



Chromeleon Enterprise Chromatography Data System

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Chromeleon 7 CDS Streamlines Chromatography



From sample to knowledge...



Introducing Chromeleon 7 Chromatography Data System

- New-generation Thermo Scientific™ Chromeleon™ Chromatography Data System
- Core design principle **“Simply Intelligent”** delivering...
 - **Intelligent Functionality** - it does everything you need!
 - **Operational Simplicity™** - everything you need to do is fast and easy!
- Major design rules:
 - Minimize number of steps needed to perform any task
 - Make all steps easy to understand and easy to use
 - Minimize time needed to perform any task



Universal Instrument Control

- Bi-directional instrument control for over 525 different modules from 20 different manufacturers including:

- Thermo Scientific (LC, IC, GC, MS, Sample Prep)

- Agilent (LC, GC)

- Waters (LC)

- Shimadzu (LC, GC)



- LIMS can incorporate data from non-chromatographic (AA, ICP, UV, FTIR, MS, etc.) & 'simple' instruments (balance, pH meter, etc.)



Console – Easy Access to Data

The screenshot displays the Chromeleon Console interface for a sequence named "SOFTDRINK_Analysis". The interface is divided into several sections:

- Navigation Pane (Left):** A tree view showing the project structure, including folders like "ChromleonLocal", "Bootcamp", "CMTraining", "Company Specific", "Demo", "GU", "STABILITY", "STABILITYAdvanced", "2Channel-FID+PID", "150216 Calib", "COBRA and SmartPeaks", "CovanceExample", "DAD - SLS", "EPAMethod8270Curve", "ICS 5000 Autodilution", "IRC", "QC BATCH", "QC BATCH_JS", "SmartPeaks", "SmartPeaks_JS", "SOFTDRINK_Analysis", "TestSeq", "UltiMate 3000 Fraction Collection", "Demo Data", "DemoFolder", "DualGCDdetector", "ExtensionPackages", "Feb", "Germering", "Instrument Data", "Instruments Methods", "Methods", "Processing Methods", "SalesRepTraining", "SequencesTest", "StationQualification", and "Training".
- Run Finished Table (Center):** A table listing 11 runs. The first column shows a small chromatogram for each run. The columns include: #, UV_VIS_1, Name, Type, Level, Position, Volume [ul], Instrument Method, Processing Method, Status, Inject Time, Lock Status, and Weight.
- Integrated sequence editor (Top Right):** A yellow callout box pointing to the "Run Finished" header area.
- Navigation Pane (Right):** A yellow callout box pointing to the "Run Finished" header area.
- Category Bars (Bottom):** A yellow callout box pointing to the "Instruments", "Data", and "eWorkflows" tabs at the bottom left.
- Associated Items (Bottom):** A table listing items associated with the selected sequence, including "Acclaim_2p1x50mm_v4", "Default", "Softdrink", "Softdrink", "Softdrink", and "Softdrink".

#	UV_VIS_1	Name	Type	Level	Position	Volume [ul]	Instrument Method	Processing Method	Status	Inject Time	Lock Status	Weight
1	[Chromatogram]	Sd fresh wo Caffeine...	Calibration Standard		RB1	1.0000	Acclaim_2p1x50mm...	Softdrink	Finished	4/24/2008 5:03:56 PM		1.0000
2	[Chromatogram]	Sd fresh wo Vanillin...	Calibration Standard	01	RB2	2.0000	Acclaim_2p1x50...	Softdrink	Finished			
3	[Chromatogram]	Cola Zero, 2.209 mL...	Unknown	01	RA2	1.0000	Acclaim_2p1x50mm...	Softdrink	Finished			
4	[Chromatogram]	Cola light, 2.209 mL/...	Unknown	01	RA3	1.0000	Acclaim_2p1x50mm...	Softdrink	Finished			
5	[Chromatogram]	Vanilla Coke, 2.209 m...	Unknown	01	RA4	1.0000	Acclaim_2p1x50mm...	Softdrink	Finished			
6	[Chromatogram]	Cool lemon, 2.209 mL...	Unknown						Finished			
7	[Chromatogram]	Ice tea Peach, 2.209...	Unknown	01	RA6	1.0000	Acclaim_2p1x50mm...	Softdrink	Finished	4/24/2008 5:29:03 PM		1.0000
8	[Chromatogram]	Red Bull, 2.209 mL/min	Unknown	01	RA7	1.0000	Acclaim_2p1x50mm...	Softdrink	Finished	4/24/2008 5:31:15 PM		1.0000
9	[Chromatogram]	Sd fresh wo Vanillin...	Calibration Standard	01	RB2	2.0000	Acclaim_2p1x50mm...	Softdrink	Finished	4/24/2008 5:33:28 PM		1.0000
10	[Chromatogram]	Sd fresh wo Vanillin...	Calibration Standard	01	RB2	2.0000	Acclaim_2p1x50mm...	Softdrink	Finished	4/24/2008 5:35:40 PM		1.0000
11	[Chromatogram]	Standard	Calibration Standard	01		2.0000	Acclaim_2p1x50mm...	Softdrink	Finished	4/24/2008 5:37:53 PM		1.0000

Name	Type	Date	Comment
Acclaim_2p1x50mm_v4	Instrument Method	10/28/2015 3:41:56 AM -04:00	Softdrink method speed-up on Acclaim 120 c18, 2.1x50mm, BF2.7
Default	Report Template	10/28/2015 6:05:00 AM -04:00	
Softdrink	Processing Method	10/26/2015 9:15:04 AM -04:00	
Softdrink	Report Template	9/14/2015 3:41:56 AM -04:00	
Softdrink	View Settings	10/28/2015 7:13:48 AM -04:00	

Associated Items: Custom Sequence Variables (0) Custom Formulas

Console – Easy Access to Instruments via ePanels

The screenshot displays the Jstradtner - Chromeleon Console interface. On the left, a sidebar lists various instruments, with 'Vanquish' selected. The main panel shows configuration settings for the 'Vanquish' instrument, including the 'Vanquish Diode Array Detector' (Lamp, Wavelengths, Connect), 'Vanquish Column Compartment' (Temperature, Post-column cooler, Connect), 'Vanquish Autosampler' (Position, Volume, Change Rack, Connect), and 'Vanquish PumpModule' (Flow, Pressure, Eluents, Connect). A yellow callout points to the 'Instruments' list, stating 'Provides access to all instruments on the network'. Another yellow callout points to the 'Audit Trail' section, stating 'Immediate access to Audit Trail and Queue'. The 'Audit Trail' section displays a table of events.

