



NEC

SL2100

CTI Installation Manual

Version 2.0

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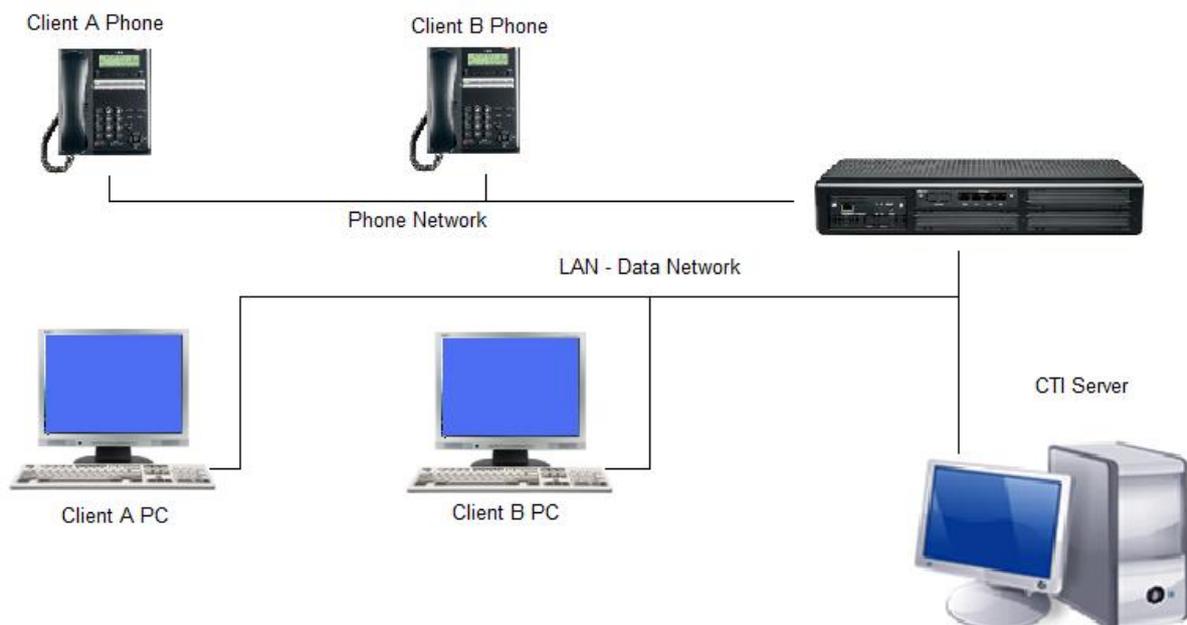
General Description

The primary function of Computer Telephony Integration (CTI) is to allow a PC based application to use an SL2100 telephone extension. The most common functions of these applications are to perform Screen popping and call control. There are two modes of CTI that can be used on the SL2100, 1st Party and 3rd Party.

1st Party CTI (TAPI 1.4) runs over a LAN and is designed to allow you to connect an SL2100 telephone extension to a PC via the Ethernet connection on the SL2100. It is aimed for smaller office of between 1 and 10 users. The 1st Party driver is installed onto each PC that needs to run 1st Party CTI and talks directly to the SL2100.

3rd Party CTI employs a similar concept, running on a LAN to allow a user to control their extension using a TAPI application. The driver used for 3rd Party CTI is installed on to a CTI Server that is responsible for all of the TAPI communication to the SL2100 from all of the TAPI clients.

Both drivers can connect to either the ETHERNET port (no IPLE) or VOIPDB port (IPLE installed).



CTI is a licensed module on the SL2100 and will only work when the appropriate licenses are installed on the CPU.

BE116756 SL2100 3RD CTI LIC (Site wide license)

No license is required for 1st Party CTI on the SL2100.

1st Party CTI

Requirements

Following are the minimum specifications required to use 1st Party CTI over LAN.

Telephone System

SL2100	Running version 1 or above software and a TCPIP connection to either the Ethernet/VOIPDB.
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PC

Operating System	Windows 7 Professional, Ultimate, Enterprise (32/64 Bit) Windows 8 Professional, Windows 8 Enterprise (32/64 Bit) Windows 10 Professional, Enterprise Windows Server 2008 (32 Bit Only) Windows Server 2008 R2 (64 Bit Only) Windows Server 2012 (64 Bit Only) Windows Server 2016 Windows Server 2019
CPU	2.5GHZ
Memory	1GB
Network Card	Using TCP/IP (Including WINS, DNS services),

A Maximum of 128 1st Party CTI clients can be used on an SL2100.

The setup requires you to be logged onto the PC Server as a Local Administrator.

If a firewall is present Port 8282 should be made an exception so as not to block/delay TAPI information.

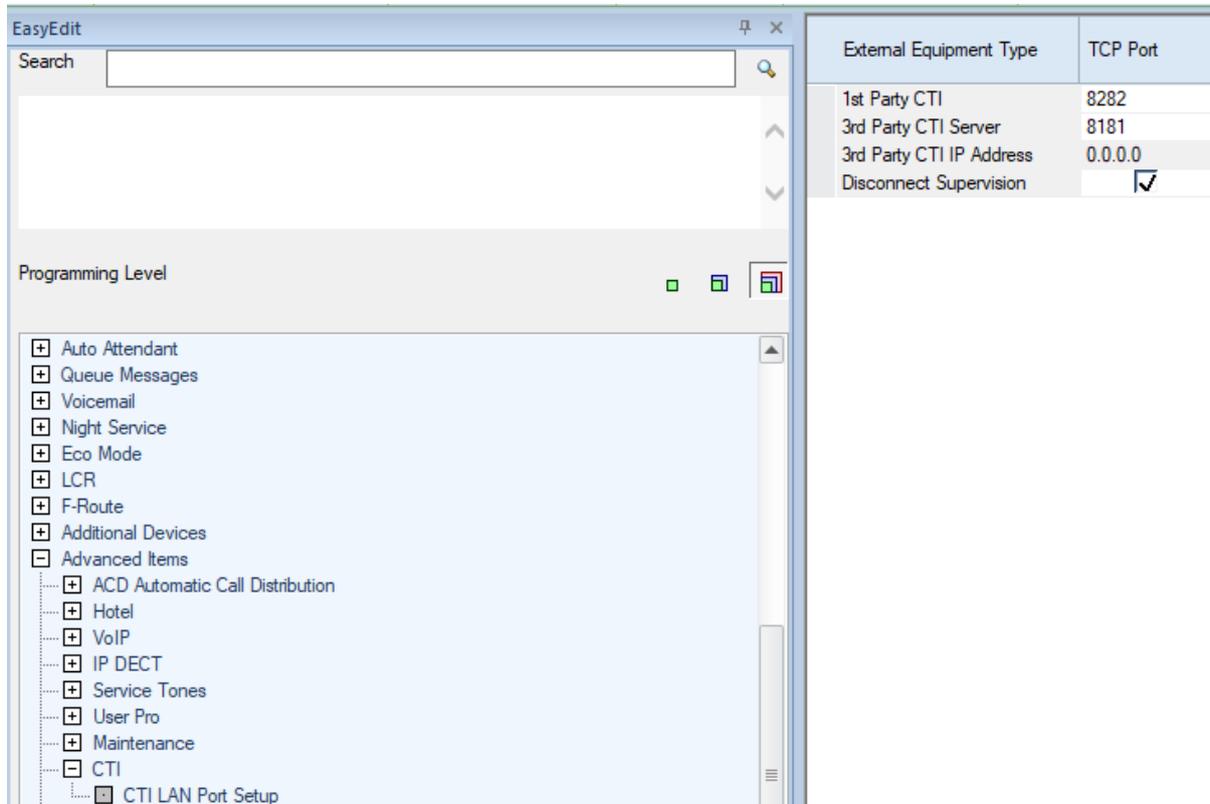
Note: The above are the specification for TAPI set-up only. They may differ when you install an application.

Configuring the SL2100

The SL2100 should have an IP address assigned to the Ethernet (PRG10-12-01) or VOIPDB (PRG10-12-09) card that is connected to the network. A TCP Port has to be assigned for the 1st Party CTI driver to connect to, the recommended port is 8282.

Assign the port in Easy Edit + Advanced Items + CTI + CTI LAN Port Setup + 1st Party CTI (PRG 10-20-09.) Set the '1st Party CTI' TCP Port to 8282

Disconnect Supervision - This should be enabled for 1st Party CTI.



The screenshot shows the EasyEdit software interface. On the left, a tree view under 'Advanced Items' is expanded to 'CTI LAN Port Setup'. On the right, a table displays the configuration for '1st Party CTI'.

External Equipment Type	TCP Port
1st Party CTI	8282
3rd Party CTI Server	8181
3rd Party CTI IP Address	0.0.0.0
Disconnect Supervision	<input checked="" type="checkbox"/>

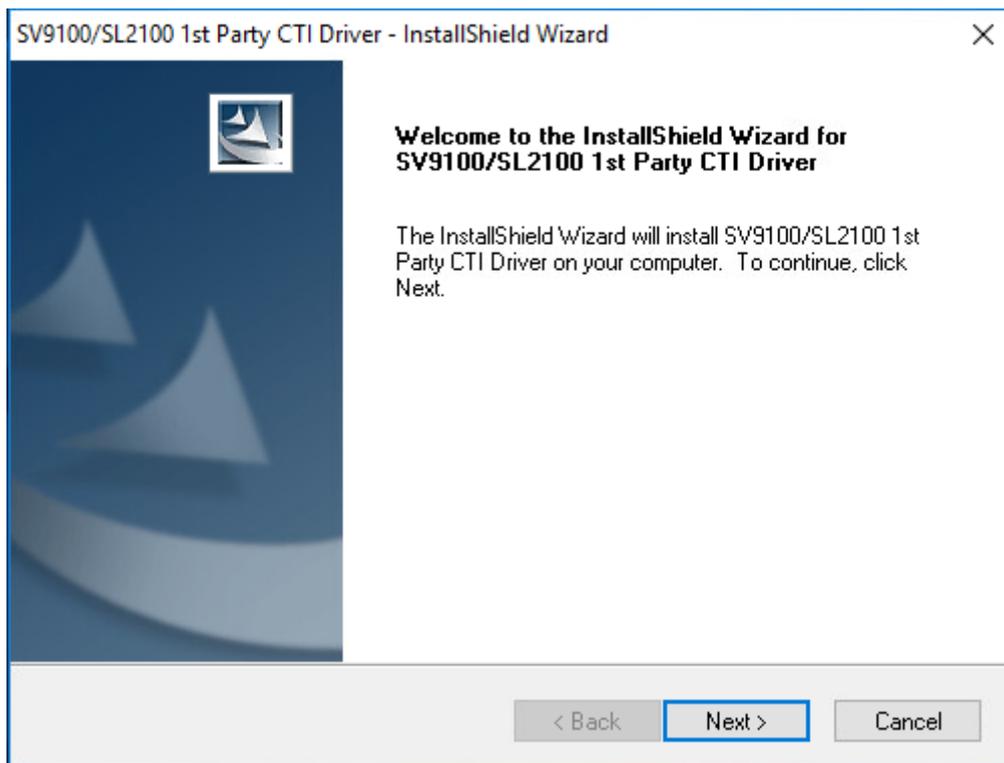
No license is required for 1st Party CTI on the SL2100. You can use up to 128 1st Party CTI clients.

Installing the 1st Party CTI Driver

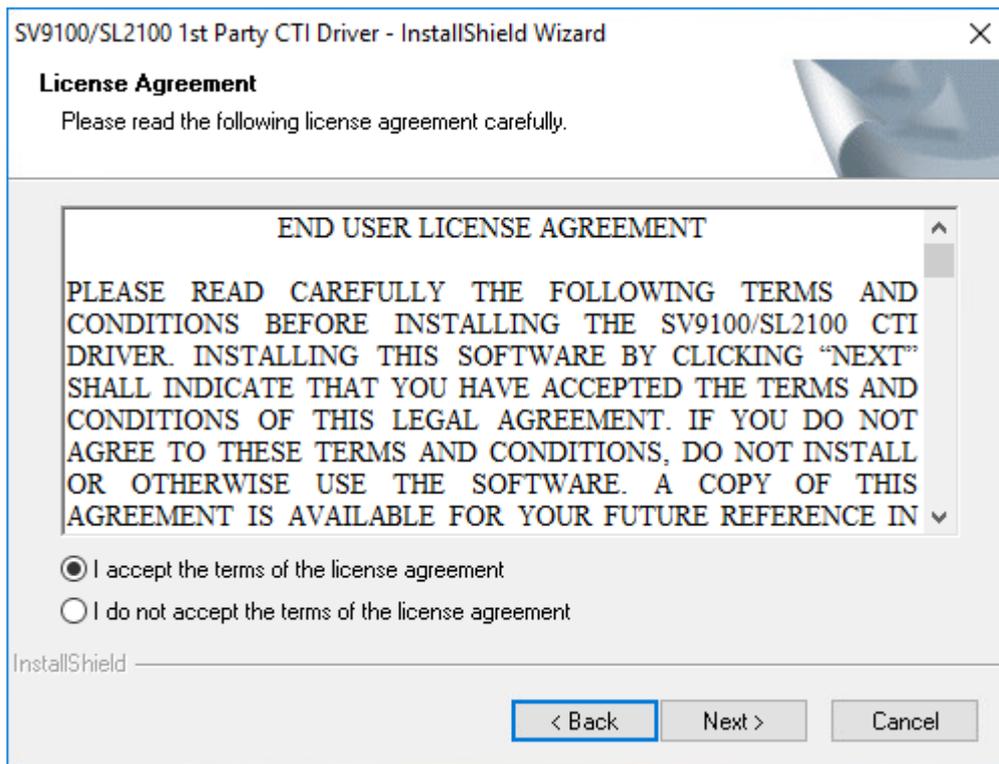
Before you can install the software, you have to logon to the PC as an administrator. To install the 1st Party CTI driver, extract the software (if zipped) and run the 'CTIDriver1stSetup.exe' application.



