Mitel MiContact Center Enterprise

MX-ONE APPLICATIONLINK
SYSTEM MANAGER'S GUIDE

Release 9.1

⋈ Mitel®

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CHAPTER 1   INTRODUCTION

This System Manager's Guide describes how to install and maintain Mitel's MX-ONE ApplicationLink 9.1. ApplicationLink is the computer-telephony integration (CTI) link that connects Mitel's MX-ONE TSW /TSE PBX with applications running on computers and computer networks.

MX-ONE ApplicationLink provides connectivity between the MX-ONE TSW/TSE and a client computer. MX-ONE ApplicationLink can be installed in a CSTA environment to be connected to API servers and applications which are written for CSTA APIs such as Novell TSAPI, Dialogic CTConnect, SUN XTL, IBM CallPath, etc. The CSTA interface is described in Standard ECMA-179 Services for Computer Supported Telecommunications Applications (CSTA) Phase I. MX-ONE ApplicationLink is fully ECMA CSTA compliant.

Throughout this document ApplicationLink refers to MX-ONE ApplicationLink installed in a CSTA environment.

DOCUMENT CONVENTIONS

These text styles are used to signify a special meaning in this manual.

Style	Meaning
Courier	A command to be entered from the keyboard or an output from such a command
Bold	A graphical element of a window, e.g. a button or menu item
Italic	A reference to another section of this manual

SYSTEM CONFIGURATION

Telephony applications based on ApplicationLink are used by agents to make their call handling easier and more efficient. These applications exchange CSTA messages with ApplicationLink over the network to determine the state of a call or to instruct the MX-ONE TSW to perform some action related to monitored/controlled devices. The next figure shows an example of an MX-ONE ApplicationLink configuration.
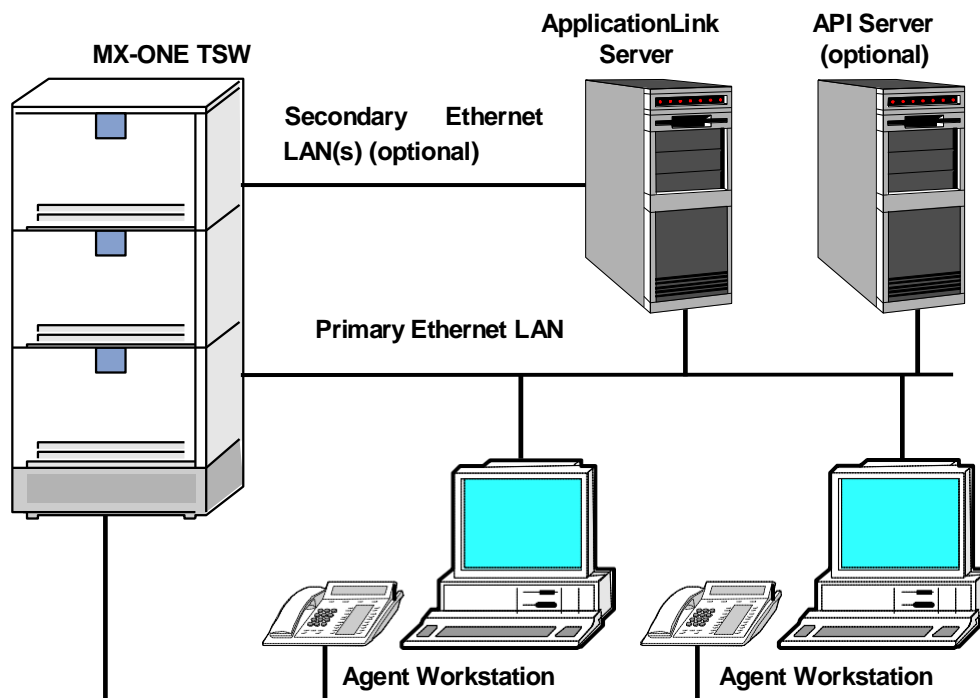
The MX-ONE TSW communicates with the ApplicationLink through the Ethernet TCP/IP LAN over logical TCP/IP connections to the NIU card in the MX-ONE TSW. Secondary Ethernet TCP/IP LANs are possible for redundancy and capacity enhancement.

APPLICATIONLINK - MX-ONE TSW CONNECTION CONCEPT

Each logical TCP/IP Connection between ApplicationLink and the NIU board in the MX-ONE TSW is called a CSTA Link, and all CSTA Links originating from the same ApplicationLink have the same Link Group name (an alphanumeric string, such as the host name of the ApplicationLink server). The following picture illustrates this concept.

MX-ONE TSW
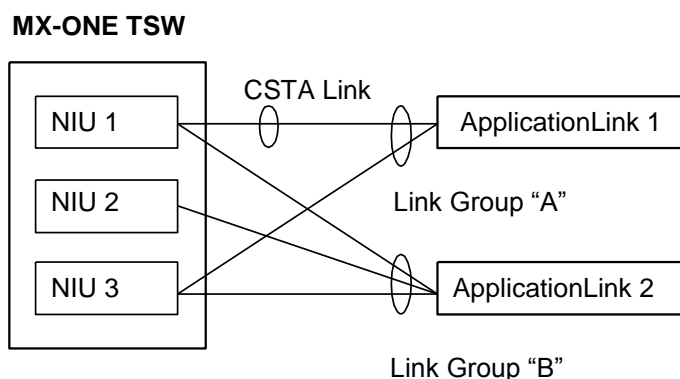
Each CSTA Link is identified by the IP Address (or host name) and Port Number of the NIU board and the Link Group name. This makes it possible for more than one ApplicationLink using the same NIU board as well as one ApplicationLink using more than one NIU.

LICENSING

ApplicationLink uses Mitel's Enterprise License server (ELM) for licenses. When ApplicationLink is purchased a number of user - licenses are purchased with it. The licensing method is based on monitored devices, i.e. for each monitored device one license is consumed and when the monitor is stopped the license is released. For example, if 10 user- licenses have been purchased, a maximum of 10 devices may be monitored or controlled simultaneously.

This table shows which device types consume licenses and which do not:

DEVICE TYPE	LICENSES CONSUMED
Analogue telephone (ATS)	Yes
Automatic Call Distribution (ACD) group	No
Channel Associated Signalling (CAS) extension	Yes
Computer Telephony Integration (CTI) group	No
Cordless telephone (CXN)	Yes
Digital telephone (DTS)	Yes
Proprietary IP eXtension (IPeX)	Yes
Remote eXtensioN (RXN)	Yes
Free Seating	Yes

LIMITATIONS

Currently supported call control services are as below.

Services	DTS	ATS	CAS	CXN	IPeX	RXN	ACD/CTI
Answer Call	X				X(*)		
Clear Call	X	X	X	X	X	X	
Conference Call	X	X	X	X	X	X	
Customer Identity	X	X	X	X	X	X	X
Deflect Call	X	X	X	X	X	X	X
Clear Queued Call							X
Remove Queue Position							X
Hold Call	X	X	X	X	X	X	
Make Call	X	X	X	X	X(*)	X	
Press Fixed Key	X	X	X	X	X(*)	X	
Press Programmable Key	X				X(*)		
Query Feature	X	X	X	X	X	X	
Retrieve Call	X	X	X	X	X	X	
Set Feature	X	X	X	X	X	X	
Single Step Transfer Call	X	X	X	X	X	X	
Transfer Call	X	X	X	X	X	X	

Note: (*): Supported only on Mitel IP terminal. These features are not supported for softphones like Mitel's ECC or any other standard soft IP clients. Here Mitel IP terminal is treated as Proprietary IP extension. Other Soft IP clients are treated as non-proprietary IP extensions.

A single given MX-ONE ApplicationLink server can only be connected to one MX-ONE TSW node, though it may use a number of different CSTA Links, all the CSTA Links must terminate in the same MX-ONE TSW node.

More than one ApplicationLink server can be connected to one MX-ONE TSW node. However, two ApplicationLinks cannot monitor the same device. Only one instance of ApplicationLink may be run on a single given server.

Other limitations are:

- Maximum of 4 ApplicationLinks (Link Groups) per MX-ONE TSW node

- Maximum of 4 CSTA Links per LIM

- Maximum of 1 CSTA Link per LIM for a particular ApplicationLink (Link Group)

- Maximum of 1000 devices can be monitored simultaneously in each LIM

- Maximum of 8000 devices can be monitored simultaneously through one ApplicationLink

SYSTEM REQUIREMENTS

These are the hardware and software requirements for ApplicationLink and the MX-ONE.

APPLICATIONLINK SYSTEM REQUIREMENTS

Hardware

- CPU of 2.3 GHz, single, hyper-threaded or multiple processors. For higher traffic performance, a higher-grade machine will be required.
- An SVGA monitor is optional that can be configured to display in High Resolution Mode (1024*768 recommended) with 32 bit truecolor.
- 2 GB RAM or better
- A mouse or other pointing device that is 100% Microsoft compatible.
- Hard disk space of at least 16 GB.
- DVD-ROM drive (during installation).
- One or more Ethernet LAN Cards.

Software

- Microsoft Windows 2003 Server with Service Pack 2.
- Microsoft Windows 2003 Server R2 with Service Pack 2.
- Microsoft Windows 2008 Server with Service Pack 2.
- Microsoft Windows 2012 Server

MX-ONE SYSTEM REQUIREMENTS

- Mitel MX-ONE TSW with latest service pack system software.
- Mitel MX-ONE TSE.
- One or more NIU (Network I/O Unit) cards.

See the Release Notes included in ApplicationLink installation for further details on system requirements, such as required CNI packages and patches.

AL CLIENTS (TSAPITOOL) TERMINAL SERVER SUPPORT:

AL clients works on Terminal Server. The configuration and test setup is as follows:

The scenario should be executed by accessing a machine remotely where Stand Alone ApplicationLink is installed and tried to perform the call control related scenarios with AL client (TSAPI Tool).

UPGRADING

If an existing ApplicationLink installation is upgraded to version 9.0, consider the following general procedure before continuing with the rest of this manual.

1. Shutdown any Clients or API servers connected to ApplicationLink and shutdown ApplicationLink.

2. Re-install the ELM (the Mitel License server software). Note that ApplicationLink 9.1 uses a different version of Enterprise License server ELM than ApplicationLink 4.0.

3. Install ApplicationLink 9.1, the install program will detect that the current installation is being upgraded and the previously installed version can be backed-up if desired.

4. If secondary LAN is desired, install the extra LAN card(s) needed to provide connections from ApplicationLink to the MX-ONE TSW.

5. Use the ApplicationLink configuration utility to configure the CSTA Links to the MX-ONE TSW.

6. Ensure the MX-ONE TSW /TSE has been upgraded to latest PBX Version and configured to accept connections from ApplicationLink 9.1.

7. Verify the installation.

APPLICATIONLINK COMES AS A PART OPEN APPLICATION SERVER MEDIA KIT

ApplicationLink is distributed as a part of Open Application Server on a CD-ROM that contains the following software and documents.

- Open Application Server
- Standalone Application Link
- Mitel Collaboration Link

When the Open Application Server CD-ROM is inserted in the CD-ROM drive a Master Setup screen is displayed automatically:
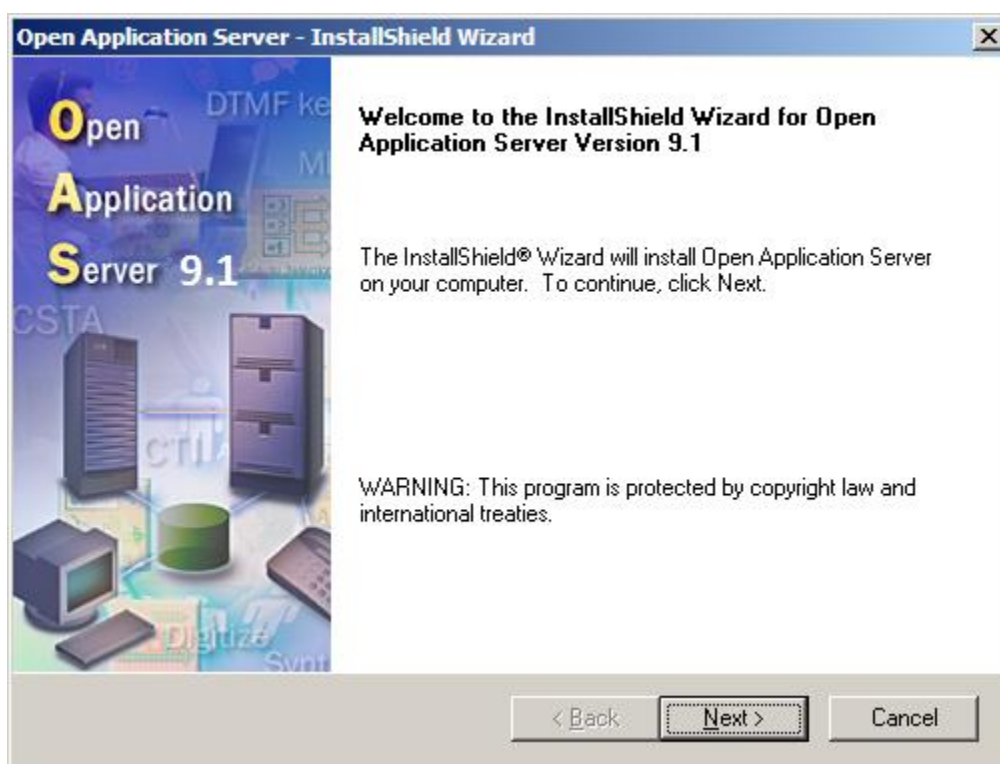
If the Master Setup screen is not automatically displayed, it can be opened manually by using the Windows Explorer: Locate the setup.exe file in the root of the CD-ROM drive and double-click it.

Click **Next** to see the following Setup Screen
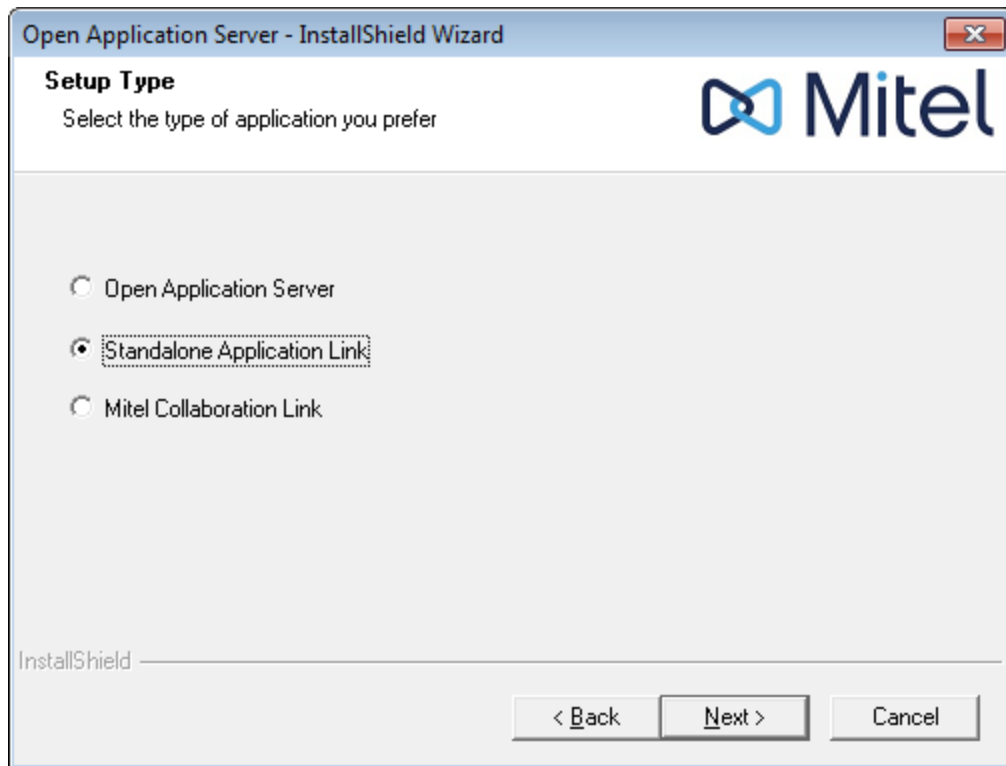
CHAPTER 2 INSTALLATION

OVERVIEW

This chapter describes how to configure and install ApplicationLink and components. In addition to the installation directions, normal initialization messages are displayed throughout the installation. The general installation procedure is given below and details of these steps are provided throughout this chapter.

1. Initiate the NIU board in the MX-ONE TSW.

2. Install ELM

3. Install MX-ONE ApplicationLink software.

After installation is completed these additional steps are necessary before ApplicationLink may be used:

4. Configure ApplicationLink; see Chapter 3 ApplicationLink Configuration and

5. Verify the link to the MX-ONE TSW is active and operating as expected, see *Chapter 5* ApplicationLink Program Execution.

INSTALLATION

INITIATE CSTA LINK ON THE MX-ONE TSW

Each NIU board intended for ApplicationLink usage must be initiated in the MX-ONE TSW using the MML command interface. Some of the commands described here may not be necessary depending on what is already initiated on the NIU board. For more detailed description on the MML commands mentioned here, see Appendix A MX-ONE TSW Administration.

Below dialog is the final status dialog of uninstallation process. Click on Finish button to complete the uninstallation process.
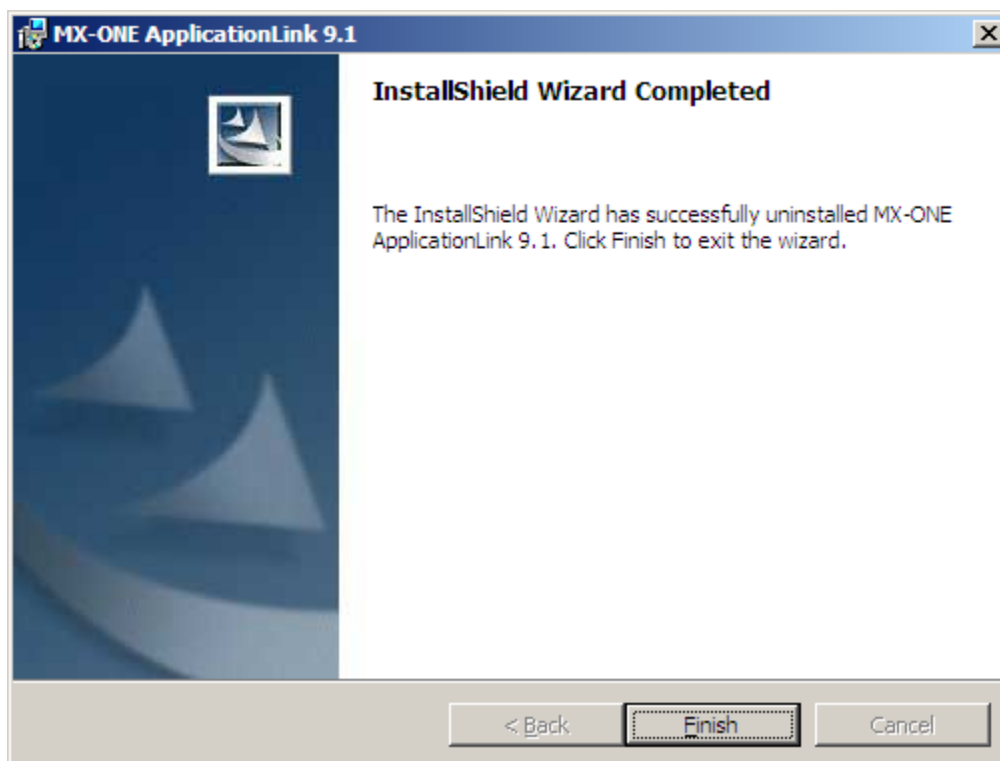
For each NIU board intended for ApplicationLink usage, follow this procedure:

1. Log on to the MX-ONE TSW using the FIOL communications package.
2. Initiate the NIU board by entering the command:

   `IOBPI:BPOS=bpos, Node=node;`

   where *bpos* is the NIU board position, e.g. `1-0-20`, and *node* is a system node name, e.g. `NODE1`.

3. Set the IP address for the NIU board:

   IONPC:EQU=*equ_pos*,IP=*ip_addr*,GATE=*gateway*,MASK=*mask*;

   where *equ_pos* is the NIU equipment position for networking, e.g. 1-0-20-4, *ip_addr* is the IP address of the board, e.g. 195.100.113.121, *gateway* is the gateway address, e.g. 195.100.113.1 and *mask* is the subnet mask, e.g. 255.255.255.0.

4. Initiate the network port of the NIU board:

   IOEQI:EQU=*equ_pos*,IODEV=*iodev*,TYPE=NETWORK,USAGE=OUT;

   where *iodev* is a device name identifying the port, e.g. CSTA1.

5. Initiate the CSTA application on the NIU board:

   IONCI:IODEV=*iodev*,USER=CSTA,LPORT=*port*;

   where *port* is the TCP/IP port number used for communication, e.g. 2500.

6. Initiate a Link Group (identifying the ApplicationLink server):

   CSTLI:IODEV=*iodev*,LGRP=*linkgroup*;

   where *linkgroup* is typically the host name of the ApplicationLink server. Repeat this step for each ApplicationLink server (LinkGroup).

7. Verify the NIU and Link Group initiation:

   `IODDP;`   Prints initiations of all NIU boards

   `IONPP;`   Prints network parameters of all NIU boards

   `IONCP;`   Prints all initiated CSTA Applications

   `CSTLP;`   Prints all initiated Link Groups and their state

   Note: The IP Address, Port number and Link Group name configured here must also be configured in ApplicationLink, see the Connection to the MX-ONE TSW section in *Chapter 3* for further details.

To reduce inter-LIM signalling, it is recommended to initiate NIU boards in different LIMs where the controlled devices are located.

INSTALLING THE ENTERPRISE LICENSE MANAGER

ApplicationLink uses Mitel License Server product called ELM Runtime Kit. Currently, the run-time kit is distributed freely by Mitel and should be installed before installing ApplicationLink Media Kit.

Note: You must have system administrator privileges on the machine where ELM Runtime Kit is to be installed.

To install the ELM Runtime Kit, follow this procedure:

1. Insert the ELM CD-ROM into the CD-ROM drive, the Master Setup screen will be automatically displayed.

   If the Master Setup screen is not automatically displayed, it can be opened manually by using the Windows Explorer: locate the setup.exe file in the root of the CD-ROM drive and double-click it.

