OpenLAB CDS ChemStation - Distributed system

Best practices

Agilent Technologies

Contents

Scope

This document is a collection of recommendations for the optimized usage of OpenLAB CDS ChemStation Instrument Controllers. It doesn't claim completeness nor does it overrule the **Distributed System Installation Guide.** It is a living document to be developed further to become an Administrator's Guide. The intended audience are system owners and administrators as well as Agilent PSO consultants.

Revision History

Revision	Author	Comment
1.0	Bernhard Etrich, Abel de Oliveira	

OpenLAB CDS ChemStation Instrument Controller (AIC)

1. Basics

With OpenLAB CDS installed as a distributed system, you are able to access and run instruments from any PC in the system. As in case of networked workstations installation, the OpenLAB Shared Services provide an overview of all instruments in the system. You can access all information provided by the Shared Services from any CDS client. For example, you can see which instruments are available in which location and which status (Online, Offline, Error, In Run, Not Ready, etc.) the instruments currently have.

In contrast to the networked workstations installation, you can configure and launch all instruments in the network. The instrument hardware configuration is installed on Agilent Instrument Control (AIC) machines. You can access the ChemStation instance on the AIC machine from any CDS client via a Remote Desktop Services client. Accessing ChemStation via a Remote Desktop connection enables you to work more flexible with ChemStation sessions. You can, for example, launch an online ChemStation, start a sequence, and then disconnect only the Remote Desktop connection while ChemStation continues running on the AIC machine.

You or another user can later connect to this session again from a different CDS client, finish work in the online ChemStation, and then shutdown ChemStation.

In Windows Server 2008, Microsoft Terminal Services introduced RemoteApp programs, which are programs that are accessed remotely through Remote Desktop Services and appear as if they are running on the end user's local computer. A single server behaves like multiple workstations whose output is redirected to multiple external devices. Each client transmits all input from the user to the server, such as keystrokes and mouse movements, and all output from the server such as application display information and print streams.

For each ChemStation instrument, an instrument account is created at installation in order to establish RDS (Remote Desktop Services) session. The default account names are CSIUser0 to CSIUser10.

CSIUser0 will be used for the Instrument configuration while CSIUserX will be used to start Instrument X (Online and Offline). When using these default accounts, the system will add these accounts to windows and it will assign randomly generated passwords. Optionally you can override these default accounts by customized accounts. Please read the **OpenLAB CDS Distributed System Installation Guide** for further details.
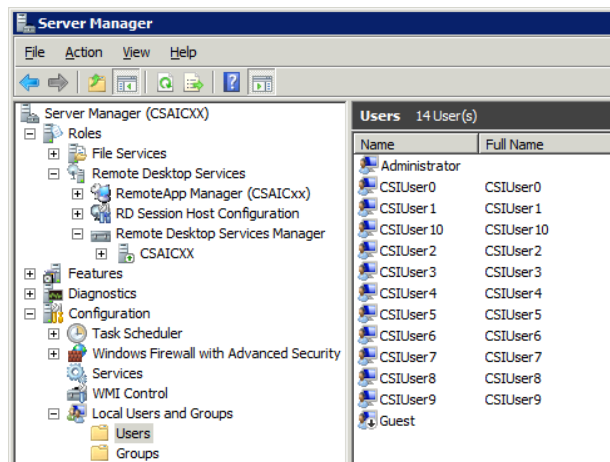
2. Licensing

Device-based or User-based Windows Client Access Licenses

There are two types of Windows Client Access Licenses from which to choose: device-based or user-based, also known as Windows Device CALs or Windows User CALs.

This means you can choose to acquire a Windows CAL for every device (used by any user) accessing your servers or you can choose to acquire a Windows CAL for every named user accessing your servers (from any device).

The option to choose between the two types of Windows CALs offers you the flexibility to use the licensing that best suits the needs of your organization.

For example: Windows Device CALs might make most economic and administrative sense for an organization with multiple users for one device, such as shift workers.

Whereas, Windows User CALs might make most sense for an organization with many employees who need access to the corporate network from unknown devices (for example, when traveling) and/or an organization with employees who access the network from multiple devices. (http://www.microsoft.com/windowsserver2008/en/us/client-licensing.aspx)

When Per Device licensing mode is used, and a client computer or device connects to an RD Session Host server for the first time, the client computer or device is issued a temporary license by default. When a client computer or device connects to an RD Session Host server for the second time, if the license server is activated and enough RDS Per Device CALs are available, the license server issues the client computer or device a permanent, RDS Per Device CAL.

An RDS Per User CAL gives one user the right to access an RD Session Host server from an unlimited number of client computers or devices. RDS Per User CALs are not enforced by RD Licensing. As a result, client connections can occur regardless of the number of RDS Per User CALs installed on the license server. This does not absolve administrators from Microsoft Software License Terms requirements to have a valid RDS Per User CAL for each user. Failure to have an RDS Per User CAL for each user, if Per User licensing mode is being used, is a violation of the license terms.
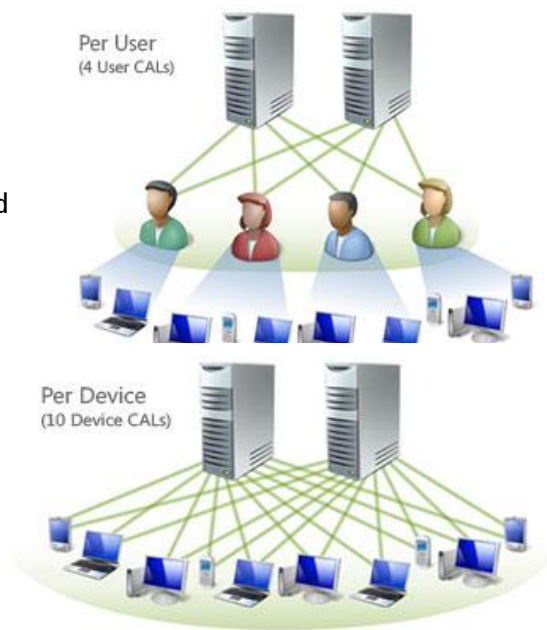
To ensure that you are in compliance with the license terms, make sure that you track the number of RDS Per User CALs being used in your organization and that you have a sufficient number of RDS Per User CALs installed on the license server to provide an RDS Per User CAL for each user that needs to connect to the RD Session Host server.

You can use the Remote Desktop Licensing Manager (RD Licensing Manager) tool to track and generate reports on the issuance of RDS Per User CALs.