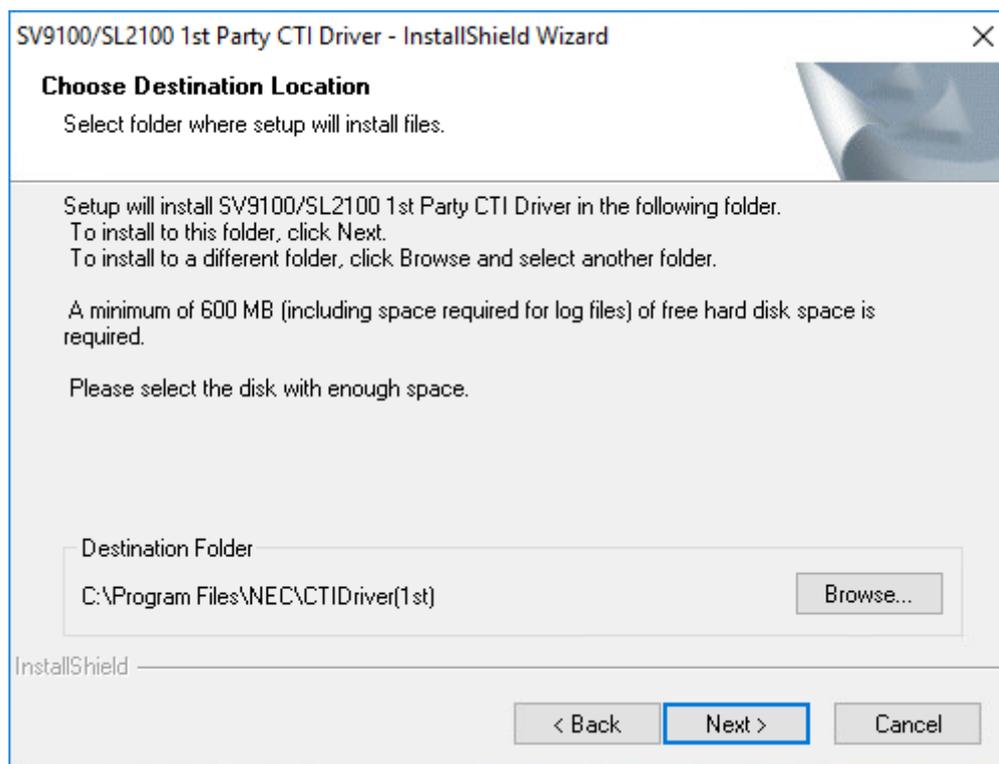
At the welcome screen, click Next.



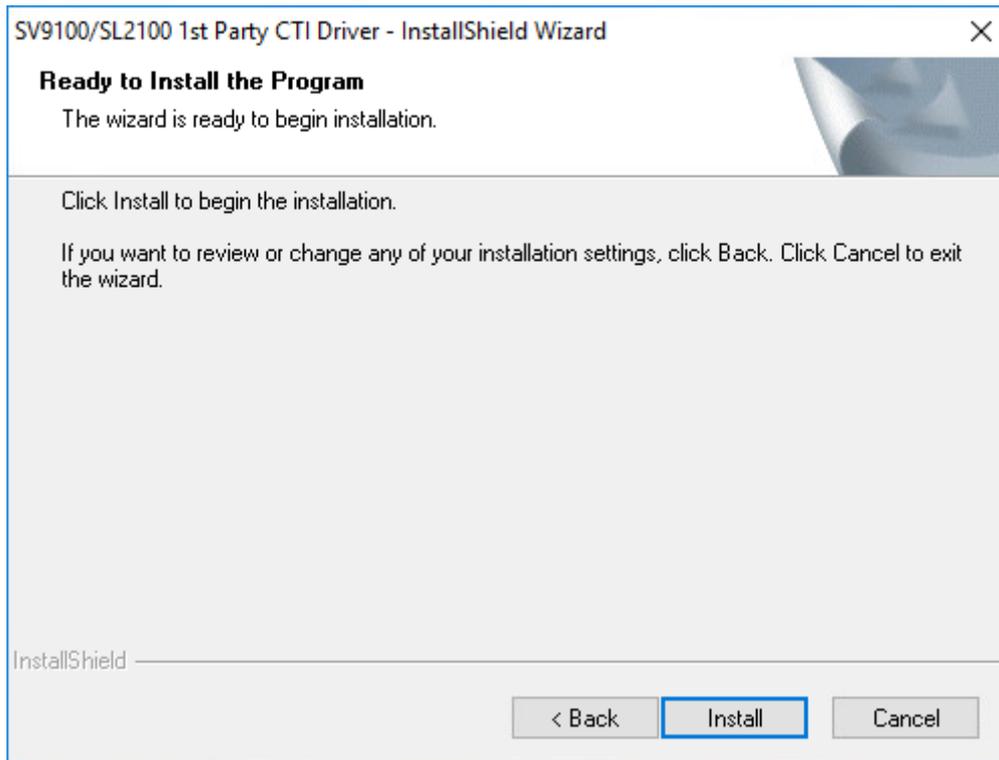
Read the End User License Agreement and if in agreement accept the terms and click Next



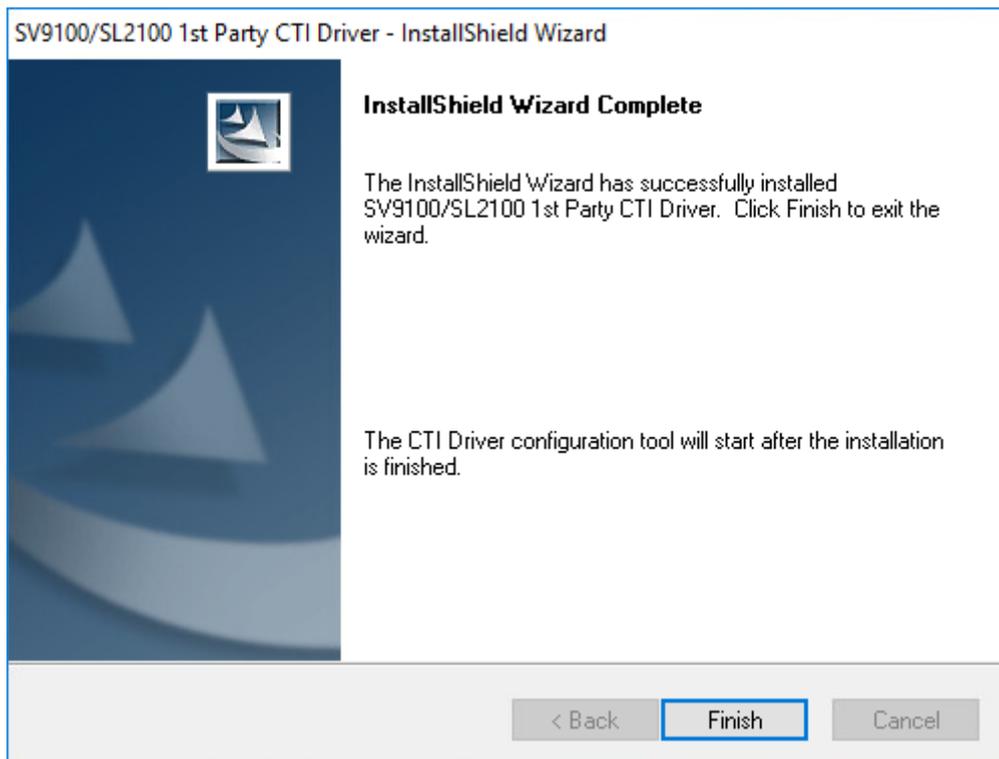
Choose the folder that the CTI driver will be installed to and click Next. Use the Browse button to select a different location should you need to.



Click Install to start the installation



After a few seconds the following screen will be displayed, click Finish.



The configuration screen will then be displayed,

Configuring 1st Party CTI Driver

Enter the IP address of the SL2100 against 'Switch IP Address' and the TCP Port number that has been configured (PRG10-20-01) against 'Switch TCP Port No'. Leave 'My PC IP Address' set as the loopback IP Address '127.0.0.1' and the 'Request Timeout (Sec)' set to 10.

Enter the correct details including the Extension number you wish to use.

It is recommended to leave all other items as default.

CTI Driver Setting (1st Party)

File

Information

CTI Driver Version: 3.0.006

CTI Driver Usage: Use CTI Driver(enable)

CTI Driver Status: Disable

Status Details: To use the CTI Driver, select "Enable" in "CTI Driver Usage", and click "Apply".

Main Software Version

CTI OCX License: --

Setting

Network Setting

Switch IP Address: 192.168.0.10

Switch TCP Port No.: 8282

Request Timeout (Sec): 10

My PC IP Address: 127.0.0.1

Operation Mode

Multi Line Mode

Single Line Mode

Outlook

Extension Number: 120

Tracelog Level: Standard

Call Mode

Auto Speaker Mode Auto Headset Mode

Starting Option

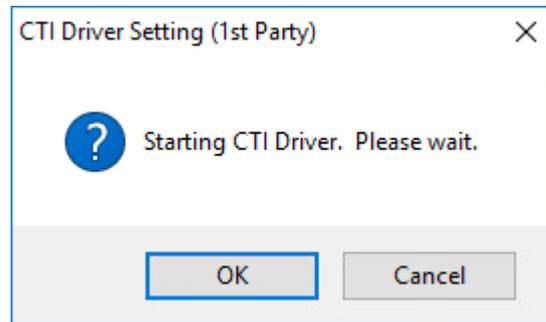
Apply Close

Multi Line Mode is the default mode, this allows information about the extension, plus information on any keys programmed. This gives extra functionality to any applications that can support this.

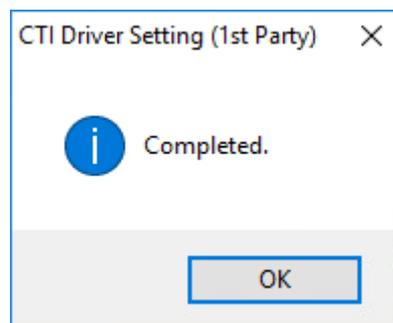
Single Line Mode is the more standard version giving information on just the extension selected. With this option, the Outlook item can be selected as this is compatible. This allows for out dialling through Outlook.

Auto Speaker Mode assumes all calls will be taken via Loudspeaker or through the handset, this is default mode, however if you always use a headset, select Auto Headset mode as this will put the audio connection to the Headset.

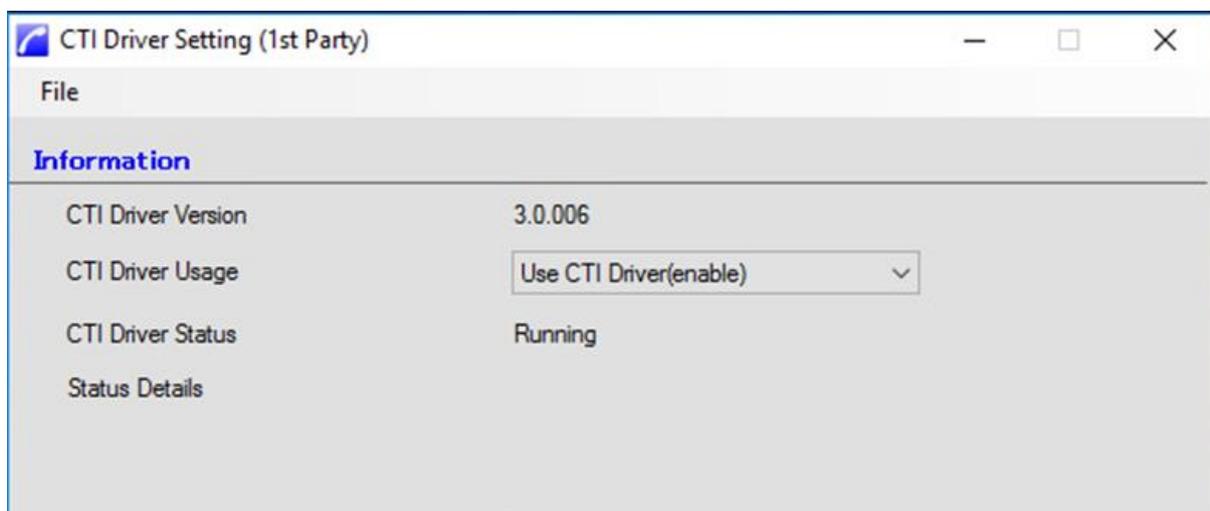
Once you have configured the require options then click Apply. The following message will the display as the CTI driver attempts to start. Click OK.



You will then see a Completed message. Click OK.