   Click on **Install setupELM.exe** to continue.
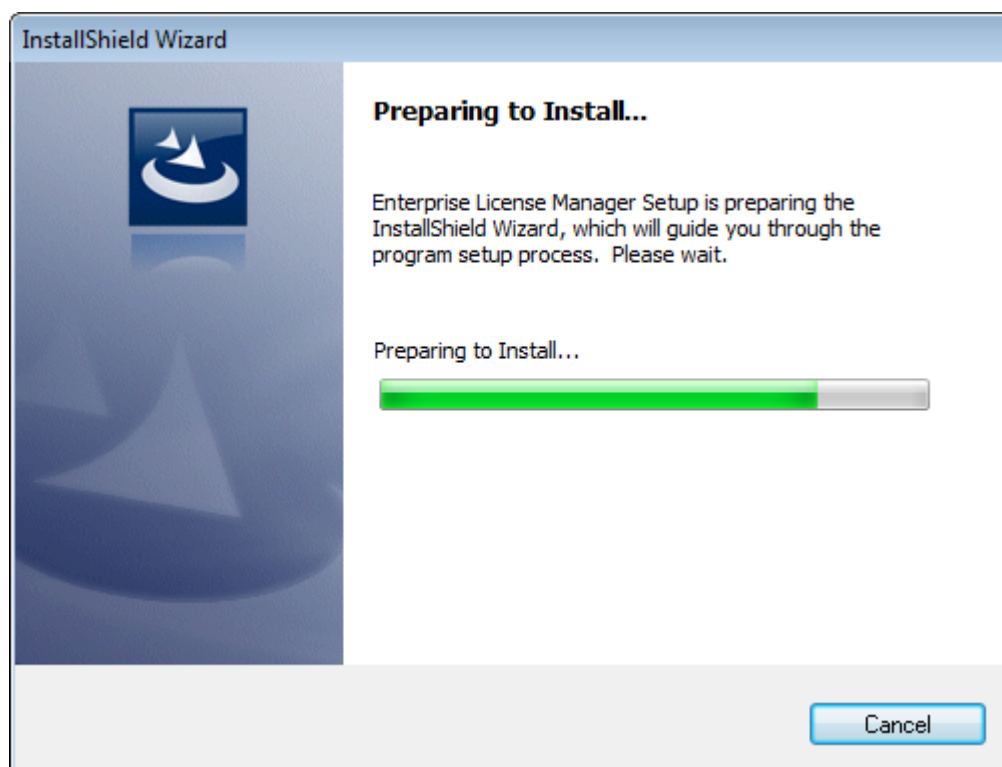
2. The ELM install shield starts up and opens a welcome dialog**.**; click **Next >**.
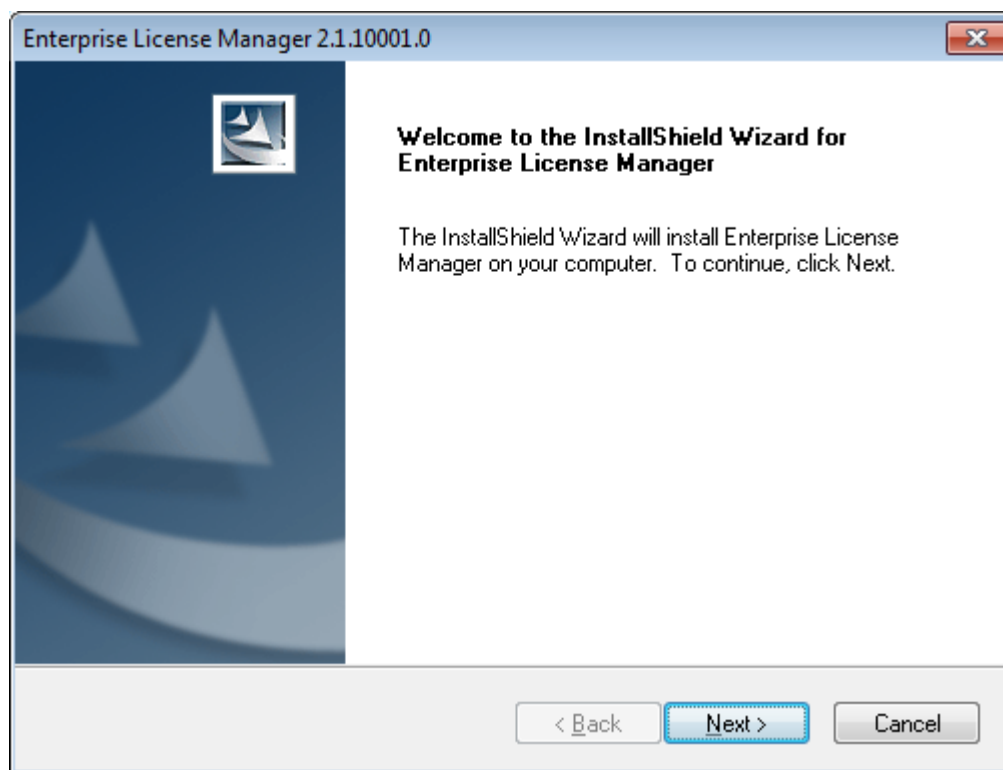
3. In the Feature Selection dialog, select Enterprise License Manager Client . Click **Next >** when done.
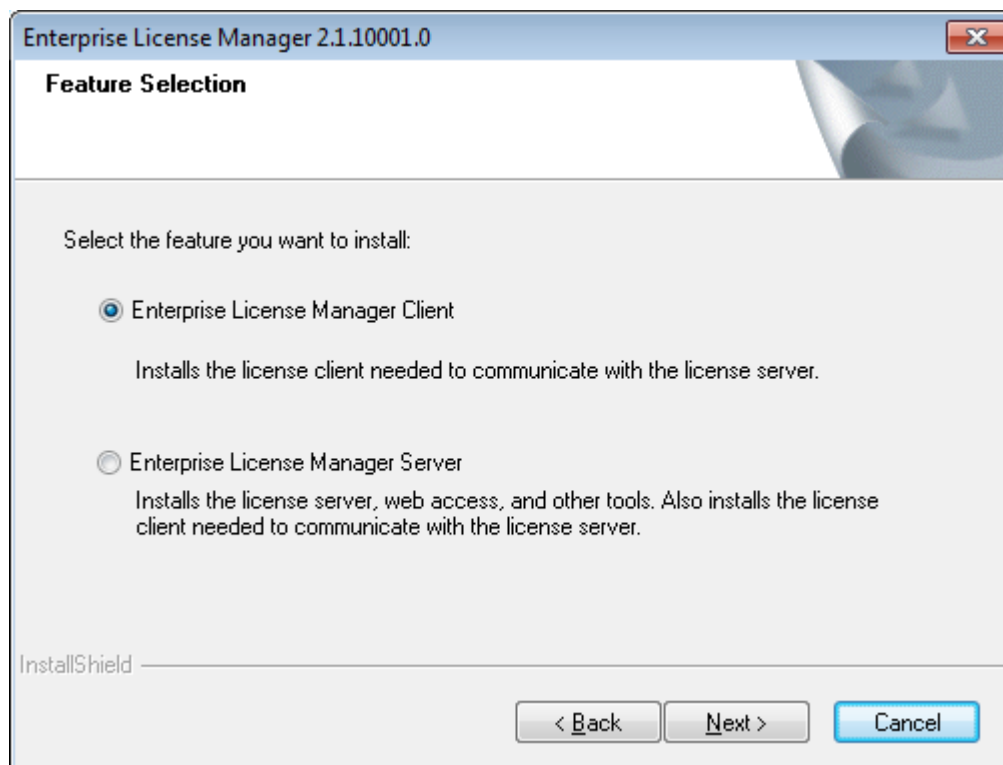
4. The **Choose Destination Location** dialog shows where ELM will be installed (the dialog allows you to select a different directory, but this is not recommended; Click **Next >** to continue.
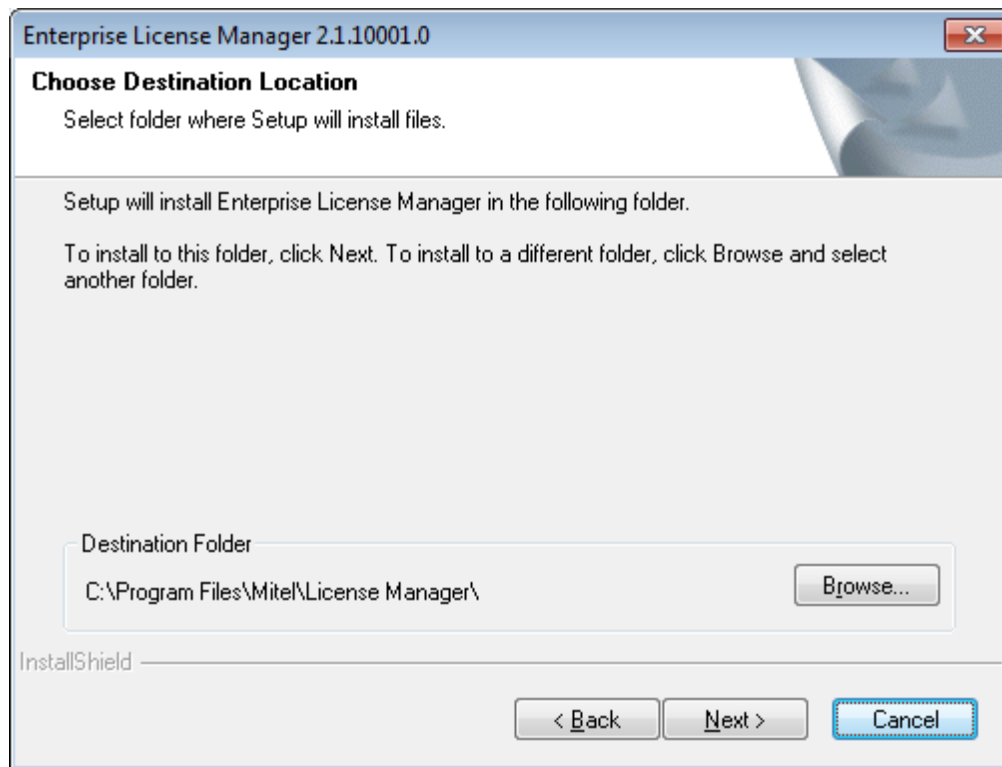
5. **License Server Options** Dialog box will provide the optional settings to be configured for ELM server with the default settings; Click **Next >**

Option **Manually specify a host in the network, containing a license server** allows you to specify a host name of IP address of a host where the Enterprise License Manager reside
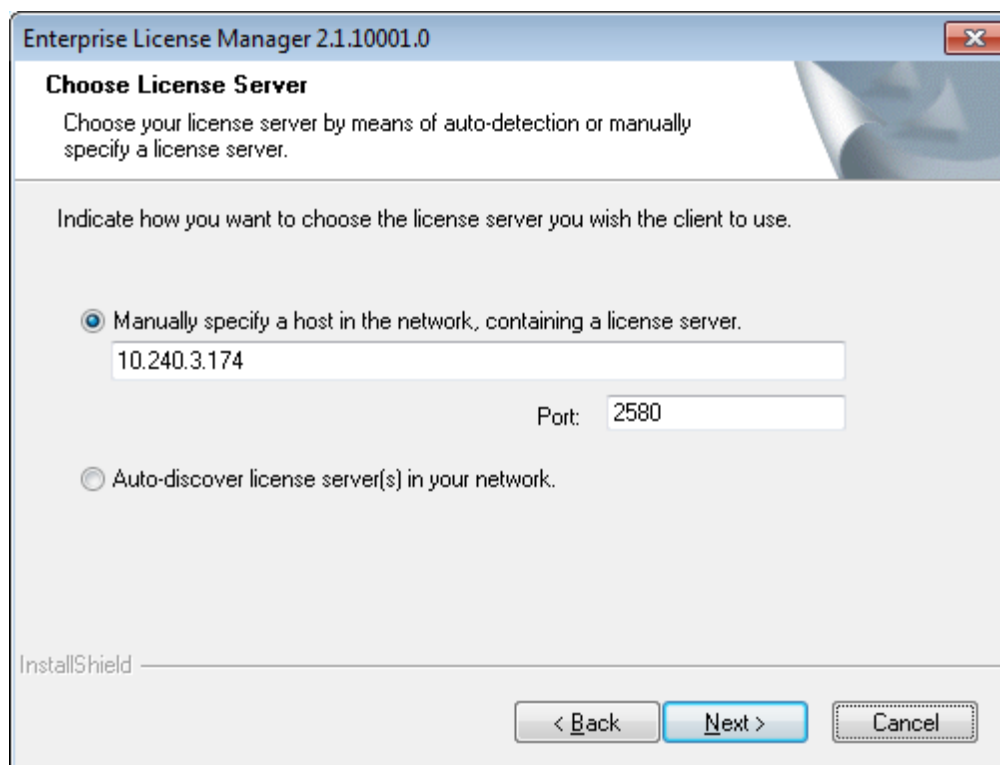
6. The **Start Copying Dialog** box displays the settings selected before installation. For any configuration or other changes click **< Back** else click **Next >**
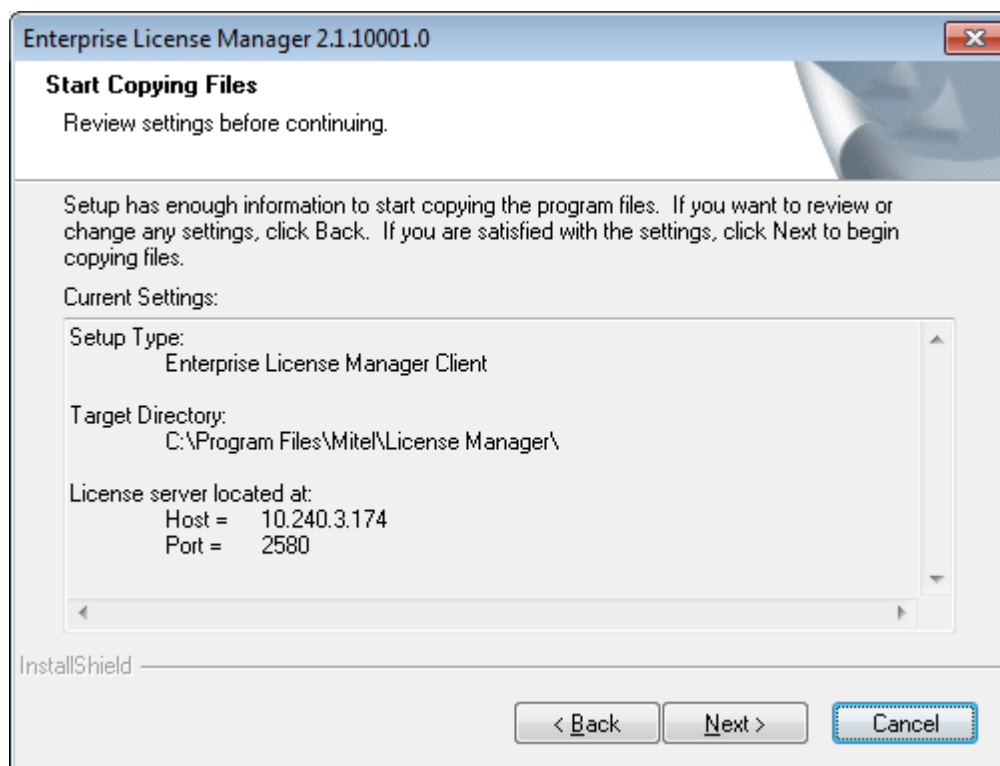
This window will appear to show the installation progress.
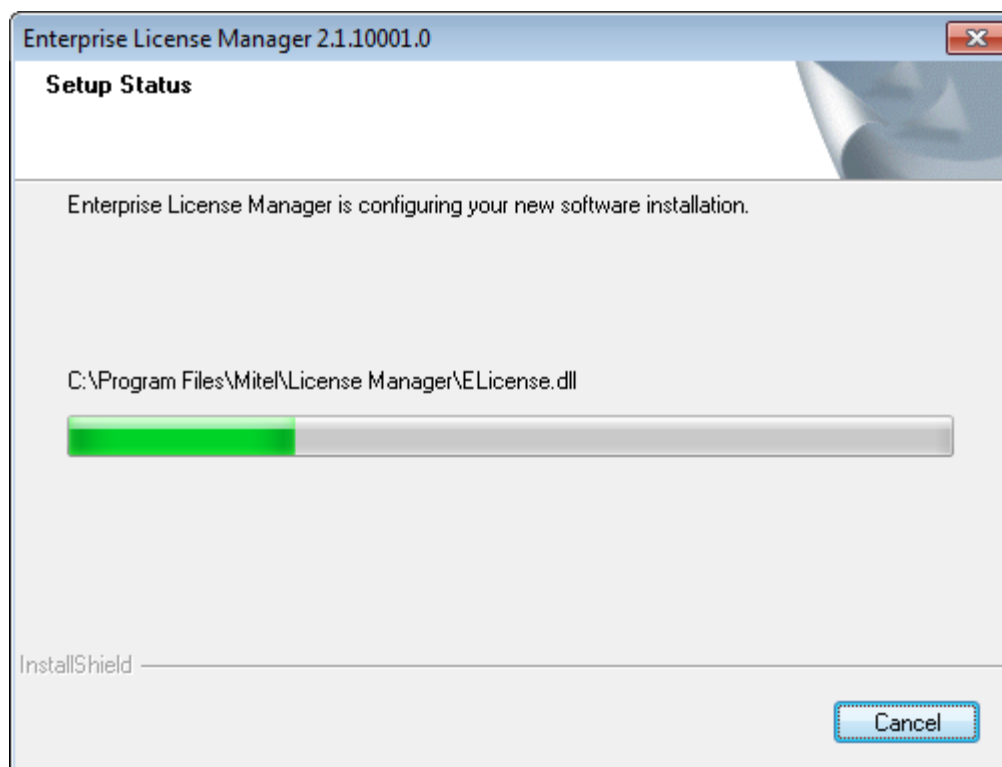
7. When finished, this dialog will appear
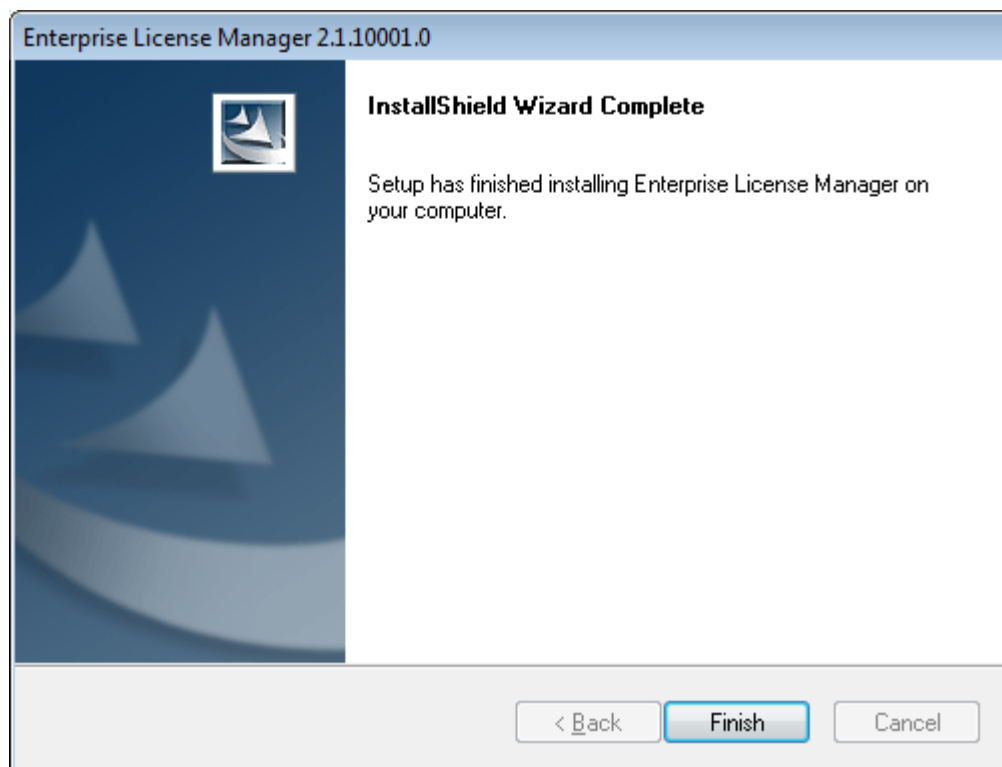
Click **OK** to confirm and close the installation program. To be able to continue with the installation of ApplicationLink you now need to **shutdown** and **restart** your PC in order to commit the changes made to your environment, otherwise ApplicationLink will not start correctly (logging off and logging back on will not commit the environment changes).

Notes:

1. Refer to ELM Technical Guide for further details on ELM Server / Client installation.

2. Once an ApplicationLink starts it fetches all the available licenses present in the ELM server and it is not possible to share the licenses present in the ELM server.

INSTALLING THE APPLICATIONLINK SOFTWARE

Notes:

1. You must have system administrator privileges on the machine where MX-ONE ApplicationLink is to be installed.

2. Standalone Application Link cannot be installed in a machine where Open Application Server is already installed.

To install the ApplicationLink software, follow this procedure:

1. Insert the Open Application Server CD-ROM into the CD-ROM drive, the Master Setup screen will be automatically displayed.

If the Master Setup screen is not automatically displayed, it can be opened manually by using the Windows Explorer: locate the setup.exe file in the root of the CD-ROM drive and double-click it. Click on **setup.exe** to continue.

2. When the Open Application Server installation program starts, the following screen appears to inform the user that initialization is in progress.
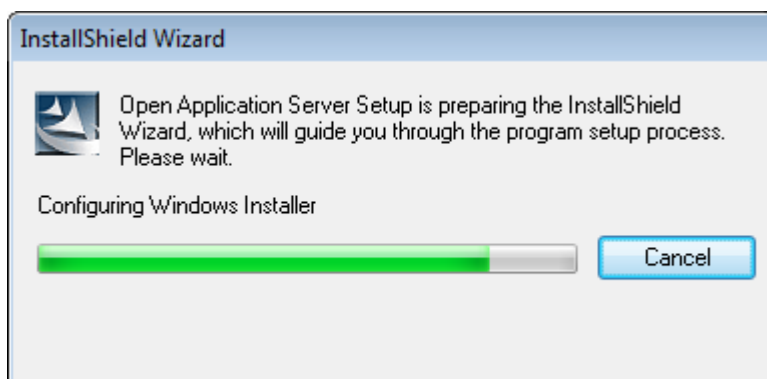
3. When the initialization is complete, the Welcome dialog box will appear to start the Installation program.
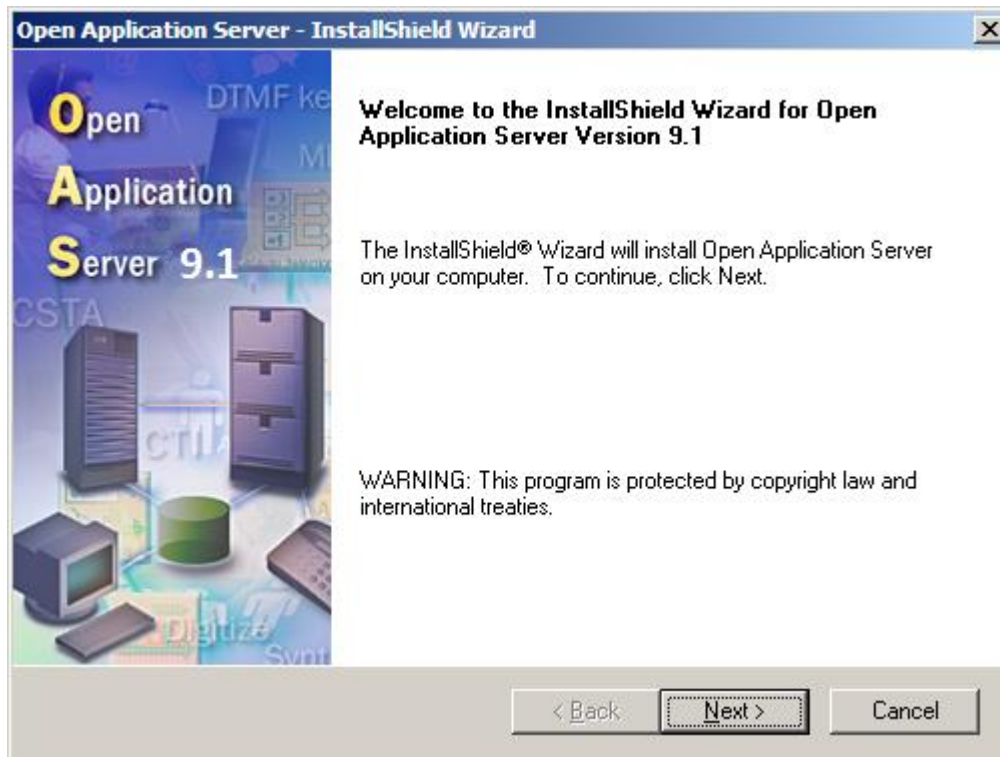
Click the **Next** button to continue with installation.

4. Select Standalone Application Link Radio Button
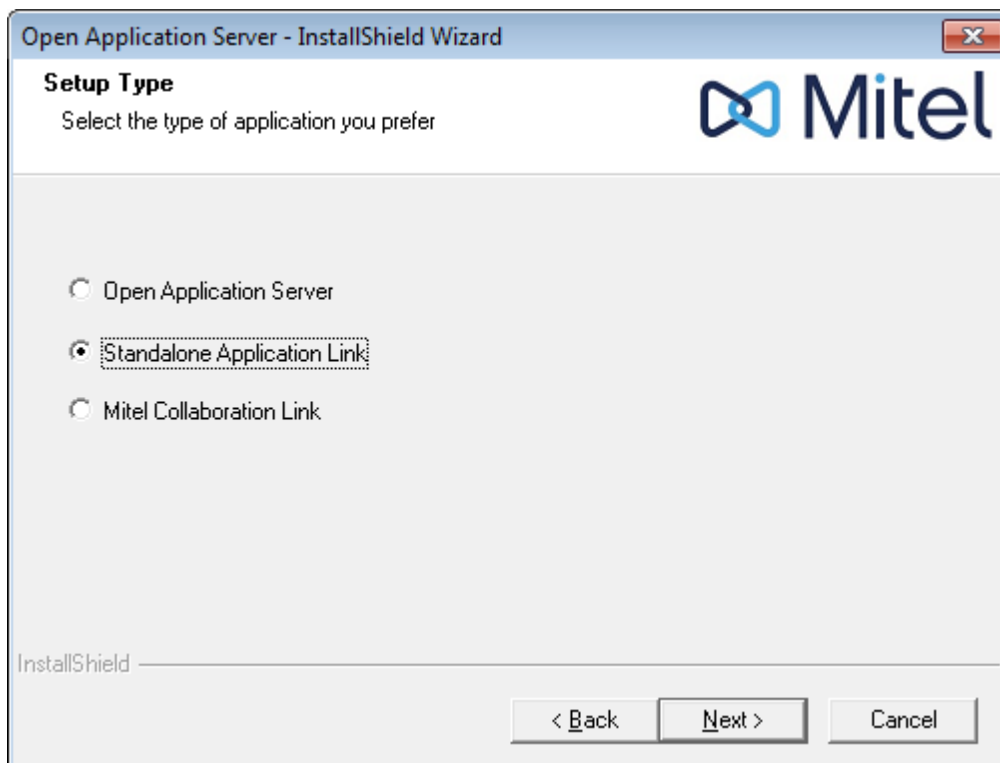
Click the **Next** button to continue with installation.

The following options will be displayed:

- ApplicationLink Server for CSTA
- Application Link Client
- Adobe Acrobat Reader
- ApplicationLink System Manager's Guide (PDF format)
- ApplicationLink Application Programmer's Guide (PDF format)
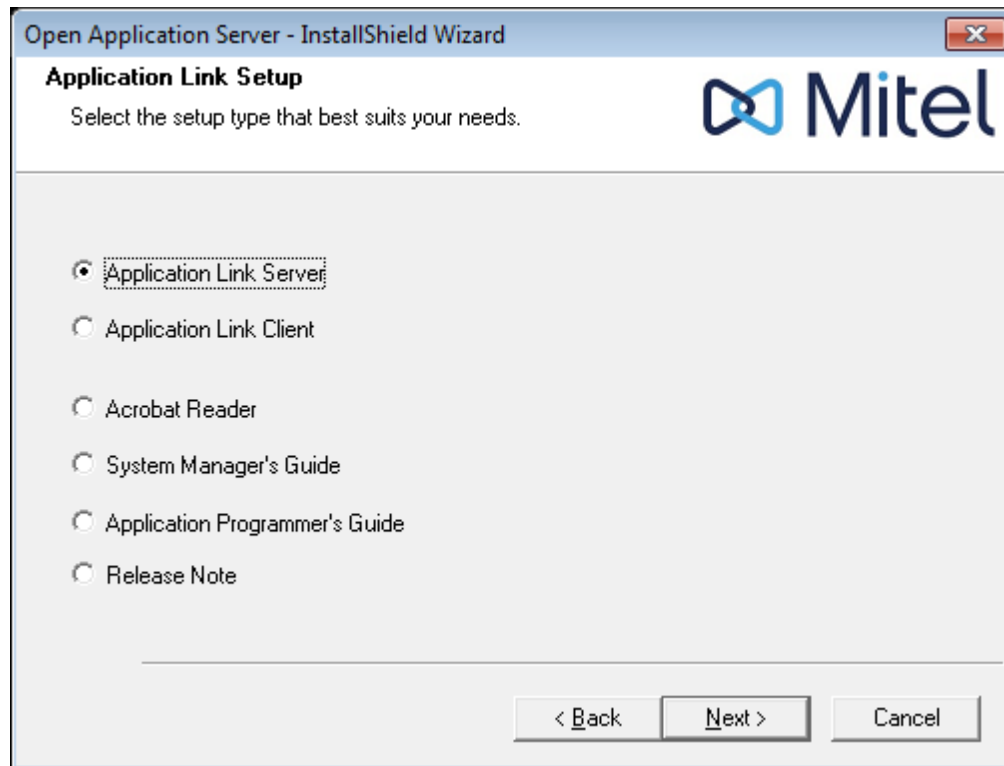
5. Select the desired option

6. If Application Link Server option is selected and the Enterprise License Manager is not installed the services dialog box will prompt to install ELM software first.

Click the **OK** button to abort the installation and verify that the Enterprise License Server is installed properly. See the *Installing the Enterprise License* section above for more information.