Date	Time	Retention Time	Device	Message
7/19/2016	5:01:25 PM -04:00			Initializing driver GC System.
7/19/2016	5:01:25 PM -04:00			ICFGC - Agilent GC System Driver, Version 1.21.0.8179. © Copyright 2009-2016 Thermo Fisher Scientific Inc.. All rights reserved.
7/19/2016	5:01:21 PM -04:00			Initializing driver GC System.
7/19/2016	5:01:21 PM -04:00			Initializing driver CmDDKDrv_1.
7/19/2016	5:01:21 PM -04:00			CmDDKDrv - Chromeleon DDK Host Driver, Version 7.2 SR4 Build 8179 © Copyright 2009-2016 Thermo Fisher Scientific Inc.. All rights reserved.
7/19/2016	5:00:42 PM -04:00			User jstradtner (from USBNKJ2GFTY1) has connected Chromeleon Instrument Configuration Manager to this controller.
7/19/2016	4:59:04 PM -04:00		ColumnComp	Connection established successfully.

User Interface – Studio – Data Processing and Reporting


The screenshot displays the Chromeleon Studio interface for data processing and reporting. The interface is divided into several key areas:

- Navigation Pane (Left):** A tree view showing the project structure, including data files, system tests, and templates.
- Category Bars (Bottom Left):** A series of buttons for navigating between different views: Injections, Instrument Method, Data Processing (highlighted), Non-Targeted MS Processing, Report Designer, Electronic Report, and UV Spectral Library.
- Ribbon (Top):** A series of tabs for different data processing tasks: Data Processing Home, Tables, Integration Table, Format, Chromatogram, Calibration Plot, Interactive Results, Processing Method, Peak Properties, Interactive Charts, Contour/3D Plot, UV-Vis Spectra, Fluorescence Spectra, I-t Plot, Injection Rack, MS Components, MS AutoFilters, and SmartLink.
- Main View (Center):** A chromatogram plot showing the detector response (mAU) over time (min). The plot includes several peaks labeled with their retention times and names: 1. 0.062, 2. 0.080, 3. 0.119 (Acetulfame K), 4. 0.170 (Saccharin), 5. 0.313, 6. 0.441 (Aspartame), 7. 0.453 (Vanillin), 8. 0.541 (Benzoate), 9. 0.563 (Sorbate), and 10. 0.621 (Benzaldehyde). Below the plot is a table summarizing the peak data.

No.	Peakname	Ret.Time min	Area mAU*min	Signal Max. bar	Type	Height mAU	Rel.Area %	Resolution
3	Acetulfame K	0.119	0.1971	1429.160	n.a.	24.563	7.33	3.87
4	Saccharin	0.170	0.8371	1429.160	n.a.	88.096	31.12	10.00
6	Aspartame	0.441	0.2069	1429.160	n.a.	27.577	7.69	0.95
7	Vanillin	0.453	0.4870	1429.160	n.a.	57.641	18.11	6.73
8	Benzoate	0.541	0.1681	1429.160	n.a.	20.100	6.25	1.72
9	Sorbate	0.563	0.1803	1429.160	n.a.	22.700	6.70	4.22
10	Benzaldehyde	0.621	0.5584	1429.160	n.a.	53.945	20.76	n.a.
Total:			2.6350	10004.1200		294.623	97.96	

Improved Integration – Simplifying Data Processing and Review

Integrating complex chromatograms



• Correctly integrates all un...

The image displays three overlapping screenshots of the Chromeleon Chromatography Studio software interface, demonstrating the integration process for a complex chromatogram.

Top Left Screenshot: Shows the main data processing window with a chromatogram plot. The y-axis is labeled 'mAU' and the x-axis is 'min'. The plot shows a baseline with several peaks. A table below the plot lists peak data:

#	Ret. Time	Param. Name	Param. Value	Inj. Type
1	<Initial>	Consider Void	Off	Any
2	<Initial>	Smothing Width	Auto	Any
3	<Initial>	Baseline Noise	Auto	Any

Top Right Screenshot: Shows the 'Cobra Wizard' dialog box. It contains the following settings:

- Integration area - Baseline noise range - Cobra smoothing width - Minimum area - Channel and injection type
- VoidPeak = Off
- Inhibit = Off
- Inhibit = On

Bottom Screenshot: Shows the 'SmartPeaks: Select Alternative' dialog box. It displays four alternative integration methods for a selected peak:

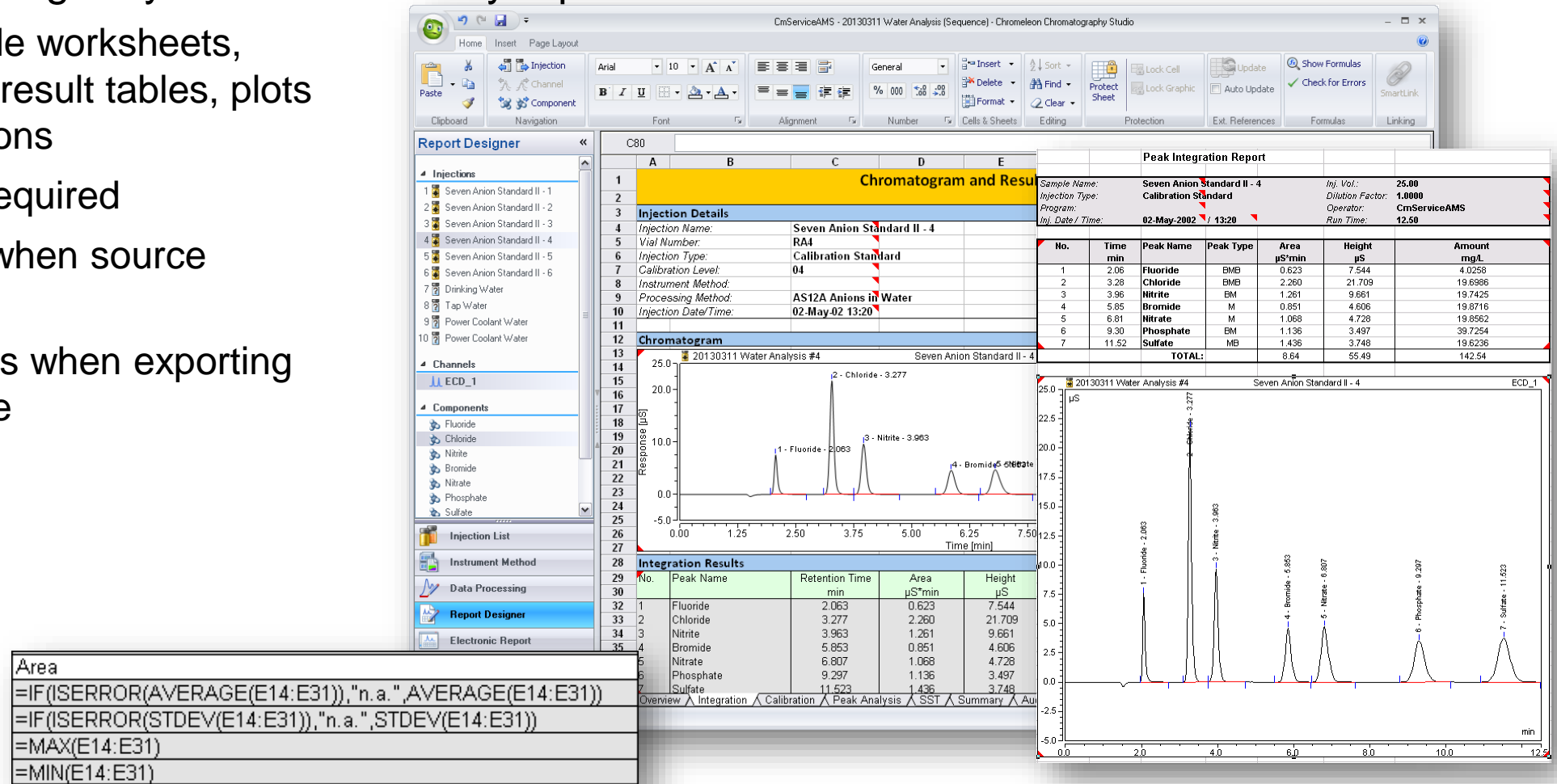
1. Original
2. Valley To Valley
3. Exponentially skinned riders
4. Tangential at both ends rider skimming