To use Remote Desktop Services, you must also have at least one license server deployed in your environment. For small deployments, you can install both the RD Session Host role service and the RD Licensing role service on the same computer. For larger deployments, it is recommended that the RD Licensing role service be installed on a separate computer from the RD Session Host role service.
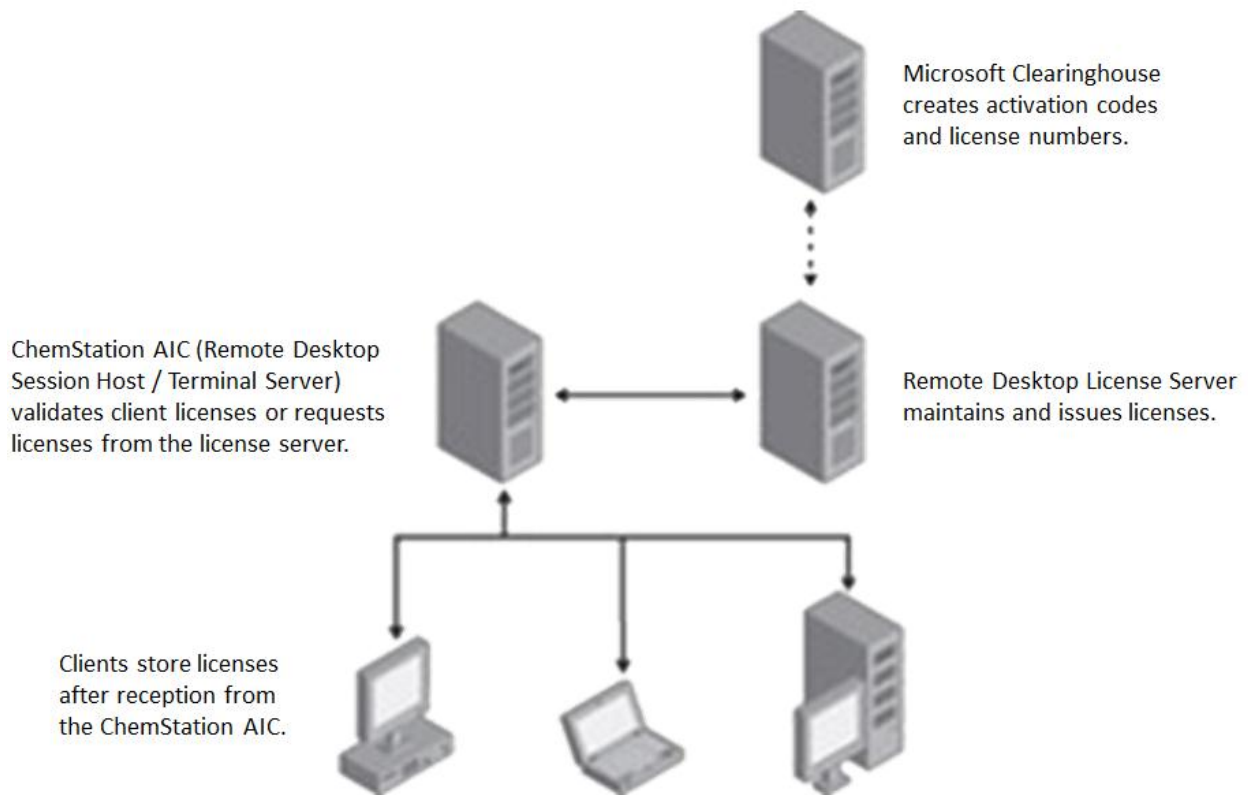
3. Configuration

This chapter describes additional configuration steps and details that help simplifying administration of the system.

Instrument Names

When setting up new instruments in the OpenLAB Control Panel the instrument's file infrastructure on the AIC does not get setup until the instrument gets configured. Hence, the internal instrument numbers are ordered by the order of configuring the instruments and can be organized as such.

When setting up a new instrument it is recommended to write the instrument's IP address to its description field in the Shared Services control panel.

Network Printers

There are three methods that you can use to assign server-based printers to users of Terminal Services

1. **Map printers in user's logon scripts**
   in a batch file use the command rundll32 printui.dll PrintUIEntry /in /n \\printserver\printer
   (see http://technet.microsoft.com/fr-fr/library/ee624057(WS.10).aspx)

2. **Map printers as part of a user's profile and policy settings.**

3. **Install the printer locally on the server**
   The network printer will be configured as a local printer, print jobs will be handled locally on the Terminal Server print queue and will be sent to the printer using a TCP/IP port.

   a. Logon to the Terminal Server as an administrator.
   b. Click on **Start > Devices and Printers**
   c. Start the **Add Printer** wizard.
   d. Select **Add a Local printer**
   e. Select **Create a new port** instead of using an existing port.
   f. Select **Standard TCP/IP port,** press Next
   g. Type in the **IP address** or the **hostname** of the printer.
   h. Select and install the printer driver corresponding to the printer

Disc configuration

If OpenLAB CDS ChemStation gets installed on a single disc drive, this disc has to handle the following I/O intensive processes:

- Windows pagefile (virtual memory)
- Windows user's temp directories (used for unzipping of data downloaded from OpenLAB ECM)
- ChemStation raw data writing

The load on this disk gets additionally increased if the ChemStation data storage location is not excluded from real-time protection of virus scanners as recommended.

The main goal is to keep the AIC disks as empty as possible and to distribute I/O intensive processes across multiple disk drives. This can be achieved by various means:

- delete locally stored data after transfer to OpenLAB ECM or OpenLAB data store
- Install or configure OpenLAB CDS ChemStation on a drive that do not host the Windows page file or the Windows user's temp directories (default: c:\users\<current user\AppData\Local\Temp)
- Install OpenLAB CDS ChemStation on the c:\drive and change the default paths for sequences methods and data files after configuring a new instrument.

The ChemStation default data path can also be changed on systems being used for a while.

Use the following procedure:

- Windows explorer on the AIC: Create new data directories chem32\<InstNumber>\Data
- On the clients: Shut down all instruments
- Open OLSS control panel and change the data path preferences in the configuration of each instrument. (Do not change the paths for methods sequences etc.)
- Start each instrument and go to View > Preferences...
- Select the new data path and leave the preferences window by pressing o.k.

Now the ChemStation explorer shows the content of the new and the initial data path.

If data gets deleted after upload to ECM the initial data path can be removed from ChemStation´s path preferences after a transition period.

Anti-virus interference with system operations

A large test campaign has been performed by Agilent to measure the impact of various software and hardware settings on AIC performance. The following recommendations have been concluded from these tests. Further details on each of this topic are listed in the following sections.

Running AntiVirus programs might influence the behaviour and performance of your computer. To demonstrate the impact of active virus scanning the following test scenario was performed on a virtual OpenLAB CDS ChemStation AIC 'AIC008': Reprocessing of a defined test sequence of 100 runs and extracting the run times for each sequence line from the sequence log files. The following graph shows the progress of sequence reprocessing while turning the on-demand virus scanning on and off at dedicated position:
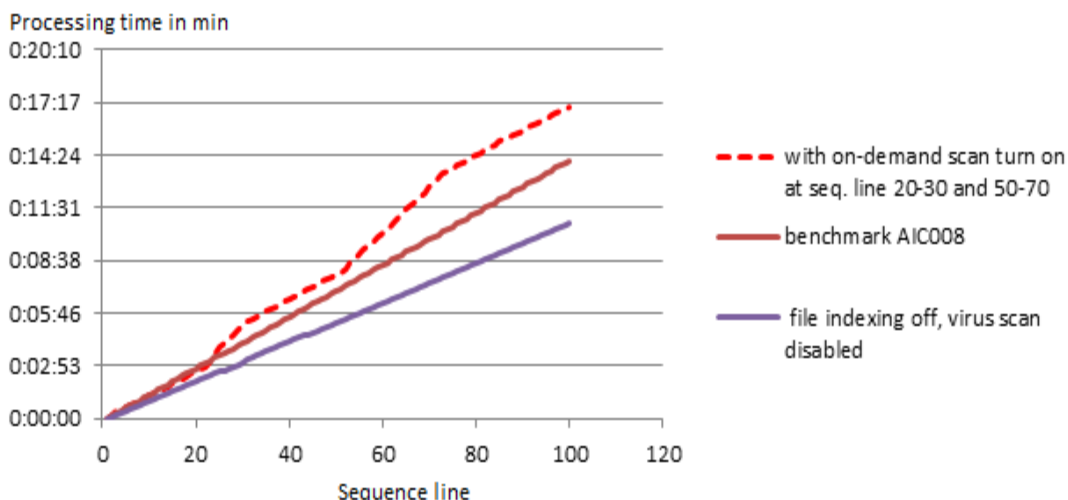
Pict. 1: Sequence reprocessing progress with and without on demand scanning and file indexing

Recommendation: Agilent OpenLAB CDS was tested to run with Symantec's Norton Antivirus. In order for the OpenLAB software to function correctly any Anti-Virus real time protection software and "on access" scanning should be configured with the following list of folder exclusions. These folders listed below should only be scanned while the AIC is idle and no data acquisition takes place. Please refer to your specific Anti-Virus software user's guide on how to configure folder exclusions.