7. If this is the first installation of ApplicationLink, you will see the Installation Location dialog.
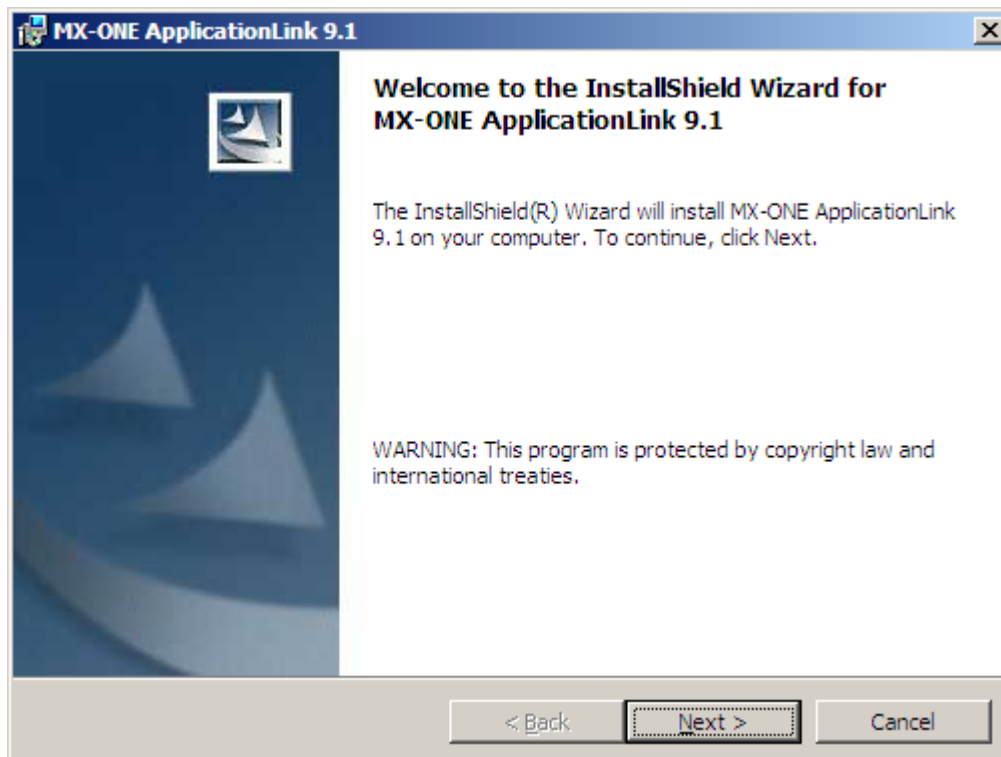
The Installation Location dialog box allows you to enter where you want the ApplicationLink files to reside. By default, these files will be located on the C: drive in the \Program
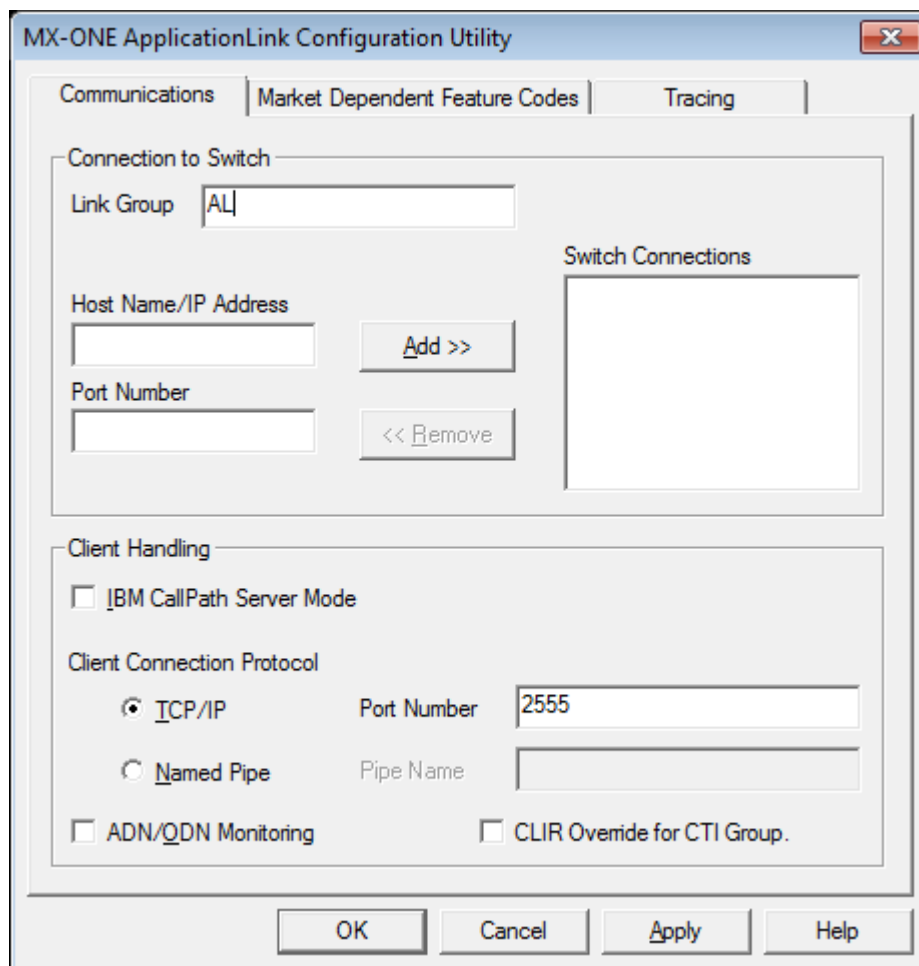
Files\Mitel\APPLINK\ sub-directory. You can change the drive and directory location as desired.

Click **Next** to proceed, if the path entered does not already exist, you will be asked to verify that you wish the new path to be created.

8. If it is a fresh installation of Application Link "Ready to install the program" dialog box appears. Click **Install** to proceed with the installation

9. If an earlier version of Application Link already exists, the Update dialog box will appear. A backup of the old version of Application Link will be performed internally before the new version is installed. Click **Yes** to proceed with installation.

10. Now, the installation of the program files may continue. The installation progress will be shown using a status box that will dynamically indicate what files are being copied and the percentage of installation completed. You can cancel the installation at any time by clicking **Cancel**.
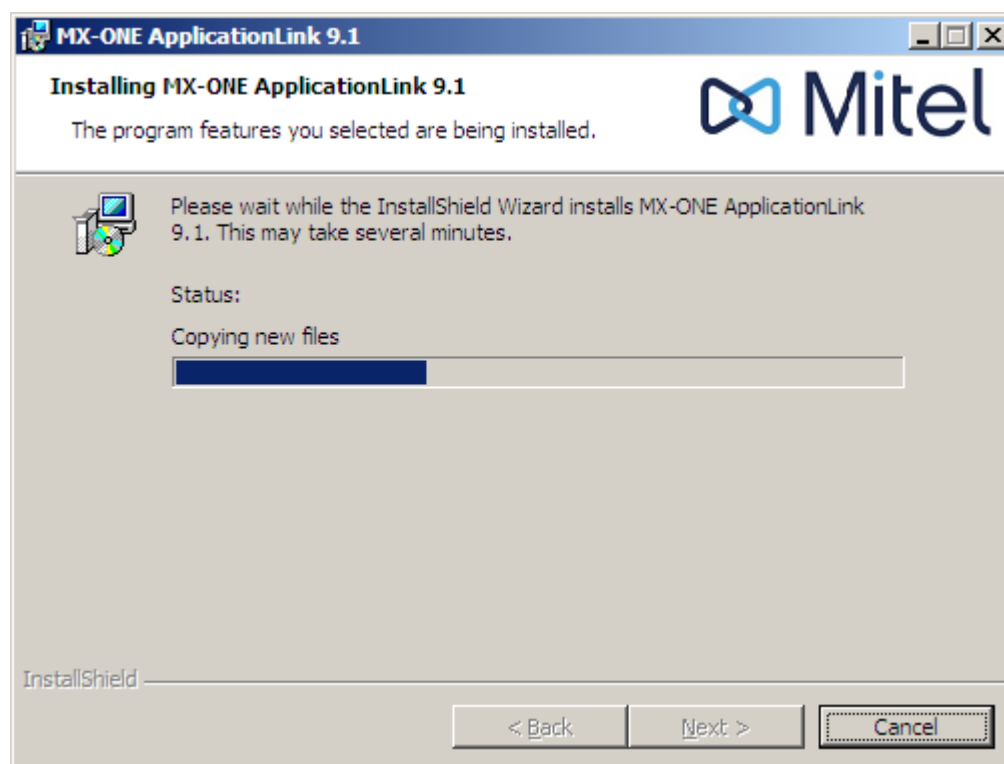
11. Next, the installation program will automatically launch the ApplicationLink Configuration program. The MX-ONE ApplicationLink configuration Utility Dialog Box will appear and you may proceed to configure the ApplicationLink. For a detailed explanation of the available settings in this dialog box, *see Chapter 3* ApplicationLink Configuration.

12. If ApplicationLink is being installed, you will see the following dialog box after the configuration is completed. This indicates that the MX-ONE ApplicationLink and Trace services are being installed and started.
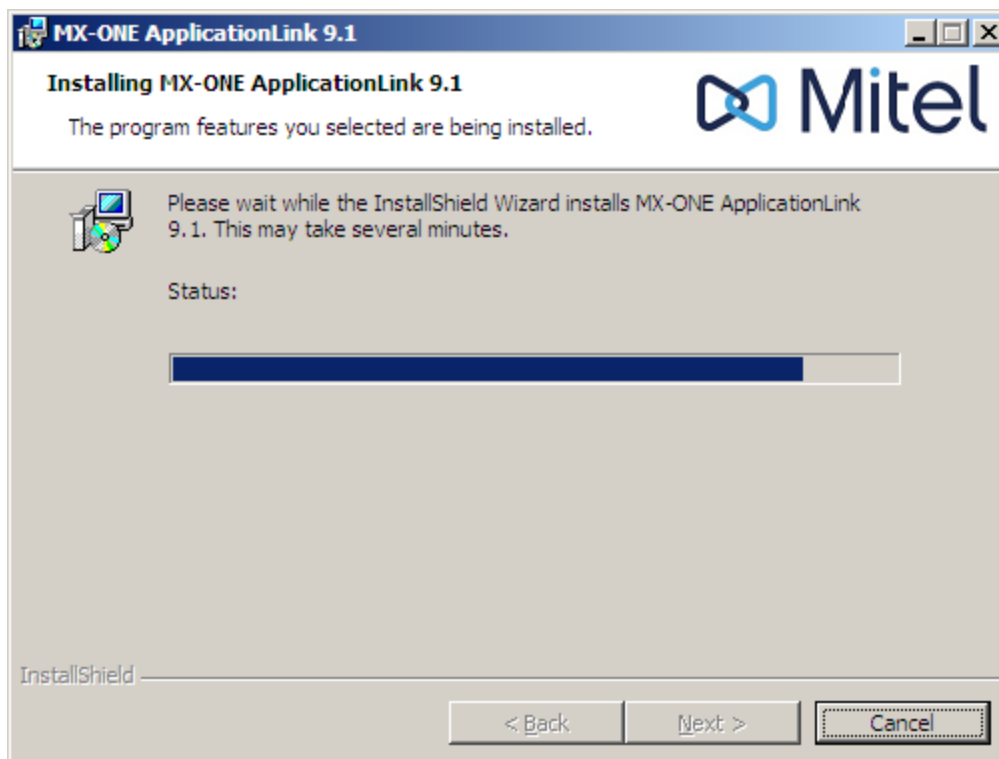
13. The installation program will next create the MX-ONE ApplicationLink program group with the following icons:

 Note: There is no icon for the MX-ONE ApplicationLink program since the CSTA version is a Windows service that automatically starts at system start- up.

14. If installation completed successfully, the following dialog box will appear.

Click **Finish** to exit the installation program.
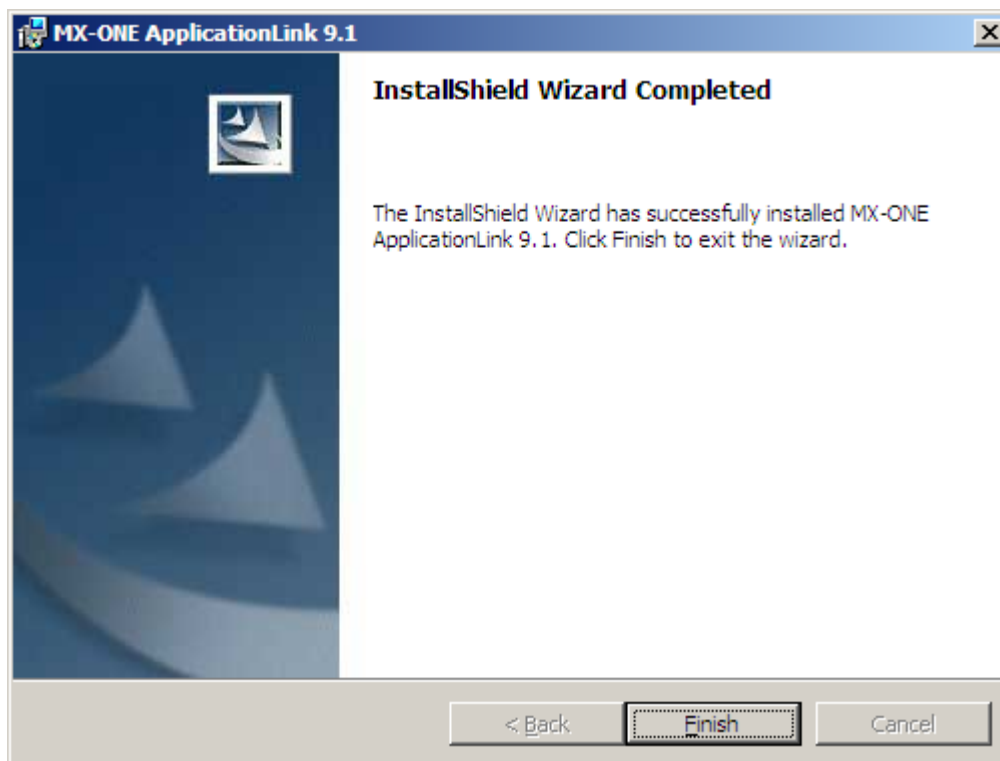
Uninstalling ApplicationLink or restoring a backed-up ApplicationLink

The ApplicationLink Uninstall program can remove ApplicationLink from the system entirely or restore a previously backed up version of ApplicationLink.

To uninstall ApplicationLink or restore a backed-up version, follow these steps:

1. Click **Start** on the task bar, point to **Programs/MX-ONE ApplicationLink** and click **Uninstall ApplicationLink**

2. The MX-ONE ApplicationLink installation program will start and you will see the following screen, to inform the user that setup for ApplicationLink is initialized.
Click **Next** to remove the ApplicationLink system components.
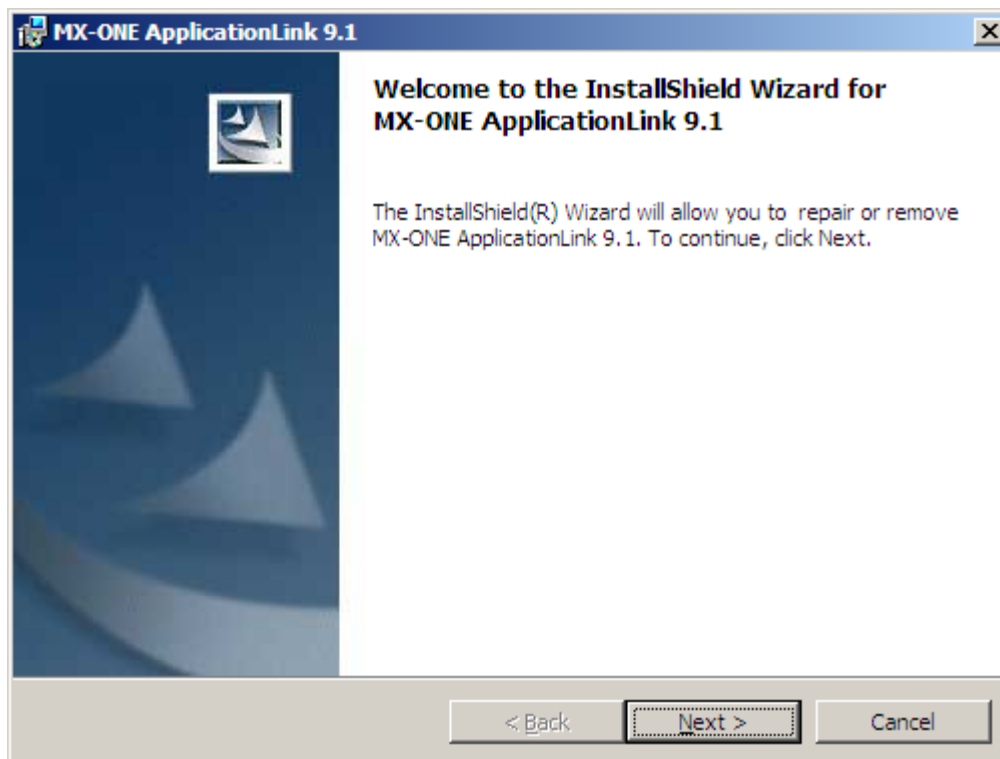
3. The un-installation will proceed immediately and the Program Maintenance dialog box will appear, which has Repair and Remove options.
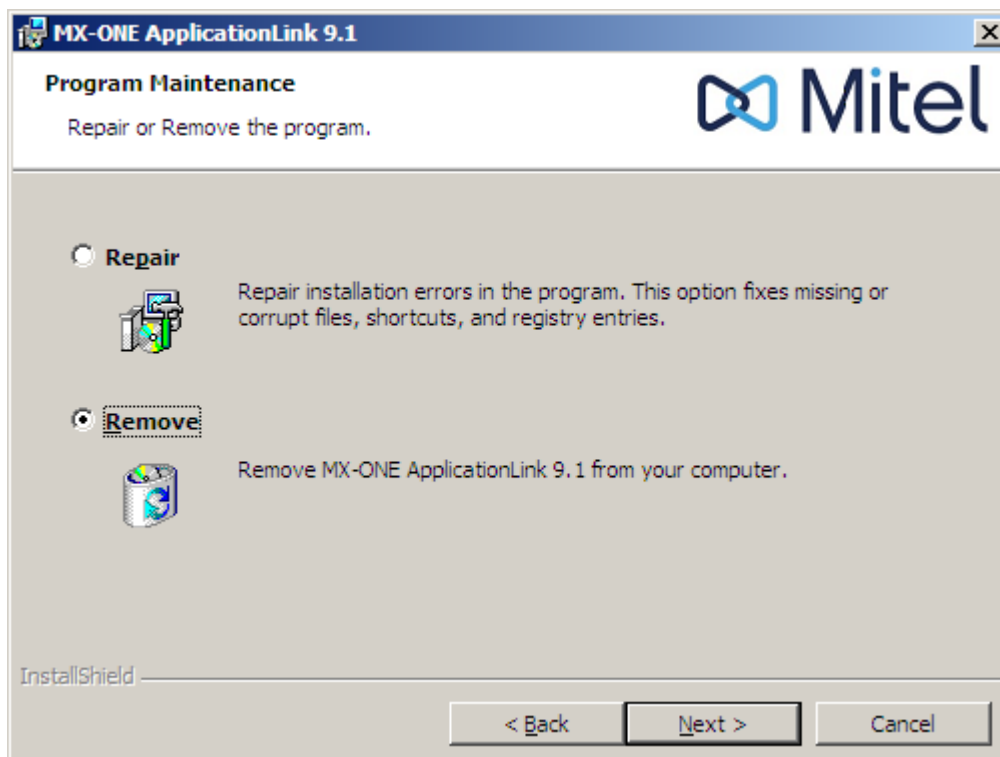
Click **Next** to remove the ApplicationLink system components.

4. When the uninstallation proceeds, this dialog will appear to indicate where to save the Trace files that are not being deleted.
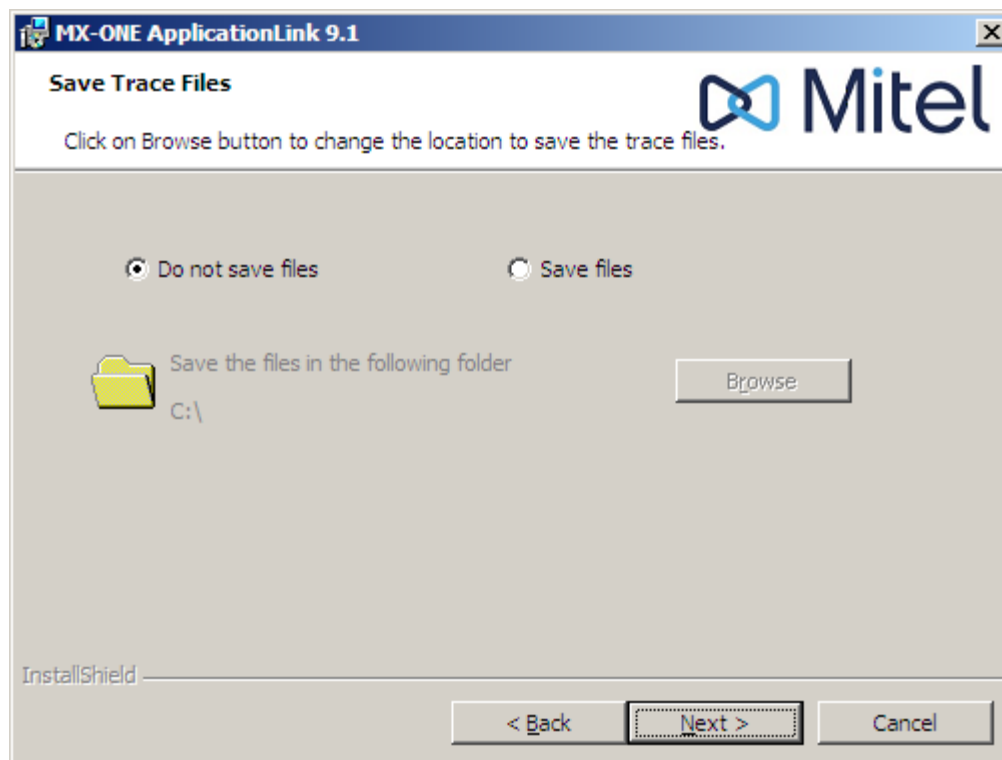
Select the save files button and click on browse button to enter the path, where these trace files are saved. If the files are not required to be saved, select Do not save files and click on **Next** to proceed with the uninstallation.

5. Next dialog is the "Remove Program" dialog, Click on **Remove** button which will start the final uninstallation process.
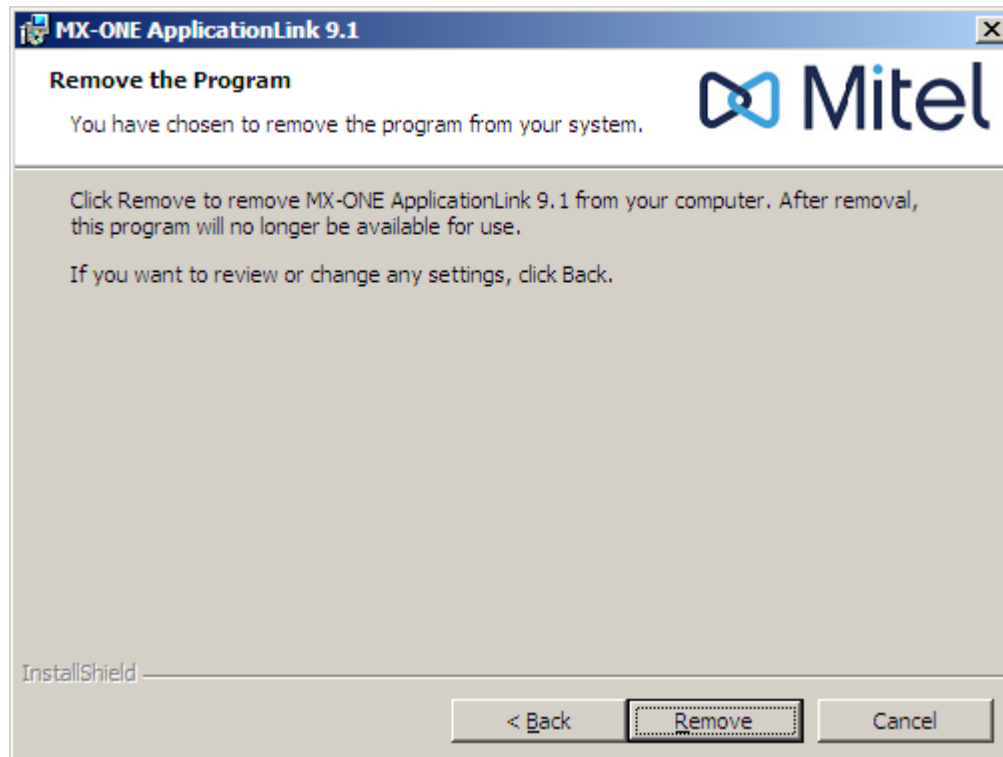
6. Below screen shows the uninstallation status. Click on **Cancel** button at any time to abort the Uninstallation.
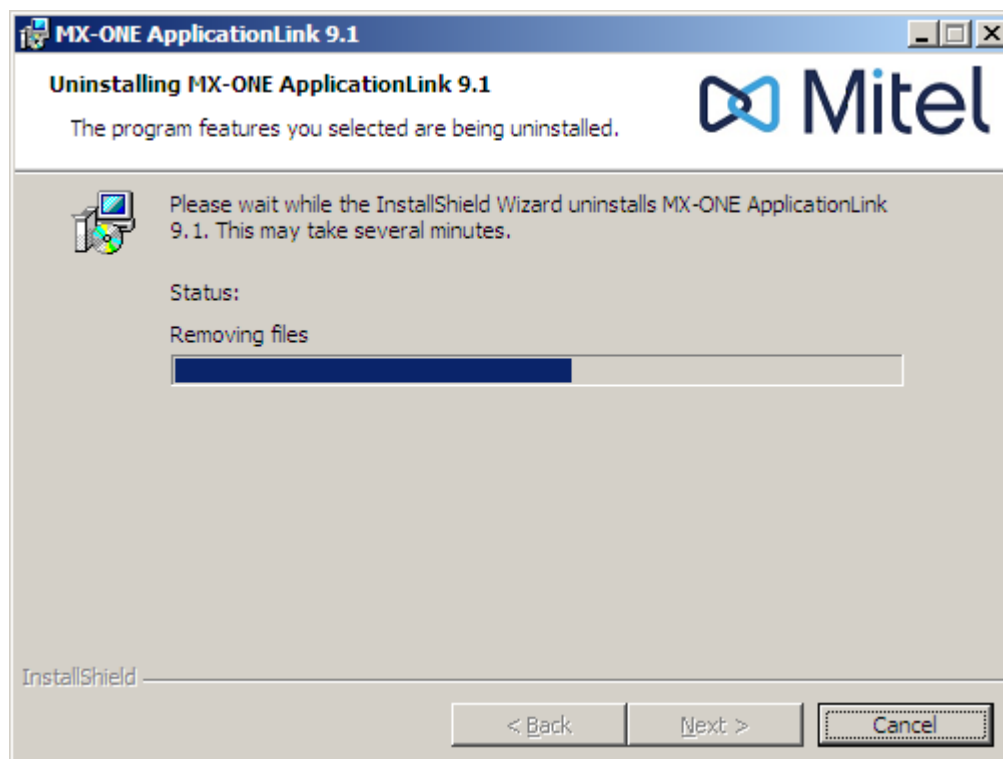
7. Below dialog is the Final Status dialog of uninstallation process. Click on **Finish** button to complete the uninstallation process.
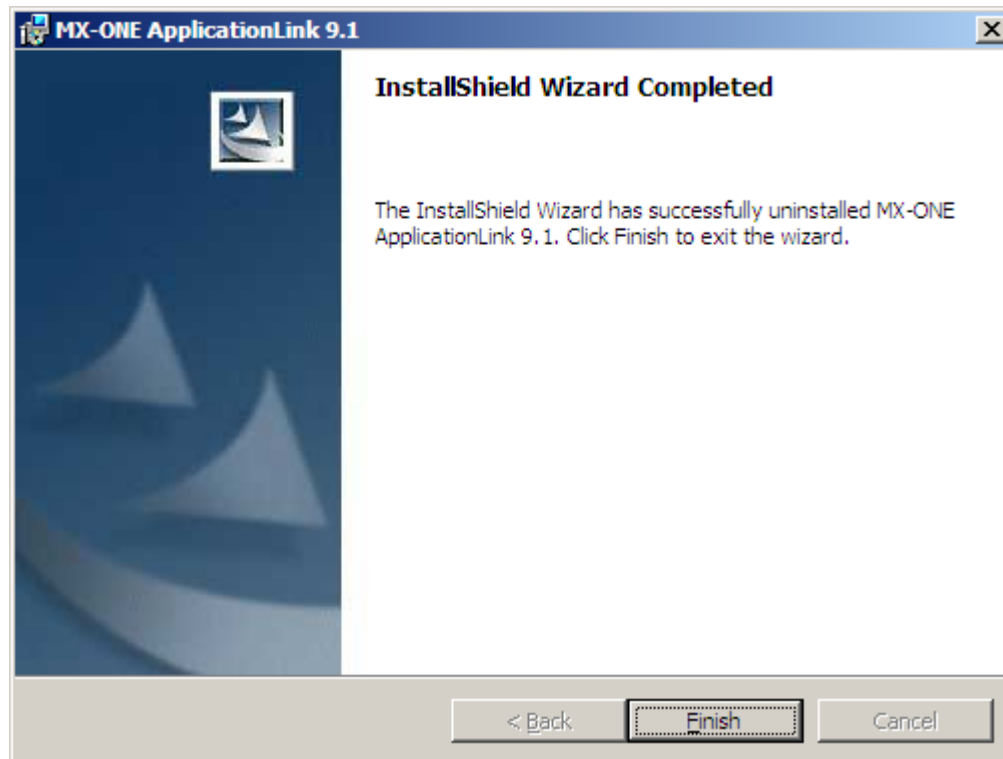
CHAPTER 3   APPLICATIONLINK CONFIGURATION

OVERVIEW

Before ApplicationLink can run, it must first be properly configured, this is accomplished in the ApplicationLink Configuration utility.