If the connection is established successfully, you will see the following:



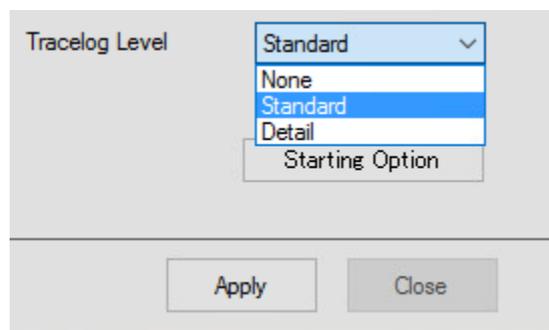
It is advised to restart your PC for this to take full effect.

To review the configuration of the 1st Party CTI driver at a later date, open via the 'CTI Driver Configuration Tool' icon which has been added to the Desktop. This will open the full configuration screen again.



Tracelog Level

It may be requested by NEC in times of investigation to turn detailed logging on, this can be achieved by simply selecting from the drop down box in the Tracelog Level. However for normal operation please use Standard.



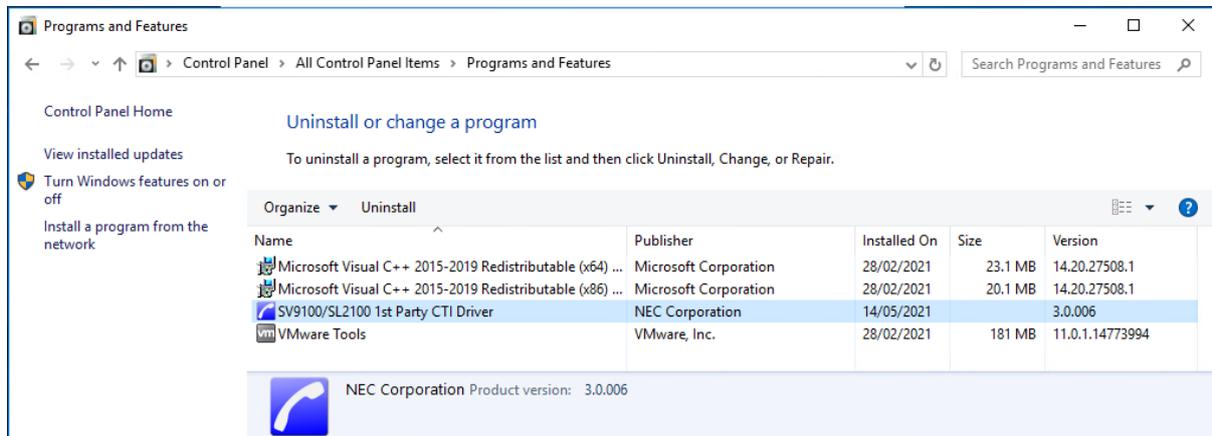
Trace logs can be obtained from C:\Program Files\NEC\CTIDriver(1st)

Upgrading the 1st Party CTI Driver

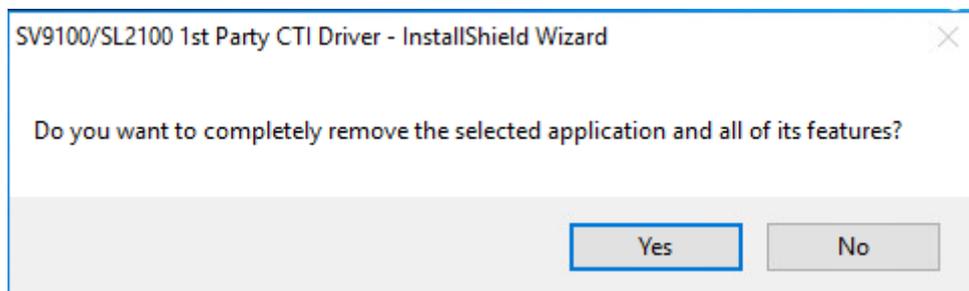
Upgrading the CTI driver is simply a case of running the new installer exe. The installer automatically updates the components, whilst keeping any settings you have.

Uninstalling the 1st Party CTI Driver

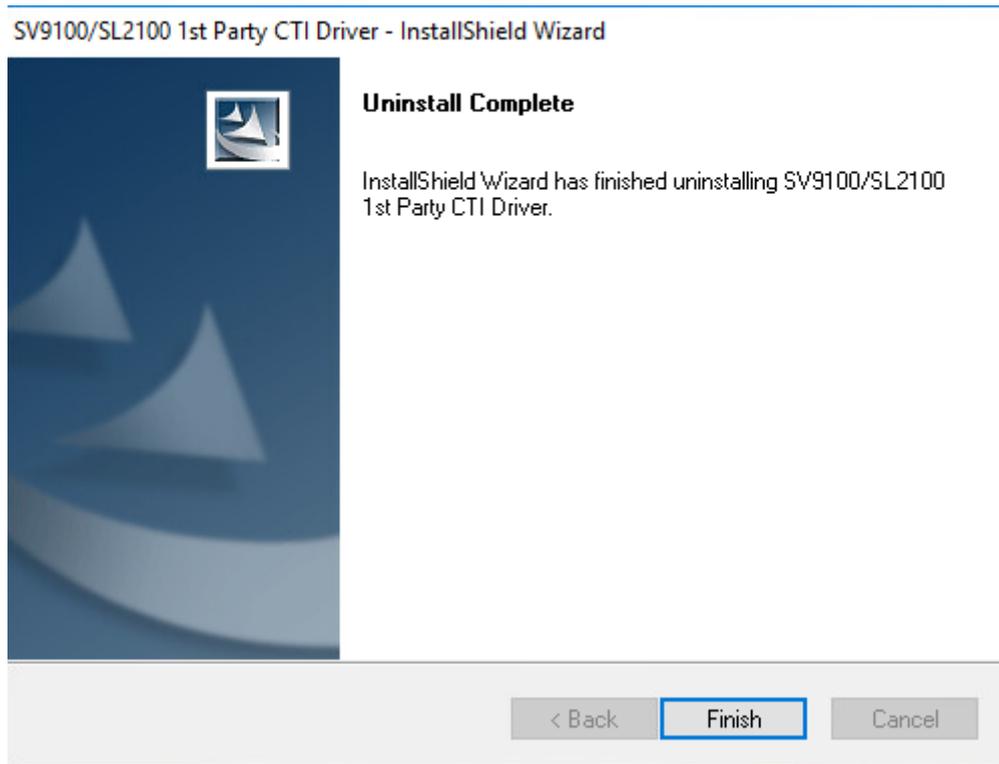
To remove the CTI driver from a PC, go into Control Panel / Programs and Features, find 'SL2100/SL2100 1st Party CTI Driver', and then right click and select uninstall (depending on Windows version, terminology may change a little)



When prompted, click Yes to begin removing the CTI driver.



Once complete the following screen will appear. Click Finish.



Uninstall is now complete.

It is advisable to reboot the server to take full effect.

3rd Party CTI

Requirements

Following are the minimum specifications required to use 3st Party CTI. Depending on what type of TAPI application will be used, it may be necessary to use a Windows Server. The 3rd Party CTI driver is installed on to the PC acting as the TAPI server. Some TAPI applications take responsibility for the communications between their application and the TAPI server. Other applications need to have the TAPI enabled on each PC. If TAPI has to be enabled on client PC's then a Windows Server operating system is required. If TAPI communications is handled by the TAPI application then any of the operating listed below can be used.

Telephone System

SL2100	Running version 1 or above software and a TCPIP connection to either the Ethernet/VOIPDB.
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PC

Operating System	Windows 7 Business, Ultimate, Enterprise (32 and 64 Bit) *Note1 Windows 8 Professional, Windows 8 Enterprise (32/64 Bit) *Note1 Windows 10 Professional, Enterprise *Note1 Windows Server 2008 (32 / 64 Bit) *Note1 Windows Server 2012 (64 Bit Only) *Note1 Windows Server 2016 *Note1 Windows Server 2019 *Note1
CPU	2.5GHZ
Memory	1GB
Network Card	Using TCP/IP (Including WINS, DNS services),

Note: The above are the specification for TAPI set-up only. They may differ when you install an application.

*Note 1: Only Server Operating systems can provide [TAPI Sharing](#) and have to be used in a Domain environment.

If the server contains 2 network cards then File and Print sharing must be disabled on the network card connected the SL2100. File and Print sharing must be enabled on the network card that is connected to the Client network.

A dedicated PC Server is strongly recommended for the SL2100 CTI Server.

Virtual environments are supported.

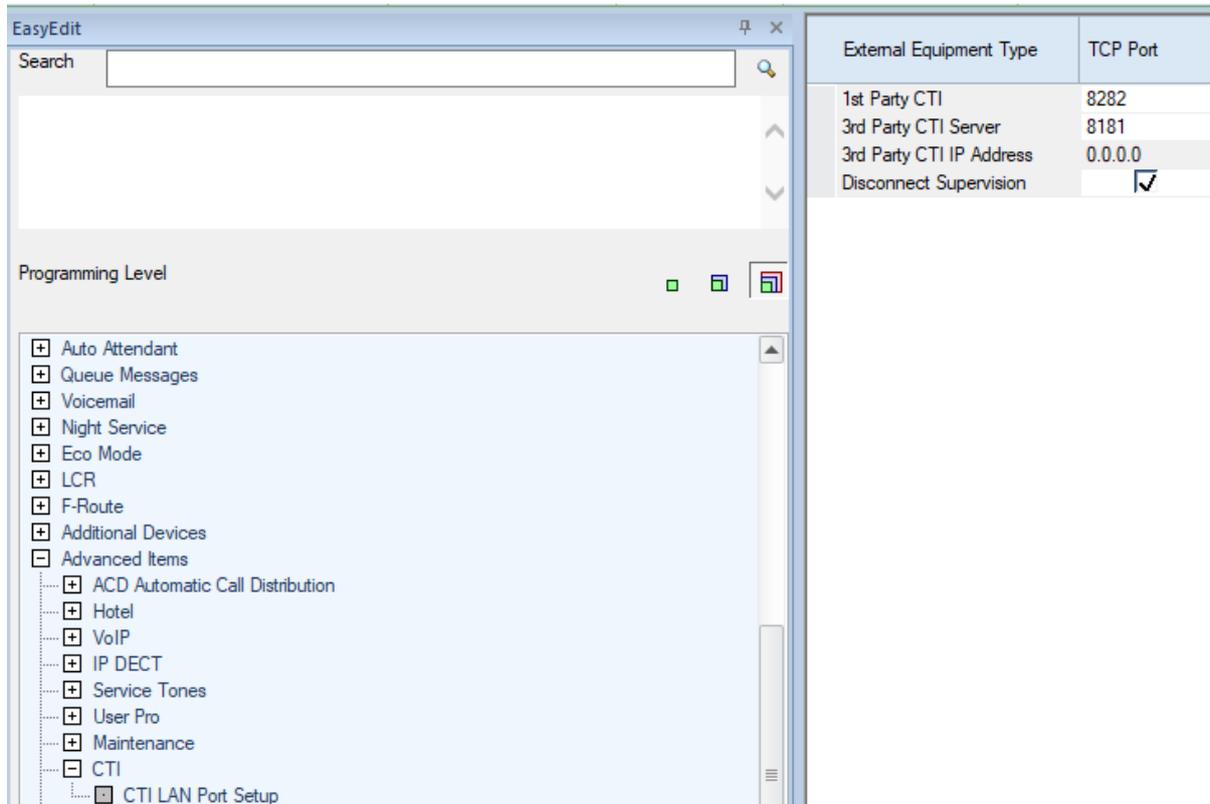
The setup requires you to be logged onto the PC Server as a Local Administrator. The server should be connected to the network via the TCP/IP Protocol (Including WINS, DNS services), and should include the appropriate number of Client Access Licenses. An IT Administrator is normally required during the installation. If a firewall is present Port 8181 should be made an exception so as not to block/delay TAPI information.

Configuring the SL2100

The SL2100 should have an IP address assigned to the Ethernet (PRG10-12-01) or VOIPDB (PRG10-12-09) card that is connected to the network. A TCP Port has to be assigned for 3rd Party CTI to connect to, the recommended port is 8181.

Assign the port in Easy Edit + Advanced Items + CTI + CTI LAN Port Setup + 3rd Party Server (PRG 10-20-01.) Set the '3rd Party Server' TCP Port to 8181.

3rd Party CTI IP Address displays the IP address of 3rd Party CTI Server currently connected. (Read Only).



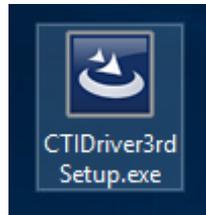
External Equipment Type	TCP Port
1st Party CTI	8282
3rd Party CTI Server	8181
3rd Party CTI IP Address	0.0.0.0
Disconnect Supervision	<input checked="" type="checkbox"/>

A license is required to turn on 3rd Party CTI on an SL2100 (BE116756). Once enabled any number of extensions can use the TAPI service.