Process	Directory	Filename
OpenLAB CDS ChemStation Data Acquisition	C:\chem32 (default, see ChemStation Preferences for current settings)	*.D *.CH *.UV *.MS
ECM upload / download	%temp% for AIC users CSIuser1 – CSIuser10 (=Users-temp-directory)	*.ssizip
Standard Reports		~p3d*.tmp ~job*.tmp
	/chem32/core	Hpspl00.que
CDS intelligent reports	%LOCALAPPDATA% %APPDATA% %PROGRAMDATA%	Files on: • Agilent • Agilent Technologies • Agilent_Technologies • Agilent_Technologies,_Inc • IsolatedStorage • Temp e.g.: C:\Users\xxxxx\AppData\Local\ Agilent Technologies\Intelligent Reporting\RawDataFileCache

Further on:

- C:\programdata\agilent
- %programfiles%\agilent
- %programfiles(x86)%\agilent
- %programfiles%\common files\agilent
- %programfiles(x86)%\common files\agilent
- %programfiles%\agilent technologies
- %programfiles(x86)%\agilent technologies
- %programfiles%\common files\agilent technologies
- %programfiles(x86)%\common files\agilent technologies
- %programfiles%\common files\agilent shared
- %programfiles(x86)%\common files\agilent shared

Please note that depending on your specific configuration some of the listed folders may not exist on your system.

If your Anti-Virus software includes program or executable deny execution settings please ensure the following program files are not denied execution. You can use the windows search feature to find the specific folder each program file is located in.

- agilentiolibrariesservice.exe
- chemmain.exe
- apg_top.exe
- iprocsvr.exe
- iproc8491.exe
- msinsctl.exe
- httpdmsd.exe
- epcsetup.exe

Please note again that depending on your specific configuration some of the program files listed may not exist on your system.

Windows File indexing

As per default the Windows file indexing (http://msdn.microsoft.com/en-us/library/ee805985%28v=vs.85%29.aspx) might be turned on all AICs that have not been purchased as an Agilent bundle PC.

On a test AIC "AIC008" we could determine a performance increase by ~10% after turning the file indexing off.

Processing time in min

Legend:
- benchmark AIC008
- file indexing off
- file indexing off, virus scan disabled

X-axis: Sequence line (0, 20, 40, 60, 80, 100, 120)
Y-axis: 0:00:00, 0:02:53, 0:05:46, 0:08:38, 0:11:31, 0:14:24, 0:17:17
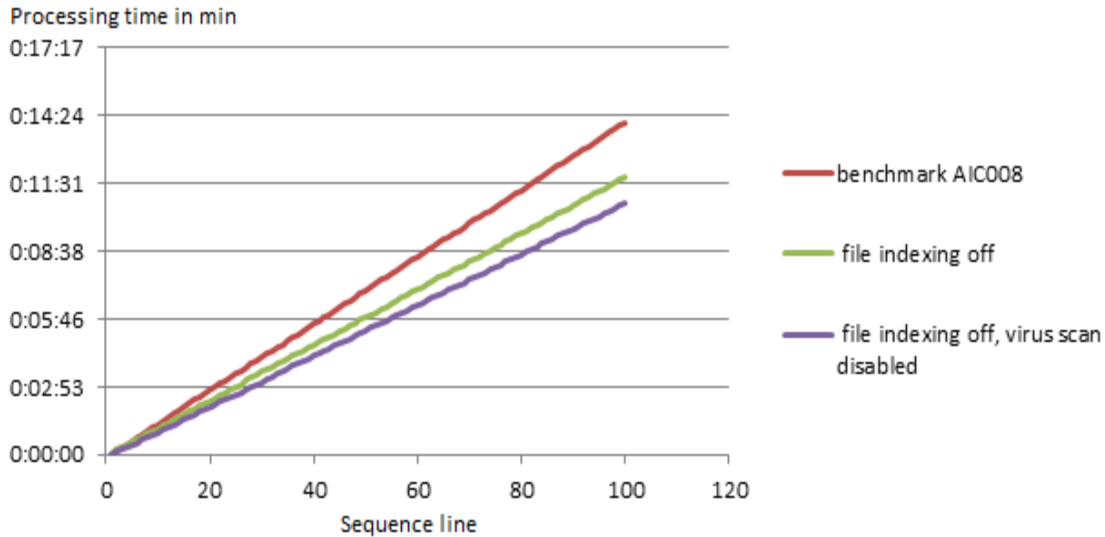
Recommendation:

The Configure your ChemStation Guide (M8301- 90090) p.15 recommends turning the file indexing off for better performance.

**Caution:** Changing the properties on thousands of files may last 15 minutes or more.

RDP-TCP Properties

Timeout and reconnection settings configured by using Remote Desktop Session Host Configuration will take precedence over timeout and reconnection settings that have been configured for a specific user account.

- **End a disconnected session**: Specify the maximum amount of time that a disconnected user session is kept active on the RD Session Host server.

- **Active session limit**: Specify the maximum amount of time that the user's Remote Desktop Services session can be active before the session is automatically disconnected or ended.

Idle session limit: Specify the maximum amount of time that an active Remote Desktop Services session can be idle (without user input) before the session is automatically disconnected or ended.

Important: All 3 settings must be set to **Never** to make sure that no running sequences get aborted due to a timeout
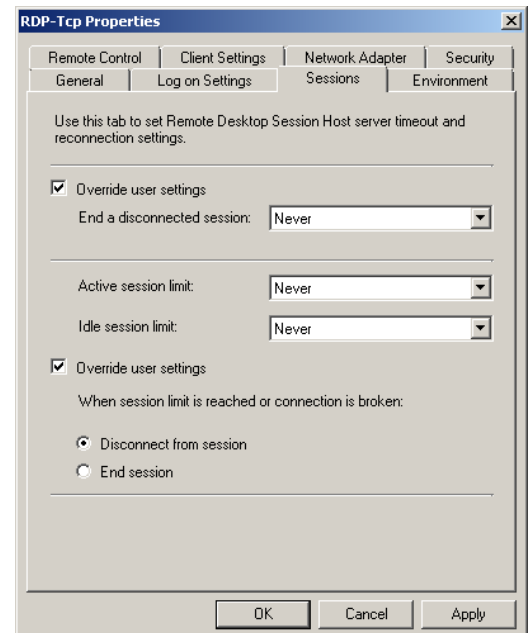
Virtualization of AICs

Virtualization of AIC hardware is possible, but not recommended in general. Adding multiple AICs to a single virtualization host server does not only create a single point of failure but also adds the risk of interference across multiple virtualized systems.

The risk of a complete system failure needs to be mitigated by adding sufficient hardware buffer (memory, NICs, disc subsystem) and redundancy. For troubleshooting purposes a physical AIC need to be set up in order to exclude the virtualization as a potential source of a problem. Agilent does not actively support the virtualized infrastructure.