To open the ApplicationLink Configuration window:

Click **Start** on the task bar, point to **Programs/MX-ONE ApplicationLink** and click **ApplicationLink Configuration**.
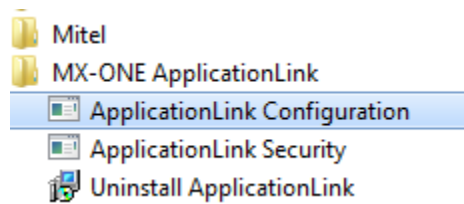
The MX-ONE ApplicationLink Configuration Utility dialog box will appear.

This dialog box contains three tabs:

- **Communications** - allows you to configure the connection(s) to the switch and to the client application.

- **Market Dependent Feature Codes** - allows you to set Feature Code values that are specific to the different market versions of the MX-ONE TSW/TSE.

- **Tracing** - allow you to configure if tracing information from ApplicationLink shall be displayed and where this information will be displayed.

In addition to these tabs, there are four control buttons located at the bottom of the dialog box. A description of these buttons can be found in the following table.

BUTTON LABEL	ACTION IF BUTTON IS SELECTED
OK	Saves any changes and closes the MX-ONE ApplicationLink Configuration Utility.
Cancel	Ignores any changes and closes MX-ONE ApplicationLink Configuration Utility dialog box. **Note**: If you make changes and then select the Apply button, these changes are not cancelled even though the Cancel button selected. See the Apply button description for

	details.
Apply	Applies or saves changes made in the MX-ONE ApplicationLink Configuration Utility dialog box. Similar to selecting the OK button except the dialog box remains open.
Help	Accesses on-line help related to the MX-ONE ApplicationLink Configuration Utility dialog box.
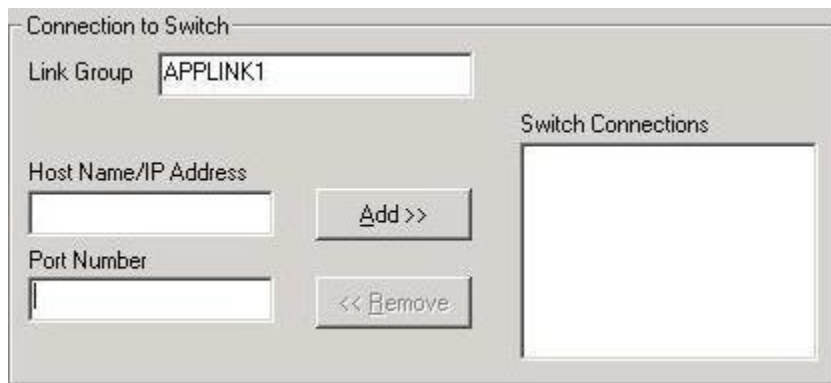
Note: Configuration parameters may be changed at any time, but configuration changes will not take effect until ApplicationLink is restarted, see *Chapter 5* ApplicationLink Program Execution for more details on how to start and stop ApplicationLink.

CONFIGURING COMMUNICATION

CONNECTION TO THE MX-ONE TSW /TSE

The connection to the MX-ONE TSW/TSE can be configured Connection to Switch section under the Communications tab of the ApplicationLink Configuration utility:

To configure the connection to the MX-ONE TSW, follow these steps:

1. Enter the Link Group identifier in the **Link Group** field. This value applies to all switch connections for this ApplicationLink.

    The Link Group is by default set to the host name of the ApplicationLink server, this is the recommended setup, but any alphanumeric identifier can be used as long as it matches the Link Group setting in the MX-ONE TSW/TSE.

    > **Note**: Refer Appendix A MX-ONE TSW Administration for information on how to set the Link Group identifier in the MX-ONE TSW.

2. For each NIU board installed in the MX-ONE TSW for use with this Link Group, enter the Host Name or IP Address and Port Number of the NIU board in the **Host Name/IP Address** and **Port Number** fields. Then click the **Add >>** button to add the Host Name/IP Address and Port Number combination to the **Switch Connections** list.

    When the **Add >>** button is clicked, the entered Host Name or IP Address will be validated, if it cannot be located in the network this dialog box will appear
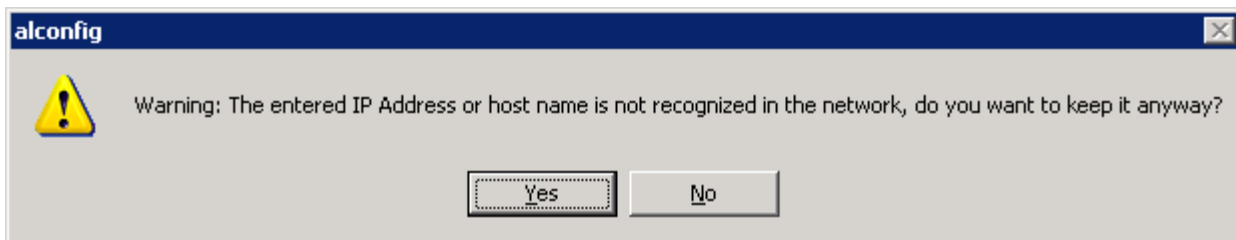
If you wish to use the entered value anyway (e.g. if the NIU is not initiated yet) click **Yes**, otherwise click No and re-enter the Host Name or IP Address.

> **Note**: A maximum of 8 switch connections (CSTA Links) may be configured.
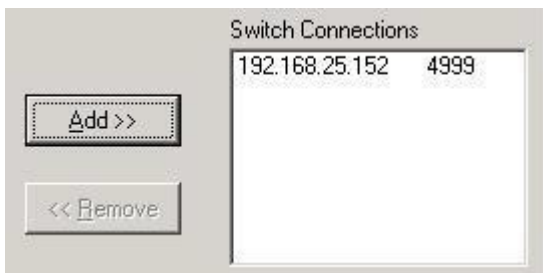
If you wish to remove a connection, select the IP Address/Port Number you wish to remove in the **Switch Connections** list and then click the **<< Remove** button.

CONNECTION TO CLIENTS OR API SERVER

The connection between Clients or API Server and ApplicationLink can be configured in the **Client Handling** section under the **Communications** tab of the ApplicationLink Configuration utility:
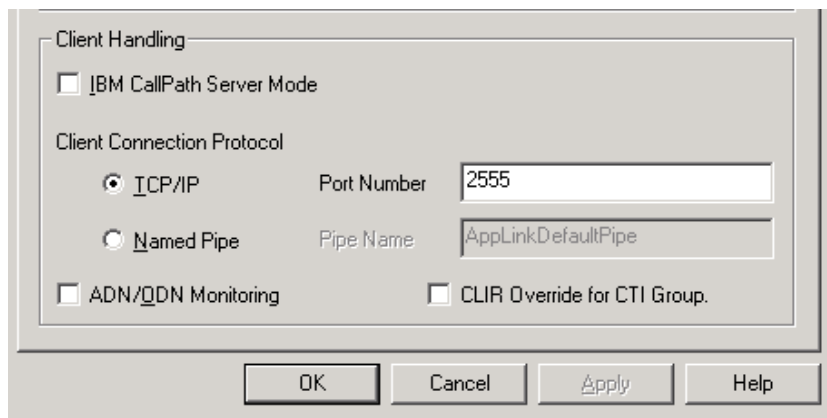
If the API Server is an IBM CallPath server, check the **IBM CallPath Server Mode** check box. Client connection protocol TCP/IP with the port number 2555 will be selected automatically, and the Named Pipe and ADN/ODN Monitoring, CLIR Override for CTI Group options will be grayed out.

> **Note**: When IBM CallPath Server is used with ApplicationLink, no other types of clients or API servers may use that ApplicationLink.

If the Client or API Server uses TCP/IP sockets:

1. Click the **TCP/IP** radio button, the **Port Number** field will become enabled.

2. Enter the desired port number in the **Port Number** field, e.g. 2555. This port number must match what is configured in the Client or API server, e.g. if ApplicationLink 32-bit Client DLL is used, it should be configured to use this port number. For information on how to configure the Client DLL, *see Chapter 8* ApplicationLink 32-bit Client DLL.

If the Client or API Server uses Named Pipe:

1. Click the **Named Pipe** radio button, the **Pipe Name** field will become enabled.

2. Enter the desired pipe name in the **Pipe Name** field. This pipe name must match what is configured in the Client or API server.

CLIR OVERRIDE FOR CTI GROUP

This option in the **Client Handling** section helps in overriding the CLIR (Caller Identity Restriction) set on a device. This option is applicable only on the events reported on a CTI group. If selected, the restricted caller ID would be presented in the Call event reports to a CTI group.

ADN/ODN MONITORING

The last option in the **Client Handling** section determines whether the Additional Directory Number (ADN) and the Own Directory Number (ODN) on the same Digital Telephone Set (DTS) are to be monitored separately by the application. Check the **ADN/ODN Monitoring** box depending on the application's desire.

The licensing method is not affected by the value of this field since the Mitels are consumed per device rather than per line. I.e. the first monitor started on a device (ADN or ODN) will consume a Mitel, and additional monitors on the device (e.g. another ADN) will be started without consuming a Mitel.

> **Note**: This setting only affects Digital devices, it has no effect on devices of type Analogue, CAS, Cordless, IPeX, Remote Extension, or ACD/CTI groups.

> **Note**: This field is only applicable to ApplicationLink installed in a CSTA environment. In a IBM CallPath environment this field will always be grayed-out to ensure the correct value.

ADN/ODN MONITORING DISABLED

When the ADN/ODN option is unchecked ApplicationLink will have the following behavior; when a monitor is started on an ADN, the ODN of the same device will be used in case a Consultation Call request is issued for the ADN. This will simulate that the ADN has a second line for multiple call handling.

A limitation in this mode is that the ODN and the ADN on the same device can not be monitored simultaneously by any application.

ADN/ODN MONITORING ENABLED

When the ADN/ODN option is checked the ODN and the ADNs on the same device can be monitored simultaneously and independently, but the ADN will only have one line and can thus only handle one call at a time. This means that a Consultation Call request will always be rejected on the ADN. Instead, it is the application's responsibility handle consultation calls by requesting a Make Call on the ODN.

Note: If you are not sure about the setting of this field it is better to leave it unchecked. Checking this field has serious implications on the CSTA protocol, please refer to the Application Programmer's Guide for more information.

CONFIGURING MARKET DEPENDENT FEATURE CODES

Some of the features accessible through ApplicationLink are market dependent, i.e. the procedures being used to access the features are different depending on what market version of the MX-ONE TSW/TSE that is being used.

Select the **Market Dependent Feature Codes** tab of the ApplicationLink Configuration Utility to access these fields.

In order to enable the given features in an ApplicationLink request, the correct values for your market must be entered. The correct values may be acquired from your MX-ONE TSW system administrator. The default values are from the MX-ONE TSW/TSE Application System "North America".

1. Click in the desired feature field.

2. Enter the correct feature value based on your specific market.

Regarding the **End-to-End DTMF** parameter, in case the DTMF dialling feature is automatically activated by the switch, e.g. when connected to voice mail, the activation code can be disabled by selecting '0' as the End-to-End DTMF parameter.

> **Note**: Configuration parameters may be changed at any time, but configuration changes will not take effect until ApplicationLink is restarted.

CONFIGURING THE TRACE DISPLAY

Note: Running the trace utility during high traffic will impact the performance of the system. It is therefore recommended that the trace is used only when necessary. If trace is used during high traffic it is recommended that the trace screen is minimised or not configured to trace to screen.

Tracing information is specified under the **Tracing** tab of the ApplicationLink Configuration Utility. Tracing information may be displayed to the screen, or saved to a file and to the screen.
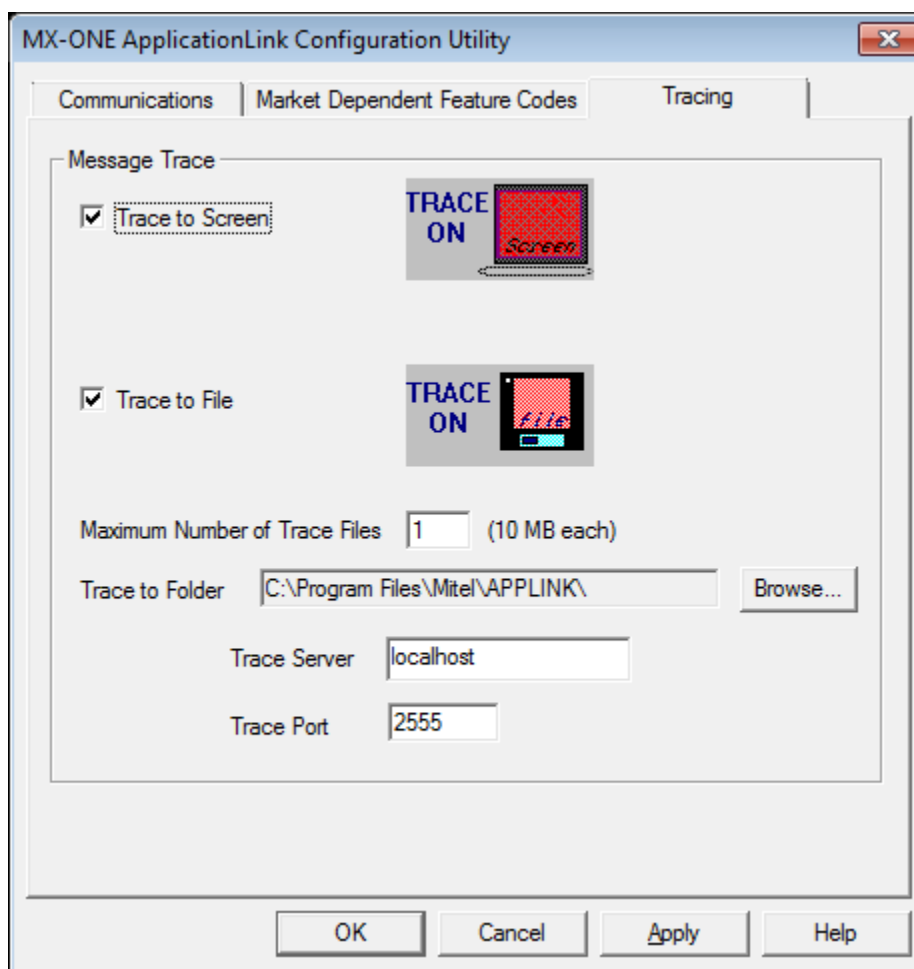
- Click the **Trace to Screen** check box to display to a screen. The Trace Off Screen icon will change to Trace On.

- Click the **Trace to File** check box to save trace information to a file. The Trace Off file icon will change to Trace On.

Clicking on an already checked option will remove that option and change the associated icon to read Trace Off.

Note: The default setting for tracing is enabled to both screen and file. This will not affect the performance of ApplicationLink when the trace tool is not running.

The **Maximum Number of Trace Files** value specifies how much trace information that will be saved. The range of the value is 1 to 100. Each generated trace file will have a maximum size of 10 MB. When the maximum size has been reached, the current file is closed and a new trace file is opened. This way up to 1 GB of trace information can be generated.

The naming convention of the trace files is "TRACEnn.OUT" where nn is the sequence number of the trace file, e.g. "TRACE07.OUT". The file that is currently being written to by the Trace Utility is named "TRACEnnC.OUT", e.g. "TRACE08C.OUT". When the Trace Utility is closed the last file will still be named "TRACEnnC.OUT" so that it will be easy to tell which file that was the last one.

When the number of files generated has reached the configured maximum value, the numbering will start over from zero and the oldest file will be deleted.

The Trace to Folder field lets you specify the directory where the trace files will be stored. By default this will be the directory where ApplicationLink is installed, e.g. "C:\Program Files\Mitel\Applink.

Note: Each time the Trace Utility is started and Trace to File is enabled, all previous trace files will be deleted.

Note: Trace Server and port number are the details of the Applink server.

Note: Configuration parameters may be changed at any time, but configuration changes will not take effect until ApplicationLink is restarted. The only exception is the tracing configuration parameters; these settings will take effect when the Trace Utility is restarted.

REMOTE TRACING

The Trace Utility may be run remotely, to do this ApplicationLink Configuration must be run on the remote computer prior to starting the Trace Utility. *See Chapter 5* ApplicationLink Program Execution for more details on running the Trace Utility.

CHAPTER 4 APPLICATIONLINK SECURITY

OVERVIEW

Security in ApplicationLink is optional and is configured in the ApplicationLink Security utility.

The Security utility assigns Host Names or IP Addresses to Directory Numbers, i.e. for a Client or API server to control/monitor a device, the Client or API server computer's Host Name or IP Address must be associated with the device's Directory Number.

To open the Security utility click Start on the task bar, point to Programs/MX-ONE ApplicationLink and click ApplicationLink Security
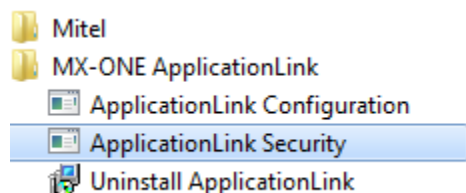
The ApplicationLink Security utility will appear:
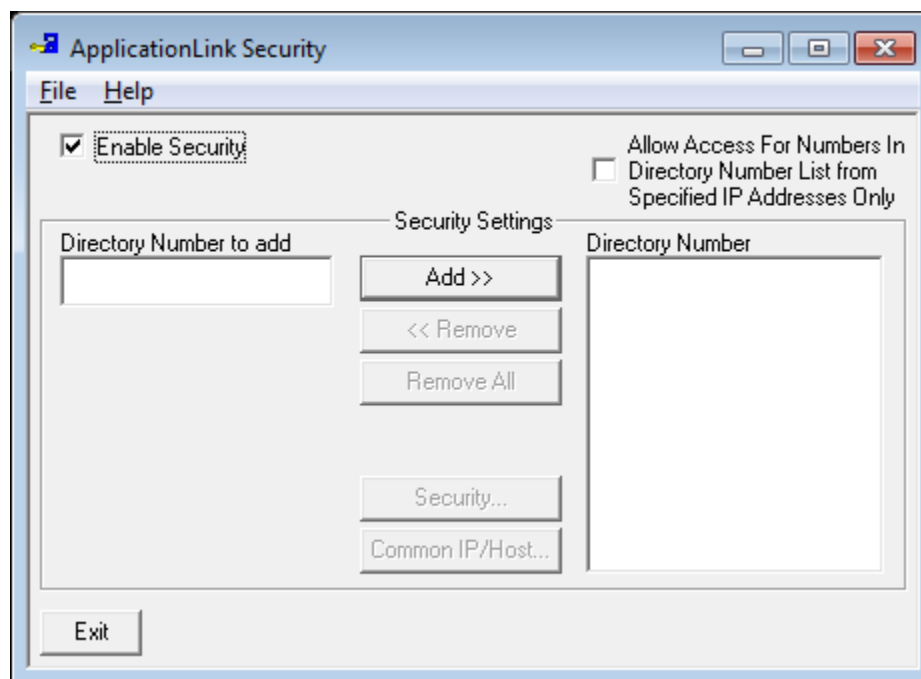
ENABLING/DISABLING SECURITY

The security functionality can be disabled and enabled without affecting the security configuration, when the ApplicationLink Security utility is opened the first time, the security will be disabled.

- Enable the security functionality by checking the Enable Security check box.

If the security functionality is no longer needed or needs to be temporarily disabled, uncheck the
Enable Security check box.

CONFIGURING DEVICE INFORMATION

There are two methods to configure MX-ONE TSW devices in the ApplicationLink Security utility:

- Importing device information from the MX-ONE TSW FIOL program, as described below.

- Add devices manually, as described in the Manually Adding Devices section later in this chapter.

IMPORTING DEVICE INFORMATION

Follow these steps to import the device information from the MX-ONE TSW.

1. Log on to the MX-ONE TSW using the FIOL communication program.

2. Start a log file using the FIOL feature

3. Enter the following MML commands:

   ```
   ACGCP:GRP=ALL;

   KSDDP:DIR=ALL;

   EXDDP:DIR=ALL;

   GEDIP:DIR=ALL;
   ```

4. Close the log file using the FIOL feature

5. Copy the log file to the computer running ApplicationLink

6. Select **Import** from the **File** menu in the ApplicationLink Security window:
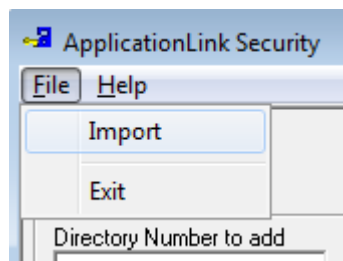
7. The **Open** dialog appears. Locate the file that was previously prepared.
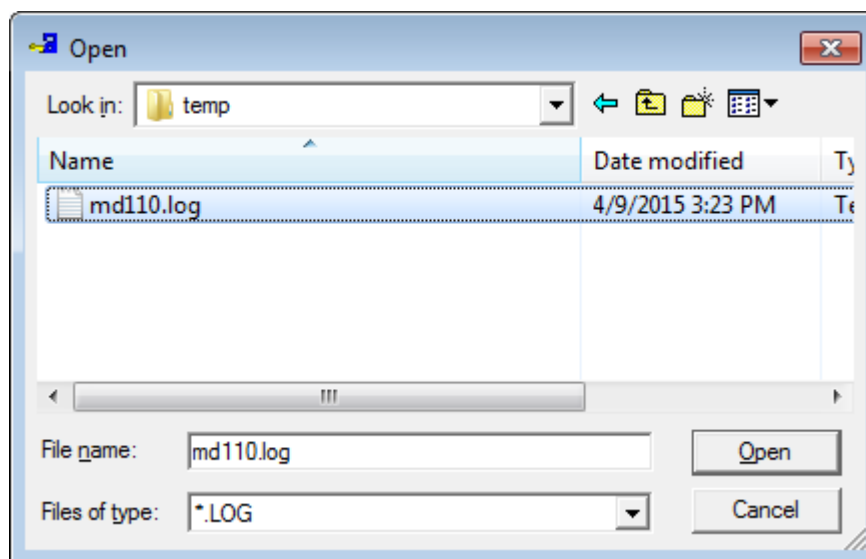
As an example, the **Open** dialog above shows a log file named MX-ONE TSW.LOG as the file to be imported. Click on the file, then click the **Open** button to proceed with the importing procedure.