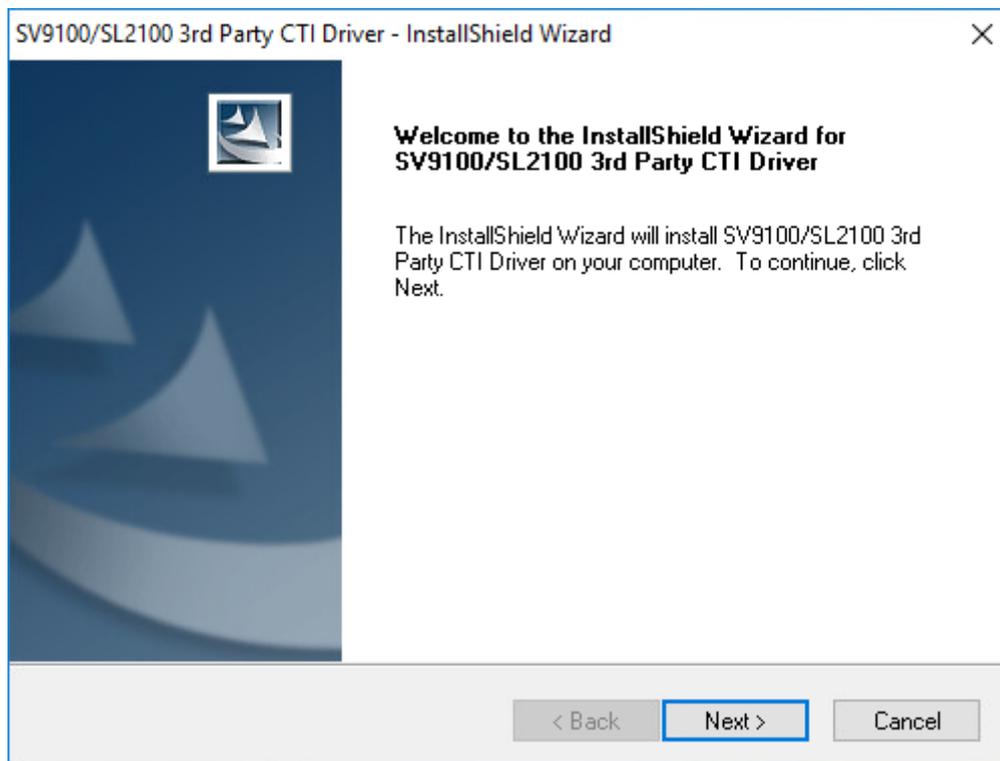
The 60 day trial license can be enabled in PRG90-55-01 if there is available time left to run. Remaining time can be checked in PRG10-52-01.

Installing the 3rd Party CTI Driver

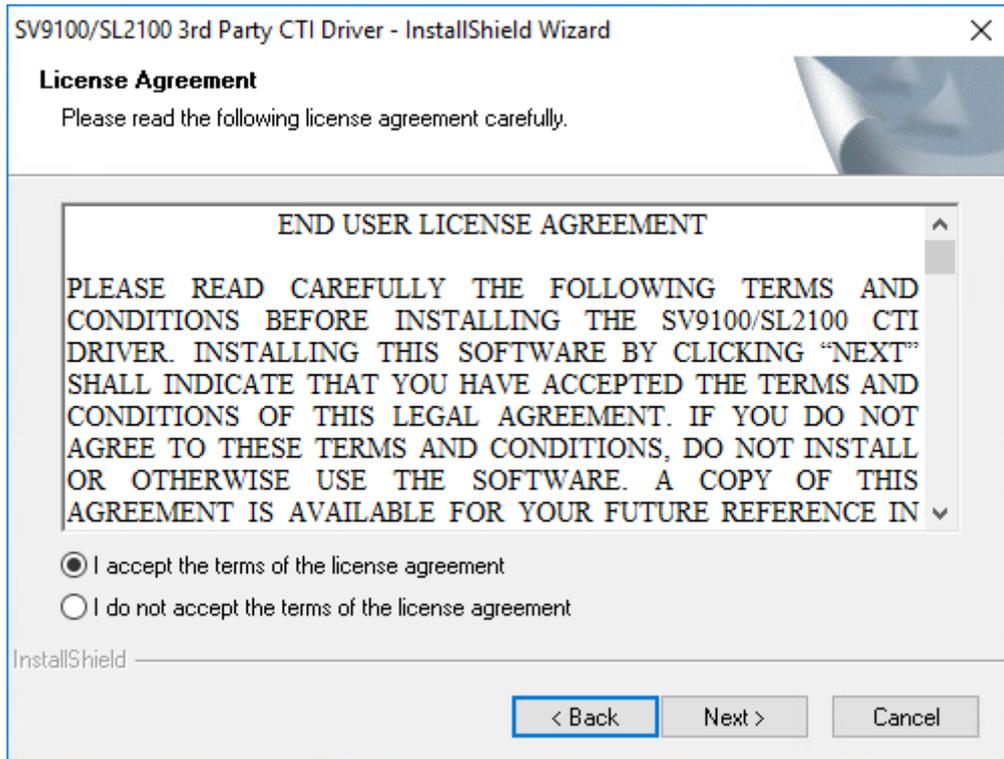
Before you can install the software, you have to logon to the PC as an administrator. To install the 3rd Party TSP click on the CTIDriver3rdSetup Icon.



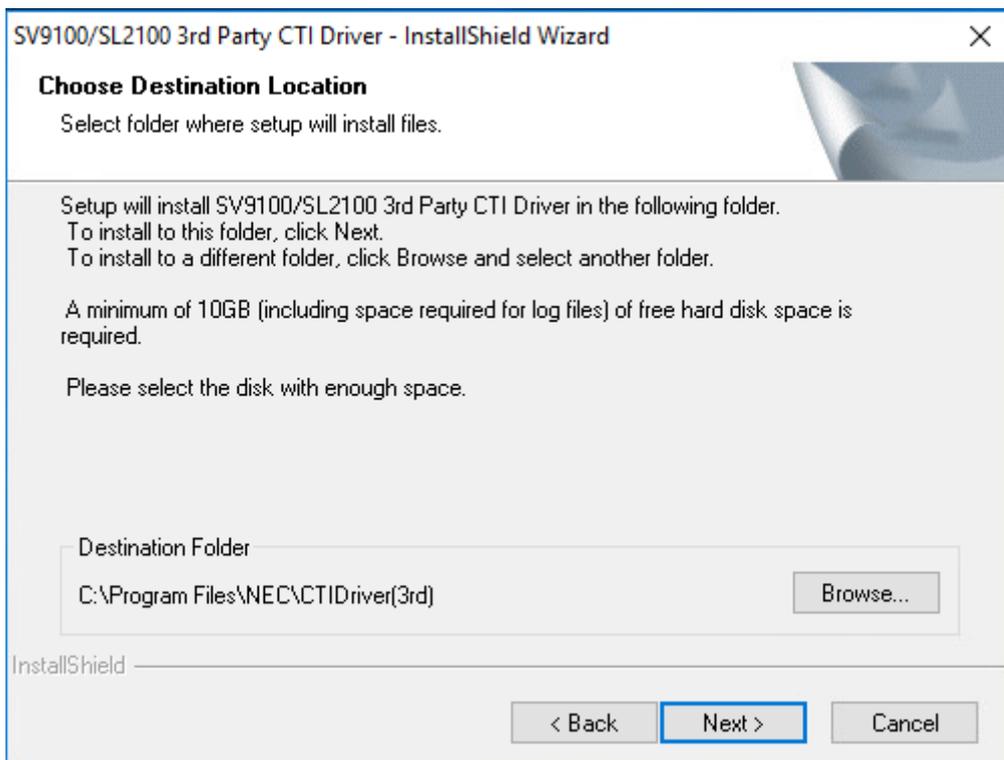
At the welcome screen, click Next.



Read the End User License Agreement and if in agreement accept the terms and click Next

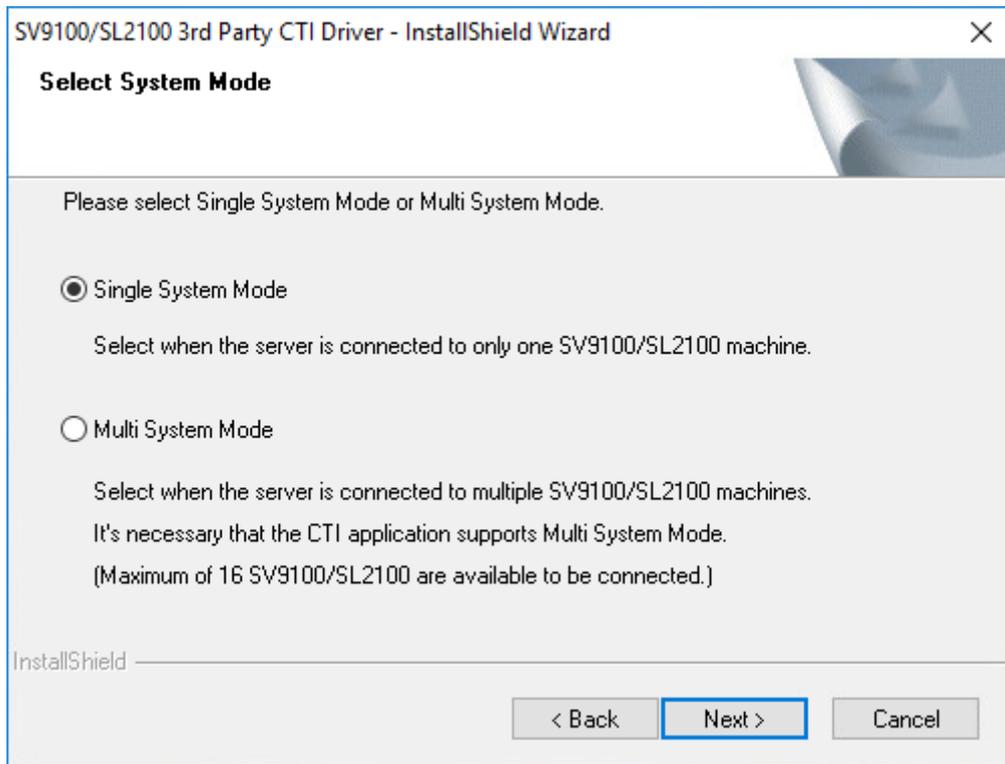


Choose where the software will be installed to and click next. Should you wish to change the location where the software is installed to, click the Browse button.

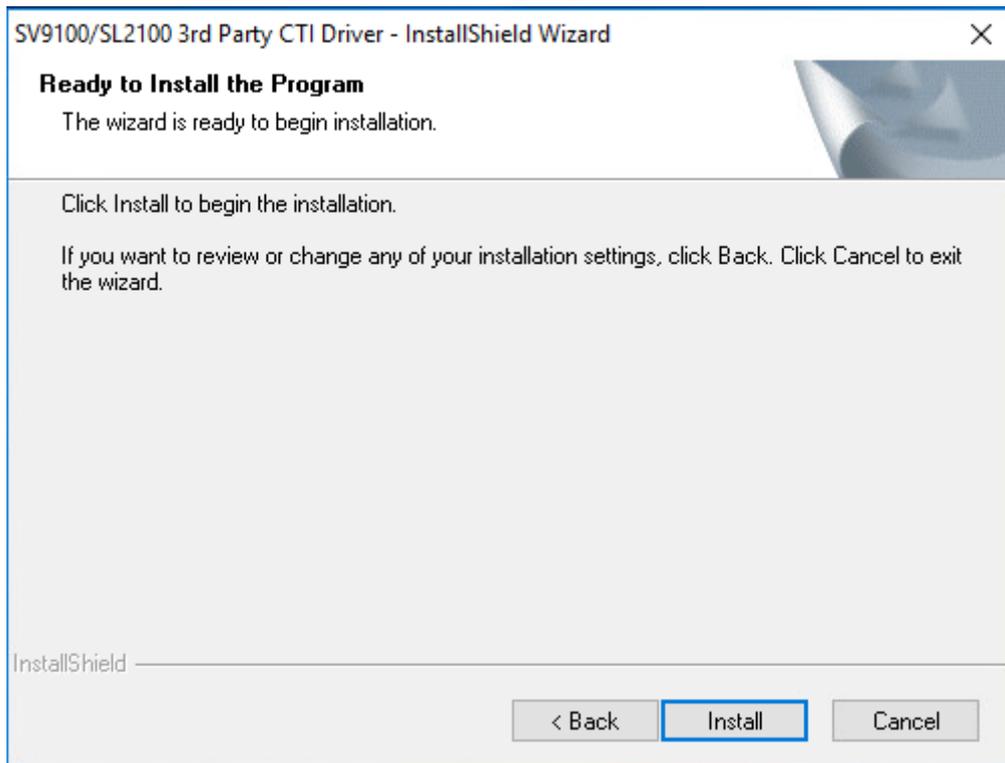


Select System Mode and click Next

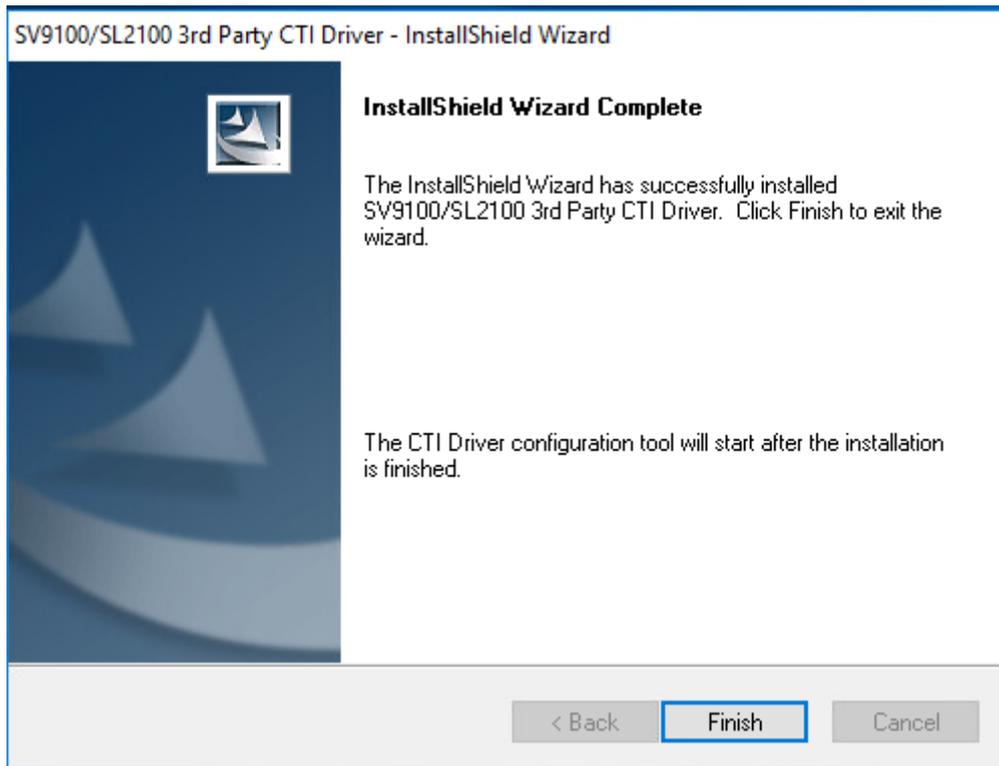
The mode **MUST** be set as **Single System Mode!** (default)



Click Install to Continue



The following will be displayed once complete. Click Finish.



