

Using EIT's Remote Lab Instructions

Various softwares used throughout the following practical exercises are installed on EIT's **Remote Lab 1, 4, 9 and 12.** (Refer to instructions: How to Connect to Remote Labs_Electromeet_HTML5.pdf)

Note: On the remote labs – you do not need to buy any add-ons.

Practical Exercise 1: Basic Client/Server interaction

1.1 Objectives

Using Remote Lab 1 and Lab 4

To demonstrate the ease with which data can be accessed from an OPC-enabled SCADA system. In this case we will use Citect version 5.4. This version of Citect has not been implemented with OPC, but rather with custom software drivers. An OPC compliant Data Access server version 1 (DA1.0) was then added as a 'back end' to the system. Also take note that the CatID was (accidentally) omitted from the Citect registry entries, which will explain some of the Clients' behavior. The Citect SCADA and the OPC client are installed on the Server in the Office and are accessed through Electromeet as usual using demopass to get access to the remote labs after you have logged in:

1.2 Procedures

Run Citect by clicking on the "Citect Explorer" icon on the desktop.



Close any other unwanted windows that may open up (there may be several). Select 'Example' under 'My Projects' and then depress the run button (second one from the left) as indicated in the following figure:

🗱 Example - Citect Explo	orer
File View Tools Help	
Example	- è <u>, 4</u> 608 ***
Project List	Contents of Example
My Projects ANIMATION Complete Complete New New New New New New New	Graphics Tags Alarms System Communications Cicode Files CitectVBA Files

Since you have no software key, it is necessary to run in demo mode when prompted. The example project will now open up.

Mer	nu			
<u>15 - T</u>	Feed_SPC_13 ROutsideCL R o	utside control limits ON		Ŭ ↔ Ø 🕅
₫		Ľł	rect	
$\overline{\mathcal{N}}$	Filter	Alarm Page	Trend	Login Manager
ч Ф	Loops	Alarm Summary	Zoom Trend	Login Worker
Ŷ	Recipe	Operator Log	Compare Trend	Login Engineer
	Genies	Report	SPC XRS Chart	Login
ଟ୍ର	Display Objects	Excel	SPC cp & cpk	Logout
	Active X	Web Browser	SPC Pareto Chart	Language
	Groups		XY Plots	
	Operator Input			
	Test			Utilities
	Help			Shutdown
	CitectVBA Example			

Spend a few minutes and examine all the functions available on the left hand side of the screen (Filter, Loops, Groups, etc.).

Go to the Filter page. Select the process variable 'Torque' (tag ID = loop_3PV). Place the cursor on the numerical display for 'Torque' to see the associated tag ID. Double-click on the Torque display to invoke the PID controller faceplate display for this variable. **Note** the red set-point value display (loop_3SP) and the green process variable display (loop_3PV).

Drag the red arrow up and down and see how the values change. If its not automatically controlling it may be in manual – have a play



Task 1: Drag it as high as you can and take a screen shot and paste this in your assessment document. Record seperately in the assessmet document the Max value that you read with the slider all the way up.



Leave the Citect session running

Now we will run a very simple diagnostic client (FactorySoft).

Locate the FactorySoft OPC Client icon on the desktop. It has OPC on a Blue Background.



Double-click to start the Client. The following will appear on your screen:

💑 Untitled - FactorySoft O	PC Client		
File OPC View Help			
?			
Tag	Value	Time	
24 To 8			
•			•
Joadu			

The next step is to establish a connection between the client and the Citect OPC Server. Click OPC -> Connect and wait for the following to appear:

	OK
Citect.OPC	Cancel
	Refresh List
Citect.UPC	
Litect.UPC FactorySoft.Example.DataAccess FactorySoft.InProc	
Ditect.UPD FactorySoft.Example.DataAccess FactorySoft.InProc FactorySoft.Sampe KEPware KEPServerEx.V4	
Untect UPC FactorySoft.Example.DataAccess FactorySoft.InProc FactorySoft.Sampe KEPware.KEPServerEx.V4 KEPware.LinkMaster.V1	

Locate the Citect OPC Server (ProgID = Citect.OPC) amongst the available servers. This will now appear as 'Server Name' in the upper window. You may ignore the server node entry as it will default to the local host. Now click OK.