8. When the import has been executed the ApplicationLink Security window will show the imported devices:
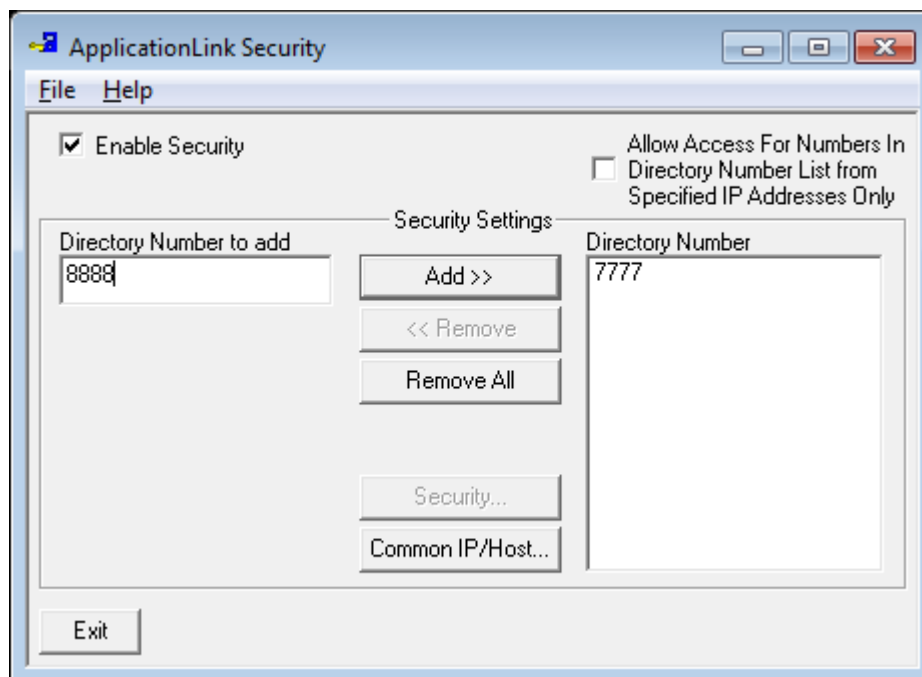
9. You may now proceed with assigning security to the devices as described in the Assigning Security to Devices section later in this chapter

MANUALLY ADDING DEVICES

To manually add devices to the ApplicationLink Security utility, follow this procedure.

1. In the ApplicationLink Security window, type the desired directory number in the **Directory Number** to add field.

2. Then click the **Add >>** button to add the directory number to the list of devices.
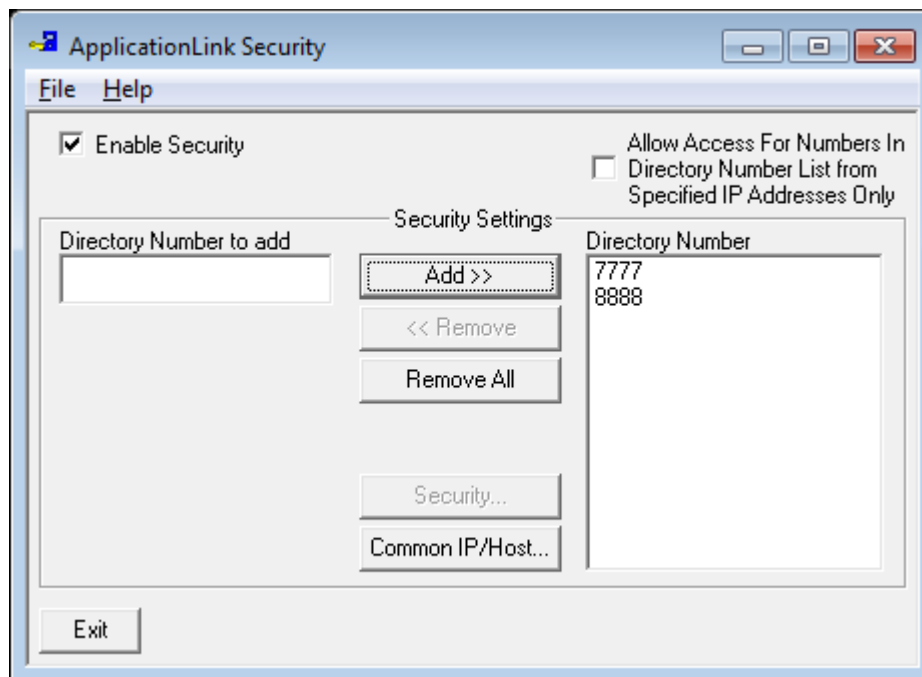
3. Repeat steps 1 and 2 until all desired directory numbers are added.

REMOVING DEVICES

To remove existing devices from the ApplicationLink Security utility, follow this procedure.

1. Select the directory number(s) to be removed from the **Directory Number** list.

2. Then click the **<< Remove** button.
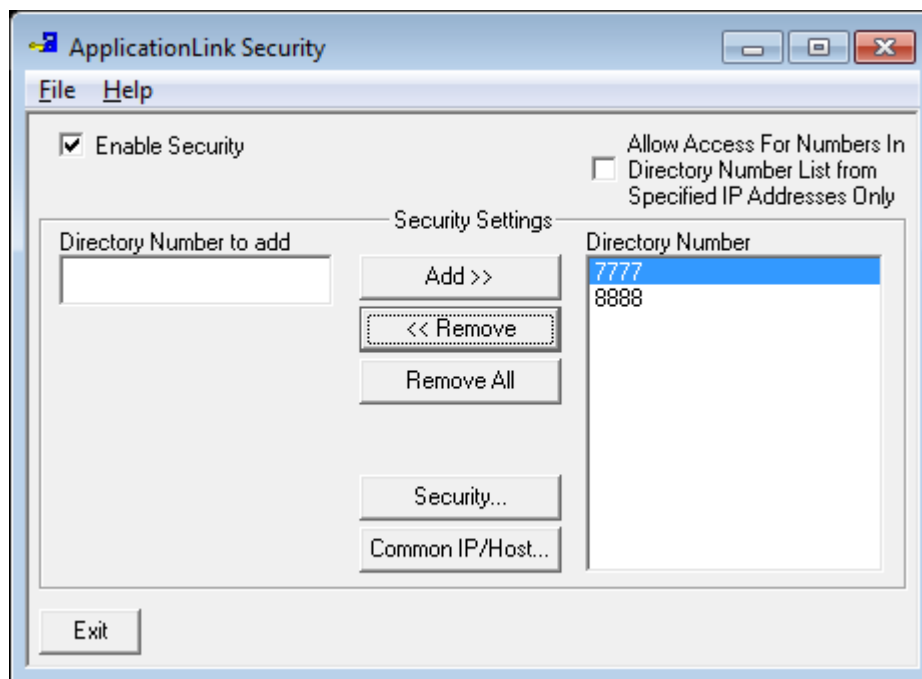
3. This confirmation dialog will be displayed:
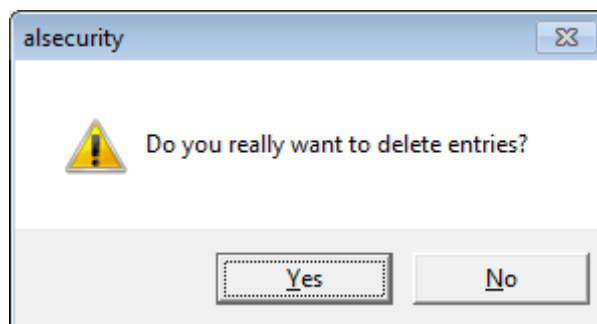
Click **Yes** to confirm that you want to remove the device(s).

REMOVING ALL DEVICES

If all devices are to be removed, click the Remove All button, this confirmation dialog will appear:
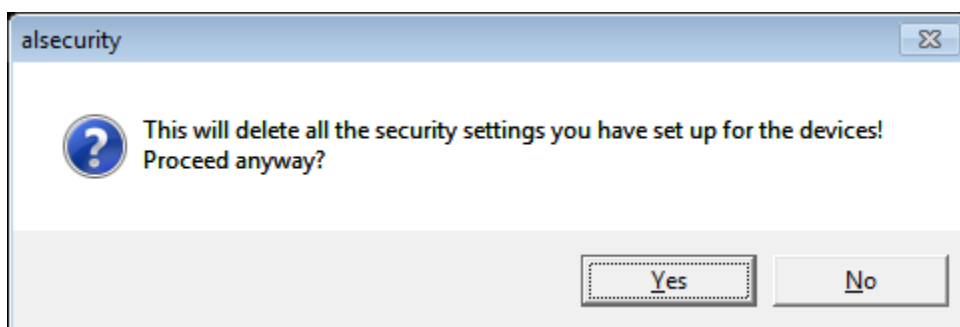
Click **Yes** to confirm that you want to remove the devices.

Note: If security is to be temporarily disabled, uncheck the Enable Security check box rather than removing the devices. This way, the exact same security configuration can be easily re-activated

ASSIGNING SECURITY TO DEVICES

To assign security to devices in the ApplicationLink Security utility, follow this procedure.

1. Select the desired directory number from the **Directory Number** list and then click **Security…**
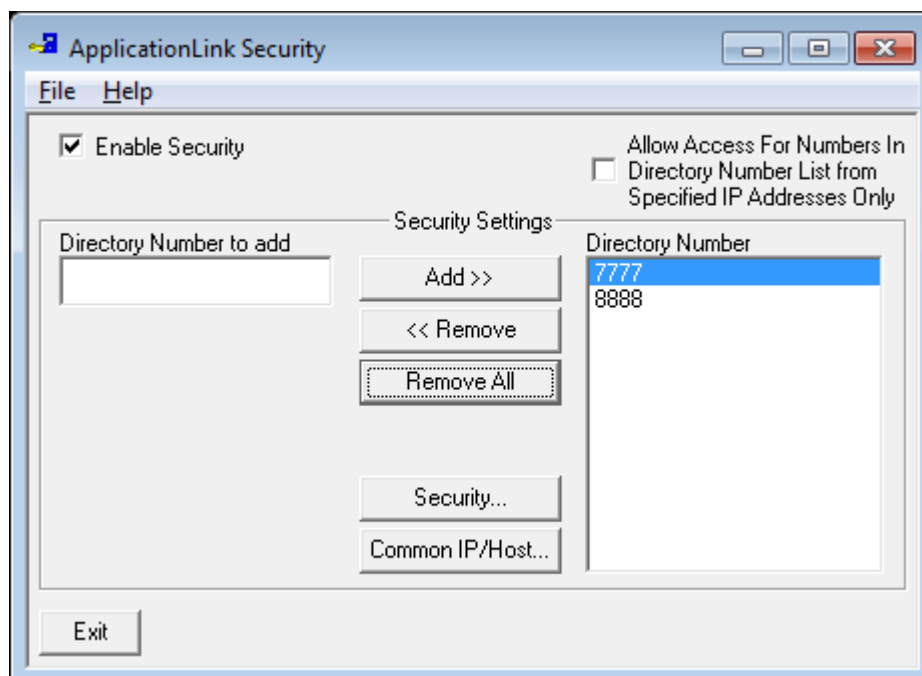
2. The Security for Directory number dialog is opened and the current security assignment (if configured) is shown in the **IP/Host Addresses Assigned** field.
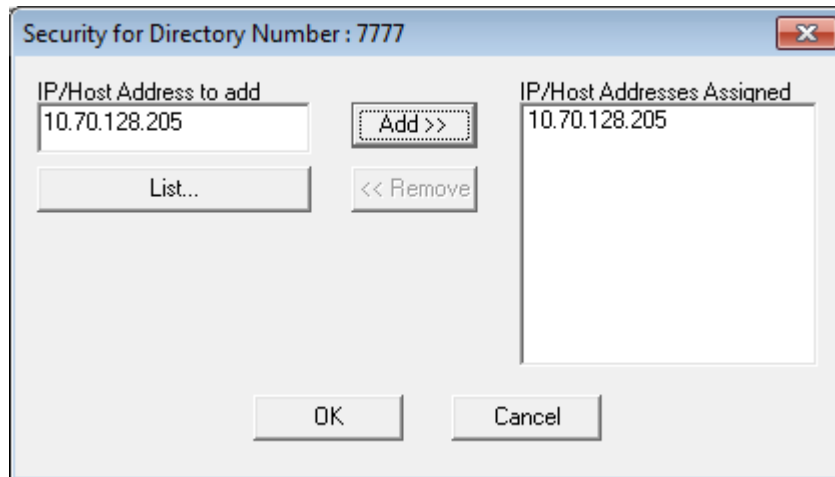
3. There are two methods to assign Host Names or IP Addresses to devices:

   - If the Host Name or IP Address is known it can be entered directly in the

   - **IP/Host Address to add** field (it is recommended to use the Host Name rather than the IP Address since DHCP, i.e. dynamic IP Address assignment, may be used in the network).

   - If neither the IP Address or the Host Name is known, the currently available hosts in the Windows domain can be browsed by clicking **List…**
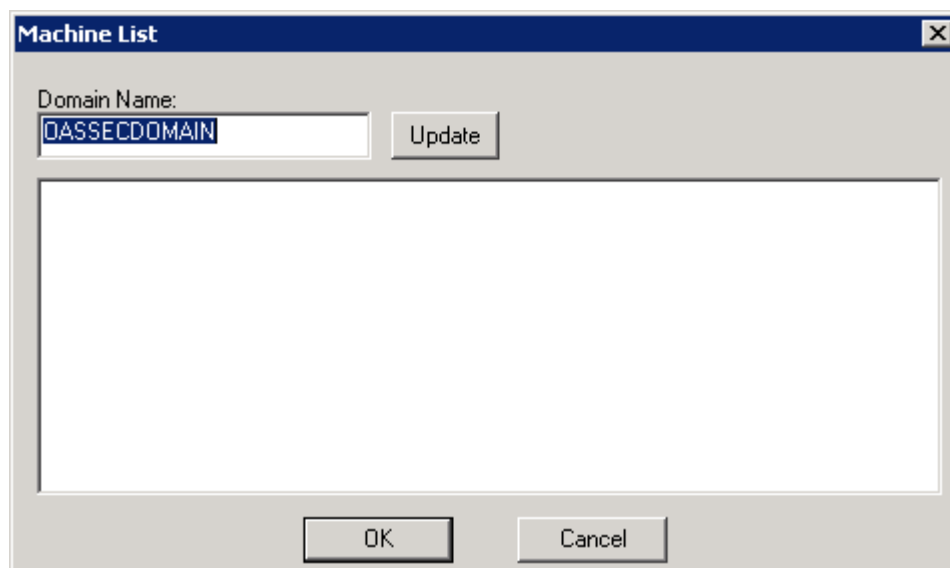
   - If a different Windows domain is desired, enter it in the **Domain Name** field and click **Update**.

   - Select the desired Host Name and click **OK**. The **Host Name** and **IP Address to add** fields of the previous window will be updated.

4. When the Host Name or IP Address is entered in the **IP/Host Address to add** field, click **Add >>** to add it to the **IP/Host Addresses Assigned** list.
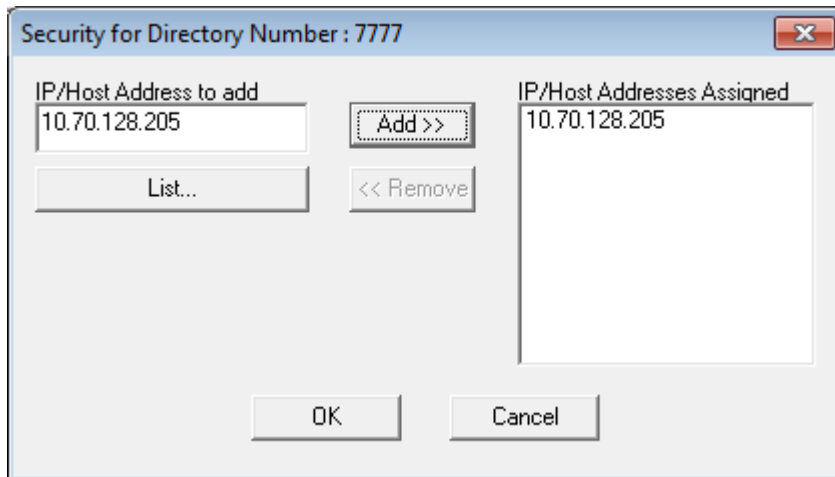
5. Repeat steps 3 and 4 if more IP Addresses are to be added to the device.

   Click **OK** to confirm the changes and close the window.

REMOVING ASSIGNED CLIENTS

To remove a Host Name assignment, follow this procedure:

1. Select the desired directory number from the **Directory Number** list and then click **Security…**
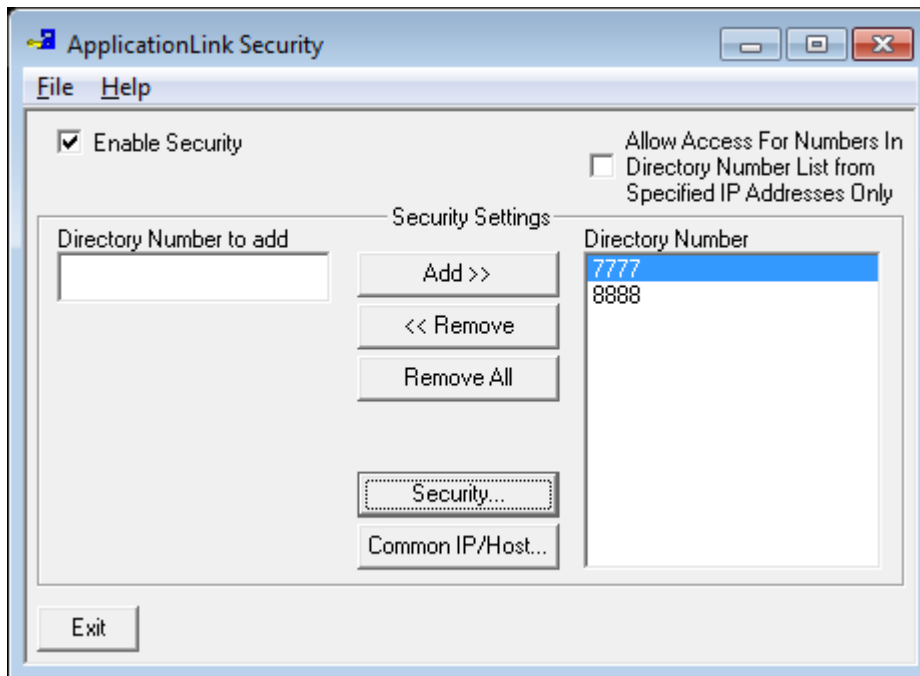
2. The Security for Directory number dialog is opened and the current security assignment (if configured) is shown in the **IP/Host Addresses Assigned** field.

   Select the IP Address to be removed and click **<< Remove**.
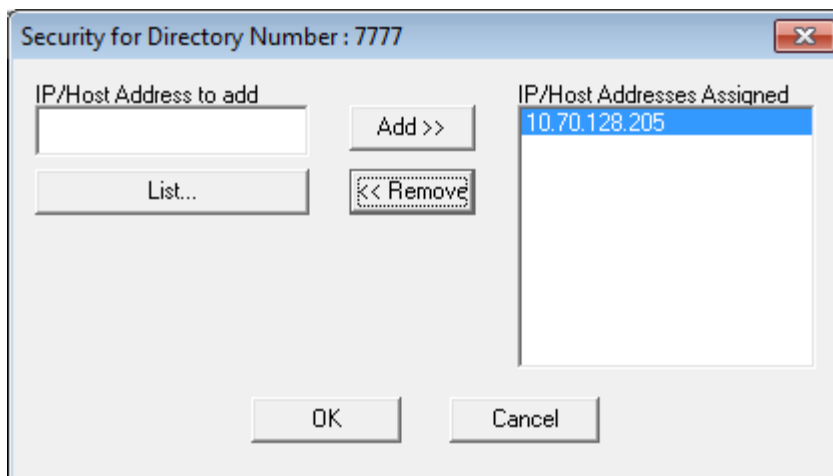
3. Click **OK** to confirm the change and close the window.

ASSIGNING CLIENTS TO MULTIPLE DEVICES

In environments where one API server is used, the Host Name or IP address of the API server should be assigned to all devices for security, not individual devices. The Common IP/Host feature of the security tool is used for this purpose as shown below:

> **Note**: This feature is useful for environments where more than one ApplicationLink is used in the same MX-ONE TSW node. By assigning different devices in the security tool for each different ApplicationLink server you are sure not to have clients or API server attempting to monitor the same devices.

1. Select one or more devices in the **Directory Number** list in the ApplicationLink Security utility and click **Common IP/Host…**
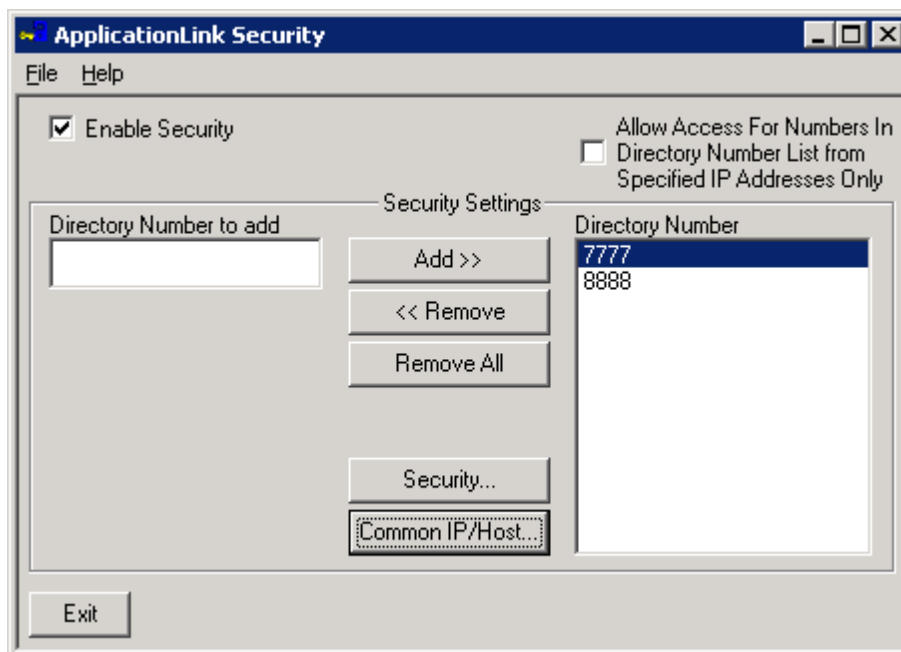
Note: All devices may be selected to assign common IP addresses. If no devices are selected, this will act the same as *all* devices being selected.

2. The **Security for - Directory Number** dialog box appears. The devices selected will be listed in the directory numbers list box

Security for - Directory Number

Directory Numbers
8888

IP/Host Address to add

Add >>

List...

<< Remove

IP/Host Addresses Assigned

OK   Cancel
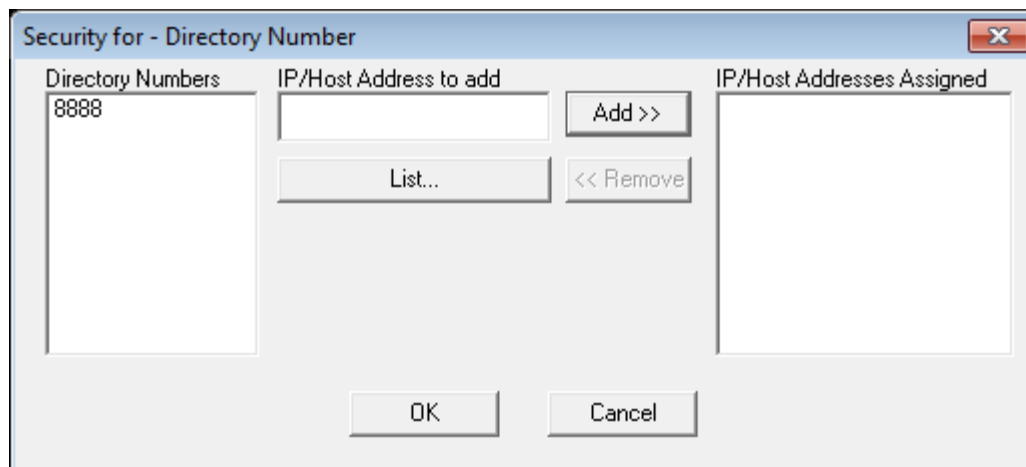
Note: One or more IP addresses may be added as common IP address.

Security for - Directory Number

Directory Numbers
8888

IP/Host Address to add
10.70.128.205

Add >>

List...

<< Remove

IP/Host Addresses Assigned

OK   Cancel
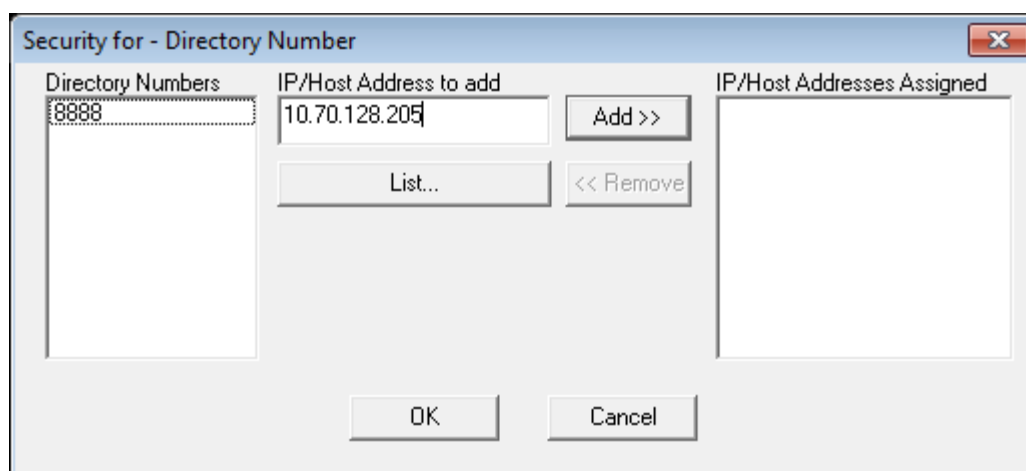
UNLISTED DEVICES

There are two different possibilities for devices not listed in the ApplicationLink Security utility:

- Allow access to unlisted devices for any client or API server

- Deny access to unlisted devices for any client or API server

Check the **Deny Access For Numbers Not In Directory Number List** check box in the ApplicationLink Security utility at your preference.

CHAPTER 5   APPLICATIONLINK PROGRAM EXECUTION

EXECUTING APPLICATIONLINK

After ApplicationLink is installed and configured as outlined in the previous sections, the ApplicationLink program will automatically attempt execution. ApplicationLink runs as a Windows service. It is set up during installation to automatically run when the Windows operating system starts up and connection to the MX-ONE TSW will automatically be attempted. After a successful connection to the MX-ONE TSW, the ApplicationLink server is ready to accept connections from the Client or API server.

STARTING AND STOPPING THE MXONE APPLICATIONLINK AND MXONE TRACE SERVICES

Starting MXONE ApplicationLink and MXONE Trace service

To start the ApplicationLink Service, follow this procedure.