The Configuration screen will then be displayed.

Configuring 3rd Party CTI Driver

Enter the IP address of the SL2100 against 'Switch IP Address' and the TCP Port number that has been configured (PRG10-20-01) against 'Switch TCP Port No'. Leave 'My PC IP Address' set as the loopback IP Address '127.0.0.1' and the 'Request Timeout (Sec)' set to 10.

The screenshot shows the 'CTI Driver Setting (3rd Party)' window. It has a 'File' menu and an 'Information' section. The 'Information' section contains the following fields:

CTI Driver Version	3.0.006
CTI Driver Usage	Use CTI Driver(enable) [v]
CTI Driver Status	Disable
Status Details	To use the CTI Driver, select "Enable" in "CTI Driver Usage", and click "Apply". [v]
Main Software Version	
CTI OCX License	--
CTI Client License	--

The 'Setting' section is divided into three sub-sections:

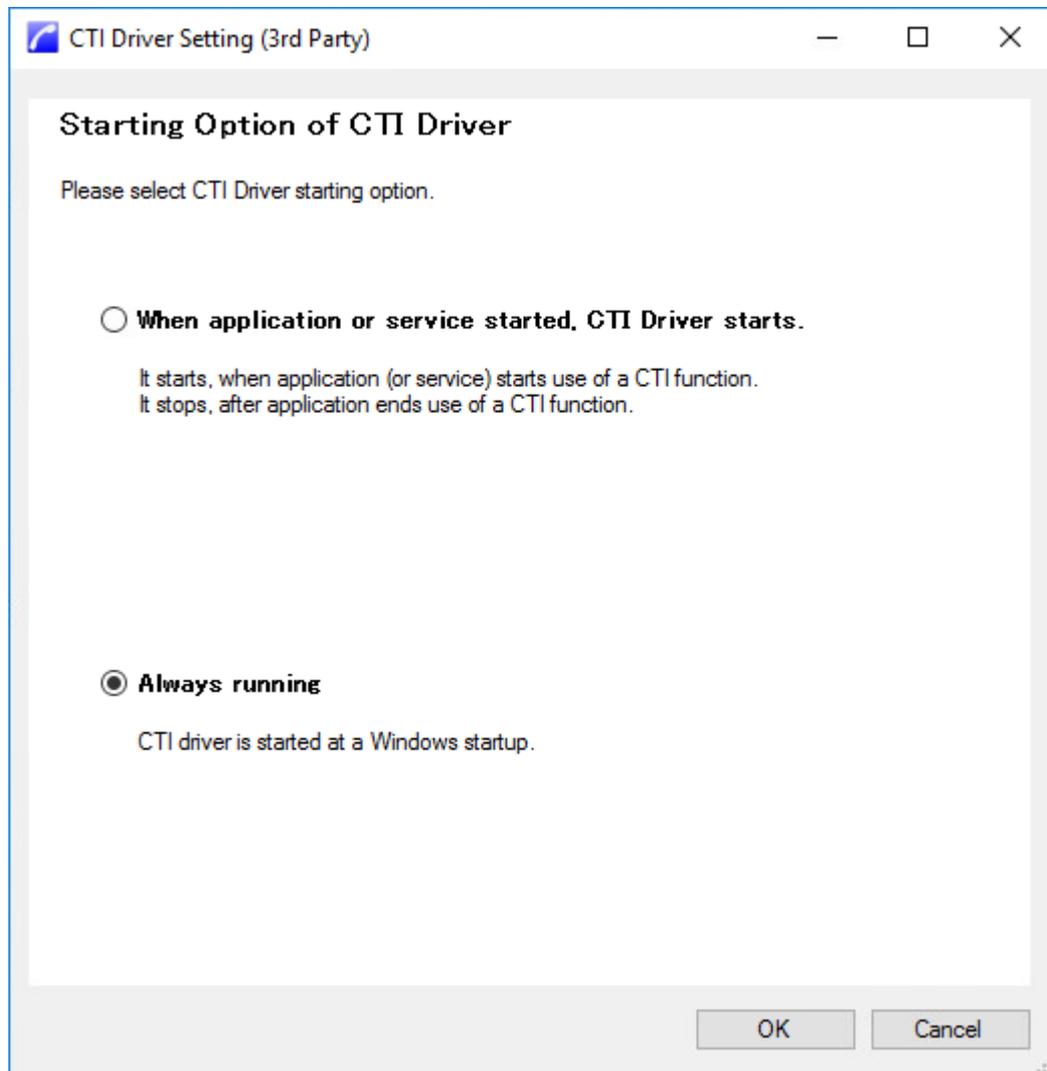
- Network Setting:** Switch IP Address (192.168.0.10), Switch TCP Port No. (8181), Request Timeout (Sec) (10), My PC IP Address (127.0.0.1).
- Operation Mode:** Multi Line Mode (selected), Single Line Mode.
- Trunk Port Message Setting:** When trunk port receives a message of Busy and Ringback, application can get CalledID. (checkbox unchecked).

At the bottom, there are buttons for 'Device list', 'Starting Option', 'Tracelog Level' (Standard [v]), 'Apply', and 'Close'.

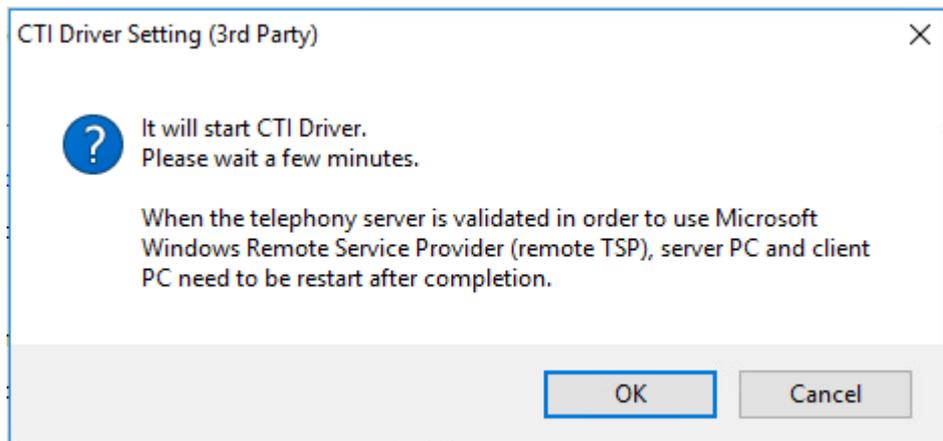
Multi Line Mode is the default mode, this allows information about the extension, plus information on any keys programmed. This gives extra functionality to any applications that can support this. This is the recommended state for any NEC CTI products.

Single Line Mode is the more standard version giving information on just the extension selected. With this option, the Outlook item can be selected as this is compatible. This may be required for 3rd Party Applications.

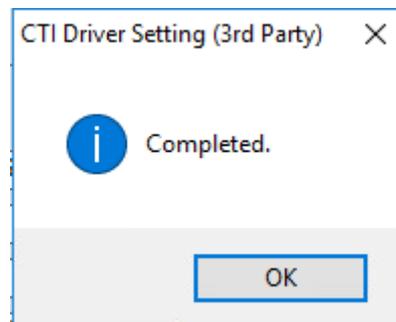
The Starting Option brings open a new dialog box, select 'Always running' and click OK to save the changes.



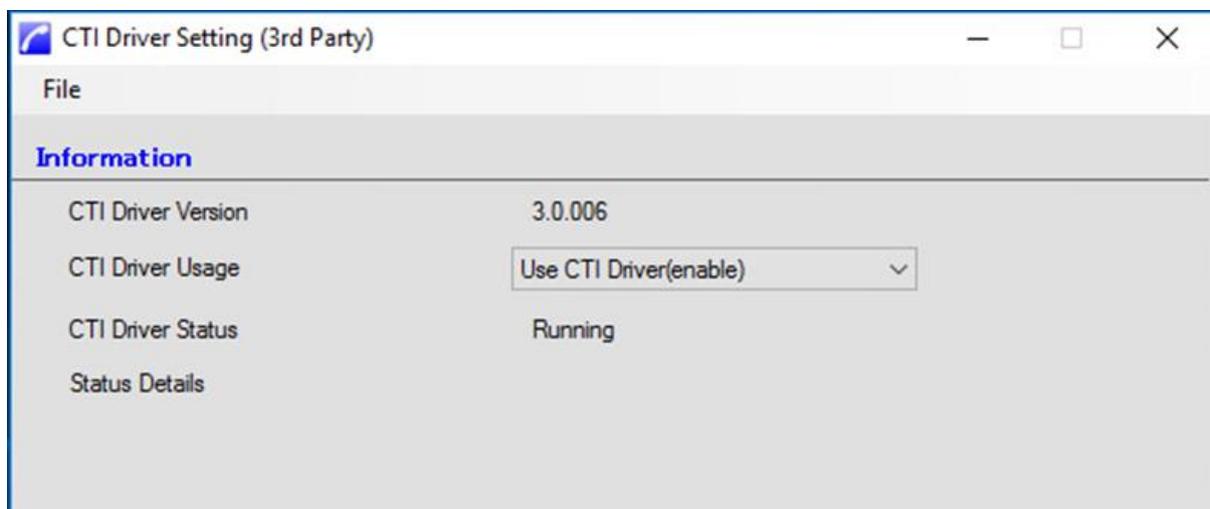
You will be returned to the Main Configuration screen, click Apply



You will then see a Completed message. Click OK.



If the connection is established successfully, you will see the following:



If you click on Device list this should now be populated.

Device list Starting Option Tracelog Level Standard

Apply Close

CTI Driver Device Information (3rdParty)

File

Port Type	PortNo	ExtNo	PortKind	Auto Headset	Mount
Extension	1	100	SLT	<input type="checkbox"/>	Enable
Extension	2	101	SLT	<input type="checkbox"/>	Enable
Extension	3	102	SLT	<input type="checkbox"/>	Enable
Extension	4	103	SLT	<input type="checkbox"/>	Enable
Extension	5	104	SLT	<input type="checkbox"/>	Enable
Extension	6	105	SLT	<input type="checkbox"/>	Enable
Extension	7	106	SLT	<input type="checkbox"/>	Enable
Extension	8	107	SLT	<input type="checkbox"/>	Enable
Extension	9	108	SLT	<input type="checkbox"/>	Enable
Extension	10	109	SLT	<input type="checkbox"/>	Enable
Extension	11	110	SLT	<input type="checkbox"/>	Enable
Extension	12	111	SLT	<input type="checkbox"/>	Enable
Extension	13	112	SLT	<input type="checkbox"/>	Enable
Extension	14	113	SLT	<input type="checkbox"/>	Enable
Extension	15	114	SLT	<input type="checkbox"/>	Enable
Extension	16	115	SLT	<input type="checkbox"/>	Enable
Extension	17	116	MLT	<input type="checkbox"/>	Enable

Apply Close

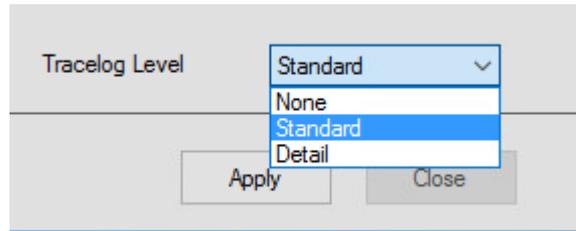
To ensure the changes have made full effect it is recommended the computer is restarted.

To review the configuration of the 1st Party TSP at a later date, open via the CTI Driver Configuration Tool icon. This will open the full configuration screen again.