4. Maintenance

**Planned reboots on variable schedule/reboot procedure**

In order to free up allocated memory and to delete temporary files it is recommended to reboot every AIC every 4 to 6 weeks of operation. In order to minimize the instrument downtime of the instruments, the following workflow is recommended:

- Announce the AIC shutdown e.g. 3 days in advance
- Operators are obliged to start partial acquisitions only and schedule only as many runs as the instrument would run before the planned shutdown
- After partial sequence acquisition has finished, users should shut down the instrument (not disconnect) and keep the pump flowing and the lamps turned on
- The user should use the OpenLAB Control panel to lock the instrument
- When all instrument show the lock icon in the instrument overview panel: Start the task manager on the AIC to verify that no ChemMain.exe process is running
- Reboot the AIC (Note: When shutting down the AIC you receive a warning about users being logged on remotely. This is the expected behaviour as the CSIUser's sessions remain open after closing a ChemStation instrument)
- Perform additional maintenance tasks on the AIC
- After finishing the maintenance tasks remove the locks from all instruments and inform users about the finished reboot
- User can start the on-line instrument again and proceed with the partially acquired sequence
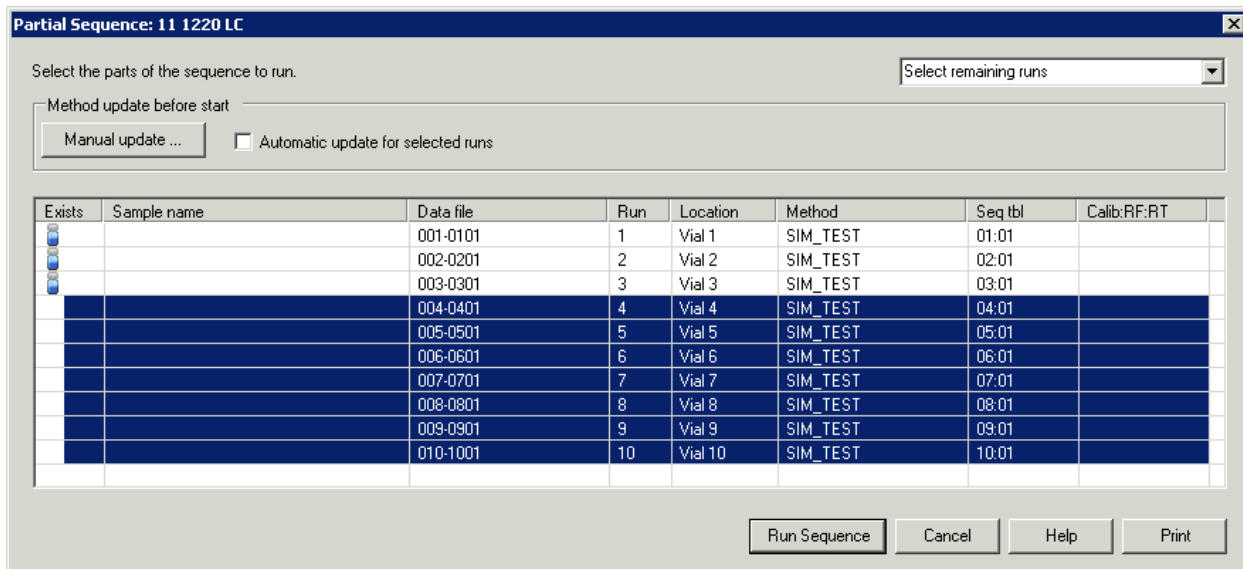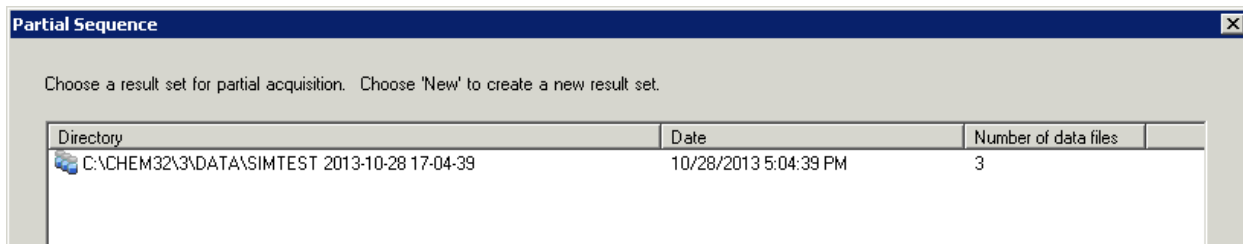
Disk clean-up

A big impact on reprocessing performance has been observed on a productive system after **deleting data after transfer to ECM** and by writing the data to a dedicated disc as described in the **Configuration** section of this document. Pointing the data path to an empty d:\ partition **tripled** the speed of sequence reprocessing on this specific test AIC.

Processing time in min
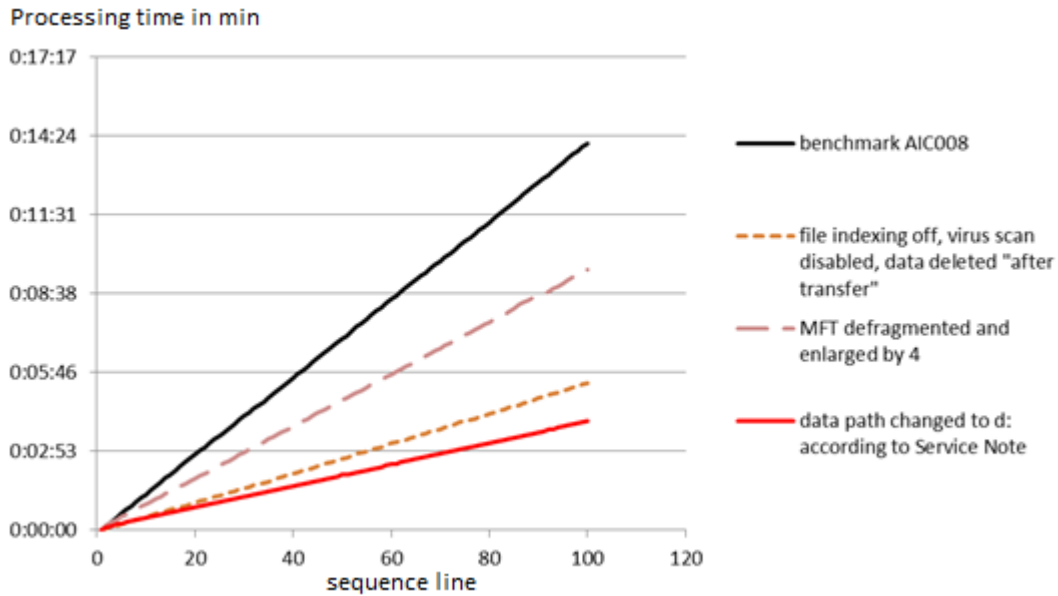
If ECM transfer settings are set to keep the data on the 'local' AIC disc after closing an instrument, the accumulated data needs to be deleted on a regular base – ideally during a 4-6 weeks maintenance cycle.

It is recommended to use the ChemStation **Cleanup Data** function to ensure that only data gets deleted that is safely stored in ECM:

- Start up a single ChemStation instrument on the AIC and log on to ECM and switch to Data Analysis view
- Go to ECM > Manage Queue and verify the data upload queue is empty
- Use the **Clear Navigation Table** button to clear the navigation table view (Note: This step does not delete any data)
- Go to ECM > Cleanup Data .. and select a filter like **Select older than one week** to keep the latest data locally stored and to delete any data older than one week. Verify there is no **Locally Modified** flag before proceeding with data deletion.
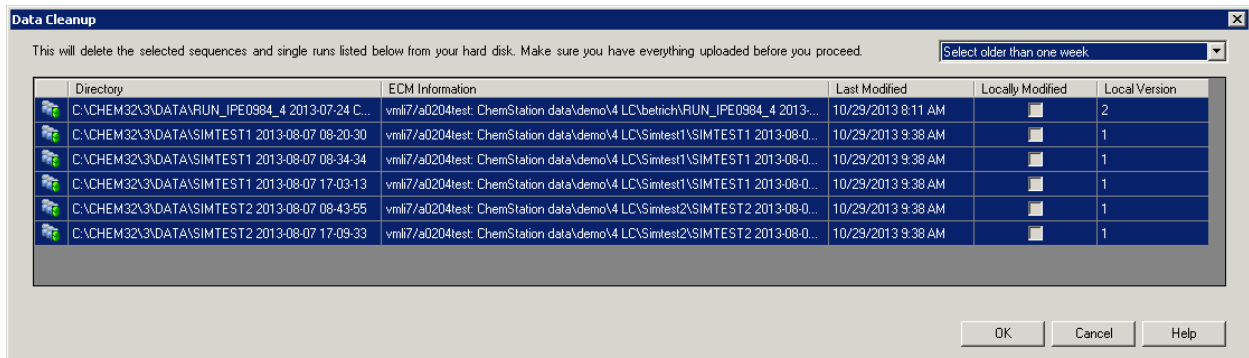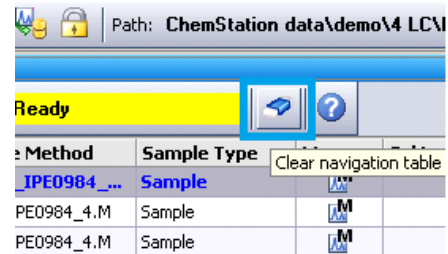
Disk defragmentation

Raw data generated by OpenLAB CDS ChemStation consists of a large number of small files. A disc filling of 100 GB generates a large number of records in the disc's Master File Table (MFT) as opposed to a use case of storing 5 large files of 20 GB. The fragmentation of the (MFT) can be determined according to http://support.microsoft.com/kb/961095/en-us.