The bottom screenshot also shows a table with peak data:

#	Ret. Time	Param. Name	Param. Value
1	<Initial>	Consider Void	Off
2	<Initial>	Smothing Width	Auto
3	<Initial>	Baseline Noise	Auto
4	0.000 [min]	Inhibit Integration	On
5	0.000 [min]	Minimum Area	0.496
6	8.672 [min]	Inhibit Integration	Off
7	28.945 [min]	Inhibit Integration	On

Data Reporting – Flexible Report Designer

- With the Report Designer you can create any report
 - Can contain multiple worksheets, test and variables, result tables, plots and custom equations
 - Instant results as required
 - Automatic update when source data changes
 - No validation issues when exporting to external software



Boosting Lab Productivity – Getting It Right The First Time

Getting analysis right first time automatically gives:

- ✓ High quality of and confidence in results
- ✓ Lower cost of analysis
- ✓ Improved lab efficiency
- ✓ Faster release to market and return on investment



Predictive Performance

- ✓ Analysis more likely to complete first time



ICH Method Validation Templates

- ✓ Robust method more likely to run first time



Sequence Ready Check

- ✓ Confirms sequence will run to completion



Smart Startup

- ✓ Ensures first injection is always good



System Suitability Tests

- ✓ Gives highest confidence in results



Intelligent Run Control

- ✓ Get right results, no out of spec investigations



Report Templates with Report Check

- ✓ Correct calculations give high confidence in results



eWorkflow Procedures

- ✓ Create correct sequence first time, every time

Simplifying Lab Workflows – eWorkflow Procedures

eWorkflow procedures contain:

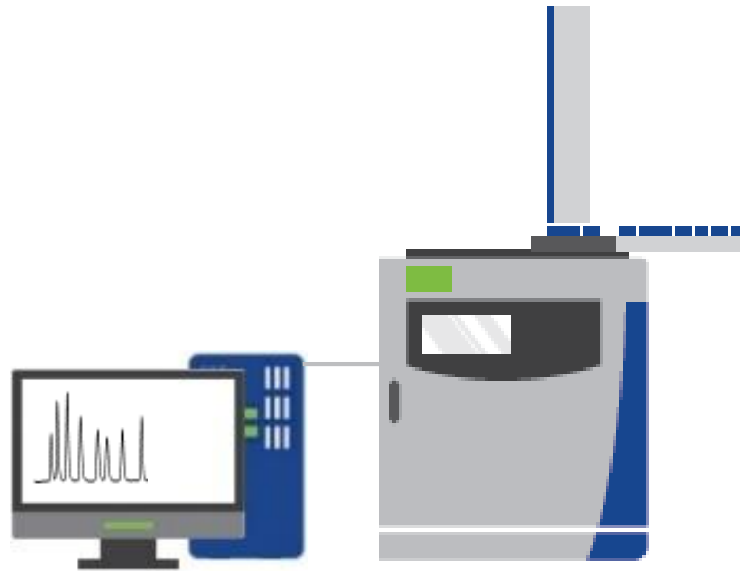
- Instruments on which the analysis can be run
 - All associated methods and files including reports and external documents like SOPs
- ✓ Ensure your SOP is followed
 - ✓ Reduce errors and produce reliable results faster
 - ✓ Fully customizable for any application in any laboratory
 - ✓ Minimize amount of training required

The screenshot displays the 'cadmin - Chromeleon Console' interface. On the left, a sidebar shows a tree view of eWorkflows, including 'CUT Templates Stage 1 (10 units)', 'CUT Templates Stage 2 (20 units)', 'Demo_eWorkflow', 'Dissolution Templates' (selected), 'GPC Templates', 'ICH Accuracy', 'ICH Intermediate Precision', 'ICH Linearity', 'ICH Linearity-2', 'ICH LOD LOQ (Blank SD)', and 'ICH LOD LOQ (Curve)'. Below this are sections for 'Instruments', 'Data', and 'eWorkflows'. The main panel is titled 'Dissolution Templates' and contains a description: 'This eWorkflow contains all files required for performing Dissolution calculations for all Stages. Please refer to attached user manual for more information.' It also shows the 'Type: HPLC' and 'Status: Approved for Use'. A 'Launch' button is present, with a tooltip that reads '< Run 'Dissolution Templates' using instrument '01_ICS-5000+' >'. Below the launch button is a table titled 'Dissolution Experiment 21-Feb-2014 16:42' with columns for '#', 'Instrument Name', 'Instrument Status', 'Sequence Status', and 'Queue Status'. The table lists 19 steps, including 'Blank', 'System Suitability', 'Calibration Standard', and 'Sample'. At the bottom, there is a table with columns for 'Name', 'Type', 'Date Modified', and 'Comment', listing various files and methods associated with the workflow.

