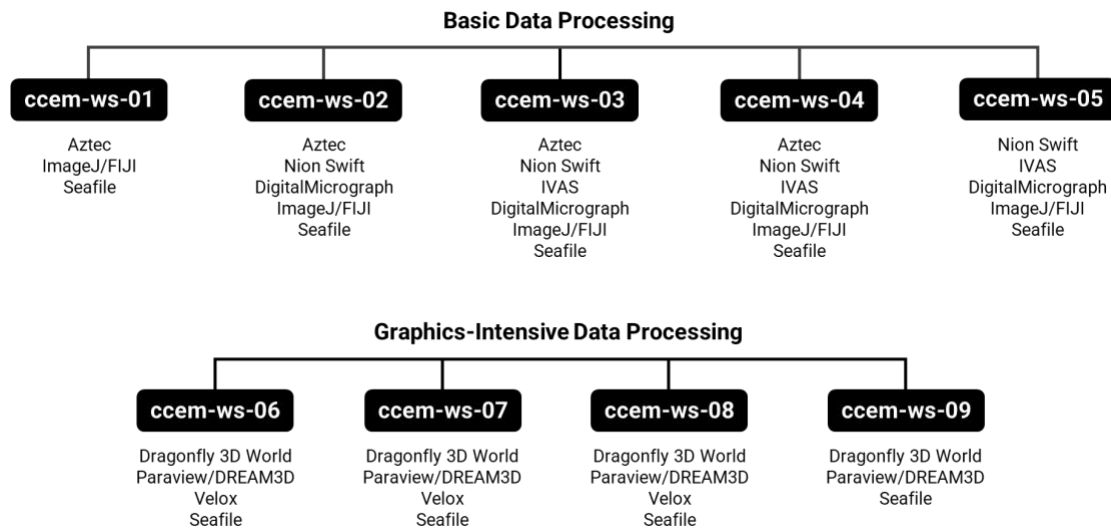
Accessing the CCEM Virtual Machine Workstations

CCEM has created virtual machine (VM) computing workstations for remote data analysis – providing users access to common software packages for post-process analysis of any microscopy dataset generated at CCEM.

Through the VM workstations, users now have remote access to computing resources designed to handle large datasets and key microscopy software, including:

- AP Suite
- Aztec
- Digital Micrograph / Gatan Microscopy Suite
- Dragonfly 3D World
- Nion Swift
- ImageJ
- Paraview/Dream3D
- Velox

The current infrastructure is partitioned into nine VMs (ccem-ws-01 through ccem-ws-09), each with their own subset of software installations. ccem-ws-01 through ccem-ws-05 are designed to handle day-to-day data processing, whereas ccem-ws-06 through ccem-ws-09 are intended for graphics-intensive data processing. The current software map is as follows:

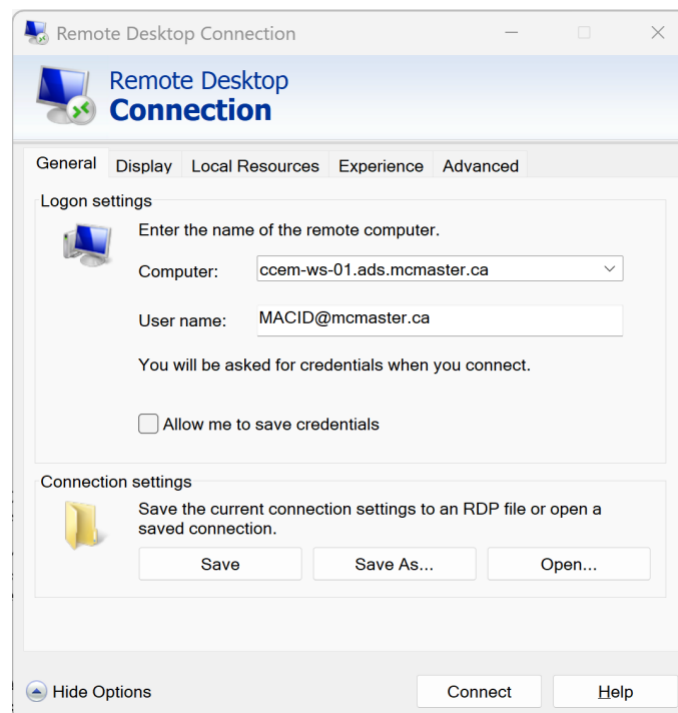


Files can be transferred to/from these workstations using Seafile. **Please save file to the Desktop, Documents, or Downloads folder.** Any files saved in these folders on a given workstation will also be accessible on any of the other linked workstations (i.e. an image saved on the desktop of ccem-ws-01 can also be found on the desktop of ccem-ws-05 or ccem-ws-06). Files saved to Desktop, Documents, or Downloads are linked to your McMaster login credentials, and are not accessible to other users of the VM workstations.

CCEM reserves the right to periodically remove data from each workstation.

Accessing CCEM Virtual Machines Remotely (Windows)

1. (First-time access only) Contact CCEM to have your “@mcmaster.ca” credentials whitelisted for access to the CCEM VM workstations and associated software. Access should be granted within a few days of your request.
2. Reserve the appropriate VM workstation on Infinity.
3. Make sure you are connected to either the McMaster Wi-Fi network (Mac-WiFi) or are connected to the McMaster-approved [Cisco Secure VPN Client](#) if accessing the VM workstations off-site.
4. Launch the Remote Desktop Connection application on your local machine/PC.
5. Enter the ID of the workstation to which you are trying to connect (ccem-ws-01.ads.mcmaster.ca, ccem-ws-02.ads.mcmaster.ca, etc.) and your McMaster-affiliated email as your username.

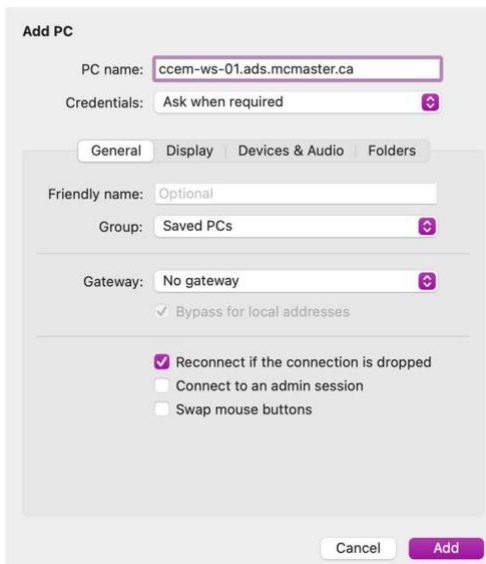


6. Click “Connect”. The remote access protocol will then prompt you to enter your McMaster log-in credentials (email and password). Accept the security certificates.
7. You should now be connected to the CCEM VM workstation. Please remember to **close all software before disconnecting** from the virtual workstation. When finished with your session, you can exit the virtual workstation by closing the Remote Desktop Connection window on your local computer.

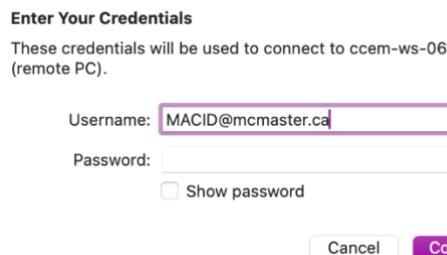
Any files/programs will be automatically closed after four days from the initial connection to free up computational resources for other users. The VM workstations will also be unavailable every Tuesday morning as CCEM performs weekly maintenance.

Accessing CCEM Virtual Machines Remotely (macOS)

1. (First-time access only) Contact CCEM to have your “@mcmaster.ca” credentials whitelisted for access to the CCEM VM workstations and associated software. Access should be granted within a few days of your request.
2. (First-time access only) Download and install the [Windows App](#) application.
3. Reserve the appropriate virtual workstation on Infinity.
4. Make sure you are connected to either the McMaster Wi-Fi network (Mac-WiFi) or are connected to the McMaster-approved [Cisco Secure VPN Client](#) if accessing the VM workstations off-site.
5. Launch the Windows App application on your local machine. Click the “+” icon in the top right corner of the app and select “add PC”
6. Enter the ID of the workstation to which you are trying to connect (ccem-ws-01.ads.mcmaster.ca, ccem-ws-02.ads.mcmaster.ca, etc.) and click “Add”.