By increasing the MFT size by factor 4 and defragmentation (see http://support.microsoft.com/kb/961095/en-us) the reprocessing performance can be improved. The impact of a MFT defragmentation needs to be tested on a sandbox system first and a complete backup of the disc is mandatory before applying it to a production system.

Virus scanning

As part of the maintenance procedure it is recommended to perform a full scan of all disks while the AIC is in maintenance mode.

Performance benchmarking

At the end of a maintenance cycle it is advisable to run a performance benchmark test as described in the Performance monitoring chapter.

5. Troubleshooting

This chapter contains some general troubleshooting tips. Read the "Known Problems" section for further information.

Starting instruments on the AIC

For troubleshooting purposes you may want to exclude the influence of CDS client connections to the AIC. You may start an instrument on the AIC directly, but with OpenLAB CDS ChemStation C.01.03 it is not possible to take over a session currently operated by another client.

The open remote session is owned by the local CSIUserX and the user who logs on to the AIC directly would start another on-line instance of the same instrument. Having multiple instrument controllers gets actively prevented and the 2nd on-line session would start with no instrument connection.

Since OpenLAB CDS ChemStation rev. C.01.04 it is possible taking over a running client session while being logged on to an AIC directly.

Identifying the CSIUser assigned to an instrument

After deleting and reconfiguring multiple instruments, the instrument #X might no longer be operated by CSIUser #X and you want to find out which user hosts the remote application session.

This information can be displayed in the task manager of the AIC if you check the **Show processes from all users** box and add the column (View > Select Columns) **Command Line** to the monitor window. The command line of process ChemMain.exe *32 would appear like

<div align="center">C:\chem32\CORE\ChemMain.exe""3""/a</div>

Where 3 indicates the instrument number and "/a" indicates an on-line session.
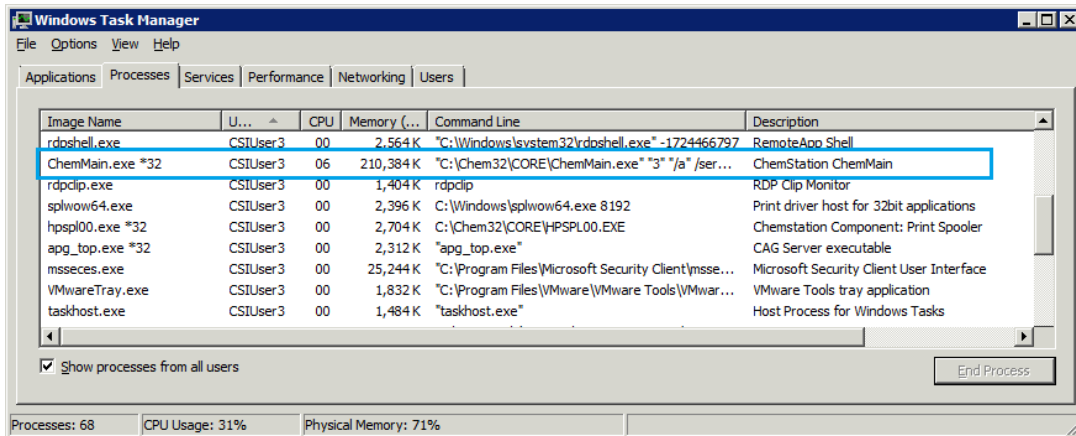
Sandbox system

In case of larger systems with multiple AICs it is recommended to setup a 'sandbox' system to test the deployment of updates, performance tuning and troubleshooting with no interference with the productive systems.

6. Performance monitoring

Whenever attempting to increase ChemStation AIC performance it is important to monitor and classify potential performance issues carefully.

A simple method for monitoring disk performance is by reprocessing a large example sequence data for benchmarking purposes. The run time of the reprocessing cycle can be graphically displayed by importing the sequence logfile to Microsoft® Excel® and plotting the start time versus the sequence line number. The sequence used with the examples in this document can be requested from Agilent.

By repeating these benchmark tests on a regular base – ideally after performing a maintenance procedure – slow digression of performance can be identified earliest.

Software operations typically start a whole chain of processes where the slowest step determines the overall performance. If the slowness of this step is exceeding the other processes by magnitudes this single bottleneck might be corrected by a single action.

In cases where the individual processes along the chain show equivalent performance the bottleneck may become hard to identify as it jumps along the chain as soon as a single parameter gets optimized. A multi-step optimization becomes necessary then.

The following parameters do have potential impact on AIC performance and can be tuned for performance optimization

·   Network configuration

·   Memory configuration

·   Disk configuration

Network configuration

Please refer to the Network Requirements document on disk 1 of the OpenLAB CDS DVD suite.

Memory Configuration

Troubleshooting: Monitor the overall memory usage and the private Bytes used by each ChemMain.exe process. If memory usage exceeds 95% of the available memory Windows starts to swap memory content into virtual memory – which is a slow process as the pagefile (virtual memory) is typically hosted by a spinning disk.

Possible Causes for insufficient free memory: The memory usage increases with the server load or the application in use may also suffer from memory leaks.

As the server load is typically constant on larger time scales the memory consumption due to memory leaks increases over time. If performance and free memory can be re-gained by rebooting the AIC the system might suffer from memory leaks. Please ensure that Microsoft hot fix 2636613 (http://support.microsoft.com/kb/2636613/en-us) is installed.

If 95% of the memory is already consumed after a reboot of the AIC and all instruments connected more physical memory should be added.

If a ChemStation OpenLAB CDS ChemStation instance is operated for several weeks in a row with no shut-down the chemmain.exe process associated with this instrument may allocate 500 MB private memory or even more. Hence it is recommended to restart every instrument instance after 4-6 weeks of operation. This does also trigger the clean-up of temporarily stored files with positive impact on disc performance.

Disc configuration

In order to identify disc related performance problems it is recommended to monitor the average disk queue for logical and physical disks (http://technet.microsoft.com/en-us/library/cc938625.aspx). With a volume set a queue that is never shorter than the number of active physical disks indicates that you are developing a bottleneck.

7. Performance tuning

### Optimize disc configuration
AICs operating up to 10 instruments in parallel may show disc related performance problems if all instruments are using a single disk drive for operation. If disc maintenance has been performed and performance measurements still indicate a disc related bottleneck it should be considered to spread the disk load across multiple disks. This can be achieved by adding additional hard disks or utilize the c:\ partition to an extent where the operation of the operating system does not get impacted.

Minimize CPU usage

Minimize the effect on CPU usage when you are running many RDS sessions by opening the MMC snap-in for Group Policy (Gpedit.msc) and making the following changes under **Local Computer Policy > User Configuration > Administrative Templates**:

- Under Start Menu and Taskbar, enable "Do not keep history of recently opened documents".