The next step is to create a Group object as this is necessary in order to access the tags. Click OPC -> Group Parameters. The following window will appear:

Name	Group one		OK
Update Rate	1000	mSec	Cancel
Active			00.100.
Deadband	0	%FS	Apply
Time Bias	-360	Minutes	
LocalID	0	1	

In this particular case the group name is 'Group one', the update rate is once every second, the group is active, the dead-band is 0% of full scale, the time difference between the client and server (in terms of time zones) is -6 hours and the language used by the client (local ID) will default to English. Pretend that this is all fine and click OK.

Now it is time to add the items to the group. Click OPC -> Add Item. The following window will appear:

dd Item		
Access Path		Add Item
Item Name LOOP_3_PV		Done
Browse items:	Filter:	
LOOP_2_PV		
LOOP_2_SP		
LOOP_3_1		
		<u></u>
LOOP 3 P		
LOOP_3_PV		
LOOP_3_SP		
		-
Data Type		
 Use native type 	C Long	
C Bool	O Double	
C Short	C String	

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Select the items (as many as you wish) and enter them by clicking on the 'Add Item' button. For example, you may enter loop_3_PV (a read-only value) and loop_3_SP (a read/write value). When finished, click 'done'. The process variables will now appear on the client display.

Maximize the filter display (the client display will be hidden) then select the client again so that it is now superimposed on the plant display.

Use your cursor to vary the set-point on the PID display and observe how the client values change accordingly. Now right-click on loop_3_SP (loop 3 set-point value) in the client display and attempt to write back to the server. You may also attempt to this with a process variable and observe what happens.

Task 2 – Take a screen shot of this opc client to show what you have selected – with the current date and save it into your assessment document.



Remember to close all the programs on the remote lab before exiting the session.

Practical Exercise 2: OPC Server

2.1 Objectives

The purpose of this exercise is to familiarize yourself with a fully-fledged Data Access server.

The Matrikon, Cogent and Kassl Software is installed on Remote Labs 9 and 12.

2.2 Procedure

First we set up our own defined alias on the server so that we can see that it's your work. Start up the server configuration application on the Lab Computer



Right click on the Alias Configuration, this allows you to generate custom groups and names for the tags on the server that can be more "human" readable. Call it "YourNameGroup" eg. *JackSmithDIT07*.

	C Server for	simula	tion an	a ies	ting - u	Intitiea	_
File Edit Vie	w Tools	Help			_		
🔕 🗅 🗳	H	đ	đ	×		9 👲	
Current configu	ration:	-	Con	tents o	of alias	group '(r	oot)':
Server C	onfiguration		N	lame		ltem Path	
Alias Con	figurau	Insert /	Alias G	roup		Ctrl+A	
		Delete			Ci	trl+Del	1
			Т				-

Now right click in the right hand pane and select Insert New Alias



Call it something unique that allows it to be identified as yours

🥺 Insert New A	lias	N	×
Alias Settings: -	BrianHobbyRandomRea(~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<u>S</u> ave
<u>I</u> tem Path: Data Type:	(Default)	Read <u>o</u> nly	Default to new
Update Rate:		Poll when inactive	Cancel

Then click on the button at the end of the Item Path entry field and navigate the tree structure and select a tag from the right hand pane – you are now setting up "items" in the server that can be requested from the client.





Click OK and then Save the Alias.

Task 3 - Copy a screen shot of your server window with your name in the group and the alias name and paste into your assessment document.

You can save the server configuration if you want to so you can easily come back and have it the same.

Next time to get the data across the COM interfaces to the client.



Right click on the Matrikon.OPC.Simulation.1 and connect. If you have several servers available as in this screen shot then as you click them the Explorer will talk to the ICommon inface and request information that is displayed to the right to give you information about the interfaces and categories available.



Right click and select add group – call it something that uniquely identifies it as yours, it can be different to the group you created on the server.

Add Group			Same of the local diversion of	<u> ? X</u>
New Group Set	tings:		Create Active	ОК
Update Rate:	1000	(msec)	Auto-Detect I/0	Cancel
% <u>D</u> eadband:	0	(Full Scale)		
Time <u>B</u> ias:				
[

You will have a dialogue box pop up – navigate to the configured aliases group and add the tag you exposed earlier.