Tracelog Level

It may be requested by NEC in times of investigation to turn detailed logging on, this can be achieved by simply selecting from the drop down box in the Tracelog Level. However for normal operation please use Standard.



Trace logs can be obtained from C:\Program Files\NEC\CTIDriver(3rd)

Dynamic learning

On the SL2100 this is dynamic and therefore does not need to be rebooted to see these.

This can be verified using the Phone.exe test tool and dropping down to the new extension number.

Although the CTI driver recognises these new devices, the TAPI application may not, so it would still be necessary to restart the application or its CTI interface to pick up these new lines. However this is usually a much quicker process and can sometimes be scheduled (depending on application).

Restarting TAPI

If for any reason a TSP reset is required, the simplest way to do this is to reboot the server.

DO NOT make any alterations in the Phone and Modems area, such as removing the TAPI Driver and Adding again, as this will cause any User/Extension associations to be lost when sharing TAPI.

TAPI Sharing

NEC products distribute their service to clients from the Server product.

3rd Party Products may need to have TAPI control at Client machines. To allow other PC users to use the TAPI services the TAPI server must be enabled.

To perform this, it necessary to share through the Windows Telephony Server (Only available on Windows Server Operating Systems) using the 3rd Party CTI driver.

Windows Server 2019

Follow the same instructions as [Windows 2008 Server](#).

Windows Server 2016

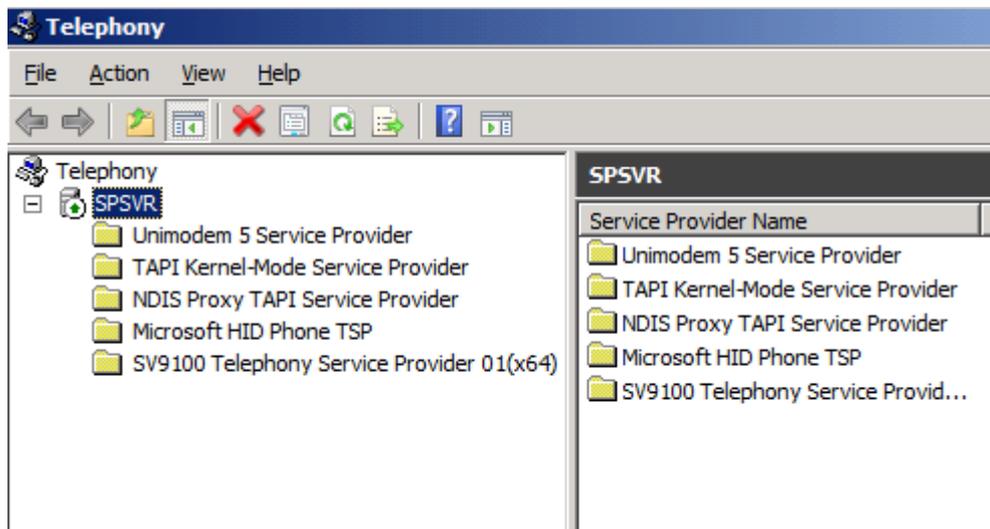
Follow the same instructions as [Windows 2008 Server](#).

Windows Server 2012 & 2012 R2

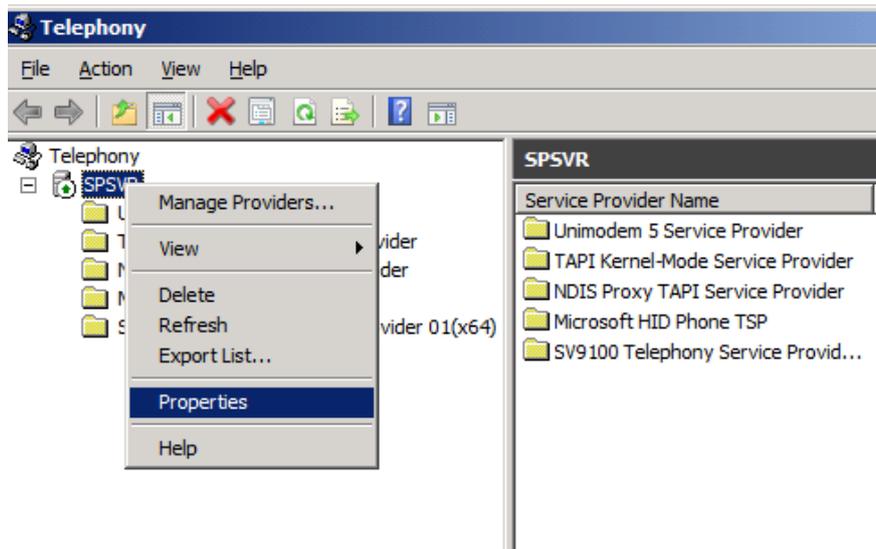
Follow the same instructions as [Windows 2008 Server](#).

Windows Server 2008

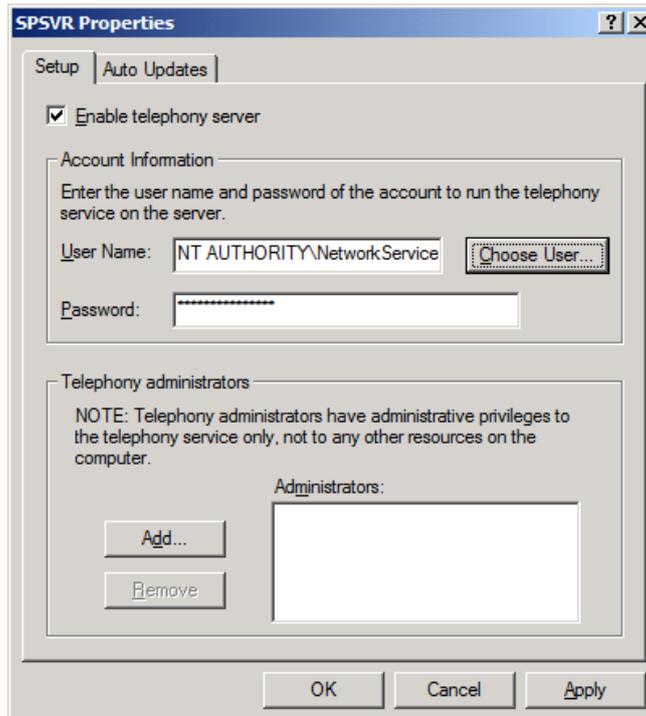
Click **Start**, then click **Run**, and then enter the command **mmc tapimgmt.msc**



Right Click on the Server Icon and select Properties:



In the Telephony Properties, tick the box which says 'Enable Telephony Server.' Below in the user name field, click the choose user button.

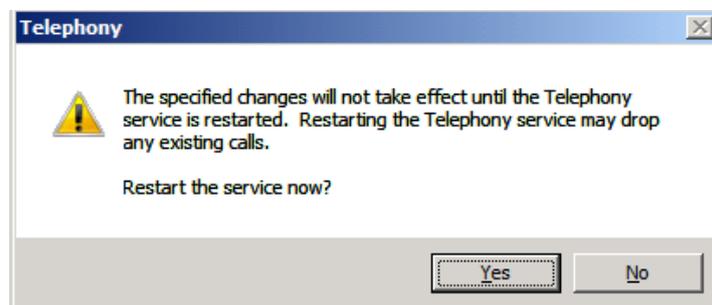


The Select User window will appear, type in the name and select Check Names. The account must be a Windows Domain account with local admin rights (it is recommended to create a new one for clarity). Click OK. Alternatively use the default as shown here.

It is recommended that the password for this account is not changed (such as 30 day policies) as this will cause the service to fail at a later date.

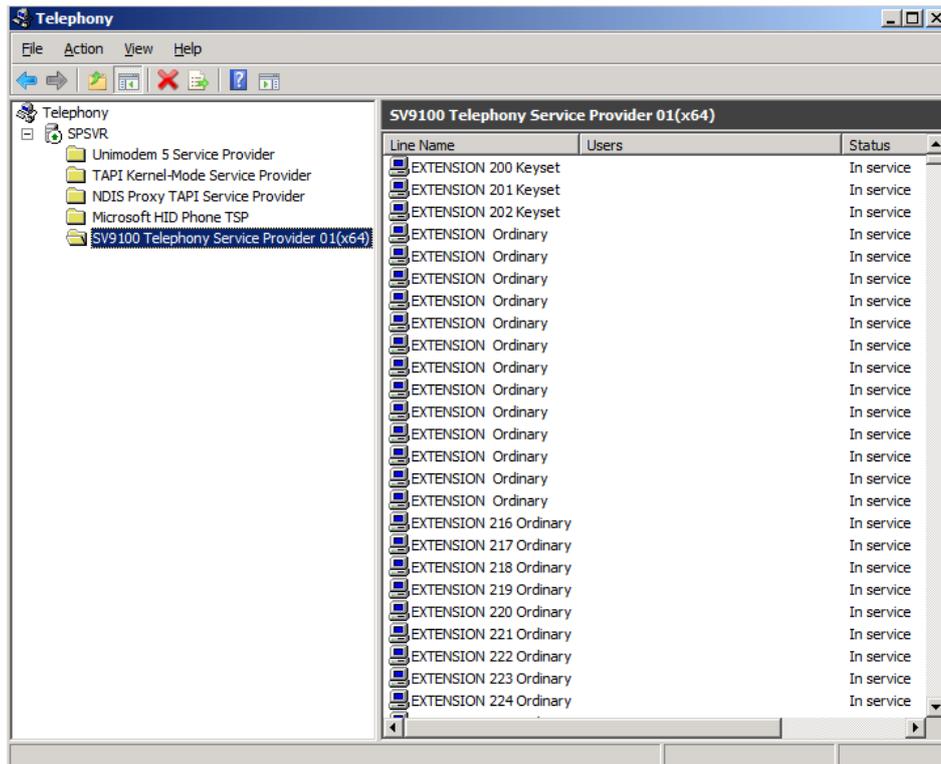
Click Ok, the following message will be displayed:

Click Yes to Restart.

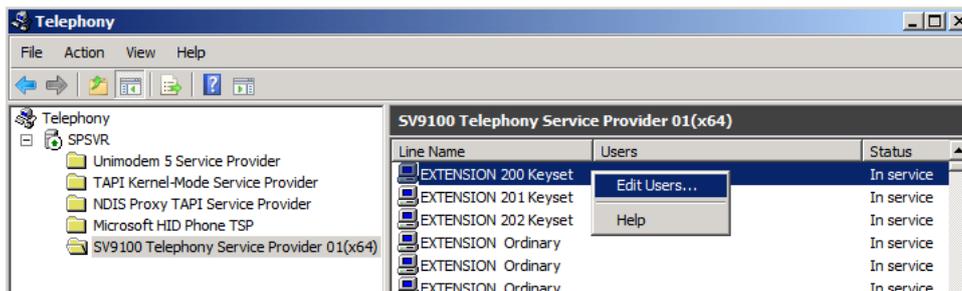


Each client must be allocated the extensions to be allowed to monitor/control. This is based on the Microsoft Network Logon and is configured within the computer management tool. This gives domain user permissions to TAPI extensions. Without allocating extensions to users the client computers will not be able to control or monitor their extension.

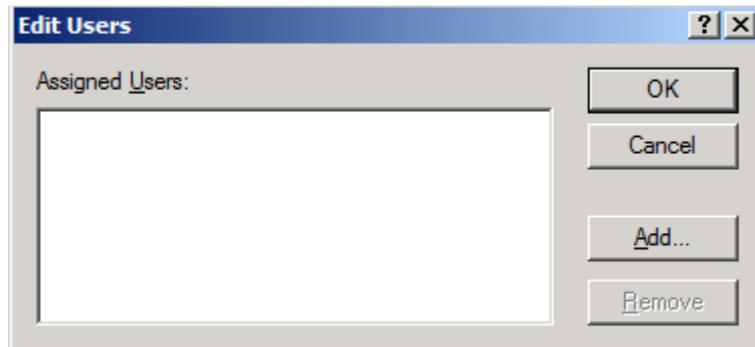
Click **Start**, then click **Run**, and then enter the command **mmc tapimgmt.msc** and click on the NEC Infrontia Telephony Service Provider. In the right hand pane, there will be a list of extensions.



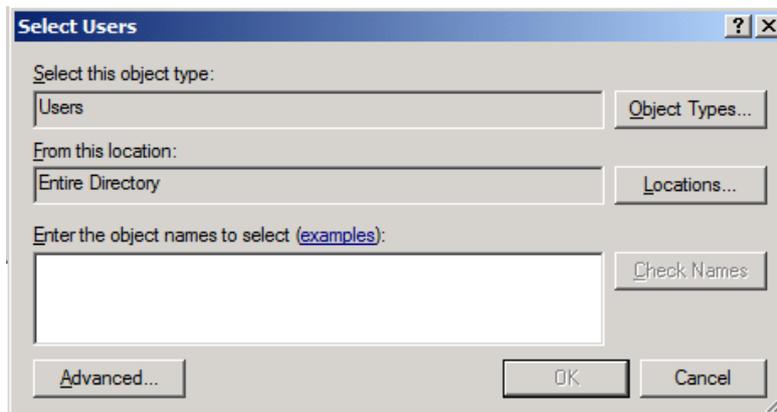
Right click on one of the extensions and select Edit Users...



The following dialog box will be displayed. Click Add..