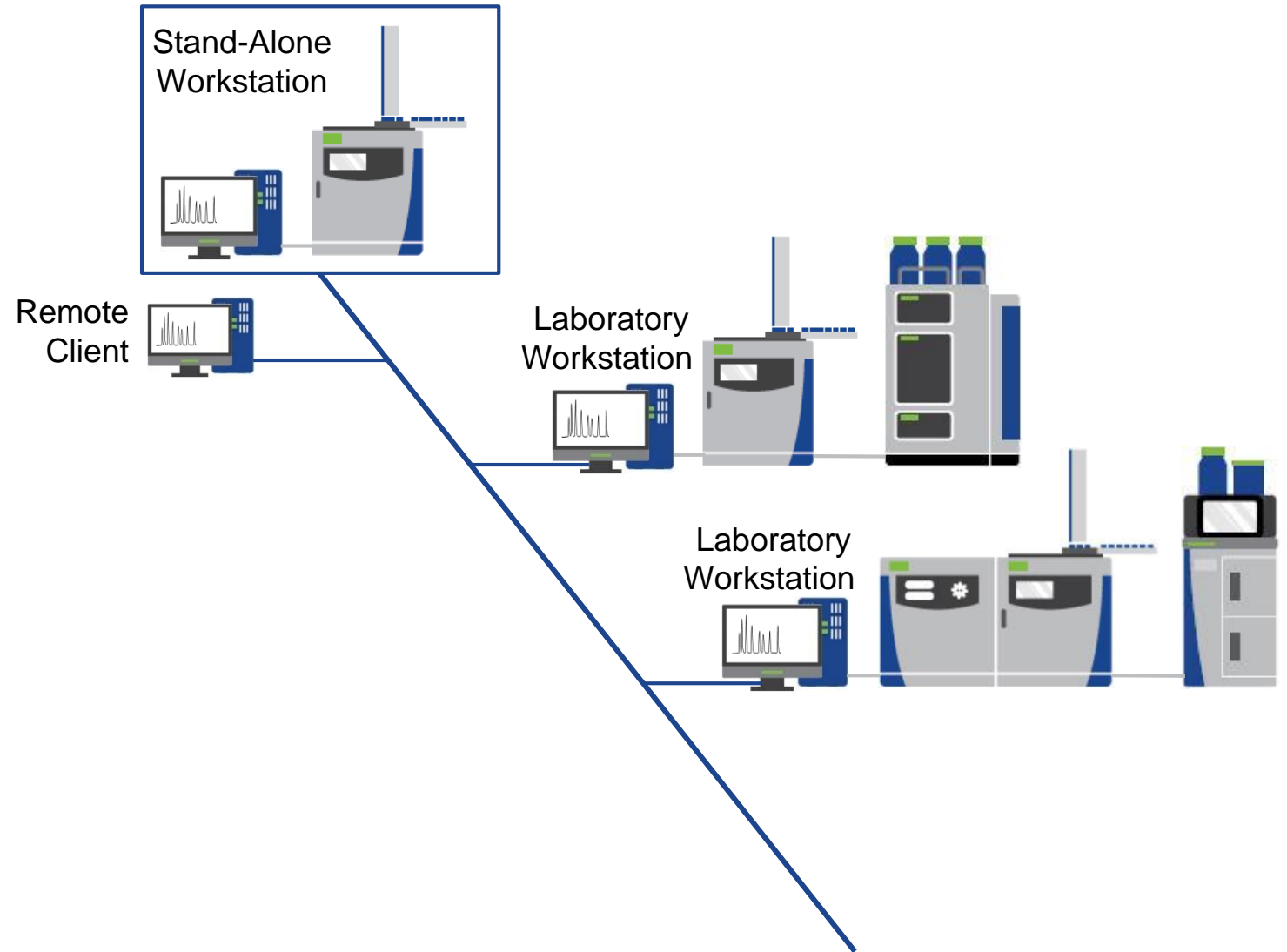
#	Instrument Name	Instrument Status	Sequence Status	Queue Status
1	01_ICS-5000+	Monitor		
2	02_ICS-5000_Dual_1	Idle		
3	03_ICS-5000_Dual_2	Idle		
4	UltiMate3000	Running		
5	UltiMate3000_RS	Idle		

Name	Type	Date Modified	Comment
Dissolution Templates - User Ma...	Associated File	13/03/2013 06:10	
Dissolution_IM	Instrument Method	21/02/2014 16:48	Alkylphenone Linearity Test for UltiMate 3000 RSLC
Dissolution_PM	Processing Method	13/03/2013 06:10	Dissolution Method for Conventional Release Solid Dos...
Dissolution_Report	Report Template	13/03/2013 06:10	
Dissolution_VS	View Settings	13/03/2013 06:10	

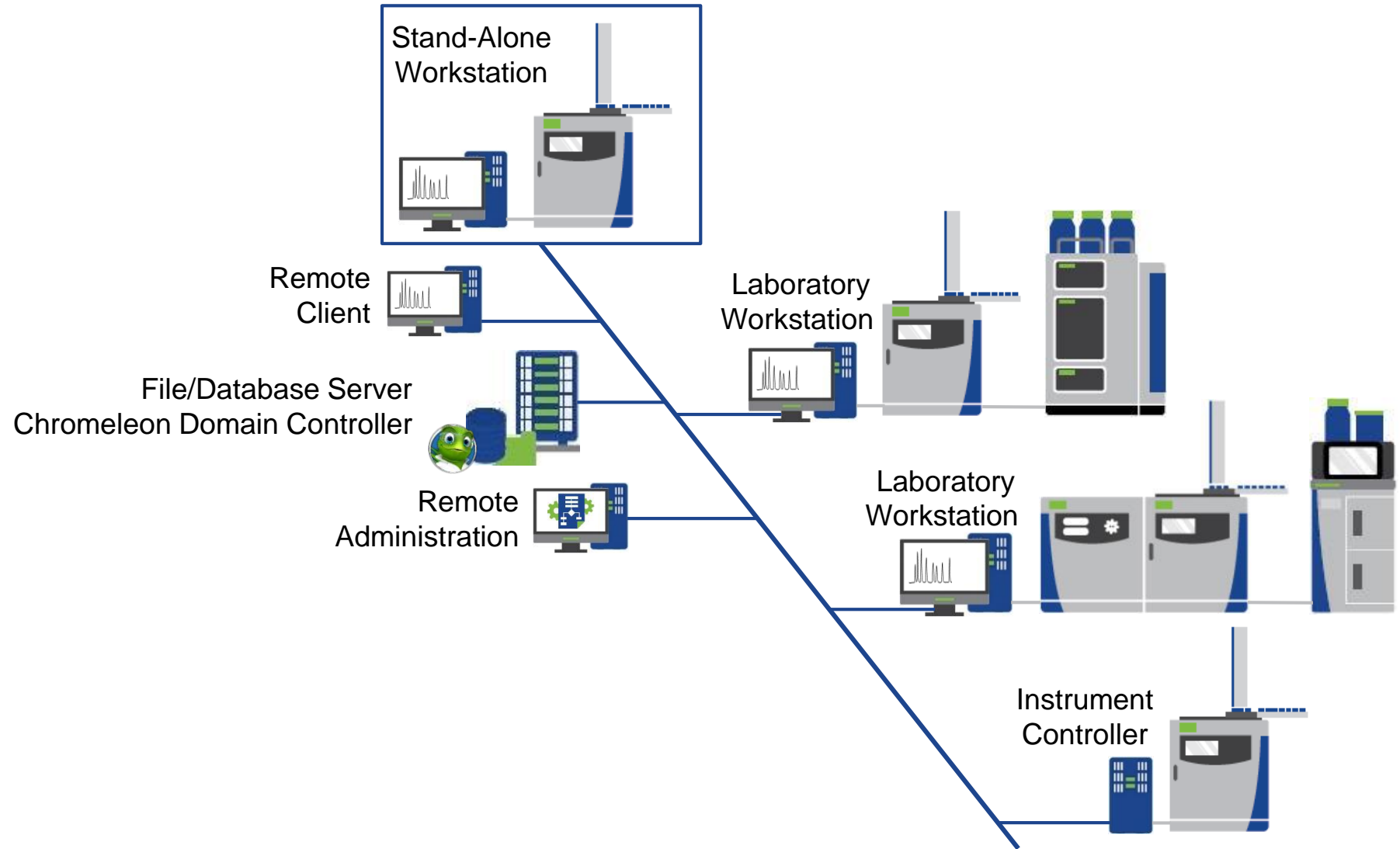
Centralized Software Solution – From Stand-Alone Workstation...