AutrikonOPC Explorer (BrianHobbyAliases)	
File Edit View Browse	
🍕 🍇 🗶 🔳 🔥 🔮 🚅	
Tag Entry	Tags to be added:
Tag Entry Item ID: BrianHobbyGroup.BrianHobbyRand(Data Type: Empty/Default Image: Constraint of the second se	
	OK Cancel
dd this item to the current tag definition.	1

Task 4 – Provide a client screen shot into your assessment document – showing your Tag value, clearly showing your name together with the value (naturally there will only be one value in the screen shot).



Practical Exercise 3: Simple Alarm and Event (AE) Client/Server interaction

3.1 Objectives

The purpose of this exercise is to demonstrate the interaction between a simple AE (Alarms and Events) Client and an AE Server.

3.2 Procedure

Because of the way the server is configured it generates an event whenever a value is written to this particular string.

Next lets subscribe to the event. Change back to the Matrikon Explorer, right click on the Simulation and select add subscription – this is available because the A&E inteface is implemented by this server.



Give it a unique name that identifies the subscription as yours and have a look at the filtering options – leave them as default for this.

Add Subscription		N		×
Subscription Settings	Filtering	13		
New Subscription S	ettings:			
Subscription Name	BrianIsSubscribed	V	Enable	
Update Rate:	1000	(m	sec)	
Max Size:	0	\$ (0	enables unlimited size)	

Next we will use the Kassl client to write values to the Bucket Brigade string on the OPC server proving they all play nicely.

Open the KassI DA client – on the desktop, make sure you get the **dOPC<u>DA</u>Client** as there are AE and HDA ones as well.



_					
\$	🚺 d	OPC DA Client (c) www.kassl.c	le		
0	File) Help			
		Connect to Server		1	
		Disconnect from Server		tems	
		Open			
		Save			
		Exit	Alt+F4		
				1	
🗊 Select C	PC S	Server			— ———————————————————————————————————
COM XN	۱L				
Compute	r nan	me			
				•	Refresh
Available	serve	ers			
Cogent Da	ataHu	ub			
MatrikonO	PC S	Server for Simulation and Testi	ng		
Cogent Da	ataHu	ub A&E			
					\
					\mathbf{X}
Name	Mat	trikon.OPC.Simulation.1			Ok
Cisid	{F8	3582CF2-88FB-11D0-B850-000	C0F010430	5}	Cancel

So we need to connect to the server with the Kassl client

This will give you an explorer view with the tree shown; click the Inspector button to let us make a group – put your name in it.

🗊 dOPC DA Client (c) www.kassl.de	
File Help	
Explorer Inspector	
Path	OPC Items
Configured Aliases	#MonitorACLFile @Clients

🕼 dOPC DA Clier	nt (c) www.kassl.de		
File Help			
Explorer Inspec	tor		
	ItemId	Active	Value
		Right cl add it	lick to ems
Group state U	Right click t add group	o	
Sever state Matr Matrikon Inc (780) 4 http://www.matriko	ikon.OPC.Simulation.1 148-1010 nopc.com	State Start time Last update	running 12/8/2014 12/8/2014

Drill down and add the bucket brigade string item

BriansItems	ItemId		Active	Va	alue	Time	Quality		
	ſ	Select OPC	Item						×
		Path	Bucket	Brigade		2			
Group state Updat	te rate	Array0)fReal8	蒙 ArrayOfStrii 蒙 Money 📸 UInt1	ng 😹 Boolean 🛃 Real4 🛃 Uint2	is Int1 SReal8 SReal8 Clint4	😹 Int2 🛃 String		
Sever state Matriko Matrikon Inc (780) 448 http://www.matrikono	on.OPC.S 8-1010 opc.com	Filter				🔲 Writable	e [Open	

Next right click on the String Item and write a value to it. It is a string so numbers and letters are all permissable.

🗊 dOPC DA Client	(c) www.kassl.de						
File Help							
Explorer Inspector							
🛅 BriansItems	ItemId	Active	Value	Time			
	Bucket Brigade.Str	×	25	11:21:53 PM			

Your Subscription in the Matrikon Explorer should now have a value in it.

Task 5 - Obtain 2 screen shots : one showing a subscription event and another of the Kassl client showing the String Item with a value in it that matches the subscription event. Paste these into your assessment document. This can be one screen shot with both showing if you are able to arrange the windows easily.