The Select Users screen will then appear. Type in the users name. Click Check Names, the name will then fully resolve.



Or alternatively, click Advanced.

Select Users [?] [X]

Select this object type:
Users [Object Types...]

From this location:
Entire Directory [Locations...]

Common Queries

Name: Starts with []

Description: Starts with []

Disabled accounts

Non expiring password

Days since last logon: []

[Columns...]
[Find Now]
[Stop]

[OK] [Cancel]

Search results:

Name (RDN)	E-Mail Address	In Folder
------------	----------------	-----------

Find Now to list users. Select Users and Press OK.

Select this object type:
Users

From this location:
Entire Directory

Common Queries

Name: Starts with

Description: Starts with

Disabled accounts

Non expiring password

Days since last logon:

Columns...
Find Now
Stop

OK Cancel

Name (RDN)	E-Mail Address	In Folder
Administrator		andy.smedley.co...
Guest		andy.smedley.co...
John Smith		andy.smedley.co...
Kelly Tate		andy.smedley.co...
krbtgt		andy.smedley.co...

The following will be displayed, confirming the names selected:

Select this object type:
Users

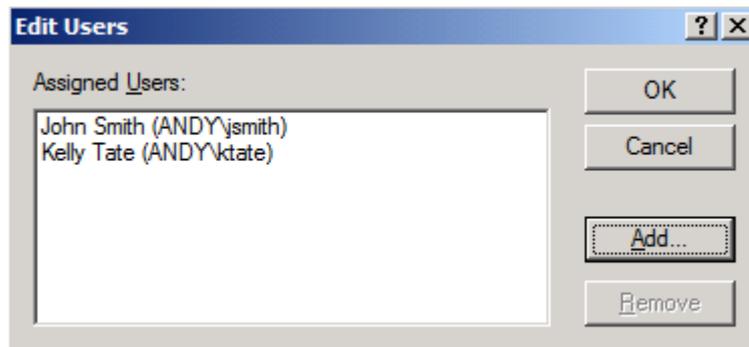
From this location:
Entire Directory

Enter the object names to select (examples):
John Smith (jsmith@andy.smedley.com):
Kelly Tate (ktate@andy.smedley.com)

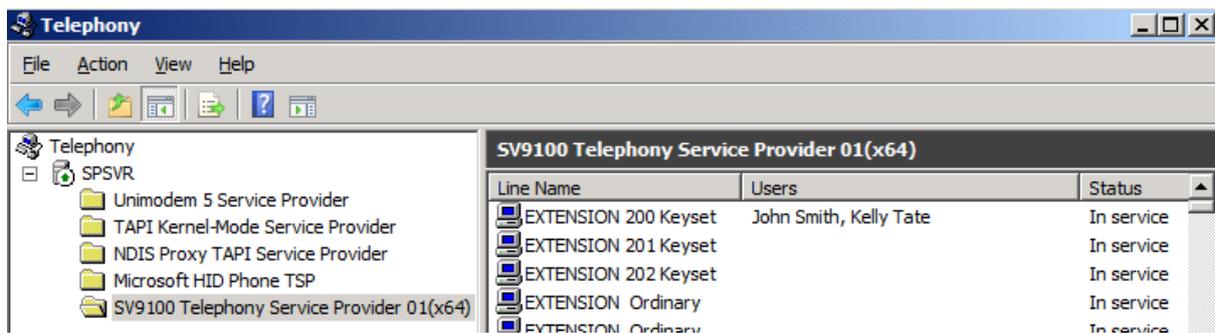
Advanced... Check Names OK Cancel

Click Ok.

The following screen will be displayed, click Ok.



You will notice that the user is now against the extension.



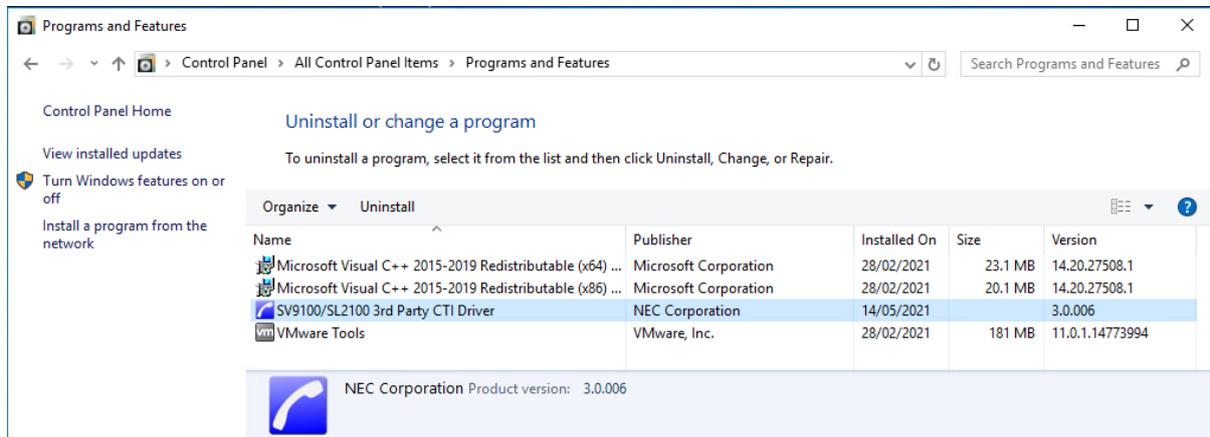
Repeat as required to allow all required extensions to users.

Upgrading the 3rd Party CTI Driver

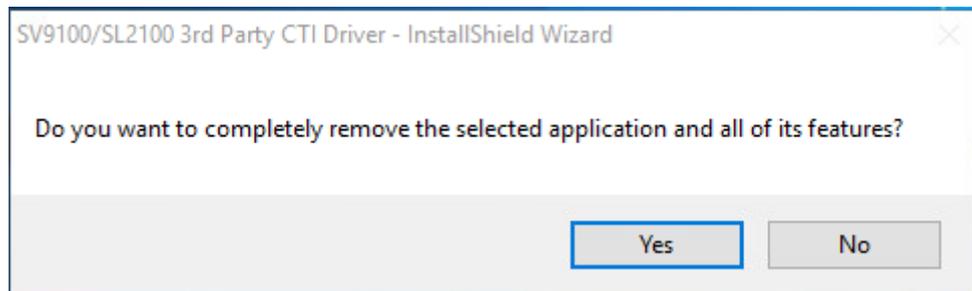
Upgrading the CTI driver is simply a case of running the new installer exe. The installer automatically updates the components, whilst keeping any settings you have.

Uninstalling the 3rd Party CTI Driver

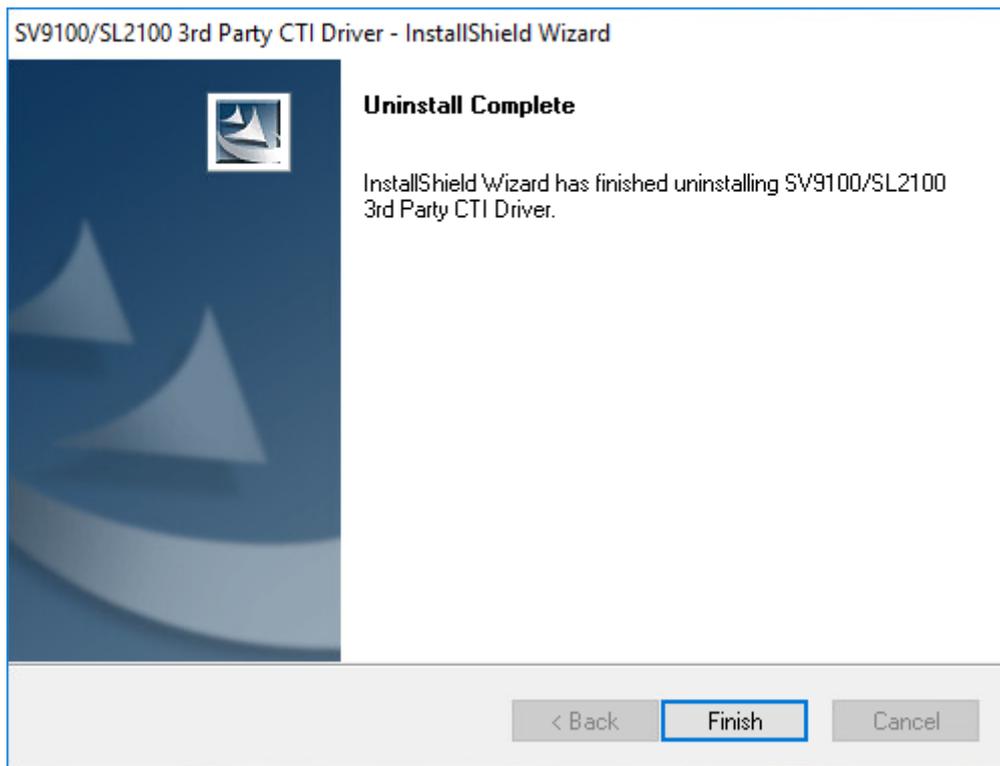
To remove the CTI driver from a PC, go into Control Panel / Programs and Features, find 'SL2100/SL2100 3rd Party CTI Driver', and then right click and select uninstall (depending on Windows version, terminology may change a little)



When prompted, click Yes to begin removing the CTI driver.



Once complete the following screen will appear. Click Finish.

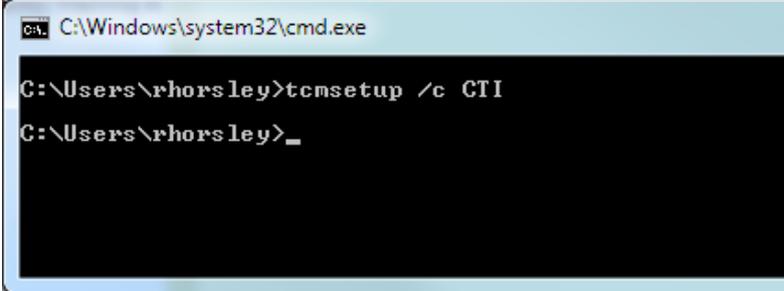


Uninstall is now complete.

It is advisable to reboot the server to take full effect.

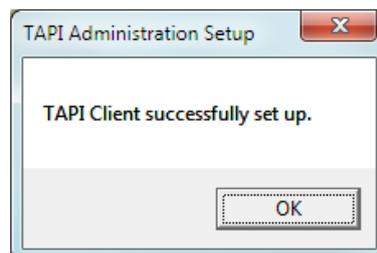
Enabling the TAPI Client

To allow a client PC to connect to a Telephony server, the client PC should be connected a Domain. The user account should already have been assigned to an extension or a domain administrator account will see all devices. To enable the TAPI client, from a command prompt type `tcmsetup /c servername` where `servername` is the name of the telephony server. The example below show the TAPI client being enabled on a server called CTI.



```
C:\Windows\system32\cmd.exe
C:\Users\rhorsley>tcmsetup /c CTI
C:\Users\rhorsley>_
```

Once the command has run, a confirmation box will be displayed.



The TAPI client is now enabled and is available for use.

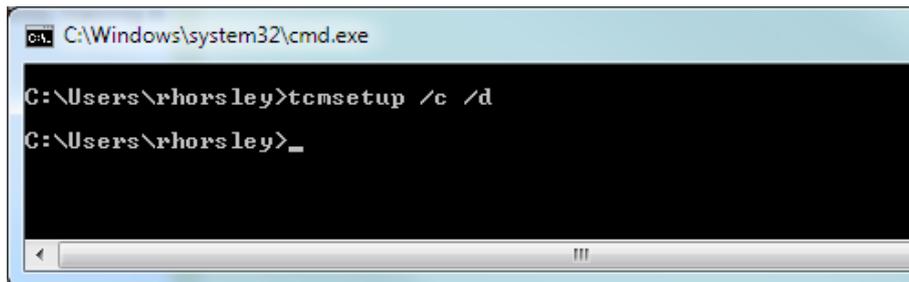
There is a known issue that will stop a TAPI client from using the telephony service, on Windows Vista 64 Bit, 7 64Bit, see KB2304914 for details. (<http://support.microsoft.com/kb/2304914>)

Where Windows Firewall is enabled on Server and/or Client PC's, the File and Printer sharing exception MUST be enabled as an exception under the Windows Firewall settings.

Where File and Printer Sharing Exception is not enabled, the TAPI Client experiences several seconds delay in observing LineCallState messages from the TAPI Server. This also can slow the server leading to delay on other clients.

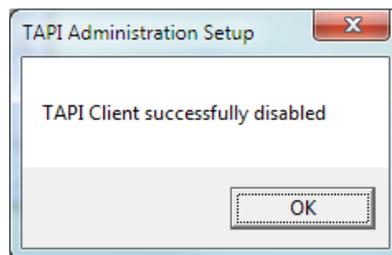
Disabling the TAPI Client

To Disable the TAPI client start a command prompt



```
C:\Windows\system32\cmd.exe  
C:\Users\rhorsley>tcmsetup /c /d  
C:\Users\rhorsley>_
```

Once the command has run, a confirmation box will be displayed.



The TAPI client has now been disabled.

TAPI on a Citrix Client

Examples follow using Phone.exe operating under Citrix XenApp and Citrix XenDesktop (Utilising Citrix XenServer).

