
Using the Computer Programming Environment

Overview

C2k has developed an environment to allow GCSE and A-Level students to undertake computer programming from within the C2k Managed Service. This environment will deliver the tools and facilities required by students while retaining the security and integrity of the C2k managed service.

About the Computer Programming Environment (CPE)

The CPE is accessed via a software tool which delivers a virtual desktop. This provides all users with access to a basic Windows 7 32-bit environment. In order to optimise performance this has had the “Aero” GUI removed.

- The CPE is available on C2k managed computers only.
- The CPE delivers a range of programming tools. These are outlined in [Appendix A](#).
- Internet Access – access to the internet is enabled for users of the CPE. See below for further details.
- Saving work – The CPE is designed to be used with USB storage. When connected to the managed computer, a USB drive will be automatically connected to and accessible via the CPE. Further guidance on the use of USB drives can be found in [Key Points](#) below.
 - If a school has opted in to G Suite for Education or Office 365, it is also possible to save work to a user’s Google Drive or One Drive.
 - It must be noted that upon logging off, the environment is cleaned down and **any changes or saved work will be lost**. As such it is essential that all work is saved to external storage or uploaded to MyFiles before logging off.

Accessing the Programming Environment

Access to the CPE is managed by a school via the following process:

1. Request school access by completing the online form on C2k Exchange. The form can be found under School Services>Information Management.
2. Once access confirmed, add the required users to the “Programming Environment” group in Identity Manager. For information on adding users to groups, please refer to Information Sheet EN026
3. Download the Programming Environment software to make it ready for use. This is a first-time use activity only. To do this click the shortcut available under the ICT tab in MyApps:



Please note, this can take up to an hour to download and install. Once installed, this process does not need to be repeated.

Using the Programming Environment

The CPE is accessed by clicking the Programming Environment icon available under the ICT tab:



Please note, this icon is only visible to users who have been made members of the Programming Environment group as described above.

When the programming environment launches, the user will be presented with a login screen:



At the password prompt, enter **Password1**.

The environment has been pre-populated with a range of programming applications accessible via Start>All Programs:



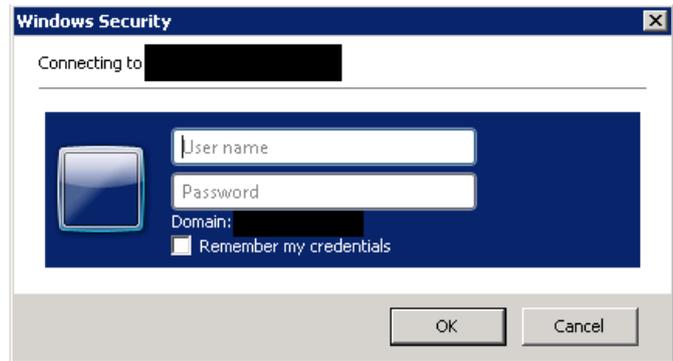
Useful information on using the CPE, including a description of all the applications available, can be found by launching Internet Explorer.

Internet Access

Internet access is enabled through the CPE. Users are required to **log in with their own username and password** in order to gain access. Usernames should be prefixed with

C2ken\ as in the example below. Users will then have the same internet access as from a C2k managed computer.

Username: C2ken\jbloggs123
Password: *****



Microsoft Office

Microsoft Office 2016 is available within the CPE.

Copying/Pasting

It is possible to copy text and images from the CPE and paste into the C2k computer. This can be best done if the CPE window is less than full screen, enabling easy access to the taskbar.

Please note, it is NOT possible to copy files from the CPE to the C2k computer.

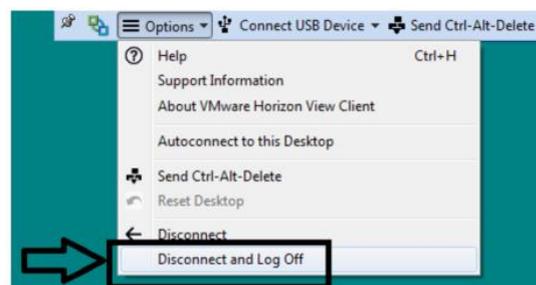
Printing

Printing from the CPE is possible. The virtual machine will adopt the default printers from the managed computer.

Logging off the Programming Environment

To log off correctly and ensure that the system can be cleared and rebuilt for the next student.