Example									
MatrikonOPC	Explorer - [Untitled*	1							
File Server G	roup Item View	Help							
£ 💥 🗗 🖪) 💣 💣 🖌	🌢 🗹 🍽 📥							
BrianIsSubscribed	1				Contents of 'BrianIsSubscr	ribed'			
E-S Localhost	\IE11WIN7				Source	Message	Severity	Time	Quality
Cogent	.DataHub.1				ABucket Brigade. String	73	1	12/08/2014 1	N/A
- OFC Cogent	DataHubAE.1				Bucket Brigade.String	25	1	12/08/2014 1	N/A
L Bria	anIsSubscribed				Bucket Brigade.String	50	1	12/08/2014 1	N/A
🕀 🍚 Network Ne	eighborhood								
······ S Other Netw	ork Computers								
And									
	🗊 dOPC DA (Client (c) www.ka	ssl.de						
	File Help								
	Explorer In	Ispector							
		ns ItemId	Active		Value	Time	Quality		
		Bucket Bri	gade.Str X		73	11:37:21 PM	good		
				0	D				
-				0	ĸ				
MatrikonOP	C Explorer - [Untitled	i*]							
File Server (Group Item View	/ Help							
ê 🗶 🗶 😭 🛛	🖻 💣 💣 🕷	🔒 🗹 🍽 📥	. 🖉 🗮 🖨 🗳						
BrianIsSubscribe	ed				Contents of 'BrianIsSubsc	ribed'			
E	'\\IE11WIN7'				Source	Message	Severity	Time	Quality
	nt.DataHub.1				ABucket Brigade. String	73	1	12/08/2014 1	N/A
- Matrik	on.OPC.Simulation.1				Bucket Brigade.String	25	1	12/08/2014 1	N/A
🕰 Br	ianIsSubscribed				M Bucket Brigade.String	50	1	12/08/2014 1	N/A
Network N	leighborhood	🗊 dOPC DA Client	(c) www.kassl.de						
Uther Net	work Computers	File Help							
		Explorer Inspect	or						
		Brianeltarra		1.0					
		Dianstents	Itemid	Active	Value	11.07.01.01	Quality		
			Bucket Brigade.Str	X	13	11:37:21 PM	good		

Practical Exercise 4: Simple HDA Client/Server interaction

4.1 Objectives

The purpose of this exercise is to demonstrate the interaction between a simple HDA Client and a server.

4.2 Procedure

Open up theKassI dOPCHDAClient, it's a very simple implementation good for checking values out.



As before connect to the server (Matrikon.OPC.Simulation.1) you should see a connected message in the bottom of the client window.

dOPC HD File Help Conner Discon Server 1 Server 1	A Client (c) www.kassl.de ct to Server nect from Server Status interfaces	• 12:00:00 AM 🔄 • 12:00:00 AM 蒙	Raw Processed Requested values Include bounds Async Read	Modified	At Time
Timestamp	Value	Qua	lity	HDA Quality	

Drill down into the server until you get to the Bucket Brigade.String again, then press the read history button. You should get the values that you wrote into the DA server earlier that generated the A and E events.

🏨 dOPC HDA Client (d	:) www.kassl.de		
File Help			
Get history data for item From date and time To date and time	Bucket Brigade.String 1/ 1/2000 12:00:00 AM 1/ 1/2020 12:00:00 AM	Raw Processed Requested values Include bounds	Modified At Time
		Async Read	Read History
Timestamp	Value	Quality	HDA Quality
12/8/2014 11:21:41 PM 12/8/2014 11:21:53 PM 12/8/2014 11:37:21 PM	Brian Example :E	good good good	raw raw
Returned values 3	Max. possible values 0		
connected to server: Matri Get history from 1/1/2000 3 items values loaded	kon.0PC.Simulation.1 to 1/1/2020		

Task 6 – Obtain a screenshot of any tag with valid time series data of some sort with a time stamp (Bucket Brigade.String would be a good choice as you should have been changing it in the previous questions).

Practical Exercise 5: Tunnelling

5.1 Objectives

The purpose of this exercise is to demonstrate connection between 2 separate computers using a Tunnelling solution for DA client server

5.2 Procedure

The software is installed on <u>**Remote Labs 9 and 12**</u>. These have been set up to be mirrors of each other with the configuration at each end set to expose the Matrikon Server through the Cogent tunnelling solution.