7. The workstation should now appear under “Saved PCs”. Double click it to connect. You will then be prompted to enter your McMaster login credentials (email and password), then click “continue”.



8. You should now be connected to the CCEM VM workstation. Please remember to **close all software before disconnecting** from the virtual workstation. When finished with your

session, you can exit the virtual workstation by closing the Windows App on your local computer.

Any files/programs will be automatically closed after four days from the initial connection to free up computational resources for other users. The VM workstations will also be unavailable every Tuesday morning as CCEM performs weekly maintenance.

Frequently Asked Questions

Do I need to be present at CCEM to use the VM workstations?

No, the VM workstations can be accessed from anywhere if you are connected to [McMaster's VPN](#) (through Cisco Secure VPN Client). If you are accessing the VM workstations from on campus, you must be connected to the [Mac-WiFi](#) network. Thin client PCs will be set up in CCEM as physical access points to the VM workstations if in-person access is needed.

How can I request access to the CCEM VM workstations?

Access to the VM workstations can be requested by submitting a [Virtual Resource Access Form](#) in Infinity X. Any questions relating to the VM workstations can be directed to ccem@mcmaster.ca.

Where can I safely store files on the CCEM VM workstations?

For short-term storage, files should be saved to the Desktop, Documents, or Downloads folders. Any files stored in these three locations will be visible only to you and CCEM staff – no other users will be able to access your files. These three folders are automatically synced across linked workstations:

The VM workstations are not meant for long-term file storage, and files may be deleted with little or no notice.

How do I get my data on and off the CCEM VM workstations?

Data can be loaded onto and off the CCEM VM workstations using Seafile. When prompted, the default Sync location should be set to one of Desktop, Documents, or Downloads.

How do I reserve time on CCEM VM workstations?

Booking calendars for all workstations can be found on Infinity X. An Infinity booking is required before accessing any virtual machine.

What happens if another user is active on the workstation when I try to connect?

If another user is active on the VM while you are trying to connect, you will receive a prompt that another user is logged on and be provided the choice to (i) disconnect them, or (ii) cancel your connection. If you choose to disconnect them, they will then receive a pop-up that you are attempting to connect. They will be provided the option to (i) allow your connection, or (ii) deny your connection. They will be disconnected from the virtual machine if they do not respond within 30 seconds. All users are expected to respect the calendar bookings made in Infinity.

I'm trying to open software, but it says the license is in use or unavailable.

This can happen if another user has left software open when they last accessed that virtual machine. It is therefore important that all users close all active software before disconnecting from a virtual machine. If you run into this message, contact ccem@mcmaster.ca and CCEM staff can reset the virtual machine for you.

I need software that isn't currently available on CCEM VM workstations, can I download it?

No, read/write access for software installation is restricted to CCEM staff only. If you would like to request a new software package on the CCEM VM workstations, please email ccem@mcmaster.ca.

Why is there a weekly Infinity calendar hold?

We perform weekly maintenance and updates on the virtual machines in this period. All users may be logged off during the maintenance period and any open files may be closed on your account.

I had files open a few days ago, but it seems like someone has closed them. What happened?