- Under Start Menu and Taskbar, enable "Remove Balloon Tips on Start Menu items".

- Under Start Menu and Taskbar, enable "Remove frequent program list from Start Menu".
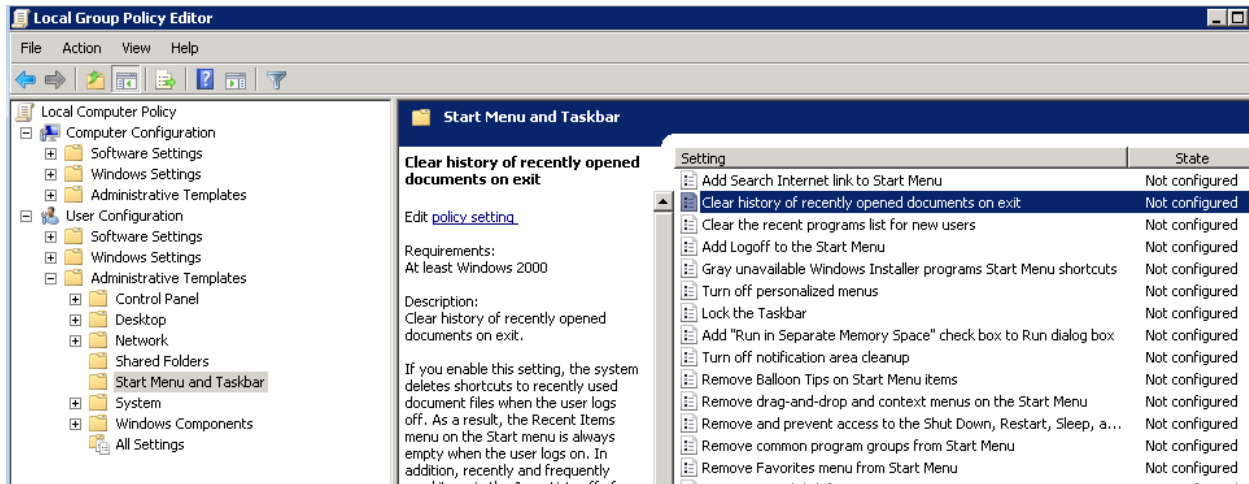
Under **Computer Configuration > Administrative Templates > Windows Components > Remote Desktop Services > Remote Desktop Session Host**

- Under Connections, do not configure or disable Turn off Fair Share CPU Scheduling

- Under Remote Session Environment,

  - Limit the "Maximum Color Depth" to 24 bpps.

  - Enable "Enforce Removal of Remote Desktop Wallpaper".

  - Enable the policy "Set compression algorithm for RDP data" and set it to optimized to use less memory

  - Do not configure or disable the policy "Allow desktop composition for remote desktop sessions"

- Under Session Time Limits

  - Enable the policy Set time limit for disconnected sessions and select **Never**

  - Enable the policy Set time limit for active but idle Remote Desktop Services sessions and select **Never**

  - Enable the policy Set time limit for active Remote Desktop Services sessions and select **Never**

  - Disable the policy Terminate session when time limits are reached

Type GPupdate to refresh the policies on the AIC or Reboot the server

8. Known Problems

KPR#: 1617 AIC can experience communication loss if Application Experience service is running
(http://www.chem.agilent.com/Library/Support/Patches/SSBs/M83xxAA.html#TTID:163419)

Problem: The likelihood of an irrecoverable communication loss between instrument, AIC and OLSS will increase, when the Application Experience service is running on the AIC.

Temporary Solution: To increase stability of communication it is recommended to disable the Aero look on the AIC, install the SP1 for Windows Server 2008 R2 and disable the Application Experience Service

See also: http://support.microsoft.com/kb/902196

KPR#: 1842   Memory leak in RDPShell.exe may cause significant performance decrease
(http://www.chem.agilent.com/Library/Support/Patches/SSBs/M83xxAA.html#TTID:198399)

Problem: The following problem has been reported for OpenLAB CDS ChemStation C.01.0x Acquisition Instrument Controllers (AIC) operated on Windows 2008 R2 SP1 operating systems. Windows 7 or Windows XP operating systems are not affected.

A memory leak in RDPShell.exe may cause significant performance decrease as the overall memory usage may exceed 80% after several weeks of operation. This unintended and permanent memory allocation is triggered by moving the ChemStation application window over the client desktop.

This problem is acknowledged by Microsoft (http://support.microsoft.com/kb/2636613/en-us) and hot fix is available on request.

NOTE: The hot fix is not deployed as part of the automated update procedure.

Temporary Solution:

- Unpatched AIC machines should be rebooted every 2nd week to release the allocated memory. (Note: ChemStation instances need to be shutdown (rather than disconnected) before rebooting the AIC)
- Use the remote application window in full screen mode only and avoid moving the application window on the client screen.

Shutting down the ChemStation instances does not release the memory on the Windows 2008 server as the RDP sessions remain in an idle state until they are re-used.

Fix Information: Microsoft offers a hot fix that is not automatically distributed by the update process. The patch needs to be explicitly requested from http://support.microsoft.com/kb/2636613/en-us .

Please follow the back-up and installation recommendations from Microsoft. Agilent performed limited tests with the mentioned hot fix and no negative impact was found.

Password policy not satisfied by default passwords

The local users created during installation by default have a password consisting of a random mixture of 3 uppercase letters, 3 lowercase letters, 3 digits and 3 special characters. This should satisfy almost any password restriction rules. To check if the user password matches the password restriction rules:

1. Create a test user on the AIC.

2. Set the test user's password to "uK0%wJ8+kA6+" for example. If the password does not conform to the password rules:

3. Create 11 compliant passwords and enter them during installation of the AIC

"Allow log-on through Remote Desktop Services" not granted

Some IT departments revoke the privilege **Allow log-on through Remote Desktop Services** from the **Remote Desktop Users** group (to which it is granted by default) by domain policy.

To check if the logon privilege is granted:

1. Select **Start > Run...**
2. Type secpol.msc
3. Check the security setting for **Local Policy > User Rights Assignment > Allow log-on through Remote Desktop Services**.

If the security setting does not include the **Remote Desktop Users** group:
   a) Negotiate with the local IT department to get an exception for this policy (preferred solution), or
   b) Check if the logon privilege is granted to the **Local Administrators** group (workaround solution).

If the privilege is granted:
   c) Set the unsafe="true" switch during installation of the AIC (see Configure ChemStation instrument users manually).

Remote Desktop Users group is emptied by Group Policy

Some IT departments empty the **Remote Desktop Users** group periodically by Group Policy.
To check if the Remote Desktop Users group is emptied:

1. Create a local test user.
2. Add the test user to the **Remote Desktop Users**.
3. Wait until the Group Policy application period has elapsed (in most cases 24 hours)
4. Check in the **Computer Management** tool under **Local Users and Groups > Groups > Remote Desktop Users** if the test user is still present in this group.

If the user is not present:

a) Negotiate with the local IT department to get an exception for this policy (preferred solution), or
b) Check whether the security setting for **Local Policy > User Rights Assignment > Allow log-on through Remote Desktop Services** includes the **Local Administrators** group (workaround solution).

If the security setting includes the Local Administrators group:

c) Set the **unsafe="true"** switch during installation of the AIC (see **Configure ChemStation instrument users manually**).

Error message "Your credentials did not work"

After selecting the **Configure Instrument** or **Launch** button in the OpenLAB Configuration Panel an error message appears, stating that the logon to the AIC failed.