1. Open the Windows Control Panel and double click the **Services** icon:

2. The Services window is opened.
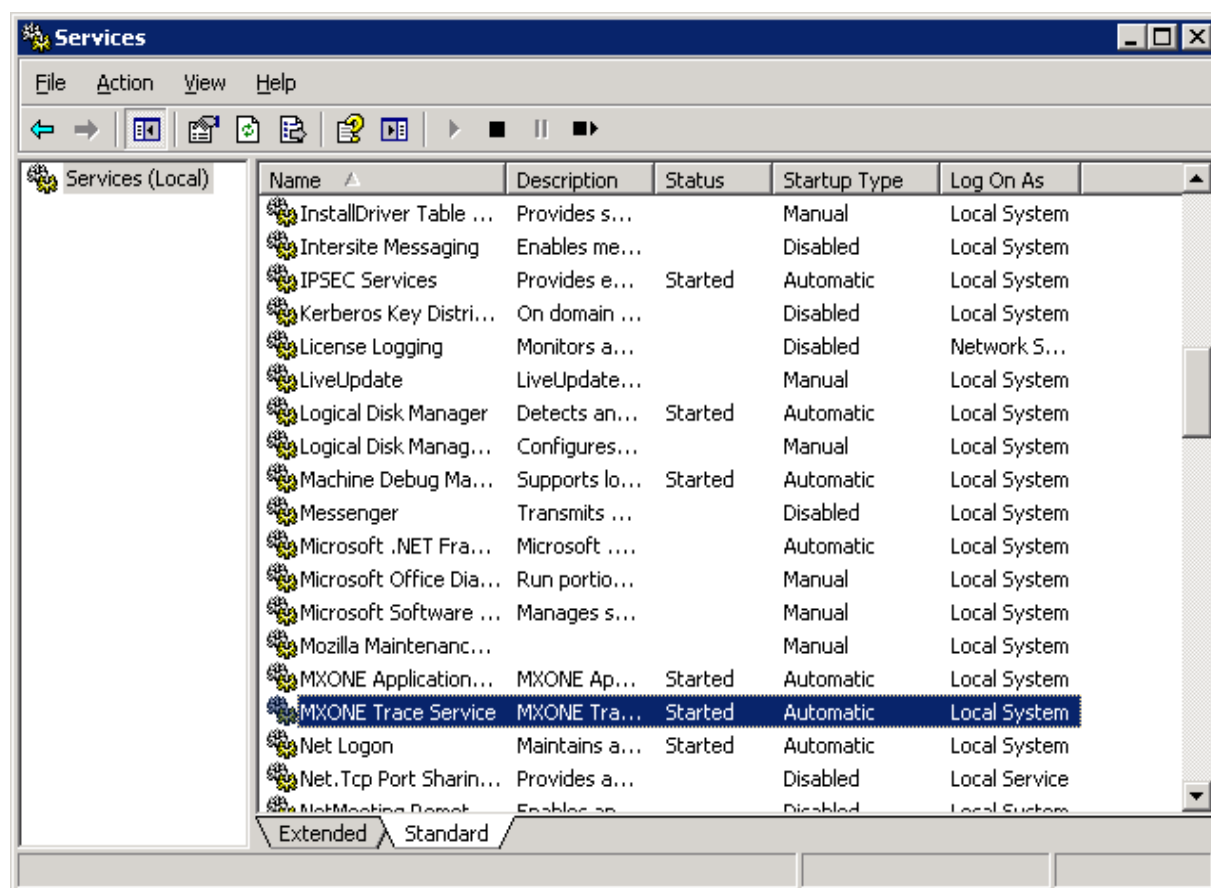
Select **MXONE ApplicationLink and MXONE Trace servic**e from the list of services and click **Start**.

3. While attempting to start the ApplicationLink and MX-ONE TSW Trace service, this dialog shows the progress.
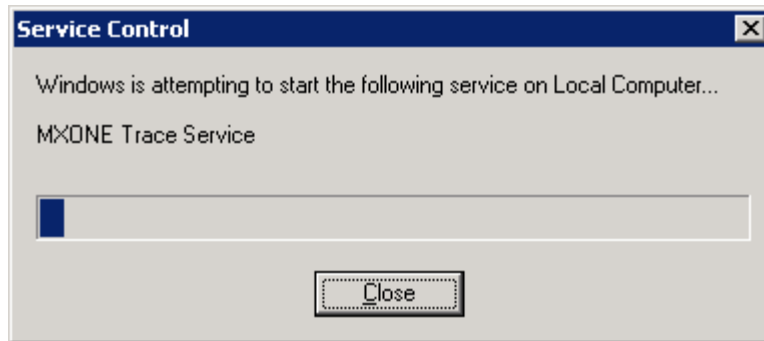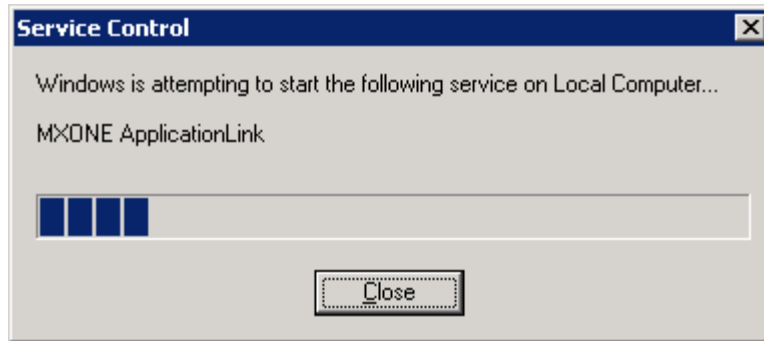
STOPPING MX-ONE APPLICATIONLINK AND MX-ONE TRACE SERVICE

To stop the ApplicationLink Service, follow this procedure.

1. Open the Windows Control Panel and double click the **Services** icon

2. The Services window is opened.
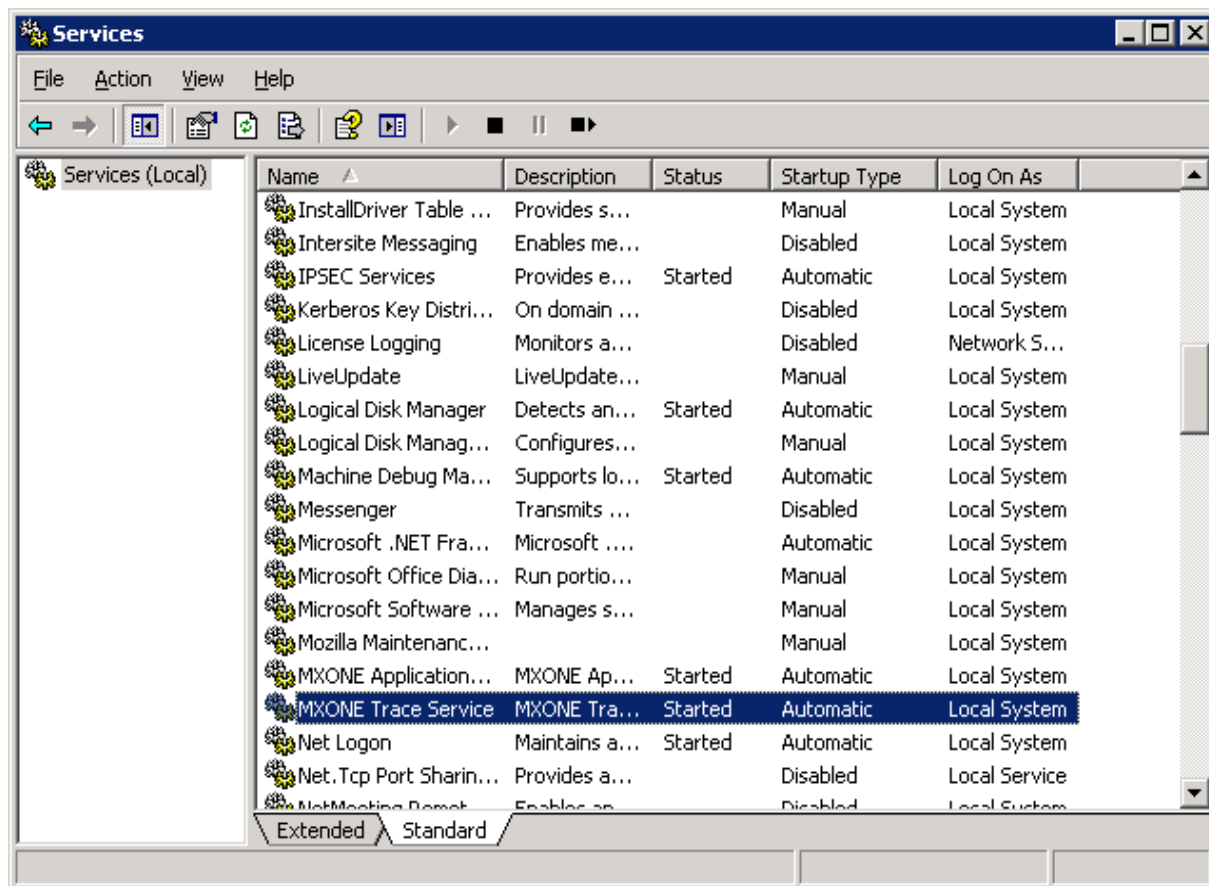
Select **MXONE ApplicationLink/ MXONE Trace Service** from the list of services and click **Stop**.

3. While attempting to stop the ApplicationLink service, this dialog shows the progress:
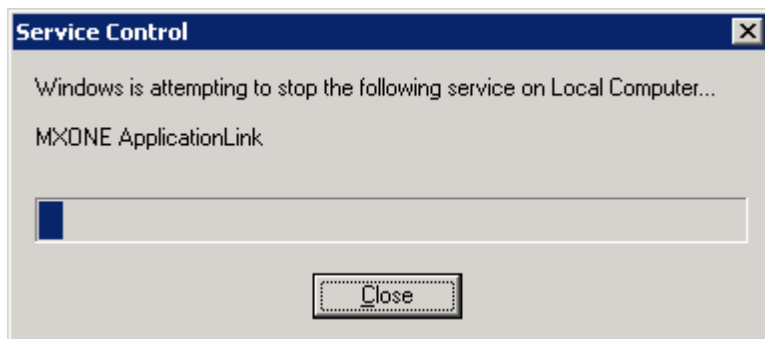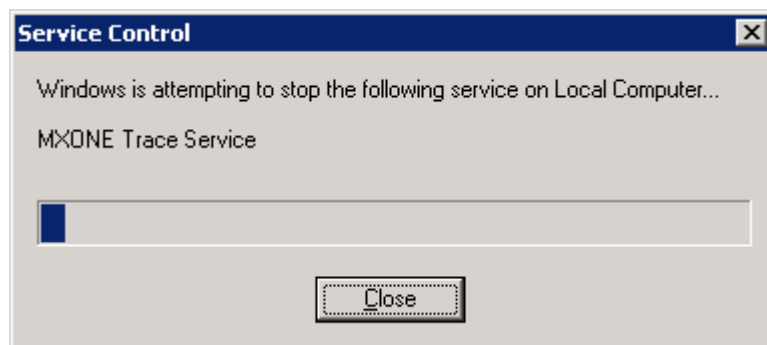
TRACING

To help during fault location, a Trace Utility is included in ApplicationLink. The Trace Utility writes internal information about various events in the ApplicationLink program to the Trace Utility window and to a trace file.

> **Note**:The trace information is primarily meant to be analysed by Mitel's service engineers, the information in this section therefore only describes the operation of the Trace Utility so that necessary trace information can be provided to the service engineer in case of problems.

See the *Configuring the Trace display* section for information on how to configure the trace functionality.

REMOTE TRACING

The Trace Utility for ApplicationLink may be run on a remote host to reduce the load on the ApplicationLink server. To do this, copy the files `alconfig.exe` and altrace.exe to the remote computer, run `alconfig.exe` and configure the trace parameters, then run `altrace.exe`. When the **Server Information** dialog opens, enter the Host Name and Port number of the ApplicationLink server to connect remotely.

VERIFYING APPLICATIONLINK

VERIFYING INITIALIZATION

Verify successful initialization of ApplicationLink by checking that the ApplicationLink Service is executing (using the Services control panel as described above) and that there are no error messages in the Windows Event Log (see also Chapter 7 Troubleshooting for more details).

VERIFYING THE STATUS OF THE LINK BETWEEN THE MX-ONE TSW AND APPLICATIONLINK

Use the MML command CSTLP as described in Below dialog is the final status dialog of uninstallation process. Click on Finish button to complete the uninstallation process.
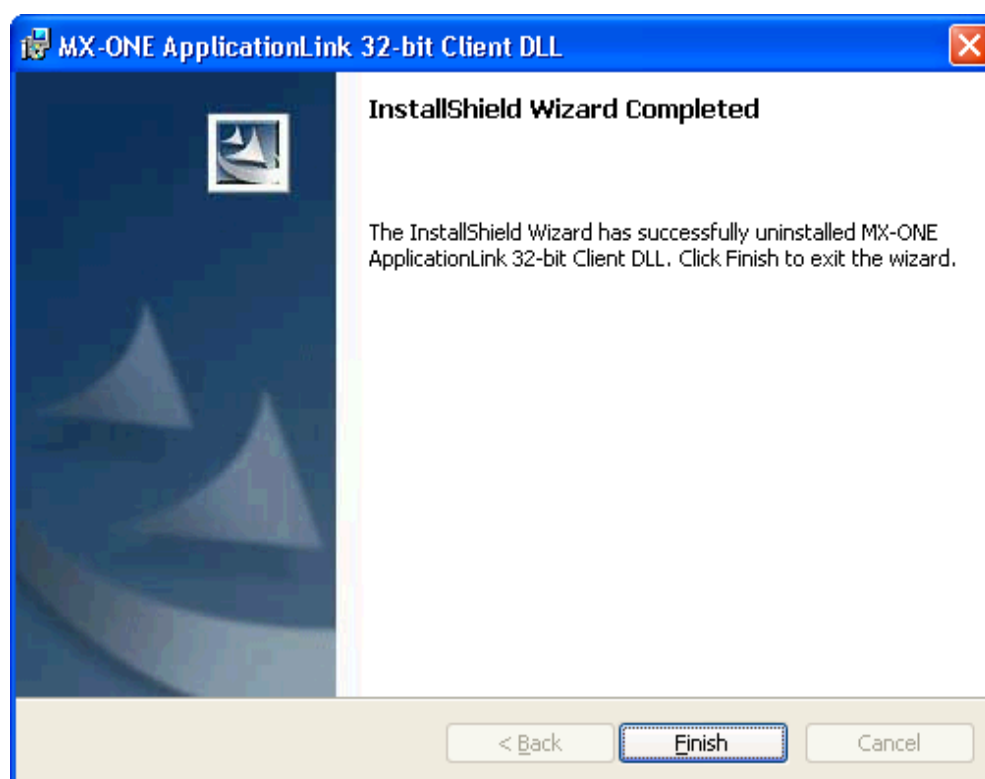
VERIFYING CLIENT OR API SERVER CONNECTIVITY

When a Client or API server connects to ApplicationLink, the following message should be received if tracing is activated:

```
Client Session Connected
```

If a connection to the Client or API Server cannot be established, verify the physical connection to the Ethernet LAN from both the Client/API server and ApplicationLink, and verify the client connection configuration parameters, as outlined in the section *Connection to Clients or API Server*.

CHAPTER 6   ADVANCED TOPICS

REDUNDANCY

Redundancy for ApplicationLink is possible in several different ways, the following table shows what can be duplicated and what the advantages are:

DUPLICATED OBJECT	ADVANTAGES
NIU board	The signal path can be optimised by putting NIU boards in the same LIMs as the monitored devices are located.
	The system becomes less vulnerable for switch malfunctions since the monitors ar dynamically moved in case of a CSTA Link failure.
	For details on how to set up the CSTA Links, see *Chapter 3 ApplicationLink Configuration* and Below dialog is the final status dialog of uninstallation process. Click on Finish button to complete the uninstallation process.
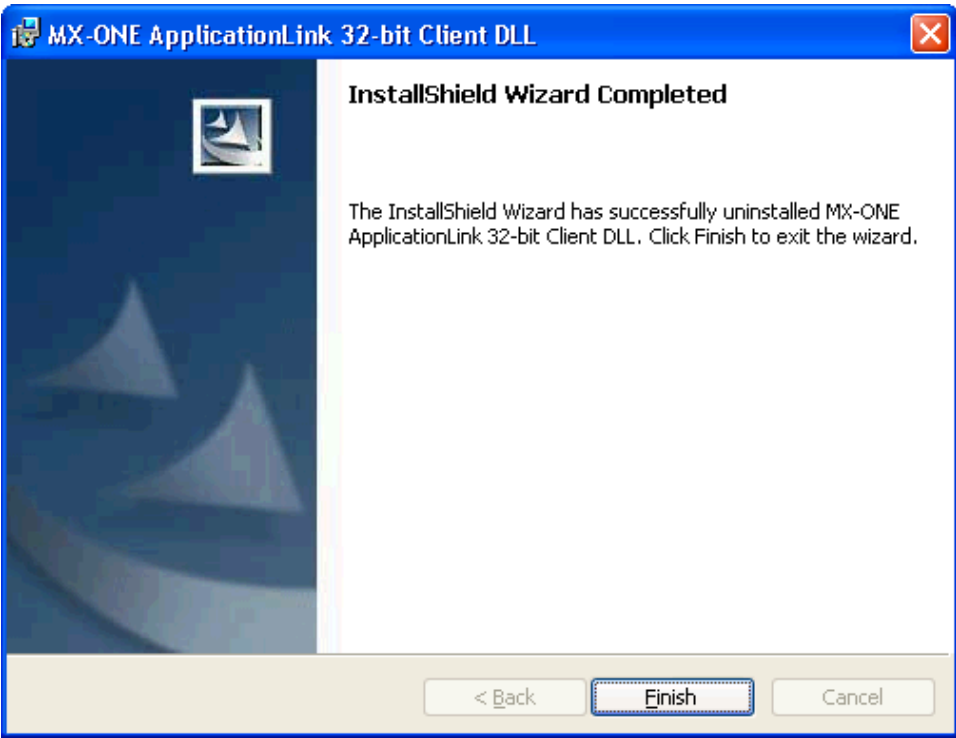
ApplicationLink server	By having a backup ApplicationLink server cold standby can be provided, but this is solely the responsibility of the client software.
	See the *Standby ApplicationLink* server section below for further details.
LAN for CSTA Links	The signalling performance is increased due to the reserved bandwidth.
	The system becomes less vulnerable for network
	The security of the network is increased since the NIU/AL communication is isolate from the rest of the network.
	See the *Secondary LANs for CSTA Links* section below for details on installing a secondary LAN.

STANDBY APPLICATIONLINK SERVER

No standby functionality is provided by ApplicationLink, this is solely the responsibility of the client software. The following subsections explain the possibilities of different types of standby.

For information on the client software requirements for standby, see the *ApplicationLink Application Programmer's Guide*.

COLD STANDBY

Cold standby means that two ApplicationLink servers are configured and running, but only one is actively used (primary server), the other is a pure backup (secondary server) in case of a primary server malfunction. If such a malfunction occurs the client software must detect that and switch over to the second server. This procedure may affect the end-users as all existing monitors will need to be restarted, i.e. the context of each device may be lost.

WARM STANDBY

If two ApplicationLink servers are each responsible for half of the monitored devices, warm standby can be accomplished. I.e. in case one server should go down, the other server could take full responsibility and monitor all devices and only half of the endusers may be affected.

HOT STANDBY

Hot standby, i.e. switching between two ApplicationLink servers without impacting the end- user, is not possible since two ApplicationLinks cannot monitor the same device.

SECONDARY LANS FOR CSTA LINKS

Secondary LANs are possible for the communication between the ApplicationLink server and the MX-ONE TSW, this may be desired for a number of reasons, e.g. capacity since the bandwidth is guaranteed on a secondary LAN and the traffic will not load the rest of the network. This section describes how to set up a secondary LAN.

To set up the secondary LAN, follow this procedure.

1. Mount the secondary LAN card in the ApplicationLink server.

   This manual does not cover the details on this procedure, consult your PC technician if you are unsure on this procedure.

2. Set up the network cabling between the LAN card and the NIU boards.

   One or more NIU boards:

   Use an Ethernet Hub and connect the LAN card and the NIU boards to the Hub.

   One NIU board:

   Instead of an Ethernet Hub a cross-wired network cable may be used tobdirectly connect the LAN card to the NIU, the following figure shows how the cable should be wired.

RJ-45 Socket   **RJ-45 Plug**

```
        Tx+  1                                              1 Tx+
        Tx-  2                                              2 Tx-
        Rx+  3                                              3 Rx+
   not  used  4                                             4 not used
   not used 5                                               5 not used
        Rx-  6                                              6 Rx-
   not  used  7                                             7 not used
   not used 8                                               8 not used
```
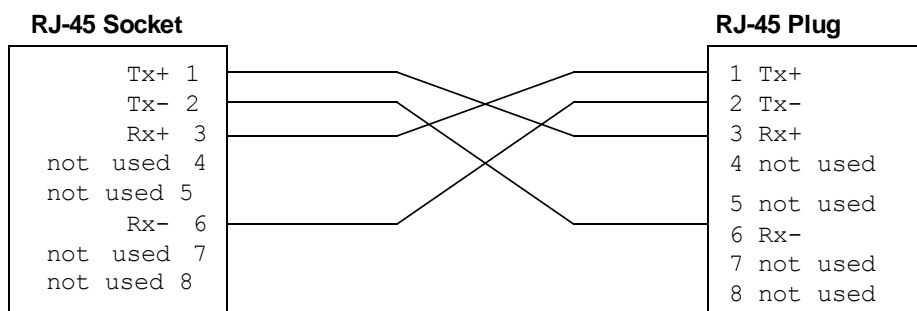
The cable from the NIU should be connected to the RJ45 Socket and the RJ-45 Plug should be connected to the LAN Card.

3. Select an IP Address range for the secondary LAN

    The address range needs to have a different sub-net address than the LAN card and NIU boards on the primary LAN, i.e. the first, second or third number of the IP Address needs to be different. For example, if the primary LAN IP Address range is 1.2.3.* the secondary address range could be is 1.2.4.* assuming that no other devices on the network is already using that address. Consult your network administrator if you are unsure about what addresses that are available.

4. Configure the LAN card (refer Windows for instruction)

5. Configure the NIU boards by following the procedure described in Below dialog is the final status dialog of uninstallation process. Click on Finish button to complete the uninstallation process.
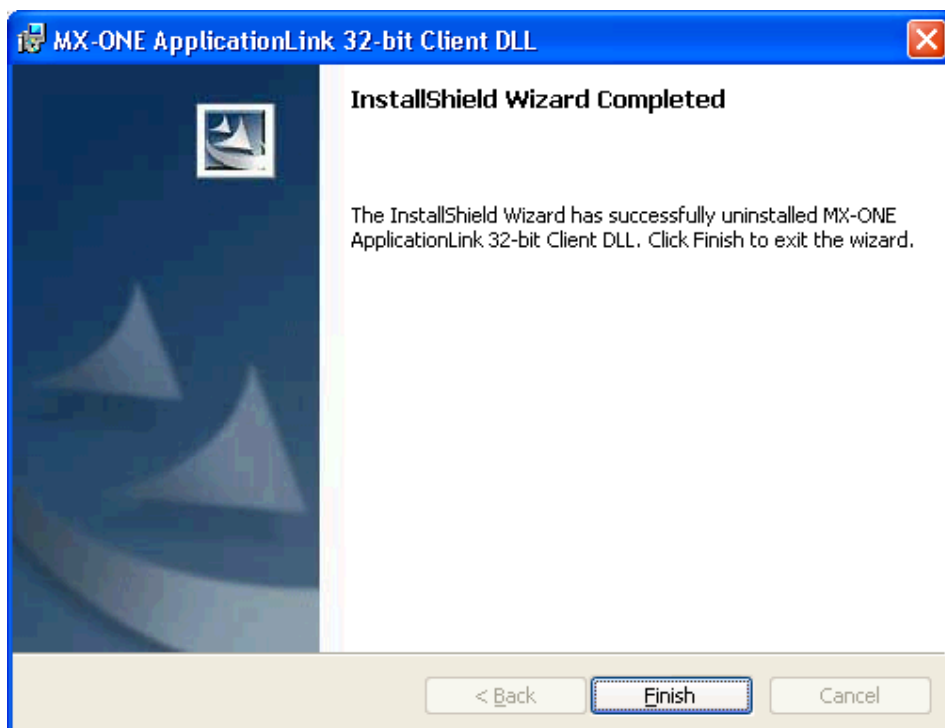
6. As Gateway address enter the IP Address of the newly installed LAN card.

7. Test the secondary LAN with the command ping on the Windows

    Command Prompt, for example:

```
C:\>ping 195.100.113.121

Pinging 195.100.113.121 with 32 bytes of data:

Reply    from 195.100.113.121:    bytes=32  time<10ms     TTL=59

Reply    from 195.100.113.121:    bytes=32  time<10ms     TTL=59

Reply    from 195.100.113.121:    bytes=32  time<10ms     TTL=59
Reply    from 195.100.113.121:    bytes=32  time<10ms     TTL=59
```

8. Configure ApplicationLink to use the secondary LAN by adding the IP Address of the NIU on the secondary LAN in the Configuration Utility, see Chapter 3

   ApplicationLink Configuration for more details.

9. Verify that the secondary LAN is being used with the MML command CSTLP. In the command printout, check that the state of the CSTA Link is CONNECTED.

CHAPTER 7   TROUBLESHOOTING

This chapter describes messages that may occur during operation and installation of ApplicationLink. Descriptions of possible error messages related to ApplicationLink are also presented.

DISPLAYING TRACE INFORMATION

Tracing information can be sent to the screen, a file or both. See the section Configuring the Trace display for more information.

To begin tracing, the ApplicationLink Trace Utility must be started. See the sections Tracing ApplicationLinkfor more information.

> **Note**: The trace utility should not be used for normal operation as it may cause degradation in system performance.

The general messages in the Trace Utility have the following categories.

Failure Appears in Red text

Failures indicate system or protocol malfunction. An example of a failure is a CSTA protocol message received from the Client that could not be decoded by the ApplicationLink. The failure messages are also logged in the Windows Event log, which may be viewed using the Windows Event viewer under the Application type log.

Failure messages should be logged and reported to Mitel.

Warning Appears in Green text

Warning messages indicate that an unexpected operation occurred which is not a malfunction but should be investigated. An example of a warning is when the configuration tool is not able to write trace settings to the Windows Registry. Warning messages should be logged and investigated.

Success/Status Appears in Black text

Status messages indicate normal status information. An example of a status message is when a Client connects over TCP/IP to the ApplicationLink.

Status messages need not be logged, but it is recommended those status messages are observed especially at start up of ApplicationLinkand at Client connection.

The protocol specific messages have the following categories:

CSTA request Appear in Blue

CSTA requests are messages received from the computing domain, such as the Client, into the MX-ONE TSW domain, which also includes ApplicationLink service.