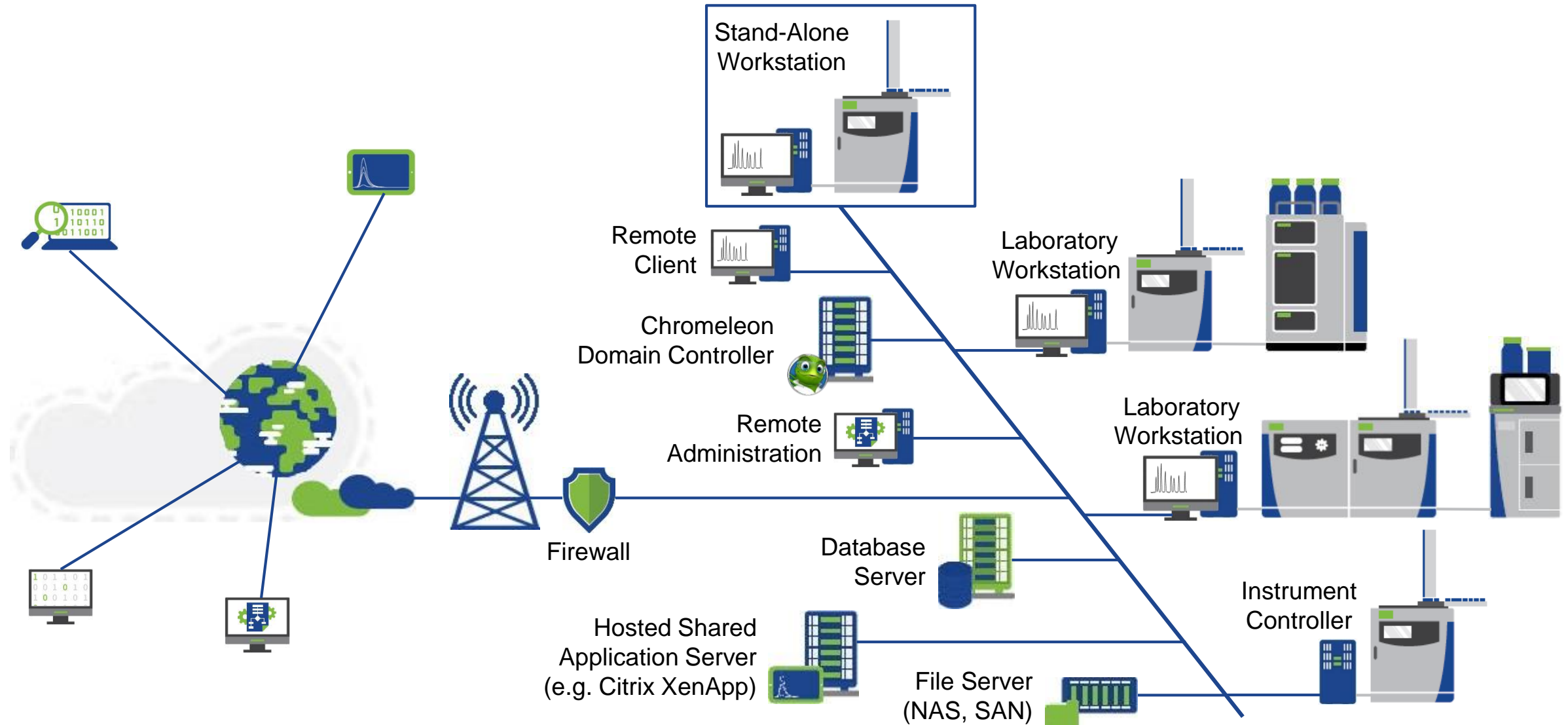
Centralized Software Solution – ...or a Workgroup...



Centralized Software Solution – ...to a Small Network...



Centralized Software Solution – ...or a Global Wide Area Network



Operational Efficiency – Standardized and Centralized Software Solution

- One software to control all chromatography instruments in the lab
 - Including Thermo Scientific™ Mass Spectrometry (MS) instruments
 - Remote instrument control
- Centralized software solution
 - Scalable from workstation to global enterprise and anything in between
 - Manage and maintain one software
 - Centralized storage and data access
- Decreased cost of operation
 - Reduced learning – lower training cost
 - License only one software – concurrent user licenses
 - Use one, existing infrastructure
 - Adaptable from walk-up user to system administrator