1. Log on by selecting **Use another account**.
2. Type in the user name and password from the retained users.xml file (see **Configure ChemStation instrument users manually**). If this logon attempt succeeds, the logon information registered on the OLSS server for this AIC is corrupt.
3. Re-register the users.xml file as described in **Register ChemStation instrument users with OLSS**. Check if the ChemStation instrument user still has the necessary access rights (see sections **Configure ChemStation instrument users manually** and **Remote Desktop Users group is emptied by Group Policy**):
4. Apply the remedy or workaround as described in the sections mentioned above.
5. On the AIC check if this account is locked out, using the **Computer Management** tool under **Local Users and Groups > Users.**
6. Uncheck the box **Account is disabled**.

Error message "Program Execution Failed"

After selecting the **Configure Instrument** or **Launch** button in the OpenLAB Configuration Panel an error message appears, stating that program execution failed.

1. On the AIC, start **Server Manager**. Select **Roles > Remote Desktop Services > RemoteApp Manager properties**.
2. Check that the **RemoteApp Programs** list contains **Process Cleaner and CS Launcher** and **SetupWizardLauncher**, both with the attribute **Unrestricted** in column **Arguments**.

3. On the AIC, start **Windows Explorer** and check that the **instrument users** (**Local Users group** or **Remote Desktop Users group)** have read/write and execute access to the ChemStation installation directory.

Login delay

If you are experiencing high response times during log on to the system or reconnecting after a session lock, the following causes might apply:

- DNS not set up correctly. Check that the name resolution is working properly for all affected computers.
- Ports blocked by firewall. Check that the ports listed in OpenLAB CDS Network Requirements are not blocked by your firewall.

OpenLAB CDS ChemStation Clients

1. Configuration

Visual effects

In cases where CDS client PCs show a medium performance and poor user experience (Slow display of menus, windows cannot be moved by the mouse) the graphical options on the clients should be adjusted. The visual effects set on the client do also affect the graphical performance of the remote application.

Recommendation:

Turn off animations and other graphical features on all clients and protect the settings from being changed by users. The following setting should be chosen for best performance. At least all animations and fade effects and "show windows contents while dragging" should be turned off for a better user experience.

Virus Scanning

No special exclusions are required on an OpenLAB CDS ChemStation clients. Depending on the client hardware a full scan during working hours may result in a bad user experience while the scan is performed.
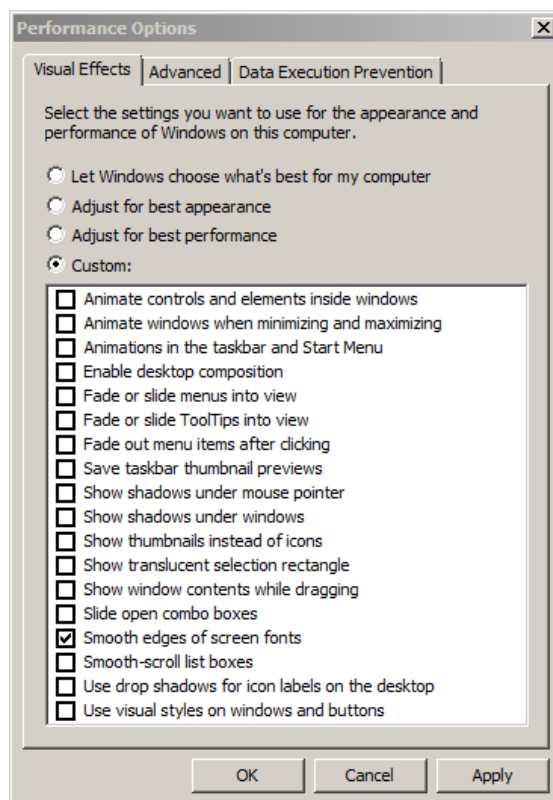
9. Maintenance

The OpenLAB CDS ChemStation clients do not require specific maintenance procedures as far as they are not used as office PCs or with other applications. A reboot after 2 weeks of operation is recommended.

10.   Troubleshooting

Reference PC

A major advantage of OpenLAB CDS ChemStation clients are the reduced PC requirements and expensive state-of-art PCs are like not be used as CDS clients. Therefor it is likely that PC hardware related problems may appear as being introduced by the ChemStation application running on the Instrument Controller.

For troubleshooting purposes it strongly recommended to have at least one Agilent ChemStation bundle PC operating as an OpenLAB CDS ChemStation client. This PC should be kept as a reference to identify client PC hardware related display and performance problems.

By taking over a ChemStation session from an "affected" client to the reference client, it can be concluded whether the problem stays with the session or with the client PC.

11.   Known Problems

Distorted graphics in chromatogram window

Issue: After un-locking a Windows user session lock or un-hiding the Windows task bar users may observe multiple graphical issues:

- Zoom function of ChemStation does not show the rectangle you would use to define the zoomed are. Zooming is working well
- Letters of peak annotations are incomplete
- Chromatogram and baseline might be incomplete
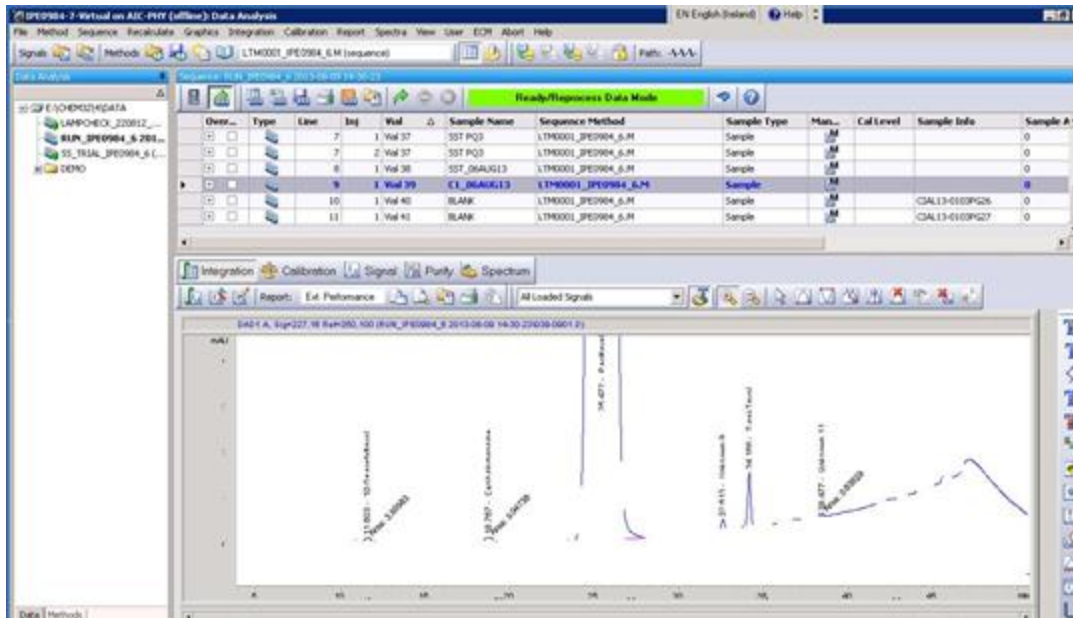
- A ChemStation window that was fully maximized gets shifted by about 5 x 5 pixels after unlocking the session.

- The status of this window is still "maximized". This is indicated by the yellow marked button, which looks different if the window is not maximized.

- After maximizing the ChemStation window again, the graphical issues are gone.
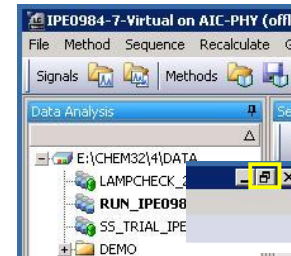
The problem does not appear if the ChemStation window was not maximized when locking the client PC or if the task –bar is set to 'auto-hide'.

Recommend workarounds:

- The problem can be prevented by using and closing the ChemStation in non-maximized mode
- The problem can also prevented by auto-hiding the task bar

If the problem appears, the screen can be repositioned by minimizing and maximizing the ChemStation window.

Sequence table does not allow entering long sample names

The following problem was observed during a customer visit: The Sample name column did not allow left/right key strokes and longer sample names could not be entered.