- From **Options**
- Select **Disconnect and Log Off**



Accidental disconnection from the Programming Environment

If a user inadvertently is disconnected from the CPE due to a network issue or user error (eg accidentally closing the window), they have 15 minutes to login again. The session will be retained for that period. After 15 minutes being disconnected the machine will be recycled and all data lost

Unlocking a Virtual Machine Screen

If the Virtual Machine screen locks **do not use** CTRL+Alt+Delete as this only affects the managed desktop.

Instead, from the **Options** menu

- select **Send Ctrl-Alt-Delete**
- re-enter the admin password (Password1) and continue your session.

Key Points

- **Helpsheet:** Launching Internet Explorer in the virtual machine will display a range of useful information on using the programming environment on the home page.
- **Storage:** There is no local storage on the virtual machine.

It is possible to copy and paste between the virtual machine and your own computer. Files may be accessed using a USB pen drive, via MySchool !MyFiles or through C2k provided cloud storage (Google Drive or One Drive where a school has opted in to these services).

Advice re USB usage:

1. USB devices that are connected to the computer will automatically be detected and become available on the CPE virtual machine.
2. When accessible on the CPE virtual machine, the USB device will not be accessible on the computer desktop.
3. To make the USB device available on the computer desktop (without disconnecting from the CPE virtual machine):
 - a. Click 'Connect USB' from the options menu.
 - b. Untick the USB device.

The USB device will then be available on the computer desktop, but not on the CPE virtual machine.

To reconnect, simply tick the USB device again in the same menu.

*As the USB device can only be present on one environment at a time, it is advised that any files that are stored on the USB device are saved and closed before switching.

4. On first connection of a USB device, the option to run a scan may appear on the virtual machine.

This message can simply be closed, or the user can select to run a scan. The length of the scan will depend on the content of the USB device.

During the scan the user can continue to launch applications from within the virtual machine.

- **When Disconnect and Logoff** is selected: the session is shutdown and any data stored locally will be removed.
- **If disconnected or  selected by mistake** the session will stay active for 15 minutes. If the user logs in again within 15 mins, they can retrieve their session and data.
- The Internet is accessed using a user's own C2k credentials.

Appendix A: Applications List

The following applications are installed within the CPE. :

Alice	more info
MIT App Inventor	more info
Blue J	more info
Greenfoot	more info
IIS 7.5 Express (inet manager)	more info
IIS 8.0 Express	more info
Java Development Kit	more info
MySQL	more info
Netbeans	more info
Notepad++	more info
Lazarus Pascal	more info
ActiveState Perl	more info
PHP 5	more info
Processing	more info
Python 2.7.3	more info
Python 3.4.1	more info
Ruby on Rails	more info
Small Basic	more info
SpringSource	more info
Microsoft SQL Express 2012	more info
Microsoft Visual Studio 2013 Express (Windows Desktop)	more info
Microsoft Visual Studio 2013 Express (Web)	more info
7-Zip	more info

Alice

Alice is an innovative 3D programming environment that makes it easy to create an animation for telling a story, playing an interactive game, or a video to share on the web. Alice is a teaching tool designed to be a student's first exposure to object-oriented programming. It allows students to learn fundamental programming concepts in the context of creating animated movies and simple video games. In Alice, 3-D objects (e.g., people, animals, and vehicles) populate a virtual world and students create a program to animate the objects.

MIT App Inventor

App Inventor is a visual, blocks language for building Android Apps, with a particular focus on helping students learn programming. When App Inventor is selected it will automatically launch in Chrome browser.

Blue J

A Java Development Environment designed for beginners, used by millions worldwide.

Greenfoot

Greenfoot teaches object orientation with Java. Create 'actors' which live in 'worlds' to build games, simulations, and other graphical programs.

IIS 7.5 Express (inet manager)

IIS 7.5 Express enhances your ability to develop and test web applications on Windows by combining the power of IIS 7.5 with the convenience of a lightweight web server like the ASP.NET Development Server. IIS 7.5 Express can also be used with Visual Studio 2013.

When executed, go to <http://localhost> to see the content of your IIS 7.5 Express site.

Content goes in C:\inetpub\wwwroot\.

IIS 8.0 Express

Internet Information Services (IIS) 8.0 Express is a free, simple and self-contained version of IIS that is optimized for developers. IIS 8.0 Express makes it easy to use the most current version of IIS to develop and test websites in development tools like Visual Studio and WebMatrix. IIS 8.0 Express has all the core capabilities of IIS 8 and above as well as additional features to ease website development

When executed, go to <http://localhost:8080> to see the content of your IIS 8 site.

Content goes in C:\Users\Admin\Documents\My Web Sites\Website1.

Java Development Kit

The JDK is a development environment for building applications, applets, and components using the Java programming language. The JDK includes tools useful for developing and testing programs written in the Java programming language and running on the Java platform.