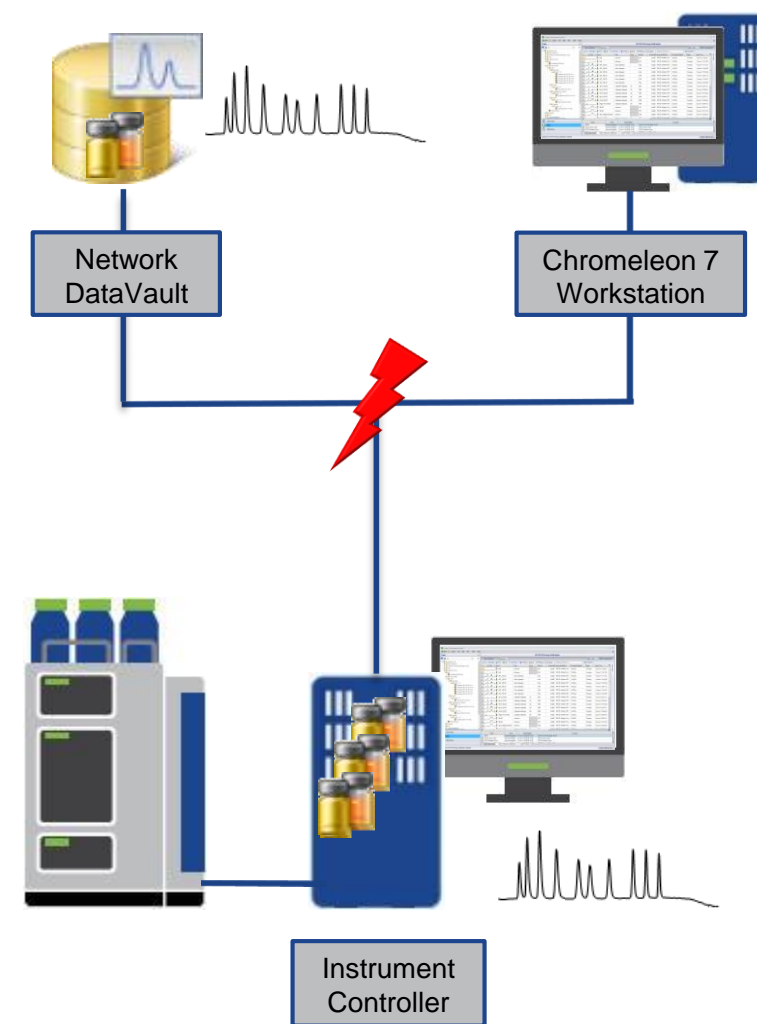


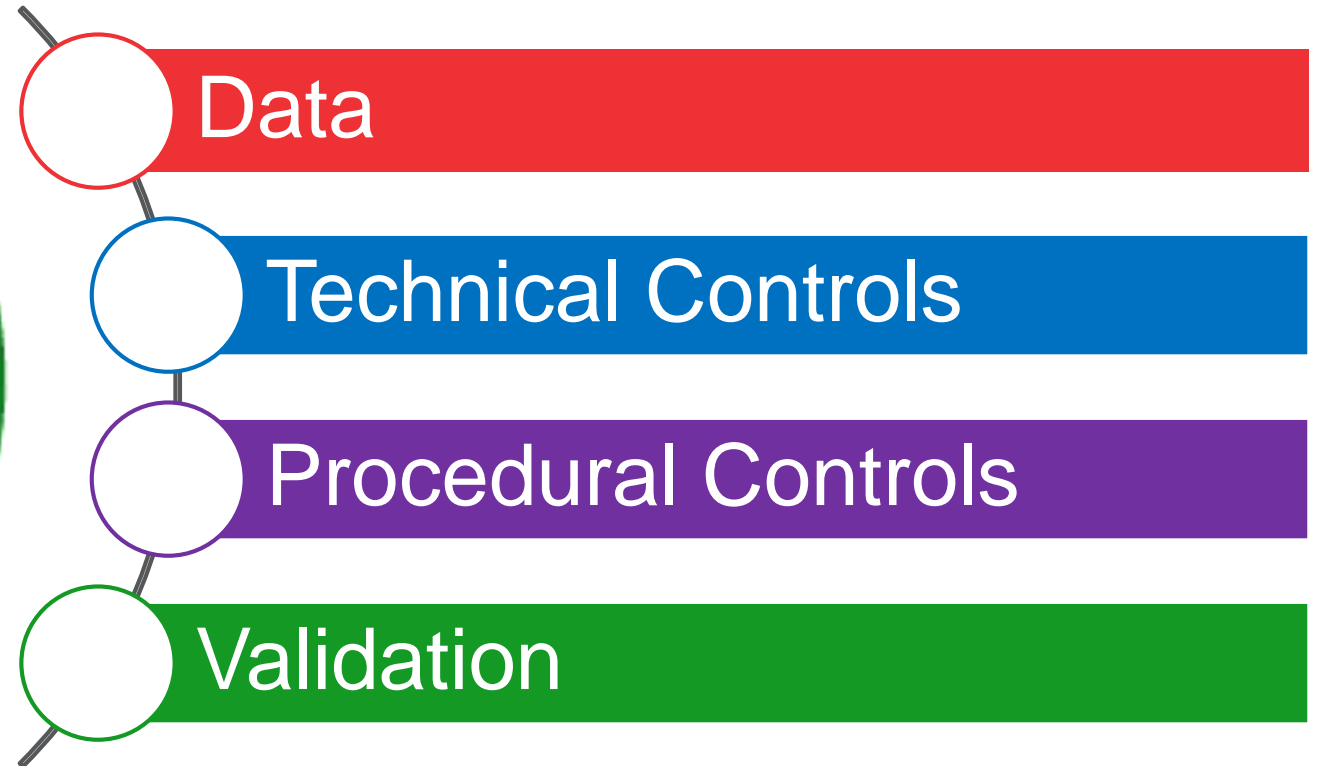
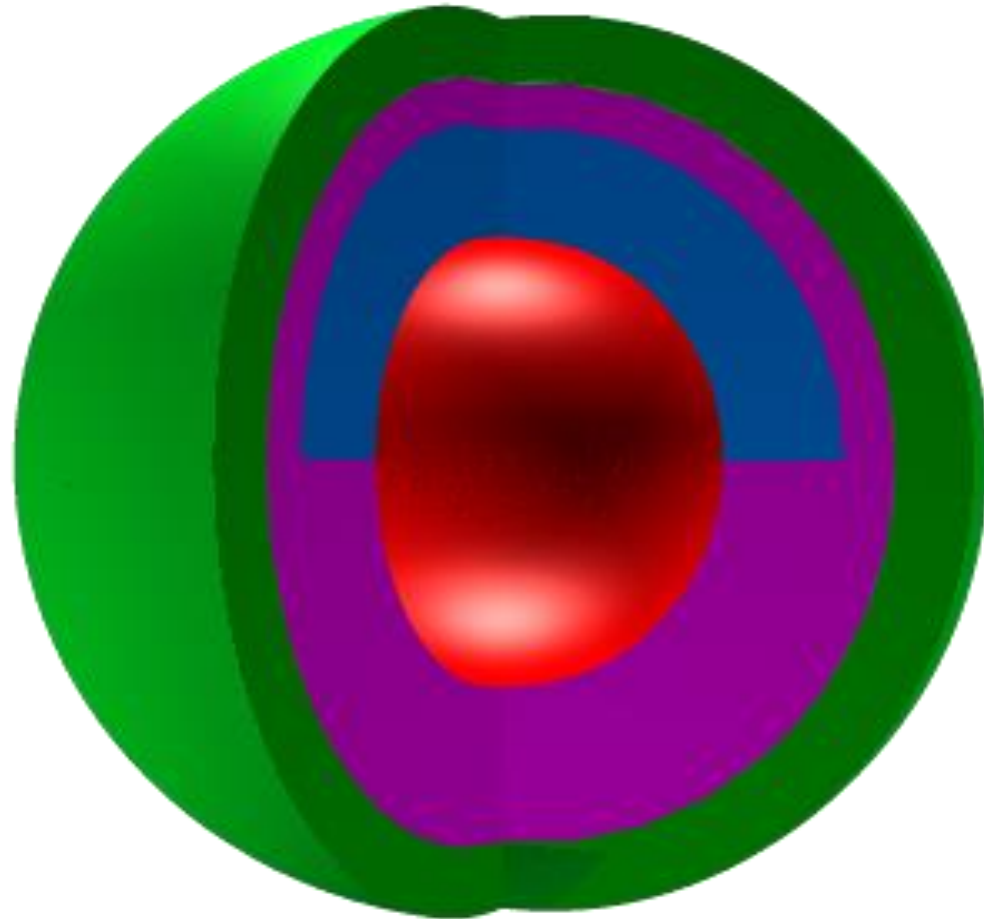
Chromeleon Enterprise Advantages...