Brief Video on setting up the Cogent tunnel http://www.cogentdatahub.com/DataHub_Videos.html





- 2. DataHub OPC Tunnelling in 3 easy steps (no DCOM problems). (5:45)
- 3. Logging data to a database / Reading data from a database.
 - a) Logging data creates new rows in the database table. (12:55)
 - b) Logging data modifies the same row in the database table. (9:05)
- c) Reading data from a database. (8:24)
- d) Using DataHub Scripting to read from a database. (10:50)

To access the Cogent software you double click the Icon in the tray



If this is not present you may need to start it up by double clicking the icon on the desktop. If the licence has not been loaded the Cogent software will only run for 1 hour



Note: You could conceivably do this question by logging into Lab 9 (or 12) starting the Cogent Software and then completing the rest of the question on Lab 12 (or 9) having started the Cogent software on the second Lab. The labs by default should have the software running on both 9 and 12, if you have trouble then check the other lab to ensure the tunnelling software is running there as well; a tunnel requires 2 ends to work correctly.

On each of the lab computers the the Cogent data hub has been setup as a client to the Matrikon server with a data domain of "MatrikonOnLab9 (or 12)". Make sure you leave this alone as this is what the student at the other end of the "tunnel" will be connecting to.



Lab 12



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First you need to set up the tunnel, select the tunnel/mirror option in the control panel



Info you will need, IP address'

- Lab 12 is 192.168.1.55
- Lab 9 is 192.168.1.23
 - Remote data domain "MatrikonOnLab9 (or 12)"

Click the add master button on the right to get the setup screen.

This is set up on Lab 12 so the IP and Remote data domain has been used for Lab 9. Call the local data domain something that uniquely identifies it as your assignment.

Tunnel/Mirro <mark>r Maste</mark>	r Configuration					
Primary Host:	192.168.1.23	Port:	4502	Secure (SSL)		
Secondary Host:		Port: 4	4502	WebSocket		
Local data domain:	BriansOPCTunnel	Remote user	name:			
Remote data domain:	MatrikonOnLab9	Remote pass	word:			
Data Flow Direction	nd and receive data t	to and from the M	laster			
C Read-only: Red Write-only: Ser	eive data from the M nd data to the Master	aster, but do not , but do not rece	Cal	I the local		
When the connection is initiated: • Get all values from the Master • Override the Master's values with my values • Override the Master's values with my values						
Synchronize based on time stamp Vours						
C Synchronize ba	sed on time stamp	y values		yours		
Overnde the M Synchronize ba When the connection Mark data qual Mark data qual O not modify t	is lost: ity here as "Not Conn ity on the Master as " the data quality here	ected" Not Connected" or on the Master		yours		
C Synchronize ba	is lost: ity here as "Not Conn ity on the Master as " the data quality here is ng time stamp with th changes in binary (fa	ected" Not Connected" or on the Master e local current tin ster, x86 CPU on	ne Iy)	yours		
Connection Propertie Connection Propertie Replace Incomi	is lost: ity here as "Not Conn ity on the Master as " the data quality here is ng time stamp with th changes in binary (fa gent Embedded Toolki	ected" Not Connected" or on the Master e local current tin ster, x86 CPU on t server	ne ly)	yours		
C Synchronize ba When the connection Mark data quali Mark data quali Do not modify the Connection Properties Replace incomi Transmit point Target is a Cog Heartbeat (ms):	is lost: ity here as "Not Conn ity on the Master as " the data quality here is ing time stamp with th changes in binary (fa gent Embedded Toolki	ected" Not Connected" or on the Master e local current tin ster, x86 CPU on t server Retry Delay (r	ne ly) ms): [yours		
Connection Propertie Connection Propertie Replace Incomi Transmit point Target is a Cog Heartbeat (ms): Timeout (ms):	sed on time stamp is lost: ity here as "Not Conn ity on the Master as " the data quality here is ing time stamp with th changes in binary (fa pent Embedded Toolki 1000 5000	ected" Not Connected" or on the Master e local current tin ster, x86 CPU on t server Retry Delay (r	ne ly) ms): [yours		

You must click the Apply button after you ok the configuration for it to save.