MySQL

MySQL is a relational database management system (RDBMS), and ships with no GUI tools to administer MySQL databases or manage data contained within the databases. Users may use the included command line tools, or use MySQL "front-ends", desktop software and web applications that create and manage MySQL databases, build database structures, back up data, inspect status, and work with data records.

The account which manages the MySQL database installation is as follows:-

Username: root

Password: Password1

Netbeans

NetBeans IDE lets you quickly and easily develop Java desktop, mobile, and web applications, as well as HTML5 applications with HTML, JavaScript, and CSS. The IDE also provides a great set of tools for PHP and C/C++ developers. It is free and open source and has a large community of users and developers around the world.

MySQL has been pre-integrated into Netbeans.

Included with Netbeans is the Apache Tomcat web server. There are 2 accounts which may be required when using this application.

1. The account which manages Apache Tomcat, and is the authentication of the service in Netbeans is:

Username: root

Password: Password1

2. The account which manages the web based administration of Apache Tomcat, shown as /manager or /host-manager under web applications:-

Username: tomcat

Password: Password1

Notepad++

Notepad++ is a free source code editor and Notepad replacement that supports several languages.

Lazarus Pascal

Lazarus is a cross-platform visual integrated development environment (IDE) for rapid application development using the Pascal compiler.

ActiveState Perl

ActiveState's ActivePerl is the industry-standard Perl distribution available for Windows, Linux, Mac OS X, Solaris, AIX and HP-UX.

PHP 5

PHP is a popular general-purpose scripting language that is especially suited to web development.

Processing

Processing was designed as a user's first programming language. It was inspired by earlier languages like BASIC and Logo, as well as teaching visual arts foundation curricula. The same elements taught in a beginner's high school or university computer science class are taught through Processing, but with a different emphasis. Processing is geared toward creating visual, interactive media, so the first programs start with a focus on drawing.

Python 2.7.3

Python is a widely used general-purpose, high-level programming language. Its design philosophy emphasizes code readability, and its syntax allows programmers to express concepts in fewer lines of code than would be possible in languages such as C. The language provides constructs intended to enable clear programs on both a small and large scale.

Python 3.4.1

Python is a widely used general-purpose, high-level programming language. Its design philosophy emphasizes code readability, and its syntax allows programmers to express concepts in fewer lines of code than would be possible in languages such as C. The language provides constructs intended to enable clear programs on both a small and large scale. Python 3.0 (also called Python 3000 or py3k), a major, backwards-incompatible release, was released on 3rd December 2008 after a long period of testing. Many of its major features have been back ported to the backwards-compatible Python 2.6 and 2.7.

Ruby on Rails

Ruby on Rails is an open source web-framework, optimised for ease of programming and sustainable productivity.

Small Basic

Small Basic combines a friendly environment with a very simple language and a rich and engaging set of libraries to make your programs and games pop.

SpringSource

The Spring Tool Suite is an Eclipse-based development environment that is customized for developing Spring applications. It provides a ready-to-use environment to implement, debug, run, and deploy your Spring applications, including integrations for Pivotal tc Server, Pivotal Cloud Foundry, Git, Maven, AspectJ, and comes on top of the latest Eclipse releases.

Microsoft SQL Express 2012

Microsoft SQL Server 2012 Express is a powerful and reliable free data management system that delivers a rich and reliable data store for lightweight Web Sites and desktop applications.

Note that Windows Authentication is enabled for SQL Server on this system, and clicking "Connect" will sign you in using the local administrator account on the machine which is currently in use.

Microsoft Visual Studio 2013 Express (Windows Desktop)

Visual Studio Express for Windows Desktop includes XAML designers, a productive IDE, and a variety of programming languages including **C#**, **Visual Basic**, and **C++**. Choices include Windows Presentation Foundation (WPF), Windows Forms, and Win32, to target the Windows desktop with the right technology for your application and your skills.

NOTE: The SQL express instance has been pre-integrated into Visual Studio. You can use the default authentication settings to Connect to the SQL Express database and run queries etc. to it.

Microsoft Visual Studio 2013 Express (Web)

Visual Studio Express 2013 for Web provides the core tools for creating compelling, innovative web applications and services.

NOTE: The SQL express instance has been pre-integrated into Visual Studio. You can use the default authentication settings to Connect to the SQL Express database and run queries etc. to it.

7-Zip

7-Zip is an open source file archive tool, or an application used to compress files. 7-Zip operates with the 7z archive format, but can read and write several other archive formats.