CSTA event Appear in Green

CSTA events are messages sent from the MX-ONE TSW domain, which includes ApplicationLink service to the computing domain such as the Client.

USING EVENT VIEWER FOR TROUBLESHOOTING

Start-up error messages are normally related to the configuration settings, the network connection system or failure to set up the connections to the MX-ONE TSW or Clients.

All error messages will be stored in the Windows System Event Log, as well as sent to the trace file or screen, if tracing is enabled. The Windows System Event Log can be viewed using the Windows Event Viewer.

APPLICATIONLINK - MX-ONE TSW LINK FAILURES

This section describes the different possible failures on the link between ApplicationLink and the MX-ONE TSW, the effects on monitored devices, symptoms in the Trace Utility and the Windows Event Log, and possible actions that can be taken to correct the problem.

> **Note**: Due to the nature of some problems, the trace and/or failure messages may not occur immediately when the problem occurs. It may be minutes, in some cases, after the failure that a message is sent to the trace or an error message is logged in the Windows Event Log.

> **Note**: This section uses the term CSTA Link to specify the communication path between the ApplicationLink server and one NIU board, this must not be confused with the client connection protocols CSTA, i.e. CSTA Links are used by both ApplicationLink.

All CSTA Links Down

	Description
Reason	MX-ONE TSW restarted. All LIMs with a CSTA Link are blocked. Network malfunction or cable damage.
Effect	All monitors that were active are ended
Trace messages	System Status CSTA message, cause Messages Lost. System Status CSTA message, cause Disabled. Messages indicating which CSTA Links that are down.
Even Log	Logs showing which CSTA Links that are down.
Action	Check connections between ApplicationLink and MX-ONE TSW. Consult with your MX-ONE TSW administrator.

One CSTA Link Down (not all)

	Description
Reason	NIU cable unplugged/damaged. NIU board blocked or malfunctions. MD Software malfunction.
Effect	The monitors on that CSTA Link are dynamically reallocated to other available CSTA Links. If no other CSTA Link is available, all monitors will be stopped.
Trace messages	If no other CSTA Link is available: System Status CSTA message, cause Messages Lost. Message indicating which CSTA Link that is down.
Even Log	Log showing which CSTA Link that is down.
Action	Check NIU cabling. Check if other functions on NIU are OK.

LIM with CSTA Link Isolated

	Description
Reason	The LIM where a CSTA Link is located is isolated (i.e. the group switch link is not operational).
Effect	If no other CSTA Link exists in another LIM, the monitors of devices that are not on the same LIM as the CSTA Link are ended. Otherwise they will be dynamically re-routed to other available CSTA Links. Monitors of devices on the isolated LIM are not affected
Trace messages	Messages indicating which monitors that are ended.
Even Log	No event logged.
Action	Consult with your MX-ONE TSW Administrator.

LIM with CSTA Link Blocked

	Description
Reason	LIM where a CSTA Link is located is manually blocked or blocked due to a fault in the MX-ONE TSW.
Effect	If no other CSTA Link is available in another LIM all monitors will be stopped, otherwise monitors on devices in the blocked LIM are ended.
	Messages indicating which monitors that are ended.
Event Log	No events logged.
Action	Consult with your MX-ONE TSW Administrator.

LIM without CSTA Link Blocked

	Description
Reason	LIM where no CSTA Link is located is manually blocked or blocked due to a fault in the MX-ONE TSW.
Effect	All monitors on that LIM are ended.
Trace messages	Messages indicating which monitors that are ended.
Event Log	No event logged.
Action	Consult with your MX-ONE TSW Administrator.

LIM without CSTA Link Isolated

	Description
Reason	A LIM where no CSTA Link is located is isolated (i.e. the group switch link is not operational).
Effect	All monitors on that LIM are ended.
Trace	Messages indicating which monitors that are ended.
Event Log	No event logged.
Action	Consult with your MX-ONE TSW Administrator.

CHAPTER 8   APPLICATIONLINK 32-BIT CLIENT DLL

OVERVIEW

The ApplicationLink 32-bit Client DLL enables TSAPI applications to communicate with ApplicationLinkwithout the need for a Novell Telephony Server. This is accomplished by emulating the TSAPI API in a Dynamic Link Library (DLL) that can be used by TSAPI Applications running on Win32 platforms, e.g. Windows 95/NT. When other platforms are desired, the Novell Telephony Server is still required.

INSTALLING APPLICATIONLINK 32-BIT CLIENT DLL

Install ApplicationLink 32-bit Client DLL as follows:

1. Insert the Open Application Server CD-ROM into the CD-ROM drive, the Master Setup screen will be automatically displayed.

    If the Master Setup screen is not automatically displayed, it can be opened manually by using the Windows Explorer: locate the setup.exe file in the root of the CD-ROM drive and double-click it.

    Click on **Install TSAPI Client DLL** to continue.

2. When the ApplicationLink 32-bit Client DLL installation program starts, you will see the following screen:
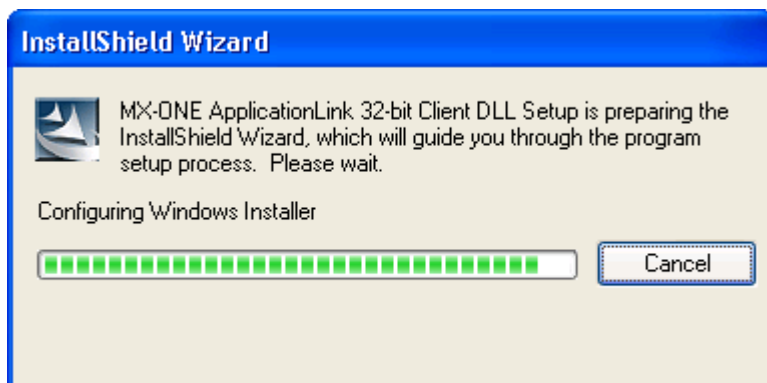
3. When the initialization is complete, the Welcome dialog box will appear.
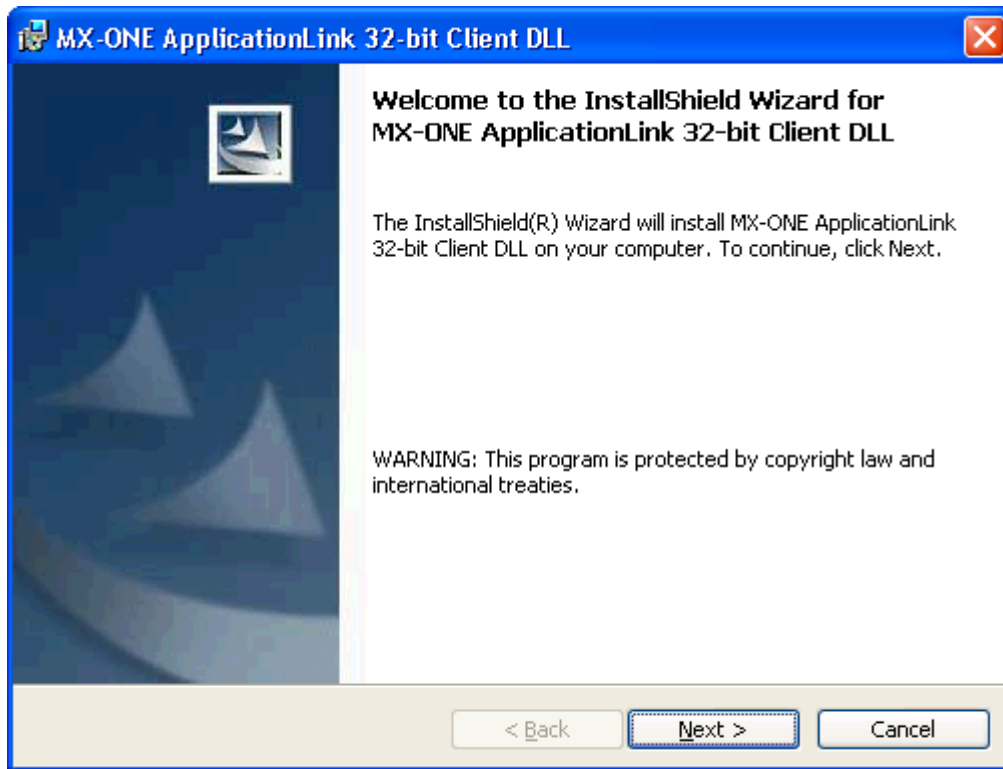
Click **Next >** to proceed with the installation.

4. The Destination Location dialog box allows you to enter where you want the ApplicationLink 32-bit Client DLL files to reside. By default, these files will be located on the C: drive in the \Program Files\Mitel\AppLinkClient sub-directory. You may change the drive and directory location as desired, by clicking on the **Change** utton.
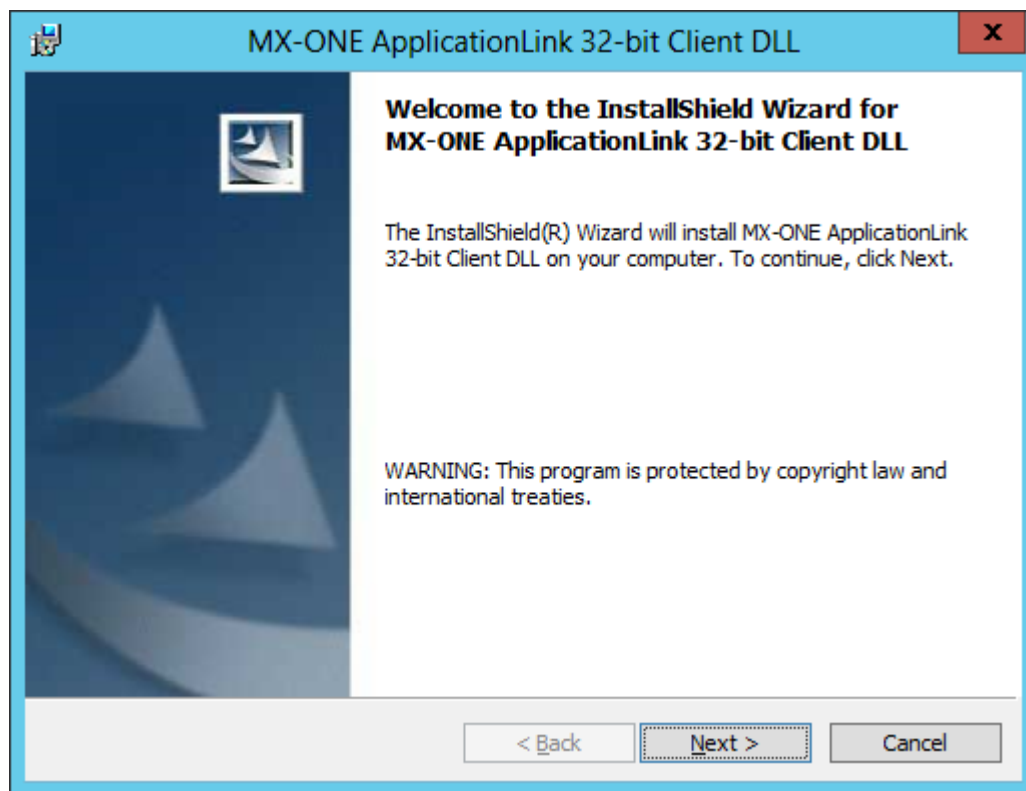
Click **Next >** to proceed with the installation.

5. The next dialog is the "Ready to install the Program" dialog, which will start the installation process.
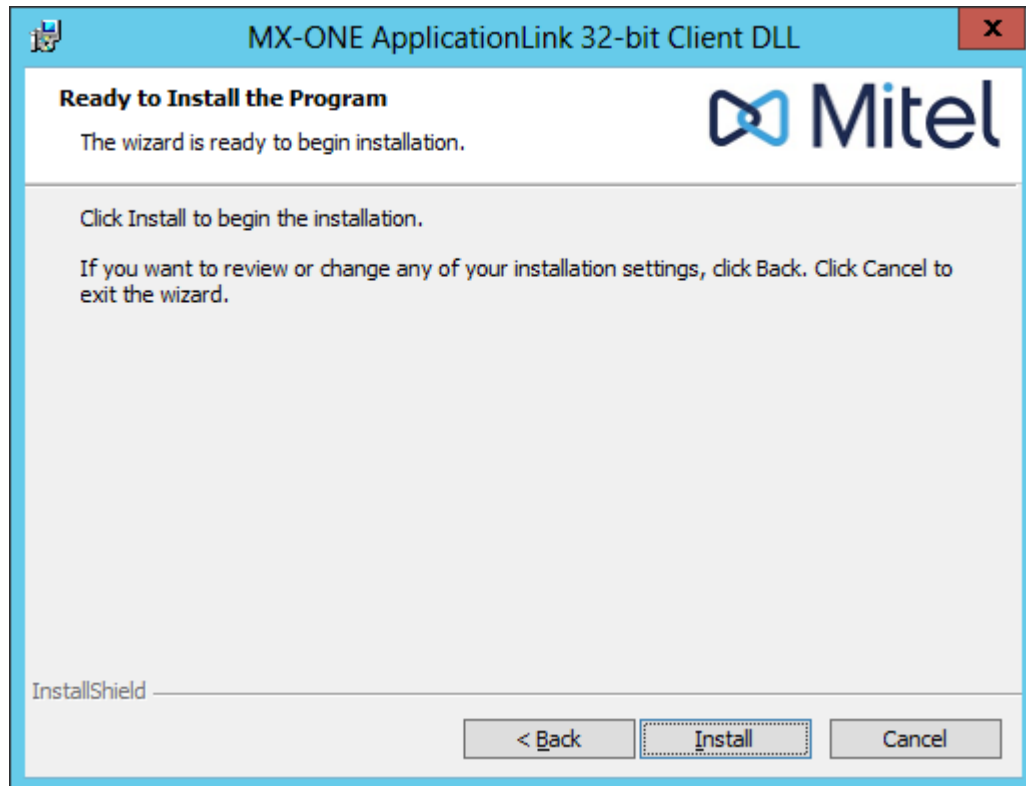
Click on **Install** to start the installation.

6. This dialog box will appear to indicate progress of the ApplicationLink 32-bit Client DLL installation.
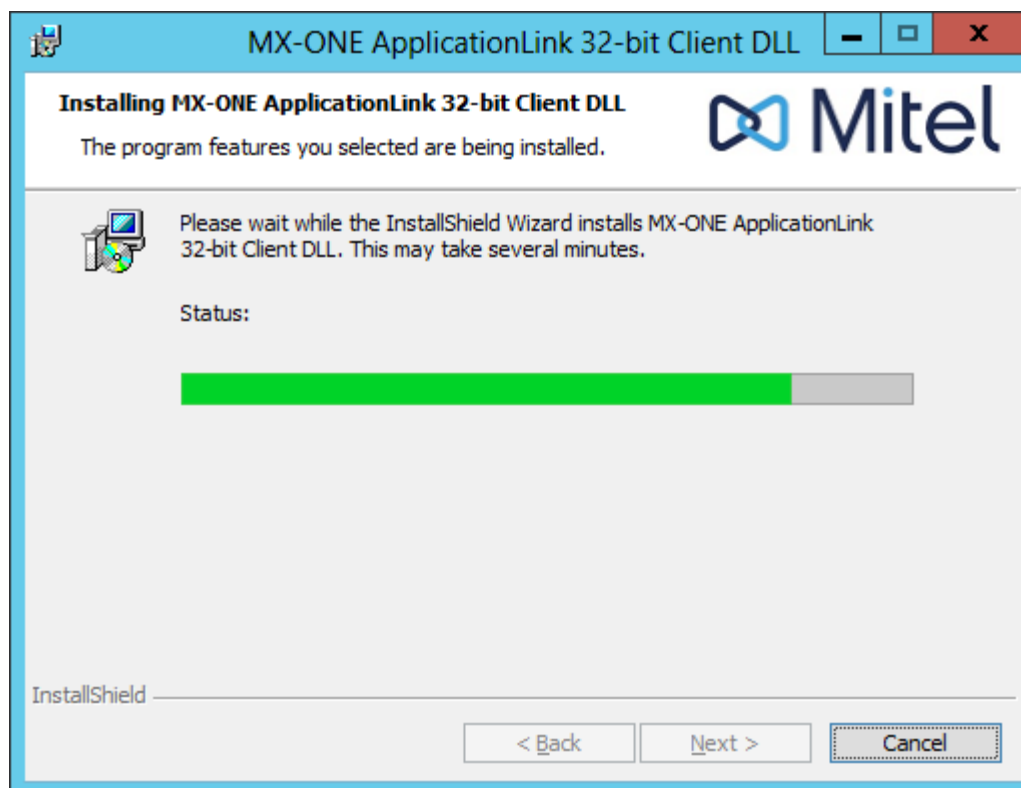
7. The **Mitel CSTA32 Workstation Setup** window will appear automatically, see the Configuring ApplicationLink 32-bit Client DLL section below for details on this dialog. Click **OK** to continue.

8. The installation is now complete and the following dialog box will appear.
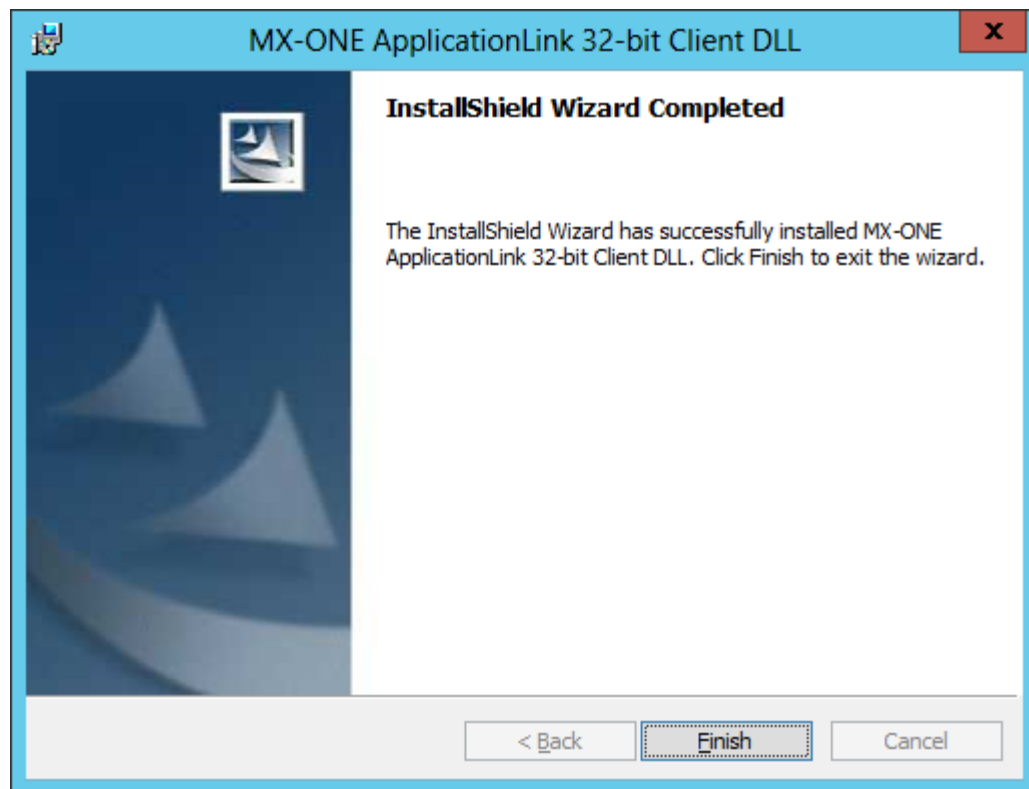
CONFIGURING APPLICATIONLINK 32-BIT CLIENT DLL

Before the ApplicationLink 32-bit Client DLL can be used it must be properly configured. Follow this procedure to configure the ApplicationLink 32-bit Client DLL.

1. Click **Start** on the task bar, point to Programs/MX-ONE ApplicationLink Client and click on **Client Configuration**
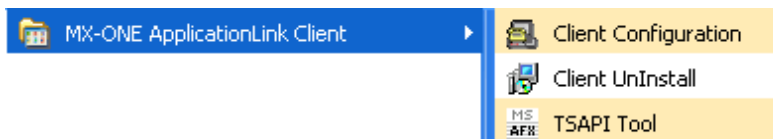
2. The Mitel CSTA32 Workstation Setup dialog will appear.
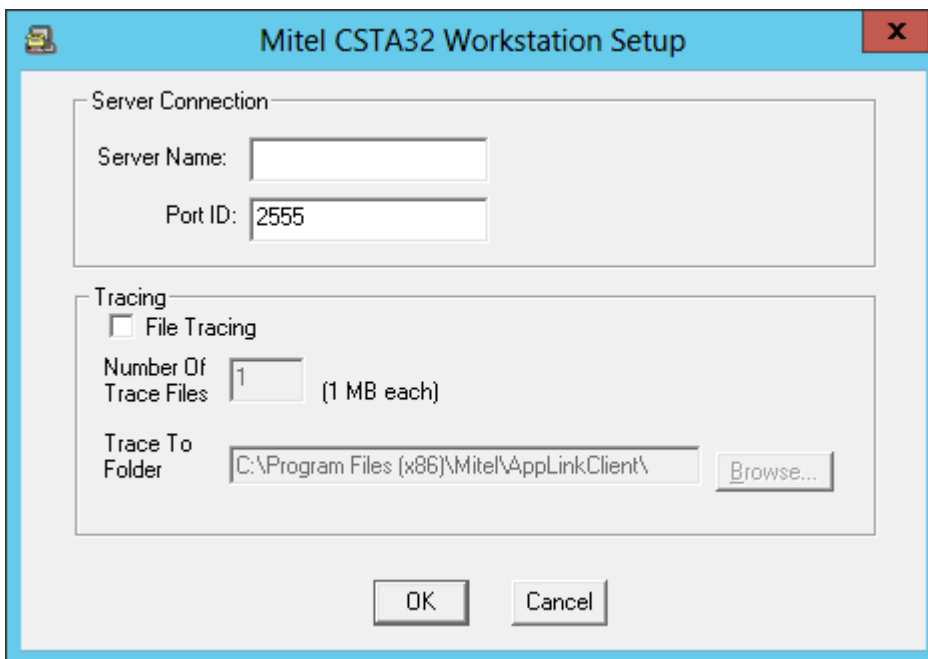
   a. In the **Server Connection** section, enter the host name of the ApplicationLink server and the port number selected for ApplicationLink Client Connection in the appropriate fields (for information on configuring the Client connection port number see Chapter 3

   b. In the **Tracing** section, check **Screen Tracing** and/or **File Tracing** if trace nformation is desired. If tracing is enabled, it will activate automatically when the ApplicationLink 32-bit Client DLL is being used by an application.

   The **Number of Trace Files** value specifies how much trace information that will be saved. The range of the value is 1 to 100. Each generated trace file will have a maximum size of 10 MB. When the maximum size has been reached, the current file is closed and a new trace file is opened. This way up to 1 GB of tr ace information can be generated.

   The Trace To Folder value specifies the trace file location. Default value is specified as the installation directory of the csta32 client DLL. A Browse button also provided to change the default location of trace file.

The naming convention of the trace files is "TSAPITRCnn.OUT" where nn is the sequence number of the trace file, e.g. "TSAPITRC07.OUT". The file that is currently being written to is named "TSAPITRCnnC.OUT", e.g. "TSAPITRC08C.OUT". When the 32-bit Client DLL is no longer used and the tracing is deactivated the last file will still be named "TRACEnnC.OUT" so that it will be easy to tell which file that was the last one.

When the number of files generated has reached the configured maximum value, the numbering will start over from zero and the oldest file will be deleted.

The location of the generated trace files is dependent on what application that is using the 32-bit Client DLL, look in the TSAPI trace window for a message telling where the files are located.

Note: Each time the 32-bit Client DLL is being used and **File Tracing** is enabled, all previous trace files in the same directory will be deleted.

Note: The Trace function is only supposed to be used during fault location, and the information printed in the Trace window is only intended to be read by Mitel's service engineers.

Click **OK** to close the window and save the settings or **Cancel** to discard the changes.

UNINSTALLING APPLICATIONLINK 32-BIT CLIENT DLL

To remove ApplicationLink 32-bit Client DLL from the system, follow this procedure.

1. Click **Start** on the task bar, point to **Programs/MX-ONE ApplicationLink Client** and click on Client Uninstall.
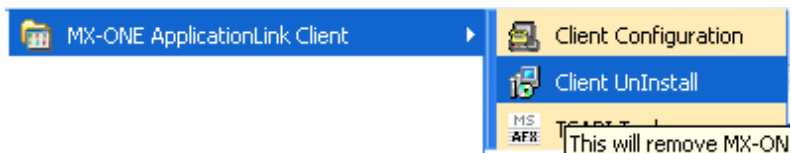
2. The MX-ONE ApplicationLink Client Uninstallation program will start and you will see the following screen, to inform the user that setup for ApplicationLink Client is initialized. Click Next to continue the Uninstallation.
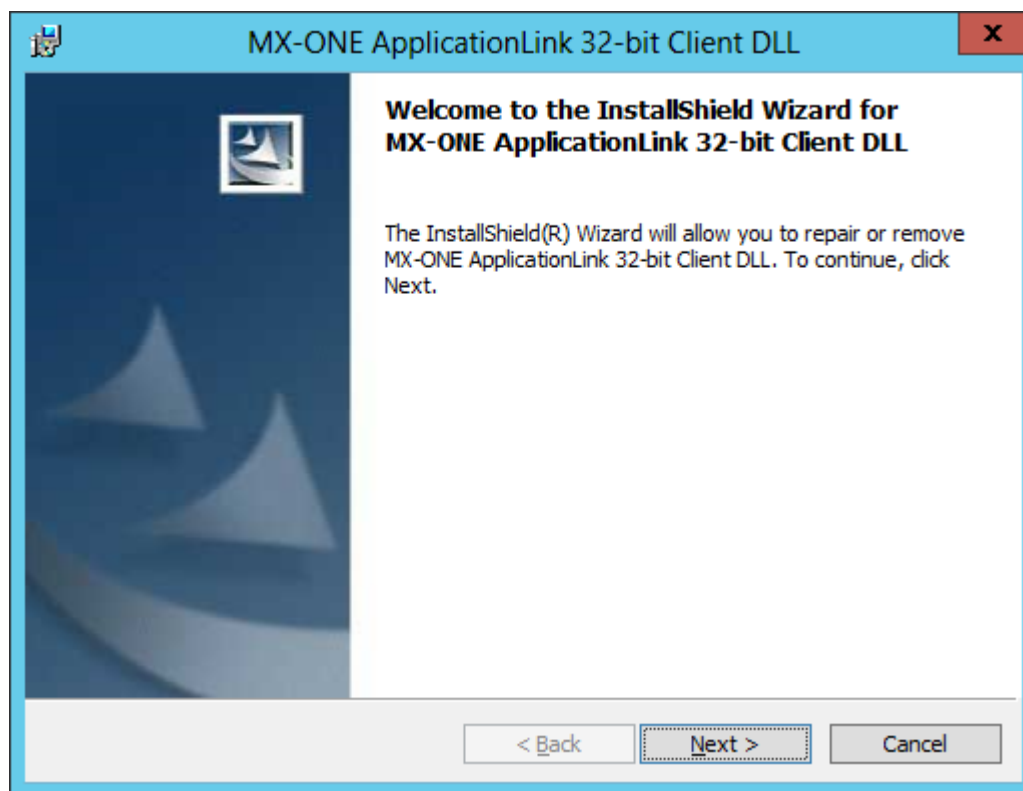
Click **Next** to continue the Uninstallation.