By taking over the session to a reference client and swapping keyboards the problem could be traced back to a particular client PC.

KPR#: 1863   ChemStation CDS client appears to freeze after hiding a save as dialog

The following workflow may lead to a situation where a ChemStation client session appears to be frozen, where it is not:

Whenever downloading a result set from OpenLAB ECM to OpenLAB CDS ChemStation a warning message pops up in case where the same result set is already stored on disk. A message pops up informing the user to save result set with a different name, as it does already exist on the client.

After pressing o.k., the SAVE AS dialog comes up and may jump behind the ChemStation window to become invisible. This happens when either clicking the ChemStation window while the Save As dialog is open or if the previous info box got committed by a double-click. The second click brings the ChemStation window to the foreground.

While the 'save as ' dialog is waiting for a user's input the ChemStation appears to be frozen during the ECM download operation. Even pressing the ALT+TAB keys does not allow accessing the SAVE AS dialog.

Note: The same symptom would be noticed if the OpenLAB ECM File Transfer Service is currently stopped and if the user tries to download an older result set which is no longer stored in the file transfer cache on the ECM file transfer server.

Solution: In cases where the ECM download to a CDS client seems to be frozen follow this procedure to mitigate the situation:
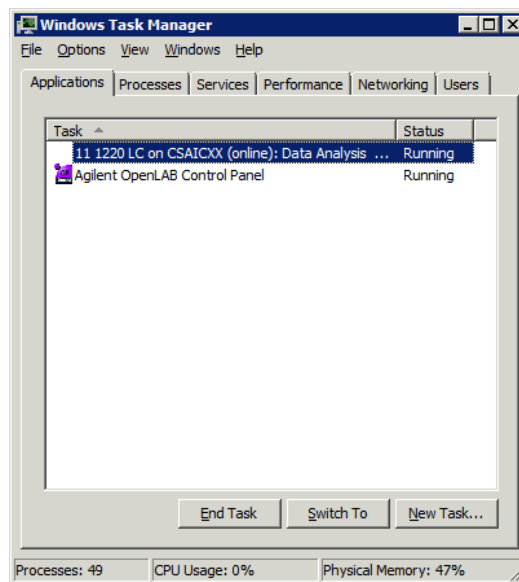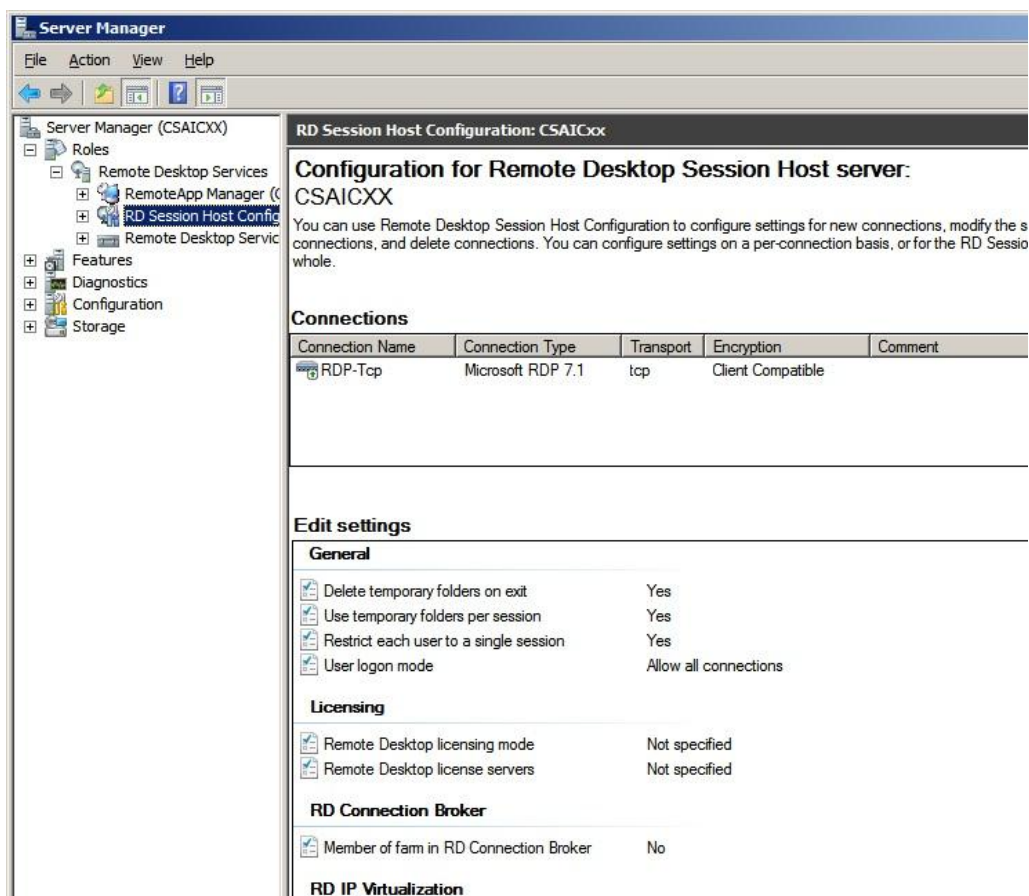
1. If the ChemStation window was not maximized users could move the foreground window aside and regain access to the **Save As** dialog.

2. If the ChemStation window was maximized:
    - open the Windows task manager on the CDS client
    - Select the current instrument under the applications tab
    - Press the **Switch To** button. This brings the **Save As** dialog back to the foreground.
3. If the previous steps do not apply, ask an OpenLAB ECM administrator to verify the run status of the **ECM File Transfer Service.** (ECM client > Administration tab > Global administration > System status)

Appendix

1. Default RDP configuration

After installation of an OpenLAB CDS ChemStation Instrument Controller on a Windows 2008 R2 server with no pre-installed roles, the remote desktop services show the following configuration:

- Remote Desktop licensing mode is not yet specified
- No Remote Desktop license sever is selected

The RemoteApp manager is setup with the following default settings:

RemoteApp Deployment Settings

| RD Session Host Server | RD Gateway |
| Digital Signature | Common RDP Settings | Custom RDP Settings |

You can sign .rdp files that are used for RemoteApp connections by using a digital certificate. This will allow clients to recognize and trust remote resources from your organization.

☐ Sign with a digital certificate

Digital certificate details:

Signing as:

Issued by:

Valid until:

[Details] [Change]

More about digitally signing files for RemoteApp connections

[OK] [Cancel] [Apply]

RemoteApp Deployment Settings

| RD Session Host Server | RD Gateway |
| Digital Signature | Common RDP Settings | Custom RDP Settings |

The following RDP settings will be used when a user connects remotely to the RD Session Host server. To configure additional RDP settings, see the Custom RDP Settings tab.

Devices and resources

Select the devices and resources on the client computer that the user will use in the remote session.

☑ Printers   ☑ Disk drives
☑ Clipboard   ☑ Smart cards
☑ Supported Plug and Play devices

User experience

Select the display settings for the remote session.

☐ Use all client monitors when connecting to a remote desktop
☑ Allow font smoothing
Colors: Highest Quality (32 bit) ▼

More about RDP settings

[OK] [Cancel] [Apply]

RemoteApp Deployment Settings

| RD Session Host Server | RD Gateway |

| Digital Signature | Common RDP Settings | Custom RDP Settings |

You can specify additional RDP settings, such as audio redirection, that cannot be specified on the other tabs. These RDP settings will be used when a user connects remotely to the RD Session Host server.

To specify custom RDP settings, type the RDP settings into the Custom RDP settings box. You can also copy the desired RDP settings from an existing .rdp file by using Notepad.

Custom RDP settings:

```
authentication level:i:2
```

More about specifying custom RDP settings

[OK]   [Cancel]   [Apply]