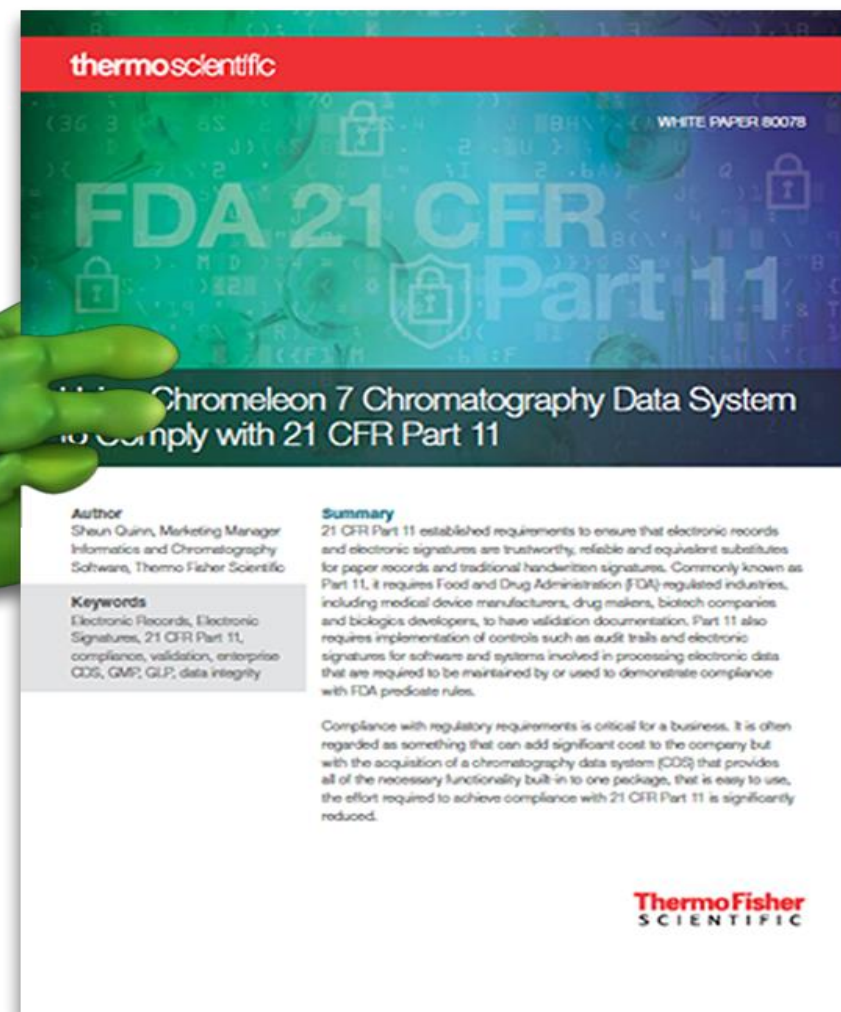
- Free license upgrades
- Access to 24/7 dedicated Chromeleon support team
- Easily scale-up for the addition of resources (users, instruments, servers)
- Centralised secure data storage in relational DB on server
- Central and automated administration of Instrument Maintenance windows, Chromeleon/Windows update rollout; System printers
- Network Failure Protection
- Easier backup and archive of data
- Share methods/reports simply across whole lab
- Data Trending for comprehensive data interrogation
- Standardise processes across labs
- Lower IT overhead
- Lower administrative overhead
- eSignatures
- Email notification of completed sequences/user logout
- Auto-reporting
- LIMS integration
- Data more secure in full SQL database
- Maximise running time of expensive instruments
- Time stamps consistent across lab
- Scalable on the IT, admin and instrument/user levels
- Failover options for the servers
- Virtualisation and cloud options
- Discovery enables easy enterprise role-out

Ensure 24/7 Laboratory Uptime - Unique Network Failure Protection Function (NFP)

- License and User Management information is cached locally
 - License is always available
 - Users can always logon
 - Users can continue to work
- XVault technology ensures continuous operation
 - NFP mode is automatically enabled at network failure
 - Continued data acquisition
 - After network recovery, data is automatically uploaded to the central server
 - User can log on to the instrument controller to view and edit the running queue, submit new analyses, process and report data
 - User management is active to ensure data security
 - All information and actions are audited and traceable