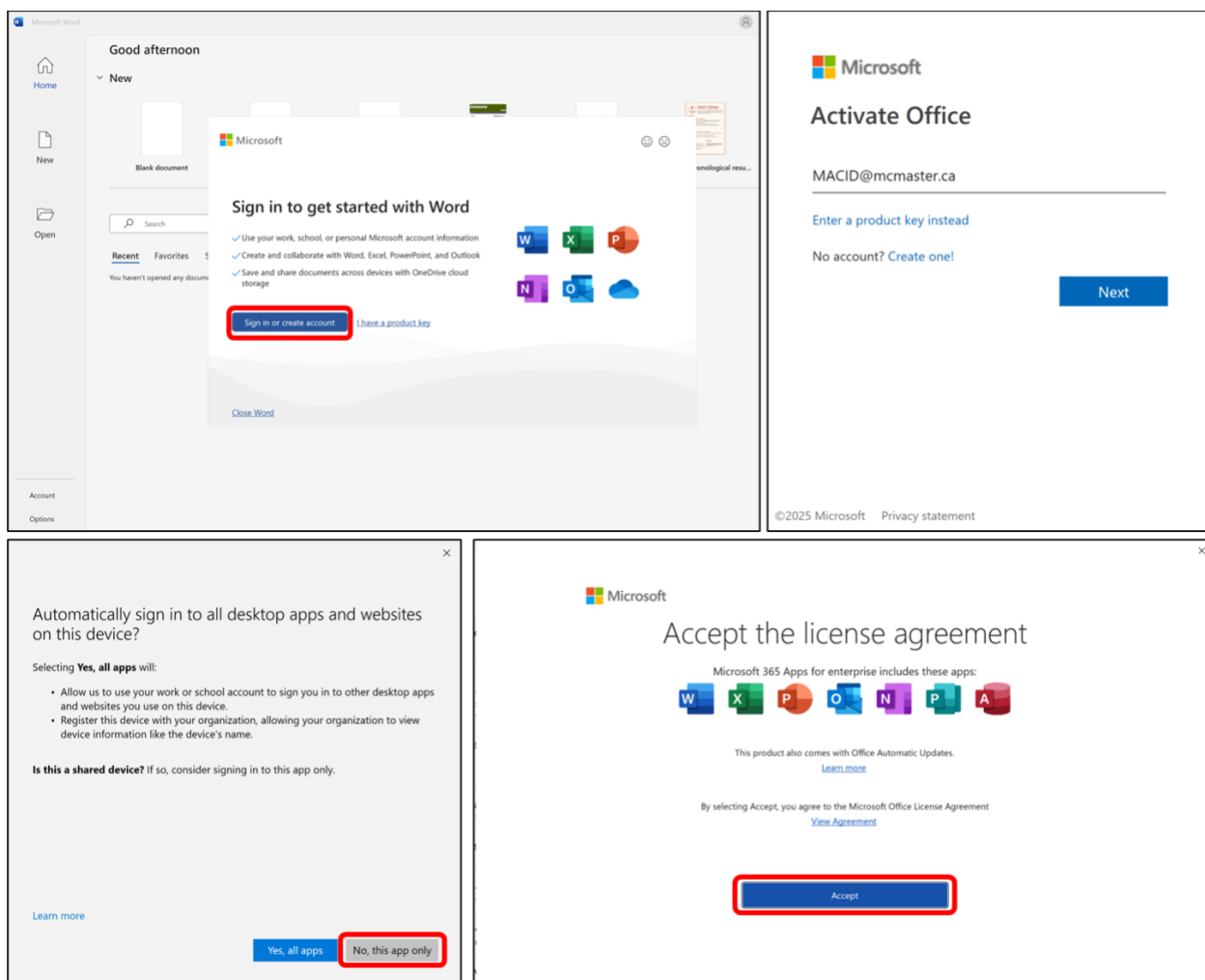
CCEM VM workstations are configured to automatically log off users four days after their initial connection. This frees up resources to help the VM run more efficiently for other users.

Application-Specific Notes:

Aztec

(First-time access only) Many reporting functions in Aztec rely on Microsoft Office (Word, Excel, and Powerpoint) to view exported files. If you are a McMaster user (or if your external organization provides licensing to Microsoft Word), you can sign in to Office by launching any of the apps and using the following workflow.

Aztec can still be used if your organization does not provide access to Microsoft Office, but exported reports will not be viewable on the virtual machine. Report files can be moved off the virtual machine using Seafile if additional offline processing is required.