Tunnel/Mirror Master
Accept plain-text connections on service/port: 4502
Current Connections: 0
Accept secure connections on service/port: 4503
SSL Certificate: C:\Program Files (x86)\Cogent\Cogent DataHub\pl Browse
Current Connections: 0
Try to send data even if it is known to be superseded
🔽 Boolean 🔽 Integer 🔽 Float 🔽 String
View Data View Connections Event Log Script Log
About OK Apply Cancel Help

Now click the view data button and navigate to the local data domain name you have just configured.

Task 7 - Obtain a screen capture similar to this one showing the data flowing across the tunnel from the other computer.



Next let's prove the interoperability of it all.

Open the KassI DA client – on the desktop, make sure you get the **dOPC<u>DA</u>Client** as there are AE and HDA ones as well.



Connect as before to a server but make sure you choose the Cogent DataHub

DE	Selecce		<u> </u>
🗊 dOPC DA Cli	COM X	(ML]	
File Help	Comput	ter name	
Explorer Ins			
Path		▼ Refre	sh
	Availabl	e servers	
	Cogent (Matrikon Cogent (DataHub OPC Server of Simulation and Testing DataHub A&E	
Sever state r	Name	Cogent.DataHub.1 0	ĸ
	CIsId	{C0634700-0837-4044-AEF8-771E5A500009} Car	icel

As previously add a group that identifies it as your own and add some items from the tunnel you have created with your data domain.

🗊 dOPC DA Client	(c) www.kassl.de				_	
File Help						
Explorer Inspect	or					
📃 BriansGroup	ItemId	Active	Value	Time	Quality	
	BriansOPCTunnel:Simulat	. ×	11786.66437419;	6:15:43 AM	good	
	BriansOPCTunnel:Simulat	. ×	with;us;for;a;soluti	6:15:43 AM	good	
	BriansOPCTunnel:Simulat	. ×	False	6:15:40 AM	good	
	BriansOPCTunnel:Simulat	. ×	66	6:15:43 AM	good	
	BriansOPCTunnel:Simulat	. ×	16956	6:15:43 AM	good	
	BriansOPCTunnel:Simulat	. ×	2534	6:15:43 AM	good	
	BriansOPCTunnel:Simulat	. ×	4723	6:15:43 AM	bad	
	BriansOPCTunnel:Simulat	. ×	7653.078125	6:15:43 AM	good	
	BriansOPCTunnel:Simulat	. ×	13229.24328891	6:15:43 AM	good	
	BriansOPCTunnel:Simulat	. ×	solution	6:15:43 AM	good	
	BriansOPCTunnel:Simulat	. ×	14/12/2014 10:1	6:15:43 AM	good	
	BriansOPCTunnel:Simulat	. ×	220	6:15:43 AM	good	-
	•					
Group state Upda	ate rate Deadband Acti	ve				
BriansGroup 1000) 0.00 acti	ve				
Sever state Coger	nt.DataHub.1 9	State	running			
Cogent Real-Time Sy DataHub	vstems Inc Cogent S L	Start time Last update	15/12/2014 5:45:32 AM 15/12/2014 6:15:11 AM			

And for the final part of the exercise - repeat the above using the MatrikonOPC Explorer

Here is an example.

MatrikonOPC Explorer - [Untitled*]						
File Server Group Item View Help						
오 💥 🗊 🖄 💣 🔗 🏠 🖉 📟 🕹 💷 📻 🍛	🖆					
BrianGroup	Contents of 'BrianGroup'					
E-S Localhost '\RL-3D-PC'	Item ID	Access Path	Value	Quality	Timestamp	Status
Cogent.DataHub.1	BriansOPCTunnel:Simulation Items.Saw-toothed		-51	Good, non	12/15/201	Active
BrianGroup	BriansOPCTunnel:Simulation Items.Saw-toothed		48	Good, non	12/15/201	Active
Cogent.DataHubAE.T	BriansOPCTunnel:Simulation Items.Saw-toothed		111105	Good, non	12/15/201	Active
Matrikon.OPC.Simulation.	BriansOPCTunnel:Simulation Items.Saw-toothed		465000000	Good, non	12/15/201	Active
Other Network Computers	×					
Chervork Neighborhood			46500000	3000, non	12/13/201	ALUVE

Task 8 - Obtain a screen captures of both clients (Matrikon and Kassl) showing showing the data flowing across the tunnel from the other computer.

As a final tidy up please go into the Cogent DataHub and **Delete** your tunnel so the next user can have a clear screen.

Remember you must "Apply" to make the changes confirmed.