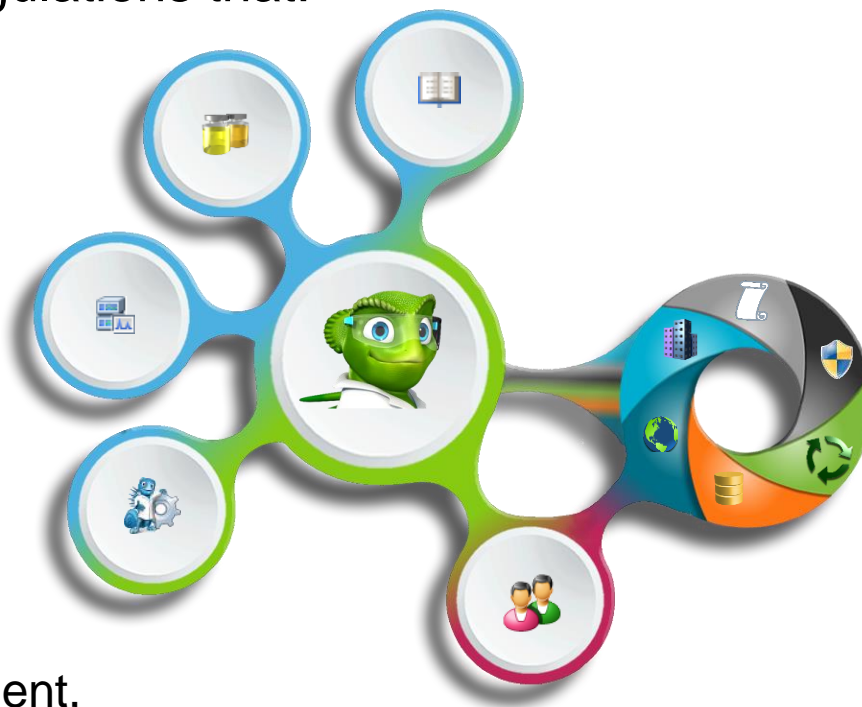






Audit Trails in Chromeleon CDS

- Audit Trails are a critical requirement of electronic record regulations that:
 - Enable detection of non-desirable activity by users
 - Provide management with a tool that influences users' behaviour
 - Ensure data integrity
- Chromeleon CDS provides Audit Trails in all locations
 - Data Audit Trail – Changes to all objects in the Data Vault
 - Enables version comparison of objects and results
 - Injection Audit Trail - All information that was recorded in the Instrument Audit Trail for a specific injection
 - User Management Audit Trail – Log of changes to user management, Captures logon, logoff and failures
 - Administrative Audit Trail – Domain Resources, Data Vault Manager, eWorkflow Tags, Station, Global Policies, Organizational Units
 - Track actions at the record or system level (such as attempts to access the system or rename or delete a file).

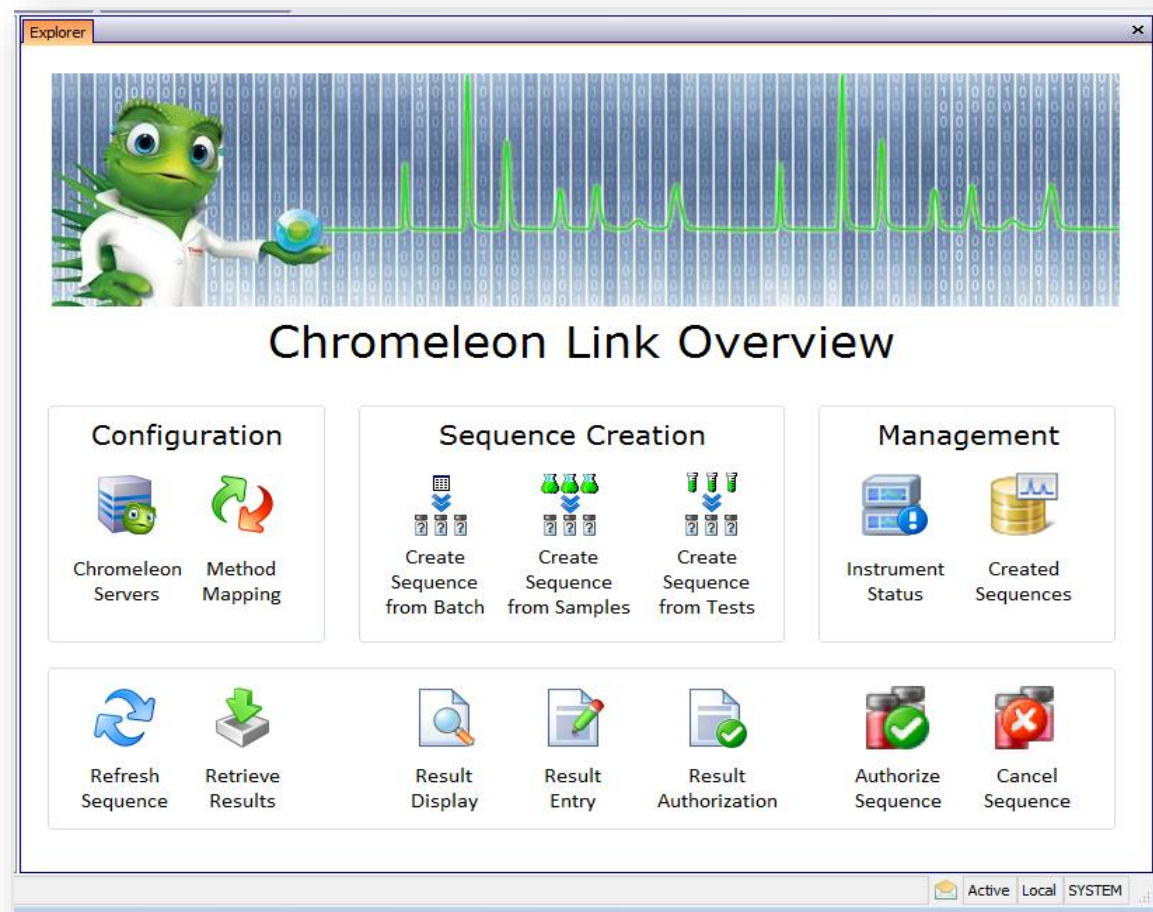


Connectivity – Seamless Data Flow

Chromeleon CDS to SampleManager LIMS link

This link gives users ability to:

- See real time information like instrument status & queue in LIMS
- Select samples in LIMS & use eWorkflows to create sequence
- Pull LIMS samples into existing sequence from Chromeleon CDS
- Show Chromeleon CDS results directly in LIMS



Thermo Scientific Chromeleon 7 enterprise CDS



... Increase productivity

- Industry-leading Operational Simplicity™ and throughput with eWorkflows™
- Faster data processing, visualization, and reporting with dynamic updating and Intelligent Functionality built-in



... Control all your instrumentation

- Thermo Scientific LC/IC/GC/(quant)MS plus >300 third-party modules
- Customizable instrument ePanels for consistent look and feel



... Achieve regulatory compliance

- Flexible to support research and compliant laboratories
- Comprehensive user management and eSignatures



... Simplify administration

- Centralized or distributed data storage
- Scales from workstation to large global networks



... Connect your laboratory

- Easily interface with other laboratory software (e.g. LIMS)
- Download ready-to-run applications from AppsLab Library



Thank You!