3. The Uninstallation will proceed immediately and the Program Maintenance dialog box will appear, which has Repair and Remove options.
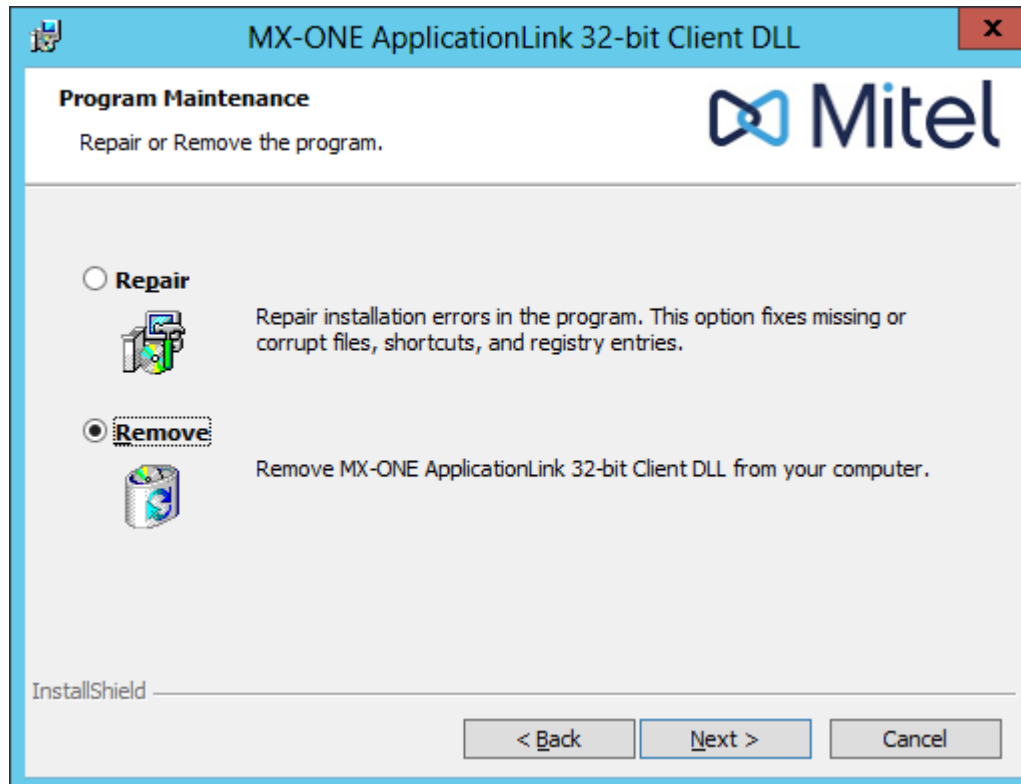
4. Click **Next** to get the below dialog which will start final uninstallation process.
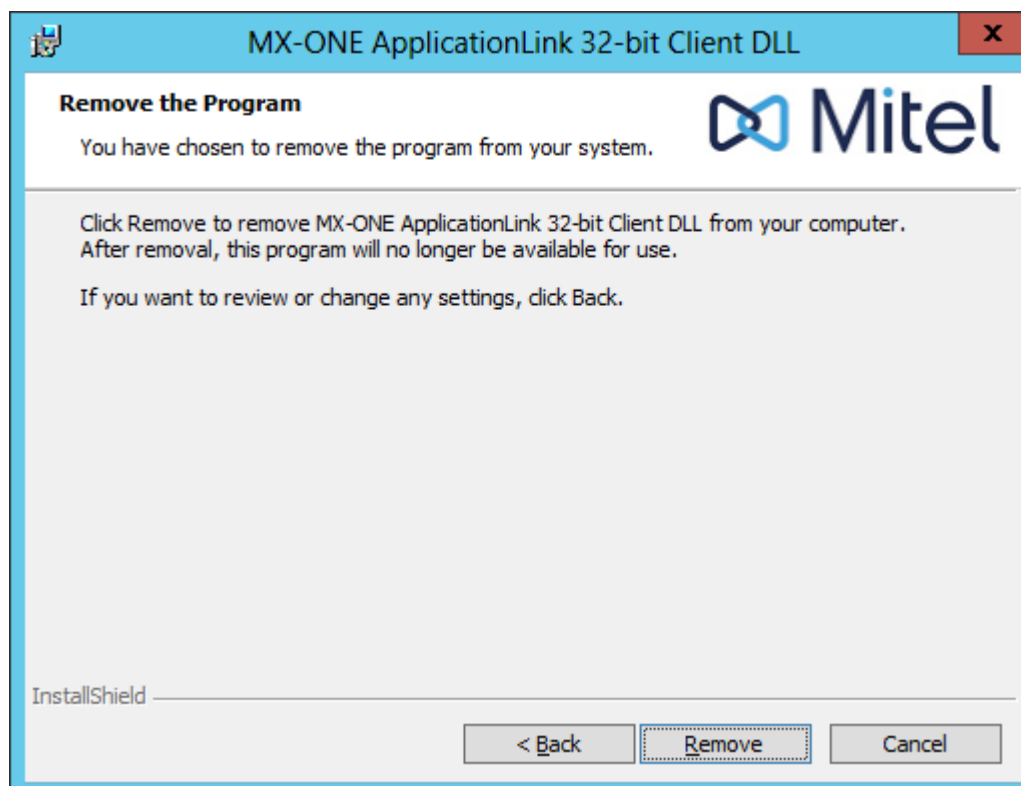
5. The following dialog box will appear to indicate uninstallation progress
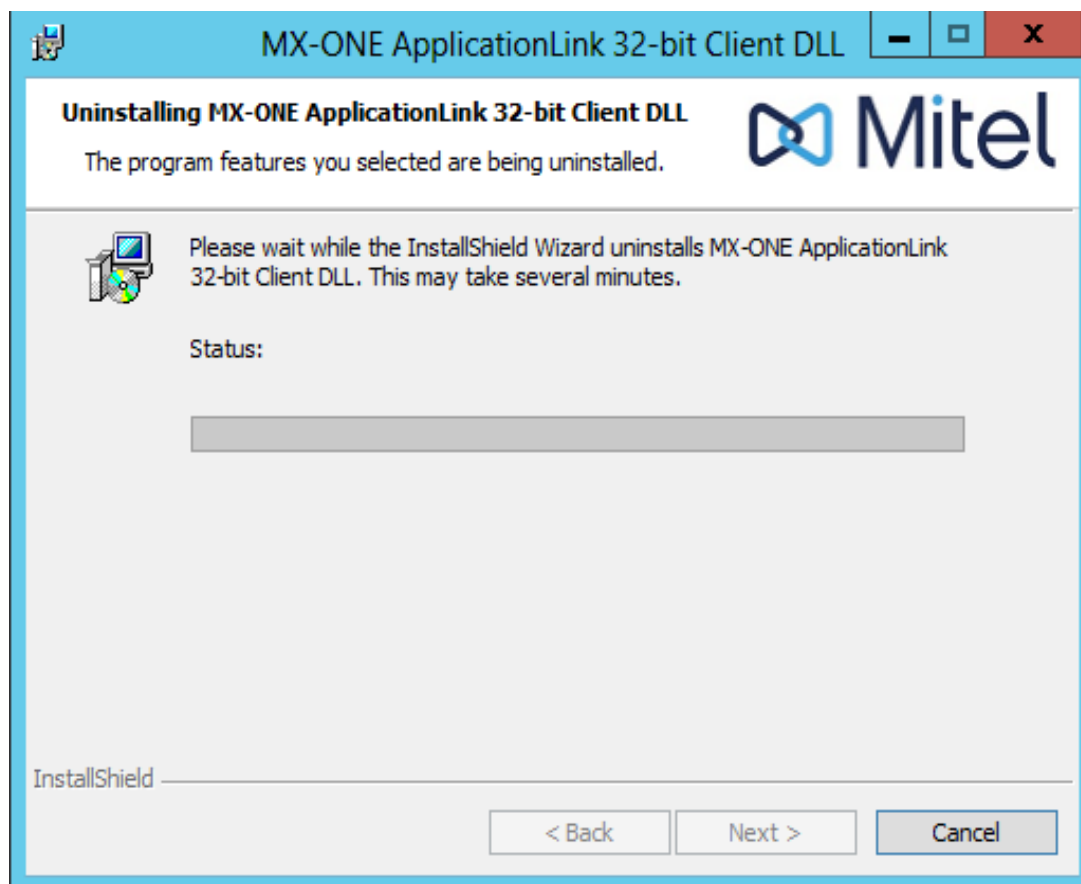
6. Below dialog is the final status dialog of uninstallation process. Click on Finish button to complete the uninstallation process.
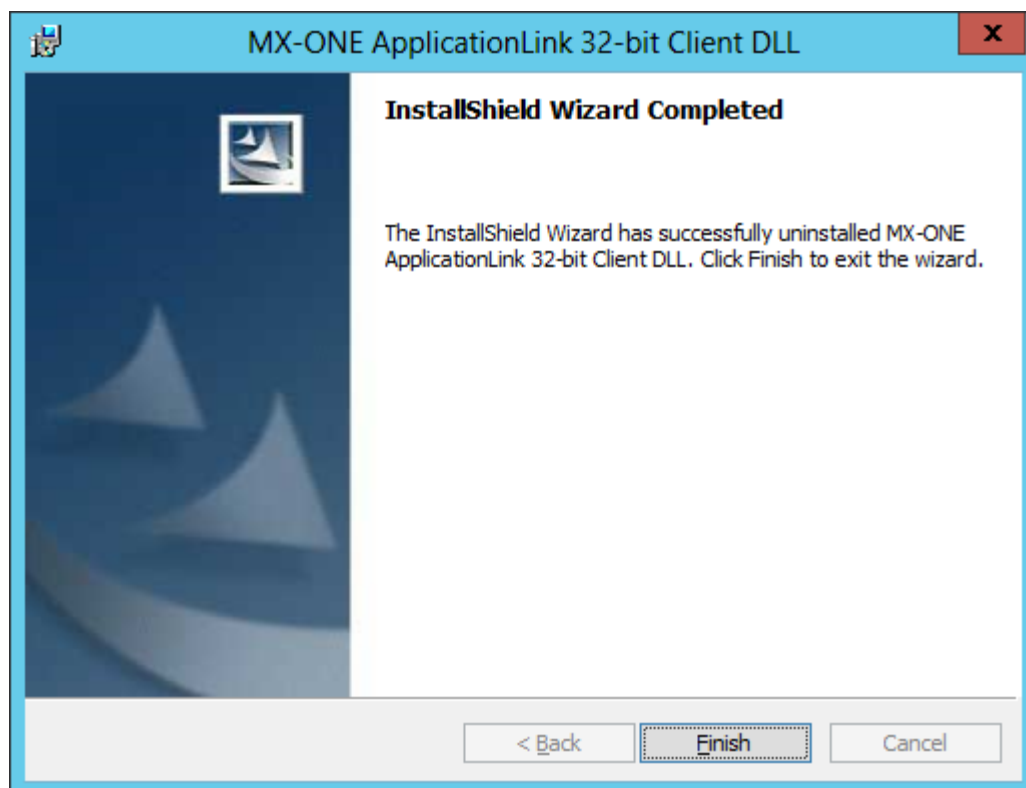
APPENDIX A MX-ONE TSW ADMINISTRATION

The communication between ApplicationLink and the MX-ONE TSW must be configured in the MX-ONE TSW as well. This appendix describes a number of MML commands for Initiation, Verification and Deletion of the ApplicationLink connections in the MX-ONE TSW.

The MML commands should be entered using the FIOL or WinFIOL communication program.

	Command	Description
Initiation	IOBPI	Initiates the NIU board
	IONPC	Sets the network parameters of the NIU board
	IOEQI	Initiates the I/O device of the NIU board
	IONCI	Initiates the CSTA Application on the NIU board
	CSTLI	Initiates the Link Group
Verification	IODDP	Prints initiations of all NIU boards
	IONPP	Prints network parameters of all NIU boards
	IONCP	Prints all initiated CSTA Applications
	CSTLP	Prints all initiated Link Groups and their state
Deletion	CSTLE	Removes the Link Group
	IONCE	Removes the CSTA application
	IOEQE	Removes the I/O device
	IOBPE	Removes the NIU initiation

After a configuration change has been made, a dump to backup media (using MX-ONE TSW command DUSYI) should be performed to ensure that the configuration change persists if the MX-ONE TSW is restarted.

This section uses the terms CSTA Link and CSTA Application to specify the functionality of link(s) between Application Link and the MX-ONE TSW. This must not be confused with the client connection protocols CSTA, i.e. the following commands apply to both ApplicationLink.

This section briefly describes the commands necessary for CSTA Link maintenance in the MX-ONE TSW, for a complete description, refer to the MX-ONE TSW Operation and Maintenance manual.

The NIU board is a multi purpose board, some of these commands may not be necessary depending on what is already initiated on the NIU board.

INITIATING THE NIU BOARD(S) FOR APPLICATIONLINK COMMUNICATION

For each NIU board intended for ApplicationLink usage the following command sequence is necessary:

IOBPI	Initiates the NIU board
IONPC	Sets the network parameters of the NIU board
IOEQI	Initiates the I/O device of the NIU board
IONCI	Initiates the CSTA Application on the NIU board
CSTLI	Initiates the Link Group This command must be repeated for each ApplicationLink

When the board is initiated its configuration should be checked using the print commands described in the Verifying the NIU board(s) configuration section below.

IOBPI - Initiates the NIU board

The IOBPI initiates the NIU board and associates a NODE identifier with it. The command syntax is:

```
IOBPI:BPOS=bpos,NODE=node;
```

where `bpos` represents the board position of the NIU board on the format *LIM-Magazine-BoardSlot* and `node` is an alphanumeric string used for identification of the board.

Verify the successful execution of the command by looking for the printout:

```
EXECUTED
```

Example

In this example the NIU board in LIM 1, Magazine 0, Board slot 10 `(1-0-10)` is initiated with the NODE identifier NIU1.

```
<IOBPI:BPOS=1-0-10,NODE=NIU1;
EXECUTED
```

IONPC - Sets the network parameters of the NIU board

The IONPC command sets or changes the network parameters of the NIU board. The parameters that can be controlled are the IP Address, Gateway address and Network Mask. The command syntax is:

```
IONPC:EQU=equ_pos,IP=ip_addr,GATE=gateway,MASK=mask;
```

where `equ_pos` is the Equipment Position of the Networking individual of the NIU board, this value is always the Board Position appended with `-4`. The parameters `ip_addr`, `gateway` and `mask` are addresses on the format `N.N.N.N` where each number is between 0 and 255.

Verify the successful execution of the command by looking for the printout:

```
EXECUTED
```

Example

In this example the IP Address `195.100.113.121`, Gateway address `195.100.113.1` and Network mask `255.255.255.0` are set for the NIU board on position `1-0-10`.

```
<IONPC:EQU=1-0-10-4,IP=195.100.113.121,GATE=195.100.113.1,MASK=255.255.255.0;
EXECUTED
```

IOEQI - Initiates the I/O device of the NIU board

The IOEQI command initiates an I/O device on the Networking individual of the NIU board. The command syntax is:

```
IOEQI:EQU=equ_pos,IODEV=iodev,TYPE=NETWORK,USAGE=OUT;
```

where equ_pos is the same as in the IONPC command above, and iodev is an alphanumeric string identifying the I/O device. The TYPE and USAGE parameters should be entered exactly as stated when using NIU with ApplicationLink.

Verify the successful execution of the command by looking for the printout:

```
EXECUTED
```

Example

In this example the I/O device ID is set to CSTA1 for the NIU board on position `1-0-10`.

```
<IOEQI:EQU=1-0-10-4,IODEV=CSTA1,TYPE=NETWORK,USAGE=OUT;
EXECUTED
```

IONCI - Initiates the CSTA Application on the NIU board

The IONCI command initiates the CSTA Application on the I/O device previously created. The command syntax is:

```
IONCI:IODEV=iodev,USER=CSTA,LPORT=port;
```

where `iodev` is the I/O device ID defined in the IOEQI command above and `port` is a TCP/IP port number between 1024 and 65535. The `USER` parameter should be entered exactly as stated when using NIU with ApplicationLink.

Verify the successful execution of the command by looking for the printout:

```
EXECUTED
```

Example

In this example the port number 2500 is set for the CSTA Application on I/O device `CSTA1`.

```
<IONCI:IODEV=CSTA1,USER=CSTA,LPORT=2500;
```

CSTLI - Initiates the Link Group

The CSTLI initiates a Link Group name that identifies the ApplicationLink server and assigns it to an I/O device. The command syntax is:

```
CSTLI:IODEV=iodev,LGRP=linkgroup;
```

where `iodev` is the I/O device ID defined in the IOEQI command above and `linkgroup` an alphanumeric string, preferably the host name of the ApplicationLink server.

Verify the successful execution of the command by looking for the printout:

EXECUTED

Example

In this example the Link Group name BT-`HOLDUP` is assigned to the I/O device `CSTA1`.

```
<CSTLI:IODEV=CSTA1,LGRP=BT-HOLDUP;
```

Note: This command should be repeated for each ApplicationLink server connected to the NIU board.

VERIFYING THE NIU BOARD(S) CONFIGURATION

The NIU configuration can be verified using these commands:

IODDP	Prints initiations of all NIU boards
IONPP	Prints network parameters of all NIU boards
IONCP	Prints all initiated CSTA Applications
CSTLP	Prints all initiated Link Groups and their state

The printed data can be useful during initiation, fault location, re-configuration etc.

IODDP - Prints initiations of all NIU boards

The IODDP prints the initiations of all existing NIU boards. The command syntax is:

```
IODDP;
```

Example

In this example two NIU boards are initiated for CSTA usage. Since the NIU board is a multi-purpose board, the printout may be very large; here the bold lines show the CSTA I/O device initiations.

```
<IODDP;
I/O DEVICE DATA


NODE   IODEV/SUBFS      BPOS/EQU      SIPOS   TYPE/USAGE     STATUS         AUTH


NIU1   -                001-0-10      -       -              IN SERVICE
NIU1   SYSDISK1         001-0-10-0    3       ADTX           IN SERVICE
       SYSSUBFS11
       SYSSUBFS21
NIU1   SYSTERMINAL      001-0-10-1    -       MML            -              7
NIU1   CSTA1            001-0-10-4    -       NETWORK/OUT    IN SERVICE
NIU1   NETTY1           001-0-10-4    -       NETWORK/MML    -              7
NIU1   NETTY2           001-0-10-4    -       NETWORK/MML    -              7
NIU2   -                002-2-00      -       -              IN SERVICE
NIU2   CSTA2            002-2-00-4    -       NETWORK/OUT    IN SERVICE
NIU2   NETTY4           002-2-00-4    -       NETWORK/MML    -              7
NIU2   NETTY5           002-2-00-4    -       NETWORK/MML    -              7
END
```

IONPP - Prints network parameters of all NIU boards

The IONPP command prints the networks parameters of the initiated NIU boards. The command syntax is:

```
IONPP;
```

Example

In this example two NIU boards are initiated with network parameters.

```
<IONPP;
NETWORK PORT CONFIGURATION DATA
```

EQU	IP	GATE	MASK	ETHERNET
001-0-10-4	195.100.113.121	195.100.113.1	255.255.255.0	00.01.EC.0C.15.51
002-2-00-4	195.100.113.122	195.100.113.1	255.255.255.0	55.AA.55.AA.55.AA
END				

IONCP - Prints all initiated CSTA Applications

The IONCP command prints the initiated CSTA Applications and their port numbers on the NIU boards. The command syntax is:

```
IONCP;
```

Example

In this example two CSTA Applications are initiated.

```
<IONCP;
NETWORKING CONNECTION
```

NODE/IODEV	LIM	USER	TYPE/CON	IP	PORT	PROC
NIU1	1					
CSTA1		CSTA	SERVER/2	195.100.113.121	2500	TCP
NIU2	2					
CSTA2		CSTA	SERVER/2	195.100.113.122	2500	TCP
END						

CSTLP - Prints all initiated Link Groups and their state

The CSTLP command prints the initiated Link Groups and their connection state to ApplicationLink. The command syntax is:

```
CSTLP;
```

Example

In this example two Link Groups are initiated and connected to both NIU boards, i.e. four CSTA Links exists.

```
<CSTLP;
COMPUTER SUPPORTED TELECOMMUNICATIONS APPLICATIONS LINK GROUP DATA

LGRP          ACTIVE JOBS   IODEV        LIM        STATUS
BT-HOLDUP     15            CSTA1        1          CONNECTED
                            CSTA2        2          CONNECTED
BT-PEGASUS    22            CSTA1        1          CONNECTED
                            CSTA2        2          CONNECTED
END
```

The `ACTIVE JOBS` column shows how many devices that are currently being monitored/controlled by the connected ApplicationLink.

The `STATUS` column shows the status of each CSTA Link, the following table shows the possible values and what they mean:

Status	Description
CONNECTED	The CSTA Link is up
NOT CONNECTED	The CSTA Link is down, i.e. not connected to ApplicationLink
CONNECTED(NOT RESPONDING)	The CSTA Link is up but ApplicationLink is not responding
FAULTY	The CSTA Link is down due to a malfunction detected in the NIU or MD software related to the CSTA Link.

DELETING THE NIU BOARD(S) CONFIGURATION

If the initiation on a NIU board is to be removed the following command sequence is necessary:

	Removes the Link Group
CSTLE	This command must be repeated for each ApplicationLink
IONCE	Removes the CSTA application
IOEQE	Removes the I/O device
IOBPE	Removes the NIU initiation

CSTLE - Removes the Link Group

The CSTLE command removes the Link Group association from the I/O device. The commend syntax is:

    CSTLE:IODEV=iodev,LGRP=linkgroup;

where `iodev` is the I/O device identifier and `linkgroup` is the Link Group name. Verify the successful execution of the command by looking for the printout:

    EXECUTED

The command must be repeated for all Link Groups associated with the I/O device before continuing with the next command.

Example

In this example the Link Groups BT-HOLDUP and BT-PEGASUS are removed from the I/O device `CSTA1`.

    <CSTLE:IODEV=CSTA1,LGRP=BT-HOLDUP;
    EXECUTED

    <CSTLE:IODEV=CSTA1,LGRP=BT-PEGASUS;
    EXECUTED

IONCE - Removes the CSTA Application

The IONCE command removes the CSTA Application from the I/O device. The command syntax is:

    IONCE:IODEV=iodev,USER=CSTA;

where `iodev` is the I/O device identifier.

Verify the successful execution of the command by looking for the printout:

    EXECUTED

Example

In this example the CSTA Application is removed from the I/O device `CSTA1`.

    <IONCE:IODEV=CSTA1,USER=CSTA;
    EXECUTED

IOEQE - Removes the I/O device

The IOEQE command removes the I/O device from the NIU board. The command syntax is:

    IOEQE:IODEV=iodev;

where `iodev` is the I/O device identifier.

Verify the successful execution of the command by looking for the printout:

    EXECUTED

Example

In this example the I/O device `CSTA1` is removed.

    <IOEQE:IODEV=CSTA1;
    EXECUTED

IOBPE - Removes the NIU initiation

The IOBPE command removes the NIU initiation from the MX-ONE TSW. The command syntax is:

    IOBPE:NODE=node;

where `node` is the NODE identifier of the board.

Verify the successful execution of the command by looking for the printout:

    EXECUTED

Example

In this example the NIU board with the NODE identifier NIU1 is removed.

    <IOBPE:NODE=NIU1;
    EXECUTED

NIU INITIATION EXAMPLES

In this section, complete examples of initiation and removal of NIU initiations for ApplicationLink is presented. The examples use two NIU boards and two ApplicationLinks so that the concept of CSTA Links and Link Groups may be easier to understand.

The NIU boards are placed on the positions 1-0-10 and 2-1-30, the IP addresses 195.100.113.121 and 195.100.113.122 have been chosen for the boards, and the Link Group names are ALSERV1 and ALSERV2.

Initiation

```
/* NIU board on 1-0-10 */
IOBPI:BPOS=1-0-10,NODE=NIU1;
IONPC:EQU=1-0-10-4,IP=195.100.113.121,GATE=195.100.113.1,MASK=255.255.255.0;
IOEQI:EQU=1-0-10-4,IODEV=CSTA1,TYPE=NETWORK,USAGE=OUT;
IONCI:IODEV=CSTA1,USER=CSTA,LPORT=2500;
CSTLI:IODEV=CSTA1,LGRP=ALSERV1;
CSTLI:IODEV=CSTA1,LGRP=ALSERV2;


/* NIU board on 2-1-30 */
IOBPI:BPOS=2-1-30,NODE=NIU2;
IONPC:EQU=2-1-30-4,IP=195.100.113.122,GATE=195.100.113.1,MASK=255.255.255.0;
IOEQI:EQU=2-1-30-4,IODEV=CSTA2,TYPE=NETWORK,USAGE=OUT;
IONCI:IODEV=CSTA2,USER=CSTA,LPORT=2500;
CSTLI:IODEV=CSTA2,LGRP=ALSERV1;
CSTLI:IODEV=CSTA2,LGRP=ALSERV2;
```

Removal

```
/* NIU board on 1-0-10 */
CSTLE:IODEV=CSTA1,LGRP=ALSERV1;
CSTLE:IODEV=CSTA1,LGRP=ALSERV2;
IONCE:IODEV=CSTA1,USER=CSTA;
IOEQE:IODEV=CSTA1;
IOBPE:NODE=NIU1;


/* NIU board on 2-1-30 */
CSTLE:IODEV=CSTA2,LGRP=ALSERV1;
CSTLE:IODEV=CSTA2,LGRP=ALSERV2;
IONCE:IODEV=CSTA2,USER=CSTA;
IOEQE:IODEV=CSTA2;
IOBPE:NODE=NIU2;
```