Citrix XenDesktop

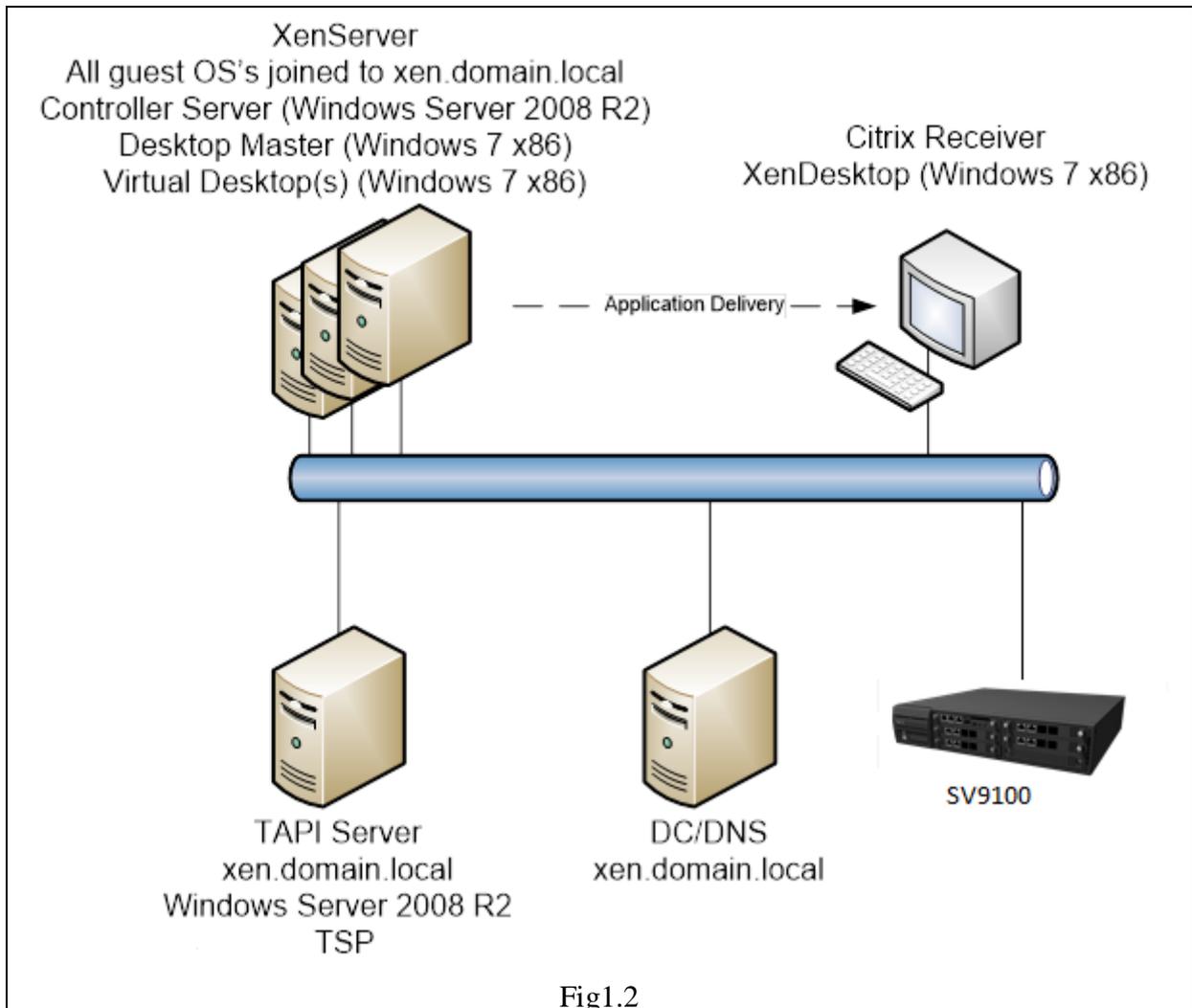


Fig1.2

The above is the setup used to provide TAPI operation under XenDesktop. This method requires the Microsoft TAPI Client to be installed onto the Master Desktop running Windows 7 x86. Phone.exe is also installed onto the Master Desktop. Users connecting to a Virtual Desktop via the Citrix Receiver operate the Phone.exe application.

Citrix XenDesktop

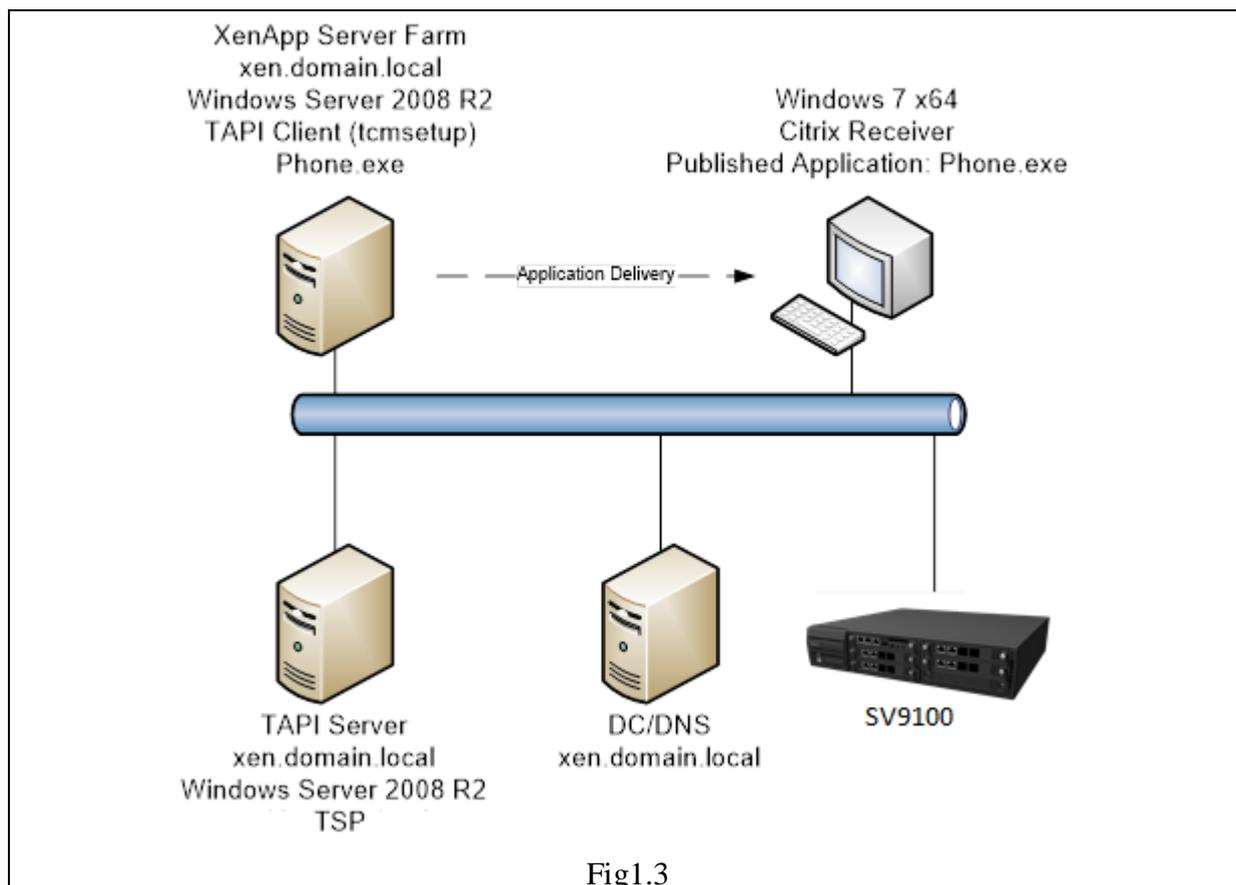


Fig1.3

The above is the setup used to provide TAPI operation.

This method requires the Microsoft TAPI Client to be installed onto available Citrix Server Farm, with phone.exe published as an available application to users of the Farm.

Users connecting to the Server Farm via the Citrix Receiver operate the Phone.exe application.

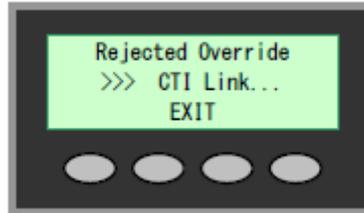
Citrix Versions utilised for test, it is recommended this version or higher is utilised for provision of TAPI.

Citrix XenApp	11.6.1 build 10007
Citrix XenDesktop	5.5
Citrix XenServer	V5.6.100 (SP2)

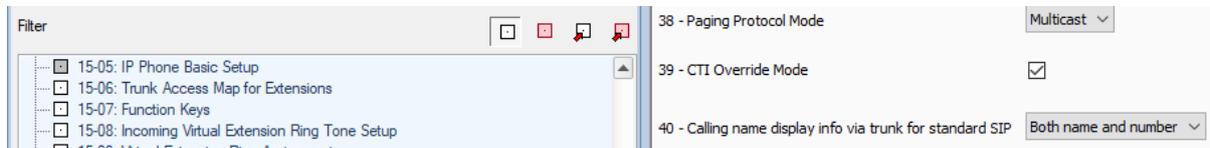
Hotdesking with CTI

It is possible to hotdesk on 8IPLD, DT820's and SP310 Softphone when 1st or 3rd party CTI connections are established. SP310 softphone is supported on SL2100 from version 3.10.01 main software and above.

If Hotdesking is performed the terminal will display:



By default CTI Override is disabled. It can be enabled on a per extension basis using Programming Command PRG15-05-39 'CTI Override Mode'

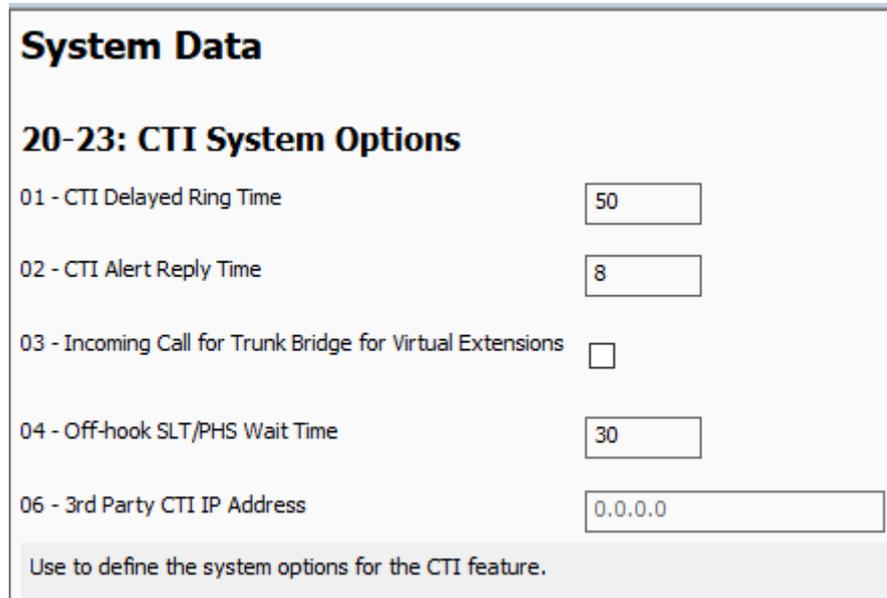


Once enabled, if a hot-desking attempt is made it will override the extension that is currently using that extension number successfully.

Important: This feature can only work correctly with phones of the same type and number of keys. Hotdesking different phone types will cause errors and cannot be supported.

3rd Party CTI IP Address

From R1 System software and Version 1.00 of SL2100 PC Programming it is possible to see the IP address of the PC that is running 3rd Party TAPI driver. As only one PC can be connected to the SL2100 at any one point in time, this can be particularly useful for an installer who could be trying to determine which PC was running the 3rd Party TAPI driver and was connected the SL2100. PRG command 20-23-06 can be used to see the IP address of the PC running the TAPI driver.



The screenshot shows a configuration window titled "System Data" with a sub-section "20-23: CTI System Options". It contains five settings:

Option ID	Description	Value
01	CTI Delayed Ring Time	50
02	CTI Alert Reply Time	8
03	Incoming Call for Trunk Bridge for Virtual Extensions	<input type="checkbox"/>
04	Off-hook SLT/PHS Wait Time	30
06	3rd Party CTI IP Address	0.0.0.0

Use to define the system options for the CTI feature.

Outlook Dialing Rules

In order to dial out directly from Outlook on a pc with the TAPI client enabled, the numbers should be stored in canonical format. Further information on storing numbers in canonical format, see KB318575 for further details.

Document History

Date	Issue/Release	Comments
Nov 2014	Initial Release	
22 June 2021	Second release	<p>Document Contents organised.</p> <p>'Configuring the SL2100' sections updated for 1st Party and 3rd Party connections to include new version screenshots and general information.</p> <p>Installing 1st Party and 3rd Party Driver sections updated to include new version screenshots and general information.</p> <p>Added upgrade instructions for 1st Party CTI Driver.</p> <p>Removed support for Windows XP. Removed support for Windows Vista. Removed support for Windows Server 2003. Removed support for Windows Small Business Server (SBS). Removed support for Windows 2008.</p> <p>Added support for Windows Server 2019.</p> <p>Added SP310 Softphone under Hotdesking.</p> <p>Removed link to Microsoft Website under 'Outlook Dialing Rules' as the link is no longer valid for KB318575.</p>