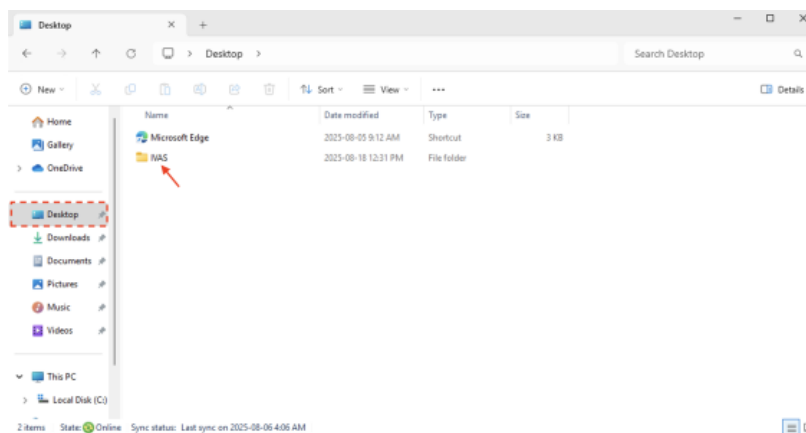
The image displays a four-step workflow for activating Microsoft Office in a virtual machine:

- Microsoft Word Home Screen:** Shows the "Sign in to get started with Word" dialog. The "Sign in or create account" button is highlighted with a red box.
- Microsoft Activate Office:** Shows the "Activate Office" screen with the email address "MACID@mcmaster.ca" entered. The "Next" button is highlighted with a blue box.
- Microsoft Sign-in Prompt:** A dialog asking "Automatically sign in to all desktop apps and websites on this device?". The "No, this app only" button is highlighted with a red box.
- Microsoft License Agreement:** Shows the "Accept the license agreement" screen. The "Accept" button is highlighted with a red box.

IVAS

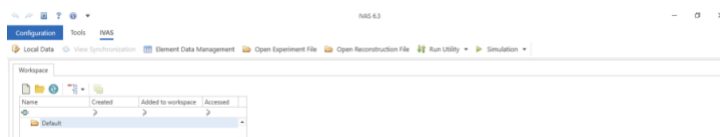
Accessing data files:

(First-time access only) The data pathway in IVAS must be properly set up before files can be imported/exported. Once connected to the virtual workstation, open the file explorer (bottom tab), select the desktop, and create a new folder called "IVAS". IVAS will be set up to read/output files from this location.



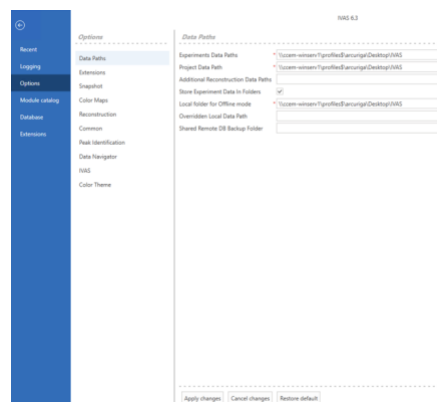
In the Seafiler app, right-click the folder containing the data you want to import, then select "Sync this library." When prompted, choose the IVAS folder you created on the desktop in the previous step. The synced folders and files should now appear in the main "IVAS" folder on the desktop (e.g., the "APT demo" folder in the image below was synced from Seafiler and now appears in the desktop IVAS folder). A green checkmark beside any folder's name indicates that syncing is complete.

Setting up data paths in IVAS:



(First-time access only) The data pathways in IVAS must be set up in the application. Select Configuration in the top left corner of IVAS, then select Options > Data Paths.

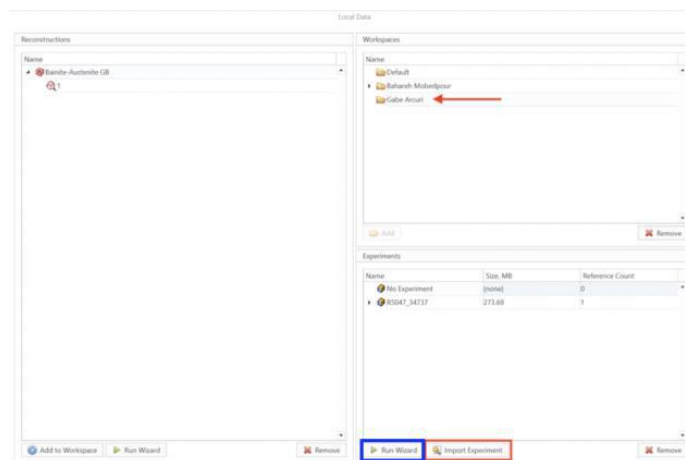
The Experiments Data Path, Project Data Path, and Local Folder for Offline Mode must be set to the "Desktop\IVAS" folder created in the previous step. All data you wish to open in the IVAS software must first be placed in the "Desktop\IVAS" folder, so the software knows where to read it from. The experiments data path is required, as it will search for your raw data (.HITS file) to start the reconstruction wizard. The other data pathways are required to save your data (i.e., reconstructions, ranges, csv files, etc.) directly to your IVAS folder. Make sure to click "Apply Changes" at the bottom of the data paths window to save to the newly added data pathways.



The “Store Experiments in Data Folders” checkbox will automatically create sub-folders in your IVAS folder to store exported data (i.e., an ‘Experiments’ folder will contain a copy of the raw data (.HITS) file and a ‘Reconstructions’ folder will hold all exported .apt files, .csv files, and images).

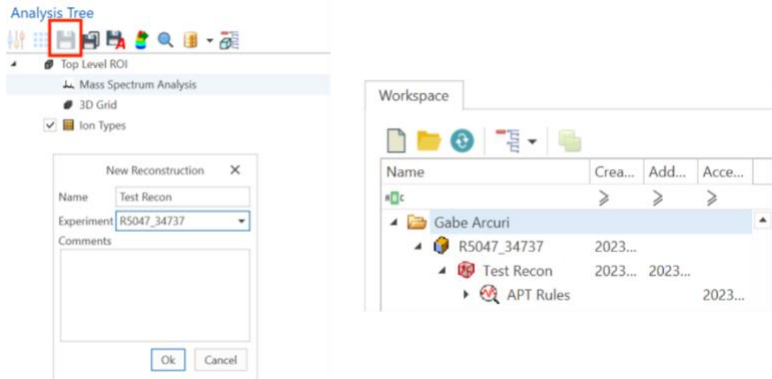
Using IVAS 6:

Workspaces are used to help organize data. A new workspace can be created by clicking the “New” button under the left workspace tab. Select the “Open” button if you already have a workspace created. Your workspace should now appear in the list. Raw .HITS files can be uploaded into the software using the “Local Data” button in the top tab. Using the Local Data window, make sure your workspace is selected (top right, red arrow), then click the import experiment button (bottom right – red box), and upload your raw .HITS file. This file should appear in the experiments list. Select the experiment and click “run wizard” to begin your reconstruction (bottom right – blue box). Alternatively, you can select the “open experiment file” button from the top toolbar.



Use Experiment File to select your raw .HITS file from your IVAS folder and select “Ok”. This will open the wizard and allow you to proceed with starting your reconstruction. Upon completion of the wizard, your new reconstruction will automatically open. To upload a previously saved reconstruction, select the “open reconstruction file” button from the top toolbar. Use Reconstruction File to select your .apt file from your IVAS folder. Select “Ok”. This will open the reconstruction and allow you to begin your data analysis.

Once the reconstruction is open, save your analysis by using the “Save Analysis Tree” button found along the top toolbar in the right analysis tree window. Give your reconstruction a name and make sure to select the correct experiment from the drop-down list. Click “Ok”. This will prompt you to give your analysis a name. A project tree should appear in the workplace tab under your chosen workplace – this includes your raw data (.HITS), reconstruction (.apt), and analysis.



Uploading an .apt file (i.e., reconstruction) will only contain the 3D volume but not any previously completed data analyses, such as profiles, maps, isosurfaces, etc. To save these, you must select the “Save to File” button found along the top toolbar in the Analysis Tree window. This will save a “.analysisset” file that can later be opened together with the .apt file to continue working on your data analysis.

You should now be set up to access IVAS 6 and upload data to CCEMdata via the Seafiler app. Please remember to close all software before disconnecting from the virtual workstation.